सत्यमेव जयते

Government of India

Ministry of Mines



Annual Report 2017-18

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By Rabi Rath

ANNUAL REPORT
2017-18



सत्यमेव जयते

Ministry of Mines
Government of India



Ministry of Mines

Website Addresses:

Ministry of Mines	:	https://mines.gov.in
Geological Survey of India	:	www.portal.gsi.gov.in
Indian Bureau of Mines	:	www.ibm.nic.in
National Aluminium Company Limited	:	www.nalcoindia.com
Hindustan Copper Limited	:	www.hindustancopper.com
Mineral Exploration Corporation Limited	:	www.meclindia.com
Jawaharlal Nehru Aluminium Research Development and Design Centre	:	www.jnarddc.gov.in
National Institute of Rock Mechanics	:	www.nirm.gov.in
National Institute of Miners' Health	:	www.nimh.gov.in



Abbreviations

ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
BALCO	Bharat Aluminium Company Limited
BGML	Bharat Gold Mines Limited
BISAG	Bhaskaracharya Institute for Space Applications and Geo-informatics
CBM	Coal Bed Methane
CCEC	Central Coordination-Cum-Empowered Committee
CCoM	Chief Controller of Mines
CMDC	Chhattisgarh Mineral Development Corporation
CGPB	Central Geological Programming Board
CHQ	Central Head Quarter
CII	Confederation of Indian Industry
CMPDI	Central Mine Planning & Design Institute
CMR	Coal Mines Regulations
CoI	Commission of Inquiry
CoM	Controller of Mines
CPGRAMS	Centeralised Public Grievance Redressal and Monitoring System
CPPP	Central Public Procurement Portal
CSO	Central Statistical Office
CSR	Corporate Social Responsibility
DCoM	Deputy Controller of Mines
DGCA	Directorate General of Civil Aviation
DGM	Directorate of Geology & Mining
DGMS	Directorate General of Mines Safety
DGR	Draft Geological Report
DMF	District Mineral Foundation
DRDO	Defence Research and Development Organisation
DRM	District Resources Maps
EC	Environmental Clearance
ETP	Effluent Treatment Plant
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
EPMA	Electron Probe Micro Analyser
EPS	Enterprises Procurement System
FC	Forest Clearance
FGR	Final Geological Report
FICCI	Federation of Indian Chamber of Commerce and Industry
FIMI	Federation of Indian Mineral Industries
FMCP	Final Mine Closure Plan
FS	Field Season





GA	Geoscience Australia
GAC	Geoscience Advisory Council
GAIL	Gas Authority of India Limited
GMS	Geological Map Series
GPM	Geophysical Mapping
GQM	Geological Quadrangle Maps
GSI	Geological Survey of India
GSITI	Geological Survey of India Training Institute
GTV	Geotechnical Vessel
HCL	Hindustan Copper Limited
HGSS	Heliborne Geophysical Survey System
HINDALCO	Hindustan Aluminium Company Limited
HoD	Head of the Department
HPC	High Power Committee
IBM	Indian Bureau of Mines
ICMM	International Council of Mining and Metals
ICT	Information and Communication Technology
IDCOL	Industrial Development Corporation of Odisha Limited
IGC	International Geological Congress
IGCP	International Geoscience Programme
IMYB	Indian Mineral Year Book
INSA	Indian National Science Academy
ISRO	Indian Space Research Organisation
ISTM	Institute of Secretariat Training and Management
IUCN	International Union for Conservation of Nature and Natural Resources
JNARDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
JWG	Joint Working Group
KCC	Khetri Copper Complex
LME	London Metal Exchange
LOC	Local Organization Committee
LOI	Letter of Intent
MCAS	Mineral Concession and Approval System
MCDR	Mineral Conservation & Development Rules
MCP	Malanjkhand Copper Project
MCR	Mineral Concession Rules
MECL	Mineral Exploration Corporation Limited
ML	Mining Lease
MMDR Act	Mines & Minerals (Development and Regulation) Act, 1957
MNRE	Ministry of New and Renewable Energy
MSMP	Monthly Statistics of Mineral Production
MoC	Ministry of Coal
MoEFCC	Ministry of Environment, Forest and Climate Change



MoES	Ministry of Earth Sciences
MOIL	Manganese Ore India Limited
MoM	Ministry of Mines
MoTA	Ministry of Tribal Affairs
MoU	Memorandum of Understanding
MSDE	Ministry of Skill Development and Entrepreneurship
MSS	Mining Surveillance System
MTS	Mining Tenement System
NALCO	National Aluminium Company Limited
NCMT	National Centre for Mineral Targeting
NDSAP	National Data Sharing and Accessibility Policy
NER	North Eastern Region
NFTDC	Non-Ferrous Materials Technology Development Centre
NGCM	National Geochemical Mapping
NGIS	National Geo-Spatial Information System
NIMH	National Institute of Miners' Health
NIRM	National Institute of Rock Mechanics
NLSM	National Landslide Susceptibility Mapping
NMEEE	National Mission for Enhanced Energy Efficiency
NMA	National Mineral Awards
NMEP	National Mineral Exploration Policy
NMET	National Mineral Exploration Trust
NMI	National Mineral Inventory
NMP	National Mineral Policy
NPCIL	Nuclear Power Corporation of India Limited
NRSC	National Remote Sensing Centre
NSDC	National Skill Development Corporation
NSDI	National Spatial Data Infrastructure
OAMDR	Offshore Areas Mineral (Development & Regulations) Act, 2002
OC	Other Charges
OCBIS	Online Core Business Integrated System
OGP	Obvious Geological Potential
OGRV	Oceanographic Research Vessel
OMC	Odisha Mining Corporation
ONGC	Oil & Natural Gas Corporation
PDAC	Prospectors and Developers' Association of Canada
PERC	Project Evaluation and Review Committee
PGE	Platinoid Group of Elements
PL	Prospecting Licence
PMCP	Progressive Mine Closure Plan
PMKKKY	Pradhan Mantri Khanij Khsetra Kalyan Yojana
PRAGATI	Pro-Active Governance and Timely Implementation



PWDs	Persons with Disabilities
RA	Revision Application
RCoM	Regional Controller of Mines
REE	Rare Earth Elements
REY	Rare Earth Yettrium
RHQ	Regional Head Quarter
RMDS	Regional Mineral Development Studies
ROM	Run-of-mine
RP	Reconnaissance Permit
RQP	Recognised Qualified Persons
RSAS	Remote Sensing and Aerial Survey
RSMML	Rajasthan State Mines & Mineral Ltd.
RTI	Right to Information
SAC	Standing Audit Committee
SAIL	Steel Authority of India Ltd.
SCEC	State Coordination-Cum-Empowered Committee
SCMS	Skill Council for the Mining Sector
SCPP	Standing Committee on Promotional Projects
SDF	Sustainable Development Framework
SEGEMAR	Servicio Geologico Minero Argentino
SGM	Systematic Geological Mapping
SGPB	State Geological Programming Board.
SHe-Box	Sexual Harassment electronic-Box
SMIORE	Sandur Manganese & Iron Ores
SoP	Standard Operating Procedure
SSA	Senior Secretariat Assistant
SSAG	Standing Scientific Advisory Group
STM	Specialised Thematic Mapping
SU	State Unit
TAMRA	Transparency, Auction Monitoring and Resource Augmentation
TERI	The Energy and Resources Institute
TL	Thermo Luminescence
TOASS	Twin Otter Airborne Survey System
ToR	Terms of Reference
TW	Territorial Water
UCIL	Uranium Corporation of India Ltd.
UNFC	United Nations Framework Classification
VAL	Vedanta Aluminium Limited
WOCS	Working Office-cum-Secretariat
WPI	Wholesale Price Index



Contents

S.No	Chapters	Page No.
1	An Overview	1
2	Minerals and Metals in the Country	9
3	Legislative Framework, Mineral Policy and Implementation	19
4	Revenue from Mineral Resources	31
5	International Co-operation	37
6	Attached / Subordinate Offices	45
7	Central Public Sector Undertakings	75
8	Science & Technology Programme and Autonomous Bodies	103
9	Corporate Social Responsibility	113
10	Progressive Use of Hindi	119
11	Exploration Activities in the North-Eastern Region	129
12	Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities.	137
13	Budget and Audit Paras	145
14	Miscellaneous	155
Annexures		169



1

Ministry of Mines : An Overview



Ministry of Mines
An Overview

- Vision and Mission Page - 3
- Role and Organization of the Ministry Page - 3
- List of Subjects Allocated to the Ministry Page - 3
- Organizational Structure Page - 4
- Major Activities, Achievements and Initiatives during the Year Page - 5



Vision & Mission

1.1 Ministry's Vision and Mission are as below:

Vision

(i) Achieve optimal utilization of India's mineral resources through scientific, sustainable and transparent mining practices, exploration and geo-scientific research & development.

Mission

i) To develop geo-scientific partnerships with State Governments, Industry and other stakeholders for management of mineral resources both on land and offshore and development of mineral-based industries on scientific and sustainable basis.

ii) To ensure fairness and transparency in allotment of mineral concessions.

iii) To establish an e-governance mechanism for accountability of mineral resources from mine to end use/export.

iv) To ensure that the Geological Survey of India (GSI) and Indian Bureau of Mines (IBM) provide high standards of services to stakeholders.

Role and Organisation of the Ministry

Main Functions

1.2 Ministry of Mines is responsible for survey and exploration and mining of all minerals, other than natural gas, petroleum and atomic minerals and coal. In the case of atomic minerals and coal activities of the Ministry are limited to regional exploration. The Ministry is responsible for the administration of the Mines and Minerals (Development and Regulation) Act, 1957, (67 of 1957) and rules made there under in respect of all mines and minerals other than coal, natural gas and petroleum. The Ministry also administers the Offshore Areas Mineral (Development and Regulation) Act, 2002 and rules made there under.



Hon'ble Minister of Mines Shri Narendra Singh Tomar and Hon'ble Minister of State, Mines, Shri Haribhai Parthibhai Chaudhary

1.3 List of Subjects Allocated to the Ministry of Mines:

a) Legislation for regulation of mines and development of minerals within the territory of India, including mines and minerals underlying the ocean within the territorial waters or the continental shelf, or the exclusive economic zone and other maritime zones of India as may be specified, from time to time by or under any law made by Parliament.

b) Regulation of mines and development of minerals other than coal, lignite and sand for stowing and any other mineral declared as prescribed substances for the purpose of the Atomic Energy Act, 1962 (33 of 1962) under the control of the Union as declared by law, including questions concerning regulation and development of minerals in various States and the matters connected therewith or incidental thereto.

c) All other metals and minerals not specifically allotted to any other Ministry/ Department, such as aluminium, zinc, copper, gold, diamonds, lead and nickel.

d) Planning, development and control of, and assistance to, all industries dealt with by the Ministry.

e) Administration and management of Geological Survey of India.

f) Administration and management of Indian Bureau of Mines.

g) Metallurgical grade silicon.

Attached Office/Subordinate Office

1.4 Geological Survey of India (Headquarters at Kolkata) is an attached office and Indian Bureau of Mines (Headquarters at Nagpur) is a subordinate office of the Ministry.

Public Sector Undertakings

1.5 There are three Public Sector Undertakings under the Ministry of Mines, namely:-

- National Aluminium Company Limited (NALCO), Bhubaneswar
- Hindustan Copper Limited (HCL), Kolkata
- Mineral Exploration Corporation Limited (MECL), Nagpur

Autonomous Bodies

1.6 There are three Research Institutions which are Autonomous Bodies of this Ministry:

- Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur;
- National Institute of Rock Mechanics (NIRM), Bengaluru, and;
- National Institute of Miners' Health (NIMH), Nagpur.

1.7 In addition to one registered Society, namely, the Non-Ferrous Materials Technology Development Centre (NFTDC), Hyderabad which is non-grant institution within the administrative purview of Ministry of Mines.

Organisational Structure

1.8 Shri Narendra Singh Tomar, assumed the charge of the office of the Minister of Mines and Shri Haribhai Parthibhai Chaudhary assumed the charge of the office of the Minister of State in the Ministry of Mines w.e.f 03.09.2017.

1.9 The Secretariat of Ministry of Mines is headed by the Secretary assisted by one Additional Secretary, three Joint Secretaries, one Joint Secretary & Financial Adviser common for Ministries of Coal, Ministry of Mines and Ministry of Corporate Affairs, one Economic Adviser and seven Directors / Deputy Secretaries; one Director and one Assistant Director of IES cadre. Sanctioned strength and present incumbency of officers/officials in the Ministry of Mines is given at **Table 1.1.** Organisational structure of the Ministry of Mines is shown in **Annexure 1.1. (Page No. 171)**



National Geoscience Awards presentation ceremony at Rashtrapati Bhawan, New Delhi



Table 1.1
Sanctioned Strength and Present Incumbency of Officers/Officials in Secretariat Proper of Ministry of Mines as on 01.01.2018

Group	Sanctioned Strength	Total Number of Present Incumbents (Including General)	Number of SC/ST/OBC/ Minority/Women out of Present Incumbents					VH/HH/OH out of Present Incumbents		
			SC	ST	OBC	Minority	Women	VH	HH	OH
Group-A Gazetted	29	21	02	-	02	02	06	-	-	-
Group-B Gazetted	38	22	04	03	04	-	03	-	-	-
Group-B Non-Gazetted	58	53	12	06	09	02	15	01	-	-
Group-C	84	54	13	01	03	01	04	-	-	02
Total	209	150	31	10	18	05	28	01	-	02

Contribution to GDP

1.10 The Gross Value Added (GVA) accrued from mining and quarrying sector at 2011-12 prices for the first quarters of 2017-18 is estimated at ₹ 85,911 crore, indicated a decrease of about 0.7% over that in the same period of previous year. Similarly, the quarterly estimates of GVA (at current prices) for the first quarter of the year 2017-18 is estimated at ₹ 82,270 crore. The mining and quarrying sector contribution (at current price) to GVA accounted for about 2.3 % for the first quarter of the year 2017-18.

1.11 Major Activities, Achievements and Initiatives during the year.

- The Mineral Conservation and Development Rules, 2017 was notified on 27.02.2017.
- Shri Arun Kumar, IAS (AM-83) takes charge as Secretary (Mines) on 1st March, 2017.
- Shri Piyush Goyal, the then Hon'ble Minister of State (Independent Charge) Power, Coal, New & Renewable Energy and Mines, inaugurated the Multi-sensor Aero-geophysical Survey of the Obvious Geological Potential area on 7th April, 2017. Airborne geophysical surveys is one of the most time efficient, comprehensive and cost effective methods of resource exploration worldwide. The project is one of the largest airborne projects to be executed at one go anywhere in the world.



Meeting of Mines Ministers at Goa on 19.1.2018

- Shri Pranab Mukherjee, the then Hon'ble President of India conferred the National Geoscience Awards - 2016 (NGA-2016) on twenty five geoscientists on 12th April 2017.
- Secretary, Ministry of Mines chaired Central Coordination-cum-Empowered Committee (CCEC) meeting of MoM on 2nd June, 2017 with the representatives of mineral-rich states regarding Mineral Development and Regulation. Ministry has been successful to a great extent in convincing the state governments to adopt the Mining Surveillance System using satellite based systems to check illegal mining of minor minerals as well.
- A workshop on GST was conducted by the then Hon'ble MoS (IC) for Power, Coal, New and Renewable Energy and Mines (PCNREM), Shri Piyush Goyal on 22nd June, 2017.
- Shri Piyush Goyal, the then Hon'ble MoS (IC) for Power, Coal, MNRE and Mines chaired 5th Geoscience Advisory Council (GAC) meeting of the Ministry of Mines on 27th June, 2017.
- A meeting of the Parliamentary Consultative Committee on "Sustainable Sand Mining" was held on 20th June, 2017 under the chairmanship of the then Hon'ble MoS (IC) for PCNREM.
- Two Assistant Secretaries of IAS 2015 batch, Shri Apoorv Devgan (HP) and Shri Shashank Mani Tripathi (AGMUT) joined the Ministry of Mines on 3rd July, 2017 for a period of 3 months.



National Geoscience Awards - 2016

- Hon'ble Prime Minister reviewed the progress of mineral auctions in the country on 21st July, 2017.
- A Committee was set-up to review the provisions of the Mineral (Auction) Rules, 2015 and the Minerals (Evidence of Mineral Contents) Rules, 2015 based on the experience gained in the auction process, with a view to making the process more effective. The amended Mineral (Auction) Rules were notified on 30th November 2017.



Shri Haribhai Parthibhai Chaudhary, Hon'ble Minister of State for Mines speaking on the occasion of Golden Jubilee Celebration of HCL on 9th November, 2017

- A consultation was held with the 13 private exploration agencies empanelled by National Mineral Exploration Trust (NMET) on 10th August, 2017 to arrive at modalities before rolling out a private exploration contractual framework.
- On 2nd August, 2017 and 3rd August, 2017, 6.83% paid up equity capital (6,31,72,849 equity shares of face value of ₹ 5/- each) of Hindustan Copper Limited out of the Government of India holdings of 82.88% were sold through "offer for sale of shares through Stock Exchanges". A total amount of ₹ 404,70,98,150.14 has been raised by Government of India.
- The Offshore Areas Mineral (Development & Regulation) Act 2002 draft Amendment Bill has been framed and put out for public consultation on 1st

September, 2017 giving 30 days' time for public comments. A major work, this will bring in transparency in the allocation of Offshore Mineral resources.

- Shri Narendra Singh Tomar assumed the charge of the office of the Union Minister of Mines on 3rd September, 2017 and Shri Haribhai Parthibhai Chaudhary took charge as Minister of State on the same day.
- The Ministry observed "Swachhata Mah" in the month of September 2017. All the offices, institutions, CPSEs participated in Swachhata drive for overall improvement in the office and residential complexes.
- To speed up exploration, the Odisha Mining Corporation Limited and West Bengal Mineral Development and Trading Corporation Limited have been notified as entities to section 4 (1) of the MMDR Act, 1957 by the Ministry. This will enable the respective State Governments to conduct exploration of mineral bearing areas and subsequently grant such areas for mining through auction.
- A meeting of the Apex Committee for implementation of Star Rating scheme with regard to minor minerals, was held under the chairmanship of Secretary (Mines) on 26.10.2017. The standards and templates for the Star Rating of minor minerals has been finalized. The states can now adopt them to implement the system, of Star Rating of minor mineral leases as well.
- Geological Survey of India Training Institute (GSITI) and the Indian Institute of Technology, Hyderabad (IIT-H) have signed a Memorandum of Understanding (MoU) on collaboration for academic and research programs leading to award of Ph.D. Degree by GSITI from academic year beginning 1st April, 2018.
- A meeting of Hindi Salahkar Samiti of Ministry of Mines was held under the chairmanship of Hon'ble Union Minister Shri Narendra Singh Tomar at New Delhi on 15th November 2017.
- Swachhata Pakhwada observed in the Ministry and its field organizations from 16th to 31st December, 2017.
- Till December, 2017, 33 mineral blocks have been successfully auctioned having total value of estimated resource of ₹ 1,69,391 crore.
- A meeting of Ministers-in-charge of Mining Departments of major mineral rich states was held on 19.01.2018 at Goa, under the Chairmanship of Hon'ble Minister of Mines, Shri Narendra Singh Tomar.



Hon'ble Minister of Mines, Shri Narendra Singh Tomar, Hon'ble Minister of State for Mines Shri Haribhai Parthibhai Chaudhary and Shri Arun Kumar, Secretary in the Meeting of Mines Ministers at Goa on 19.1.2018



HCL representative receiving the prestigious the National Safety Award- Mines from Hon'ble President of India, Shri Ram Nath Kovind

2

Minerals and Metals in the Country



Minerals and Metals in the Country

- National Mineral Scenario Page - 11
- Index of Mineral Production Page - 11
- Gross Value Added from Mining and Quarrying Sector Page - 12
- Mineral Production Page - 14
- Self-reliance in Minerals and Mineral Based Products Page - 16
- Production Trends Page - 17
- State-wise Mineral Scenario Page - 18

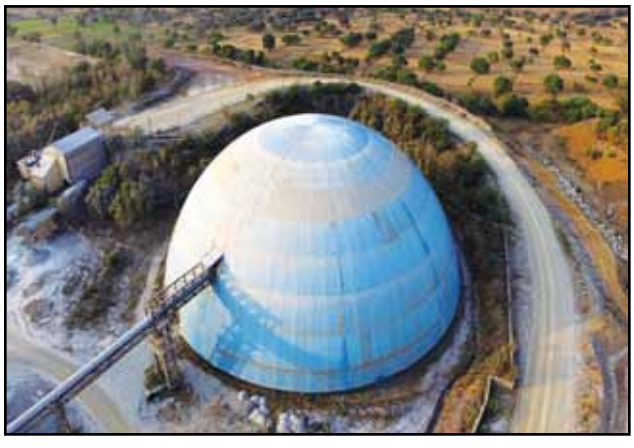


National Mineral Scenario

Introduction

2.1 Minerals are valuable natural resources. They constitute the vital raw materials for many basic industries and are a major resource for development. The history of mineral extraction in India dates back to the days of the Harappan civilization. The wide availability of the minerals provides a base for the growth and development of the mining sector in India.

2.2 The country is endowed with huge resources of many metallic and non-metallic minerals. Mining sector is an important segment of the Indian economy. Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and value. India produces as many as 95 minerals, which includes 4 fuel, 10 metallic, 23 non-metallic, 3 atomic and 55 minor minerals (including building and other materials).



Closed Stacker Reclaimer in a limestone mine

Index of Mineral Production

2.3 Ministry of Statistics and Programme Implementation has shifted the base year of index of mineral production from 2004-05 to 2011-12. Based on the overall trend so far the index of mineral production (base 2011-12 = 100) for the year 2017-18 is estimated to be 105.9 as compared to 102.5 of previous year showing a positive growth of 3.3%. The trend of index of mineral production and trend of value of mineral production is depicted in **Figure 2.1**. and **Figure 2.2** respectively. The value of minerals produced by groups for the last five years is given in **Figure 2.3**

Figure 2.1
Index of Mineral Production
(Base 2011-12=100)

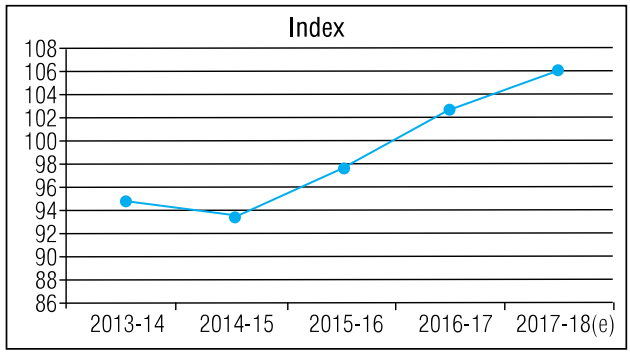


Figure 2.2
Trends in Value of Mineral Exports & Imports

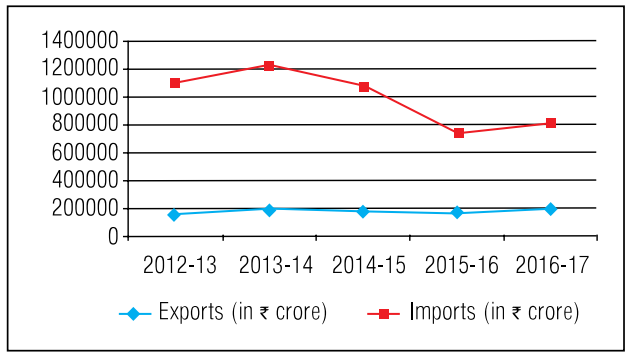
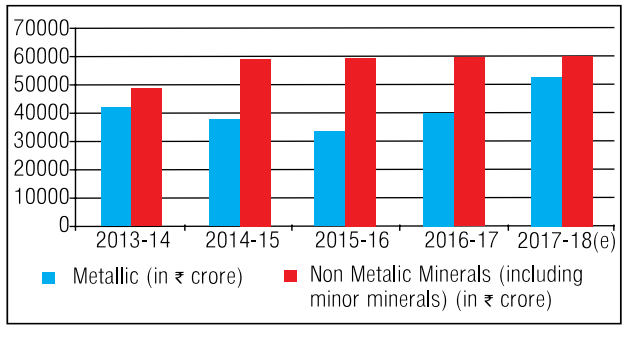


Figure 2.3

Value of Minerals Production (By groups)
(Excluding atomic & fuel minerals)



2.4 The total value of mineral production (excluding atomic & fuel minerals) during 2017-18 has been estimated at ₹ 1,13,541 crore, which shows an increase of about 13% over that of the previous year. During 2017-18, estimated value for metallic minerals is ₹ 53,029 crore or 47.7% of the total value and non-metallic minerals including minor minerals is ₹ 60,512 crore or 53.3% of the total value. Information on production and value of minerals from 2013-14 to 2017-18 is given in **Annexure 2.1**. **(Page No. 172)** The details of export and import of minerals during the period 2012-13 to 2016-17 is given in **Annexure 2.2 (Page No. 173)** and **Annexure 2.3 (Page No. 174)** respectively.



Deployment of rock breaker for easy transportation of ROM

Price Trend

2.5 The Office of the Economic Advisor, Ministry of Commerce and Industry has shifted the base year from 2004-05 to 2011-12. The WPI for minerals (base 2011-12=100) stood at 118.2 in August 2017 and the corresponding index was 128.1 for August, 2016.

2.6 The minerals included in the wholesale price index are bauxite, chromite, iron ore, copper conc, lead conc., garnet, zinc conc, manganese ore, limestone, phosphorite, and sillamanite. The wholesale price index for metallic minerals was 103.3 in August, 2017 as compared to 118.4 in August, 2016 and that of other minerals was 170.2 in August, 2017 as compared to 162.1 in August, 2016.

Gross Value Added from Mining & Quarrying Sector

2.7 The Gross Value Added (GVA) accrued from mining and quarrying sector at 2011-12 prices for the first quarter of 2017-18 is estimated at ₹ 85,911 crore, indicated a decrease of about 0.7% over that in the same period of previous year. Similarly, the quarterly estimates of GVA (at current prices) for the first quarter of the year 2017-18 is estimated at ₹ 82,270 crore. The mining and quarrying sector contribution (at current price) to GVA accounted for about 2.3 % for the first quarter of the year 2017-18.

Mining

2.8 Indian mining industry is characterized by a large number of small operational mines. The number of mines which reported mineral production (excluding atomic, fuel and minor minerals) in India was 1531 in 2017-18 as against 1508 in the previous year. Out of 1531 reporting mines, 230 were located in Tamil Nadu, followed by Madhya Pradesh (197) Gujarat (191), Karnataka (142), Odisha (132), Andhra Pradesh (129), Chhattisgarh (112), Goa (87), Rajasthan (85), Maharashtra (75) and Jharkhand (58). These 10 States together accounted for 94% of total number of mines in the country in 2017-18. The numbers of reporting mines are given in **Table 2.1**. Area-wise distribution of Mining Leases all over India pertaining to all minerals excluding fuel, atomic and minor minerals is given in **Table 2.2.**

Table 2.1
Number of Reporting Mines

Sector	2015-16	2016-17(P)	2017-18(E)
All Minerals*	1619	1508	1531
Metallic Minerals	715	644	657
Non-Metallic Minerals	904	864	874

**Excluding atomic minerals, petroleum (crude), natural gas (utilized) and minor minerals.*



Table - 2.2
Area Wise Distribution of Mining Lease*
As on 31/03/2015 (All India)

Frequency Group (Area in Hect.)	Number of Mining Leases	Percentage of Total Leases	Area in '000 Hects.	Percentage of Total Area
All Groups	4,128	100	3,54,908.75	100
0 to 10	1,942	47	7,852.95	2
10 to 20	469	11	6,882.63	2
20 to 50	585	14	19,401.02	5
50 to 100	513	13	38,854.06	11
100 to 200	235	6	33,242.80	9
200 to 500	204	5	65,878.66	19
Above 500	180	4	1,82,796.63	52

**Excluding coal, lignite, petroleum, natural gas, atomic & minor minerals.*

2.9 The number of underground mines in operation mineral-wise (excluding fuel, atomic and minor minerals) is given **Table 2.3**.

Table 2.3
Number of Underground Mines 2016-17@
(By Principal Minerals)

Minerals	'A' Category	'B' Category	Total
Apatite	-	1	1
Chromite	6	-	6
Copper ore	4	-	4
Gold	4	1	5
Lead & Zinc	8	-	8
Manganese ore	9	6	15
Total	**31**	**8**	**39**

@ Excluding fuel, atomic & minor minerals
'A' Mechanized Mines: >150 labour in all or >75 labour in workings below ground.
'B' Other than 'A'



Modern ETP at a chromite mine

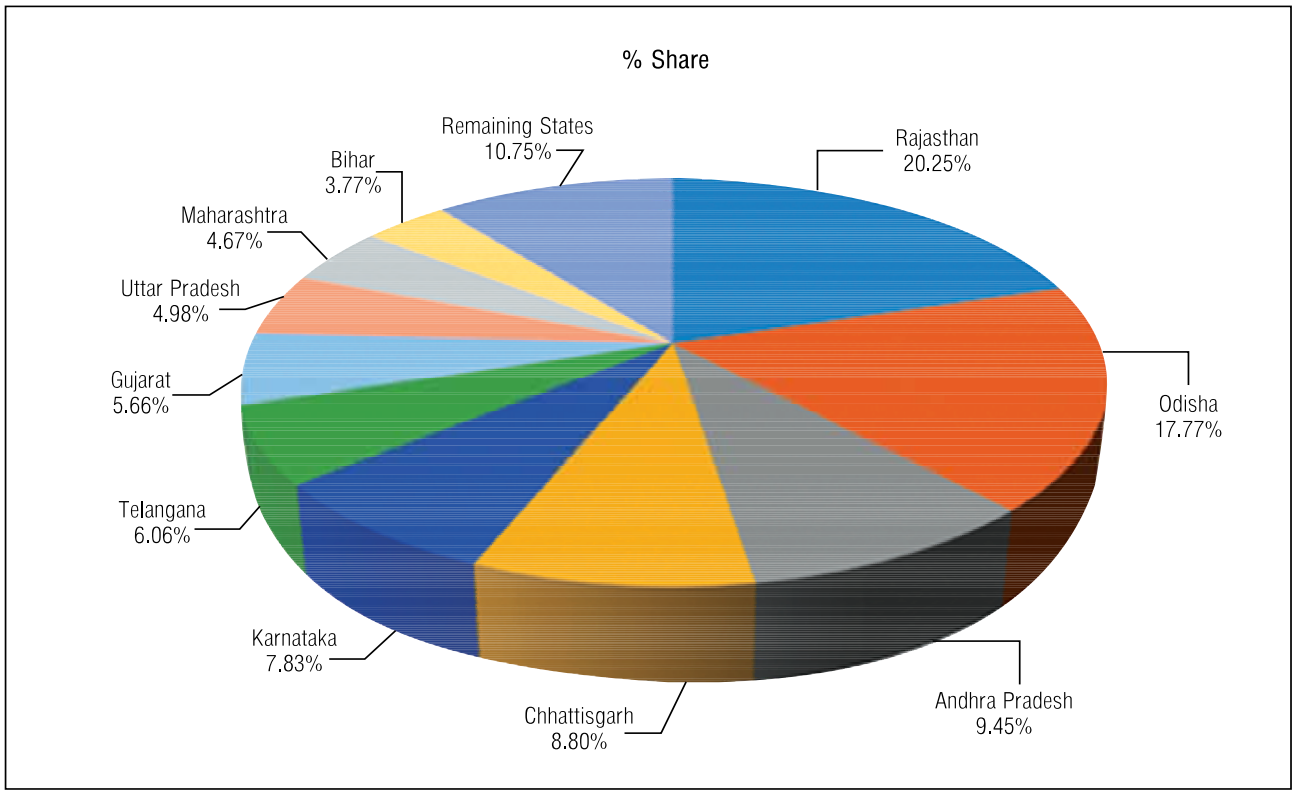


Mineral Production

2.10 During 2017-18, mineral production was reported from 32 States/Union Territories (actual reporting of MCDR from 22 states and estimation of minor minerals for all 32 States/Union Territories) of which the bulk of value of mineral production (excluding fuel and atomic minerals) of about 93.65% was confined to 10 States. Rajasthan is in leading position, in terms of estimated value of mineral production in the country and had the share of 20.26% in the national output. Next in order was Odisha with a share of 17.77% followed by Andhra Pradesh (9.45%), Chhattisgarh (8.80%), Karnataka (7.83%), Telangana (6.06%), Gujarat (5.66%), Uttar Pradesh (4.98%), Maharashtra (4.67%) and Bihar (3.77%) in the total value of mineral production. Remaining States and Union Territories having individual share of less than 3.0% all together accounted for remaining of total value during the year under review. The contribution of States/Regions in the value of mineral production during 2017-18 estimated is pictorially shown in **Figure 2. 4**.

2.11 State-wise analysis revealed that during 2017-18, the value of mineral production (excluding fuel & atomic minerals) have shown a mixed trend as compared to that in the previous year. The states which have indicated major increase in the value of mineral production are Karnataka (30.66%), Chhattisgarh (29.98%), Rajasthan (25.61%), Goa (23.46%), Odisha (21.98%), Madhya Pradesh (17.34%), Maharashtra (2.07%), Jammu & Kashmir (1.35%) etc. However, some of the principal mineral producing states recorded decrease in value of mineral production and those include Meghalaya (13.38%), Jharkhand (11.14%), Assam

Figure 2.4
Share of States in Value of Mineral Production 2017-18 (Estimated)
(Excluding Atomic & Fuel Minerals)





(10.3%), Tamil Nadu (8.69%), Himachal Pradesh (4.96%) and Gujarat (3.01%). The all India reserves and resources of various minerals as on 01.04.2005, as per UNFC System is given in **Annexure 2.4. (Page No. 175)**

2.12 During 2016-17 (excluding atomic, fuel, and minor minerals), the private sector emerged to play a dominant role in mineral production accounting for 66.84% or ₹ 31,707 crore in the total value. Small mines, which were mostly in the private sector, continued to be operated manually either as proprietary or partnership ventures. The minerals which were wholly mined / recovered by the public/ joint sector in 2016-17 were Copper ore and concentrate, Diamond, Fluorite (graded), Selenite and Sulphur. In 2016-17, the public sector accounted for sizeable 99% of Gold & Phosphorite each, Graphite 76% and 54% of Magnesite.

2.13 India's ranking in 2015 as compared to world production was 2nd in barytes, and talc/ steatite/pyrophyllite, 3rd in chromite, coal & lignite and zinc (slab), 4th in kyanite/ andalusite/ sillimanite, 5th in iron ore, and Steel (Crude), 6th in bauxite ore, 7th in manganese ore and 8th in aluminium. The statistics on indigenous and world production of principal minerals and metals are given in **Table 2.4**.

Table 2.4
Contribution and Rank of India in World Production of Principal Minerals & Metals, 2015

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India* (2014-15)		
Mineral Fuels					
Coal & lignite	Million tonnes	7,860	683	8.13	3rd
Petroleum (crude)	Million tonnes	4,225	37	0.88	23rd
Metallic Minerals					
Bauxite	'000 tonnes	2,94,074	28,134	9.57	4th
Chromite	'000 tonnes	35,300	2,894	8.20	4th
Iron ore	Million tonnes	3,328	156	4.69	4th
Manganese ore	'000 tonnes	53,200	2,148	4.04	6th
Industrial Minerals					
Kyanite, andalusite & sillimanite	'000 tonnes	390(e)**	73	18.72	3rd
Magnesite	'000 tonnes	44,900	265	0.59	11th
Apatite & rock phosphate	'000 tonnes	2,65,140	1,474	0.56	16th
Metals					
Aluminium	'000 tonnes	57,670	2,355	4.08	5th
Copper (refined)	'000 tonnes	22,900	790	3.45	7th
Steel (crude/liquid)	Million tonnes	1,620	90@	5.56	3rd
Lead (refined)	'000 tonnes	10,700	145	1.36	14th
Zinc (slab)	'000 tonnes	13,227	759	5.74	5th

**Figure relate to 2015-16.*
*(e)** Estimated figure given in mineral commodity summary, 2017, USGS.*
@ Ministry of Steel Annual Report 2016-17.





Self-reliance in Minerals & Mineral Based Products

2.14 India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials to industries, such as, thermal power generation, iron & steel, ferro-alloys, aluminium, cement, various types of refractories, etc. India is, by and large, self-sufficient in coal (with the exception of very low ash coking coal required by the steel plants) and lignite among mineral fuels; bauxite, chromite, iron ore, rutile, etc. among metallic minerals; and almost all the industrial minerals with the exception of chrysotile asbestos, borax, fluorite, potash, rock phosphate and elemental sulphur. Despite high degree of self-sufficiency, some quantities of various minerals/ores are imported due to economic consideration or requirement of specific grade to meet the demand for either blending with locally available mineral raw materials and/or for manufacturing special qualities of mineral-based products. To meet the increasing demand of uncut diamonds, emerald and other precious and semiprecious stones by the domestic cutting and polishing industry, India continued to depend on imports of raw uncut stones for their value-added re-exports. The degree of self-sufficiency in respect of various principal minerals and metals/ferro-alloys in 2015-16 is given in **Table 2.5**.

Table 2.5
Degree of Self-sufficiency in Principal Minerals & Metals, 2015-16(P)

Sl. No.	Commodity	Demand/Domestic consumption ('000 tonnes)	Supply/Domestic supply ('000 tonnes)	Order of self-sufficiency (%)
	Minerals			
1	Bauxite	1,408	28,133	100
2	Chromite	2,191	2,894	100
3	Fluorite	64	2	3
4	Iron ore	1,22,619	1,55,910	100
5	Kyanite	3	3	100
6	Limestone & other calcareous minerals	3,07,355	3,03,815[1/]	99
7	Magnesite	263	265	100
8	Manganese ore	3,544	2,148	61
9	Rock phosphate (including apatite)	4,363	1,474	34
10	Sillimanite	34	70	100
	Metals[2/]			
11	Aluminium	2,872	2,355	82
12	Copper (refined)	820[3/]	790	96
13	Lead (primary/refined)	266[4/]	145	55
14	Zinc (slab)	669[5/]	759	100

Source: Consumption: Data based on statutory and non statutory information; Production MCDR returns and MSMP, March, 2015 for production data
Note: Even in cases where almost entire domestic demand is satisfied by domestic supplies, some quantities of certain special quality/types of minerals and metals/ferro-alloys are imported to meet the requirement in certain specific end-uses.
As per Govt. Of India Notification S.O 423(E) dated 10 Feb 2015 following minerals have been declared as minor mineral i) Barytes ii) dolomite iii) Felspar iv) Fire clay v)quartz/silica sand vi)Talc/steatite/soapstone/pyrophyllite. Hence not included in the table due to non availability of production data for the year 2015-16
Figures rounded off.
1 / Excludes production of limestone as a minor mineral, calcite and chalk.
2 / Apparent demand.
3/ Based on production of copper cathode and imports & exports of refined copper.
4/ Based on production of lead (primary), and imports & exports of refined lead, unwrought.
5/ Based on production of zinc (ingots) and imports & exports of zinc (not alloyed).





Production Trends

Metallic Minerals

2.15 The value of metallic minerals in 2016-17 at ₹ 40,017 crore increased by 19.03% over the previous year. Among the principal metallic minerals, iron ore contributed ₹ 25,139 crore or 62.82%, zinc concentrate ₹ 4,339 crore or 10.84%, chromite ₹ 3,644 crore or 9.11%, silver ₹ 1,832 crore or 4.58%, manganese ore ₹ 1,603 crore or 4.00%, bauxite ₹ 1,417 crore or 3.54%, lead conc. ₹ 967 crore or 2.42%, copper (concentrate) ₹ 640 crore or 1.60%, gold ₹ 436 crore or 1.09%, while the remaining was contributed by tin concentrates.

The Production of **bauxite** at 24,665 thousand tonnes during 2016-17 registered a decrease of 12% as compared to the previous year. Odisha with 49% contribution was the leading producer of bauxite followed by Gujarat (24%), Jharkhand (9%), Chhattisgarh and Maharashtra (8% each) etc. The share of public sector mines in the total production was 31% while remaining 69% was contributed by private sector mines. There were 157 reporting mines of Bauxite during 2016-17 of which 17 were owned by public sector and 140 by private sector.

The production of **chromite** at 3728 thousand tonnes in 2016-17 increased by 28% as compared to that in the previous year due to increase in production reported by few major mines. Odisha reported almost entire production of chromite. Public sector companies having 10 mines together reported 34 % of the total production. There were 25 reporting mines during the year as well as in the previous year.

The production of **copper** ore in 2016-17 at 3,846 thousand tonnes decreased by 2% as compared to that in the previous year. There were 5 reporting mines (all in public sector) of copper ore in 2016-17. The production of copper concentrates at 135 thousand tonnes decreased by 11% in 2016-17 as compared to that in the previous year.

The production of **gold** ore at 582 thousand tonnes in the year 2016-17 increased by 3% as compared to that in the previous year while the production of gold primary was 1594 Kgs. Almost entire production of gold ore and bullion was reported from Karnataka. There were 5 reporting mines of gold during the year under review. Of these, 3 mines are located in Karnataka and 1 mine each in Andhra Pradesh and Jharkhand.

The production of **Iron Ore** consisting of lumps, fines and concentrates at 192 million tonnes in 2016-17 increased by 22% as compared to 158 million tonnes in the previous year. Odisha was the leading producer of iron ore accounting for 52% of total production followed by Chhattisgarh (16%), Karnataka (14%), and Jharkhand (11%). Production of iron ore was also reported from Andhra Pradesh, Goa, Madhya Pradesh, Maharashtra and Rajasthan. Public sector mines contributed about 36% of total production and share of private sector was 64% in 2016-17. There were 296 reporting mines in 2016-17 as against 330 mines in the previous year.

The production of **lead & zinc ore** at 11881 thousand tonnes in 2016-17 increased by 14% as compared to that in the previous year. Rajasthan was the sole producing state of lead and zinc ores and concentrates. There were 8 mines (all in private sector) reporting production of lead and zinc ore in the current year. The production of lead concentrate increased by 2% and the production of zinc concentrate increased by 1% during the year.



Panchpatmali Bauxite mine reclaimed area plantation





The production of **Manganese Ore** at 2,393 thousand tonnes in 2016-17 increased by 10% as compared to the previous year. Madhya Pradesh was the leading producer of manganese ore accounting for 27% of total production followed by Maharashtra and Odisha (25% each), Karnataka (11%) and Andhra Pradesh (10%). Production of manganese ore was also reported from Gujarat, Jharkhand, Rajasthan and Telangana. There were 142 reporting mines of manganese ore in 2016-17. In the year under review, 24 public sector mines were engaged in the mining of manganese ore with 44% contribution to the total production.

Non-Metallic Minerals

2.16 The value of production of non-metallic minerals at ₹ 7,414.53 crore during 2016-17 decreased by 2.07% as compared to the previous year. Limestone retained its leading position by contributing 90.20% of the total value of non-metallic minerals in 2016-17. The other non-metallic minerals in the order of importance were Phosphorite/Rock phosphate (5.25%), and Garnet (abrasive) (1.02%).

The production of **limestone** at 313.2 million tonnes during 2016-17 increased by 2% as compared to that in the previous year. Rajasthan was the leading producer of limestone (21%), followed by Madhya Pradesh and Andhra Pradesh (11% each), Chhattisgarh & Karnataka (10% each), Gujarat, Tamil Nadu & Telangana (8% each). There were 771 reporting mines during the year, as against 807 mines in the previous year. In all, there were 382 captive mines in India contributing about 95% of total Limestone production. There were 27 public sector and 744 private sector reporting mines during 2016-17 as against 26 public sector and 781 private sector reporting mines in the previous year. The share of public sector mines in production was 3.35% as against 3.98 % in the preceding year.

The production of **magnesite** at 299 thousand tonnes during 2016-17 decreased by 9% as compared to that in the previous year. Tamil Nadu contributed 75% of the total production during the year under review. The remaining was reported jointly from Karnataka and Uttarakhand. Public sector mines contributed 54% of total production in 2016-17 as compared to 64% in the previous year. There were 19 reporting mines in 2016-17, of which 4 were in public sector and 15 in private sector.

The production of **phosphorite** at 1181 thousand tonnes in 2016-17 decreased by 25% as compared to that in the previous year. Rajasthan contributed 94% of the production while rest was reported from Madhya Pradesh. The share of public sector mines and private sector mines during the year was 99% and 1% respectively. There were 5 reporting mines during 2016-17, of which 4 were in public sector and 1 in private sector.

Minor Minerals

2.17 The value of production of minor minerals was estimated at ₹ 52,810 crore in 2016-17. Andhra Pradesh with share of 18.46% in the value of minor minerals produced in the country occupied the top position. Rajasthan was at second place had a share of 16.49% in the value of minor minerals. Next in the order was Telangana 12.05%, Gujarat 11.13%, Uttar Pradesh 10.64%, Bihar 8.09%, Maharashtra 7.94%, Kerala 5.15% and the contribution of remaining states and UTs was less than five percent each.

Item-wise analysis revealed that road metals had the largest share of 19.6% to the total value of minor minerals followed by granite 17.0%, building stone 11.5%, ordinary sand 10.0%, stone 8.1%, bricks earth 5.9% and boulder 4.5 percent. The individual share of remaining minerals was less than 4.0% which together contributed 23.3 percent of value of minor minerals.

State-wise Mineral Scenario

2.18 Status of mineral production in 10 mineral rich states of India is at **Annexure 2.5**. **(Page No. 179)**

3

Legislative Framework, Mineral Policy and Implementation



Legislative Framework, Mineral Policy and Implementation

- The Legislative Framework — Page - 21
- Mines & Minerals (Development and Regulation) Act, (MMDR Act) 1957 — Page - 21
- National Mineral Policy, 2008 — Page - 22
- Amendment to the Mineral (Auction) Rules, 2015 — Page - 23
- District Mineral Foundation (DMF) Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) — Page - 24
- Measures taken to control illegal mining — Page - 25
- Mining Surveillance System (MSS) — Page - 26
- National Mineral Exploration Policy (NMEP)-2016 — Page - 27
- National Mineral Exploration Trust — Page - 28
- Offshore Areas Mineral (Development & Regulation) (OAMDR) Act, 2002 — Page - 28
- Mineral Auctions — Page - 29



The Legislative Framework:

3.1 In the federal structure of India, the State Governments are the owners of minerals located within their respective boundaries. The Central Government is the owner of the minerals underlying the ocean within the territorial waters upto the Exclusive Economic Zone (EEZ) of India.

3.2 In this context, the entry at serial No. 23 of List II (State list) to the Constitution of India states,

> 'Regulation of mines and mineral development subject to the provisions of List I with respect to regulation and development under the control of the Union.'

3.3 The entry at serial No. 54 of List I (Central list) to the Constitution of India states,

> 'Regulation of mines and mineral development to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.'

3.4 In pursuance to the entry at serial No. 54 of List I, the Central Government have framed Mines & Minerals (Development and Regulation) (MMDR) Act, 1957 as Central Act No. 67 of 1957.

Acts under the administrative control of the Ministry of Mines:

3.5 The Mines and Minerals (Development and Regulation) (MMDR) Act, 1957: To provide for the development and regulation of mines and minerals.

3.6 The Offshore Areas Mineral (Development and Regulation) Act, 2002- To provide for development and regulation of mineral resource in the "offshore areas" (which means the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India under the Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976) and to provide for matters connected therewith or incidental thereto.



Fully mechanized Ore Stacking system in a limestone mine

Mines & Minerals (Development and Regulation) Act, (MMDR Act) 1957

3.7 The Mines & Minerals (Development and Regulation) Act, (MMDR Act) 1957 is the law governing the mineral sector (other than Petroleum and Natural Gas) of the Country.

3.8 The MMDR Act, 1957 recognizes a substantial role for the State Governments. As per Section 15 of the MMDR Act, 1957 State Governments have complete powers for making rules for grant of concessions in respect of minor minerals; and levy and collection of royalty on minor minerals. Further, as per section 23C of MMDR Act, 1957, State Governments have complete powers to make rules for prevention of illegal mining and for purposes connected therewith. Therefore, matters relating to regulation of mining of minor minerals and control of illegal mining of all minerals are in the domain of State Governments.

3.9 In exercise of powers under section 3(e) of the MMDR Act, 1957, the Ministry notifies 'minor minerals'. On 10.02.2015 the Ministry notified 31 minerals as 'minor minerals'. The

notification has been published in the Gazette of India vide S.O. 423(E) dated 10.2.2015. The total number of minerals notified presently as 'minor minerals' is 55.

3.10 The other Minerals are popularly known as major minerals. In the case of major minerals, States substantially regulate and develop minerals subject to provisions of the Act. In the case of Minerals covered under Part A - Coal and Lignite and Part B - Atomic Minerals in the First Schedule to the Act, States are required to take prior approval of the Central Government to grant concessions. The Central Government retains the power of revision, fixation of royalty etc. in respect of major minerals.

3.11 The Ministry of Coal exercises all powers of the Central Government with respect to Coal and Lignite under the Act. The Department of Atomic Energy similarly exercises all powers for Atomic Minerals.



Central Coordination-Cum-Empowered Committee (CCEA) Meeting held on 2nd June 2017

National Mineral Policy, 2008

3.12 The National Mineral Policy (NMP) was notified in 2008. It recommends measures like assured right to next stage mineral concession, transferability of mineral concessions and transparency in allotment of concessions, in order to reduce delays which are seen as impediments to investment and technology flows in the mining sector in India. The Mineral Policy also seeks to develop a Sustainable Development Framework for optimum utilisation of the country's natural mineral resources for the industrial growth in the country and at the same time improving the life of people living in the mining areas, which are generally located in the backward and tribal regions of the country.

Review of National Mineral Policy

3.13 The Ministry of Mines has constituted a committee on 14.08.2017 to review the National Mineral Policy 2008, as per directions of Hon'ble Supreme Court in its judgment dated 02.08.2017 in the matter of Common Cause Vs. UOI & Ors. [Writ Petition (Civil) No. 114 of 2014].



Central Coordination-Cum-Empowered Committee (CCEA) Meeting held on 2nd June 2017

3.14 The Committee submitted its report to the Ministry in December, 2017. A draft National Mineral Policy, 2018 received from the Committee has been placed in the website of Ministry of Mines for public consultation.

Mines and Minerals (Development and Regulation) Amendment Act, 2015

3.15 The NMP 2008 provides for a change in the role of the Central Government and the State Governments to incentivize private sector investment in exploration and mining and for ensuring level playing field and transparency in the grant of concessions and promotion of scientific mining within a sustainable



development framework so as to protect the interest of local population in mining areas. This necessitated harmonization of the extant legislation with NMP 2008.

3.16 Reforms in the mining sector have been initiated through the amendment to MMDR Act, 1957 through the MMDR (Amendment) Act, 2015 which came into effect from 12th January, 2015. It has ushered in a regime of transparent and non-discretionary grant of mineral concessions. The salient features of the MMDR (Amendment) Act, 2015 are as follows:-

i) All mineral concessions will be granted only through auction.

ii) Transition provisions for extension of existing leases to obviate disruptions in supply of ore and to ensure regular supply of raw material to the industry;

iii) Uniform lease period of 50 years; no renewals at the end of lease period and all such leases will be put up for auction.

iv) Assured tenure and easy transferability of concessions granted through auctions so as to attract private investment and FDI.

v) No mineral concession, in respect of any mineral specified in Part A and Part B of the First Schedule of MMDR Act, 1957, shall be granted except with the previous approval of the Central Government.

vi) District Mineral Foundation (DMF) to work for the welfare of people and areas affected by mining related operations.

vii) National Mineral Exploration Trust (NMET) to be set up to give impetus for regional and detailed exploration.

viii) Stricter punitive provisions to deter illegal mining; Higher penalties or imprisonment or both for offences; special courts may be constituted, if necessary.

3.17 The Central Government by exercising the powers conferred under the MMDR, Act, 1957, has framed the following rules to give boost to the mining sector. The newly framed Rules are listed as follows:-

- The Minerals (Evidence of Mineral Contents) Rules, 2015
- The Minerals (Non-exclusive Reconnaissance Permits) Rules, 2015
- The Mineral (Auction) Rules, 2015
- The Minerals (Mining by Government Companies) Rules, 2015
- The Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015
- The National Mineral Exploration Trust Rules, 2015
- The Minerals (Other than Atomic and Hydrocarbons Energy Mineral Concession) Rules, 2016
- The Minerals (Transfer of Mining Lease Granted Otherwise than through Auction for Captive Purpose) Rules, 2016
- The Atomic Minerals Concession Rules, 2016
- The Mineral (Conservation and Development) Rules, 2017.

3.18 Further, the Granite Conservation and Development Rules, 1999 and Marble Development and Conservation Rules, 2002 have also been framed under Section of 18 of the MMDR Act, 1957 for conservation and systematic development of granite and marble resources in the country, respectively.

Amendment to the Mineral (Auction) Rules, 2015

3.19 The auction of minerals (other than coal, petroleum and natural gas) has been taken up under the MMDR Act, 1957 for major minerals for the first time in the history





of the nation. It is recognised that the Mineral (Auction) Rules, 2015 have served well for the past two years since its notification. However, it is felt that the provisions of these rules may be revisited on the experience gained from the working of these rules in the auction process. In this regard, a Committee has been set up on 30.06.2017 to review the Minerals (Evidence of Mineral Contents) Rules, 2015 and the Mineral (Auction) Rules, 2015, which furnished its final report to the Ministry in August 2017.

3.20 Subsequently, the Mineral (Auction) Rules, 2015 have been amended through the Mineral (Auction) Amendment Rules, 2017 published in the Official Gazette vide notification No. G.S.R. 1469 (E) dated 30.11.2017 which make the auction procedure simpler. The salient features of amended rules are given below:

i) Extending the applicability of Mineral (Auction) Rules, 2015 to the minerals specified in Part B of the First Schedule to the Act having grade below the threshold value as prescribed under the Atomic Minerals Concession Rules, 2016.

ii) Allowing the end users to sell the mineral equivalent to twenty five percent of total mineral excavated in the previous financial year, for which the end use was specified.

iii) Providing relaxation to the state governments in auction process by allowing them to continue with even less than three Technically Qualified Bidders in second attempt.

iv) Provisions for executing the mining lease deed within three years which is extendable up to a maximum period of five years.

v) Relaxing the eligibility criteria for bidders in respect of mining lease as well as the composite licence.

3.21 District Mineral Foundation (DMF) and Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY)

i) To ensure that the welfare of host population are protected and the benefit of the economic activity in the mining sector equitably flows to those directly affected, provision has been made in the MMDR (Amendment) Act, 2015 for the establishment of District Mineral Foundation (DMF) in any district affected by mining related operations. The objective of DMF is to work for the interest and benefit of persons in and areas affected by mining related operations. DMF is funded by way of contributions at the prescribed rates from holders of mining lease.

ii) Ministry of Mines framed the Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015 which were published in the Official Gazette on 17.9.2015.

iii) The rates of contribution to DMF have been prescribed as follows:

   a) 30% of the royalty for leases granted prior to 12.1.2015; and

   b) 10% of the royalty for leases granted on or after 12.1.2015.

iv) The manner in which the DMF shall work for the interest and benefit of persons and areas affected by mining; as also the composition and functions of the DMF shall be prescribed by the State Governments.

v) Directions have also been issued to all States to incorporate the 'Pradhan Mantri Khanij Kshetra Kalyan Yojana' in the rules framed by them for the District Mineral Foundations.

vi) The Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) will be implemented



by the DMFs of the respective districts using the funds accruing to the DMF. At least 60% of PMKKKY funds will be utilized for: (i) drinking water supply; (ii) environment preservation and pollution control measures; (iii) health care; (iv) education; (v) welfare of women and children; (vi) welfare of aged and disabled people; (vii) skill development; and (viii) sanitation. Up to 40% of the PMKKKY funds will be utilised for: (i) physical infrastructure; (ii) irrigation; (iii) energy and watershed development; and (iv) any other measures for enhancing environmental quality in mining district.

vii) 12 major mineral rich states of the country, [i.e. Goa, Karnataka, Chhattisgarh, Odisha, Jharkhand, Madhya Pradesh, Rajasthan, Telangana, Andhra Pradesh, Gujarat Maharashtra and Tamilnadu] have framed DMF rules and DMF has been set up in 338 districts of these states.

viii) Total amount collected under DMF in 12 mineral rich states as on 30.11.2017 is provided in **Table 3.1.**

Table 3.1

S. No	State	Total Amount Collected (figures are in ₹ crore)
1	Goa	140
2	Karnataka	608
3	Chhattisgarh	2,331
4	Odisha	3,548
5	Madhya Pradesh	1,449
6	Jharkhand	2,314
7	Rajasthan	1,235
8	Telangana	603
9	Andhra Pradesh	322
10	Gujarat	244
11	Maharashtra	487
12	Tamilnadu	117
Total		**13,398**

3.22 Measures taken to control illegal mining:

i) The Shah Commission of enquiry was set up as reports had been received on illegal mining of minerals in particular Iron and Manganese.

ii) State Governments were asked to frame rules to control illegal mining as per Section 23 (c) of MMDR Act, 1957 (so far 23 States have framed Rules).

iii) State Governments were requested to set up Task Forces at State and District levels to control illegal mining since the year 2005 (so far 22 States have reported to have set up Task Forces).

iv) State Governments were advised to set up State Coordination-cum-Empowered Committee (SCEC) to coordinate efforts to control illegal mining by including representatives of Railways, Customs and Port authorities (13 State Governments have set up such committees).

v) All State Governments have been advised to adopt an Action Plan with specific measures to detect and control illegal mining including use of remote sensing, control on traffic, gather market intelligence, registration of end-users and setting up of special cells, etc.

vi) Railways have instituted a mechanism for control to allow transportation of iron ore only against permits issued rake-wise and verified by State Governments, apart from taking measures to fence and set up check posts at the railway sidings.

vii) Customs Department has issued instructions to all its field units to share information on ore export with State Governments.

viii) Ministry of Shipping has issued a direction to all major Ports to streamline the verification procedures for movement of consignment by road and rail to ports for export.



3.23 In addition the Central Government through Indian Bureau of Mines (IBM) has constituted a Special Task Force for inspection of mines in endemic areas. During the year 2013-14 up to March 2014, IBM conducted 205 Special Task Force inspections in the States of Madhya Pradesh, Jharkhand, Karnataka, Kerala, Andhra Pradesh, Gujarat, Rajasthan and Tamilnadu. IBM has suspended 72 mines under rule 13(2) of Mineral Conservation and Development Rules, 1988 for serious violations of rules.

3.24 The Mineral Conservation and Development Rules, 1988 (MCDR) provides for measures to ensure scientific management of the mining process. Rule 45 of the MCDR provides for the mining companies to provide periodic reports on the extraction and disposal of the mined material. Rule 45 of MCDR also facilitates end-to-end national-scale accounting of all minerals produced in the country from the pit head to its end-use, reducing the scope for illegal mining, royalty evasion, etc. The amended Rule 45 now makes it mandatory for all miners, traders, stockist, exporters and end-users of minerals to register and report on the production, trade and utilization of minerals to the State Government(s) and Indian Bureau of Mines. 3,555 mining leases excluding 31 minor minerals have been registered online with IBM as on September, 2017. IBM has suspended 145 mines for noncompliance and recommended 251 cases to State Governments for termination. Similarly, as regards to the status of registration of end users, traders, stockist and exporters, a total of 3,345 units of end-users, 5162 number of traders, 1683 number of stockists and 898 number of exporters have been registered as on September, 2017. Indian Bureau of Mines has also requested the State Governments not to issue transit passes for movement of minerals to unregistered operators.

3.25 In order to bring a check on illegal mining, the MMDR, Amendment Act, 2015 has made the penal provisions for illegal mining more stringent. Higher penalties, or imprisonment or both have been provided for violations. A provision has also been made for constitution of Special Courts by State Governments for speedy trial of cases related to illegal mining.

Space Technology for checking illegal Mining.

3.26 Indian Bureau of Mines (IBM), has entered into a MoU with National Remote Sensing Centre (NRSC), for a pilot project "Sudoor Drushti" to demonstrate the feasibility of using High Resolution Satellite imagery and Digital Elevation Model (DEM) in monitoring mining activities / changes over a period of time, for select a group of mines.

Mining Surveillance System (MSS)

3.27 The Project was undertaken by the Indian Bureau of Mines, Ministry of Mines and BISAG (Bhaskaracharya Institute for Space Applications and Geo-informatics) of Ministry of Electronics and Information Technology (MEITY) to develop a system for detection of incidence of illegal mining by use of space technology and surveillance of area up to 500m beyond the lease boundary to check incidences of illegal mining.

- To facilitate detecting and curbing illegal mining with the help of space technology
- Initially rolled out for major minerals by the Hon'ble Minister in October 2016
- Dashboard on National Centre for Geo Informatics has been developed.
- A mobile app has also been developed and launched.
- No. of triggers generated in first cycle - 296
- No. of triggers verified (by the States) – 287 (as on 1.12.2017), 48 cases of illegal mining were identified.



- Setting up of Remote Sensing Laboratory at Hyderabad with the assistance of NRSC, Hyderabad.
- As a part of Pilot Project in Tandur area, Andhra Pradesh, volume changes in a cluster of mines (6) were studied for 2007- 2015 period and observed that overall volume change is +10 to 11% only.
- Facilitate to monitor periodic changes of the mining areas within the mining lease boundary for a time period.

The second round of MSS has been started in January, 2018.

National Mineral Exploration Policy (NMEP)- 2016

3.28 India has a huge potential for mineral resources. However, till date the Government did not have a mineral exploration policy and initiatives taken so far by the Government could achieve only a limited success.

3.29 Investment flow for mineral exploration was insignificant, which was primarily being carried out by Government agencies viz. Geological Survey of India and Mineral Exploration Corporation Limited with their limited resources. As per international best practices and successful models, government agencies generate and disseminate baseline geoscience data and private agencies carryout regional & detailed exploration.

3.30 Further, the MMDR Amendment Act – 2015 had brought in significant changes in the legal framework related to mineral exploration, the most important feature being the grant of mining leases (ML) and prospecting license-cum-mining lease (PL-cum-ML) only through auction process. This created the necessity of boosting exploration operations in the country so as to create a pool of auctionable blocks.

3.31 The Government comprehensively reviewed its exploration strategy and formulated the National Mineral Exploration Policy-2016, which was notified on 13th July, 2016.

3.32 NMEP aims towards accelerating mineral exploration in the country. The salient features of the NMEP are as follows:

- Attractive provisions for inviting private investment in mineral exploration through revenue sharing model. GSI has already identified 100 exploration blocks for mineral exploration for implementing such schemes.
- GSI will make available pre-competitive baseline Geoscience data of international standard in a time bound manner. This data will be acquired as a public good for open dissemination free of charge.
- GSI will undertake a National Aero geophysical Mapping project for magnetic and spectrometric survey. Initially this will be done on the most potential areas of about 8 lakh sq km. of the country.
- A National Geoscience Data Repository (NGDR) will be set up by GSI which will collate all geo-scientific baseline data and mineral exploration information generated by diverse exploration agencies on a geo-spatial format.
- Government proposes to establish a non-profit autonomous institution, called National Centre of Mineral Targeting (NCMT) which will be a collaborative effort of government, industry and academic institutions.
- Govt. launched "Operation Khanij Khoj" to probe deep seated/concealed mineral deposits in the country.
- Upgradation of chemical and ore beneficiation laboratories of the Central Agencies and State Governments.



National Mineral Exploration Trust (NMET)

3.33 The National Mineral Exploration Trust (NMET) was established on 14th August 2015, in pursuance of subsection (1) of Section 9C of the Mines and Minerals (Development and Regulation) Amendment Act, 2015 with the objective to expedite mineral exploration in the country. NMET has a two tier structure, the Governing Body, of the Trust is chaired by Hon'ble Minister of Mines and the Executive Committee, chaired by Secretary, Ministry of Mines, which administers and manages the activities of NMET.

3.34 Besides, a Technical Committee has also been constituted to evaluate the mineral exploration proposals submitted by exploration agencies. The Technical Committee has evaluated and recommended 58 mineral exploration projects on non-coal and coal minerals for implementation and they are under various stages of progress. The National Aerogeophysical Mapping Programme of GSI is also being supported by NMET.

3.35 As on 2.01.2018 as per SBI Bank Account statement, the NMET Fund has accrued an amount of ₹ 1,046.45 crore in its account.

Offshore Areas Mineral (Development & Regulation) (OAMDR) Act, 2002

3.36 The Offshore Areas Mineral (Development & Regulation) (OAMDR) Bill 2017 has been prepared and placed in the public domain on 1.09.2017 for a period of 30 days under Pre-Legislative Consultation Policy (PLCP) for seeking comments/suggestions from public at large. This proposed amendment to OAMDR Act, 2002 will ensure greater transparency in allocation of natural resources in offshore areas.

Mineral Concession System

3.37 The State Governments used to grant the mineral concessions [Reconnaissance Permit (RP), Prospecting License (PL) and Mining Lease (ML)] under the provisions of the pre-amended Mines and Minerals (Development and Regulation) (MMDR) Act, 1957. Prior approval of the Central Government was required under Section 5 (1) of the Act for grant of RP, PL and ML in respect of Atomic and Metallic & Non- Metallic Minerals specified in Parts 'B' and 'C' of the First Schedule to the Act. Subsequent to the prior approval of the Central Government, mining leases etc. are executed by the State Governments in favour of the applicants with the mining agencies after they obtain all statutory clearances and approvals as specified in the principal/LoI as the case may be. The metallic minerals which figure in Part 'C' of the First Schedule to the Act in which prior approval is required are Asbestos, Bauxite, Chrome Ore, Copper ore, Gold, Iron ore, Lead, Manganese ore, Zinc and precious stones. The Central Government amended the existing MMDR Act and brought the amended Act into force w.e.f 12.1.2015. The State Government will continue to grant mineral concession but all these grants would be through auctions, thereby bringing in greater transparency and removing discretion. The tenure of the mineral concession has been increased from the existing 30 years to 50 years. Thereafter, the mining lease would be put up for auction.

3.38 Major Initiatives taken to infuse greater transparency

i) All mineral concessions will be granted only through auction as per Section 10 B & 11 of amended MMDR Act, 2015. However, the provisions of this section shall not be applicable to cases covered under Section 10A or Section 17A or to minerals specified in Part A or Part B of the First Schedule or to land in respect of which the minerals do not vest in the Government.



ii) Prior approval of the Central Government for grant of mining lease under Section 5(1) has been done away with.

Mineral Auctions

3.39 The MMDR Amendment Act, 2015 instituted the system of e-auction for grant of mineral concessions for major minerals with a view to bringing in greater transparency and removal of discretion in allotment. 21 mineral blocks across 7 States, namely Rajasthan, Odisha, Madhya Pradesh, Chhattisgarh, Karnataka, Jharkhand and Andhra Pradesh have been successfully auctioned till 31.03.2017. Further, 12 blocks have been auctioned till 01.12.2017 in the states of Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Maharashtra, Odisha and Rajasthan.

3.40 The successful e-auction of 33 mineral blocks across the country with estimated value of resources over ₹ 1,69,391 crore have been auctioned in a transparent manner. The total estimated revenue to the state government over the lease period stands at ₹ 1,28,388 crore. Out of this the cumulative Royalty, District Mineral Fund (DMF) and National Mineral Exploration Trust (NMET) contributions works out to be ₹ 29,556 crore (₹ 26,390 crore, ₹2,639 crore and ₹ 528 crore, respectively). Thus, the additional revenue to be garnered through the auction process would be ₹ 98,832 crore over the entire lease period.

Revision Applications

3.41 Under Section 30 of the Mines and Minerals (Development and Regulation) Act, 1957 and Rule 35 of the Minerals (other than Atomic & Hydro Carbons Energy Minerals) Concession Rules, 2016 the Ministry of Mines exercises its Revisionary Powers in dealing with the Revision Applications filed by the applicants who are aggrieved by any order passed by the State Govt. or any other authority under Rule 35 and 36 of MCR 2016 detailed procedure for filing and disposal of Revision Application has been prescribed.

3.42 Disposal of Revision Applications has public interface. In order to ensure transparency in disposal of Revision cases, software i.e. ras.nic.in has been implemented for effective monitoring of the Revision Applications, received in the Ministry of Mines. This system keeps track of the various stages of the Revision Applications filed by the applicants till the final disposal of the applications. The system is web enabled and has link on the website of the Ministry of Mines. The salient features of the system are as under:-

i) Status of Revision Application is available on website.

ii) Final Orders are available on the website;

iii) Final Order numbers are generated by the system automatically;

iv) Hearing details etc. are available on the website;

v) Revision Application numbers are generated by the system automatically;

3.43 As far as possible, cases are being heard in on a chronological order and as per their age of pendency.

3.44 The website is accessible by public and the copy of Final Order & Hearing Notices can be downloaded from the Website.

3.45 During 1st January, 2017 to 31st December, 2017, 375 Revision Applications were disposed of by the Revisionary Authority in the Ministry of Mines.



Hon'ble Minister of Mines Shri Narendra Singh Tomar and Hon'ble Minister of State, Mines, Shri Haribhai Parthibhai Chaudhary alongwith officers of Ministry of Mines

4

Revenue from Mineral Resources



Revenue from Mineral Resources

- Royalty - Legal provisions Page - 33
- Revision of rates of royalty and dead rent in respect of major minerals (Non-coal minerals) Page - 33
- Rates of royalty *Page - 35*



Royalty

Legal Provisions

4.1 Under the provisions of Section 9(3) of the MMDR Act, 1957, the Central Government may, by notification in the Official Gazette, amend the Second Schedule, so as to enhance or reduce the rate at which royalty shall be payable in respect of any minerals with effect from such date as may be specified in the Notification, provided that the Central Government shall not enhance the rate of royalty in respect of any minerals more than once during any period of three years. Similarly under Section 9A (2) of the Act, the Central Government may, by notification in the official Gazette, amend the Third Schedule so as to enhance or reduce the rate at which the dead rent shall be payable in respect of any area covered by mining lease and such enhancement or reduction shall take effect from such date as may be specified in the notification, provided that the Central Government shall not enhance the rate of the dead rent in respect of any such area more than once during any period of three years.

Revision of rates of royalty and dead rent in respect of major minerals (non-coal minerals)

4.2 In exercise of the powers conferred under Section 9(3) of the MMDR Act, 1957, the Central Government has amended the Second Schedule (Rates of Royalty in respect of Second Schedule minerals) to the said Act, and notified/published vide notification No. G.S.R. 630(E) dated 01.9.2014. Further, in exercise of the power conferred under Section 9A (2) of the above said Act, the Central Government has amended the Third Schedule (Rates of Dead Rent) of the said Act and published/ notified vide notification No. G.S.R. 631(E) dated 01.9.2014. Royalty accrual for 4 years for major minerals (other than coal, lignite and sand for stowing) from the various State Governments for the year 2013-14, 2014-15, 2015-16 and 2016-17 are enclosed as **Table 4.1**.



Badlands, carved in ancient moraines with screen aprons, Shego Village, Lahaul & Spiti district, Himachal Pradesh



Table 4.1
Accrual of Royalty for Last 4 Years for Major Minerals other than Minor Minerals, Coal, Lignite and Sand for Stowing

(Value in ₹ Lakh)

Sl No	State	2013-14*	2014-15*	2015-16	2016-17
1	Andhra Pradesh	48,784.20	33,571.00	26,650	29,527
2	Assam	44.87	139.67	248	512
3	Bihar	128.17	107.31	NA	NA
4	Chhattisgarh	1,14,535.52	1,55,634.52	1,07,364	1,11,517
5	Goa	3,650.62	4,838.24	4,288@	31,475@
6	Gujarat	35,031	43,476	NA	NA
7	Haryana	8	40.3	NA	NA
8	Himachal Pradesh	6,625	9,740	NA	NA
9	Jharkhand	62,706.56	82,870.25	NA	NA
10	Jammu & Kashmir	914.49	1,182.14	NA	NA
11	Karnataka	74,304	92,594	79,766	1,01,534
12	Kerala	1,239.31	1,390.53	757	NA
13	Madhya Pradesh	36,527	46,697	39,185	37,735
14	Maharashtra	16,825.87	14,100	16,241	16,925
15	Meghalaya	2,465.59	2,199.58	2,998	NA
16	Odisha	3,76,765	3,44,338	3,41,343	2,47,678
18	Rajasthan	1,59,147	1,97,024	1,86,575	NA
17	Telangana	-	19,702.72	19,015	20,126
19	Tamil Nadu	16,741.50	18,087.4	NA	NA
20	Uttara Khand	1,522	1619	NA	NA
21	Uttar Pradesh	1,410	1037	NA	NA
	Total	**9,59,375.7**	**10,70,388.66**	**8,24,430**	**5,97,029**

Source:- Information received from respective State Governments.
NA:- Not Available
**: Include minor minerals as declared by Gazette Notification dtd. 10.02.2015*
@: Not included the e-auction iron ore royalty of ₹ 522.74 lakh and ₹ 3,387.94 lakh for the years 2016-17 and 2015-16 respectively.



4.3 Existing royalty rates for some important industrial use minerals is given at **Table 4.2**.

Table 4.2
Rates of Royalty

(Published vide notification GSR 630 (E) dated 01.09.2014 in Extra Ordinary Gazette of India)

1. Bauxite and Laterite	**a) Metallurgical Grade:** Zero point six zero per cent of London Metal Exchange Aluminium metal price chargeable on the contained aluminium metal in ore produced for those dispatched for use in alumina and aluminium metal extraction. **b) Non-Metallurgical Grade:** Twenty five per cent of sale price on ad valorem basis for those dispatched for use other than alumina and aluminium metal extraction and for export.
2. Chromite	Fifteen per cent of average sale price on ad valorem basis.
3. Copper	Four point six two per cent of London Metal Exchange Copper metal price chargeable on the contained copper metal in ore produced.
4. Diamond	Eleven point five per cent of average sale price on ad valorem basis.
5. Gold : (a) Primary (b) By-product gold	Four per cent of London Bullion Market Association Price (commonly referred to as "London Price") chargeable on the contained gold metal in ore produced. Three point three per cent of London Bullion Market Association Price (commonly referred to as "London Price") chargeable on the by-product gold metal actually produced.
6. Iron ore: (lumps, fines & concentrates all grades)	Fifteen per cent of average sale price on ad valorem basis.
7. Manganese Ore : (a) Ore of all grades (b) Concentrates	 Five per cent of average sale price on ad valorem basis. One point seven per cent of average sale price on ad valorem basis.
8. Nickel	Zero point one two per cent of London Metal Exchange nickel metal price chargeable on contained nickel metal in ore produced.
9. Silver (a) By-product (b) Primary silver	 Seven per cent of London Metal Exchange Price chargeable on by-product silver metal actually produced. Five per cent of London Metal Exchange silver metal price chargeable on the contained silver metal in ore produced.
10. Zinc	(a) Nine point five per cent of London Metal Exchange zinc metal price on ad valorem basis chargeable on contained zinc metal in ore produced. (b) Ten per cent of London Metal Exchange zinc metal price on ad valorem basis chargeable on contained zinc metal in concentrate produced.



Secretary, Shri Arun Kumar speaking during Africa India co-operation meet

5

International Co-operation



International Co-operation

- Participation in International Mining Exhibitions Page - 39
- Bilateral Meetings Page - 40

Objectives

5.1 Development of Mining Sector is essential for a country's development in industrial sector. India is also deficient in many important minerals. India also needs capacity building in geosciences, transfer of technology in mining sector as well as acquisition of mining assets abroad by public and private sector. In order to achieve these objectives International Co-operation Division has been engaged in collaboration with countries like Canada, Australia, Russia and African countries. India has been participating in various International Mining events by setting up Indian Pavillion, making presentations before the delegates about the recent reforms and opportunities in mining sector in India so as to attract foreign investment in Indian mining sector.

5.2 Participation in International Mining Exhibitions:

i) Mining Indaba – 2017 (from 6th to 9th February, 2017 at Cape Town, South Africa)

5.3 It is the largest mining exhibition and conference of the African continent. This serves as the pathway for foreign investments into Africa's mining value chain with opportunities ranging from various minerals.

5.4 A 12 member Indian delegation led by Shri Susheel Kumar, Secretary, Ministry of Coal alongwith Joint Secretary, Ministry of Mines, Directors of Ministry of Coal and Steel and representative of PSEs participated in this event. Secretary, Ministry of Coal made a presentation in 'Mining Indaba-2017' Conference during Non-African session on the overview of mining in India, highlighting India's capabilities in mining sector and the potential of India as a mining destination. On the sidelines of Mining Indaba-2017, bilateral meeting was held between Indian delegation led by Secretary (Coal) and Mali, led by Minister of Mining, Republic of Mali.



Meeting between Indian delegation and delegation led by Minister of Mining, Republic of Mali

ii) Prospectors & Developers Associations of Canada (PDAC) – 2017 from 5th to 8th March, 2017 at Metro Toronto Convention Centre in Toronto, Canada.

5.5 In this largest mining event of the world attended by more than 24,000 delegates from 130 countries including investors, analysts, mining executives, geologists, government officials and students a 19 member Indian delegation led by Shri Subhash Chandra, Joint Secretary, Ministry of Mines participated. An 'India Day' celebration was held on 7th March, 2017. Shri Subhash Chandra, Joint Secretary presented an overview of the mining and exploration scenario in India and answered various queries from the delegates. Shri Deb Kumar Bhattacharya, Director, GSI, Shri T.R.K. Rao, Director, NMDC, Mrs. Reena Babasaheb Kangale, MD, Chhattisgarh Mineral



India - Malawi Joint working Group Meeting on Mineral Resource Development

Development Corporations Ltd. Shri D.C. Samal, DGM (NALCO), Shri S.K. Bhattacharjee, Director, HCL made presentations on the specific areas of their organizations/companies to appeal to the attendees to invest in India in Mining sector.

iii) International Mining and Resources Conference 2017 (IMARC-2017): from 30th October to 3rd November, 2017 at Melbourne, Australia

5.6 In this important mining conference organized by three of Australia's leading industry associations' i.e the Australasian Institute of Mining and Austmine and the Australian Mines and Metals Associations (AMMA), about 2,800 internationally-diversified professionals across the world and delegations from nearly 55 countries participated in the event.

5.7 Shri Bipul Pathak, Joint Secretary, Ministry of Mines participated on behalf of the Government of India in this event. At the plenary session alongwith ministerial delegates from other countries he made a presentation on the recent development and progress of Indian mining sector and its opportunities. The presentation highlighted the reforms carried out in the mineral administration regime in India and the result and achievements of those reforms. On the sidelines of IMARC- 2017, Shri Bipul Pathak, Joint Secretary, Ministry of Mines met the Venezuela delegation led by Mr. Franklin Ramirez Araque, Secretary of Mining, Venezuela. During the meeting Venezuelan delegation flagged their issues of copper mines and gold mines along with other issues of Venezuela.



Indian Pavilion in PDAC – 2017

Bilateral meetings:

(i) Co-operation with Canada

5.8 A meeting between Indian delegation and the delegation of Department of Natural Resources, Government of Canada was held under the existing MoU on Co-operation in the field of earth sciences and mining between the two countries, was held on 7th March, 2017 on the sideline of PDAC- 2017 in Toronto, Canada. On conclusion of the meeting, an Implementing Arrangement (IA) under the MoU was signed by Shri Subhash Chandra, Joint Secretary, Ministry of Mines and Mr. Kenneth Ko, Director Management Services and International Affairs Division, Earth Sciences Sector, Natural Resources Canada. It focused on capacity building programme for GSI's scientists on Platinum Group Element and Research with the support of Geological Survey of Canada.



Indian Pavilion in PDAC-2017

(ii) Co-operation with Australia from 4th to 8th September, 2017 in Australia.

5.9 An 18 member Indian delegation led by Dr. Niranjan K. Singh, Joint Secretary, Ministry of Mines along with representatives of the

mineral rich state governments visited Australia to learn exploration techniques, mining technology and equipment, improvement of mining environment etc. They visited Fosterville gold mine, Monash University in Victoria, Iron ore mine, Center for Exploration Technology (CET) and Geological Survey of Western Australia, Alcoa Huntly Bauxite Mines, Newmont's Boddingtons gold/copper mine, Kalgoorlie Superpit, Red Hill lookout Kambalda, St. Ives gold mines, Western Australia School of Mines, Kalgoorlie Hall of Fame near Perth city in Western Australia.



Visit of Indian Delegation led by Dr. Niranjan K. Singh, Joint Secretary to Monash University, Victoria, Australia in September, 2017

(iii) Co-operation with Russia

5.10 The 6th Meeting of India-Russia Sub-Group on Mining under the India- Russia Working Group on Modernization and Industrial Co-operation was held on 15th September, 2017 in Moscow, Russia. This India-Russia Sub-Group is one of the four Sub-Groups of the Working Group on Modernization and Industrial Co-operation under the India-Russia Inter-Governmental Commission (IR-IGC) on Trade, Economic, Scientific & Technical and Cultural Co-operation.

5.11 Shri Bipul Pathak, Joint Secretary, Ministry of Mines co-chaired the meeting on behalf of the Government of India. Mr. Eugene V. Muratov, Deputy Director, Department of Heavy Machinery and Investments, Ministry of Industry and Trade co-chaired the meeting on behalf of Russian Federation. Mining issues related to Geological Survey of India, Steel Authority of India Ltd., Mishra Dhatu Nigam India Ltd., aluminium and coal sector were discussed. On conclusion of the meeting, a Protocol was signed between the two countries.



Africa India Co-operation meeting on 24th May, 2017 at Gandhinagar, Ahmedabad

(iv) Co-operation with Malawi

5.12 The 2nd meeting of the India-Malawi Joint Working Group under the existing MoU in the field of mineral resource development was held during 16th to 18th August, 2017 at Lilongwe, Malawi. The Indian side chaired by Shri Subhash Chandra, Joint Secretary, Ministry of Mines and the Malawian side was chaired by Mr. Patrick Matanda, Principal Secretary, Ministry of Natural Resources, Energy and Mining, Government of Malawi. During the meeting, both sides discussed and exchanged information about the development and recent reforms in their respective mining sector. On conclusion of the meeting, a Protocol for further co-operation between the two countries was signed on 17th August, 2017.



Meeting with the Delegation of Republic of Poland on 29th November, 2017

5.13 36th International Geological Congress (36th IGC)

India has won the global bid at Brisbane in 2012 to host the 36th International Geological Congress in India in the year 2020. The IGCs are prestigious geoscientific events held quadrennially with an attendance to the tune of 6000 or more. The event assumes greater significance for the fact that it is registering a come back to the Indian soil after nearly six decades. India is the only Asian country privileged to host the event twice in the history of the IGCs.

The Congress will be funded by the Ministry of Mines and Ministry of Earth Sciences, Govt. of India with the support of the Indian National Science Academy (INSA) and the Science Academies of the other co-host countries, namely, Bangladesh, Nepal, Pakistan and Sri Lanka.

The legal entity entrusted with the responsibility of organizing the event is the Society named "36th International Geological Congress", registered under the Society Registration Act-1860, on 27th April, 2016. The management of the affairs and funds of the Society vests with the Governing Body (GB) comprising, among others, Secretary, Ministry of Mines; Secretary, Ministry of Earth Sciences; and President, INSA.The GB is supported by an Executive Committee, the Local Organizing Committee and 12 supporting thematic subcommittees. Geological Survey of India is the nodal organization for organizing the event.

Prof. V.P.Dimri, Shri N.KutumbaRao (DG, GSI) and Dr.P.R.Golani are the President, Co-President and Secretary General, respectively of the 36th IGC.

The International Union of Geological Sciences (IUGS), the scientific sponsor of IGCs, had visited India in November, 2017 to interact with the 36th IGC. The delegation comprised Dr.Qiuming Cheng, President, Prof. Stanley Finney, Secretary General, and Prof. H. Kitazato, Treasurer. The IUGS team, during its visit, also met Shri Arun Kumar, Secretary, Mines; Dr. M. Rajeevan, Secretary, Ministry of Earth Sciences; Shri N. Kutumba Rao, DG, GSI; Dr. Rajeshwer Rao, Addl. Secretary, Mines and senior officers of the Ministry of Mines, Ministry of Earth Sciences and INSA. The team left highly impressed with the progress of the preparations as well as the facilities available with the India Expo Centre, the venue of the 36th IGC. It expressed hope of having a very successful 36th IGC in 2020.



Shri Arun Kumar, Secretary, Mines, Dr. M Rajeevan, Secretary, Ministry of Earth Sciences, Dr.Qiuming Cheng, President, and Prof. Stanley Finney, Secretary General, IUGS, along with other members of IUGS and 36th IGC during IUGS-36th IGC LOC meeting held on 22nd Nov. 2017 at Ashok Hotel, New Delhi.

5.14 AGM of Inter Government Forum (IGF)



Delegation from the Ministry of Mines led by Shri Prithul Kumar, Director along with a member Shri Pushpender Gaur, DCOM IBM, participated in AGM of Inter Government Forum (IGF) on Mining, Minerals, Metals and Sustainable Development from 16 October to 20 October 2017 at Palais des Nations, Geneva. The IGF supports more than 60 nations committed to leveraging mining for sustainable development to ensure that negative impacts are limited and financial benefits are shared. Shri Prithul Kumar, Director, Ministry of Mines presented the recent change in policies which are dedicatedly focused on increasing the transparency in grant of mineral concession and sustainable development of the mining industry and society.



Secretary, Shri Arun Kumar and other officers of Ministry of Mines and Ministry of Coal with Poland Delegation lead by Shri H. E. Grzegorz Tobiszowski, First Deputy Minister of Energy of the Republic of Poland in Shastri Bhawan, New Delhi - 29th November, 2017

6

Attached/Subordinate Offices



Attached / Subordinate Offices

- Geological Survey of India Page - 47
- Organisation of GSI Mission Page - 48

  Mission - I Page - 49

  Mission - II Page - 51

  Mission - III Page - 52

  Mission - IV Page - 55

  Mission - V Page - 56
- Central Geological Programming Board Page - 56
- Indian Bureau of Mines Page - 61
- Key activities and functions Page - 63
- Inspection of mines Page - 64
- Statistical publication Page - 69
- Mining Tenement System (MTS) Page - 70
- Sustainable Development Framework (SDF) Page - 71
- Mining Survellance System (MSS) Page - 72

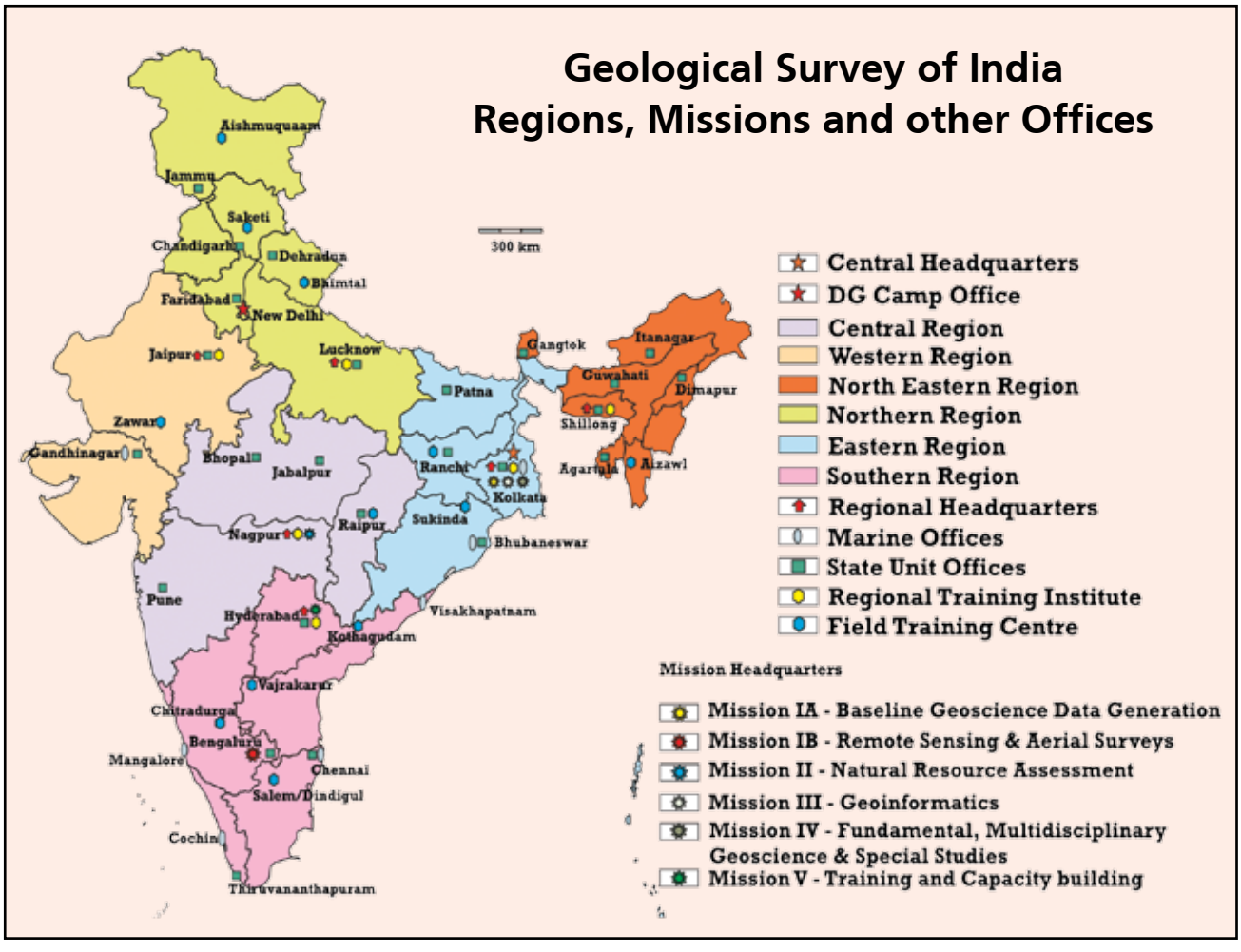


Geological Survey of India (GSI)

6.1 Founded in 1851, the Geological Survey of India (GSI) started its voyage to search for and assess coal and mineral resources of the country with regional level exploration. In the 166 years since its inception, GSI has continued to grow and diversify into various geoscientific activities, and made colossal contribution in the arena of geosciences as well as in the economic growth of India. One of the oldest Surveys of the world, the history of GSI is synonymous with history of development of the infrastructure and industries in India. The main functions of GSI relate to creation and updation of national geoscientific information and mineral resource assessment. These objectives are achieved through ground surveys, air-borne and marine surveys, mineral exploration, multi-disciplinary geoscientific, geo-technical, geo-environmental and natural hazards studies, glaciology, seismotectonics, and carrying out fundamental research.

GSI, headquartered at Kolkata, has six Regional offices located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata and State Unit offices in almost all States of the country **Figure.6.1**. Geological Survey of India is an attached office to the Ministry of Mines.

Figure 6.1





Director General GSI, Shri M. Raju greets Prime Minister of India Shri Narendra Modi and Prime Minister of Bangladesh, Her Excellency Sheikh Hasina at Hyderabad House, New Delhi

Performance of GSI during 2017-18

6.2 Summarized performance of Geological Survey of India in terms of physical targets and achievements as per XII plan [2012-13, 2013-14, 2014-15, 2015-16 & 2016-17] and Annual Plan of GSI 2017-18 (up to September, 2017)] is given at **Annexure 6.1**. **(Page No 180)**



5th Meeting of Geoscience Advisory Council held on 27th June, 2017

Organization of GSI

6.3 The activities of GSI is organized into 5 Missions in line with its future challenges, which are namely, Baseline Geosciences data generation (Mission-I), Natural Resource Assessments (Mission-II), Geoinformatics (Mission-III), Fundamental and Multidisciplinary Geoscience (Mission- IV) and Training and capacity building (Mission-V). Three Support Systems viz Policy Support System (PSS), S&T Support System (STSS) and Administrative Support System (ASS) provide support and cross-cutting co-ordination.



Mission I: Baseline Geoscience Data Generation

6.4 Systematic Geological Mapping (SGM) aided by Remote Sensing Techniques

Systematic Geological Mapping on 1:50,000 scale is the most fundamental mapping programme. Out of the 3.146 million sq km mappable area of the country, an area of 3.108 million sq km has been covered upto March' 2016, bringing the total coverage to 98.5%. For completion of geological mapping on 1:50,000 scale in the most inaccessible terrain of the Northern and North-Eastern Himalayas, GSI has embarked on geological mapping aided by remote sensing , including satellite data, from the Annual programme of the year 2016-17 and an area of 6500 sq.km has been covered during FS 2016-17. During the period from April to September' 2017, an area of 8780 sq km has been covered in the inaccessible terrain of north-eastern Himalayas.

6.5 Specialised Thematic Mapping (STM)

The theme-specific mapping in 1:25,000 or larger scale involves collection of multidisciplinary data and is backed by advanced laboratory studies. STM has a pivotal role in prognostication of natural resources and it is also important in environmental analysis, natural hazard recognition, risk evaluation, land use management, and in evaluation of major civil engineering projects etc. Specialized Thematic Mapping of 2.58 lakh sq km has been achieved till March 2017 and during the six-month period from April to September 2017 an area of 1291 sq km has been covered by STM against the total target of 14,000 sq km for the year 2017-18.

6.6 Geochemical Mapping

The National Geochemical Mapping (NGCM) is a countrywide programme and under this programme, geochemical mapping is carried out in 1:50,000 scale with sample density of one sample per 1km × 1km grid having the objective to generate elemental baseline data



Launch of Aero-geophysical Survey programme in Speaker Hall, Constitution Club of India, 07th April, 2017 at New Delhi



for use in managing and developing natural resources including mineral occurrences, in environmental, agricultural, human health, other social concerns.

Based on the geological mapping of the country, an area of 5.71 lakh sq km, out of total mappable area of 3.146 million sq km, has been demarcated as Obvious Geological Potential (OGP) area, where geological potential for occurrence of mineral deposit is higher.

Till March 2017, an area of 7.75 lakh sq km containing 4.11 lakh sq km OGP area has been mapped by NGCM and during the period from April to September 2017 an area of 8185 sq km has been covered against the total target of 1,37,000 sq km for the year 2017-18.

6.7 Geophysical Mapping

The Geophysical mapping under the Geophysical Mapping Programme (GPM) comprises ground geophysical survey in 1:50,000 scale. The main objective of the survey is to generate baseline Geoscientific data to generate models to locate and delineate subsurface geological bodies / structures and in postulating conceptual models.

Till March 2017, an area of 4.66 lakh sq km containing 2.97 lakh sq km OGP area has been mapped by NGPM and during the period from April to September 2017 an area of 6095 sq km has been covered against the total target of 1,00,000 sq km for the year 2017-18.

6.8 Remote Sensing and Airborne Survey

Airborne Geophysical Surveys are being carried out by the Geophysical sensor systems on-board the fixed-wing Twin Otter Aircraft Survey System (TOASS) and the Heliborne Geophysical Survey System (HGSS). The TOASS consists of Magnetic and Gamma Ray Spectrometric sensors while the HGSS consists of Gravity, Magnetic, Time Domain Electro-Magnetic (TDEM), and Gamma Ray Spectrometric sensors.

During the six-month period from April to September 2017, Heliborne surveys over Shimoga area covered 1,366 line km with Time Domain Electro-Magnetic (TDEM), Magnetic and Spectrometric sensor configuration.

The target of TOASS survey for the year 2016-17 has been completed by March 2017 and the survey for the year 2017-18 is likely to resume in October 2017 after the end of monsoon. Therefore, during April to September 2017 there is no progress in target achievement, however during the year 2016-17 a total of 61,351 line km has been covered by this survey.

6.9 Hyperspectral Remote Sensing Technique in Exploration

Spectral Geological studies in Mineral Exploration

Photogeology and Remote sensing divisions have taken up mapping of alteration/ mineralized zones on 1:50,000 scale using Multispectral and Hyperspectral remote sensing data and spectro-radiometer covering 6,400sq km in potential areas (Tikamgarh & Chhatarpur district, MP & Jhansi district, UP; Saraikela Kharsawar district, Jharkhand; Sirmaur district, UP & Dehradun district, Uttarakhand; Uttangarai, Dharampuri district, TN and Udaipur,& Banswara district, Rajasthan) with the objective of delineating alteration zones associated with mineralization, and building up of spectral library for litho-units in these areas.

Application of Synthetic Aperture Radar (SAR) interferometry and morphometric studies

SAR interferometry, and morphometric studies carried out to understand the temporal changes due to ground deformation & neotectonism in sub-himalayan parts of Arunachal Pradesh covering 1500 sq km.



6.10 Marine and Coastal Surveys

Geological Survey of India carried out off shore geo-scientific studies both in Exclusive Economic Zone (EEZ) and Territorial Water (TW) along the East and West coasts of India. The main purpose of the Marine Survey is not only to discover the undersea hidden treasure of Economic Minerals but also to unravel the evolutionary history of formation of seabed morphology and its continuous transformation under the influence of dynamic processes operative on different scales in different parts of the globe.

Upto September 2017, Geological Survey of India has completed seabed mapping of 1,32,585 sq km out of 1,50,000 sq km within Territorial Waters and 18,60,549 sq km out of 18,64,900 sq km in the EEZ beyond Territorial Waters on reconnaissance scale. The total EEZ coverage including TW is 19, 93,134 sq km out of a total EEZ area of 20,14,900 sq km.



Tabular cross bedding within Shillong Quartzite

Significant resource of lime mud has been demarcated within the EEZ off Gujarat and Maharashtra Coasts. Potential areas of phosphate bearing sediments, seabed massive sulphides Fe-Mn encrustations, Rare Earth Yttrium and Gas Hydrate bearing zones have been identified within the EEZ of India, besides resource evaluation of heavy mineral placers and construction grade sands within the TW off east and west coasts of India.

Mission: II Natural Resource Assessment

6.11 Mineral Resource Assessment

The National Mineral Policy (2008) envisaged GSI to perform the tasks of regional survey and exploration for minerals. The exploration activities of GSI have been prioritized keeping in view the thrust accorded by the Government of India, the directives given by Niti Aayog, the recommendations of Central Geological Programming Board (CGPB) and State Geological Programming Board (SGPBs).



Ultramafic cumulate exposed towards north of Phange, Ukhrul district Manipur

GSI carries out 'reconnaissance survey' [G4], 'preliminary exploration' [G3] and 'general exploration' [G2] [following the guidelines of United Nations Framework Classification (UNFC) and Mineral Evidence and Mineral Content Rules (MEMC)-2015].

During FY 2017-18, a total of 211 investigation programs have been taken up of which 175 are under 'Mineral resource assessment' (ores and minerals); 23 belong to 'Natural energy resources' [coal, lignite and geothermal] and 13 belong to the 'offshore mineral investigation' (MCSD) projects.

6.12 'Mineral resource assessment' (ores and minerals):

Among 175 Mineral Resource Assessment Projects, 29 are on Ferrous Minerals (Iron, Manganese and Chromite), 42 Precious Metals

& Minerals, 72 for Non-Ferrous and Strategic Minerals, 32 on Industrial & Fertilizer Minerals.

6.13 'Natural energy resources' [Coal and Lignite]

GSI has augmented coal resource in different states and the total resource of coal of the country stands at 3,15,148.81 million tonnes and that of lignite stands at 44698.14 million tonnes as on 01.04.2017.

6.14 Geothermal Studies

During the FS 2017-18 geothermal studies are to be carried out in Maharashtra, Telangana and Jammu& Kashmir.



Ultramafic rock exposure near Washello in Phek District, Nagaland

Mission-III: Geoinformatics

6.15 Mission III is actively involved in national as well as international collaborative initiatives (NSDI, NDSAP, NGIS etc) concerning dissemination of geo-information. Mission III has formulated a new "Data Dissemination Policy", which is in approval stage, incorporating guidelines from MOM, MOD, MMDR Amendment Act 2015 and National Mineral Exploration Policy (Non-Fuel Minerals) 2016.

6.16 Mission IIIA – IT Infrastructure and Connectivity

Mission IIIA as part of Mission III, maintains and manages the IT infrastructure connectivity, applications and databases in GSI and provides the necessary setup to archive and disseminate data and deliver geo-information to various stakeholders in an effective way.

The tool for dissemination of digital information in GSI is its portal (www.gsi.gov.in) which provides structured, logically organised information to different categories of users. All GSI offices including Central Headquarters (CHQ), Regional Headquarters (RHQ) and State Units (SU) are connected through an enterprise Virtual Private Network (MPLS IP VPN) with converged data voice-video communication. Mission IIIA also takes an active role in promoting e-governance in GSI by maintaining administrative transactional modules for office automation.

GSI has implemented Online Core Business Integrated System (OCBIS) during 2015-17. Under OCBIS project a state-of-art new Data Centre (DC) has been developed at Dharitri Building, Salt Lake, GSI, Kolkata. The DC provides a robust physical infrastructure to maintain 24X7 uptime, scalability and highly secured environment with integrated building management system for monitoring round the clock, 365 days. A similar setup is put in place as Disaster Recovery Centre, Hyderabad to ensure 24X7 availability in case of any exigency.

Hardware setup for OCBIS is unique and is designed to cater to all GSI internal and external stake holders. It will host all scientific and administrative applications and robust e-mail solution with MS Exchange Suite and Skype for Business for Mail Messaging and IM.

GPS aided mobile field devices to aid field officers has been introduced for the first time as part of the project. A Smart GIS application



5th Meeting of Geoscience Advisory Council in progress

is hosted in the field device (rugged pad) which has been configured to collect sample / observation data from the field in both online and offline mode. The smart application can also be accessed through laptops / desktops. Field devices were dispatched to different Regions and the SUs and Training - hand holding support to make OCBIS field applications smooth and operational has been completed.

6.17 Mission IIIA – Data Repository and Management

GSI's Information Technology (IT) vision achieved a milestone with OCBIS Enterprise Portal launched in April, 2017. Mission IIIA is also entrusted with the task of maintaining the Enterprise Database and the Repository Infrastructure. OCBIS aims at comprehensive data management through integrated database scheme and repositories to house all geoscientific as well as administrative information.

"Bhukosh", the integrated spatial data management portal facilitates the authorised users to visualise, query, create maps and download data. One can access a host of geoscientific data pertaining to Geological mapping, Geochemical mapping, Geophysical Mapping, Aerogeophysics, Seismotectonics, Landslide, Geochronology and meteorites in the form of OGC compliant map services.

Field Season Project Management Information System (FSPMIS) together with Laboratory Management System (LMS), Drilling Management Information System (DMIS), Vehicle management Information System (VMIS) and Smart Field Application are amongst the core applications open for usage. One can directly formulate a programme in FSPMIS, propose analysis of samples in specific laboratories, assign drilling units and vehicles as per requirement from the GSI resource and monitor the activities over period of time. The FSP Items pertaining to FS 2017- 18 are formulated through the new OCBIS Portal for further execution and monitoring by the concerned users.

6.18 Virtual Museum is a unique portal service which displays a diverse collection of natural specimens like rocks, minerals, fossils and meteorites from all over the country. Thus, selected museum specimens of GSI can be viewed three dimensionally by just a click of the computer mouse.

Support services like, CGPBIS, Grievance, RTI, Legal, Rajbhasha, Parliamentary questionnaire, etc. have been also implemented. The APAR of the GSI Employees for the year 2016-17 was submitted through the HRMS Portal. Service Book of the Employees can be viewed through OCBIS Portal.



Arial view of Dalli Iron Ore Mine

6.19 Mission IIIA– Advanced Spatial Data Systems

Geological Survey of India is the Nodal Agency for execution of the programs relating to the National Spatial Data Infrastructure (NSDI). Advanced Spatial Data System Division (ASDSD) placed at DGCO, New Delhi to act as GSI node of NSDI. The division is creating metadata of unpublished GSI reports and 50K maps in conformity with NSDI Standard version 2.0 for uploading on NSDI hosted India Geoportal. The division is also rectifying the error and implementing the correction of the metadata of 50K map uploaded on the NSDI portal.

The document pertaining to Data Content Standards on Surface Geological Mapping theme is being finalised. Compiling of the definition for geological formation to be incorporated in the Content Standard is under progress.

6.20 Mission IIIB– Publication & Library

All major categories of GSI publications (Memoirs, Bulletins, Records, Special Publications, Miscellaneous Publications, Catalogues, Palaeontologia Indica, Indian Journal of Geosciences, e-news) are uploaded in the OCBIS portal as per the existing data sharing and access policy of GSI of 2014. During the period of April 2017 to September 2017 nine numbers of scientific publications are released and another 20 numbers are expected to be released by March 2018.

To keep pace with technological advancement, Central Library of GSI, is under modernization process with the introduction of digital database management & development by converting the physical documents in soft copy format, stepping towards the electronic formats of scientific (Earth Sciences & allied) journals, library automation etc.

E-Library in the GSI: Special thrust has been given to offer library services through e-library format at Central Library and access to Earth Science journals to GSI officers through GSI OCBIS portal. The Central Library, CHQ, GSI, Kolkata has procured online journals of earth science journals, which can be accessed through all the 31 offices of GSI through LAN. For the year 2017, total 13 online Science Direct journals (published by Elsevier) are subscribed. The publisher has given additional complimentary access to 103 Science Direct Journals for all offices of GSI.

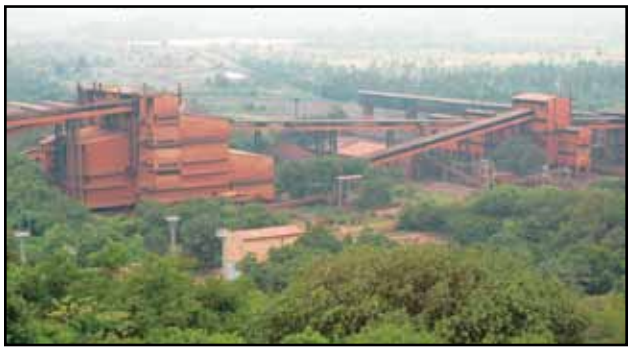
National Digital Library (NDL) Project: Central Library participated in different training programmes/workshop at IIIT, Hyderabad; IIT, Kharagpur and Central Library, University of Calcutta pertaining to NDL Project under Ministry of Human Resources and Development, which is coordinated by IIT, Kharagpur. Objective of the project is to integrate all the digitized and digital contents across educational institutions of the nation to provide a single-window access with e-learning facility to different groups of users ranging from primary level to higher education level of the country. GSI has been registered as institutional member of the said project.

6.21 Mission IIIC – Map, Geoinformatics & Data Integration

GSI, has been mandated to prepare both analog and digital geological maps / map databases for the entire country, and publication of the same. Following this, Maps like Geological Quadrangle Maps (GQM), District Resources Maps (DRM), Geological and Mineral Maps of States, Mineral Belt Maps (MBM), Coal Field Maps, Marine Maps etc., several thematic maps covering pan India are being compiled and printed under this Mission. The Mission is publishing "Second Edition of GQM" that has been compiled from 1:50K digital map database for pan India in OCBIS portal. Moreover, it is also compiling and preparing a separate geo-database for Thematic Geological Maps in 1:25K scale of selected belts of India, where such mapping has been carried out by GSI. The compilation and publishing the Sea Bed Sediment Maps of Territorial Water (TW) and Exclusive Economic Zone (EEZ) is also carried out in a regular basis. The Mission has already completed "All India Unified Legend for 1:50K GMS upto lithounit level" and "One-Geology (IGCP 624)" projects. It has also published "Quaternary Geological Atlas of India" (Volume 1) encompassing selected quaternary terrains of India. In addition, the Mission is also engaged in Data Integration Modelling for mineral commodity-wise by combining Geological, Geochemical, Geophysical (both aero and ground), Geomorphology, and Alteration map data in 1:50k scale to find out areas of probable mineralisation. The area demarcated by the Integration exercise is used for planning future exploration campaign under G4 stage by Mission II.

Moreover, Mission IIIC is pursuing the following all India projects in GSI Central Headquarters:

- Revision of Seismotectonic Atlas of India and its Environs [SEISAT] updating it to digital (GIS) version.
- Synthesis and collation of All India National Geochemical Map data (NGCM) and National Geophysical Map data (NGPM) on 1:50K scale and uploading in BhuKosh (OCBIS GeoPortal).
- Creation of National Geoscience Data Repository (NGDR) in GSI.
- Creation of Stratigraphic Database in India in 1:50K scale upto lithounit level with stratigraphic hierarchy, colour coding and stratigraphic notation.
- Creation of Theme based compiled geological map on Granite/Granite Complex of India.



Aerial view of Processing Plant of Dalli Iron Ore Mine

Mission: IV Fundamental and Multidisciplinary Geosciences and Special Studies

6.22 National Mission–IV, with headquarters at Kolkata, structured under three sub-missions:

1. Geotechnical & Geohazards management, Kolkata 2. Climate change & Eco systems, Polar Studies, Environmental Geology, Medical Geology & Biogeohazards, Faridabad and 3. Fundamental Geosciences & Research, Kolkata.

During the FY 2017-18, 153 regular items have been taken up in total under Mission-IV including 21 items in Engineering Geology, 50 items on landslide studies, 14 items on

seismic and earthquake studies, 50 items in the domain of Fundamental Geosciences & Research and 18 items under the Climate change & Eco systems, Polar Studies, Environmental Geology, Medical Geology & Biogeohazards category.

Mission: V Training and Capacity Building

6.23 Human Resource Development

The specialized divisions of GSITI headquarters at Hyderabad and with six (6) Regional Training Institutes (RTIs), one each at the Regional Headquarters of GSI, viz., Lucknow, Jaipur, Nagpur, Hyderabad, Kolkata and Shillong along with the 11 Field Training Centres at Aishmuqam (J&K), Saketi (H.P.), Bhimtal (Uttarakhand), Zawar (Rajasthan), Kuju (Jharkhand), Aizawl (Mizoram), Raipur (Chhattisgarh), Sukinda (Odisha), Kothagudem (Telangana), Wajrakarur (Andhra Pradesh) and Chitradurga (Karnataka), impart training in different disciplines of earth sciences. In addition to conducting the different induction level training programs for Geologists, Geophysicists, Chemists and Engineers, the institute conducts training for middle level professionals by organizing Basic, Refresher, Advance courses, Workshops, etc. in various disciplines of geosciences for scientific, technical and administrative streams. Besides, the Institute has been imparting sponsored training in collaboration with DST, ISRO and ONGC. The Training Institute has also outreached different Central and State Departments like Indian Institute of Management (IIM) Kolkata, Administrative Training Institute (ATI) Kolkata, Jaipuria Institute of Management Lucknow, Administrative Staff College of India (ASCI) Hyderabad, Dr. Marri Channa Reddy Human Resource Development Institute (Dr. MCRHRD) Hyderabad, HCM Rajasthan Institute of Public Administration (HCM-RIPA) Jaipur, Institute of Secretariat Training and Management (ISTM) Nagpur, National Institute of Financial Management (NIFM) Faridabad, etc. for various training courses. In addition, three international courses on Remote Sensing, GIS and Mineral Exploration are proposed to be conducted for foreign nationals under MEA sponsored ITEC program.

During the FY 2017-18 upto September 2017, a total of 70 training programs are convened. The total number of personnel trained is 1628, out of which 1579 are from GSI, 26 are from State DGMs and 23 are from University/ College students/ lecturers.



ROM Mucking at Nuasahi Mines underground

6.24 Central Geological Programming Board [CGPB]

The Central Geological Programming Board (CGPB) is the apex body at the national level to overview the programme of geoscientific activities including mineral exploration in the country. The Secretary (Mines) is the chairman of CGPB. Geological Survey of India (GSI) is the nodal department (Member Secretary) and the State Geology and Mining departments and Central Government institutions and other stakeholders are its participating members.

The 56th Central Geological Programming Board (CGPB) meeting of GSI, Ministry of Mines (MoM), was held on 09-10 February, 2017 at Indian Council of Agricultural Research, Pusa, New Delhi, under the chairmanship of Shri Balvinder Kumar, Secretary (Mines) and ninety five stakeholders from different Central Organizations/State Governments/PSUs and Private Companies participated.



During the 56th CGPB meeting, four GSI publications were released and 816 programmes proposed for field season 2017-18 were approved by the chair during this meeting.

The main agenda/ focus of the 56th CGPB meeting revolved around various technical/ financial and administrative issues regarding identification of mineral blocks and their auctioning in each mineral bearing state. It was directed to expedite the process of establishing the ambitious project of National Centre for Mineral Targeting (NCMT) and National Geoscientific Data Repository (NGDR).

6.25 ISO certification of Chemical Laboratories & Central Headquarters

The Central Chemical Laboratories (XRF and ICPMS laboratories) at CHQ and the Regional Chemical Laboratories at NRO, SRO, WRO, CRO, ERO have been accredited by National Accreditation Board for Testing and Calibration Laboratories, Government of India (ISO/IEC 17025:2005). For an accredited laboratory to maintain its accreditation status, it is mandatory that the laboratory continues to comply with the requirements of ISO/IEC 17025:2005 and NABL specific criteria(s) for applicable field(s).

6.26 Quality Management (QM) Cell of GSI

The activities of Quality Management (QM) Cell is being carried out by PSS-P&M-8, CHQ, GSI, Kolkata. The mandate of QM Cell is to devise methodology and various modus operandi in the form of Standard Operating Procedure (SOP) for improving the quality of services provided by GSI so as to ensure customers satisfaction and also to strive for meeting international standards. Accordingly, SOPs are formulated, for various activities of GSI, and implemented for compliance.

As per the mandate, the QM Cell had undertaken external peer review of 20% reports of FS 2015-16 submitted during FS 2016-17. Out of 516 standard reports submitted by the six Regions and Central facilitates (CHQ) of GSI, 84 reports were randomly identified (domain-wise) from various Regions/Divisions of GSI and were peer reviewed by external experts before final circulation in the GSI Portal.

6.27 Internal Resource Generation

During the period from April to September 2017, a total of ₹ 2,37,11,570.00 (Rupees two crore thirty seven lakh eleven thousand five hundred seventy only) has been generated as Internal Resource and ₹ 34,19,387.00 (Rupees thirty four lakhs nineteen thousand three hundred eighty seven only) collected as Service Tax and Cess by way of undertaking various commercial activities such as sponsored commercial geotechnical works; sharing of data; multidisciplinary & fundamental research; sale of maps, unpublished reports; providing analyses of samples (petrological/ chemical/mineral physics/ geotechnical Labs.), EPMA studies, gem testing, exploration for minerals etc.

6.28 The activities of GSI in the field of International Cooperation include monitoring Bilateral Collaborative programmes (MoU) with various foreign governmental organisations/ scientific agencies, as well as coordinating GSI's participation in International Seminar/ Symposia, bilateral partnership with other countries for knowledge acquisition, skill & technology transfer in India/abroad and facilitate foreign visits to India for programmes/trainings, visit of expert team abroad (in conjunction with International Division, GSI, CHQ).

During the F.S: 2017-18, the division was involved in providing and facilitating technical and associated inputs from GSI pertaining to bilateral activities with China (project proposals from CGS), UK (project proposals from BGS), Canada (collaboration with NRCaN for PGE Exploration), Australia (collaboration with Geoscience Australia for capacity building and technological upgradation of GSI), Bangladesh (collaboration with GSB for Mutual Scientific Cooperation in the field of Earth Sciences),



Malawi (2nd India-Malawi Joint Working Group meeting), Finland, Zimbabwe, Tajikistan, Brazil (related to formulation of MoUs), Bhutan & Nepal (related to formulation of MoUs with WAPCOS for geotechnical services from GSI in various hydroelectric projects).

6.29 Bilateral Collaborative Activities

GSI continued its participation in bilateral cooperation and collaborative programmes with other countries on several geoscientific arenas for mutual benefit. Ministry of Mines as well as GSI had entered into MoUs with different countries in various spheres of geosciences.

6.30 Collaborative Projects with other Organisations:

A total of 53 programmes have been taken up on request or sponsorship. Out of these 53 programs, 15 have been taken up on State request, 7 under collaboration with National Agencies (IIRS, Dehradun; BARC; NGRI; IISC, Bengaluru; DGH, NIO & ONGC and DTRL), one collaboration item with Osmania University, three International collaboration items (one with NRCaN and two with BGS), six sponsored training items (2 sponsored by MEA, 2 by ISRO, 01 by DST & 01 by ONGC) and 21 Geotechnical items have been sponsored by various agencies.

6.31 Modernization programme in GSI

During XII Plan period GSI was allotted a budget of ₹ 2,004.42 crore. The modernization budget of GSI had been scaled up as the major expenditure under M&E Head during FY 2012-13 and 2013-14 was earmarked for instalment payment of Ocean Going Research Vessel. The details of actual expenditure of the total XII Plan budget under the Modernization & Replacement scheme are shown in **Table 6.1**.

Table 6.1
Details of Actual Expenditure of the total XII Plan Budget Under the Modernization & Replacement Scheme

(₹ in Crore)

Scheme	2012-13 (actual expenditure)	2013-14 (actual expenditure)	2014-15 (actual expenditure)	2015-16 (actual expenditure)	2016-17 (actual expenditure)	Total
Modernisation & Replacement	152.48	351.49	39.61	66.41	50.51	660.50

In order to establish GSI as a world class geoscientific Institute, the modernization programme has been started since XI Five Year Plan onwards on the advice of the Parliamentary Standing Committee on Industries, and as per guidelines laid down by an Expert Panel on Modernization of GSI, constituted by the Ministry of Mines, who are entrusted to improve the functioning of GSI in its different activity domain including exploration for assessment of natural resources by infusion of latest state-of-the-art technology.

GSI has acquired Oceanographic Research Vessel 'Samudra Ratnakar' with State-of-the-art equipment like Acoustic Doppler Current Profiler, multi-beam Echosounder, sub bottom profiler, Acoustic positioning system, Single streamer Multi- channel Seismic system, Marine Magnetometer, Side scan sonar, Synthetic Aperture Sonar system, ROV, and different kinds of sampling devices. Regular scientific cruises are being taken up since FS 2014-15. The induction of new Ocean going Research Vessel Samudra



Systematic common lease boundary work in Chromite mines in Odisha

Ratnakar in the fleet of GSI's research vessels has enhanced the exploration capability to a great extent. This vessel can probe up to a depth of 30 m below sea floor (BSF) with the help of many other high precision sensor survey data for delineating the disposition of the off shore ore deposits. The marine maps produced during sea bed mapping are being used for identifying offshore mineral deposits, placer deposits etc. and they can also be used for development of ports and harbours etc.

GSI is acquiring a new Geotechnical Vessel (GTV) with shallow drilling capability at a total cost of ₹ 258.34 crore (calculated @ ₹ 68.0 per USD). An amount of ₹108 crore had been provisioned in F.Y. 2016-17 for instalment payment for the GTV but no payment could be made during 2016-17. In FY 2017-18 also provision of ₹ 108.00 crore has been made for instalment payments towards GTV. The contract was signed with M/s. Triyards Marine Services Pte. Ltd., Singapore in January 2017. Payment of one instalment has already been made and another instalment is scheduled to be paid during this financial year. The delivery of the GTV is scheduled in January 2019.

6.32 Scheme wise plan budget expenditure of GSI against the approved plan outlay during the last two years and BE grant and expenditure till September of 2017-18 is presented in **Table 6.2**.



Table 6.2
Year wise Scheme-wise Financial Performance of GSI against the approved plan outlay during the last two years (2015-16, 2016-17) and BE grant and expenditure till September of current Year (2017-18)

(₹ in crore)

Schemes	2015-16			2016-17			2017-18	
	Grant	RE/FE	Actual Expenditure	Grant	RE / FE	Actual Expenditure	BE Grant	Actual Expenditure for (up to Sept' 2017)
Survey and Mapping	156.22	115.81	115.07	118.68	106.51	105.71	112.09	69.53
Mineral Exploration	53.51	38.49	38.71	54.88	63.04	63.01	67.97	35.54
Spl. Investigation	11.00	11.16	11.10	10.03	9.46	9.26	9.58	6.88
Research & Development	12.63	11.8	11.72	14.32	10.53	10.44	8.72	5.80
Information Dissemination	144.46	95.18	95.07	79.91	78.12	77.73	41.04	34.50
HRD	11.82	10.52	10.49	21.47	19.60	19.62	11.00	6.15
Mod. & Replacement	62.94*	65.07	52.10	171.64	50.12	37.19	167.60	61.43
TSP	10.00	8.20	8.20	12.70	12.70	12.51	11.00	7.37
Total	**462.58**	**356.23**	**342.46**	**483.63#**	**350.08**	**335.47**	**429.00**	**227.20**
*Minor Works Authorization to Ministry of Urban Development			14.31			13.32		
Total (considering Minor Works authorization & L/C opened)			356.77			348.79		
% of Utilisation of Fund against allotment (RE)			100.15%			99.63%		52.96%

#The original BE grant of GSI for the F.Y. 2016-17 was ₹ 480 crore. Additional funds amounting ₹ 1.70 crore under TSP, ₹ 1.50 crores under the M & E head for NER and ₹ 0.43 crores under HRD were allotted to GSI by Ministry of Mines subsequent to the initial BE grant. Thus the total BE grant including these additional funds was ₹ 483.63 crore.

Human Resources

6.33 The total sanctioned strength of GSI i.e. 12,369 as on 31.08.2017, 6636 posts are occupied. The group wise sanctioned strength of personnel as on 31.08.2017 is given in **Table 6.3**.



Table 6.3
Statement Showing sanctioned & Filled up Strength in GSI as on 31.08.2017

Class	Sanctioned Strength**	Total No. of employees in position	SC	ST	OBC	No. of Women	PH	Total (SC,ST,OBC Women, PH)
GROUP-A	4,080	2,671	463	204	742	683	21	2,113
GROUP-B	786	381	84	40	55	77	5	261
GROUP-B (NG) (Min.)	1,310	697	111	78	63	148	15	415
GROUP-B (NG) (Tech.)	1,624	487	96	67	43	44	6	256
GROUP-C (Min.)	925	509	104	47	101	93	6	351
GROUP-C (Tech.)	1,644	713	173	99	96	15	4	387
MTS (Erstwhile Gr. D)	2,000	1,178	288	150	172	184	33	827
Total	**12,369**	**6,636**	**1,319**	**685**	**1,272**	**1,244**	**90**	**4,610**

***Sanctioned strength as per the Cabinet approval and vide GSI Notification date 29.12.2011 and it will achieve in 2018.*

6.34 Multi-sensor Aero-geophysical surveys over Obvious Geological Potential (OGP) and Adjoining areas of India

The Remote Sensing and Aerial Surveys (RSAS) Bangalore, GSI has initiated a Pilot project during the field season 2016-17 to carry out multi-sensor aero-geophysical surveys (Magnetic Gradiometer and Radiometric sensors) over Obvious Geological Potential (OGP) and adjoining areas of about 8.13 lakh sq km in a period of three (3) years. The primary purpose of this project is to collect high-quality data to support the identification of target areas for mineral exploration, for metal occurrences. In the 1st year of project, four different blocks covering an area of 2.06 lakh sq km has been targeted.

Survey has commenced in Block-4 on 15th April, 2017 and continued till June, 2017 from Nagpur and Chindwara bases. For the period April to September 2017, survey has covered 86,800 line km thereby achieving 52.75% of total target in this block. Survey in all the four blocks is expected to resume after the end of monsoon.

Indian Bureau of Mines (IBM)

6.35 The Indian Bureau of Mines (IBM) is a subordinate office under the Ministry of Mines. It is engaged in the promotion of scientific development of mineral resources of the country, conservation of minerals, protection of environment in mines, other than coal, petroleum and natural gas, atomic minerals and minor minerals. It performs regulatory functions with respect to the relevant provisions of Mines and Minerals (Development and Regulation) Act, 1957 and enforcement of the rules framed there under, namely Mineral Conservation and Development Rules, 1988 and MineralConcession Rules, 1960 and Environmental (Protection) Act, 1986 and Rules made there under.

6.36 It undertakes scientific, techno-economic, research oriented studies in various aspects of mining, geological studies, ore beneficiation and environmental studies.





Organizational set up of IBM

6.37 IBM has its headquarters at Nagpur, 4 Zonal Offices at Bengaluru Nagpur, Udaipur and Kolkata, and 13 Regional Offices at Ajmer, Bengaluru, Bhubaneswar, Chennai, Gandhinagar, Goa, Dehradun, Guwahati, Hyderabad, Jabalpur, Nagpur, Ranchi and Raipur and 1 sub-regional office at Nellore. During the year 2017, IBM opened two new skill development centres for sustainable mining practices at Udaipur and Kolkata.

6.38 IBM has well-equipped ore dressing laboratories and pilot plants at Ajmer, Bengaluru and Nagpur. A clay laboratory has also been established at Kolkata to cater tothe needs of the North–Eastern Region.

6.39 Objectives

i) To work as National Technical Regulator operating at national-level designing systems, processes and guidelines for regulation of the mining sector;

ii) To function as a facilitator for creation and improvement of state-level regulatory mechanisms and to facilitate state agencies to ensure adherence to standards and parameters for scientific and systematic mining in the sector;

iii) To work as catalytic agent for development of mineral sector by evolving capability & proficiency in beneficiation techniques; dissemination of knowledge and skills in mining and allied areas through its training facilities; consultancy services.

iv) To play crucial role of that of an Advisor to the Government in matters and issues relating to the mineral sector in areas of short-medium and long-term mineral-wise strategies, mineral taxation and legislative processes.

v) To play the role of National Repository of mineral data through maintaining a data bank of mines and minerals in the country by developing advanced IT based Mineral Information System enabling the industry to report and access information online, and

vi) To broaden its interactive base and reach out to overseas counter parts through consultations and exchange programmes and to build capacity, skill & expertise through academic and training programmes at institutes of international repute.

6.40 Present Charter of Functions

In the wake of liberalization of the policy regime governing mineral sector and increasing need for adequate environment management as part of systematic and scientific mining, the mandated functions for IBM, as given for notification in Official Gazette vide Resolution No. 31/ 49/ 2014 – M. III, dated 3rd November, 2014 are given below:-

i) Collect, collate and organize into a database, all information on exploration, prospecting, mines and minerals in the country in the shape of a National Mineral Information Repository and take steps to publish and disseminate the same;

ii) Function as the National Technical Regulator in respect of the mining sector, and lay down regulations, procedures and systems to guide the State Governments (first tier of regulation);

iii) Build up capacity in the system, both for regulatory as well as the developmental work, at the central level as well as at the level of the States;

iv) Establish institutional mechanisms of coordination between the centre, the States, mineral industry, research and academic institutions and all stake holders, so as to proactively develop solutions to the demands and problems faced by the industry;



v) Promote research on all aspects of practical relevance to the Industry and to act as bridge between research institutions on the one hand and user industry on the other;

vi) Provide Technical Consultancy Services;

vii) Participate in International collaborative projects in the area of regulation and development of the mineral sector;

viii) Advise Government on all matters relating to the mineral industry; and

ix) Undertake any such other activity as has become necessary in the light of developments in the field of geology, mining, mineral beneficiation and the environment.

6.41 Key Activities and Functions

In light of the role and charter of IBM, the key functions being performed by IBM can be broadly classified as

1. Regulatory Functions, and
2. Developmental Functions.

6.42 Regulatory Functions

i) Mining Plan & Scheme of Mining -Inspections and Approval (Rule 13 to 17 of Chapter V of Mineral (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules 2016; Rule 9, 10, 11 & 12 of MCDR 1988);

ii) Mining Regulations for ensuring implementations of Mining Plan, Schemeof Mining, Mine Closure Plan and other statutory provisions of MCDR 1988 and launching of prosecutions (Section 22 & 24 of MMDR Act 1957);

iii) Inspections and grant of permissions to carry out 'stoping' operations in underground mines (Rule 26 of MCDR1988);

iv) Monitoring of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) aspects of mining operations (Rule 13 and 31 to 41 of MCDR 1988 and Section 10 of EP Act 1986);

v) Calculations of State-wise, mineral-wise and month-wise royalty on ad valorem basis (Rule 64D of MCR 1960 and Rule 45 of MCDR 1988);

vi) Mine Closure Plan - Inspections, Approval and monitoring (Rule 23A to 23F of MCDR 1988);

vii) Co-ordination with State Governments for curbing illegal mining activities (intimation of violation of Section 4(1) of MMDR Act 1957 to State Government agencies).

viii) As prescribed under Section 9(C) of the Act, IBM will discharge a pro- active role in NMET by furnishing advise on mineral-wise conservation strategies, exploration gaps etc. keeping in view of the national interest.

ix) IBM administer the framework for sustainable development of the mining sector, as prescribed under section 20A (2) of the Act.

x) IBM will continue to publish the Average Sale Price of all the major minerals through its MMS division. This information is required as per the rule 8 of Mineral (Auction) Rules, 2015 for calculating the "Value of estimated Reserves" and "Value of the Mineral Dispatched" and that of 'Reserve Price' of the deposit to be put to auction

xi) Grant of mineral concessions and monitoring of its activities in the offshore areas [various provisions of Offshore Areas Mineral (Development and Regulation) Act 2002 and the Offshore Areas Mineral Concession Rules, 2006].





6.43 Developmental Functions

i) R&D in Mineral Processing - To play a role of a catalytic agency to promote & develop the much-needed R&D in mineral processing in the field of mineral beneficiation, mineral characterization, chemical analysis of ores and minerals and analysis of environmental samples;

ii) Information Support and Advisory Services- To function as an advisory body to the government in formulation of mineral policy, lending technical guidance & support for framing Mineral Acts and in articulating provisions, rules & regulations thereof and lend it the credentials to formulate strategies, articulate policy requirements and oversee their implementation at both national and State levels;

iii) National Mineral Inventory – Periodical Updation of National Mineral Inventory reflecting the micro-level status and possession of various mineral resources of the country as per the international standards like UNFC;

iv) Repository on Mines & Minerals– To shoulder the responsibility for collection, processing and storage of statistical data in respect of all major minerals through statutory and non-statutory basis;

v) Publications on topical interest– To assort process and analyze mines and mineral information generated on account of statutorily and non-statutorily collected information and supply them as important inputs for policy interventions, and

vi) Training and Capacity Building– To provide training facilities for human resource development and to develop required technical expertise and skill inthe personnel manning the mineral industry.

6.44 Performance of IBM

The activities of IBM have been conducted through the following continuing schemes:

Scheme No. 1. Inspection of mines for scientific and systematic mining, mineral conservation and mine environment;

Scheme No. 2. Mineral beneficiation studies, utilization of low-grade and sub-grade ores and analysis of environmental samples;

Scheme No. 3. Technological Upgradation and modernization, and

Scheme No. 4. Collection, processing, dissemination of data on mines and minerals through various publications

Scheme No. 5. Mining Tenements System (under implementation)

6.45 These schemes are being implemented by the following divisions of IBM:

i) Minerals Development & Regulation Division (MDRD) erstwhile Mines Control & Conservation of Minerals Division (MCCM);

ii) Mineral Processing Division (MPD) erstwhile Ore Dressing Division (OD);

iii) Technical Consultancy, Mining Research and Publication Division;

iv) Mineral Economics Division;

v) Mining and Mineral Statistics Division and

vi) Planning and Coordination Division.

6.46 Performance relating to various activities of IBM during the year 2017-18 (up to September 2017) is given hereinafter.

Inspection of Mines

6.47 During the year 2017-18 (up to September, 2017), 766 inspections for enforcement of the provisions of Mineral Conservation and Development Rules (MCDR)



1988 and for examination of mining plans/ schemes of mining/mine closure plans were carried out. Consequent to inspection of mines, 465 violations were pointed out as against 981 violations in 2016-17 in respect of 449 mines. Total 178 violations were rectified during the year. So far, for the reporting period, 3 cases (previously launched) were decided in favour of IBM as against 6 in 2016-17. Mining operations were suspended under Rule 13(2), 45 and 56 of MCDR 1988 in 12 mines for not carrying out mining operations in accordance with the approved mining plan/ scheme of mining and for non-submission of online returns/ discrepancies in submitted returns. A list of principal violations observed during inspection of mines for the year 2016-17 and 2017-18 is given at **Table 6.4**.

Table 6.4
Principal Violations of MCDR, 1988 detected by IBM during 2016-17 and 2017-18 (up to September 2017)

Rule No	No. of Violations Pointed out 2016-17	No. of Violations Pointed out 2017-18 (up to Sep.2017)	Rule description
11(1)	289	68	Rule11 (1)- Mining operations in accordance with mining plans
11(3)	64	7	Rule 11 (3) - Submission of Review of Mining Plan / Scheme of mining
20	6	1	Rule 20 - Notice of opening of mine
23	6	0	Rule 23 - Submission of progressive mine closure plan
26 (2)	136	53	Rule 26 (2) - Responsibility of the holder of mining lease to submit yearly report
27(2))	6	16	Rule 27(2) - Submission of Financial assurance
28(1)	40	17	Rule 28 (1)- Notice of temporary discontinuance of mining operations
31(4)	56	13	Rule 31(4) -Maintenance of plans and sections
33	19	17	Rule 33 - Copies of plans and sections to be submitted
37(1)	2	0	Rule 37(1) - Storage of overburden, waste rock, etc.
38, 39, 40, 41, 42, 43, 44	11	0	**Protection of environment :** Rule 38, 39, 40, 41,42, 43, 44- Precaution against ground vibrations, Control of surface subsidence, Precaution against air pollution, Discharge of toxic liquid, Precaution against noise, Permissible limits and standards, Restoration of flora respectively.
45(5)(b)	45	10	Rule 45 (5) (b) - Submission of Monthly Return
45(5)(c)	134	9	Rule 45 (5)(c) - Submission of Annual Return
55(1)(c)(i)	4	18	Rule 55(1)(c)(i) -Employment of Whole time Mining Engineer/Geologist
55(1)(c)(ii)	15	21	Rule 55(1)(c)(ii) -Employment of Part time Mining Engineer/Geologist
Others	148	215	
Total	**981**	**465**	

Note: Rules are as per MCDR 1988 / MCDR 2017.



6.48 The status of mining leases and mines in India in respect of scheduled minerals is given in **Annexure 6.2**. **(Page No. 182)**

6.49 Inspection of Mines carried out by IBM during 2017-18 (up to September, 2017) is given at **Table 6.5**.

Table 6.5
Inspection of Mines carried out by IBM during 2017-18 (up to September, 2017)

S No	State	No. of inspection
1	Andhra Pradesh	74
2	Chhattisgarh	63
3	Goa	58
4	Gujarat	73
5	Jharkhand	38
6	Karnataka	44
7	Madhya Pradesh	95
8	Maharashtra	47
9	Odisha	50
10	Rajasthan	74
11	Tamil Nadu	113
12	Telangana	10
13	Others	27
	TOTAL	**766**

Mining Plan, Scheme of Mining and Mine Closure Plan

6.50 The Mineral (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and the Mineral Conservation and Development Rules, 2017 stipulate that mining operations are required to be conducted as per an approved Mining Plan and after extraction of minerals, the mines are required to be reclaimed as per an approved Mine Closure Plan. The Mining Plans are approved by the IBM and in case of mines of minor minerals including 31 notified (on 10.02.2015) non-metallic or industrial minerals; the powers have been delegated to respective State Governments. The Mine Closure Plan is required to comprise a Progressive Mine Closure Plan (PMCP) prepared for five yearly periods of the successive mining schemes and a Final Mine Closure Plan (FMCP). Mine Closure Plan is expected to address issues relating to environment protection including air, water and land protection, management of top soil and overburden, reclamation and rehabilitation of land and control on ground vibration, surface subsidence and restoration of flora.

6.51 As on September 2017, Financial Bank Guarantees for a value of ₹ 18,06,71,47,711/- (As per revised per hectare rate of Rule 27(1) of MCDR, 2017) have been collected and certificates under Rule 29A of MCR 1960 have been issued for 14 cases (excluding 31 minor minerals) of partial or full surrender of lease.



All India Rajabhasha Technical Seminar Organized by IBM

6.52 During the year 2017-18 (Up to September, 2017), 21 Mining Plans were approved and 3 not approved, 149 Review of Mining Plan/Schemes of Mining were approved and 39 not approved and 3 Final Mine Closure Plans approved and 01 was not approved. State-wise break-up is given at **Table 6.6**.



Table 6.6
State-wise Mining Plans/Review of Mining Plans / Schemes of Mining/Final Mine Closure Plans approved by IBM during 2017-18 (up to September 2017)

S. No	State	Mining Plans		Scheme of Mining		FMCP	
		Approved	Not Approved	Approved	Not Approved	Approved	Not Approved
1	AP	4	0	18	5	0	0
2	Jharkhand	1	0	3	3	2	0
3	Bihar	0	0	0	0	0	0
4	Chhattisgarh	0	0	13	3	0	0
5	Goa	0	0	2	0	0	0
6	Gujrat	3	0	37	8	0	0
7	Karnataka	2	0	5	1	0	0
8	MP	3	0	23	8	0	0
9	Maharashtra	0	1	15	2	1	0
10	Odisha	2	0	7	3	0	1
11	Rajasthan	5	0	6	2	0	0
12	Tamilnadu	1	0	12	3	0	0
13	UP	0	0	2	0	0	0
	Total	**21**	**1**	**143**	**38**	**3**	**1**

6.53 IBM monitors the progress of reconnaissance permits and prospecting licences, the details of which are given at **Table 6.7** and **Table 6.8**, respectively.

Table 6.7
Status of Reconnaissance Permits in India as on 30th September, 2017.

S. No	State	Total No. of RPs	No. of RPs where final exploration data submitted to IBM
1	Andhra Pradesh	56	44
2	Arunachal Pradesh	01	00
3	Chhattisgarh	42	26
4	Gujarat	04	00
5	Jharkhand	04	02
6	Karnataka	66	26
7	Kerala	01	00
8	Madhya Pradesh	91	29
9	Maharashtra	10	08
10	Manipur	01	00
11	Odisha	26	19
12	Rajasthan	74	29
13	Uttar Pradesh	21	08
14	West Bengal	04	01
	Total	**401**	**192**





Table 6.8
Status of Prospecting Licences in India as on 30th September, 2017*

S. No	State	Total No. of PLs granted by the State Governments on 30.09.2017	No. of PLs where final exploration data submitted to IBM
1	Andhra Pradesh	93	71
2	Arunachal Pradesh	17	01
3	Chhattisgarh	152	83
4	Gujarat	18	01
5	Himachal Pradesh	07	04
6	Jharkhand	28	05
7	J & K	01	00
8	Karnataka	10	06
9	Kerala	01	00
10	Madhya Pradesh	563	156
11	Maharashtra	44	09
12	Manipur	16	01
13	Meghalaya	15	04
14	Odisha	16	06
15	Rajasthan	234	10
16	Tamil Nadu	18	00
17	Telangana	44	11
18	Uttarakhand	44	00
19	Uttar Pradesh	03	00
20	West Bengal	03	00
	Total	**1,327**	**334**

**To the extent grant orders, reports received as well as information received from Regional Offices.*

Preparation of Mineral Maps

6.54 During 2017-18 up to September, 2017, 98 multi-mineral lease hold maps on a scale of 1:50,000, with corresponding forest overlays in respect of various states are under finalization.

Mineral Beneficiation

6.55 Mineral beneficiation studies including mineralogical testing and chemical analysis intimately related to both conservation and development of mineral resources. During the year 2017-18 (up to September 2017), 2,425 ore dressing investigations, 21,092 chemical analyses, 1,254 mineralogical examinations and 05 in-plant study were completed. Ore Dressing officers are also associating with officers of MDRD division in carrying out Regional mineral Development Studies (RMDS).

National Mineral Inventory (NMI)

6.56 Synthesis of NMI as on 01.04.2015 of freehold, leasehold Public & Private sector deposits in respect of 71 minerals as per UNFC was completed.

6.57 Mineral wise and state wise (including UNFC code wise) chapters for all the71 minerals



for **"NMI at a glance (As on 01.04.2015 (P))"** were prepared and uploaded on IBM web portal.

Statistical Publications

6.58 IBM disseminates statistical information on mines, minerals, metals and mineral-based industries through various publications. Information on mineral production, stocks, dispatches, employment, inputs in mining, mining machinery and related matters received from the mine owners on statutory basis under the MCDR, 1988 and ancillary statistics on metals production, mineral trade and market prices of minerals, revenue fromthe mining sector, rent, royalty and cess on minerals, etc from other agencies is compiled regularly by IBM.

6.59 The statistical publications released during the year 2017-18 (up to September 2017) include Statistical profiles of minerals 2015-16 and 12 issues of Monthly Statistics of Mineral Production (MSMP). Further, Indian Mineral Industry at a Glance 2015-16, remaining MSMP issues are under progress.

Consultancy Service

6.60 IBM provides technical consultancy services on prescribed charges for geological appraisals, survey of the areas, preparation of feasibility study reports, environment impact assessment and environment management plan, selection of suitable mining equipment, evaluation of feasibility report prepared by other consultants, financial institutions, etc.

Technical Publications

6.61 IBM brings out technical publications relating to mines and minerals, mineral-based industries, trade, beneficiation, R&D activities, etc. During the year 2017-18, IMYB 2015 (three volumes) released on 30.08.2017. IMYB 2016 advance releases of three volumes are also released. Half-yearly Bulletins on Mineral Information (April 2016 – September 2016 & October 2016– March 2017 issue), Bulletin on ML/ PL/RP-2016 are released.

Training

6.62 IBM imparts training to technical and non-technical officials of IBM and also to persons from the mineral industry and other agencies in India and abroad. During the year 2017-18 up to September, 2017, 09 training programmes were conducted in which a total of 279 IBM personnel, 30 industry personnel and 01 State DGM personnel participated. During the year 2016-17, 15 training programmes were conducted in which a total of 381 IBM personnel, 81 industry personnel, 08 officers of Directorate and Geology participated.

Measures for Abatement of Pollution and Environmental Protection

6.63 The IBM undertakes inspections/ studies for the enforcement of provisions of MCDR, 1988 which include provision on protection of mine environment to ensure that due care is being taken by the mine operators. During inspection it ensures that mine operators are taking due care for preservation and utilization of top soil, storage of overburden / waste rocks, reclamation and rehabilitation of land, precaution against ground vibration, control of ground subsidence, abatement measures against air, water- and noise pollution, restoration of flora, etc. in addition to other conservation and developmental measures. Necessary guidance to mine managements/ operators are also given for systematic and scientific development of mine including protection of environment. While approving the mining plans, schemes of mining and mine closure plans, IBM ensures that environment impact assessment studies have been carried out and to that effect environmental management plan has been incorporated for its effective implementation, besides



reclamation and rehabilitation of mined-out areas.

6.64 As a result of follow up for implementation of EMP, extensive afforestation has been undertaken in the mines by the mine owners. So far, 115.70 million saplings have been planted over an area of about 57,996 hectares with a survival rate of 68.38 percent.

6.65 Similarly, work of simultaneous reclamation/ rehabilitation is also undertaken by the mine owners for abandoned mines. So far, 110 abandoned mines covering an area of 1363 hectares have been reclaimed / rehabilitated.

6.66 The Mines Environment and Mineral Conservation (MEMC) Week is organized every year under the aegis of IBM in important mining centres through its regional offices to promote awareness among mine owners for minimizing environmental pollution.

Revenue Generation

6.67 IBM generates revenue through consultancy, training, statutory processing and sale of publications & data etc. Revenue generated during 2017-18 (up to September 2017) is ₹ 84.93 lakh comprising ₹ 42.94 lakh from mineral processing assignments; ₹ 38.50 lakh from processing of mining plans/schemes of mining and compounding fees & fines; ₹ 2.80 lakh from training and balance ₹ 0.69 lakh from sale of publications, mineral maps, mineral inventory data etc.

Computerization

6.68 The Regional/Zonal offices and Headquarters of IBM have been linked through a sophisticated system based on client server architecture established with the help of BRGM, France. IBM has well established LAN facility, besides WAN system to communicate and exchange data with Regional, Zonal offices and Headquarter offices. In all RO/ZO offices, VC facility has been installed & tested. IBM has shifted its network to NICNET. The VC facility is also shifted to NICNET.

6.69 The Web Portal of IBM www.ibm.gov.in provides information on IBM's history, functions, organisation, divisions of IBM and its activities, jurisdiction of regional & zonal offices, services offered by IBM. The new domain ibmreturns.ibm.gov.in is also functional for facilitating the stakeholders to submit the Monthly & Annual Return online and also scrutiny of the same by IBM. Further, to fulfill the assurance given to Third Sub-Committee of Parliament on Official Language Committee, the Bilingual Website of IBM has put on live since 15th January, 2015 and is being updated as and when required.

6.70 After introduction of online submission of returns system consequent upon amendment to Rule 45 of MCDR, 1988 vide notification No. 75(E), dated 9th February, 2011, the mine owners have commenced submission of monthly and annual returns online. IBM is monitoring and guiding/ encouraging the mine owners and their representatives for online submission of returns. The month-wise monthly returns submitted online are given in **Table-6.9**.

Table 6.9
Month-wise Returns Submitted online (up to August, 2017)

Sl No.	Month	No. of monthly returns received online
1	April, 2017	2,191
2	May, 2017	2,183
3	June, 2017	2,164
4	July, 2017	2,118
5	August, 2017	2,077

Mining Tenement System (MTS)

6.71 MTS has been taken up by IBM during the programme year 2009 - 10. The objective



of the Scheme is to develop an online National Mineral Information System for investors by linking Central and State organizations engaged in administration of mineral resources in the country. The mining tenement system would have graphical information database (GIS) as well as information in textual form. These two databases, i.e., nonspatial database and spatial database would be seamlessly integrated so as to retrieve graphical information as well as relevant textual information. The system will be thus web enabled and access to the system will be given online to prospective investors, government organizations, private and public organizations through Internet as per policy of the Government.

6.72 As approved by Core committee on MTS, a letter of Intent has been issued to the successful bidder M/s WIPRO. Acceptance from the vendor is also received along with the required Bank Guarantee. Contract has been signed between IBM and M/s WIPRO on 10.11.2016 in the august presence of Secretary (Mines) at Nagpur. M/s NISG, Hyderabad signed agreement as Project Management Unit (PMU) on 04.05.2017. Core Committee approved the Project Plan, SRS Document of Phase-I and COTs Software along with release of linked payments as per RFP. Pradhan Mantri Khanij Kshetra KalyanYojna (PMKKKY) will be a part of MTS as a change request and its techno commercial office is under examination with NISG and IBM. The Project will tentatively go-live by 31st March, 2018.

Sustainable Development Framework (SDF)

6.73 Star Rating System: A good governance initiative is designed as a tool for evaluation of the performance of lease operators on the various parameters encompassed by the Principals of the Sustainable Development Framework (SDF) approved by Ministry of Mines in 2011 in line with the National Mineral Policy 2008. Thus it can be viewed as a mapping of mining footprints from the view point of Sustainability.

- The system has been developed primarily on the basis of self-assessment followed by validation by Indian Bureau of Mines along-with provisions for third party auditing as may be considered fit by Ministry of Mines.
- The Star rating has been mandated by rule 35 of newly notified MCDR 2017. All the mine operators are mandated to achieve four or five star ratings within a stipulated time period of two years from the date of commencement of mining operations or the date of notification of the rules (i.e. March 2017) whichever is later in accordance with rule 35 of MCDR 2017. Failing which Mining operations are liable to be suspended.
- A system of third party auditing of the award of rating system and the process implementation is also proposed.

6.74 Following are the anticipated outcomes of the Star rating system:

- Reduced environmental and social conflicts in areas awarded for mining.
- Greater clarity for all concerned stakeholders, on risk levels of mining lease areas.
- Potentially reduced delays in obtaining clearances (environmental, forest) for mines.
- Improved protection of high risk areas in terms of environment and social considerations.
- A Regional Mineral Development Plan for selected mining areas and addressing key regional and cumulative impacts of mining through coordinated and collective action.





- Opportunity for clustering of small operators to become more competitive, and compliant.
- A robust E&S Management framework in mining companies.
- A disclosure process that provides stakeholders with relevant and timely information, and allows issues to be raised in engagement forums.
- Enhanced control on illegal mining activities through intensive stakeholder scrutiny by publishing details on mining activity in public domain.
- Intensive use of geo-spatial and geo-scientific information at mine level for assessment, planning, management and monitoring of the mining sector.
- Stronger monitoring and assurance systems and processes and
- SDF reporting on governance and ethical practices.
- The critical analysis of the Star rating templates will result into -
    - ❖ Identification of the thrust areas for policy formulation
    - ❖ The resource base creation for investment opportunity in the field of exploration, mining, mining as a hub for green energy development, mine water management, skill development requirements and efforts, the use and scope of space and digital technology
    - ❖ Dissemination of best practices in the field of mining and allied activities.
    - ❖ Critical analysis of mining activities in our country vis a vis global mining practice.
    - ❖ Issues related to Raw material Security in country.

Mining Surveillance System (MSS)

6.75 The Project was undertaken by the Indian Bureau of Mines, Ministry of Mines and BISAG (Bhaskaracharya Institute for Space Applications and Geo-informatics) of Ministry of Electronics and Information Technology (MEITY) to develop a system for detection of incidence of illegal mining by use of space technology and Surveillance of area up to 500m outside the lease boundary to check incidences of illegal mining.

6.76 For the minor minerals leases, the process of procuring satellite image is going on as the State Minor Mineral Data is still being plotted in the MSS. So far almost all the States have been trained on MSS for Minor Minerals. After identifying, trigger generation for minor minerals will be done and accordingly informed to BISAG. Also, trigger generation for sand mining will be discussed with BISAG as it is very difficult to identify sand mining areas.

Threshold Values of Minerals

6.77 In order to promote conservation of valuable mineral resources of the country, IBM has fixed threshold values for 12 minerals namely apatite and rock phosphate, bauxite, baryte, chromite, dolomite, fluorite, graphite, iron ore, limestone, magnesite, manganese ore and wollastonite were notified in the year 2009 vide Gazette notification dated 16th October 2009.

Provisions have been made in the Mineral Conservation and Development Rule 2017 (MCDR) notified on the 27 February 2017 where IBM has to review the threshold values of the minerals periodically.

Committee for Review and Restructuring of the Functions and Role of IBM

6.78 A Committee was constituted on 23 July, 2009 by the Ministry of Mines for reviewing



and restructuring of the functions and role of IBM in terms of the Policy directions given in the National Mineral Policy 2008. Based on deliberations with stakeholders and industry personnel through various meeting the final report was submitted to the Government in May 2012. The Government accepted the recommendations of the Committee in September 2012. The Committee had made 73 major recommendations for overall restructuring of the IBM including creation of additional posts and infrastructure development. Non-financial implicated recommendations have been implemented.

6.79 There have been numerous developments since the acceptance of the Committee's report and subsequent incubation period for implementation of its recommendations after the amendment of MMDR Act 1957 and framing of new sets of rules under the said Act. All these developments and contemplated developments which now necessitated re-examination and re-review of the role and scope of the functions of the IBM to make the IBM a competent instrument for the implementation of the National Mineral Policy, 2008, and to bring its functioning in line with the contemporary situation. Accordingly, a revised proposal has been submitted to Ministry for consideration.

Human Resources

6.80 The total sanctioned personnel strength of IBM is 1,479. The present filled-in strength is 944 as on 1st October, 2017. The cadre-wise employment position in IBM as on 01.10.2017 is given in **Table 6.10**.

Table 6.10
Employment of Personnel in IBM as on 01.10.2017

Group	Sanctioned strength	Total No. of employees in position	Number of Personnel					
			SC	ST	OBC	Minorities	Women	Physically Handicapped
A	247	155	22	13	24	12	10	---
B (Gaz.)	176	111	13	07	07	01	13	---
B (NG)	362	234	33	11	20	28	39	03
C	694	444	89	36	73	19	49	08
Total	**1479**	**944**	**157**	**67**	**124**	**60**	**111**	**11**

IBM Budget 2017-18

(₹ in crore)

Head	B. E.	R.E (Proposed)	Expenditure (Up to September 2017)
Establishment	61.9300	76.2400	41.0409
IBM Activities	49.1500	70.3570	20.5490





MoU signed between MECL, NALCO & HCL to form a JV company

7

Central Public Sector Undertakings



Central Public Sector Undertakings

- National Aluminium Company Ltd. Page - 77
- Aluminium industry in India Page - 86
- Hindustan Copper Limited Page - 89
- Copper industry in India Page - 92
- Mineral Exploration Corporation Limited Page - 94



National Aluminium Company Limited (NALCO)

Introduction

7.1 National Aluminium Company Limited (NALCO) is a Navratna CPSE under Ministry of Mines. It was established on 7th January, 1981, with its registered office at Bhubaneswar. The Company is an integrated and diversified mining, metal and power group 'A' CPSE with gross sales turnover of ₹ 7,933 crore in financial year 2016-17, Export sales accounted around 46% of turnover (₹ 3,625 crore) and business in more than 15 countries. In 2015-16, the Company ranked 2nd net foreign exchange earning CPSEs' of India and is a winner of Top Export Award of CAPEXIL since 1988 and Star Performer Award of EEPC in exports. As on 31.03.2017, net worth of Company is ₹ 10,206 crore. Presently, Government of India holds 65.36% equity of NALCO.



NALCO corporate office, Bhubaneswar

7.2 NALCO is the first Public Sector Company in the Country to venture into international metal market in a big way with London Metal Exchange (LME) registration since May, 1989. The Company is listed at Bombay Stock Exchange (BSE) since 1992 and at National Stock Exchange (NSE) since 1999. Besides, ISO 9001, ISO 14001, OHSAS 18001 & SA 8000 certification; the Company has also adopted ISO 50001 standards for energy management system.

Existing Operations & its Locations

Bauxite Mines

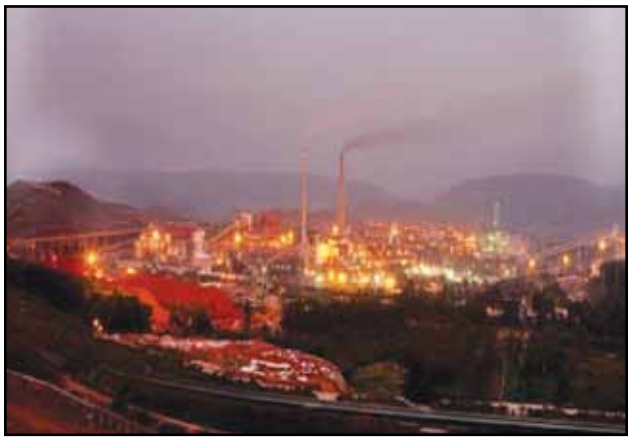
7.3 The Company has its bauxite mines situated on a plateau in Damanjodi, Koraput, in the State of Odisha. This bauxite deposit is mined by a fully mechanised system having a capacity of 6.825 MT per year. Panchpatmali plateau stands at an elevation of 1154 m to 1366 m above mean sea level. Bauxite occurs over the full length of the Panchpatmali plateau, which spans over 18 km. The mined-out bauxite is transported from the mine to refinery by a 14.6-km-long single-flight multi-curve 1800 tonnes-per-hour (TPH)- capacity cable belt conveyor.



Handing over of Interim Dividend 2016-17 to Govt of India on 21.03.2017

Alumina Refinery

7.4 The alumina refinery is located at Damanjodi, Odisha, approximately 14 km from the bauxite mine at Panchpatmali. The alumina produced is transported to aluminium smelter at Angul (Odisha) and to Vizag (Andhra Pradesh) port by rail with NALCO's captive wagons.



Alumina Refinery, Damanjodi

Operations

7.5 The present normative capacity of alumina refinery is 21 lakh TPA. Alumina produced is used to meet Company's requirements for production of primary aluminium at smelter. The surplus alumina that remains after internal consumption is sold in the export markets. A small portion is also sold in domestic market.

Aluminium Smelter

7.6 The aluminium smelter is located at Angul, Odisha, approximately 699 km from the refinery and 5 km away from the captive thermal power plant. The aluminium produced at the smelter is transported to Vizag port (548 km away), Kolkata Port (526 km away) and Paradeep port (183 km away) by rail for export. Aluminium in the forms of ingots, sow ingots, tee ingots, billets, wire rods, cast strips, alloy ingots and chequered sheets is also sold in the domestic market through its stockyards located across the country.



Aluminium Smelter, Angul

Operations

7.7 The aluminium smelter entered into production progressively from 1987. The present capacity of smelter is 4.60 lakh tonnes per year. Alumina is converted into primary aluminium through a smelting process using electrolytic reduction. From the pot-line, the molten aluminium is routed to either the casting units, where the aluminium can be cast into ingots, sow ingots, tee ingots, billets, wire rods, cast strips and alloy ingots, or to holding furnaces at flat aluminium products unit where the molten aluminium is rolled into various cold-rolled products or cast into aluminium strips.

Captive Power Plant

7.8 The aluminium smelter and coal-based pit head captive power plant at Angul are strategically located. The Power Plant is located approximately 5 km away from aluminium smelter.

7.9 The location of captive thermal power plant at Angul is also strategic to the availability and supply of coal. NALCO sources its major coal requirement for captive thermal power plant from the Talcher coalfields of Mahanadi Coalfield Ltd. (a subsidiary of Coal India Ltd.), located approximately 15 km from Angul. The 18.5-km captive railway system links the captive thermal power plant to the Talcher coalfields, enabling transport of the critical and bulk requirement of coal.



Captive Power Plant, Angul



Wind Power Plant, Jaisalmer

Operations

7.10 The captive thermal power plant commenced operations in 1986. Presently the captive thermal power plant has a generation capacity of 1200 MW by way of 10 turbo-generators, each rated at 120 MW. While the captive thermal power plant provides entire electric power requirement of aluminium smelter, it also provides for approximately 35 MW of the power requirement to the alumina refinery.

Wind Power Plants

7.11 The 1st wind power plant of capacity 50.4 MW (2.1 MW, 24 nos. WEGs) in Gandikota, Andhra Pradesh was commissioned in December 2012 and the 2nd wind power plant of capacity 47.6 MW (0.85 MW, 56 nos. WEGs) at Ludarwa site, in Jaisalmer, Rajasthan was commissioned in Jan'2014. 3rd wind power plant of capacity 50 MW (2 MW, 25 nos. WEG) at Devikot site, Jaisalmer, Rajasthan and a 50.4 MW (2.1MW, 24 nos. WEGs) Wind Power Plant at Sangli, Maharashtra commissioned in FY 2016-17.

Rooftop Solar System

7.12 NALCO utilised the entire available roof top space in Corporate Office, Township and NRTC at Bhubaneswar for setting up of 310 kWp solar power plant.



Rooftop Solar Panels

Port Facilities

7.13 On the Northern Arm of the Inner Harbour of Visakhapatnam Port on the Bay of Bengal, Nalco has established mechanized storage and ship handling facilities for exporting Alumina in bulk and importing Caustic Soda.





7.14 Physical performance, financial performance and sales performance are presented at **Table 7.1**, **Table 7.2** and **Table 7.3.** and Notable achievements of the company during the year FY 2017-18 is given in **Table 7.4**.

Table 7.1
Physical Performance of NALCO

Product	Unit	2014-15	2015-16	2016-17	2017-18	2017-18	2017-18	Total
		Actual	Actual	Actual	Target (Very Good)	Actual till Sep'17	Projected (Oct'17 to Mar'18)	2017-18
Bauxite	Lakh MT	57.39	63.40	68.25	66.30	37.07	31.18	68.25
Alumina Hydrate	Lakh MT	18.51	19.53	21.00	20.40	10.36	10.64	21.00
Aluminium Metal	Lakh MT	3.27	3.72	3.87	4.20	2.07	2.08	4.15
Net power	MU	5131	5841	6066	6457	3290	3119	6409
Wind Power	MU	175	156	198	345	176	79	255

Table 7.2
Financial Performance of NALCO

(₹ in crore)

Sl. No.	Particulars	2014-15 Actual	2015-16 Actual	2016-17 Actual	2017-18 Target (Very Good)	2017-18 Actual upto Sep' 17	Estimated Total for 2017-18
1.	Income *	8,055	7,353	7,964	8,196	4,404	9,315
2.	Operating Cost**	5,528	5,825	6,516	7,253	3,658	7,165
3.	Interest & Transaction Loss	0	1	3	2	1	3
4.	Depreciation & Amortization	414	424	480	510	229	515
5.	Net Profit before Income tax and Dividend	2,113	1,103	965	431	516	1,632

**Income and expenditure are net of excise duty on sales.*
***Operating cost includes exceptional items*

Table 7.3
Sales Performance of NALCO

Sales	Unit	2015-16 Actual	2016-17 Actual	2017-18 Target (Very Good)	2017-18 Actual Upto Sept'17	2017-18 Projected (Oct'17 to Mar'18)	Estimated 2017-18
Total Alumina/ Hydrate Sale	Lakh MT*	12.20	12.95	12.19	6.39	6.01	12.40
Aluminium Export	Lakh MT	0.94	1.01	1.35	0.44	0.31	0.75
Domestic Aluminium Sale	Lakh MT	2.78	2.85	2.85	1.59	1.81	3.40
Total Aluminium Sale	Lakh MT	3.72	3.86	4.20	2.03	2.12	4.15

**Metric Tonne*



Table 7.4
Notable Achievements of the Company during the year 2017-18

Sl No.	Product	Unit	H1 17-18		CPLY*	% Growth Over CPLY
			Target (Very Good)	Actual		
A.	**PRODUCTION**					
1	Bauxite	MT	34,10,000	37,06,517	35,07,567	5.67
2	Alumina Hydrate	MT	10,01,000	10,35,700	9,67,700	7.03
3	Aluminium Cast Metal	MT	2,03,600	2,06,568	1,87,359	10.25
4	Net Power Generation	MU	3,230	3,290	2,945	11.71
5	Wind Power	MU	263	176	137	28.47
B.	**SALES**					
1	Alumina /Hydrate Sale	MT	6,24,330	6,39,170	5,81,145	9.98
2	Aluminium Export	MT	58,200	43,665	35,991	21.32
3	Domestic Metal Sale	MT	1,38,600	1,59,041	1,41,479	12.41
4	Total Metal Sale (2+3)	MT	1,96,800	2,02,706	1,77,470	14.22

**CPLY - Corresponding period last year*

7.15 Projects:

a) 5th Stream Refinery: All the statutory clearances obtained for brownfield expansion of 1 million ton Refinery. The technology supplier and the EPCM consultant have already been engaged and the ground breaking will start very soon.

b) Development of Pottangi Mines: DGPS survey of the sites already completed. Pre project activities are in progress and Mining plan submitted to IBM for approval, application for TOR for Environment Clearance submitted to MoEF, forest diversion proposal to be submitted by Nov'17.

c) Utkal D & E Coal Mines: Pre project activities are in progress and works related to approval of Mining plan, grant of Environment Clearance & forest clearance, land transfer are under progress.

d) 25.5 MW Wind Power plant: Work order issued to set up a 25.5 MW wind power project in Tamil Nadu.

e) JV with GACL for setting up of 2.7 Lakhs caustic soda plant at Gujarat: Tendering & evaluation activities for various package of power plant started. Evaluation of Part-I bids for Technology selection of caustic soda plant has been completed and award of package is under process.

f) Angul Aluminium Park in JV with IDCO: The land acquisition for the project completed and construction of boundary wall started.

g) Aluminium alloy manufacturing plant in JV with MIDHANI: NALCO signed an MOU with Mishra Dhatu Nigam Ltd. (MIDHANI) in Apr'17 for establishment



of Aluminium Alloy manufacturing plant in JV mode for meeting the requirement of Defence, Aerospace, Automobile and Transport sectors under the "Make in India" initiative of Government of India. JV Agreement between NALCO and MIDHANI has been finalized and is under approval.

h) Coal Tar distillation plant in JV with NINL: NALCO signed MoU with Neelachal Ispat Nigam Ltd. (NINL) in Jan'17 for setting up a Coal Tar distillation plant in JV mode for production of Coal Tar Pitch. Consultant has been engaged by NINL for preparation of Techno Economic Feasibility Report (TEFR) for the project.

i) Brownfield Expansion of Smelter (6 lakh TPA) and up-gradation of pot amperage in existing Smelter: HLCA (High Level Clearance Authority) approval for expansion obtained in June'17. Way-forward plan approved by Management. Appointment of RTA to provide DPR input completed. Activities are underway to appoint consultant for preparation of DPR. Land acquisition shall be kick started soon through IDCO.

j) MoU with HCL and MECL: NALCO, HCL and MECL, the three CPSEs under the Ministry of Mines, Government of India have signed an MoU in Sep'17 to set up a JV Company named Khanij Bidesh India Limited (KABIL) to identify, acquire, develop, process and make commercial use of strategic minerals in overseas locations for supply in India and boost "Make in India" initiative of Government of India. Draft JV agreement have been cleared by respective Boards.

New Corporate Plan:

7.16 The Company with the help of a globally reputed consultant KPMG, prepared a long term corporate plan to position itself in a growth trajectory taking into account emerging market conditions and evolving global scenarios. The plan has been developed as per the guidelines of NITI Aayog, envisaging progressive growth of the company over a period of 3 years, 7 years and 15 years. This also includes a forward looking new vision, mission and values of the company which will give a direction to the company assuring steady growth, minimizing the price volatility of commodities while ensuring profitability. The company envisages expanding its Alumina and Aluminium capacity through both greenfield and brown field expansion targeting to reach 3.2 MnT Alumina and 1.05 MnT Aluminium by 2024 in medium term and 4.2 MnT Alumina and 1.73 MnT Aluminium by 2032 in long term. The market share of the Company is projected to rise from present 15% to 32% by 2032.

7.17 Emphasis has been laid on value additions through wire rod mills, Rolled products, conductors etc and foraying into new business initiatives of commercial mining, Li Ion batteries, futuristic products etc. with financial analysis and time frames for achievements.

The Company is projected to achieve a turnover of ₹ 18,171 crore by 2024 & ₹ 31,248 crore by 2032 with a CAGR of 11% and profits rising to ₹ 1,693 crore by 2024 & ₹ 3,010 crore by 2032 at a CAGR of 16%.

New Product

7.18 In line with the Make in India Movement, NALCO, has started commercial production of AA 3105 Alloy (having a composition of Aluminium, Manganese & Magnesium) in its Rolling Plant of Smelter Division to its existing product range. This alloy has wide application in manufacturing of Fan Blades and commands a premium over the existing product range being produced in Rolling Plant.



I.T

7.19 Strong IT Security solutions have been implemented to protect the data and the networks, and action is underway to implement ISO 27001 for the IT infrastructure. The Data Centre facilities at Corporate Office are supported by a Disaster Recovery site at Damanjodi, so as to effectively implement Business Continuity Plan for the IT based processes. Centralisation of Servers hosting legacy applications and services is also afoot, so that all servers shall be covered under the standard DC-DR model with appropriate advanced support infrastructure. NALCO has established fault tolerant redundant data links across Units and to the internet to ensure un-interrupted data connectivity. The Local Area Networks (LAN) at all the works sites and Corporate Office have been replaced with high bandwidth and fault tolerant, state of the art technologies. Multi Protocol Label Switching (MPLS) based WAN connectivity has been implemented for Corporate Office, all Units and Regional Offices. Internet bandwidth has been augmented to facilitate quick internet access.

7.20 In e-governance, E-tendering is now widely implemented in various spheres of tendering activity like Materials procurement through SRM 7 module of SAP, Works/Service tenders including reverse auction through CPPP procurement portal of GoI, and exports tenders using bespoke application, all using secure tools like SSL and Digital signature systems. In the area of HR, GET recruitment, lateral recruitment, etc, are being done using online applications, etc. Biometric based attendance solutions have been implemented for employees as well as contract labour. Employee services like attendance, leave, loan applications, perquisites, property returns, etc have been made online for ease of transaction and monitoring.

7.21 Higher impetus has been applied on user friendliness to various stake holders in providing services via mobile Apps and portals. A mobile app "Hamesha Nalconian" has been launched for Retired employees. Similar mobile apps for MSE vendors, CSR and customers are in the pipeline to provide digital services to stakeholders. A Centralised Contract Labour Management System is being implemented. For hospitals at Angul and Damanjodi, a Hospital Management System is being implemented.

7.22 In the area of green computing, NALCO practises same by use of low power devices coupled with power management. Both internal and external communication is mostly over e-mail.

Action Taken on Pollution Control and Environment

7.23 As a Responsible Corporate Entity, NALCO is pioneer in the front of Pollution Control and Environment Management and is committed for a cleaner, greener and safe working environment in all its production units. All production units are certified to International Standards on Environmental Management Systems (ISO14001) as well as Occupational Health and Safety Management Systems (OHSAS 18001).

7.24 The Global Climatic Change scenarios along with Global Warming have forced the regulators to enforce stringent Environmental regulation day by day. However being certified to international Standards NALCO proactively takes steps to face the challenges of upcoming stringent statutory regulations from time to time. NALCO published a Sustainable development Report every year aligned with the International guideline (GRI G4).

7.25 For developing awareness on environmental issues, NALCO imparts internal as well external training to its employees as well as contractor workers on Pollution Control measures and on prevention of pollution. NALCO also Celebrates Environmental functions like



Earth Day, World Environment Day, Vanamahotsav, Chemical Disaster Prevention Day, Ozone Day, National Pollution Prevention Day and also made publication of Bulletins, Newsletter and Annual journal in some of its units.

7.26 Awards & Accolades Received During the Year 2017-18 for performance in Pollution Control & Environment:

- Panchpatmali Bauxite Mine was awarded the CII Eastern Region SH&E Excellence Appreciation Award -2016-17.

Energy Conservation

7.27 In order to enhance competitiveness, major thrust is put on Energy Conservation measures in all the production units.

7.28 Energy Management System conforming to the International Standard ISO 50001 is implemented in the energy-intensive Production Units: CPP, Aluminium Smelter & Alumina Refinery. As on date, all the three units are operating with valid ISO 50001 certificates, with international accreditation.

7.29 Replacement of HPSV fittings, CFL and incandescent bulbs with energy efficient LED lights in all the operating units of the Company.

Research & Development

7.30 Since inception 31 patents have been filed out of which 10 have been granted and 5 have been commercialized. One patent filed earlier has been granted in FY 2017-18.

7.31 NALCO'S R&D centers at Refinery & Smelter are recognized by Department of Scientific & Industrial Research (DSIR), Govt of India.

7.32 Development cooperation agreement has been signed with RTA/ AP for various R&D and improvement work in March, 2016. Under this agreement development of low energy cell technology for smelter plant (AP2XN) has been taken up with an objective to reduce specific energy consumption in Smelter Plant.

7.33 The 2nd phase of the project for separation of alumina from Partially Lateritized Khondalite (PLK) with CSIRO, Australia under technical agreement signed for Extraction of Alumina from PLK through Nitric Acid route has been completed.

7.34 As a step forward for implementation of dry discharge of Red mud at Alumina Refinery, pilot pressure filtration studies have taken up at Refinery and completed. After successful completion of filtration trials of Red mud and fly ash in the pressure filtration set up, report has been submitted for further course of action.

7.35 After completion of Up-gradation of Alumina in NALCO Fly ash through bio leaching of silica and subsequent recovery of alumina through pyro/hydrometallurgical routes, upscale study for the same has been started.



38th Foundation Day of NALCO

7.36 In-house project has been taken up in Smelter for Improvement of Billet Quality through addition of Strontium. Procurement of the material for the project is in process.

Industrial Relations

7.37 The excellent Industrial Relations scenario in the Company provided a conducive atmosphere for achieving different milestones in the physical performance of the Company



during the period 1st April to 30th September 2017. In order to promote better Industrial Relations and to create congenial atmosphere for achieving the organisational objectives, due care was given to employees' participation in Management, Employee Welfare and CSR activities in the nearby areas of all the Units. The problems of land affected persons were addressed in true spirit in order to maintain a healthy business environment. Employee grievance handling, discipline, and positive work culture remained the main focus of industrial relation policy of the Company.

MOU rating of NALCO during the last three years

Year	Composite Score	Grade
2012-13	1.50	Excellent
2013-14	1.562	Very Good
2014-15	1.258	Excellent
2015-16	91.19%	Excellent
2016-17	88.48%	Very Good

7.38 Awards & Accolades during FY 2017-18.

i) SCOPE Award of Excellence in Institutional category (Navratna/ Maharatna) & SCOPE Meritorious Award for CSR from the then Hon'ble President of India Shri Pranab Mukharjee in Apr'17.

ii) Bharat Ratna Atal Bihari Vajpayee Award for innovative practices instituted by Rethink India Group in May'17.

iii) Kalinga CSR Award from IQEMS, Bhubaneswar in May'17.

iv) EEPC (Engineering Export Promotion Council, Eastern Region) Silver Trophy, in the Large Enterprise category, for its outstanding export performance in Aug'17.

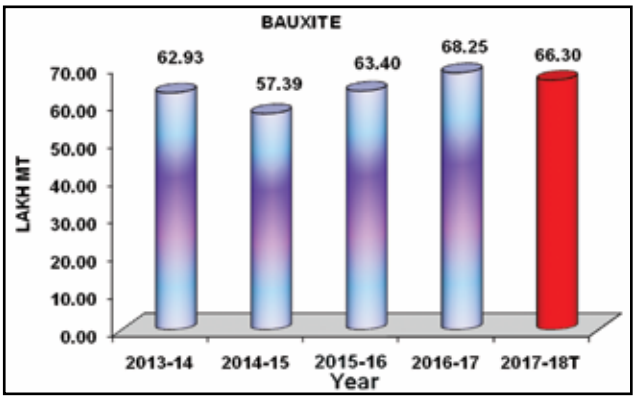
v) Panchpatmali bauxite mine bagged the Appreciation Award in large mines category at CII Eastern Region Safety Health & Environment Excellence Awards 2016-17 at Kolkata in Aug'17.

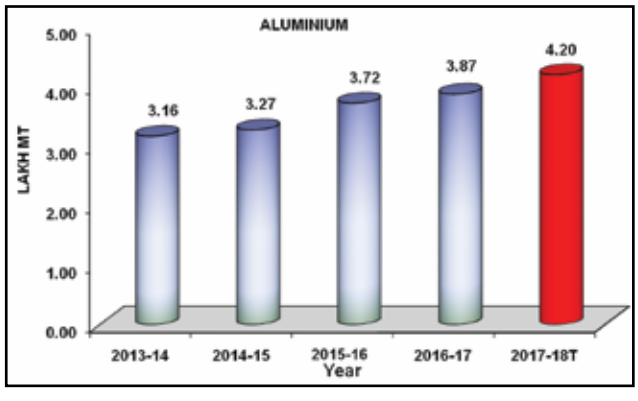
vi) Panchpatmali Bauxite Mine bagged four prizes in inter-mines competitions under the aegis of DGMS, Bhubaneswar.

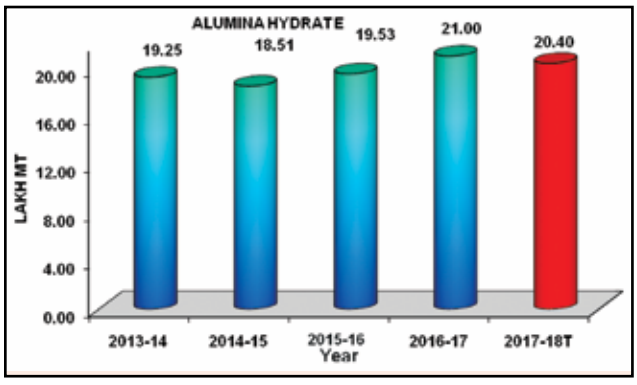
vii) Best Exporter Award for the year 2015-16 under metallurgical products category at the State Export Award Ceremony at Bhubaneswar in Sep'17.

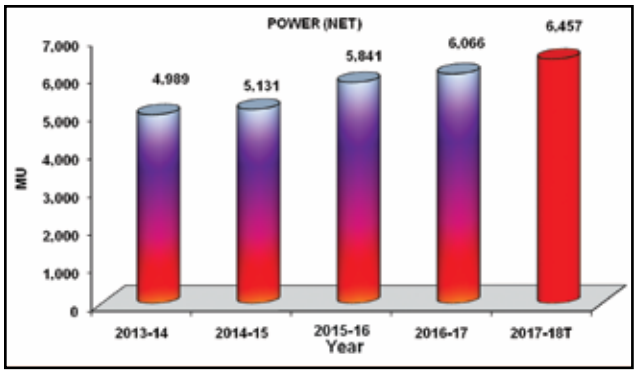
viii) First prize in heavy industries category in Odisha Business Award organised by Kanak News & the Sambad in Sep'17.

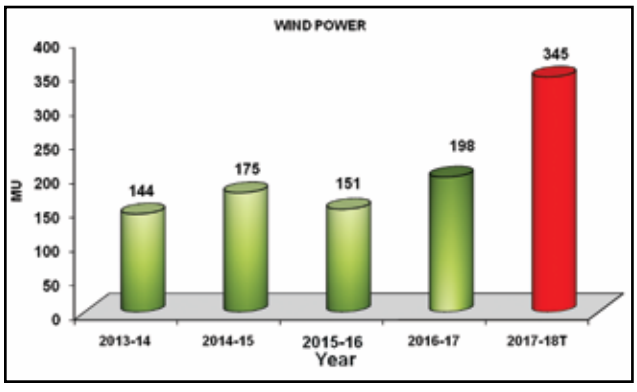
7.39 Trends of Production & Sales Parameters of NALCO

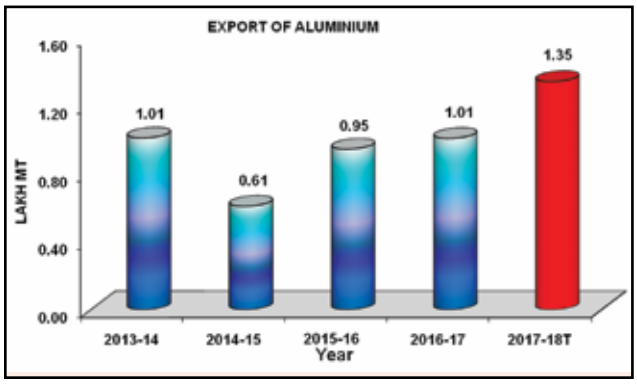


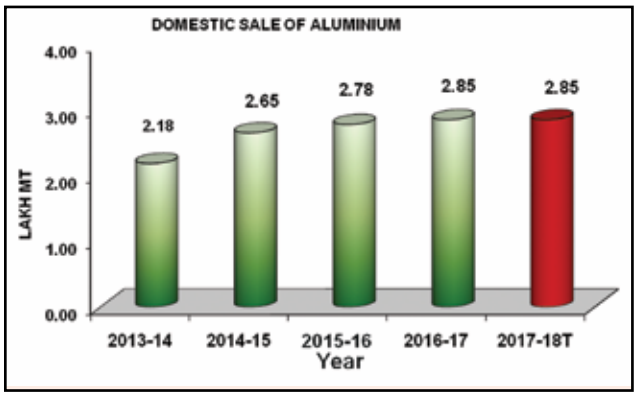


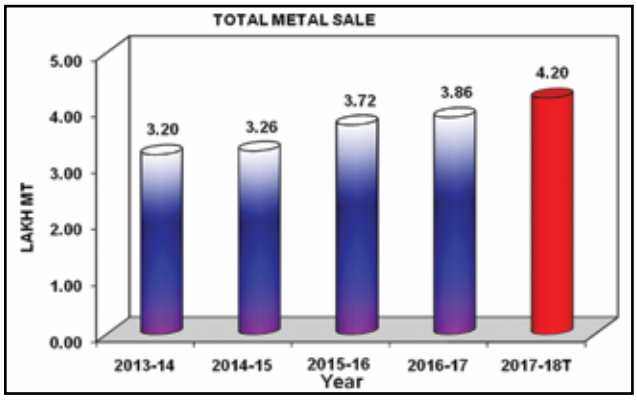


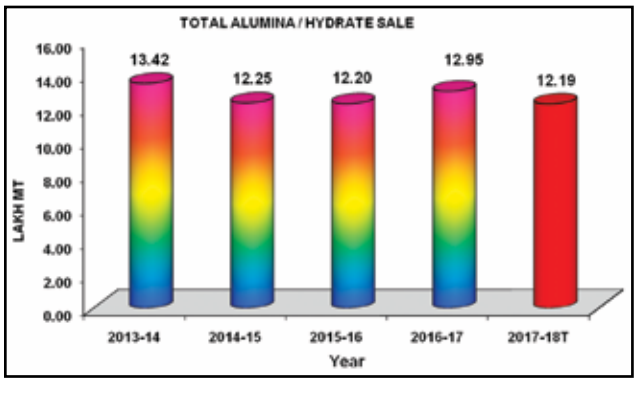












Aluminium Industry in India

7.40 India is richly endowed with bauxite resources, which is the basic raw material for aluminium production. Estimated bauxite reserves of the country (proven and probable) stand at 590 million tonnes.

7.41 The total domestic production of aluminium metal during FY 2016-17 was about 2.86 million tonnes and in FY17-18, it is expected to increase to about 3.2 million

tonnes, as domestic aluminium producers ramp up output in order to achieve higher capacity utilization. The total domestic consumption of primary aluminium metal in 2016-17 was 1.55 million tonnes and it is expected to be at the same level during 2017-18. The Indian primary aluminium industry consists of three major players i.e. National Aluminium Company Limited (NALCO), Hindalco Industries and Vedanta Ltd., having total installed smelting capacity of about 4.1 million tonnes, presently.

7.42 The aluminium per capita consumption level in India continues to be very low i.e. it stands currently at around 2.2 kg against the world average of roughly 8 kg. In India, the power sector continues to be the major consumer of aluminium with almost 40% share of total aluminium consumption in the country. Besides th is, strong growth prospects are also seen in packaging, machinery & equipment, construction and consumer durables sectors.

7.43 With the Government's increased thrust on investment in infrastructure, it is expected that aluminium off take from the electrical, building and construction sectors would pick up considerably. The Government's initiatives such as "Make in India" scheme, 100 "Smart Cities" program, rural electrification schemes, indigenous space programmes etc. are expected to boost off take of aluminium sharply in the country.



Registered Office of Chhattisgarh Copper Limited (a joint venture of HCL and CMDC) inaugurated by Dr. V. K. Saraswat, NITI Aayog

7.44 The total domestic production of aluminium metal by aluminium producers in the year 2015-16 to 2017-18 (April - September) is at **Table 7.5**.

Table 7.5
Production of Aluminium in India

(Figs. in MT)

Sl No.	Producer	2015-16	2016-17	2017-18 (Apr-Sept)	Oct'17- Mar'18 (Estimated figures)
1	NALCO	372,183	3,87,422	2,06,568	2,33,432
2	Hindalco	1,141,079	12,64,062	6,44,785	-
3	Vedanta Group	9,24,465	12,13,099	7,49,312	-
	Total	**24,37,727**	**28,64,583**	**16,00,665**	**2,33,432**

(Note: Production figures pertaining to other primary producers are based on available market data; Estimated figures for Oct'17-Mar'18 have been provided for NALCO only and details pertaining to other primary producers are not available with NALCO)



7.45 The sales figures of aluminium (Domestic Sales of Aluminium & Export Sales of aluminium in India are given in **Table 7.6** and **Table 7.7**.

Table 7.6
Domestic Sales of Aluminium

(Figs. in MT)

Sl No.	Producer	2015-16	2016-17	2017-18 (Apr-Sep)	Oct'17- Mar'18 (Estimated figures)
1	NALCO	2,77,753	2,84,926	1,59,041	1,60,959
2	Hindalco	6,68,774	6,62,902	3,04,007	-
3	Vedanta Group	6,26,249	5,97,300	3,17,578	-
	Total	**15,72,776**	**15,45,128**	**7,80,626**	**1,60,959**

Table 7.7
Export Sales of Aluminium

(Figs. in MT)

Sl No.	Producer	2015-16	2016-17	2017-18 (Apr-Sep)	Oct'17- Mar'18 (Estimated figures)
1	NALCO	94,671	1,00,591	43,613	65,987
2	Hindalco	4,88,055	6,00,505	3,30,348	-
3	Vedanta Group	3,01,354	6,10,657	4,14,504	-
	Total	**8,84,080**	**13,11,753**	**7,88,517**	**65,987**

(Note: Sales figures (Domestic/Export) pertaining to other primary producers are based on available market data; Estimated sale figures for Oct'17-Mar'18 for NALCO are based on Internal Sales targets for 2017-18; estimated figures for Oct'17-Mar'18 for other primary producers are not available with NALCO)



GCP-Refinery plant, HCL



Hindustan Copper Limited (HCL)

7.46 Hindustan Copper Limited (HCL), a Mini Ratna Government of India (GoI) Enterprise under the administrative control of the Ministry of Mines, was incorporated on 9th November 1967 under the Companies Act., 1956. It was established as a Govt. of India Enterprise to take over all plants, projects, schemes and studies pertaining to the exploration and exploitation of copper deposits, including smelting and refining from National Mineral Development Corporation Ltd. It is the only company in India engaged in mining of copper ore and owns all the operating mining lease of Copper ore and also the only integrated producer of refined copper (vertically integrated company). Major activities of HCL include mining, ore beneficiation, smelting, refining and casting of refined copper metal into downstream products. HCL has acquired assets of Jhagadia Copper Limited from M/s ARCIL(Asset Reconstruction Company (India) Limited) in 2015-16 and renamed as GCP (Gujarat Copper Project). With this acquisition HCL now have five operation units - one each in the states of Rajasthan, Jharkhand, Madhya Pradesh, Gujarat and Maharashtra. HCL is a listed company on BSE and NSE, with 76.05 % equity owned by the Government of India. The Registered office of the company is at Kolkata.

7.47 Highlights of 2017

i) Production–Copper Ore production of HCL at 38.45 lakh tonnes during the year ending March 2017.

ii) Extraction of minerals from copper ore tails–Installation of commercial scale plants of capacity 3.3 million tonne per annum is in progress at Malanjkhand to extract gold, silver, copper, magnetite, glass grade silica, micronutrients etc., from copper ore tail is in progress.

iii) Commissioning of the KALDO Furnace at GCP was successfully done in August 2017.

iv) HCL celebrated its Golden Jubilee in 2017.

7.48 Awards and Accolades

i) HCL was declared the Winner of 'Golden Peacock Award for Corporate



CT – PT Set ***ABT Meter*** ***CT & PT***

Power procurement through M/S PTC India Ltd (open access) was initiated in Khetri Copper Complex on 1st February, 2014 to reduce the electricity cost, the savings obtained in the year 2014-15, 2015-16 & 2016-17 are ₹ 384 Lakhs, ₹ 939 Lakhs & ₹ 309 Lakhs respectively.





Social Responsibility' for the year 2016. Hindustan Copper Limited's Kolihan Copper Mine was given "The National Safety Award (Mines)-2013" on 17.08.2017 at New Delhi by the His Excellency The President of India.

ii) Hindustan Copper Limited received the 'ABP NEWS - CSR Leadership Awards' in 2017 at Taj Lands End, Mumbai.

iii) The Quality Circle teams 'Sahyog' and 'Dinkar' of ICC were placed in 'Gold Category' during the Chapter Convention on Quality Concepts (CCQC) held on 12.09.2017 held on at Kolkata.

7.49 The capital structure of the Company as on 31st March, 2017 was as follows:-

Authorized Capital Structure of HCL

a) Authorized Capital:		
i)	180 crore equity shares of ₹ 5/- each	₹ 900 crore
ii)	20 lakh preference shares of ₹1000/- each	₹ 200 crore
	Total	**₹ 1,100 crore**
b) Issued, Subscribed and Paid-Up Capital		
i)	92, 52, 18,000 equity shares of ₹ 5/- each	₹ 4,62, 60, 90,000/-
	Total	**₹ 4,62, 60, 90,000/-**

7.50 Present capacities of HCL's Mines, Smelters and Wire Rod are given in **Table 7.8, Table 7.9** and **Table 7.10**.

Table 7.8
Production Capacity of Mines under HCL

Location of Mines	Ore Capacity (lakh tonnes per annum) (As per IBM approved Mine Plan)
Khetri Copper Complex, Rajasthan #	14.00
Malanjkhand Copper Project, Madhya Pradesh	20.00
Indian Copper Complex, Jharkhand	4.00
Total	**38.00**

#- includes production capacity of Khetri, Kolihan and Banwas mines.

Table 7.9
Production Capacity of Smelters under HCL

Location of Smelters	Metal Capacity (Tonnes per annum)
Khetri Copper Complex, Rajasthan*	31,000
Indian Copper Complex, Jharkhand	18,500
Gujarat Copper Project	50,000
Total	**99,500**

**- Plant not operational since Dec., 2008 due to economic reasons*

Table 7.10
Production Capacity of Wire Rod Plant under HCL

Location of Plant	Capacity (Tonnes per annum)
Taloja Copper Project, Maharashtra	60,000
Total	**60,000**





7.51 Production of ore, metal in concentrates, refined copper (cathode) and wire rod during the year 2015-16, 2016-17 and 2017-18 (upto September, 2017) are shown in **Table 7.11** and **Table 7.12**.

Table 7.11
Physical Performance of HCL

Product	Actual for the previous 2 years		Target for FY 2017-18	Actual for FY 2017-18 (up to Sep'2017)	FY 2017-18 (Anticipated)
	FY 2015-16	FY 2016-17			
Ore Production ('000MT)	3,908	3,845	3,570	1,609	3,570
Metal in Concentrate (MT)	31,578	30,587	30,800	14,216	30,800
Refined Copper * (Cathode) (MT)	23,024	18,602	32,511	13,491	32,511
Wire rod (MT)	26,062	18,167	32,163	11,065	32,163

**includes tolled cathodes.*

Table 7.12
Financial Performance of HCL

Financial Performance of the Company since 2015-16 is as given below: **(₹ in crore)**

Sl No	Details	Actual for the previous 2 years		Target for FY 2017-18	Actual for FY 2017-18 (Up to Sep'2017 (Provisional)	FY 2017-18 (Anticipated)
		FY 2015-16	FY 2016-17			
1.	Turnover	1,068.95	1,216.94	1,758.16	927.56	1,758.16
2.	Net Profit/(Loss) before Income Tax	39.61	94.20	77.05	59.86	77.05
3.	Net Profit/(Loss) after income tax	37.74	61.94	48.98	38.76	48.98

Sales Performance

7.52 The Company has achieved total sales of 20,323 tonnes of copper up to September, 2017. The anticipated sales of wire rod, cathode and metal in concentrate (MIC) during 2017-18 would be around 35,659 tonnes

Mine Expansion Schemes:

7.53 The Company's strategy is to aggressively expand its mine and ore beneficiation capacities. Such a strategy would also enable the company to sustain its profitability even at significantly lower copper prices and also position it to remain a dominant copper player in the country. A road map has been prepared for enhancing its mine production from current level of 3.4 million tonne per annum to 12.4 million tonne per annum in the next few years. The Company is concurrently implementing eight mining projects. The Company's capital requirement for expansion of existing mines and re-opening of closed mines is estimated at ₹ 3,435 crore.





Information Technology (IT) Initiatives

7.54 The following IT initiatives, spanning all operational areas taken up by the Company for bringing about dynamism, transparency and business efficiency, are being maintained and updated. Major initiatives are:

Enterprise Resource Planning (ERP) implementation

7.55 Maintaining ERP (Oracle eBiz Suite R 12.1.3) implementation has enabled HCL to adopt a centralized business management platform based on which the entire company has been thoroughly unified, increased real-time visibility of critical business parameters, thereby strengthening financial management & spares control, supply chain management, customer service and HR functions. Audited financial results have been finalized within scheduled planned time.

E-Procurement/EPS

7.56 Procurement of Stores & Spares items above ₹ 2.0 lakh continues to be done through Enterprise Procurement System (EPS), conducted by third party namely M-Junction, Kolkata. E-reverse auction for procurement of high value item is in place.

Real time LME booking

7.57 The web based system is in place to enable customers to place on-line orders for copper wire rod and cathode with the Company in a Real time LME rate scenario.

Sustainable Development

7.58 HCL adheres to the sustainable development requirement as per the guidelines and policy of the Department of Public Enterprises (DPE). Following projects are implemented under sustainable development plan for the year 2017-18:

i) Covering top soil & plantation at the waste rock dump at Malanjkhand, Madhya Pradesh.

ii) Installation of roof top solar project (35 KWp)at MCP

iii) Water conservation by recycling of mine water.

iv) Gradual replacement of conventional lights with LED (Light Emitting Diode) in all Units.

Manpower Strength

7.59 The manpower strength of the Company as on 01.10.2017 is in **Table 7.13**.

Table 7.13

Category	SC	ST	OBC	General	Total
Executives	77	21	76	394	568
Non-Executives	357	335	241	1,092	2,025
Total	**434**	**356**	**317**	**1,486**	**2,593**

Human Resource Development

7.60 Training and Development of all levels of employees is given due priority by the Company to increase effectiveness. Special emphasis was given to organization building and shaping right attitudes, team building and work culture besides preparing employees to understand the trends in fast changing technology/switching over to latest technology for achieving higher results in production, productivity and profitability.

Copper Industry in India

7.61 Copper finds widespread use in a wide range of application in all major sectors namely, construction, electric & electronic products, industrial machinery & equipment, transportation equipment & consumer and general products.

7.62 At present, the demand for copper minerals in the country for primary copper





production is met through two sources i.e. copper ore mined from indigenous mines and imported concentrates. The indigenous mining activity among the primary copper producers is limited to only Hindustan Copper Limited (HCL). The other primary copper producers in the private sector import the required mineral in the form of concentrate.

7.63 Currently, three major players dominate the Indian Copper Industry. Hindustan Copper Limited (HCL) in Public Sector, M/s Hindalco Industries and M/s Sterlite Industries in Private Sector. HCL is the only vertically integrated copper producer in the country, while M/s Hindalco Industries at Dahej in Gujarat and M/s Sterlite Industries in Tuticorn in Tamil Nadu have set up port based smelting and refining plants. Current year production is given in **Table 7.14**.

Table 7.14
Production of Copper in India **(Tonnes)**

Commodity	Number of Factories	Installed Capacity	Production during April to September 2016-17	Production during April to September 2017-18
Cathode				
a) HCL	3	99,500	6,398	13,491
b) Sterlite Industries Ltd.	1	4,00,000	1,97,785	1,96,593
c) Hindalco Ind. Ltd. (Unit: Birla Copper)	1	5,00,000	1,71,880	2,05,349

Reserves & Resources

7.64 India has very limited known reserves of copper ore exploitable for copper production. The total resources of copper ore as on 1.4.2010 as per UNFC system are estimated at 1.56 billion tonnes. Of these, 394.37 million tonnes (25.31%) fall under 'reserves' (proved and probable) categories while the balance 1164 million tonnes (74.69%) are 'remaining resources' category. India's share of world reserve is 1.8% only. According to USGS, total global copper reserves amount to 690 million tones (Mt) of copper. Globally, Chile has the largest reserves of copper accounting for about 30% of the total world reserves followed by Australia 13%,Peru 12%, Mexico 7% , USA 5%, China & Russia 4% each, DR Congo and Zambia 3% each and other countries 19%.

7.65 The mean undiscovered totals of global copper resource is estimated at 3500 Mt of copper. With identified copper resources currently estimated at 2100 Mt, total copper resources (undiscovered + identified) are estimated at 5600 Mt. As on April 1, 2010, HCL hold around two-fifths of the copper ore reserves in India, with an average of 1.05% copper content. HCL as on 1.4.2010 has reserves (proved & probable) of 411.53 million tonne ore (average grade 1.05%) and resource (proved & probable) of 623.31 million tonne ore (average grade 1.04%).

Price of Copper

7.66 The domestic price of copper is linked to London Metal Exchange (LME) price. The LME Cash Settlement Price (CSP) is the basis on which prices of copper products are declared by domestic producers.

7.67 The year wise average LME price per tonne of copper is as indicated in **Table 7.15**.





Table 7.15
The Year-wise Average LME Price of Copper

YEAR	Average LME price of Copper (US $ per tonne)
2006-2007	6,970
2007-2008	7,584
2008-2009	5,864
2009-2010	6,101
2010-2011	8,140
2011-2012	8,485
2012-2013	7,855
2013-2014	7,103
2014-2015	6,554
2015-2016	5,215
2016-2017	5,154
2017-2018 (upto September 2017)	6,005

7.68 HCL is the only Company having captive mines, whereas private producers have to depend on import of copper concentrate to operate their smelter & refining plants and their profitability is dependent on the international variation in treatment charges and refining charges but they offset the risk of LME copper price volatility through hedging.

Refined Copper Consumption

7.69 The Indian demand is expected to be strong on the back of improved outlook for Industrial and infrastructure growth. The government's thrust on power sector spells good news for copper industries. According to International Copper Study Group (ICSG), Chinese apparent usage declined by 2% because, although refined copper production increased by 6.5%, net imports of refined copper declined by 20% in the first seven months of 2017 as compared to the same period last year. Among other major copper using countries, usage increased in India, Japan and in the United States but declined in Germany and South Korea during this same period in 2017 over the same period in 2016.

MoU ratings achieved by HCL

Year	Grade
2013-2014	Very Good
2014-2015	Good
2015-2016	Very Good
2016-2017	Good

Mineral Exploration Corporation Limited (MECL)

7.70 Mineral Exploration Corporation Limited (MECL), a Miniratna Category-II PSU under Ministry of Mines, is carrying out mineral exploration activities and is the premier exploration agency in the country. It carries out its exploration activities under Promotional programme funded by Govt. of India and on contractual basis on behalf of other agencies including Public Sector, Private Sector and State Government(s) on mutually agreed terms and conditions. It has added 161 billion tonnes of mineral resources to National Mineral Inventory upto September '2017.

7.71 The authorised share capital and paid up equity of the company are ₹ 125.00 crore and ₹ 119.55 crore, respectively. The equity is fully held by Govt. of India. The company's registered office is at Nagpur, (Maharashtra). To facilitate the prompt maintenance of plants and machineries deployed at various projects, two Regional Maintenance Centres at Ranchi and Nagpur are being operated. Technical guidance to the projects, finalisation of geological reports, close liaisoning with the clients and looking for new business opportunities is being carried out through the Zonal Offices located at Ranchi, Hyderabad and Nagpur. The business generation and commercial activities of the Company are being



Corporate Office Nagpur, Maharashtra - MECL

looked after by Business Development and Commercial Division at Nagpur. In addition, one Business Development unit is in operation at New Delhi and a Liaison office at Kolkata.

7.72 In accordance with the national priorities identified in the Five Year Plan(s) and potentiality of the prospects, detailed exploration schemes are formulated and after due approval of Standing Committee on Promotional Projects (SCPP) and Ministry of Mines, projects are executed. Since its inception, MECL has carried out detailed exploration for ferrous, non ferrous, precious, industrial and other minerals on behalf of Ministry of Mines and a total of 6.88 billion tonnes of resources have been established in respect of above said minerals. After Amendment in MMDR Act 2015, MECL has been identified by Govt. of India as "Nodal Agency" for mineral exploration under National Mineral Exploration Trust (NMET) for speedy and expeditious exploration of mineral block so as to enable State Government for their auctioning.



MECL signs MoU, 2017-18 with Ministry of Mines

7.73 MECL is also engaged in regional exploration of coal & lignite on behalf of Ministry of Coal. The schemes of exploration are being finalised by the Core Group of Committee on Energy Minerals and Resources, Group V of Central Geological Programming Board (CGPB). So far, a total of 49.40 billion tonnes of coal and 30.83 billion tonnes of lignite resources have been established by MECL on behalf of Ministry of Coal upto September 2017.



Physico-Financial Performance 2016-17

7.74 The physical performance in drilling, developmental mining and geological reports for 2015-16, 2016-17, 2017-18 (anticipated) is given in **Table-7.16** and the financial performance is given in **Table-7.17**.

Table – 7.16
Physical Performance of MECL

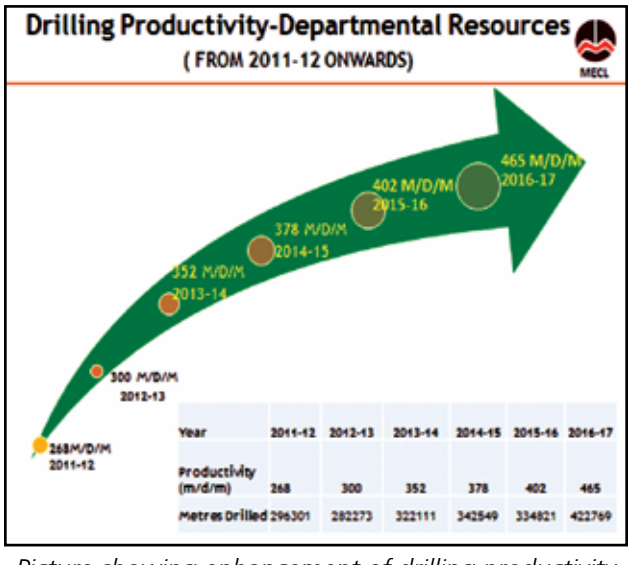
Items	2015-16	2016-17	2017-18		
	Actuals		MoU Target (Very Good)	Actual Achmt. (Upto Sep' 17)	Anticipated (For 2017-18)
Drilling (Mtrs)	4,02,488	5,16,466	5,60,000	3,19,903	5,60,000
Mining (Mtrs)	3,481	1,722	–	–	–
Geological Reports (Nos.)	21	38	45	18	45

Table No. 7.17
Financial Performance of MECL

(₹ in crore)

Details	2015-16	2016-17	2017-18		
	Actuals	Actuals	MoU Target (Very Good)	Actual Achmt. (Upto Sep '17)	Anticipated (For 2017-18)
Total Revenue #	282.60	364.70	393.50	193.14	400.53
Operating Cost	158.97	195.80	225.48	113.57	228.82
Depreciation and DRE	5.03	7.63	8.90	4.30	9.00
Net profit After Taxes	76.76	104.86	103.20	49.22	106.46

 # Including other income



Picture showing enhancement of drilling productivity of MECL

Dividend Paid

7.75 MECL has paid a dividend of ₹ 35.87 crore to Govt. of India for the year 2016-17.



Shri Narendra Singh Tomar Hon'ble Minister of Mines receiving Dividend Cheque from Dr. Gopal Dhawan, CMD, MECL in the presence of Shri Arun Kumar, Secretary to Govt. of India, Ministry of Mines



7.76 MoU Performance

MoU rating of MECL during last 3 years

Year	Composite Score	Rating
2013-14	1.159	Excellent
2014-15	1.48	Excellent
2015-16	87.18	Very Good
2016-17	83.42	Very Good

Awards & Achievements

7.77 MECL has won the SCOPE Award for Excellence for Outstanding Contribution to the Public Sector Management. The award has been received by CMD, MECL from Hon'ble President of India at New Delhi on 11.04.2017.



CMD, MECL receiving SCOPE award from Hon'ble President of India

Perspective on Non-ferrous minerals

7.78 During the year 2017 -18 (upto September, 2017) exploration for non-ferrous minerals has been carried out by MECL in 7 projects. Out of these 7projects, 2 projects viz. i) Vellempatti South (Molybdenum) Block & ii) Marudipatti (Molybdenum) Central Block, Tamil Nadu have been completed and geological reports have been submitted.

7.79 In the other five projects viz. i) Vellempatti Central (Molybdenum) Block, Tamil Nadu, ii) Nandup East & Bayanbil Combined (Copper) Block, Jharkhand, iii) Gap area of Mc Taggart West (Gold) Block, KGF, Karnataka, iv) Gap area of Oriental Lode (Gold) Block, KGF, Karnataka & v) Old Tailing Dump, KGF, Karnataka, work is under progress.

7.80 Projects Funded by Mineral Exploration Fund (MEF)

i) Jaitpur (Potash) Block, District - Bikaner, Rajasthan:

ii) (Bharusari Sub-basin (Potash) Block, District- Bikaner, Rajasthan:

7.81 Projects Funded by National Mineral Exploration Trust (NMET)

i) Purheibahal-Chandiposhi (Iron Ore) Block, District- Sundergarh, Odisha:

ii) Sendurkhar (Bauxite) Block, District - Kabirdham, Chhattisgarh:

iii) Saraipani-Dadar (Bauxite) Block, District- Kabirdham , Chattishgarh:

iv) Dalmiya-RMMPL (Iron ore) Bellary district, Karnataka:

v) Jumka-Pathiriposhi (Iron ore) Block, District- Sundergarh , Odisha:

vi) Lanjera-Futala (Manganese), Block, District- Bhandara, Maharashtra:

vii) Mandri-Panchala (Manganese) Block, District- Nagpur, Maharashtra

viii) Ranigaon-Godaiya (Limestone) Block, District - Bilaspur, Chhattisgarh:

ix) Gunchihai (Limestone) Block, District- Satna, Madhya Pradesh:

x) Naubasta-Kolard (Limestone) Block, District- Satna, Madhya Pradesh:

xi) Jamodi-Mahanna (Limestone) Block, District- Satna, Madhya Pradesh:

xii) Nonbirra (Coal) Block, District-Korba, Chhattisgarh :

xiii) Veeranam (Lignite) Block, District-Cuddalore, Tamil Nadu:

xiv) Palamkottai (Lignite) Block, District-Cuddalore, Tamil Nadu:

7.82 Besides this, MECL has also taken up new Greenfield exploration (G-4 level) in 30 blocks in the states of Odisha, Andhra Pradesh, Rajasthan, Maharashtra, Jharkhand, Karnataka, Madhya Pradesh, Tamil Nadu & Kerala.



MECL is adopting drone (UAV) Technology for topographic survey & geological mapping.

Action taken on abatement of pollution and environment

7.83 MECL is dedicated for conservation, prevention of degradation and equity of natural resources to ensure an eco-friendly environment in all areas of its operations for sustainable growth.

7.84 The exploration activities of MECL do not cause any significant pollution. However, as a part of exploration work, MECL is carrying out environmental studies to generate baseline environmental data on Geology & Geomorphology, Meteorology, Air Quality, Noise, Land use/ Land cover studies, Soil quality, Biota, Water regime & Socio-economic studies.

7.85 For helping the exploration agencies to plan measures for abating possible pollution and Environmental Impact Assessment (EIA) in various exploration projects a report on the same is included as a part of Geological Report of various exploration projects.

7.86 MECL has prepared a Corporate Environment Policy. The objective of the policy is to execute exploration and its associated operations in an environmental friendly responsible manner to comply with applicable laws and other requirements related environmental aspects with due consideration of sustainable development.

Business Development Activity

7.87 Through Business Development & Commercial Division, rigorous efforts are being made to obtain works from both public and private sectors through submission of competitive techno-commercial offers and MoU route. As a result, during the financial year 2017-18, the total value of order book position up to September 2017 stood at Rs. 474 crore. This includes contractual works for various clients such as CMPDIL, DMG Karnataka, MAHAGENCO, CIL and Promotional work on behalf of Ministry of Mines and regional coal exploration work on behalf of Ministry of Coal.

7.88 As a Nodal Exploration Agency of National Mineral Exploration Trust (NMET), MECL has signed **"Tripartite Agreement"** with NMET and Ten State Governments viz. Maharashtra, Andhra Pradesh, Odisha Chhattisgarh, Jharkhand, Madhya Pradesh, Karnataka, Rajasthan, Telangana and Tamil Nadu. Efforts are being made for signing of the Tripartite Agreement with other State Governments also.

7.89 Keeping in the current economic scenario, taking into consideration priorities of Government and opportunities available in present mineral industry, MECL is reviewing its "Business Module' to offer its service in diversified areas in addition to core competent area of detailed mineral exploration. The new diversified areas are given below:

- MECL has entered into the MoU with NALCO and HCL in September 2017 in connection with the formation "Khanij Bidesh India Ltd. (KABIL) a Joint Venture Company for exploration and mining of strategic minerals overseas and supply to India to make it self-reliant in such critical minerals.
- Transaction Advisory cell is newly formed in MECL for offering handholding services to the State Governments for auction of prospective mineral blocks.
- MECL is also working with Indian Bureau of Mines (IBM), Geological Survey of India (GSI) and various Mines and Geological Departments of State Governments to prepare a "Road Map" for auctioning mineral blocks for which Mining Leases are going to expire by March 2020.



MECL signs Tripartite Agreement with NMET & Govt. of TN

Future Plan

7.90 To achieve its VISION 2020, MECL has prepared 'Comprehensive Strategic Plan for Enhancement in Growth and Profitability of MECL'. MECL has planned to invest ₹ 208 crore in next 5 years for modernization and upgradation. Salient feature of the Strategic Plan are given below:

- Replacement of old conventional drills with modern Hydrostatic drills in phased manner
- Planned recruitment and Skill development of manpower.
- Infrastructure Development: Construction of modern and State of the Art building for Laboratories and Workshop at Utility Complex of MECL, Nagpur
- Gearing up for faster & more accurate survey by addition of DGPS etc
- Up gradation of workshop by installation of Induction Hardening Plant, setting up diamond bit manufacturing plant, Gear Hobbing Machine, CNC etc. for reliable and uninterrupted supply of accessories
- Modernization and expansion of laboratory by purchasing of AAS, XRF, XRD, Derivatograph etc. for enhancing capacity of analytical studies.
- Increase in outsourcing of drilling work to meet additional drilling requirement.
- Entering into production mining for perennial source of income.

7.91 Accordingly, during 2016-17, 12 nos. of new Hydrostatic drill machines were inducted in its drill fleet.



Sandvik DE-710 Drill Rig

7.92 During 2017-18, it has planned to induct 12 more High Tech Hydrostatic drill machines.

Construction of new & ultramodern infrastructure for laboratories has also been commenced during the year and is under progress.



The new Laboratory Complex of MECL at Nagpur(underconstruction).

7.93 MECL has also signed a Mining Lease (ML) deed for mining of bauxite in Serengdag block, Chhattisgarh. The clearance from National Board for Wild Life (NBWL) is being pursued.

Manufacturing Unit

7.94 MECL has a well equipped central workshop and manufacturing unit at Nagpur to cater to the needs of drilling and developmental mining projects and to provide engineering support to field operations. It carries out repairing/ overhauling of drilling and mining equipment and light/heavy vehicles. It manufactures Tungsten Carbide (TC) bits and spares & accessories for coring and non-coring drill machines. Also, it has CNC lathe machine for the manufacturing of drill tubular. During 2017-18 (upto September 2017), a total of 7537 items were manufactured, which include 1622 TC bits and 504 other drill accessories.

Energy Conservation

7.95 MECL is replacing age old drill rigs with new Hydrostatic drill rigs which are fuel efficient and high performing and have resulted in conservation of energy. The company has also set up POL norms for all types of drilling machineries and are maintained effectively based on energy conservation factors. MECL has started replacing conventional source of energy with non-conventional renewable sources from year 2011-12 by Installation of solar power plant and solar water heating system has resulted in saving of 18000 units of electricity a year.

Hindustan Zinc Limited (HZL)

7.96 Hindustan Zinc Limited (HZL) was disinvested on 28th March, 2002 and the management control of the Company was also transferred to the Strategic Partner namely Sterlite Opportunity Ventures Limited (SOVL)



on 11th April, 2002. At present Government of India is holding 29.54% shares in HZL.

7.97 In the year 2016-17, HZL has given Interim dividend of ₹ 237,11,06,121/- @ 95% and Special Interim dividend of ₹ 3431,86,41,225/- @ 1375% (₹ 27.50 per share) the total dividend amount to ₹ 3668,97,47,346/- (Thirty six hundred sixty eight crore ninety seven lakh forty seven thousand three hundred forty six only).

Bharat Gold Mines Limited (BGML)

7.98 Bharat Gold Mines Limited (BGML), has been closed since 1st March, 2001. The Cabinet had taken a decision in the year 2006 to dispose off the assets and liabilities of the Company through an open tender with Right of First Refusal (RoFR) in favour of the co-operative society formed by the ex-employees of the Company. However, the Cabinet decision could not be implemented due to litigation. Finally in 2013 the Supreme Court allowed the Government to go ahead with the tender. Presently the matter of disposal of assets of BGML is under consideration.

7.99 The Ministry had explored the possibility of handing over BGML to Government of Karnataka for reviving mining operation in the area. However, Government of Karnataka refused to take over BGML. THe Ministry of Mines is now exploring the possibility to revive BGML in view of the preliminary estimates of MECL on gold reserves in the Kolar Gold Fields. MECL has been engaged for carrying out detailed exploration for fair estimation of gold in the previously uncxtracted part of mineralized portion in the lease area at Kolar Gold Fields including the 13 tailing dumps. The exploration of dumps has already been started by MECL and expected to complete by March-June, 2018. If exploration of dumps suggests considerable resource and techno-economical feasibility report for extraction is encouraging, the Ministry will take appropriate action accordingly.



Systemmatic Method of Mining in Limestone Mine of TN state



MECL Training Centre

8

Science & Technology Programme and Autonomous Bodies



Science & Technology Programme and Autonomous Bodies

- Science & Technology Programme (R&D component) Page - 105
- Jawaharlal Nehru Aluminium Research Development & Design Centre Page - 106
- National Institute of Rock Mechanics Page - 109
- National Institute of Miners' Health Page - 110



Introduction

8.1 Recognizing the paramount importance of safety, economy, speed and the efficiency in extraction of mineral resources and in its convergence into viable economic alloys and metals, National Mineral Policy has accorded higher priority to R&D programmes. For fructification of principles as enunciated in the National Mineral Policy, guidelines for support to 'Mining Research' was issued in May 2013. With a view to promote R&D in the mining sector, Ministry of Mines has launched a comprehensive Science & Technology Programme which includes (i)R&D component (ii) Information Education and Communication (IEC)and (iii) one-time capital component for up-gradation of R&D facilities of Jawaharlal Nehru Aluminium Research Development & Design Centre, National Institute of Miners' Health and National Institute of Rock Mechanics.

Science & Technology Programme (R&D component)

8.2 The underlying principle behind R&D component is to foster utilization of the available mineral resources judiciously, economically efficiently and environmentally sustainable manner. Under the R&D component of the Science & Technology Programme, Research projects are funded through grant–in–aid. The broad thrust areas for supporting research in mining sector include– (i) Prospecting exploration for strategic and rare earth minerals.(ii) Research in mining methods. This includes rock mechanics, mine designing, mining equipment, energy conservation, environmental protection and mine safety. (iii)Improve efficiency in process, operations, recovery of by-products and reduction in specification and consumption norms. (iv) Research in metallurgy and mineral beneficiation techniques to utilize lower grade and finer size ores. (v) Extraction of value added products from mine waste, plant tailings etc. (vi) Development of new alloys and metal related products etc. (vii)Evolve low capital and energy saving processing systems (viii) Production of materials of high purity.

8.3 Based on scrutiny which passes through different stages of evaluation including presentation of shortlisted projects before the Project Evaluation and Review Committee (PERC) and final approval of an inter-ministerial Standing Scientific Advisory Group (SSAG) chaired by Secretary (Mines), grants are given to the projects submitted by R&D institutions.

8.4 During the financial year 2017-18, 10 projects which were considered as relevant to the identified priorities have been recommended by PERC in its meeting held on 6th September 2017 and approved by SSAG for approval in its meeting held on 20.11.2017 for grant-in-aid by the Ministry under S&T programme.

Information Education and Communication Component (IEC)

8.5 The purpose of this component of the Scheme is to create awareness regarding issues relating to the mining and mineral sector by organizing or being associated with promotional events, like seminars, workshops, exhibitions etc. evaluation studies, surveys, awareness programmes, consultation with stakeholders, organization of national and international events/conference, creating audio-visual publicity materials and propagation of policies and programmes.

8.6 Industry associations, recognized universities, recognized academic and research bodies having at least three years experience in the mining and mineral sector are eligible for receiving funds under the scheme. Under this component, grant-in-aid was released to FIMI and JNARDDC, during the year 2017-18 (till October 25, 2017).



"Grants for Creation of Capital Assets" Component for up-gradation of R&D facilities

8.7 The quality of R&D hinges upon availability of state of art research facilities in the country. In the mining sector R&D activities are being pioneered by the three autonomous bodies functioning under Ministry of Mines i.e. Jawaharlal Nehru Aluminium Research Development & Design Centre, Nagpur National Institute of Miners' Health, Nagpur and National Institute of Rock Mechanics, Bengaluru. During the financial year 2017-18 (till October 25, 2017), grant to the tune of 251.25 lakh has been released to JNARDDC for up-gradation of R&D facilities under "Grants for Creation of Capital Assets" Component.

8.8 Grants for Creation of Capital Assets and Grant-in-aid-Salaries provided to the three autonomous institutions under Ministry of Mines is given in **Table 8.1** and **Table 8.2**.

Table 8.1
Grants for Creation of Capital Assets

(₹ in lakh)

Institute	BE
JNARDDC	350
NIMH	24
NIRM	163

Table 8.2
Grant-in-aid-Salaries

(₹ in lakh)

Institute	BE
JNARDDC	929
NIMH	172
NIRM	636

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur

8.9 JNARDDC an Autonomous Body under Ministry of Mines is a "Centre of Excellence" set up in 1989 as a joint venture of Ministry of Mines, Government of India and UNDP with a view to provide major R&D support system for the emerging modern aluminium industry in India.

8.10 The Centre is also recognized as a scientific & industrial research organization by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. It is the only institute of its kind in India pursuing the cause of R&D from bauxite to finished product under one roof.

8.11 The objective of the Centre is to assimilate the technology available in the country and abroad for the production of alumina and aluminium including aluminium alloys as well as to develop technical know-how for the basic engineering process and downstream areas and to provide training to the personnel employed in the Indian aluminium industries.

8.12 The Centre caters to R&D needs of both primary and secondary producers. It has made key contribution in the areas of beneficiation, characterization, technological evaluation, upgradation of bauxites, reduction of energy consumption and environmental pollution by the effective utilization of aluminium industry residue materials such as red mud, dross & scrap etc. and process modeling for the overall interest of the aluminium industry and the nation as a whole.

Major Activities

8.13 The Centre completed two projects in the field of aluminium and ten R&D projects were in progress till October, 2017 for various government and non-government organization.



Hard geopolymer bricks prepared by utilizing industrial rejects

8.14 Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India Ministry of Power has once again renewed the nomination of JNARDDC as a sector expert for the aluminium sector under the PAT-2/PAT-3 (Perform, Achieve &Trade) Scheme in the National Mission for Enhanced Energy Efficiency (NMEEE) under Climate Change Project. Director, JNARDDC has been nominated as the Chairman, Task force of aluminium sector. Services of JNARDDC are utilized by BEE as a sector expert for evaluation of energy audit reports of Indian aluminium industries and setting up normalization patterns for evaluating the performance of industries in terms of energy efficiency.

8.15 21st International Conference on Non-ferrous Metals & Minerals 2017

JNARDDC organized the 21st International Conference on Non-ferrous Metals & Minerals, ICNFMM-2017 at Hotel Shangri-La Eros, New Delhi on July 7-8, 2017, in association with Corporate Monitor, Indian primary Copper producers and media Partner. The Conference was supported by Ministry of Mines, Gov. of India. The theme of this conference was global and national scenario: aluminium, copper, zinc, lead, uranium, precious, strategic and rare metals that aimed for bringing together leading technology & process equipment development for non-ferrous metals industry and share their experiences on all aspects of non ferrous metal material. Dr Anupam Agnihotri, Director, JNARDDC and other scientists presented five technical papers based on the recent R&D activities. The chief guest of the Conference Shri Arun Kumar, Secretary, Mines of Mines awarded token of appreciation to various industries and individuals for their notable contribution to the Non-ferrous Metals & Minerals sector.



Release of HCL's Coffee Table Book on the occasion of Golden Jubilee celebrations on 9th November, 2017

8.16 Review of JNARDDC by Secretary (Mines) and Joint Secretary (Mines)

Shri Arun Kumar, Secretary (Mines) visited the Centre on 3rd Oct 2017 to review the activities of the Centre. The completed and ongoing R&D projects were reviewed by Secretary (Mines) which was followed by lab visit and inauguration of the new ICP facility.



Shri Arun Kumar, Secretary (Mines) inaugurating ICP lab at JNARDDC.

Finances

8.17 The Centre is expected to achieve an Internal and Extra Budgetary Resource generation (IEBR) of ₹ 4.00 crore in 2017-18. A revenue budgetary grant of ₹ 5.79 crore for salary component and ₹ 3.50 crore has been allocated for creation of capital assets by Ministry of Mines in 2017-18 for the Centre.

8.18 With a view to promote non-conventional energy JNARDDC has commissioned solar power plant of 264 Kw(p) capacity at JNARDDC roof top.The project will lead to 50% energy savings and also promote clean energy.



Solar panels on JNARDDC building

8.19 JNARDDC undertook a pledge to implement the Swachh Bharat Abhiyan launched by Hon'ble Prime Minister Shri Narendra Modi. JNARDDC has already undertaken the cleanliness of all labs and office premises, toilets etc which includes disposal of old Central AC and obsolete materials. Majority of the office lighting systems have been changed with LED lights in a phased manner. Swachatha pakhwara was observed during Oct 2017 with a view to encourage the zeal of the above program.

स्वच्छ भारत
एक कदम स्वच्छता की ओर

8.20 Pandit Deen Dayal Shatabdi celebration

JNARDDC organised a function to celebrate the birth centenary of Pandit Deen Dayal Upadhyay on 18th August 2017. The function was presided by Dr. N.Kutumba Rao, Addl D G, Geological Survey of India, Shri C S Gundewar, Ex Controller



Pandit Deen Dayal Shatabdi celebration in JNARDDC on 18th August, 2017

General, IBM & Ex Director, JNARDDC, Nagpur and Dr Kumar Shashtri, Vidarbha's Renowned Speaker & Great Thinker. They enlightened the gathering about the his noble life, simple living, high thinking and need for self governance-Swaraj.

National Institute of Rock Mechanics (NIRM)

8.21 National Institute of Rock Mechanics with its Head Office at Bangalore and Registered Office at Kolar Gold Fields carries out applied research and provides its R&D support and expertise to the mining industry and major civil engineering including infrastructure projects by carrying out varieties of investigations, modelling, instrumentation etc. in the area of rock engineering and rock mechanics.

8.22 NIRM is expanding its activities in the academic field by conducting a series of professional training programs like training program on 'Tunnelling Technology' for the executives of Indian Railway, on 'Safe Blasting Practices' for the engineers of Border Road Organization and on 'Rock Mechanics' for the executives of the South Eastern Coalfields Ltd. An MoU is signed with Indian railways for undertaking similar training program in future.

8.23 During the year 2017-18, the Institute has completed over 50 industry projects apart from government-funded S&T projects. Around 65% of the recurring expenditure is earned as IEBR from industry sponsored projects. The financial position of the Institute is shown in **Table 8.3** :

Table 8.3 (₹ in lakh)

Year	Recurring Expenditure	Government Grants		IEBR (earning from projects)	IEBR as % of expenditure
		Recurring	Capital		
2015-16	885.84	500	235	545.20	61.6
2016-17	940.85	594	100	509.30	54.13
2017-18	1015.52	636	163	679.76	65.66

8.24 Some of the major projects executed by the Institute during this year include seismotectonics studies for evaluation of lineament at the proposed Jaithapur Nuclear Power Plant at Ratnagiri, geophysical investigations for the Chenab bridge in J&K, design of stoping parameters for mines of MOIL, strata behaviour analysis in the mines of SECL, micro-seismic monitoring for the stability of excavations for the Tapovan-Vishnugad hydro-electric project, technical advice on rip-rap blasting for the construction of earth cum rock filled dam at Polavaram Project, blast vibration study for the Darlipali Super Thermal Power Project, 3D Numerical Modelling analyses of pump house and surge pool caverns, geological mapping and in-situ stress parameters for the major Lift Irrigation Schemes in Telangana State.



Re-opening of Kendadih Mines (HCL)

National Institute of Miners' Health (NIMH)

About NIMH

8.25 National Institute of Miners' Health, an autonomous Institute under Ministry of Mines, conducts applied research in the field of occupational health and hygiene among persons employed in mining and mineral based Industry with the vision of "Safe Mines and Healthy Miners" and the mission "Indian mining and mineral industry sans occupational diseases". The Institute is recognized as a Scientific & Industrial Research Organization by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. The Institute has completed 25 years of service to the nation in conducting research and promoting occupational health & hygiene among mine workers.

8.26 The institute has state of the art infrastructure, facilities and trained manpower to officer Technical Support Services for;

- Routine Initial and periodic medical examinations as per Mines Rules, 1955
- Health surveillance as recommended by Conferences on Safety in Mines.
- Personal exposure assessment studies for noise, dust, vibration, heat & humidity as required under the Mines Act, 1952 and recommended by Safety Conferences.
- Work environment evaluation for dust, noise, vibration, illumination, etc as required under Metalliferrous Mines Regulations 1961 and Coal Mines Regulations 1957.
- Evaluation of Mining Machineries for vibration, noise, dust emission etc.
- Ergonomic assessment of Mining Machinery as per ISO Standards.
- Training of airborne dust survey in-charge as per circulars of Directorate General of Mines Safety (DGMS).
- Health awareness and promotion programme on occupational health issues.

8.27 The Institute provides services to both Private and Public sector mining companies viz. Reliance Industries, Ambuja Cements Ltd., NALCO, ACC Limited, UltraTech, NMDC, Essel Mining, Sesa Goa, GMDC, APMDC, RSMML, Western Coalfields Ltd. etc.



8.28 The main objectives of the Institute include:

- Promotion of health and prevention of diseases among persons employed in mines and mineral based industries.
- Research & development to ensure safe and healthy extraction of the country's mineral wealth.
- Assessment of health hazards in the work environment of mines and allied industries for regulatory and remedial measures.
- Develop human resources in the field of occupational health, hygiene and safety.

Activities during the year 2017-18

Clientele/ Sponsored Projects

8.29 Clientele/sponsored projects undertaken during the year are given below;

- Dust, Vibration and Noise Mapping at NALCO, Damanjodi
- Airborne Respirable Dust Survey at NMDC-Kirandul (Phase II)
- Workplace monitoring and Noise Mappingat NMDC-Panna (Phase II)
- Noise, dust and whole body vibration analysis in a limestone mine of UltraTech Cements Limited, Tadipatri
- Equipment Vibration Studies & Assessment of Associated Health Riskat M/s. Dhilon Construction Pvt. Ltd.
- Medical examination of mine workers, M/s Gujrat Mineral Development Corporation Limited.
- Medical Examination of Maharashtra State Mining Corporation Iron ore mine employees.
- Airborne respirable dust survey at Silica sand and masonry mines Bharatpur, Rajasthan.
- Equipment Vibration Studies & Assessment of Associated Health Risk at TRB Iron ore Mine (Jindal Steel and Power), Orissa

S&T Projects

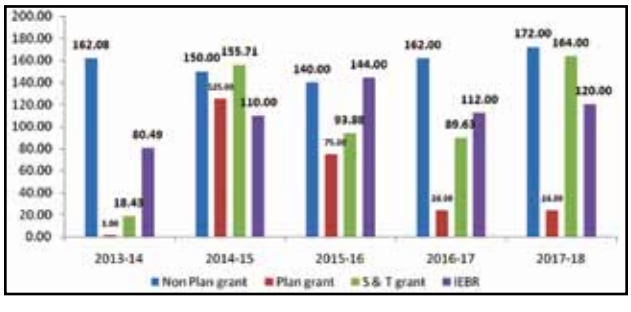
8.30 The Institute is implementing following two S&T projects sponsored by Ministry of Mines.

- Multi Centric Study of dust Related Diseases in Stone Mines and Development of Sustainable Preventive Programme. (In collaboration with Ministry of Labour & Employment)
- Development of standard protocol of field Audiometry for notifying noise induced hearing loss.
- Possible implications of bio-available iron in coal mines dust on coal workers' lung disease. Project is in collaboration with National Institute of Miners' Health (NIMH) and Priyadarshani Institute of Engineering and Technology (PIET), Central India Institute of Medical Research (CIIMS) and Western Coal Fields Ltd. (WCL) (Sanctioned by Central Mine Planning and Design Institute (CMPDI), Govt. of India).
- Postural risk analysis of Mining equipment operators and its relation to Musculoskeletal Disorders

Financial Performance of Institute

8.31 The below given chart depicts financial position of the Institute for last five years

(Amount in ₹ in lakh)



Note: 2017-18 - Projected figure.



Meeting of Mines Ministers at Goa on 19.1.2018

9

Corporate Social Responsibility



Corporate Social Responsibility

- NALCO Page - 115
- HCL Page - 116
- MECL Page - 117



National Aluminium Company Limited (NALCO)

9.1 Periphery Development & CSR Initiatives

Highlights on CSR activities for the financial year 2017-18 are furnished below:

- After promulgation of the new Companies Act, 2013, the Company has developed its CSR Policy in line with the provisions of the Statutes. Accordingly, the Company needs to spend at least 2% average of Profit Before Tax (PBT) made during the three immediately preceding financial years which came into force with effect from 1st April 2014.
- Total provisional fund allocation for CSR activities for the financial year 2017-18 is ₹ 2,788 lakh. The amount assigned can be spent in line with the provisions of the Companies Act, 2013.
- As NALCO Foundation is an arm created for the CSR implementation, the projects can be executed by them also.
- For bringing the Tribal students to the mainstream of education, as an important CSR initiative, 855 students from periphery villages of Damanjodi and Pottangi Sector have been sponsored for formal education in 3 reputed residential schools in Odisha. NALCO Foundation has taken the responsibility for funding the total cost related to study, lodging and boarding of those students till they complete schooling.
- 8 Mobile Health units and 2 OPDs are in operation in peripheral villages of Angul and Damanjodi sector for providing free health check up to more than one lakh patients every year.
- NALCO has joined the National movement of Swachh Bharat Mission and carried out Swachhata Abhiyan in and around its operation units.
- Identification and distribution camp for providing assistive devices to the persons with disabilities arranged in collaboration with Artificial Limbs Manufacturing Corporation of India (ALIMCO). Total 427 beneficiaries are provided with wheel chair, motorized tricycle, hearing aids, etc.
- NALCO ventured into massive urban plantation in and around Bhubaneswar and Angul in collaboration with Odisha Forest Development Corporation.
- Under swachha iconic city initiative, Puri Shri Jagannatha Temple illumination completed. Both side walls of VIP road, Puri beautified with thematic painting based on Jagannatha culture. Renovation and beautification of Gandhi Park taken up at Puri.
- Work order placed on Technopak Advisors Pvt Ltd and Frontline NCR) business solutions Pvt Ltd for Skill Develop for youth for a period of 2 years. It is planned to train 2000 persons belonging to Angul, Damanjodi, Visakhapatnam and Bhubaneswar.
- Assistance provided for renovation and modernization of schools at Varanasi.
- Assistance provided for Sansad Adarsh Gramya Yojana at Vizianagaram
- Eight lakh water pouch distributed to thirsty pilgrims during Jagannath car festival this year.
- 277 poor meritorious girls from BPL families identified for monthly scholarship under NALCO KI LADLI scheme designed under BETI BACHAO BETI PADHAO scheme.
- NALCO was awarded Kalinga CSR award-2016 for consistency in CSR activities in a national level seminar held on 20th May'2017 at Bhubaneswar.



Swachh Vidyalaya Abhiyaan: Indian Copper Complex, Jharkhand

- A book on health in 2 language were distributed in periphery Schools of S&P complex, Angul and M&R complex, Damanjodi



Full-fledged hospitals at Damanjodi and Angul, NALCO

Hindustan Copper Limited (HCL)

9.2 HCL embraces the principles of United Nations Global Compact (UNGC). HCL's CSR Policy revolves round the principles laid down in the Millennium Development Goals (MDGs) and Targets.

9.3 The actual expenditure in the CSR activities during two financial years and current financial year is given in the table below.

9.4 CSR expenditure during last two financial years and current financial year

(₹ in Lakh)

Financial Years	Required Spent (2 % of average net profit (PBT) of last three FYs	Spent
2015-16	610	768
2016-17	371	515
2017-18 (Up-to 30.09.2017)	147	101*

**Provisional*

9.5 A detailed Plan for FY 2017-18 was prepared in alignment with The Companies Act, 2013 and also considering the learnings from project implemented during FY 2016-17. The company allocated CSR Budget of 2% of the average net profits of the company made during the three immediately preceding financial years to the extent of ₹ 147 lakh for FY 2017-18.



Swachh Vidyalaya Abhiyaan: KCC



Mobile Health Camp at Malanjkhand Copper Project (MCP), Madhya Pradesh

9.6 The projects are being implemented in the target communities with the help of NGO, state government and other agencies. Following CSR activities have been taken up during the year.

i) Drinking Water, Health and Sanitation: Construction of drinking water structures (borewell with motor fitting) including soak pit for water recharging, health camps, supply of drinking water services through water tankers for nearby villagers.



Mobile medical units of NALCO visit peripheral villages in Angul and Damanjodi sectors and hold health camps round the year, distributing free medicines.

ii) Education, Vocational skills and Livelihood: 'Kaushal Vikas Yojna', Training on hand glove making unit/ handloom unit and wooden craft making were undertaken.

iii) Environment and Animal Welfare: Plantation of Perennial Saplings (including RCC posts fencing with GI barbed wires) was undertaken.

iv) Sports: Provision of sports items and organizing tournaments.

Mineral Exploration Corporation Limited (MECL)

9.7 MECL has drawn a long term Corporate Social Responsibility Policy;

9.8 For the year 2017-18, an approximate amount of ₹ 274.59 lakh has been proposed to spend under Corporate Social Responsibilities. The details for programme is as given below:

1. Promoting Sanitation & Safe drinking

a) Construction of 68 Toilets

b) Established RO systems water cooler for RO.

c) Maintenance of Toilets/ RO system

2. Promoting Healthcare

a) Medical Equipment to Hospitals.

3. Promoting Education

a) Distribution of School bags, Sports kit, Benches & Chairs in Government Schools.

b) Distribution of Computers and peripherals

c) Scholarship for Meritorious students.

d) Education system for deaf, dumb and blind students.

4. Skill development

a) Skill development programme for 100 candidates.



Odisha Live CSR Award - NALCO

5. Promoting Art & Culture

a) Construction of stage and community hall for cultural activities

6. Rural Development

a) Construction of CC road

b) Construction of Community Centre



Water Sprinkler arrangement on mine haul roads

10

Progressive Use of Hindi



Progressive Use of Hindi

- Meeting of Hindi Salahakar Samiti Page - 121
- GSI Page - 124
- IBM Page - 125
- NALCO Page - 126
- HCL Page - 127
- MECL Page - 127



Introduction

10.1 The Ministry of Mines continues to take steps to ensure compliance of the Official Language Policy of the Union in the Ministry of Mines as well as in its attached/subordinate Offices and PSUs. Utmost efforts have been made for due compliance of Section 3(3) of Official Languages Act, 1963. Letters received in Hindi were also replied to in Hindi. Following activities were undertaken for speeding up the progressive use of Hindi in the Ministry of Mines and its offices:



Meeting of Hindi Salahakar Samiti 11th July, 2017

Meetings of Hindi Salahakar Samiti

10.2 In order to propagate the use of Hindi and review the progress of Official language in the Ministry of Mines as well as in attached/ subordinate Offices and PSUs sunder its administrative control, Hindi Salahakar Samiti, a high-powered Committee under the chairmanship of the Minister of Mines has been reconstituted. The last meeting of the committee was held on 15.11.2017, under the chairmanship of Hon'ble Minister of Mines Shri Narendra Singh Tomar . The meeting was attended by non-official members of the committee and CMDs/Heads of various offices/PSUs along with senior officers of the Ministry. It recommended various measures to promote the use of Official language Hindi and to ensure the compliance of Official Language Policy. Action is being taken on decisions taken in the last meeting of the committee.

Meetings of the Official Language Implementation Committee

10.3 The Official Language Implementation Committee has been constituted in the Ministry headed by the Joint Secretary. All Officers of the rank of Under Secretary to Director in the Ministry and also representatives of attached offices/PSUs are member of the Committee. Quarterly Progress Reports received from the sections of the Ministry and various attached offices/organizations are reviewed in the meetings of the Committee and remedial measures are suggested to improve the progressive use of official language Hindi. Meetings of the Committee are being held regularly. During the year under review 4 meetings were held last being on 12.12.2017.



Meeting of Hindi Salahakar Samiti 15th November, 2017

Official Language Inspections

10.4 In order to assess the progress made in the use of official language Hindi in attached/ subordinate Offices and Public Sector Undertakings, under the administrative control of the Ministry of Mines, Officers from Ministry, mainly from Rajbhasha Division are conducting inspections of attached offices/PSUs of the Ministry from time to time. During the year, GSI, HCL HQs at Kolkata, IBM Headquarters at Nagpur and HCL & NALCO Offices at Mumbai were inspected. Shortcomings noticed during the course of inspection were



brought to the notice of the Heads of offices/ PSUs concerned and measures to remove the shortcomings were also suggested and action taken on such reports ensured. In addition to this, Headquarters of various attached and subordinate offices and PSUs also carried out inspections of their offices, with a view to monitor the progressive use of Hindi and suggest measures for further improvement in the work in Hindi.

Inspections by Committee of Parliament on Official Language

10.5 The Committee of Parliament on Official Language conducts inspections regarding progressive use of Hindi in official work in various Central Government Offices, Undertakings, Corporations etc. During the year 2017 the Committee visited offices of Geological Survey of India (GSI) HQs at Kolkata, GSI Office at Trivendrum (Kerala) and Hindustan Copper Limited (HCL) office at Delhi.These inspection meetings were also attended by the Joint Secretary concerned and Joint Director (OL) from the Ministry of Mines. Ministry of Mines has strived to ensure that assurances given to the Committee are compiled to and action taken sent to the Committee Secretariat as per scheduled.

Website of the Ministry

10.6 The website of the Ministry is a vital instrument of transparent governance. The material on website is available in bilingual in Hindi and English. Bilingual material available on website is updated from time to time by concerned sections. Also, the Ministry has ensured that all subordinate offices and PSUs are updating their respective websites in Hindi and English so that the policies and programmes of the Ministry are widely publicized.

Measures for Implementation of incentive Schemes

10.7 It is the policy of the Government of India to propagate the use of official language through motivation and incentive. In order to inspire and encourage the officers/employees of the Ministry and its subordinate offices/PSUs to work in Hindi, various Cash Award Schemes of the Department of Official Language have been implemented. Also various subordinate offices/PSUs have instituted many schemes to encourage their employees in Hindi.

Publication of Technical Terminology

10.8 With a view to bring uniformity in the technical terms used in the Ministry and its subordinate office/PSUs, a committee was constituted under the chairmanship of Shri Subhash Chandra, Joint Secretary, comprising of officers from the Ministry and its subordinate offices and PSUs as members, to draft a Technical terminology in Hindi and English. The English terms were compiled by various offices at their level and sent to the Ministry. Subsequently, two meetings of the committee were held on 22 & 23 May, 2017 to finalize the terms in Hindi. Draft of the terminology in hindi has been sent to Commission for Scientific and Technical Terminology for their approval. Ministry is pursuing the matter with the Commission for the early publication of the Terminology.

Training and Workshops

10.9 Under Hindi Teaching scheme of Ministry of Home Affairs, Department of Official Language, officers/employees are nominated for training in Hindi Language (Prabodh, Praveen, Pragya and Parangat) and Hindi stenography/typing by the Establishment section of the Ministry. In order to encourage officials/ employees to perform their official work in Hindi increasingly, Hindi workshops are also

organized from time to time. During the year four Hindi workshops were organized in the Ministry.



Meeting of Hindi Salahakar Samiti
15th November, 2017

Celebration of Rajbhasha Fortnight/Month

10.10 On 14th September every year Hindi Diwas is celebrated in the offices of Central Government. In keeping with the directions of the Department of Official Language and with a view to create a conducive atmosphere for the progressive use of Official language in the Ministry, Rajbhasha Fortnight/Month is being organized during the month of September every year. This year also Rajbhasha Hindi Prayog Protsahan Month was observed from 1st to 30th September, 2017. A message by Hon'ble Minister was circulated on the occasion of Hindi Diwas. Banners and Posters were also displayed during the month. Various competitions i.e. Hindi Noting/Drafting competition, Hindi Sulekh and Dictation, Quiz Competition, Hindi typing, Speech Competition and Hindi Workshop were organized during the month. Shri Arun Kumar, Secretary (Mines) gave away cash awards and certificates to the winners of various competitions in a function organized on 10.10.2017.



Shri Arun Kumar, Secretary (Mines) receiving Hon'ble Minister of Mines Shri Narendra Singh Tomar before Hindi Salahakar Samiti Meeting

Publication of 'Khan Sampada'

10.11 Ministry of Mines has been bringing out its Hindi house journal 'Khan Sampada' Since 1998. The 37th issue of 'Khan Sampada' was released on 05.10.2016 by Shri Piyush Goyal, the then Hon'ble MOS (I/C), Mines, Power, Coal, New and Renewal Energy in the meeting of Hindi Salahakar Samiti of the Ministry. 38th issues of the Khan Sampada is being finalized and will be published shortly.

Translation Work

10.12 A corpus of compulsory translation work relating to Meetings of Standing Committee, audit paras, Cabinet Notes, Annual Report, Parliament Questions, outcome budget, material relating to Demand for grants and MoUs for International Cooperation in the field of mines & minerals, with various countries was carried out during the year. In addition, translation related to compliance of section 3(3) of the OL Act and rules 5 of the Official Language Rule was also carried out.

Geological Survey of India (GSI)

10.13 Despite being a scientific and technical organization, GSI is also engaged in promoting the use of Hindi in its various offices.

In compliance with the Official Language provisions in Indian Constitution, Official Language Act, 1963, Official Language Rules, 1976 and the instructions issued by the Government of India, Ministry of Home Affairs, Department of Official Language from time to time, Geological Survey of India is continuously implementing the Official Language Policies. Various works are carried out in the offices for the propagation of official language, various incentive schemes are implemented and progress in propagation of official language Hindi is also reviewed from time to time. Glimpses of official language related work done by GSI during the period from 01st April to 30th September 2017 are as follows:

In-house magazines

10.14 In-house Hindi magazine of GSI, CHQ, Kolkata 'BHOOMANTHAN' 5th edition; WR, Jaipur 'BHUGAURAV' 17th edition and State Unit: Gujarat, Gandhinagar 'SABARMATI, were published during this period. In addition to that, a special issue of the compilation of Hindi papers and articles of All India Scientific and Technical Seminar held at Pune in 2016 was also published. Publication of the compilation of abstracts of technical papers in Hindi collected in All India Technical Rajbhasha Seminar held at CHQ, Kolkata on 14.06.2017 has also published.

Implementation of Hindi Incentive Schemes

10.15 To promote the use of Hindi in the Official work, the following Incentive schemes are being implemented in Geological Survey of India.

Cash award and personal Pay to the Officers/ Employees for passing the Pragya, Praveen, Prabodh, Hindi Typing, and Stenography Examinations under the Hindi Teaching Scheme of Government of India, Ministry of Home affairs.

Cash award to the Officers/Employees for noting and drafting in Hindi.



Release of "Khanij Gaveshan" by Hon'ble Minister of Mines



Hindi Workshop

10.16 Hindi Workshop was organized by Central Headquarters on 27.10.2017. During this, training was conducted on "Online Work on OCBIS Official Language Module".

Portal of the GSI in Bilingual Form

10.17 As per the policy of the Government of India, necessary steps have been taken to make the web portal of GSI in Bilingual form.

Hindi Fortnight/Week/Day

10.18 Hindi fortnight/week have been celebrated in all the Regional Headquarters, State Units, Operational Units of Geological Survey of India in the month of September. During this period various Hindi competitions/ activities i.e. Hindi Typing, Hindi essay writing, Hindi noting/drafting, Hindi poetry recitation, Hindi quiz etc organized. On 14th September, 2017 Hindi day was celebrated in the department in which the message of Honorable Minister of Home Affairs and Minister of Mines were read and the participants of Hindi fortnight were rewarded with prizes & certificates.

Hindi Translation

10.19 Gazette Notifications, Summaries, Office Orders, Circulars, Tender Notices, RTI Materials, Parliament documents send from the parliament cell and other correspondence of GSI have been translated from English to Hindi and vice-versa have been released in bilingual format, thus fulfilling the requirement of Official Language Act, 1963 Section 3(3). In addition to that, Abstracts of reports related to various survey programs of the Geological Survey of India were also translated into Hindi. 'STORY OF GSI' English version is being translated into Hindi.

Review of Quarterly Progressive Report (QPR) of Regions

10.20 The review of Quarterly Progressive Report (QPR) of all regions and Missions is carried out regularly and feedback is given regarding shortfall for necessary action.

Meeting of Official Language Implementation Committee

10.21 The meeting of Official Language Implementation Committee are being held in entire GSI offices as per the directive of Government of India, Ministry of Home Affairs, Department of Official Language. After the regular meetings in each and every quarter, the decision taken after discussion on the status of the official language and its minutes is also sent to the respective Regional Implementation Office, Department of Official Language and City Official Language Implementation Committee. The meeting of the Official Language Implementation Committee of the Central Headquarters was held on 29.06.2017 and 25.09.2017 in the said period.

All India Scientific & Technical Official Language Seminar

10.22 All India Scientific and Technical Official Language Seminar was organized on 14.06.2017 at Central Headquarters, Kolkata, in which 25 research articles/articles were presented. Five research writers were also rewarded in the best three categories.

Indian Bureau of Mines (IBM)

10.23 Indian Bureau of Mines is constantly implementing the official language policy of the Govt. of India. IBM has its headquarter situated in 'B' region. Six offices are in 'A' region and the rest are situated in 'C' region. As far as the 'A' region is concerned, all the offices achieved the target of correspondence fixed by the Department of Official language.



Except the two offices of the 'C' region, one office at 'A' region and one at 'B' region all the offices are notified under Rule 10(4). During 2017-18, the details of the progress related to Hindi are as follows:

10.24 The 100th, 101st, 102nd and 103rd meetings of the Departmental official language implementation committee were held respectively on22-12-2016, 31-03-17, 22-06-17 and 28-09-17 under the chairmanship of the Controller General IBM. In all regional offices, the meetings of the Departmental official language implementation committee are regularly held and reports are sent to the headquarter.

10.25 The Hindi Fortnight was successfully organized from 01-09-2017 to 14-09-2017. During the fortnight, various competitions such as Hindi essay, Hindi noting and drafting, Hindi translation, Hindi typing, Hindi extempore speech and Hindi Quiz were organized. The final day function of the Hindi Fortnight was organized on 19-09-2017 and prizes were distributed to the winners of the Hindi competitions. A Hindi Book Exhibition was also organized during the Hindi Fortnight from 01-09-17 to 12-09-17.

10.26 'Hindi Diwas' was celebrated on the 14th of September 2017. On the occasion the messages of the Hon'ble Union Home Minister, Shri Rajnath Singh and Hon'ble Minister of Mines Shri Narendra Singh Tomar were read out.

10.27 Two half-day Hindi workshop was organized on 19-06-17 and 20-06-17 in which 12 officers and 17 staff participated. A Hindi workshop was also organized on 14-09-17 on the occasion of 'Hindi Diwas'.

10.28 One day All India Hindi Technical Seminar was organized at IBM Headquarter, Nagpur on 25-05-2017. Total 11 technical papers have been presented and a souvenir has been released. On this occasion, the Hindi House-magazine of IBM headquarter "Khan Bharti" has also been released.

10.29 IBM Headquarter, Nagpur has got two official language Awards by the Town official language Implementation committee (office-2), Nagpur. It has got the third prize for its Hindi House Magazine "Khan Bharti" and Special encouragement prize for the implementation of Hindi.

National Aluminium Company Limited (NALCO)

Progressive use of Hindi in Official Work

10.30 As per the Official Language Act-1963 and Official Language Rule-1976, implementation Hindi is being done in Nalco.

To promote use of Hindi in official work, Hindi Fortnight was observed from 01-09-2017 at Corporate Office, Production Units and Regional Offices of the Company and several Hindi Competitions were organised for employees and students.

Meeting of the Town Official Language Implementation Committee, Angul was held at S&P Complex in June'17. Two meetings of Town Official Language Implementation Committee (Undertaking) Bhubaneswar was held in May'17 and Sewp'17 at Corporate Office, Bhubaneswar.

Four Hindi workshops was organised and employees and officers were trained to do their official work in Hindi.

Hindi Teaching Program was implemented at Corporate Office, S&P Complex, and M&R Complex and the employees who do not have working knowledge of Hindi, were nominated for Praveen & Pragya courses under Hindi Teaching Scheme of Government of India and after passing the examinations incentives and cash awards were given as per rules.



Website of Company www.nalcoindia.com is made Bilingual and being regularly updated both in Hindi and English.

During the year NALCO has provided Faculty Assistance to the member offices of TOLIC (U), Bhubaneswar in Hindi Workshops, especially for working on Computers and Mobile phones in Hindi.

Hindi Competitions were also organized on the occasion of birth centenary of Pandit Deendayal Upadhyaya among the Officers and employees of member offices of TOLIC (U), Bhubaneswar.

Hindustan Copper Limited (HCL)

10.31 During the year 2017-18, HCL made constant endeavour to increase use of Hindi in its Units/Offices. Raj Bhasha Pakhwara and Hindi Diwas were celebrated in the Units/ Offices from 14th to 28th September, 2017. The messages of Hon'ble Home Minister, Govt. of India and CMD, HCL were circulated/read out in all Offices/Units on this occasion. Various competitions were organized with a view to enhance interest among employees towards Official Language. Prizes were distributed to the winners. Employees are constantly motivated to use Hindi in their day-to-day official work. Hindi Workshops were conducted in the Units/ Offices at regular intervals. Regular review of progressive use of Hindi and difficulties faced were carried out in Quarterly meetings of Official Language Implementation Committee under the Chairmanship of CMD at Corporate Office and Unit Heads in Units.

10.32 During the year 2017-18, the Company participated in the half-yearly meeting of Town Official Language Committee (PSUs), Kolkata held on 12th August, 2017. HCL/CO has received the 'Best Performance Award' by Town Official Language Committee (PSUs), Kolkata for successful implementation of official language under "Rajbhasha Award Scheme-2016-17" on 12.08.2017.

10.33 The Company's in-house journal "Tamralipi" is published in Hindi and English and distributed among employees regularly and also mailed to the members of the Hindi Advisory Committee. Effort is continuously made to ensure that the Company's advertisements for recruitment/ tenders, etc. are also published bilingually. "One Hindi Word Every Day" scheme is operational for improving the Hindi vocabulary of employees. The use of Hindi in computers has been reinforced and advanced Unicode Software Hindi Open Office has been provided to all Units/Offices of the Company.

Mineral Exploration Corporation Limited (MECL)

10.34 In accordance with the policy of the Govt. of India for extensive use of Hindi in official work, all out efforts were continuously made for increasing the use of Hindi.

10.35 As per the guidelines of Ministry of Home Affairs, Rajbhasha Vibhag, Unicode Encoding samarthit fonts have been installed in all new computers/ laptops also in MECL, so that more officials are able to work in Hindi due to its easy functionality.

10.36 In accordance with the policy of the Govt. of India for extensive use of Hindi in official work, all out efforts were continuously made for increasing the use of Hindi during the year 2017-18. Hindi Diwas/ Pakhwada was organized wherein various competitions were organized for employees to propagate Hindi amongst them and also one successful Hindi Hasya Kavi Sammellan was organised on the occasion. Four Hindi workshops were organized during the year in which 122 Executives and Non-Executives participated. Four quarterly meetings of the official language implementation committee of MECL were held wherein steps to propagate Hindi in future in all official work were discussed and implementation position was reviewed. In

order to encourage employees to do official work in Hindi, 159 cash awards were given to employees during the year 2017-18. The house magazine of MECL "MEC Samachar" received First Prize amongst all Govt. Offices of Nagpur City and also got third prize for encouraging implementation of official language. MECL also organized a translation competition successfully for all officials of Nagpur based Govt. offices under the auspices of Nagpur Town OLIC.



"MEC Samachar" received First Prize amongst all Govt. Offices of Nagpur City"

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC)

10.37 JNARDDC continued its efforts to promote the progressive use of Hindi. The Centre celebrated Hindi Pakwhada during 14-27 September 2017 which included several competitions. Director, JNARDDC emphasized the need for further use of hindi in day to day official use of the Centre's activities. A workshop on Hindi was conducted under the able guidance of Dr.Sompal Singh.

National Institute of Miners' Health (NIMH)

10.38 Staff and Officers of NIMH at Nagpur and KGF branch celebrated 'Hindi Pakhwada' from 12–27 September, 2017 for the enrichment of Hindi language throughout the society and the Institution. Several programs like Sangoshti, Quiz session, etc., were conducted during 'Hindi Pakhwada'.



Secretary, Shri Arun Kumar at the prize distribution ceremony of Rajbhasha Mah celebrations

11

Exploration Activities in the North-Eastern Region



Exploration Activities in the North-Eastern Region

- Work done by GSI in North-Eastern Region Page - 131
- Landslide Hazard Studies Page - 133
- Work done by IBM in North-Eastern Region Page - 135



Introduction

11.1 The North Eastern Region has a unique geomorphological and geological setup. It consists of eight states with spectacular Himalayan Ranges, massif plateau and alluvium plains of Brahmaputra River. The rocks ranging in age from Precambrian to Recent age are exposed here. This part of the country attains significance with the presence of mighty Himalayan Mountain Belt in the north; Shillong Massif Plateau in the south and gorgeous Brahmaputra valley forming the extensive Assam plain in between and Indo-Myanmar Range in the east.

Review of Progress of Ongoing Projects in North-Eastern Region

11.2 GSI is relentlessly working for the development of the North Eastern Region (NER). To intensify GSI's activities in NER an office was set up at Shillong in 1961 which was a quantum leap for accelerating the activities on mapping and mineral assessment in Assam, North East Frontier Agency (NEFA), Nagaland, Manipur and Tripura. Since then with the changing need of the country and in conformity with the laid down policies of Government as envisaged under policies and Five Year Plans, GSI is continually striving for the development of NER states through augmentation of baseline geological data, natural resource assessment, addressal of societal issues (involving geotechnical, seismic, landslide studies), publication of maps, literatures, geo-spatial data base and helping the states of NER in training, capacity building, technical and scientific assistance.

Work done by Geological Survey of India (GSI) in North Eastern Region:

MISSION: I (Baseline Geoscience Data Generation)

Survey & Mapping:

Regional Survey

Systematic Geological Mapping (Scale: 1:50 K)

11.3 Nine items of Photo Geological Mapping in parts of Arunachal Pradesh and Manipur with the help of Remote Sensing Studies on1:50,000 Scale with limited field checks, have been taken up during the F.S. 2017-18 and an area of 7780 sq. km has been covered till September 2017.

Specialised Thematic Studies (Scale: 1:25 K)

11.4 During FS 2017-18,total eight items of Specialized Thematic Mapping have been taken up in North Eastern Region of which two items taken in Arunachal Pradesh, one item in Assam, one item in Meghalaya, two items in Manipur-Nagaland and two items in Tripura-Mizoram and an area of about 122 sq. km have covered till September 2017.



Exposure of pyroxenite at Sung Valley, Meghalaya

Geochemical Mapping (GCM)

11.5 Total fifteen items of Geochemical Mapping on 1:50,000 Scale with collection of samples in grid pattern have been taken up during the F.S. 2017-18 in parts of Arunachal Pradesh, Assam, Nagaland and Meghalaya and an area of 88 sq. km out of 9613 Sq.Km have been covered till September, 2017.



Geophysical Mapping (GPM)

11.6 Two items of Gravity-magnetic mapping in Bongaigaon, Kokrajhar, Dhurbi, Karbi-anglong and Nagaon district, Assam have been taken up during FS 2017-18 and an area of 140 sq. km out of 2800 sq. Km have been covered till September 2017.



Graphite schist, Dupit area, Upper Subansiri District, Arunachal Pradesh.

Mission II: Natural Resource Assessment (Mineral Exploration)

11.7 Introduction: During FSP 2017-18, a total of 19 items (11 G4 and 8 G3 stage) have been taken up under Mission-IIA and Mission- IIB. Out of 19 items, 17 items of Mission-IIA (Mineral Resource Assessment) have been taken up in the states of Arunachal Pradesh, Assam, Meghalaya, Nagaland and Sikkim and 2 items of Mission-IIB (Natural Energy Resources) are in Assam-Meghalaya border and in Alongtaki, Mokokchung district, Nagaland.

Mission: III Geoinformatics (Dissemination of Information)

11.8 During the period from April, 2017 to September 2017 the following activities were taken:

- Publications of Bulletin Series-B: Geotechnical Investigation of Hydel projects in Arunachal Pradesh; Records of GSI–Vol. 150, Part 4 (Extended Abstracts for the F.S. 2015-16) and Vol. 151, Part 4 (Extended Abstracts for the F.S. 2016-17); Misc. Pub 30, Part 4, Vol.2 (i) Geology and Mineral Resources of Assam; Bull. Sr. A- Limestone Deposits of Ukhrul district, Manipur are in progress.
- Integration of available geological, geochemical, geophysical, aero-geophysical, remote sensing and drilling data of sheet 78 O to identify the mineralization pattern.
- Updation, Editing, and Finalization of 2nd Edition of Geology and Mineral Maps of NER on 1: 2M and also for individual 8 States of NER on 1:0.5M scale.
- Preparation of Geological Quadrangle Map of degree sheets 82 P and 92 A on 1:250,000 scale based on 50K geological database uploaded to the GSI portal.
- Preparation of Geological Quadrangle Map of degree sheet 78P and 83D (Tripura-Mizoram).
- Preparation of Geological Quadrangle Map of Degree sheet 83K (Manipur-Nagaland).
- Digitization of Mission I and IV Reports: Digitisation of all unpublished reports of Mission-I, GSI, NER (551 reports) has been completed and uploaded in OCBIS portal. Out of 977 nos. of Mission-IV unpublished reports, 262 reports have been approved and uploaded and remaining reports are in different stages of digitization.

Mission: IV Fundamental & Multidisciplinary Geosciences and Special studies (Specialized Investigations)

Palaeontological Studies:

11.9 During FS 2017-18, study of Invertebrate faunal associations from the Early



Palaeogene Jaintia Group and their palaeo-environmetal reconstruction have been taken up. Preliminary study of the echinoids of Lower Shella carbonates revealed that they belong to the Cassiduloids. The Upper Shella Limestone member yielded bivalves and larger forams.



Thin section of Prang limestone (Biomicrite) showing Discocyclina foraminifera (PPL) set in carbonate mud as matrix.

Geotechnical investigations:

11.10 NER may be termed as the 'power house' of India as it possesses hydropower potential, which is about 30% of the total hydel potential of the country. The hydel potential of major river basin of Arunachal Pradesh like Kameng, Subansiri, Siang, Lohit and Dibang totals production of 34,920 MW at 60% load factor (CEA) i.e. about 90% of the total hydropower resources of NER.

During the current field season 2017-18, Engineering Geology Divisions, GSI, NER, Shillong has taken up the following three Geotechnical Investigation projects;

- Tlawang Hydroelectric Project, Aizwal District, Mizoram:
- Umri and Umsiang Irrigation Project in Ri-Bhoi district, Meghalaya:
- Feasibility stage-geotechnical assessment of Sela Pass Tunnel, Project Vartak, BRO, Tawang Districts, Arunachal Pradesh:-

Landslide Hazard Studies:

11.11 In North-Eastern Region, 14 standard items under the National Landslide Susceptibility Mapping programme are being taken up during FS 2017-18. In addition, 2 Meso-scale and 1 Site specific landslide studies are being taken up in Sikkim.

Assam:

11.12 Three Macro-scale (1:50,000) Landslide Susceptibility Mapping items have been taken up during FS 2017-18. Prefield thematic mapping have been completed and an area of 195 sq. km are validated during the field work upto September 2017. Two numbers of landslides along Nablaidisa–Hajadisa road section were studied and data as per 41-point geo-parametric datasheet were collected. These landslides are triggered by unplanned slope cutting for road construction coupled with incessant rainfall.

Meghalaya

11.13 Three Macro-scale (1:50,000) Landslide Susceptibility Mapping items have been taken up during FS 2017-18. Prefield thematic mapping have been completed and an area of 960 sq. km have been validated during the field work upto September 2017. A total of 159 landslides along the roads and the natural slope were documented during the period from April to September 2017. The hill slopes are also affected by the vicinity of E- W trending Dawki fault.

Manipur & Nagaland

11.14 Five Macro-scale (1:50,000) Landslide Susceptibility Mapping items have been taken up during FS 2017-18. Prefield thematic mapping have been completed and an area of 1150 sq. km have been validated during the field work upto September 2017. A total of 210 landslides were recorded during the field validation.



Disposition of faulted sedimetary sequence in coal bearing Barakar Formation, Ambara open cast mine, Chhindwara district, Madhya Pradesh

Sikkim

11.15 Meso scale (1:10000) Landslide Susceptibility Mapping along Singhik-Manul-Paegum-Chungthang road sector of North Sikkim Highway, North District, Sikkim and Meso scale (1:10000) Landslide Susceptibility Mapping along Singtam-Mangkha-Dikchu Road Corridor, East and North District, Sikkim have been taken up during FS 2017-18 in which preparation of pre-field thematic maps(Land use-land cover, Geomorphology, Slope forming material, Thickness and Landslide incidences map) of the study area are in progress. Detailed Site Specific Landslide Investigations of the 8th Mile Landslide on Gangtok-Nathula Road, East District, Sikkim has been taken up and initial study revealed that the slide zone is multiple/complex in nature.

Tripura & Mizoram

11.16 Three Macro-scale (1:50,000) Landslide Susceptibility Mapping items have been taken up during FS 2017-18. Prefield thematic mapping have been completed and an area of 745 sq. km have been validated during the field work upto September 2017. A total of 25 landslides were recorded during the field validation.

Earthquake Studies

11.17 During the FS 2017-18, three items have been taken up in NER on the study ofSeismic Microzonation study of Imphal City, Manipur, monitoring of Ground Motion in Brahmaputra Basin, Naga Patkoi and NE Himalaya and regional Neotectonic studies for delineation / identification of active fault along the Himalayan Frontal Thrust (HFT) at the foothills of Assam-Arunachal Himalaya in parts of Papumpare and Lower Subansiri districts, Arunachal Pradesh.



Perspective view of the Varunavat landslide, Uttarkashi District, Uttarakhand

Fundamental Geoscience

Petrological Studies

11.18 Two Research Programme items i.e. Study on fluid controlled charnockitization of granite-gneiss in parts of West Khasi Hills District, Meghalaya to evaluate the process of charnockitization, role of fluids and age of charnockitization and study of Petrology and Geochemistry of the felsic volcanic rocks of Shillong Group: Their stratigraphic and magmato-tectonic evolution with respect to the Shillong Sedimentary Basin. The work is in progress.

11.19 Budget and Expenditure of the Northeast Region for the Financial Year 2017-18 (Allocated Plan Outlay for NER) is given in the **Table-11.1**.



Table –11.1
Budget and Expenditure of the Northeast Region for the Financial Year 2017-18 (Allocated Plan Outlay for NER)

(₹ in Lakh)

Sl. No.	Schemes	BE 2018-19	RE 2017-18	Expenditure from April 2017 to September 2017
1	Survey & Mapping	141.00	128.00	48.11
2	Mineral Exploration	200.00	290.00	84.11
3	Special Investigation	39.00	36.00	12.08
4	R & D	70.00	64.00	16.08
5	Information Dissemination	122.00	183.00	75.36
6	Human Resource Development (Training)	25.00	20.00	7.98
7	Modernization & Replacement	1,500.00	150.00	38.04
8	TSP	400.00	450.00	264.71
Total		**2,497.00**	**1,321.00**	**546.47**
% utilization of budget against RE			41.37%	

Work done by Indian Bureau of Mines in North Eastern Region

11.20 The Regional Office of IBM at Guwahati continued to undertake inspection of mines and studies on development of resources in North-Eastern Region. During the year 2017-18 (up to September, 2017), 24 mines / areas were inspected for enforcement of provisions of MCDR, 2017 and for processing and disposal of mining plan/scheme of mining.

11.21 Based on the proposals received from State Government of Meghalaya, two day workshop cum training programme on "Scrutiny Processing and Implementation of Mining Plan for the Officers of DGM Meghalaya was organized on 4th and 5th August 2017. Course module in this regard was devised as per specific requirements and for which four resource persons/faculties from IBM were deputed for imparting training.

Work carried out by MECL in North-Eastern Region

11.22 MECL has been associated with mineral exploration activities and geo-technical studies for the development of mineral industry in the North Eastern Region in last 33 years. It has completed exploration for coal in 15 blocks in the states of Assam, Arunachal Pradesh, Nagaland and Meghalaya on behalf of Ministry of Coal, North Eastern Council and CMPDIL. Under its promotional programme funded by Ministry of Mines, it has completed twelve schemes which include copper, sillimanite, glass sand, shell limestone and ferro-silicon grade quartzite in the states of Assam, Meghalaya, Nagaland, Mizoram, Sikkim and Arunachal Pradesh. In addition, it has carried out geo-technical studies on behalf of Brahmaputra Flood Control Board in the state of Assam and Arunachal Pradesh and consultancy work for remote sensing studies at Tripura on behalf of Ministry of Mines. Exploration services were also rendered to Atomic Minerals Division involving survey, drilling & mining in Umarangaon / Domiaset block, West Kasi Hill district.

11.23 On behalf of Directorate General of Hydrocarbon, Govt. of India, MECL with BRGM France has completed studies for resource estimation in respect of oil shale deposit in an area of 254 sq.km. of Assam & Arunachal Pradesh.



Meeting of Hindi Salahakar Samiti 15th November, 2017

12

Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities



Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities

- Ministry of Mines Page - 139
- GSI Page - 139
- IBM Page - 140
- NALCO Page - 140
- HCL Page - 142
- MECL Page - 143
- JNARDDC Page - 143
- NIMH Page - 143
- NIRM Page - 143

Welfare of Scheduled Castes (SCs), Scheduled Tribes (STs), Women and other Weaker Sections

Ministry of Mines

12.1 The Ministry of Mines, with its attached office, subordinate office and the Public Sector Undertakings under its administrative control follow the Government guidelines with regard to welfare of weaker sections of the society, in letter and spirit. For upliftment of weaker sections of society, PSUs identify and implement a number of programmes in the peripheral area of their units/locations.

12.2 A number of activities like community education programmes, facilitating availability of drinking water, development/repair of approach roads of surrounding areas, arranging health awareness programmes and medical camps in rural areas were undertaken by the PSUs for upliftment of the community in and around their townships as part of their social responsibility.

12.3 For the welfare of SC/STs, OBCs and PWDs, Liaison Officers have been appointed.



SHe-Box Online complaint management system

Women's Welfare

12.4 A complaint committee under chairpersonship of Smt. Reena Sinha Puri, JS&FA has been constituted to look into cases of sexual harassment of women at work place.

12.5 Ministry of Women & Child Development has developed an online complaint Management System titled Sexual Harassment electronic –Box (SHe-Box) (www.shebox.nic.in) to receive complaints related to Sexual Harassment at workplace. Once a complaint is submitted to the She-Box, it will directly go to the ICC of the concerned Ministry which has the jurisdiction to inquire into the complaint. The Chairperson of Internal Complaints Committee of this Ministry monitors the progress of inquiry conducted by ICC on the Sexual Harassment complaints received from women employees of this Ministry.

Geological Survey of India (GSI)

12.6 The Geological Survey of India GSI), an attached office of Ministry of Mines, has undertaken a number of activities for the welfare of Scheduled Caste (SC)/Scheduled Tribe (ST), Other Backward Class (OBC), personnel with disabilities (PWD) and other weaker sections of the society.

- Measures were undertaken for reservations for officials belonging to SC, ST, OBC and PWD community @ 15%, 7.5%, 27% and 3% respectively against vacancies reserved for them as per order issued by the Government of India/DoPT from time to time.In GSI, reservation of SC/ST/OBC/PWD persons has been followed strictly in case of their employment/promotion wherever applicable.
- SC/ST cell has been established in Central Headquarters as well as in all the Regional offices of GSI under supervision of Liaison Officer belong to SC/ST category to address difficulties faced by these communities and also to take appropriate measures for resolving the issues.
- The Liaison Officers (SC/ST) meeting is being held regularly once in a year for discussing SC/ST grievances and to take appropriate actions accordingly.

- Quarterly meetings between the authority and the office bearers of Äll India GSI SC/ST Employees Welfare Association are conducted periodically to redress the grievances of GSI SC/ST employees. The last quarterly meeting was held at GSI, CHQ, Kolkata on 30.08.2017 under the chairmanship of the DG, GSI



Reverse Circulation Drill in operation

Indian Bureau of Mines (IBM)

Reservation of Vacancies for persons with Disabilities

12.7 IBM is strictly following the various instructions of the Government issued from time to time regarding reservation of vacancies for PWDs in respect of Group 'A' and 'B' Gazetted posts. As on 1st September 2017, 11 physically handicapped persons were under employment in IBM of which 04 are visually handicapped, 01 is hearing handicapped and 06 are orthopedically handicapped.

Welfare activities for SC/ST, women, Minorities and PWDs:

12.8 A committee under sexual harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 has been constituted in IBM to redress the complaints made by the victim of sexual harassment at work place in a time bound manner.

National Aluminium Company Limited (NALCO)

12.9 Welfare of activities for SCs/STs, Women, Minorities and Persons with Disabilities.

- The Presidential Directives issued from time to time on reservation of SC/ST persons in employment has been scrupulously followed by the Company. There are exclusive Cells constituted for the welfare of the SC/ST employees which meet and discuss their view points at regular intervals both at Complex level as well as Corporate level.
- All Statutory concession/relaxations are given to SC/ST candidates in the matter of direct recruitment.
- Relaxation/concession in Promotions- Relaxation of 10% of marks both in written test and interview is given to SC/ST employees in promotion up to lowest rank of Group-A.
- 10% reservation in A & B type quarters & 5% in C, D & E type quarters is given to SC/ST employees in allotment of residential quarters.
- Liaison Officers have been appointed for each of the units for implementing the Presidential Directives as well as to look after the welfare of SC/ST employees. SC/ST Cell have also been constituted under the control of the respective Liaison Officers to ensure prompt disposal of Grievances and representations of SC/ST employees.



- The in-house programme on Govt. Directives on reservation of posts for SC/ ST & OBC is being organised with the help of the faculty assistance of Dept. of Public Enterprises, Govt. of India at regular intervals in our Training Centre.
- 20% of the scholarships are reserved for the children of SC/ST employees under Nehru Memorial Scholarship awarded to the children of Nalco employees along with relaxation of 10% in marks.
- Invariably in all the Selection Committees/ Boards for recruitment and the Departmental Promotion Committees for promotion, an officer from SC/ ST category of appropriate status is included as one of the members in order to take care of the interest of the SC/ST candidates.

12.10 Minority Welfare: -

- A member of the minority community is associated in the Selection Committees for Recruitment in order to give a fair deal to the minority community. Advertisement to fill up the vacancy position is notified in regional languages in order to encourage the minority candidates about recruitment especially in Group- 'C' & 'D' posts.

12.11 The Persons with Disability:

- The Company has been making efforts to achieve representation in all posts in Group: A, B, C & D as per section 33 of the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 till 18 April 2017 and as per Section -34 of the Rights of Persons with Disabilities Act, 2016 from 19th April 2017 onwards. Now, 4% of vacancies are being reserved for persons with disabilities as provided in the Act. As on 30.09.2017, there are 88 persons with Disability in employment of the Company in various identified posts.

12.12 Perspective Plan for Women Welfare

- The Company has adopted the principle of equal opportunity to the women employees in the matter of employment and the Company has 370 nos. of women employees at different levels and categories.
- Need based developmental and functional training programs are provided to the women employees. Institutional mechanism through conduct rules has also been put in place to avoid sexual harassment of women. The internal committees to deal with sexual harassment cases are in place in M&R Complex, S&P Complex and Corporate Office. As a mark of development in their individual leadership, women executives of the company have got a place as Coordinator/member of National Organizations like Women in Public Sector (WIPS) and they play active roles in policy making of WIPS.
- Regular Training are conducted for women empowerment and awareness of sexual harassment in work place.
- The ladies clubs in all units have extended necessary assistance for carrying out their various activities which in turn enhances their leadership and organizing capabilities in addition to welfare of the society.

12.13 Employment in the Company of SC/ST/Ex-SM/PWD/LDP/Minorities as on 30.09.2017

Group	Total No of Employees	SC	ST	EX-SM	PWD	LDP	Minority
Executives	1,780	246	141	01	16	22	71
Non- executives	4,934	845	1,109	14	70	1,769	181
Trainees	178	30	21	01	02	66	10
Total	**6892**	**1121**	**1271**	**16**	**88**	**1857**	**262**
		2392					

It may be seen from above that every third employee of the organization belongs to SC or ST Community.

Hindustan Copper Limited (HCL)

Welfare Activities

Employees Participation in Management

12.14 Employees Participation in Management over the years has been the backbone of harmonious Industrial Relations in the Company. The successful operation of various Bipartite forums at all three levels, namely, at the Apex level, Unit level and Shop floor level has immensely contributed in the smooth performance of the Company.

Perspective Plan for Women Welfare

12.15 In pursuance to the judgment of the Supreme Court, HCL has set up committees in all the units/offices of the company for the prevention of sexual harassment of women in work place. A provision in this regard has also been incorporated in the Conduct, Discipline and Appeal Rules of HCL. During the year under report, no incidence of discrimination amongst employees on the basis of gender has come to light.

Representation of SC/ST and OBC

12.16 The representation of SC, ST and OBC employees out of the total manpower of 2593 as on 01.10.2017 is 16.74%, 13.73% and 12.23% respectively.

Industrial Relations

12.17 Industrial Relations situation in all the Units of the Company continued to be harmonious and peaceful during the year 2017-18.

The status of implementation of the Persons With Disability Act, 1995.

12.18 The number of physically challenged persons employed in the Company as on 01.10.2017 is as under:-

Group	Number of Persons with Disabilities (PWDs)
A	6
B	0
C	7
D	4
Total	**17**



100 Feet Flag post was erected on the occassion of Republic Day, 2017 - MECL

Mineral Exploration Corporation Limited (MECL)

12.19 Welfare of SC/ST: MECL gives due importance to meet socio-economic needs of the SC and ST communities.

12.20 Women and weaker sections: Being a CPSE, MECL is committed for raising and improving the socio-economic status of women and weaker sections of the society. For this purpose, under the CSR activities during 2017-18, the company will distribute cycles, sewing machine and study material for women and weaker sections.

12.21 In order to avoid sexual harassment of women at work places a Grievance Committee on 'Sexual Harassment' on women at work place has already been constituted and is functioning in the company.

Jawaharlal Nehru Aluminium Research Development and Design Center (JNARDDC)

12.22 The Centre is following the various government guidelines w.r.t PWD, SC& ST reservation.

National Institute of Miners' Health (NIMH)

12.23 The Institute is following all the standard guidelines & policies issued by Govt. / Ministry towards the woman employees/SC/ ST, PWDs Nodal Officers have been appointed for the welfare of women SC/ST/OBC and PWDs.



Conducting chest X-rays under S&T Multicentric Project at Narnaul (Haryana)

National Institute of Rock Mechanics (NIRM)

Welfare Measures

12.24 NIRM has taken measures to ensure strict compliance of all the provisions pertaining to:

- Welfare of scheduled castes, scheduled tribes, minorities, and other weaker sections;
- Implementation of the National Policy for Persons with Disabilities.
- Steps were taken to fill all the vacancies in respect of SC / ST / OBC / Persons with Disabilities.

12.25 NIRM has set up a Committee to check any form of harassment to women employees at the work place. NIRM gives equal status to its women employees and the Service Rules etc are uniformly made applicable. The women employees in the Institute are provided maternity benefits as per rules.



Pottangi Bauxite Deposit- NALCO

13

Budget and Audit Paras



Budget and Audit Paras

- Budget Allocation for the year 2017-18 and 2018-19 Page - 147
- GSI Annual Plan 2017-18 Page - 148
- GSI Annual Plan 2018-19 Page - 149
- Audit paras Page - 152



Budget Allocation For the year 2017-18 and 2018-19

Ministry of Mines

13.1 During the Financial Year (FY) 2017-18, Geological Survey of India (GSI) has been allocated a BE grant of ₹ 1027.87 crore. The request of GSI for grant of additional funds was taken up by the Ministry of Mines with the Ministry of Finance. Even though, no additional funds have been allocated due to non-availability of adequate fiscal resources, no reduction has been effected at RE stage by the Ministry of Finance. Further, additional funds amounting to ₹ 30 crore are proposed to be granted to the GSI for the BE 2018-19.

13.2 During the current year 2017-18, the total outlay sanctioned to IBM for BE 2017-18 was ₹ 111.08 crore. The request of IBM for grant of additional funds was taken up by the Ministry of Mines with the Ministry of Finance. Additional funds amounting to ₹ 4.01 crore only have been allocated to the IBM at RE stage due to non-availability of fiscal resources, additional funds amounting to ₹18 crore are proposed to be granted to IBM for the BE 2018-19. Thus the total allocation would be ₹129.08 crore.



Second National Conclave on Mines & Minerals 15th February, 2017, New Delhi

13.3 The Budget Estimates (BE), Revised Estimates (RE) 2017-18 and Budget Estimates (BE) 2018-19 in respect of Demand No. 65-Ministry of Mines including the Organisation wise breakup of the allocation is given at **Table 13.1**.

Table 13.1
The Organisation wise breakup of the allocation

(₹ in crore)

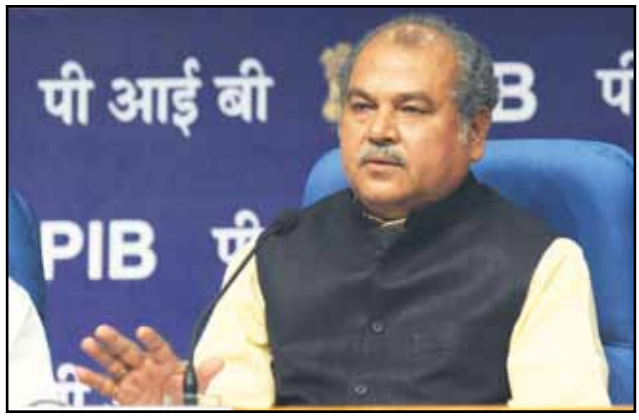
S. No.	Organisation	2017-18		2018-19
		BE	RE	BE
1.	Sectt. (Proper) (Including PAO)	36.55	35.63	43.58
2.	GSI	1,027.87	1,027.87	1,057.87
3.	IBM	111.08	115.09	129.08
4.	MECL	6.00	6.00	6.00
5.	BGML	3.50	3.50	4.50
6.	NMA	0.65	0.65	0.65
7.	INT Cooperation	0.35	0.35	0.35
8.	NIRM	7.99	6.36	7.99
9.	NIMH	1.96	1.50	1.96
10.	JNARDDC	9.29	9.29	9.29
11.	Other Research Programmes	8.25	7.25	8.25
	Total	**1,213.49**	**1,213.49**	**1,269.52**

Geological Survey of India (GSI)

Annual Plan 2017-18

13.4 During F.Y. 2017-18 against total allocation of ₹ 429.00 crore, the Central Sector Scheme Fund Expenditure of GSI is ₹ 227.20 crore (upto Sept'17) which amounts to 52.96% of the allocation.

13.5 GSI has been granted a provision of ₹ 598.87 crore under Establishment Expenditure and ₹ 429.00 crore under Central Sector Schemes in the budget grant of FY 2017-18. A major portion of the grant of ₹ 429.00 crore under Central Sector Schemes for F.Y. 2017-18 has been kept under Machinery & Equipment, Survey & Mapping 'OC', Mineral Exploration 'OC' and information technology (IT) heads. This includes ₹ 75.30 crore under Survey & Mapping 'OC' head for maintenance of the three marine vessels of GSI besides maintenance of the TOASS Aircraft & Heliborne Survey System (HGSS), ₹ 38.50 crore under Mineral Exploration 'OC' head mostly for drilling related expenditures and ₹ 36.02 crore under IT for information technology related expenditures including payments pertaining to OCBIS. An amount of ₹ 143.80 crore has been kept under M & E head for procurement of essential laboratory and drilling equipment including a provision of ₹ 108.00 crore for instalment payments for procurement of the Geotechnical vessel. Besides these, provision of ₹ 2.65 crore under R&D-Supply & Material head and ₹ 3.50 crore under R&D-OC head has been made for procurement of laboratory spares & consumables and AMC of sophisticated instruments etc. Similarly, under Special Investigation head allocation of ₹ 1.85 crore has been made for carrying out investigations pertaining to environment, polar study, geotechnical and seismic studies. Under the training head provision of ₹ 4.20 crore has been made for capacity building. GSI has also kept provision of ₹ 11.00 crore under TSP head during the FY 2017-18 for expenditure in the Tribal dominated areas.



Hon'ble Minister of Mines, Shri Narendra Singh Tomar during a press conference

13.6 Initially allocation of ₹ 147.80 crore and ₹ 6.50 crore were made under Motor Vehicle and Machinery & Equipment heads. In the month of September 2017, however, re-appropriation of funds amounting ₹ 4.00 crore was done from Machinery & Equipment head to Motor Vehicle head, making the allocation under Machinery & Equipment head ₹ 143.80 crore and that under Motor Vehicle head ₹ 10.50 crore. As mentioned earlier, out of the 143.80 crore allocation under Machinery & Equipment head, ₹ 108.00 crore was earmarked for instalment payments for the procurement of Geotechnical vessel. However, due to the change in payment schedule of the instalments, GSI is expected to make payment of only ₹ 48.00 crore in two instalments of ₹ 24.00 crore each during FY 2017-18. The proposed GBS and allocation of GSI is given in the **Table 13.2**.

Table – 13.2
Annual Plan 2017-18 GBS and Allocation

(₹ in crore)

Sl. No.	Organization	Proposed	Allocated
1.	Geological Survey of India	1369.95	1027.87 (including establishment expenditure of ₹ 598.87 crore)

Annual Plan 2018-19

13.7 GSI has proposed a provision of ₹ 1,205.56 crore in the Budget Estimate for FY 2017-18. This includes ₹ 664.25 crore under Establishment Expenditure and ₹ 541.31 crore under Central Sector Schemes. The Annual Budget includes ₹ 108.20 crore under Survey & Mapping for maintenance of the three marine vessels of GSI besides maintenance of the TOASS Aircraft & Heliborne Survey System (HGSS) and for other field items related to Mission-I.

13.8 Under Mineral Exploration scheme, provision has been made for ₹ 61.25 crore to accommodate for the exploration programmes of GSI and also for the outsourced drilling related to G2 and G3 stage exploration items. Every year GSI is taking up a large number of programmes under this head with a view to identify and deliver auctionable blocks to augment the mineral resources of the country.

13.9 ₹ 50 crore has been kept under the Information Technology (IT) head in the Information & Dissemination Scheme for payments related to OCBIS and for procurement of IT hardware & software. The OCBIS has become operational from April 2017.



5 MRAI International Indian Metals Recycling Conference

13.10 Under R&D ₹ 12.45 crore has been provisioned for procurement of gadgets, chemicals, gases etc. required for smooth running of the laboratories of GSI. Similarly, ₹ 2.40 crore has been kept under the Special Investigation & Antarctica heads for field items related to geotechnical investigations, landslide, seismic/earthquake studies, environmental geology, glaciology and polar study, etc.

13.11 Under the HRD head ₹ 3.50 crore has been provisioned for the expenditures related to the training courses to be conducted by the GSI. For the expenditures related to the IGC 2020 a separate new Grant-in-aid head has been proposed with a provision of ₹ 6.11 crore.

13.12 Under Modernization & Replacement scheme an amount of ₹ 180.00 crore has been proposed under Machinery & Equipment (M&E) head and ₹ 5.00 crore under Motor Vehicle head. A major portion of the funds amounting ₹ 125.00 crore under M&E has been provisioned for instalment payment for procurement of the Geotechnical vessel. The rest ₹ 55.00 crore of M&E has been kept for procurement of essential laboratory, field and drilling equipment. Under Minor Works of this scheme an amount of ₹ 32.00 crore has been proposed for maintenance and upkeep of the GSI buildings.

13.13 The Tribal Sub Plan budget has been kept at ₹ 11.00 crore for expenditure on GSI operations in Tribal areas.

13.14 A total consolidated budget of ₹ 1205.56 has been proposed as shown in the **Table 13.3**.

Table – 13.3
Annual Plan 2018-19 (Proposed)
GBS and Allocation

(₹ in crore)

Sl. No.	Organization	Proposed	Allocated
1.	Geological Survey of India	1,205.56 (including establishment expenditure of ₹ 664.25 crore)	1,057.87



13.15 The distribution of Outlay for Annual Plan 2017-18 and 2018-19 including proposed allocation for North Eastern Region (NER) and Tribal Sub Plan (TSP) is given in the **Table 13.4**.

Table – 13.4
Annual Plan 2017-18 & 2018-19

(₹ in crore)

Sl. No.	Schemes / Programmes	ANNUAL PLAN 2017-18 BUDGET ESTIMATE						ANNUAL PLAN 2018-19 BUDGET ESTIMATE BE 2018-19					
		Plan Outlay				Outlay earmarked		Plan Outlay				Outlay earmarked	
		Outlay	IR	EBR	GBS	North East	TSP	Outlay	IR	EBR	GBS	North East	TSP
1.	Geological Survey of India	1027.87 (excluding establish-ment expendi-ture of ₹ 598.87 crore)	0.00	0.00	1027.87	25.58	11.00	1057.87 (including establish-ment ex-penditure of ₹ 648.75 crore)	0.00	0.00	1057.87	57.00	8.00
2.	Construction												
	Geological Survey of India	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		-	-

Indian Bureau of Mines (IBM)

Annual Plan 2017-18

13.16 IBM had proposed Plan outlay of ₹ 134.74 crore for 2017-2018. The IBM's proposed outlay was mainly for five ongoing schemes and establishments. Proposed GBS and Allocation for annual plan 2017-18 is given in **Table 13.5**.

Table 13.5
Annual Plan 2017-2018
(proposed GBS and Allocation)

(₹ in crore)

Organization	Proposed Outlay	Allocated
IBM	134.74	111.08
IBM – Construction	18.31	0.00

13.17 Ministry has allocated outlay of ₹ 49.15 crore for 2017-2018 for five ongoing schemes and outlay allocated under establishment is ₹ 61.93 crore. Proposed GBS and Allocation for annual plan 2018-19 is given in **Table No. 13.6**.

Table 13.6
Annual Plan 2018-2019
(proposed GBS and Allocation)

(₹ in crore)

Organization		Proposed Outlay	Allocated
IBM	Establishment	79.3750	88.27
	IBM Activites	74.9690	40.81
	Total	**154.344**	**129.08**
IBM – Construc-tion		31.17	–

13.18 The outlay for Annual Plan 2017-18 and proposed outlay for 2018-19 showing Internal Resources (IR), Extra Budgetary Resources (EBR), Gross Budget Support (GBS), Net Budget Support (NBS), North Eastern Region (NER), and Tribal Sub Plan (TSP) is given at the **Table 13.7**.

Table 13.7

Annual Plan 2017-18 and 2018-19

(₹ in crore)

S. No.	Schemes / Programmes	Annual Plan 2017-18							Annual Plan 2018-19 (proposed)						
		Plan Outlay				Outlay earmarked			Plan Outlay				Outlay earmarked		
		Outlay	IR	EBR	GBS	NBS	North East	TSP	Outlay	IR	EBR	GBS	NBS	North East	TSP
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	IBM (Central Sector Schemes)	49.1500	0.00	0.00	49.1500	*49.1500	4.7300	1.7300	74.9690	0.00	0.00	74.9690	**74.9690	7.4900	3.0000
2.	Establishment	61.9300	0.00	0.00	61.9300	61.9300	0.00	0.00	79.3750	0.00	0.00	79.3750	79.3750	0.00	0.00
Total:		**111.0800**	**0.00**	**0.00**	**111.0800**	**111.0800**	**4.7300**	**1.7000**	**154.3440**	**0.00**	**0.00**	**154.3440**	**154.3440**	**7.4900**	**3.0000**

** The net budgetary support includes the outlay earmarked towards NER (₹ 4.73 Cr.)and TSP (₹ 1.70 crore.).*

*** The net budgetary support includes the outlay earmarked towards NER (₹ 7.49 Cr.)and TSP (₹ 3.00 Cr.).*

IR – Internal Resources

EBR – Extra Budgetary Resources

GBS – Gross Budgetary Support

NBS – Net Budgetary Support



13.19 Vision and strategy beyond 12th five year plan (2017-20) is at **Table 13.8**.

Table 13.8
Vision and strategy beyond 12th five year plan (2017-20)

(Value in ₹ Crore)

Sl. No.	Name of the Scheme	GBS Allocation - 2017-18 to 2019-20 (projected)	
		5%	10%
1	Inspection of Mines for Scientific and systematic mining, mineral conservation and mines environment.	73.2979	78.9248
2	Mineral beneficiation studies- utilization of low grade and sub grade ores and analysis of environmental samples.	31.8518	34.2970
3	Technological upgradation & Modernization.	23.8436	25.6741
4	Collection, processing dissemination of data on mines and minerals through various publications	12.3787	13.3290
5	Computerised online register of Mining tenement system*	96.4100	96.4100
6	Tribal Area Sub-Plan	7.3272	7.8897
7	NER (Capital+Revenue)	20.3869	21.9519
	Total (Sl. No.1 to 7)	**265.4961**	**278.4765**

**Project under implementation*

a) Total Project Value ₹ 96.41 crore (including cost of contingency).

i) ₹ 35.12 crore will be spent within 18 months, after selection of service provider towards development phase.

ii) After the above 18 months during 1st, 2nd 3rd, 4th & 5th year the expenditure towards operation and maintenance expenditure shall be ₹ 9.78 crore, ₹ 9.76 crore, ₹ 10.27 crore, ₹ 10.94 crore and ₹ 11.56 crore respectively.

Audit Paras

13.20 The Audit Paras are being reviewed quarterly in the Standing Audit Committee (SAC) meeting under the Chairmanship of the Secretary (Mines). There were 2 Audit Paras pending in the Ministry as on 31.3.2017. Due to the Quarterly Review by the SAC and the concerted efforts, 1 Para has been settled during the year and one is pending. There have been 12 meetings in



series, since the inception of the Committee, which was set up on 11th August, 2010. The latest status of these Audit Paras is given at **Table 13.9**.

Table 13.9
The latest status of Audit Paras

Sl. No.	Report, Para No. & concerned Sections	Subject	Current status as reported by the Administrative Division
1.	Report No. 21 of 2015 (Para No. 2.2) Compliance Audit Observations (Volume-II). (Commercial) Hindustan Copper Limited	Fraudulent accounting activities. As per the procedure followed by Hindustan Copper Limited (the Company), the customer has to deposit money in advance in form of RTGS, pay order, cheque of demand draft (DD) for purchase of copper product. Thus, before issuing delivery order, receipt of payment/ availability of sufficient credit balance in the customers' account was to be ensured. It was, however, observed in Audit that benefits were extended to customers by forging, manipulating the documents as well as by passing fictitious entries in the system to camouflage the accounts of the Company.	The Draft Action Taken Note (ATN) has been submitted by the Admn. Division dealing with Hindustan Copper Ltd. (HCL) to the Office of C&AG for vetting vide letter dated 29th December, 2016.



Loaded Dumper at Kolihan Copper Mine (KCM), HCL





Ore Loading for Transportation from KCM Stockpile (HCL)

14

Miscellaneous



Miscellaneous

- National Informatics Centre (NIC) Page - 157
- E-Office Page - 157
- Website of the Ministry Page - 158
- Skill Development Page - 158
- Redressal of public grievances Page - 160
- Swachh Bharat Abhiyan Page - 161
- RTI Page - 163
- Solar Power Page - 166



National Informatics Centre (NIC)

IT Support by NIC at Ministry of Mines

14.1 National Informatics Centre (NIC) of the Ministry of Electronics and Information Technology is providing network backbone and e-Governance support to the Ministry of Mines. The following are the IT Services that NIC is providing to Ministry of Mines.

Management Information Systems for the Ministry

14.2 Ministry of Mines with the help of National Informatics Centre (NIC) is implementing various decision support systems required for better planning, monitoring and decision making. Computerization has been done in the area of prior approval for Mineral Concession Applications, Registration under Rule 45, Revision Applications, Mining blocks and clearances associated with them and National Mineral Exploration Trust.

a) Mineral Concession Approval System (MCAS)

b) Revision Application System (RAS)

c) Registration under Rule 45 of MCDR Act 1988

d) Post approval activities of Mineral Concessions at Indian Bureau of Mines

e) Website of the Ministry

f) TAMRA Portal

g) NMET Website

Support for e-Governance Applications

14.3 The following e-Governance applications have been implemented and supported by NIC in the Ministry:

- Comprehensive DDO package for pay related data processing
- E-Office
- E-Visitor System
- Biometric Attendance System
- ACC Vacancy Monitoring

Local Area Network (LAN)

14.4 LAN has been established in the Ministry, which interconnects various officers/ staff in the Ministry. There are approximately two hundred users connected to the LAN. All kinds of trouble shooting is done by NIC to facilitate the smooth functioning of internet on user machines with the help of Facility Management services (FMS) team of the Shastri Bhawan Network Centre. Ministry of Mines has been made wifi enabled by NIC-Mines team.

Video Conferencing Support

14.5 Video conferencing of the Ministry officials with the State Governments, Subordinate offices, PSUs and PRAGATI VC being facilitated by the NIC-Mines team.

Email/VPN support

14.6 Email ID requests of the Ministry Officials are processed by NIC Mines team as and when required.

E-Office

14.7 The e-office is being implemented in the Ministry of Mines from May, 2013. The following modules have been successfully adopted.

- **E File –** (File Management System) – eFile system has been started with migrated data of File Tracking System (FTS). All new files are opened as e-files. All legacies files are being digitized for bringing them into e-file system. eSign option has also been introduced in eFile system (i.e. Aadhaar Based authentication) for easy and smooth functioning.
- **LMS-** (Leave Management System) – LMS has been started in August, 2012



and no physical leave applications are accepted for any Employee.

- **KMS-** (Knowledge Management System)- KMS is a central repository for all employees to share all the documents/ O.M./ Office Order which they want to share with all as well as for personal use if they want to restrict.
- **eTour-** (Tour Management System)- eTour has started in September, 2013 and all officer(s) apply for tour and obtain approvals in this module.
- E-Office adoption for all employees to monitor the pendency of VIP/ PMO/ CabSec/ CAG & Audit Paras/DCN/Court Cases/DO Letters from Secretaries/ Joint Secretaries(Central)/ DO Letters from Chief Secretaries(States)/ Lok Sabha references and other categories of receipts and take necessary action accordingly.

Website of the Ministry

14.8 Website of the Ministry of Mines is developed and maintained by NIC. It provides comprehensive information on various subjects like Acts & Rules and working of the Ministry, Right to Information Act, National Mineral Policy, information about the Indian Mineral Sectors, current status of the Revision Applications and Mineral Concession Cases, Annual Report of the Ministry and provides links to its PSUs and offices. The website is bilingual.

The website of the Ministry is Guidelines for Indian Government Websites (GIGW) compliant and is Standardisation Testing and Quality Certification (STQC) certified.

E- Samiksha

14.9 e-Samiksha is a real time, on-line system for monitoring of follow-up action on the decisions taken during the presentations made by different Ministries/Departments to the Prime Minister, Centre State Coordination, Committee of Secretaries etc. The follow-up action in respect of all issues concerning other Ministries/Departments and State Governments is to be updated by the concerned Ministry/Department/Agency on the e-samiksha portal and replies to issues raised by the Ministries /Departments and State Governments are taken up on priority and reply/status uploaded on e-samiksha every month.

Skill Development

14.10 The Ministry of Mines has joined hands with Ministry of Skill Development & Entrepreneurship (MSDE) to achieve faster, sustainable and inclusive growth through Skill Development in the Mining Sector. MoM along with its PSUs (NALCO, HCL and MECL) have signed Memorandum of Understanding (MoU) with National Skill Development Corporation (NSDC).

14.11 Federation of Indian Mineral Industries (FIMI) with the approval of NSDC has set up Skill Council for Mining Sector (SCMS) in 2013. The SCMS is apex body for skill development in the mining sector. SCMS is a company registered under Section 25 of the Companies Act. SCMS had entrusted Deloitte Touche Tohmatsu India pvt. Ltd for conducting "Human Resource and Skill Requirement study for the period 2014-17 and 2017-22 for Indian Mining Sector". Based on the Study Report, a Skill plan for the Mining Sector (2016-2022) has been prepared with the help of SCMS which was unveiled at National Conclave on Mines & Minerals at Chhattisgarh in July, 2016. It aims to develop, design and disseminate training modules required for scientific, sustainable and safe mining practices within the framework of National policy of Skill Development and Entrepreneurship 2015. The main objective is to focus on outcome-based approach towards quality vocational training skills for both youth



and employers to increase employability and better livelihood for individuals.

14.12 The activities to be undertaken under the skill plan are enumerated below:

i) Enhancing the existing training facilities of PSUs, attached and subordinate offices of Ministry of Mines

ii) Setting up of 2 Centre of Excellence: one each by NALCO and HCL.

iii) Skill development to get priority in fund allocation under CSR.

iv) Promoting Apprenticeship: 10% of the workforce shall be through apprenticeship programmes.

v) Recognition to Prior Learning (RPL).

vi) Coordination of skilling efforts: engaging with States for skill development initiatives.

vii) Coordination of skilling efforts: engaging with private sector for skill development initiatives

14.13 National Aluminum Company Limited (NALCO)

- In line with Skill India campaign of Govt. of India, MOU has been signed with National Skill Development Council (NSDC)/National Skill Development Fund (NSDF) to provide Skill Development Trainings to 1620 candidates including 420 candidates under recognition of prior learning (RPL) in next 02 years period as per the relevant Qualification Packs (QP) framed by NSDC.
- The skill development training classes for enhancement of employability and income generation in various skills like retail, health care, beauty & wellness, and hospitality has started in the three districts i.e. Koraput, Angul & Khurda through the training partners as identified by NSDC from December, 2016. As on end of Sep'17, 330 candidates have already been trained out of which 134 candidates are placed.
- NALCO has planned to train another 2000 persons which would include 700 women and 150 differently abled persons in fresh skilling at Angul, Damanjodi, Bhubaneswar and Vishakhapatnum in next two years i.e. FY-2017-18 & 2018-19.
- To spread the initiative to educational hubs, an MoU was signed between NALCO and Utkal University in Jan'17 to take up collaborative projects under the Industry Institution Interaction programme.
- CMD, NALCO recently laid the foundation stone of Utkal University-NALCO Skill Development & Incubation Centre in the University premises on 26.07.2017.

14.14 Status of Centre of Excellence

National Aluminium Company Limited (NALCO)

- **NALCO:** is establishing the centre of excellence at NALCO Research and Technical Centre (NRTC) building of NALCO at Gothapathana, Bhubaneshwar for simulator based training and on the job training would be provided in the company's open cast mines at Damanjodi. The centre with simulator facility will be established at an estimated cost of ₹ 20 crore.

Hindustan Copper Limited (HCL)

- **HCL:** A Skill Development institute has been set up at Khetri Copper Complex, Jhunjhunu (Rajasthan) on 24.03.2017 by upgrading the existing training centre. It has become functional on 12.04.2017 with commencement of 2 year Skill Development training for "Assistant



Surveyor". The training programme is being conducted in collaboration with SCMS.

Redressal of Public Grievances

Ministry of Mines

14.15 Department of Administrative Reforms & Public Grievances (DAR&PG) is implementing a web-based Centralized Public Grievance Redressal and Monitoring System (CPGRAMS) vide which grievances of Ministries/ Departments are forwarded for redressal. A Joint Secretary has been designated as the Nodal Officer of Public Grievances. During the year 2017-2018 (1st January, 2017 upto 31st December, 2017) 1165 cases were received. 242 cases were brought forward. Total 1185 cases have been disposed during the period and rest cases have been referred to concerned Organization/Authority for taking further necessary action in the matter.

Geological Survey of India (GSI)

14.16 Geological Survey of India has separate Unit/Cell in administrative machinery of each of its Regional offices and Central Headquarters headed by Nodal Officer (Public Grievance) under the supervision of Dy. Director General (P&A), to deal with the public grievances related to its organization. The grievances are mostly related to service matters of its serving as well as retired employees. The Grievances received through CPGRAMS, Department of Administrative Reforms and Public Grievances (DARPG), Ministry of Mines, PMO, Department of Pension & Pensioners Welfare (DOPPW) & Presidents Secretariat website (Portal Cases) as well as by post from MoM's, GSI Employees and retired-Employees (Non-portal Cases) are sorted, processed and sent to concerned Regions/Divisions/Sections for appropriate action/ decision / reply.

14.17 During the year 2017-18 (upto 30.09.2017), 453 cases of both Portal and Non-Portal were received. A total 392 cases have been disposed during the period and rest cases have been referred to concerned Regions/Authority for taking further necessary action in the matter.

Indian Bureau of Mines (IBM)

14.18 At the beginning of the year, 12 grievance cases were pending at various stages. During the year 2017-18 (up to September, 2017), 44 grievance petitions were received. So far 53 cases have been disposed of including 12 grievance cases pending at the beginning of the year. Remaining 03 cases are under processing at various stages.

Hindustan Copper Limited (HCL)

14.19 All complaints so received are registered in the Govt. web-site and accordingly disposed of. These are being regularly monitored. 91 public grievances were received during the period April to September, 2017 of which 60 were disposed off as on 30th September 2017.

Mineral Exploration Corporation Limited (MECL)

14.20 During the period under review, the number of cases reported were 15 out of which 12 were disposed of under Public Grievances. The monthly/ quarterly reports on Public Grievances are being regularly sent to the Ministry.

Vigilance cases

Ministry of Mines

14.21 During the year 2017-18 (upto 31st December, 2017), 48 complaints were received. Out of these 48 complaints 42 were brought to their logical conclusion and 6 complaints are under pending. Vigilance Awareness Week was observed from

30.10.2017 to 04.11.2017. During the week, Essay competition and debate competition related to vigilance activities was organized.

Indian Bureau of Mines (IBM)

14.22 During the year 2017-18 (up to September 2017), 10 complaints were received of which 10 were brought to their logical conclusion after investigation. During the period 01 case was decided by ministry and major penalty was imposed against the Officer.



Swachh Iconic Place- NALCO

14.23 Vigilance Awareness Week was observed in the IBM HQs at Nagpur and in all Zonal/ Regional Offices during 31.10.2017 to 04.11.2017 as per directive of CVC. During the Week, several competitions like essay writing, quiz, debate and special program on vigilance awareness have been planned to observe the week ahead.

14.24 Further a Vigilance Bulletin has also been released during the observance Vigilance Awareness Week 2017 in IBM. The concluding day was organized jointly with MECL on 03.11.2017 at IBM headquarters.

Swachh Bharat Abhiyan

Ministry of Mines

14.25 Ministry of Mines and organizations under the Ministry organized the following 5 fortnights under the Swachh Bharat Abhiyan;

i) 15.09.2015 to 31.09.2015

ii) 12.12.2015 to 27.12.2015

iii) 01.03.2016 to 15.03.2016



Release of Swachhata Pakhwara Report of the Ministry of Mines during the Meeting of Mines Ministers at Goa on 19.1.2018

iv) 16.06.2016 to 31.06.2016

v) 16.12.2017 to 31.12.2017

14.26 Apart from these Swachhata Mah was observed during September, 2017.

14.27 Various events were held on each occasion and various drives/functions/seminars were organized on the occasion.

Revamped Swachh Bharat Pakhwada

14.28 The revamped Swachh Bharat Pakhwada was observed in the Ministry of Mines and field organizations from 16th December, 2017 to 31st December, 2017 :

- Swachhta Action Plan for Swachhta Pakhwara from 16.12.2017 to 31.12.2017 was approved and uploaded on the Swachhta Samiksha Portal
- Secretary (Mines) conducted video conferences with representatives of State Governments and head of all organizations under the Ministry of Mines on this occasion.
- On this occasion a message from Hon'ble Minister of Mines was circulated to all offices.
- An appeal was issued by Secretary (Mines) to all the Public and Private Sector mines for the effective implementation of the Swachh Bharat Pakhwada.



Swachhata Abhiyan at port facilities, Vishakhapatnam - NALCO



Adoption of ICONIC Heritage sites

14.29 NALCO has adopted Shri Jagannath Temple Puri and HZL has adopted Ajmer Sharif Dargah and have started preparation of Action Plan for comprehensive improvement ofthese two ICONIC Heritage places.

Activities under Swachh Bharat Mission

14.30 Ministry of Mines has ensured in its day to day activity that toilets, rooms and corridors are kept clean. Waste item bins have been strategically placed to ensure that things are not thrown around. It has also been ensured that people don't spit or smoke in the premises or use gutka and other chewable items. Posters have been placed at various places to bring home this message. Administration carries out inspections to ensure cleanliness.

Removal/Disposal of waste/ condemned items and vehicles

14.31 The Ministry has auctioned all those items which were old/ unserviceable through the tender process. The Ministry does not have any condemned vehicle in its premises.

Fire safety measures

14.32 Instructions have been issued for fire safety and instruction has been issued to ensure that all electrical points are switched off after closing of the office.

Right to Information Act, (RTI)

Ministry of Mines

14.33 The Ministry of Mines and its subordinate office, attached office, Autonomous Bodies and Public Sector Undertakings (PSUs) have appointed Central Public Information Officers and Appellate Authorities. The List of Nodal Officer, CPIOs and Appellate Authorities in Ministry of Mines is given at **Annexure 14.1**. **(Page No. 183)** The Ministry has also set up a 'Public Information Cell' for processing of the requests received from the public under the RTI Act, 2005 and for their monitoring. During the period 2017-18 (from 1.4.2017 to 31.12.2017), the Ministry received 332 applications under the RTI Act, which were timely responded. 31 Appeals received against the decisions of the CPIOs were disposed of by the concerned Appellate Authorities within the stipulated time frame. The status regarding receipt and disposal of RTI Applications/Appeals in Ministry and its office is given at **Table 14.1**, **Table 14.2** and **Table 14.3** respectively.



Electrical Shovel Loading the Dumper at MCP (HCL)



Table 14.1
RTI Application/Request Status (w.e.f. 1st April, 2017 to 31st December, 2017)

(Consolidated figures are given)

Organisation	No. of Cases					Pendency			
	Previous Pendency	No. of RTI Request/ Application received during the period	Disposal	Balance	Information denied under Section 8(1), 9, 11, 24 and others of RTI Act	0-3 months	4-6 months	7-9 months	10-12 months
Ministry of Mines (Sectt.)	36	332	311	56	1	10	6	4	36
NALCO	26	166	118	19*	55	18	1	Nil	Nil
GSI	39	461	399	82	19	48	Nil	33	1
HCL	17	254	254	17	18	17	0	0	0
MECL	06	62	58	10	10	01**+06=07	1**	2**	--
IBM	21	322	334	9	42	9	--	--	--
NIMH	Nil	13	13	Nil	Nil	Nil	Nil	Nil	Nil
NIRM	Nil	10	9	1	Nil	1	Nil	Nil	Nil
JNARDDC	0	6	6	0	0	0	0	0	0

**19 cases are pending due to non-receipt of required information from the concerned dept/deemed PIOs as on 28.12.2017*

***0-3 months 01+06=07 – out of the total 07 Applications – 01 RTI App is pending due to Non payment of Document charges by the Applicant, 02 RTI App. Received in the months of Oct. 2017 and Nov. 2017 resp. are pending, wherein time extension has been asked as requested by the record holder, being info. pertains to very old record & 04 RTI App received in the months of Dec 2017 are under process.*

4-6 months-01 App. & 7-9 months-02 App-are pending, due to Non payment of Document charges by the applicant



Table 14.2
RTI 1st Appeal Status (w.e.f. 1st April, 2017 to 31st December, 2017)

(Consolidated figures are given)

Organisation	No. of Cases					Pendency			
	Previous Pendency	No. of RTI 1st Appeal received during the period	Disposal	Balance	No. of Appeals rejected/information denied under Section.	0-3 months	4-6 months	7-9 months	10-12 months
Ministry of Mines (Sectt.)	10	31	25	16	0	2	4	0	10
NALCO	3	32	32	3*	Nil	3	Nil	Nil	Nil
GSI	8	55	59	2	2	2	--	--	--
HCL	Nil	21	17	4	Nil	04	Nil	Nil	Nil
MECL	1	05	06	Nil	06, 2(f)	--	--	--	--
IBM	--	30	28	2	--	2	--	--	--
NIMH	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
NIRM	Nil	3	1	2	Nil	1	1	Nil	Nil
JNARDDC	0	1	1	0	Nil	Nil	Nil	Nil	Nil

**The 3 pending Appeals were received during the last week of December, 2017*

Table 14.3
CIC 2nd Appeal Status (w.e.f. 1st April, 2017 to 31st December, 2017)

(Consolidated figures are given)

Organisation	No. of Cases				
	Previous Pendency	No. of 2nd Appeals filed in CIC	Decided		Balance
			In favour of Appeallant	In favour of Organisation	
Ministry of Mines (Sectt.)	0	4	3	1	0
NALCO	0	11	9	2	0
GSI	5	13	2	14	2
HCL	0	4	1	3	0
MECL	0	0	0	0	0
IBM	19	0	0	1	18*
NIMH	0	0	0	0	0
NIRM	0	0	0	0	0
JNARDDC	0	0	0	0	0

**8 cases pertaining to 2014-15, 9 cases pertaining to 2015-16 & 1 case pertaining to 2016-17.*



Roof top solar power project at MCP administrative building, MP

Solar Power

14.34 As per the directions of Ministry of New and Renewable Energy under its National Solar Mission, Ministry of Mines has directed all its field organizations to install Roof Top solar power systems as part of its efforts towards adopting renewable energy and energy savings.

Shri Subhash Chandra, Joint Secretary, Ministry of Mines has been nominated as Nodal Officer for RTS Power Project.

- Commitment Certificate for Solar Roof Top and Land Based Systems in respect of Ministry of Mines was signed and given to MNRE on 26.05.2016. Ministry of Mines has committed to install 34 MW capacity of Solar Power generation by 2022.
- M/s. Rajasthan Electronics & Instrumentation Limited (REIL) was nominated as the facilitator by the MNRE for implementing the roof top projects in the field offices of the Ministry of Mines.
- REIL has obtained sanction for implementation of 10.894MWp capacity grid connected roof top solar power plants from MNRE in the roof tops of the buildings of the field organizations of Ministry of Mines.



"Kaushal Vikas Yojna" at Khetri Copper Complex (KCC), Khetrinagar, Rajasthan

LED Lighting

Ministry of Mines

14.35 Hon'ble Prime Minister of India, launched the National LED Programme on 5th January, 2015 to facilitate rapid adoption of LED-based home lighting and street lighting across the country.

14.36 The work of installation of LED based lightings in all rooms of Ministry of Mines in Shastri Bhawan has been completed.

- NALCO has also completed the work of fitting of LED based lights in its Mines, Refinery, Smelter, Captive Power Plant and Corporate office.
- HCL & MECL have also completed the work of fitting of LED based lights in all its premises.
- The work of installation of LED based lightings in the offices of GSI and IBM are under progress.
- JNARDDC, NIRM and NIMH have also completed the work of fitting of LED based lights in their respective premises.



Conventional Lights have been replaced with LED Lights to reduce power consumption and maintenance cost - HCL



Yoga Day MECL



Annexures

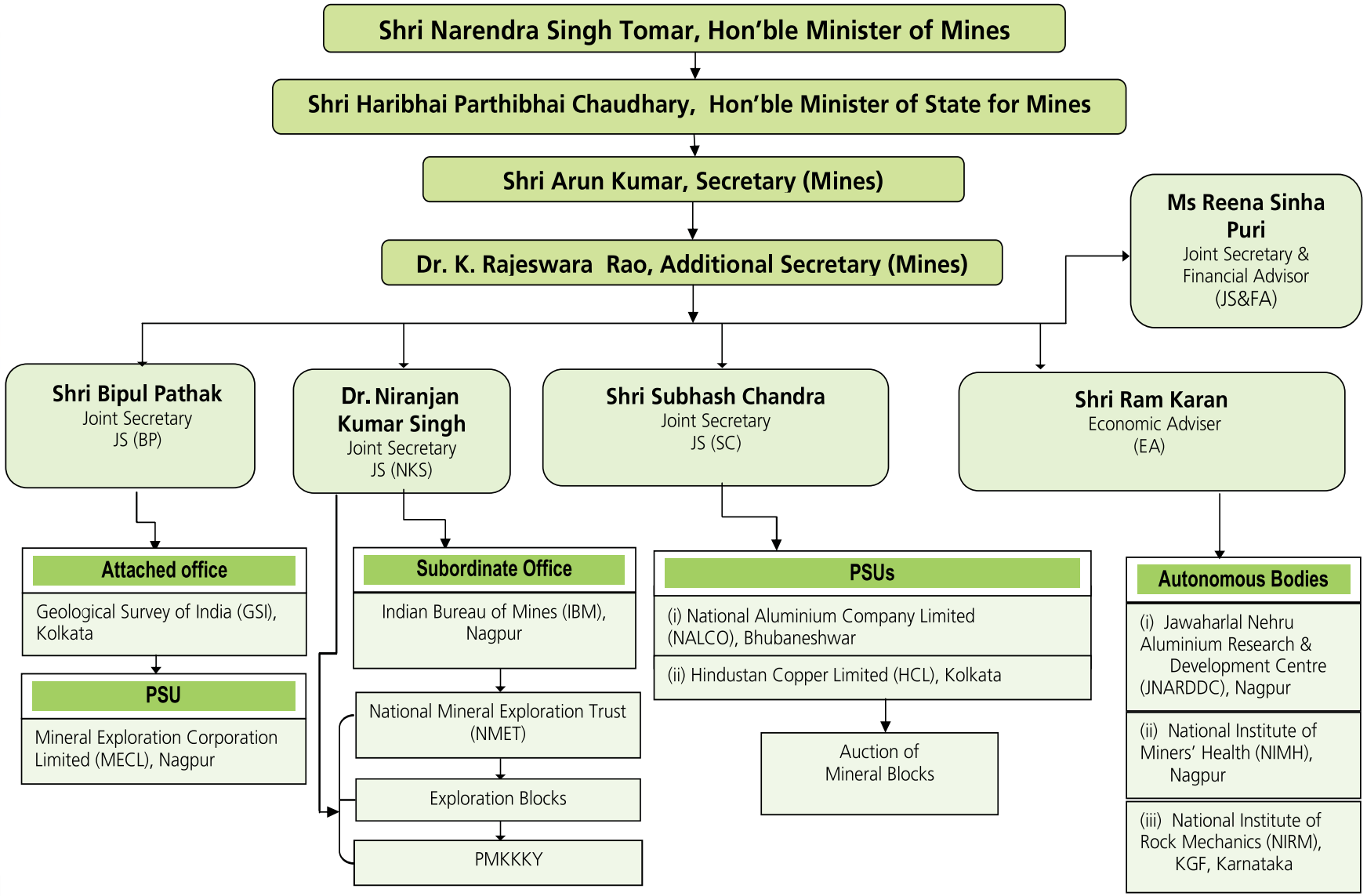




Annexures

Annex 1.1	Organizational Structure of Ministry of Mines	Page - 171
Annex 2.1	Production of Selected Minerals, 2013-14 to 2017-18	Page - 172
Annex 2.2	Exports of Ores & Minerals during 2012-13 to 2016-17	Page - 173
Annex 2.3	Imports of Ores & Minerals during 2012-13 to 2016-17	Page - 174
Annex 2.4	Reserves/Resources of Minerals as on 1.4.2015	Page - 175
Annex 2.5	Scenario of mineral rich States	Page - 179
Annex 6.1	Target and achievements during the five years of XII plan (2012-2017) and Annual Plan (2017-18) of Geological Survey of India	Page - 180
Annex 6.2	Mineral Wise Summary of Lease Distribution as on 31.03.2016 (All India)	Page - 182
Annex 14.1	List of Nodal Officer, CPIOs and Appellate Authorities in Ministry of Mines	Page - 183

Organizational Structure of Ministry of Mines



Annexure-2.1 (Page 12)

Production of Selected Minerals, 2013-14 to 2017-18
(Excluding Atomic & Fuel Minerals)

(Value in ₹ Crore)

		2013-14		2014-15		2015-16		2016-17(P)		2017-18(E)	
	Unit	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
All Minerals			**90882.36**		**97215.41**		**94003.81**		**100241.89**		**113541.03**
Metallic			**42389.95**		**37909.11**		**33621.71**		**40017.29**		**53028.83**
Bauxite	th. tonnes	22319.15	999.69	22493.67	1192.24	28123.79	1543.77	24664.63	1417.04	20630.33	1292.55
Chromite	th. tonnes	2878.32	2375.95	2164.16	1880.03	2915.58	2121.45	3727.78	3643.83	3461.80	4017.53
Copper Conc.	th. tonnes	139.31	668.10	107.60	528.94	151.84	654.83	134.79	640.35	149.97	766.52
Gold	kg	1564.00	422.53	1441.00	360.27	1323.00	321.46	1594.00	436.24	1609.00	433.07
Iron Ore	M. tonnes	152.18	31649.18	129.32	27663.68	158.11	22320.66	192.08	25138.87	210.47	32751.55
Lead Conc.	th. tonnes	194.43	437.25	197.67	564.00	261.86	788.51	268.05	966.92	349.33	1267.05
Manganese Ore	th. tonnes	2626.29	1518.18	2369.48	1366.18	2166.95	854.55	2393.18	1602.66	3100.21	2148.09
Zinc Conc.	th. tonnes	1490.66	2738.93	1489.37	3157.22	1473.81	3494.31	1484.25	4338.56	2662.43	8519.11
Other Met. Minerals			1580.15		1196.56		1522.16		1832.82		1833.36
Non Metalic Minerals			**7516.05**		**6496.23**		**7572.03**		**7414.53**		**7702.13**
Diamond	crt	37517.00	61.41	36107.00	61.35	36044.00	62.14	36516.00	63.96	43936.00	76.58
Garnet (abrasive)	th. tonnes	483.56	111.32	91.39	80.10	82.00	64.81	85.41	75.83	88.82	86.85
Limeshell	th. tonnes	18.75	3.52	16.35	3.71	10.35	2.86	12.34	3.36	29.58	7.12
Limestone	M. tonnes	280.86	5133.20	293.27	5800.04	307.00	6867.40	313.20	6688.38	325.34	7129.93
Magnesite	th. tonnes	196.94	44.56	285.01	74.88	327.66	82.71	299.17	73.57	172.48	43.64
Phosphorite	th. tonnes	1453.58	475.48	1607.22	375.91	1571.86	376.38	1181.31	389.47	914.86	216.83
Sillimanite	th. tonnes	67.27	40.82	66.27	45.61	69.94	50.93	68.14	53.41	87.75	71.73
Wollastonite	th. tonnes	192.71	15.71	186.52	16.21	175.35	15.03	166.19	15.89	136.58	10.67
Other Non-Met. Min.			#1630.03		39.41		49.77		50.66		58.78
Minor Minerals			40976.35		52810.07		52810.07		52810.07		52810.07

M.Tonnes - Million tonnes th.tonnes - Thousand tonnes Kg - Kilogram
(P) Provisional.
(E) Estimated figures
Note: # Includes 31 minerals declared as minor minerals vide notification dated 10.02.2015. The data for these minerals for 2014-15 onwards is included in minor minerals.
Source : a) MCDR Minerals: MCDR returns

b) Minor Minerals: State Governments (data repeated in case of non-availability).



Exports of Ores & Minerals during 2012-13 to 2016-17

(Value in ₹ '000)

Ores & Minerals	Unit	2012-13		2013-14		2014-15		2015-16		2016-17(P)	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
All Minerals		**	1601012597	**	1947835200	**	1780194116	**	1709463270	**	2009568961
Diamond		**	1266553169	**	1581348137	**	1481021701	**	1427340191	**	1638607380
Iron Ore	Tht	18122	89852116	16302	94811058	7297	31436684	5441	12639631	30486	101771693
Granite	Ton	6061302	79415582	6802309	98685772	6563271	98322398	5674568	92720985	6114463	93654908
Alumina	Ton	927800	18834156	1294651	25423465	1583590	32974205	1368526	25895763	1540102	30614865
Emerald (Cut & Uncut)		**	26787394	**	21570148	**	15945392	**	17879969	**	20370512
Building And Monumental Stones Nes	Ton	1540625	5806657	1686357	6268602	6127052	7786183	5133276	8489454	8002034	12007329
Precious & Semi-Precious Stones (Cut & Uncut):Total		**	11554162	**	16965361	**	12993424	**	12590265	**	10895033
Sandstone	Ton	443010	5157627	540874	7579286	627008	8523123	744657	10161784	716315	9119620
Coal(Ex Ligbite)	Tht	2511	8987175	2188	10843195	1237	7202914	1576	9006273	1451	8213959
Barytes	Ton	1740203	11920378	1067755	8699416	651571	4525674	743407	6517077	1068169	7676712
Salt (Other Than Common Salt)	Ton	4597507	5282193	4956931	6562929	4776491	6390687	5926639	6701178	7488961	7136265
Marble	Ton	371222	5434999	337937	5703435	325707	5990617	289853	5998401	393757	7069736
Titanium Ores & Conc.	Ton	800730	14571902	687923	10412481	779598	7179648	790489	6644934	532293	5720802
Limestone	Ton	2991810	2699327	2779074	3432311	3812759	4671971	3236010	4694273	4417639	4936331
Bentonite	Ton	1114907	3160993	1225568	3860451	1300083	3999734	1572469	4814345	1604461	4804585
Garnet(Abrasive)	Ton	505281	5108666	480774	6060269	448559	5673827	480408	5950865	387357	4693011
Mica	Ton	127610	3460060	127882	3759755	141100	4263736	135805	4229711	136101	4573481
Bauxite	Ton	4197804	6752047	3492546	6736456	6808588	14050662	8914624	19527405	2118648	4032515
Zinc Ores & Conc.	Ton	75870	2957887	45660	1620063	41	744	558	11345	53912	3990176
Chromite	Ton	196435	3107577	195125	3468440	25361	659259	71839	1314084	230531	3657700
Remaining Minerals		**	23608530	**	24024170	**	26581533	**	26335337	**	26022348

Source: DGCIS, Kolkata

P: Provisional

*** Quantity in different units*

Note: Top 20 minerals by value during 2016-17

Imports of Ores & Minerals during 2012-13 to 2016-17

(Value in ₹ '000)

Ores & Minerals	Unit	2012-13		2013-14		2014-15		2015-16		2016-17(P)	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
All Minerals		**	11008001478	**	12158267979	**	10717327996	**	7387889416	**	8094435689
Petroleum (Crude)	Tht	185534	7856017148	189176	8696574352	187913	7093793565	202314	4293999334	214914	4742961031
Diamond		**	1176986143	**	1349155094	**	1252140913	**	1105651211	**	1296740694
Coal(Ex Ligbite)	Tht	145790	868505454	166861	923353960	212106	1045300819	204000	861073457	190958	1002403564
Natural Gas	Ton	13135869	411417374	13020689	516992878	13289155	563400559	14376924	437824475	7717827	402490252
Copper Ores & Conc.	Ton	2296421	309704411	2048240	332267404	1702247	285028249	1886199	262965392	1143216	182986972
Emerald (Cut & Uncut)		**	37464291	**	22328772	**	63062394	**	87263267	**	113432135
Coke	Ton	3077258	56872490	4167206	67948149	3290324	43751479	3019502	31956111	4358716	54356105
Rock Phosphate	Ton	8160950	73098249	7160798	55177899	8273261	61888711	8037745	65290421	7536826	49721464
Alumina	Ton	1113927	24589496	1169523	27542194	790305	21244790	998446	22924844	1371630	33417504
Marble	Ton	757793	20313010	757948	22107203	778503	23839858	858061	27392156	882144	26142985
Precious & Semi-Precious Stones (Cut & Uncut): Total		**	8276623	**	12574990	**	14675049	**	21000375	**	24657499
Limestone	Ton	11139331	16672231	13214179	21580366	13943781	22138585	17187164	23772767	18045675	24168944
Manganese Ore	Ton	2326729	25622446	2179334	28306272	3172858	34669120	2216864	17413687	1908258	24028136
Iron Ore	Tht	3056	25778633	369	3423552	12093	65947375	7099	31971445	4607	21615220
Preciuos Metal Ores & Concentrates	Kg	840	240260	179	106977	101602	22252599	78654	13658294	83322	19423078
Asbestos	Ton	460445	19004033	285870	13298986	396493	17168105	355686	14865511	310592	11279370
Sulphur (Exc. Sublimed Precipited & Colloidal)	Ton	1547267	17358957	1289979	11002926	1626407	17445433	1432632	14172608	1345520	8751425
Bauxite	Ton	66742	1494744	421612	3662474	1800689	8560886	1116010	5982901	1894830	7785093
Gypsum	Ton	3218900	5009977	3231930	5252011	4421048	6747745	4068412	5713627	4373330	6029622
Molybdenum Ores & Conc.	Ton	6863	7522354	5572	5558080	8093	8646302	7511	4903722	7139	5442499
Remaining Minerals		**	46053154	**	40053440	**	45625460	**	38093811	**	36602097

Source: DGCIS, Kolkata
P: Provisional
***Quantity in different units*
Note: Top 20 minerals by value during 2016-17



Reserves/Resources of Important Minerals as on 1.4.2015

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnais-sance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Apatite	tonnes	27715	0	1680	29395	1385734	491818	1225345	2281521	11481250	6132768	1017646	24016082	24045477
Asbestos	tonnes	20016	0	4617	24633	2488167	3114728	4064178	100687	2527959	10569233	57800	22922751	22947384
BallClay	tonnes	33526297	11182801	4784522	49493621	11045214	4286560	13437994	624977	2497880	53357091	0	85249716	134743337
Barytes	tonnes	50449000	49358	848467	51346825	410466	323345	1258521	205834	1284390	31735548	105721	35323825	86670650
Bauxite	000'tonnes	434043	18599	203780	656422	254378	132633	382369	710878	430890	1209706	119588	3240442	3896864
Bentonite	tonnes	13926227	50000	609406	14585633	6838864	2721697	68632472	26519818	225744237	212115692	25730000	568302781	582888414
Calcite	tonnes	928119	798170	1722578	3448867	1332076	217790	3339239	9122696	1241494	4204311	97476	19555082	23003949
Chalk	000'tonnes	4215	529	319	5064	741	331	151	196	0	269	0	1687	6751
China Clay	000'tonnes	140456	36144	52869	229469	107176	42220	98627	289723	415703	1685730	72599	2711777	2941247
Chromite	000'tonnes	64465	12815	24930	102210	67618	15780	33506	26914	33076	44458	20452	241806	344016
Copper Ore														
Ore	000'tonnes	162972	0	44796	207767	44925	31090	59209	158300	232654	772912	4640	1303730	1511498
Metal	000'tonnes	2127.9	0	606.72	2734.62	382.18	324.55	585.42	1950.87	2050.98	4100.36	29.17	9423.53	12158.15
Corundum	tonnes	200	0	0	200	70844	1073	63060	13	38	105794	52675	293497	293697
Diamond	Carats	959500	0	159	959659	0	0	0	304601	1524317	29047514	0	30876432	31836091
Diaspore	tonnes	3242363	884525	3755546	7882434	114789	498756	480663	14241	110358	1045944	46068	2310817	10193251
Dolomite	000'tonnes	431750	107364	138770	677884	372515	323183	537932	307103	757005	5215075	224194	7737007	8414891
Dunite	000'tonnes	10848	18	1901	12768	436	1925	108887	25202	1087	23832	13680	175049	187818
Feldspar	tonnes	173383004	103054634	43403974	319841612	45903221	42467697	40160373	13882441	17928113	150012330	3371567	313725742	633567354
Fireclay	000'tonnes	13295	5035	8707	27037	13878	30155	18260	49290	54093	524011	6104	695791	722829
Fluorite	tonnes	224824	63860	0	288684	4976749	745390	571311	1713833	6218421	3522537	145183	17893423	18182107
Fuller's Earth	tonnes	3941000	0	0	3941000	0	0	58200	0	912340	256467419	0	257437959	261378959
Garnet	tonnes	9917936	278493	2587427	12783856	84320	1643412	3287667	121099	10247428	27992906	333	43377166	56161022

Annexure-2.4 Contd.

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnais-sance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Gold														
Ore(Primary)	tonnes	10404349	6401725	422100	17228174	1925669	1303000	1968176	30333248	70136727	233608305	145336333	484611458	501839632
Metal (Primary)	tonnes	53.41	16.26	0.42	70.09	7.69	3.85	12.1	128.65	143.8	227.44	61.12	584.65	654.74
Ore (Placer)	tonnes	0	0	0	0	0	0	0	0	2552000	23569000	0	26121000	26121000
Metal (Placer)	tonnes	0	0	0	0	0	0	0	0	2.29	3.57	0	5.86	5.86
Granite (Dimension Stone)	th.cu.m	35741	201377	26574	263692	38462	51990	8234	837325	2063964	42543908	512216	46056098	46319790
Graphite	tonnes	4229675	1204423	2526694	7960793	9571933	3825575	3593404	741377	7368340	22361229	139464128	186925987	194886779
Gypsum	000'tonnes	35141	311	1169	36621	10826	93127	33419	9071	713834	428097	4518	1292892	1329513
Iron Ore (Heamatite)	000'tonnes	4053032	449917	918801	5421751	3444103	1573822	1496674	1762741	1798557	4498142	2491176	17065214	22486965
Iron Ore (Magnetite)	000'tonnes	30352	2311	20037	52699	223388	15494	64091	1513195	1984566	6351286	584436	10736455	10789155
Kyanite	tonnes	639121	0	48958	688079	1505114	568205	2193427	579619	3577402	95869713	0	104293480	104981559
Laterite	000'tonnes	98598	12527	13608	124733	49655	8960	22724	3532	2626	243535	250787	581819	706552
Lead & Zinc Ore														
Ore	000'tonnes	31662	68687	5767	106116	5564	17411	31297	37055	192083	355403	4530	643343	749459
Lead Metal	000'tonnes	624.56	1666.02	191.76	2482.34	119.31	521.74	780.56	690.65	2171.43	6237.67	0	10521.36	13003.7
Zinc Metal	000'tonnes	2871.75	6728.14	399.63	9999.52	364.08	940.26	1362.05	1941.94	7931.06	13722.2	101.65	26363.24	36362.76
Limestone	000'tonnes	9438939	3015917	3880897	16335753	4870440	4852713	8623172	7111337	22629060	130787772	8014504	186888998	203224752
Magnesite	000'tonnes	77867	165	4244	82276	6210	9345	45574	59010	59652	131707	213	311711	393988
Manganese Ore	000'tonnes	62982	19715	10778	93475	70742	44606	73823	18189	42803	135722	16513	402399	495874
Marble	000'tonnes	0	0	4551	4551	104236	202003	72387	0	107129	1453386	2200	1941341	1945891
Marl	tonnes	117115856	4650000	2090000	123855856	11704870	0	0	0	0	0	0	11704870	135560726
Mica	Kgs	82187635	20035595	12209547	114432777	38252500	10605400	124089303	143353477	56528016	144446953	3593715	520869364	635302141



Annexure-2.4 Contd.

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnais-sance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Molybdenum														
Ore	tonnes	0	0	0	0	0	1500000	0	36000	569304	17098594	167800	19371698	19371698
Cotained MoS2	tonnes	0	0	0	0	0	1050	0	83	287	11198.03	50.34	12668.37	12668.37
Nickel Ore	mill.tonnes	0	0	0	0	0	21	21	31	53	63	0	189	189
Ochre	tonnes	21959552	4448341	10525912	36933805	44924890	13936202	31896176	2559245	3560819	32369262	1612607	130859201	167793006
Perlite	000'tonnes	0	0	0	0	140	683	595	0	0	0	988	2406	2406
Platinum Group of Metals	In tonnes	0	0	0	0	0	0	0	0	7.71	6.5	1.5	15.71	15.71
(PGM) of Metal content														
Potash	mill.tonnes	0	0	0	0	0	0	0	0	18142	3660	707	22508	22508
Pyrite	000'tonnes	0	0	0	0	27129	0	32597	9590	77729	1527356	0	1674401	1674401
Pyrophyllite	tonnes	16575493	4322386	4035079	24932958	9539407	8301411	4240016	1118943	3589624	7533340	360006	34682745	59615703
Quartz & Silica Sand	000'tonnes	433014	93339	121176	647528	354625	368216	362128	36872	219180	1897962	21436	3260420	3907948
Quartzite	000'tonnes	47758	2016	33698	83472	120723	141437	160355	119953	152715	868850	11293	1575325	1658798
Rare Earth Elements	tonnes	0	0	0	0	0	0	0	0	6353	19140	0	25493	25493
Rock Phosphate	tonnes	43832936	5179	1969370	45807485	10679080	36271671	25008353	2912633	3549750	185771368	2678275	266871130	312678615
Rock Salt	000'tonnes	0	0	0	0	10035	0	5990	0	0	0	0	16025	16025
Ruby	Kg	0	0	0	0	0	429	3296	0	0	1623	0	5349	5349
Shale	000'tonnes	15027	171	274	15472	495	0	2022	0	0	1175	90	3781	19253
Sillimanite	tonnes	323231	5728868	450016	6502115	1020187	135278	20257525	4580083	17790664	16068690	3849600	63702027	70204142
Silver														
Ore	tonnes	69277075	8413000	72753828	150443903	0	1484543	46726460	29632000	64946000	218721729	0	361510732	511954635
Metal	tonnes	4309.78	220.77	2641.39	7171.94	0	42.85	259.62	2037.99	3236.39	17233.03	0	22809.88	29981.82

Annexure-2.4 Contd.

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnais-sance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Slate	000'tonnes	19619	667	0	20286	0	0	1075	0	0	1511	0	2586	22872
Talc / Steatite / Soapstone	000'tonnes	72172	8067	26251	106490	18178	13020	32221	2994	8126	128620	6275	209434	315924
Tin														
Ore	tonnes	2067	897	1455	4419	22594200	2653	31330072	168457	561080	29064288	0	83720749	83725168
Metal	tonnes	44.56	94.02	15.62	154.2	33139.45	842.8	54049.65	813.29	231.63	13182.34	0	102259.16	102413.36
Titanium Minerals	tonnes	13552280	0	868436	14420716	19311670	31365	117416	2198668	52373956	325171754	0	399204829	413625545
Ilmenite	tonnes	12980540	0	832970	13813510	17294168	0	0	1242214	41973121	280193087	0	340702590	354516100
Rutile	tonnes	558825	0	35466	594291	1099060	0	0	4460	3425835	9007516	0	13536871	14131162
Leucoxene	tonnes	0	0	0	0	624903	0	0	1994	0	341949	0	968846	968846
Anatase	tonnes	0	0	0	0	0	0	0	0	3345000	0	0	3345000	3345000
Titaniferous Magnetite	tonnes	0	0	0	0	293539	0	117416	950000	3630000	35629202	0	40620157	40620157
Not known	tonnes	12915	0	0	12915	0	31365	0	0	0	0	0	31365	44280
Tungsten														
Ore	tonnes	0	0	0	0	2230000	0	173063	19611152	23435954	25356049	16581246	87387464	87387464
Cotained WO3	tonnes	0	0	0	0	3568.00	0.00	450.00	9914.00	20180.92	103415.15	4566.28	142094.35	142094.35
Vanadium														
Ore	tonnes	0	0	0	0	276530	1720000	4108100	0	232000	18297225	0	24633855	24633855
Contained V2O5	tonnes	0	0	0	0	1106.12	2835	6032.4	0	487.2	54133.29	0	64594.01	64594.01
Vermiculite	tonnes	1582906	19413	30566	1632885	36411	26196	39794	58396	20179	538607	0	719582	2352467
Wollastonite	tonnes	1953384	48075	240003	2241462	3750118	12000	3748191	76088	3325042	3316385	0	14227824	16469286
Zircon	tonnes	1012205	146085	0	1158290	655020	0	105773	81741	377825	1044554	0	2264913	3423203



Scenario of mineral rich States

(Excluding Atomic & Fuel Minerals)

Sl. No.	Name of the State	Value of mineral production in 2016-17 (Rs. In crore)	% Change in value as compared to previous year	Leading minerals produced in the State *	Value of minor minerals production in 2016-17 (Rs. In crore)#	No. of reporting mines during 2016-17	Share of the State in country's production of certain minerals
1	2	3	4	5	6	7	8
1	Rajasthan	23001	25.61	Lead & Zinc Ore, Zinc Conc., Copper Ore, Phosphorite, Silver, Lead Conc., Wollastonite, Siliceous Earth, Limestone, Copper Conc., Selenite, Manganese Ore, Garnet (abrasive), Iron Ore	8711	85	Lead & Zinc Ore 100% Lead Conc. 100%, Zinc Conc. 100%, Siliceous Earth 100%, Selenite 100%, Wollastonite 100%, Silver 99.9%, Phosphorite 94%, Copper Conc. 42%, Copper Ore 29%, Limestone 21%, Vermiculite 2%, Garnet (abrasive) 2%, Iron Ore 1%,
2	Odisha	20171	21.98	Bauxite, Chromite, Manganese Ore, Iron Ore, Sulphur, Garnet (abrasive), Graphite (r.o.m.), Sillimanite, Limestone	113	132	Chromite 99.9% Iron Ore 52%, Bauxite 49%, Garnet (abrasive) 26%, Manganese Ore 25%, Sillimanite 23%, Sulphur 16%, Graphite (r.o.m.) 13%, Limestone 2%,
3	Andhra Pradesh	10735	0.84	Manganese Ore, Garnet (abrasive), Sillimanite, Limestone, Vermiculite, Iron Ore	9750	129	Vermiculite 72% Garnet (abrasive) 60%, Sillimanite 54%, Limestone 11%, Manganese Ore 10%,
4	Chhattisgarh	9995	29.98	Bauxite, Limestone, Iron Ore, Moulding Sand, Tin Conc.	719	112	Tin Conc. 100% Moulding Sand 100%, Iron Ore 16%, Limestone 10%, Bauxite 8%,
5	Karnataka	8895	30.66	Gold Ore, Manganese Ore, Limestone, Iron Ore, Magnesite, Limeshell, Gold	1361	142	Gold 99% Gold Ore 99%, Limeshell 32%, Iron Ore 14%, Manganese Ore 11%, Limestone 10%, Magnesite 3%,
6	Telangana	6877	0.86	Limestone, Manganese Ore	6364	34	Limestone 8% Manganese Ore 1%,
7	Gujarat	6429	-3.01	Bauxite, Marl, Sulphur, Manganese Ore, Limestone	5876	191	Marl 100% Bauxite 24%, Sulphur 19%, Limestone 8%, Manganese Ore 2%,
8	Uttar Pradesh	5654	-0.06	Sulphur, Limestone	5617	2	Sulphur 9% Limestone 1%,
9	Maharashtra	5302	2.07	Bauxite, Manganese Ore, Sulphur, Limestone, Sillimanite, Kyanite, Iron Ore, Iron Ore	4194	75	Fluorite(graded) 100% Kyanite 100%, Manganese Ore 25%, Sulphur 9%, Sillimanite 9%, Bauxite 8%, Limestone 4%, Iron Ore 1%,
10	Bihar	4279	0.01	Sulphur	4272	1	Sulphur 2%

**Except minor minerals.*
#Figures repeated due to non availability of data from State Governments.

Annexure-6.1 (Page 48)

Target and Achievements during the five years of XII Plan (2012-2017) and Annual Plan (2017-18) of Geological Survey of India

Name of the Scheme /Project / Programme	Target Vs Achievement FS 2012-13 (Apr'12-Mar'13)		Target Vs Achievement FS 2013-14 (Apr' 13-Mar' 14)		Target Vs Achievement FS 2014-15 (Apr' 14-Mar' 15)		Target Vs Achievement FS 2015-16 (Apr'15-Mar'16)		Target Vs Achievement FS 2016-17 (Apr'16-Mar'17)		Target Vs Achievement FS 2017-18 (Apr'17-Sept'17)	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
Mission-I : Baseline Geoscience Data Generation												
A) Ground Survey Systematic Geological Mapping (sq km)	1960	1289	2,000	2,640	700	600	Nil	Nil	Nil	Nil	Nil	Nil
Spl. Thematic Mapping (sq. km.) (1:25,000 scale)	15,000@	21,566.50	18,000	20,411.5	18,000	20,307.9	16,875	19,741.50	9,230	9146	14,000	1,291
Geochemical Mapping (in sq. km.) (1:50,000 scale)	46,000@	80,318	75,000	92,275.5	85,000	1,11,871	1,01,688	1,02,716	1,37,000	1,32,639	1,37,000	8,185
Geophysical Mapping (in sq.km.) (1:50,000 scale)	22,000	27,535	27,000	34,398	33,000	46,068	76,100	70,845	95,200	1,11,375	1,00,000	6,095
B) Aerial Survey (i) Multisensor / Aeromagnetic Survey* (with Twin Otter (lkm.)	25,000	#	30,000	52,380	33,000	0	51,735	58,583	60,000	61,352	60,000	0
(ii) Heliborne Survey(lkm)	10,000	$	15,000	165	18,000	300	30,449	3,765	25,000	1943.60	25,000	2693
c) Marine Survey i) Parametric Survey within EEZ and beyond												
1) Bathymetry (lkm)	5,000	4,596	3,000	9,630	8,000	8,177	12,485	10,260	10,000	17,374	10,000	1,665
2) Magnetic (lkm)	1,700	3,923	3,000	5,531	10,000	3,829	10,060	8,419	10,000	8,833	11,000	7,843
3) Swath Bathymetry(Sq.km)	50,000	59,342	40,000	57,382	60,000	82,988	55,965	55,232	42,000	41,888	42,000	31,006
4) Seismic Survey (l. km) ^					7,000	3,188	7,450	1,993	5,000	3,949	5,000	546
5) Gravity (l. km) ^					20,140	17,014	18,300	16,958	16,000	16,550	16,000	6,259
6) Sub bottom Profiling (l. km) ^					13,485	14,393	14,925	16,070	15,000	15,587	15,000	8,019
ii) Systematic coverage within Territorial Water +EEZ (sq.km)	1,700	1,775	1,500	2,375	1,650	2,541	2,217	2,241	4,650	4,935	5,000	0
Mission-II : Natural Resource Assessment												
a) Large Scale Mapping (sq.km.)	2,500	4,916.59	4,500	5,263.65	4,500	5,422.34	5,078.50	5,924.98	5,500	8,043.10	6,600	840.87
b) Detailed Mapping (sq.km.)	40	45.43	50	62.525	50	73.9	58.59	106.03	103	145.63	110	11.28
c) Drilling (metre)	66,000	70,006.95©	70,000	68,037©	71,000	87,465.87©	8,5847	1,13,202	1,13,000	1,39,071.98©	1,15,000	48590.74
d) Preliminary mineral investigation within EEZ(sq.km)					15000	16,225	15,000	15,819	25,000	32,358	30,000	3711



Annexure-6.1 (Contd.)

Name of the Scheme /Project / Programme	Target Vs Achievement FS 2012-13 (Apr'12-Mar'13)		Target Vs Achievement FS 2013-14 (Apr' 13-Mar' 14)		Target Vs Achievement FS 2014-15 (Apr' 14-Mar' 15)		Target Vs Achievement FS 2015-16 (Apr'15-Mar'16)		Target Vs Achievement FS 2016-17 (Apr'16-Mar'17)		Target Vs Achievement FS 2017-18 (Apr'17-Sept'17)	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
Mission-III : Geoinformatics												
(Map, Publication, Information Technology, Core Library etc) (in nos)	30	30	30	30	30	30	62	62	35	35	40	41
Mission-IV : Fundamental and Multidisciplinary Geoscience												
(Geotechnical, Earthquake Geology & Seismology, Geo-environment, Glaciology, Geothermal etc.) (in nos)	91	89	85	81 Ł	77	87	100	98	61	95	70	80
Research & Development Research (No of investigation including Deep Geol., Polar studies)	36	36	30	36	45	69	63	63	49	54	40	39
Mission-V : Training and Capacity Building												
Training (in GSITI) No of Types (No of courses)	80	104	75	77	80	97	86	101	85	130	90	67

** Flying Season: normally in October – March*

 # No Airborne survey conducted 2012-13 as Navigational system PNAV -2100 not working.

$ Sensors under installation to the helicopter

@ Upward revision of target made with the induction of new officers in the Dept.

© Includes drilling under M-IV also.

◊ Four Items were sponsored items and could not be taken up as there was no request from the Sponsor Agencies.

Ω test flight over Aladahalli covering 165 lkm.

^ Instrumentation on RV Samudra Ratnakar



Annexure-6.2 (Page 66)

Mineral Wise Summary of Lease Distribution As on 31/03/2016 (All India)

Sl.No.	Mineral	No. of Leases	Lease Area (Hect.)
1	Amethyst	3	7.83
2	Apatite	2	20.17
3	Aquamarine	1	24.29
4	Asbestos	1	49.22
5	Bauxite	372	29106.76
6	Borax	1	159.00
7	Chromite	34	8955.19
8	Copper Ore	14	4253.98
9	Diamond	2	275.96
10	Emerald	1	46.32
11	Epidote	1	215.83
12	Fluorite	11	722.84
13	Garnet	105	1617.59
14	Garnet(Gem)	2	38.95
15	Gold	11	7445.46
16	Graphite	105	3482.39
17	Iolite	14	195.70
18	Iron ore	713	90301.95
19	Kyanite	30	1446.75
20	Lead & Zinc ore	13	17977.92
21	Limeshell	25	2856.78
22	Limestone	2015	156016.02
23	Magnesite	38	1894.36
24	Manganese Ore	321	17060.54
25	Marl	1	4.90
26	Moulding Sand	35	841.85
27	Perlite	1	144.88
28	Phosphorite	11	2158.60
29	Red oxide	4	80.34
30	Rock Phosphate	1	13.20
31	Ruby	6	130.00
32	Sapphire	1	673.40
33	Semi-precious Stones	13	134.43
34	Siliceous Earth	25	226.75
35	Sillimanite	7	3027.06
36	Tin	14	300.17
37	Vermiculite	104	1861.04
38	White clay	39	644.40
39	White shale	15	77.34
40	Wollastonite	16	418.59
	Total	**4128**	**354908.75**

**Excluding coal, lignite, petroleum, natural gas, atomic & minor minerals.*



Annexure-14.1 (Page 163)

List of Nodal Officer, CPIOs and Appellate Authorities in Ministry of Mines

Nodal Officer (RTI)	CPIO (RTI)
Shri Rakesh Moza Dy. Secretary Room No.-D 313, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23383096 Email- rakesh.moza@nic.in	Smt. V. Jayanthi Under Secretary Room No. –D 303, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23383946 Email-jayanthi.v@nic.in

S. No.	CPIO	Subject matter dealt in the concerning (Section)	Appellate Authority
1.	**Shri Man Singh Kasottia,** Under Secretary Room No. –D 303, Shastri Bhawan, New Delhi-01 Tel. 91-11-23073046 Email-man.kasottia@gov.in	Establishment	**Shri Shersha,** Director Room No. –D 309, Shastri Bhawan, New Delhi-01 Tel. 91-11-23381172 Email: shersha.mohideen@nic.in
		Administration	
		Cash, R&I and Records	
2.	**Smt. V. Jayanthi,** Under Secretary Room No. –D 303, Shastri Bhawan, New Delhi-01 Tel. 91-11-23383946 Email-jayanthi.v@nic.in	Coordination & Parliament Section	**Shri Shersha,** Director Room No.–D 309, Shastri Bhawan, New Delhi-01 Tel. 91-11-23381172 Email: shersha.mohideen@nic.in
		PI & PG Cell	**Shri Rakesh Moza** Dy. Secretary Room No.-D 313, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23383096 Email- rakesh.moza@nic.in
		International Cooperation	**Shri Amit Saran,** Director Room No.-D 310, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23381136 Email- amit.saran@nic.in
3.	**Smt. Lakshmi Subramanian,** Under Secretary Room No. –D 303, Shastri Bhawan, New Delhi-01 Tel. 91-11-23387223 Email: lakshmi.s@nic.in	Metal-I	**Smt. Farida M. Naik** Director Room No.-D 312, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23384593 Email- fm.naik@nic.in
		Metal-II	
		Metal-III	



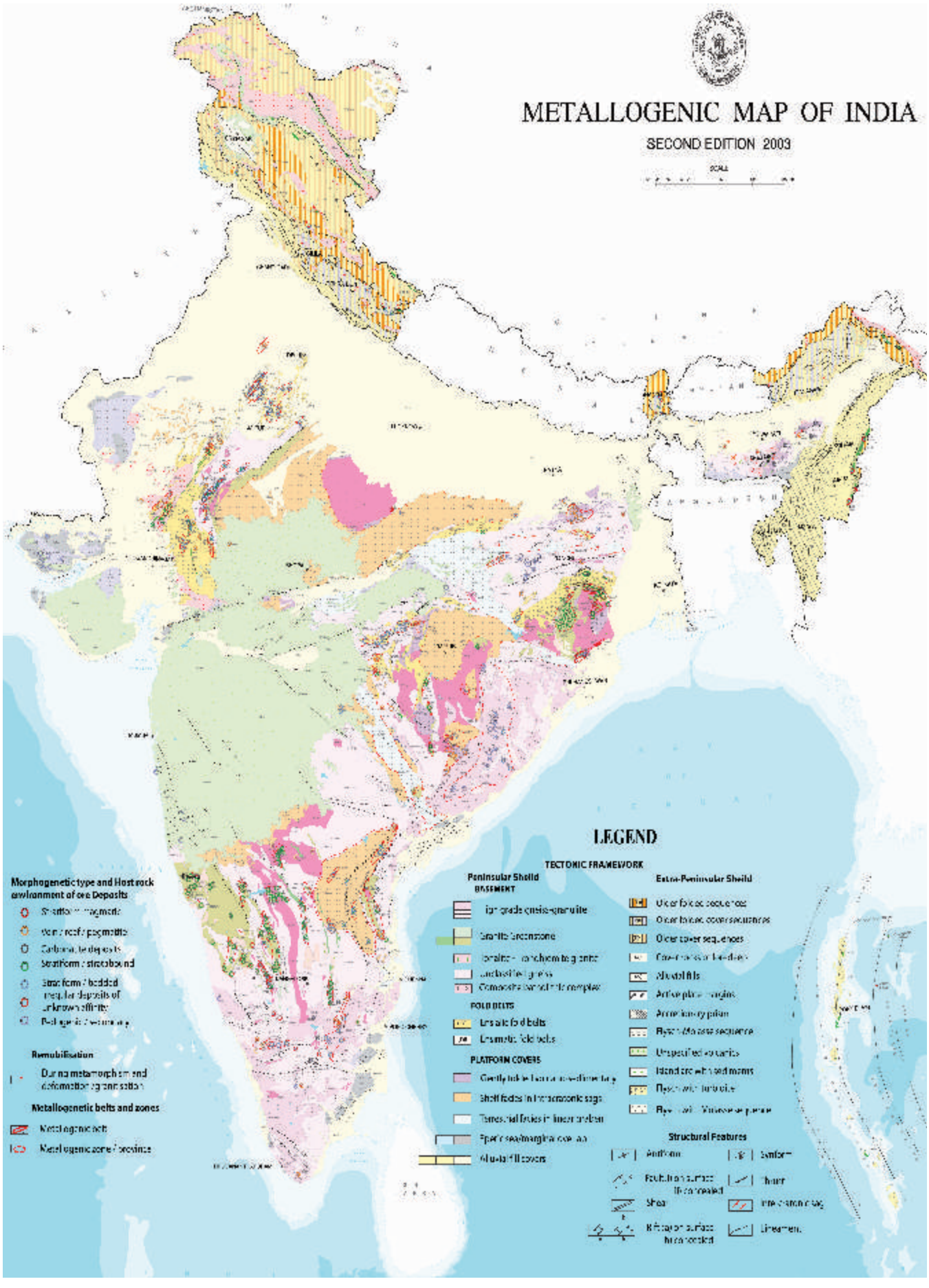
S. No.	CPIO	Subject matter dealt in the concerning (Section)	Appellate Authority
4.	**Shri Adhir Kumar Malik,** Under Secretary Room No. –D 314, Shastri Bhawan, New Delhi-01 Tel. 91-11-23384743 Email: ak.malik@nic.in	Metal-IV DMF/PMKKKY	**Shri Amit Saran** Director Room No.-D 310, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23381136 Email- amit.saran@nic.in
		Mines-III Mines-IV	**Shri Prithul Kumar** Director Room No.-D 315, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23070260 Email- prithul.kumar@nic.in
5.	**Vacant** Under Secretary Room No. –D 302, Shastri Bhawan, New Delhi-01 Tel. 91-11-23384070	Mines VI (Amendment to Rules and Acts & all court cases)	**Dr. D. Veena Kumari,** Director (Except FTA & Statistical Publication) Room No.-D 308, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23388345 Email- veena.kumarid@nic.in
6.	**Shri Prakash Mundharikar** Section Officer Room No. –D 302, Shastri Bhawan, New Delhi-01 Tel. 91-11-23384070 Email: prakash.m69@nic.in	Mines-VI (Except Amendment to Rules and Acts & all court cases) Mines-V (Except FTA & Statistical Publication)	
7.	**Ms. Kirti,** Assistant Director Room No. –D 303, Shastri Bhawan, New Delhi-01 Tel. 91-11-23380610 Email: kirti.15@gov.in	Sand Mining Statistical Publications of the Ministry	**Shri Prithul Kumar,** Director Room No.-D 315, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23070260 Email- prithul.kumar@nic.in
		FTA	**Shri Amit Saran,** Director Room No.-D 310, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23381136 Email- amit.saran@nic.in
8.	**Shri B.K. Kaushik,** Section Officer Room No. –D 304, Shastri Bhawan, New Delhi-01 Tel. 91-11-23387919 Email: bk.kaushik@nic.in	IT Cell	**Shri Shersha,** Director Room No. –D 309, Shastri Bhawan, New Delhi-01 Tel. 91-11-23381172 Email: shersha.mohideen@nic.in



S. No.	CPIO	Subject matter dealt in the concerning (Section)	Appellate Authority
		Skill Development	**Shri Amit Saran,** Director Room No.-D 310, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23381136 Email- amit.saran@nic.in
9.	**Shri M.R. Sathyanarayanan,** Section Officer Room No. –D 302, Shastri Bhawan, New Delhi-01 Tel. 91-11-23389211 Email: mines1.mom@nic.in	Mines-I	**Shri Joyesh Bagchi,** Director (T) Room No.-D 306, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23385329 Email- dirtech.mom@nic.in
10.	**Shri Ram Rashik Mandal,** Section Officer Room No. –A 339, Shastri Bhawan, New Delhi-01 Tel. 91-11-23389345 Email: ram.rashik@nic.in	Mines-II	**Smt. Farida M. Naik,** Director Room No.-D 312, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23384593 Email- fm.naik@nic.in
11.	**Shri Sandeep Kumar,** Section Officer Room No. –D 101, Shastri Bhawan, New Delhi-01 Tel. 91-11-23384070 Email: sandeep.kumar77@nic.in	Revision Cell	
12.	**Shri V.P.B. Singh,** Section Officer Room No. –D 301, Shastri Bhawan, New Delhi-01 Tel. 91-11-23382715 Email: vinaypratap.bhadur@nic.in	Vigilance Section	
13.	**Shri B.S. Rawat,** AD (OL) Room No. –D 305, Shastri Bhawan, New Delhi-01 Tel. 91-11-23383085 Email: bs.rawat62@nic.in	Hindi Cell	**Dr. R.P. Singh,** Joint Director Room No. –D 303 Shastri Bhawan, New Delhi-01 Tel. 91-11-23388061
14.	**Shri Ravinder Kumar,** Section Officer Room No. –A 338, Shastri Bhawan, New Delhi-01 Tel. 91-11-24363632 Email: if.dom@nic.in	IF Section	**Shri Rakesh Moza,** Dy. Secretary Room No.-D 313, Shastri Bhawan, New Delhi-110001 Tel. 91-11-23383096 Email- rakesh.moza@nic.in



Proglacial area of Neh-Nar glacier, Great Himalayan Range, Sind Basin, J&K, Base Camp of GSI in the foreground


METALLOGENIC MAP OF INDIA
SECOND EDITION 2003
LEGEND
TECTONIC FRAMEWORK
Peninsular Shield
BASEMENT
Extra-Peninsular Shield
FOLD BELTS
PLATFORM COVERS
Structural Features
Morphogenetic type and Host rock environment of ore Deposits
Remobilisation
Metallogenetic belts and zones



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