सत्यमेव जयते
Government of India

G20 भारत 2023 INDIA
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Azadi Ka Amrit Mahotsav

ANNUAL REPORT 2022-23

MINISTRY OF MINES

GOVERNMENT OF INDIA

MINISTRY OF

MINES

ANNUAL REPORT 2022-23

Ministry of Mines

Ministry of Mines	https://mines.gov.in
Geological Survey of India	www.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 & Consultancy Limited	www.mecl.co.in
Jawaharlal Nehru Aluminium Research Development and Design Centre	www.jnarddc.gov.in
National Institute of Rock Mechanics	www.nirm.in

Abbreviations

BEE	Bureau of Energy Efficiency
BGML	Bharat Gold Mines Limited
BISAG	Bhaskaracharya Institute for Space Applications and Geo-informatics
BSE	BSE - Bombay Stock Exchange
CGPB	Central Geological Programming Board
CHQ	Central Head Quarter
CHWTSDF	Common Hazardous Waste Treatment, Storage & Disposal Facility
CII	Confederation of Indian Industry
CIMFR	Central Institute of Mining and Fuel Research
CMPDI	Central Mine Planning & Design Institute
CPCB	Central Pollution Control Board
CPGRAMS	Centeralised Public Grievance Redressal and Monitoring System
CSR	Corporate Social Responsibility
DGM	Directorate of Geology & Mining
DGMS	Directorate General of Mines Safety
DMF	District Mineral Foundation
DRM	District Resources Maps
EC	Environmental Clearance
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
EPMA	Electron Probe Micro Analyser

ERP	Enterprise Resource Planning
FC	Forest Clearance
FDP	Forest Diversion Proposal
FMCP	Final Mine Closure Plan
FROF	First Right of Refusal
FS	Field Season
FY	Financial Year
GCM	Geochemical Mapping
GDP	Gross Domestic Product
GEM	Government e-Market
GIGW	Guidelines for Indian Government Websites
GPM	Geophysical Mapping
GQM	Geological Quadrangle Maps
GR	Geological Report
GSI	Geological Survey of India
GSITI	Geological Survey of India Training Institute
HCL	Hindustan Copper Limited
HINDALCO	Hindustan Aluminium Company Limited
IBAAS	International Bauxite, Alumina and Aluminium Society
IBM	Indian Bureau of Mines
ICC	Indian Copper Complex
ICSG	International Copper Study Group
IEBR	Internal and Extra Budgetary Resources
IEC	Information Education and Communication

IGC	International Geological Congress
IMYB	Indian Mineral Year Book
ITEC	Indian Technical Economic Cooperation
JNARDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
JV	Joint Venture
JWG	Joint Working Group
KABIL	KhanijBidesh India Limited
KCC	Khetri Copper Complex
KMS	Knowledge Management System
LEWS	Landslide Early Warning System
LME	London Metal Exchange
MCDR	Mineral Conservation & Development Rules
MCP	Malanjkhand Copper Project
MCR	Mineral Concession Rules
MDRD	Minerals Development & Regulation Division
MECL	Mineral Exploration & Consultancy Limited
ML	Mining Lease
MMDR Act	Mines & Minerals (Development and Regulation) Act, 1957
MoC	Ministry of Coal
MoEFCC	Ministry of Environment, Forest and Climate Change
MoM	Ministry of Mines
MoU	Memorandum of Understanding
MPD	Mineral Processing Division
MSDE	Ministry of Skill Development and Entrepreneurship

MSS	Mining Surveillance System
MT	Magnetotelluric
MTS	Mining Tenement System
MEQ	Micro-Earthquak
NALCO	National Aluminium Company Limited
NER	North Eastern Region
NGCM	National Geochemical Mapping
NGDR	National Geoscience Data Repository
NIRM	National Institute of Rock Mechanics
NLSM	National Landslide Susceptibility Mapping
NMEP	National Mineral Exploration Policy
NMET	National Mineral Exploration Trust
NMI	National Mineral Inventory
NMP	National Mineral Policy
NRSC	National Remote Sensing Centre
NRTC	NALCO Research & Technology Centre
NSDC	National Skill Development Corporation
NSE	National Stock Exchange
NCEGR	National Centre of Excellence in Geoscientific Research
NEA	Notified Exploration Agency
OAMDR	Offshore Areas Mineral (Development & Regulations) Act, 2012
OCBIS	Online Core Business Integrated System
OGP	Obvious Geological Potential
OL	Official Language

OLIC	Official Language Implementation Committee
OSPCB	Odisha State Pollution Control Board
PERC	Project Evaluation and Review Committee
PGRS	Photo Geology and Remote Sensing
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
REE	Rare Earth Elements
REIL	Rajasthan Electronics & Instruments Plant
RESCO	A Renewable Energy Service Company
RP	Reconnaissance Permit
RSAS	Remote Sensing and Aerial Survey
RTI	Right to Information
R&D	Research & Development
RMT	Regional Mineral Targeting
SAIL	Steel Authority of India Ltd.
SCSP	Special Component Plan for Scheduled Caste
SDF	Sustainable Development Framework
SDGs	Sustainable Development Goals
SEM	Scanning Electron Microscopy
SGM	Systematic Geological Mapping
SGPB	State Geological Programming Board

SoP	Standard Operating Procedure
SSAG	Standing Scientific Advisory Group
STM	Specialised Thematic Mapping
SU	State Unit
TAMRA	Transparency, Auction Monitoring and Resource Augmentation
TCC	Technical-cum-Cost Committee
TEFR	Techno-Economic Feasibility Report
TEFS	Techno-Economic Feasibility Study
TEHM	Total Economic Heavy Minerals
TL	Thermo Luminescence
TOASS	Twin Otter Airborne Survey System
TSP	Tribal Area Sub-Plan
TW	Territorial Water
UNFC	United Nations Framework Classification
UTs	Union Territories
VC-NIC	Video Conference – National Informatics Centre
VPN	Virtual Private Network
WPI	Wholesale Price Index

Contents

1

Ministry of Mines : An Overview

Ministry of Mines
An Overview

1.1 Vision

(i) India is well endowed with natural resources, particularly minerals, which serve as raw material for many industries, paving a path for rapid industrialisation and infrastructural development. This, in turn, will facilitate the economy's ascent to a path of sustained growth and a five trillion-dollar economy.

(ii) During last eight years, the Government has introduced important reforms to open up the mineral sector to ensure its contribution in achieving the national policy goals. Major reforms include enactment of the Mines and Mineral (Development & Regulations) (MMDR) (Amendment) Act, 2015, which made the process of allocation of mineral concessions completely transparent by introducing public auctions with active participation of the State Governments. In the federal set up, States are owners of mineral wealth in their respective territories. For realising the benefits of mineral wealth, States have primary and significant role to come up with auctionable mineral blocks that have clearance, to start production.

(iii) The Vision is to double the production of important minerals in next 5 years with resultant reduction in import dependency, by allocating and regulating minerals in a transparent and sustainable manner and to promote exploration and mining of deep-seated minerals to meet country's needs and to effectively implement other policy goals stated in the National Mineral Policy, 2019, thereby enabling the country to progress towards attaining self-sufficiency in major mineral production.

Role and Organisation of the Ministry

Main Functions

1.2 Ministry of Mines is responsible for survey, exploration and mining of all minerals, other than natural gas, petroleum, 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.

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 related to mineral wealth 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 (GSI), Headquarters at Kolkata is an attached office and the Indian Bureau of Mines (IBM), 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; and
- Mineral Exploration and Consultancy Limited (MECL), Nagpur

Autonomous Bodies

1.6 There are two 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

Organisational Structure

1.7 The Ministry of Mines is headed by Shri Pralhad Joshi as the Minister of Mines, during the period of the report. Shri Pralhad Joshi assumed the charge, after the formation of new Government, on 31.05.2019, along with Parliamentary Affairs and Coal.

Shri Raosaheb Patil Danve has assumed the charge of Hon'ble Minister of State for Mines along with Railway and Coal after cabinet reorganization/ expansion on 07.07.2021.

1.8 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 Ministry of Coal, and Ministry of Mines), one Economic Adviser and Nine Directors / Deputy Secretaries, one Director (Economic Service), one Deputy Director (OL), one Assistant Director of IES, one Assistant Director (OL). 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.**

Table 1.1
Information in r/o Secretariat proper employees as on 31st December, 2022

Group	Sanctioned Strength	Total Number of present incumbents (Including general)	No. of SC/ST/OBC/Women/PH Candidates in present incumbents				
			SC	ST	OBC	Women	PH
Group-A Gazetted	34	31	02	04	02	05	01
Group-B Gazetted	37	14	01	01	01	06	01
Group-B Non- Gazetted	56	41	10	06	11	03	01
Group-C	86	57	11	01	03	07	02
Total	**213**	**143**	**24**	**12**	**17**	**21**	**05**

Contribution of Mining and Quarrying Sector to the Gross Value Added (GVA) of the Nation

1.9 As per the first advanced estimates of National Income for 2022-23 released by the National Statistical Office, Ministry of Statistics and Program Implementation, the 1st AE of GVA of mining and quarrying sector during 2022-23 at 2011-12 prices is Rs 335810 crore, which shows a growth of 2.39% as compared to PE of GVA during 2021-22 at Rs 327984 crore. The contribution of mining and quarrying sector is in **Table 1.2**

Table 1.2
Gross Value Added (GVA): Share/Contribution of Mining and Quarrying (%)

GVA in Rs crore at current prices		
Sector	**2022-23 (1st AE)**	**2021-22 (PE)**
Mining and quarrying	705034	513076
Total	**24726215**	**21349399**
Contribution in %	2.85	2.40

AE:- Advanced Estimate; PE : Provisional Estimate
Source: MoSPI, Press Note on First Advanced Estimates of National Income for the year 2022-23.

1.10 Major Highlights /Achievements of Ministry of Mines

1.10.1 NALCO operationalized all its 960 nos. of pot at its Smelter Plant on 12.01.2022, a milestone of achieving 100% capacity utilisation for the first time.

1.10.2 A meeting between Dr. Steffen Koch, Minister and Head of the Economic and Global Affairs, Embassy of the Federal Republic of Germany, New Delhi and Joint Secretary, Ministry of Mines, Government of India was held on 07.02.2022 through virtual platform to discuss various aspects of Indo-German cooperation in the Raw Materials sector.

1.10.3 Mines and Mineral (Development and Regulation) Act, 1957 (MMDR Act) has been amended through the Mines and Minerals (Development and Regulation) Amendment Act, 2021 w.e.f. 28.03.2021. The amendments, introduced provisions to give immediate boost to mineral production and improving ease of doing business.

1.10.4 The following rules have been framed and notified in pursuance of the MMDR Amendment Act, 2021:-

(i) The Mineral (Auction) Amendment Rules, 2022 were notified on 18.02.2022. In order to facilitate the auction of large area blocks, global positioning system has been allowed for identification and demarcation of the area where a composite licence is proposed to be granted through auction. Further, the requirement of classification of area to be auctioned, for composite licence, into forests land, land owned by the State Government, and land not owned by the State Government has been removed. The Mineral (Auction) Amendment Rules, 2022 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Mineral%20Auction%20Amendment%20Rules%202022.pdf

(ii) The Mineral Conservation and Development (Amendment) Rules, 2022 were notified on 11.04.2022 for allowing reporting of the data of Iron Ore from 45% to below 51% Fe and below 45% (for Magnetite). The Mineral Conservation and Development (Amendment) Rules, 2022 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/MCDR%20Amendment%20Rules%202022.pdf

(iii) The Reimbursement of Exploration Expenditure Rules, 2022 were notified on 03.06.2022 for reimbursement of exploration expenditure of the concession holders whose rights have lapsed under Section 10A(2)(b) of the MMDR Act, 1957. The Reimbursement of Exploration Expenditure Rules, 2022 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Reimbursem%202022.pdf

1.10.5 Ministry of Mines has amended the Second Schedule of the Mines and Minerals (Development and Regulation) (MMDR) Act, 1957 vide G.S.R. No. 204(E) dated 15.03.2022 for specifying the rate of royalty in respect of Glauconite, Potash, Emerald, Molybdenum, Platinum Group of Metals (PGM), Andalusite, Sillimanite and Kyanite. Further, Ministry of Mines has notified the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Amendment Rules, 2022 vide G.S.R. No.205(E) dated 15.03.2022 for specifying the average sale price of Glauconite and Potash.

1.10.6 In the year 2022, Thirteen accredited private exploration agencies were notified by the Ministry under the second proviso to sub-section (1) of section 4 of the MMDR Act, 1957 for the purpose of carrying prospecting operation without a prospecting license.

1.10.7 NALCO has been declared as the National Winner of prestigious Golden Peacock Award-2021 for Sustainability in the Mining & Metal sector. The Award recognizes our focus on environmentally-sustainable practices.

1.10.8 The 36th International Geological Congress (IGC), themed "Geosciences: the Basic Science for a Sustainable Future" was held during 20-22 March, 2022 on a virtual platform. IGC was inaugurated by Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, Shri Pralhad Joshi. It was a joint endeavour of the Ministry of Mines, Ministry of Earth Sciences, Indian National Science Academy and the Science Academies of Bangladesh, Nepal and Sri Lanka. Renowned geo-scientists across the globe have taken part as well as delivered lectures and shared their views on recent geological activities around the world.

1.10.9 As a part of 75 week-long celebrations in commemoration of 75 years of Indian Independence (Azadi ka Amrit Mahotsav), Ministry observed Iconic Week from 11.07.2022 to 17.07.2022. The different programmes conducted during the week are at **Annexure – 1.2**. Futher, a publication taken out by the Ministry on this occasion is placed at Ministry of Mines website on web link https://mines.gov.in/writereaddata/UploadFile/EnglishBookletIconicweek.pdf.

Photo: 1.1

1.10.10 The 61st meeting of the Central Geological Programming Board (CGPB) organized by Geological Survey of India (GSI) was held on 24.03.2022 under the Chairmanship of the Secretary, Mines at ICAR Pusa, New Delhi. Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, Shri Pralhad Joshi graced the occasion as Chief Guest. DG, GSI placed the Field Season Proposals of GSI for the year 2022-23 before the Board for discussion. GSI has formulated about 983 scientific programs for the year 2022-23, which includes 250 programs under mineral exploration. During this event, the Hon'ble Minister has handed over 07 resource bearing geological reports (G2 & G3 stage) and 50 geological memorandums of potential G4 mineral blocks developed by GSI to the respective state representatives for consideration in the auctioning process.

1.10.11 Vigilance Awareness Week was observed in the Ministry of Mines during the period 31.10.2022 to 06.11.2022. On this occasion, a message from the Hon'ble Minister of Mines was circulated in the Ministry and its Attached/Subordinate Offices and PSUs in order to create vigilance awareness among staff members of the Ministry/organizations as well as public. During the Vigilance Awareness Week, various competitions such as Essay, debate & Quiz competitions were organized in the Ministry where the staff members participated with full enthusiasm.

1.10.12 To promote research in mining and mineral sector an announcement has been made by Ministry of Mines inviting Science and Technology Project Proposals from Academic Institutions, Universities, National Institutes and R&D Institutions recognized by the Department of Scientific and Industrial Research, Government of India, for up to 3 years duration which have direct bearing on mineral sector, applied and sustainable aspect of mining and industrial applications. The Project proposals were required to be submitted online on the SATYABHAMA portal (https://research.mines.gov.in).

1.10.13 Ministry of Mines and offices under its control observed Swachhta Pakhwada 2022 from 16.11.2022 to 30.11.2022 for cleanliness of office premises, beautification, digitization and weeding out of old records. A committee has been constituted for recommendation regarding 'Swachhata Pakhwada Awards' for outstanding performance in Swachhta Pakhwada to three offices under Ministry of Mines.

1.10.14 State-wise Daily Report on utilization of the funds available under the District Mineral Fund (DMF) for supplementing and augmenting facilities of medical testing, and

screening as part of the Economic Response to C0VID-19 announced under the Pradhan Mantri Garib Kalyan Package is at **(Annexure –1.3)**.

1.10.15 With respect to Department of Administrative Reforms & Public Grievances (DAR&PG) Office Memorandum No. 30011/02/2021-O&M (e No. 5866) dated 14.12.2021 the progress report on "Increasing Efficiency in Decision Making in Government" is given at **Annexure – 1.4.**

1.10.16 An interactive meeting was held on 20.04.2022 between officials of Geological Survey of India (**GSI**) and representatives of Geological, Mining and Metallurgical Institute (**INGEMMET**), **Peru** on formulation of Inter-institutional Cooperation Agreement.

1.10.17 An Indian delegation led by the Secretary (Mines) Shri Alok Tandon participated in 'Mining Indaba- 2022 (a conference and mining exhibition) in Cape Town, South Africa from 9th to 12th May, 2022. Representatives from the Ministries of Coal, Steel, MEA and GSI including State Governments and CPSUs & SPSUs also attended this event. An Indian pavilion was setup at Mining Indaba-2022 to showcase mineral potential and opportunities in India and Indian Government policies regarding mining sector.

1.10.18 An interactive meeting between Geological Survey of India (GSI) and Geological Survey of Finland (GTK) under the GSI-GTK, Finland MoU was held virtually on 17.05.2022 and 18.05.2022 to discuss on pertinent points for exploring the possibility of collaboration in Urban and Engineering geology, Geochemical Mapping and preparation of Geochemical Atlas between two organizations.

1.10.19 A meeting between the Geological Survey of India (GSI) and Geoscience Australia (GA) under the MoU was held through videoconferencing on 24.05.2022 to discuss on finalization of the Term of Reference (TOR) and any clarification under the MoU between GSI-GA as well as Critical mineral targeting, Digital Core Library and other projects.

1.10.20 A delegation led by Additional Secretary, Ministry of Mines visited Australia during 30th May to 3rd June, 2022 to review the progress status, interact with various agencies for carrying out due diligence process and also meet prospective project owners including site visits for potentional collaboration and acquisition of assets in Lithium and Cobalt projects.

1.10.21 Ministry of Mines and its field formations celebrated 8th International Yoga Day (**IYD**) on 21.06.2022, officers and officials of Ministry and Employees along with their family members, school students and teachers across the operating units of CPSEs and HQs/ Regional/SUs of GSI and IBM participated in the exclusive Yoga session on the occasion.

1.10.22 The final list of awardees for National Geoscience Awards 2019 was announced on 30.06.2022. The number of awards given under different categories is as follows:

- 1 National Geoscience Award for Excellence,
- 1 Young Scientist Award and
- 16 National Geoscience Award under four sections which include 12 individual awards
- 3 team awards & 1 Joint Award.

1.10.23 A high level delegation led by Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, Shri Pralhad Joshi, visited Australia from 02.07.2022 to

09.07.2022 to enhance co-operation between the two countries in mining sector. During the visit, the delegation met Hon'ble Minister for Resources and Northern Australia Madeleine King MP and discussed cooperation in strategic minerals especially lithium. Hon'ble Minister of Mines also met top management officials of mining companies operating in Australia and carried out discussions around multiple aspects of India-Australia ties to boost trade, investment and knowledge sharing.

1.10.24 In the 6th National Conclave on Mines & Minerals held at New Delhi on 12.7.2022, Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, Shri Pralhad Joshi felicitated forty mines securing five Star rating for the reporting year 2020-21 and launched three modules of Mining Tenement System namely Registration, Returns and Mining Plan Approval System.

Photo: 1.2

Photo: 1.3

Photo: 1.4

In the Conclave, Rashtriya Khanij Puraskar in three categories of minerals with award money of Rs. 3 Cr., Rs. 2 Cr. And Rs. 1 Cr. for 1st, 2nd and 3rd positions respectively in each category has been given for the year 2019-20 and 2020-21 to different states.

Photo: 1.5

Photo: 1.6

Further, in order to encourage the States to auction mineral blocks, following incentives are provided by the Ministry:

i. Rs. 20 lakh to those States where potential mineral blocks are available for auction.

ii. Rs 20 lakh for each successful auction of mineral block conducted by the State Government.

iii. Reimbursement of 50% of Transaction Advisor fee for conducting auction subject to a maximum of Rs. 5 lakh for each block which was put up for auction but could not be successfully auctioned.

Photo: 1.7

A total of Rs. 21.02 Cr has been released to States in the above categories during 6th National Conclave on Mines & Minerals.

1.10.25 National Geoscience Award Ceremony was also held on 12.07.2022 as a part of 6th National Conclave on Mines & Minerals at Dr. Ambedkar International Centre, New Delhi. One National Geoscience Award for Excellence, one Young Scientist Award and sixteen National Geoscience Award under four sections which include 12 individual awards, 3 team awards & 1 Joint Award were awarded in the award ceremony.

Photo: 1.8

1.10.26 A Memorandum of Understanding (MoU) between India and Argentina for cooperation in the field of Mineral Resources has been signed on 26.08.2022 at Buenos Aires by Mr. Dinesh Bhatia, Ambassador of India to Argentina & Uruguay, on behalf of India and Ms. Maria Fernanda Avila, Secretary - Ministry, Secretariat of Mining of the Ministry of Economy of the Argentine Republic, on behalf of Argentina. The MoU was signed in presence of Hon'ble External Affairs Minister Dr. S. Jaishankar and the Argentine Foreign Minister H.E. Mr. Satiago Cafiero, after the India-Argentina Joint Commission Meeting, jointly presided over by two Ministers, which was held on same day at Buenos Aires.

1.10.27 A meeting between CSIRO, Australia headed by Dr. Rob Hough, Director, CSIRO, Mineral Resources (Australia) and Ministry of Mines headed by Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines was held on 05.09.2022 in New Delhi to discuss issues focusing on critical minerals, the essential ingredients for the technologies that power the energy transformation and provides solutions as we strive towards achieving a Net Zero world.

1.10.28 Ministry of Mines organized the National Mines Ministers' Conference (**NMMC**) from 09.9.2022 to 10.9.2022 in Hyderabad Telangana. Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, Shri Pralhad Joshi inaugurated the NMMC. The event was graced by Mines Ministers' from 11 States, Principal Secretaries/ Special Secretaries (Mines) and DGMs/DMGs from 19 States and 01 Union Territory along with the officials of Ministry of Mines, Ministry of Coal and Ministry of Steel. CMDs from 14 CPSEs of Ministry of Mines, Coal and Steel and heads of 10 Notified Private Exploration Agencies.

- During the conference, Hon'ble Minister of Mines inaugurated a digital platform called 'The Mining Arena'. This is an interactive platform which will give the people first-hand experience and information about working of the Ministry of Mines.

Photo: 1.9

1.10.29 The Geological Survey of India (**GSI**) participated in the 2nd United Nations World Geospatial Information Congress (**UNWGIC, 2022**) held at Hyderabad International Convention Centre (**HICC**), Hyderabad from 10th to 14th October, 2022. The theme for the Congress was '*Geo-Enabling the Global Village: No one should be left behind*,' The activities of GSI, BHUKOSH, 3D-sub surface Models, rock samples were demonstrated to the national as well as international fraternity in the Make in India Pavilion.

1.10.30 An interactive meeting between GSI and Geoscience Australia (**GA**), as per the MoU, was held through videoconferencing on 13.10.2022. The meeting discussed the modalities of the implementation of the recently signed Terms of Reference (**ToR**) between the two organizations, particularly with reference to critical mineral targeting, Regional Mineral Targeting (**RMT**) project, Digital Core Library, DSRS and Magne to Telluric Surveys in India.

1.10.31 The first North East Geology and Mining Ministers' Conclave was chaired by Hon'ble Minister for Coal, Mines and Parliamentary Affairs on 31.10.2022 at Nagaland. Following significant decisions taken at the said Conclave:

- o The request to the Ministry of DONER for NEC Funding Guidelines to include "Geological and Mineral Development".
- o On receipt of proposals from the NE State Governments Rs. 5.00 crore will be given as advance for capacity building/ training etc. by the Ministry of Mines.
- o NE State Governments may nominate candidates/trainees for capacity building/ training/ equipment assistance in Geo-technical and Geo-spatial Technology in the training programmes conducted by GSI and IBM.

Photo: 1.10

1.10.32 Secretary (Mines) visited Bharat Gold Mines Limited (**BGML**), a closed PSU under the Ministry of Mines on 12.10.2022 to understand and close various issues pertaining to BGML. Subsequent to that following Progress achieved:

- o To expedite monetization of dumps in BGML is in the final stages of hiring a Transaction Advisor who will assist BGML in disposing off the tailings of BGML.

- After taking consent of Company Court of High Court of Karnataka BGML has hired MSTC to auction the assets lying in Andhra Pradesh.
- Discussion was held with the State Government of Karnataka for expediting the process of mutation of balance land in the name of BGML & land further mutated in the name of BGML taking total mutated land to 9060 acres.

1.10.33 Special Campaign 2.0: Ministry successfully conducted the Special Campaign 2.0 launched by Secretary (Mines) from 2nd October to 31st October 2022. Regular meetings were taken with all Senior Level Officers and Heads of the Field Formations to review the progress made by different Divisions/ Sections of the Ministry. During Special Campaign 2.0. Ministry of Mines alongwith its attached offices/subordinate offices and PSUs have reviewed 3,36,358 files which was more than the set target. Futher during this campaign 147 Swachhta Programmes were conducted at 85 sites including far flung out-station offices. Ministry of Mines along with its attached offices/subordinate offices and PSUs have been able to clear 114084 sq. feet of area during this phase. The revenue generated from scrap disposal during this campaign is Rs.4,00,20,768/- (Rupee Four Crore twenty thousand seven hundred and sixty eight only).

The Ministry achieved 100% of its targets under the following heads:

- References from Member of Parliament
- Public Grievances
- References from State Governments
- PMO References
- Record Management
- Cleanliness Campaigns

The theme for the Ministry was giving back to nature. Under the said theme the Field Offices prepared compost pits, vermi compost plants and installed rain water harvesting system, which were showcased by the DARPG in their exhibition at Vigyan Bhawan on 19th & 23rd December, 2022.

1.10.34 Secretary (Mines) led an Indian delegation to participate in the International Mining and Resources Conference (**IMARC**) - 2022 during 2nd to 4th November, 2022 held in Sydney, Australia. On the sidelines of this event, the Ministry of Mines, with the support of the Australian side, facilitated deliberations of the Indian business delegation comprising battery manufactures with the Australian critical minerals manufacturing companies. During the visit, the 3rd Meeting of the Joint Working Group under the MoU between India and Australia for cooperation in the field of Mining and Processing of Critical and Strategic Minerals, was also held on 01.11.2022 in Sydney, Australia.

1.10.35 A delegation of Khanij Bidesh India Ltd. (KABIL) visited Argentina from 20th November, 2022 to 03rd December, 2022 to evaluate and assess two prospective projects of lithium for exploration in Catamarca Province in Argentina.

1.10.36 An Indian delegation led by Shri Sanjay Lohia, Additional Secretary, Ministry of Mines alongwith Senior Officers of GSI & IBM participated in the 18th Annual General Meeting (**AGM**) of the Inter-Governmental Forum (**IGF**) on Mining, Minerals, Metals and Sustainable Development under the aegis of the United Nations Conference on Trade and Development (**UNCTAD**) during 7th - 10th November, 2022 at Geneva, Switzerland.

1.10.37 Since the amendment of MMDR Act, 1957 in 2015, a total of 224 mineral blocks have been auctioned till 31.12.2022 across 10 States. 8 mineral blocks (5-Iron ore, 1-Gold, 1-Ni, Cr & associated PGE Minerals and 1-Phosphorite) in the States of Chhattisgarh, Uttar Pradesh and Goa were successfully auctioned in the month of December, 2022. Further, 23 new NITs for Iron ore, Ni, Cr and associated PGE Minerals, Manganese, Bauxite, Copper, Basemetal and REE & Graphite blocks have been issued for the States of Chhattisgarh and Madhya Pradesh in the month of December, 2022.

1.10.38 Pradhan Mantri Khanij Kshetra KalyanYojna (**PMKKKY**) is being implemented through the funds collected under District Mineral Foundation (**DMF**) and till November, 2022, Rs. 71,917.07 Cr. was collected (monthly collection in November, 2022- Rs 788.36 Cr.). Till November, 2022, Rs.64,954.44 Cr. stands allocated and Rs. 38,562.64 Cr. has been spent. A total of 2,55,889 projects have been sanctioned under the scheme and out of them, a total of 1,37,818 projects have been completed so far.

1.10.39 Focusing on accelerating the pace of auction of mineral blocks, several meetings at different levels were held by the Ministry. Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, Shri Pralhad Joshi chaired two Review Meetings on Auction of Blocks as well as Investor Conclave, one at Mumbai on 01.12.2022 and second at Bengaluru on 03.12.2022. He also chaired a meeting on 29.12.2022 at Bhubaneswar (Odisha) to review the progress of Coal & Mining Sector with the State Government of Odisha.

1.10.40 To increase profitability through value addition, NALCO launched a new product – Aluminum LED Cap Stock on 29/12/2022. The first consignment was also dispatched from its smelter plant at Angul on the occasion. The product is used in the manufacturing of aluminum caps in LED bulbs.

2

Minerals and Metals in the Country

Minerals and Metals in the Country

National Mineral Scenario

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 mineral resources of fuel, metallic and non-metallic minerals including minor 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 the value as well. 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).

Index of Mineral Production

2.3 Based on the overall trend so far the index of mineral production (base 2011-12 =100) for the year 2022-23 (upto November) is estimated to be 110.8 as compared to 105.8 of previous year showing a positive growth of 4.7%. The trend of index of mineral production and trend in value of mineral export and import 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**.

2.4 The total value of mineral production (excluding atomic, fuel minerals & minor minerals) during 2022-23 has been estimated at Rs.107446 crores, which shows a decrease of about 19% over that of the previous year. During 2022-23, estimated value for metallic minerals is Rs. 95838 crores or 89% of the total value and non-metallic minerals (excluding Minor Minerals) is Rs. 11608 crores or 11% of the total value. Information on production and value of minerals from 2017-18 to 2022-23 (upto November 2022) is given in **Annexure 2.1**. The details of export and import of Minerals during the period 2017-18 to 2021-22 and value of mineral production is given in **Annexure 2.2** and **Annexure 2.3** respectively.

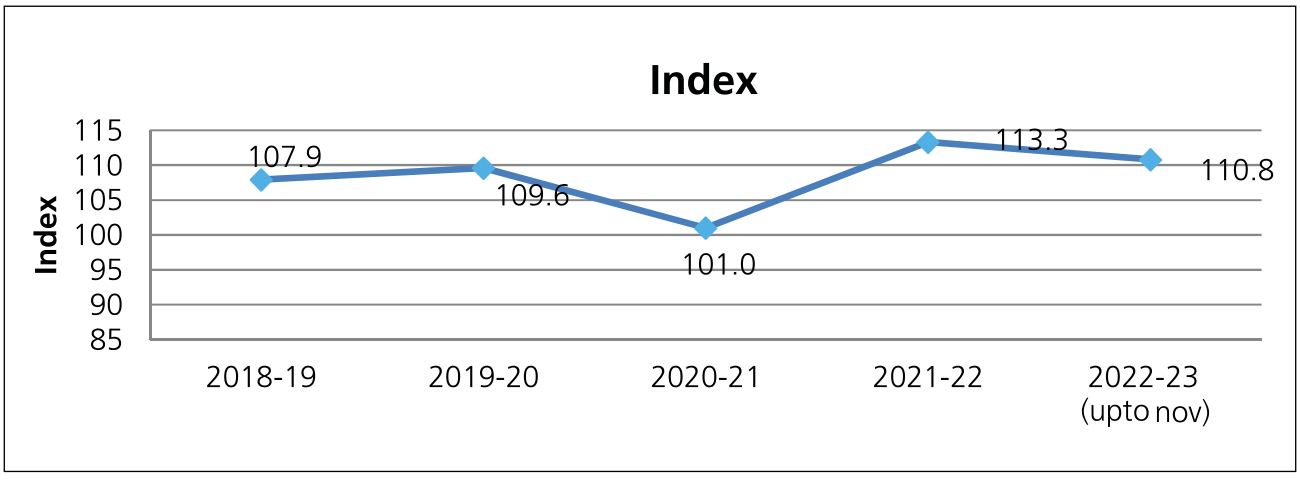


Figure 2.1: Index of mineral production (Base 2011-12=100)

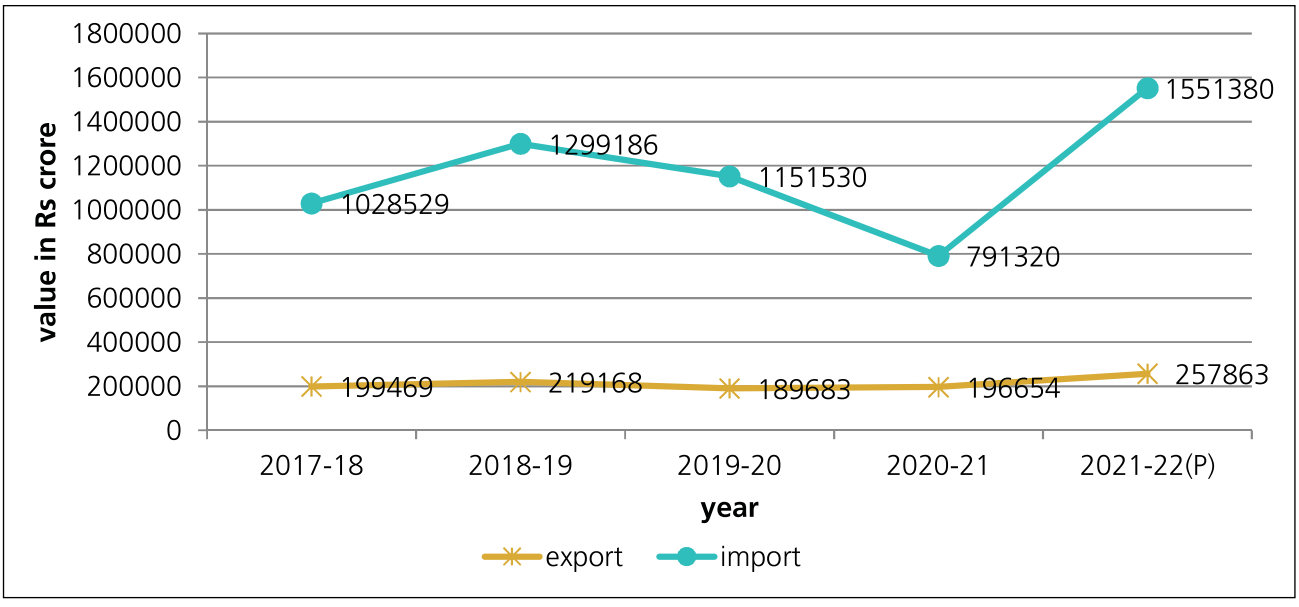


Figure 2.2: Trends in Value of Mineral Exports & Imports

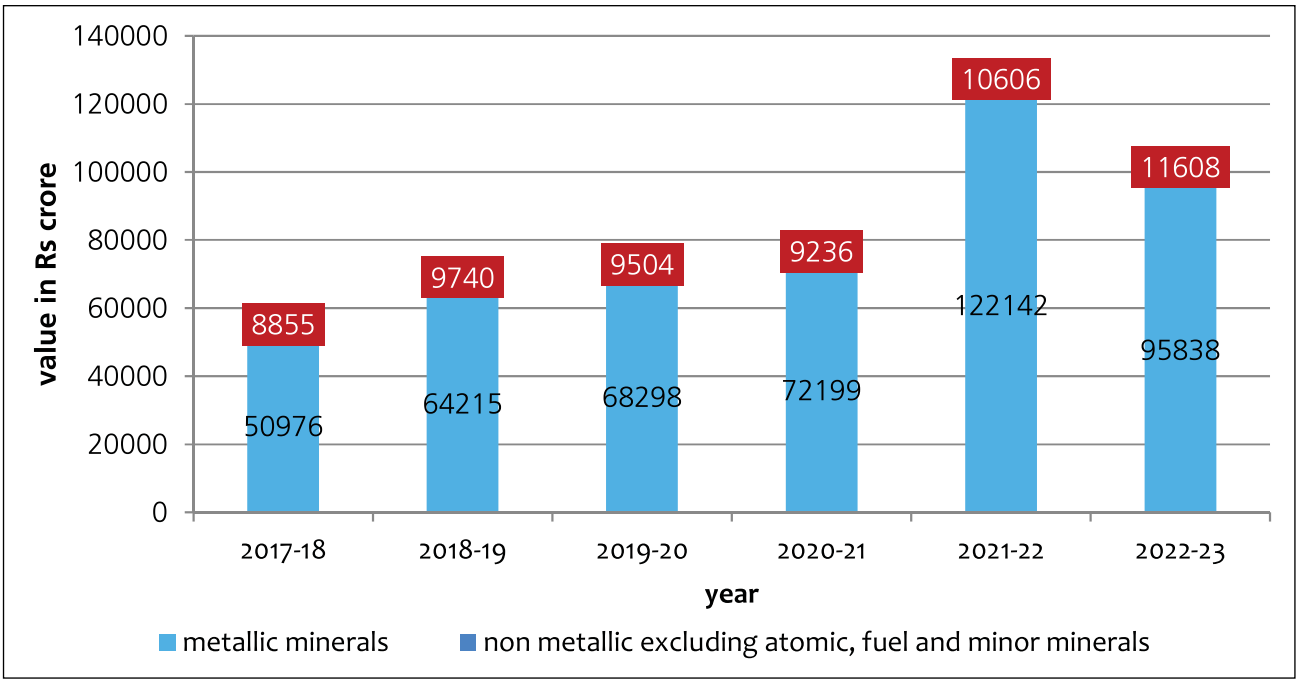


Figure 2.3: Value of Minerals Production (by groups)
(excluding atomic & fuel minerals) (2022-23 figures are estimated)

Source: Monthly statistics on mineral production of IBM.

Price Trend

2.5 The WPI for minerals (base 2011-12=100) stood at 196.7 in November 2022 and the corresponding index was 190.3 for November 2021.

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 sillimanite.

The wholesale price index for metallic minerals was 182.6 in November 2022 as compared to 194.7 in November 2021 and that of other minerals was 246.2 in November, 2022 as compared to 212.1 in November, 2021. Source of this particular information is www.eaindustry.nic.in.

Mining

2.7 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 1319 in 2021-22 as against 1375 in the previous year.

2.8 Out of 1319 reporting mines, most of the mines reported are in Madhya Pradesh followed by Gujarat, Karnataka, Odisha, Chhattisgarh, Andhra Pradesh, Rajasthan, Tamil Nadu, Maharashtra, Jharkhand and Telangana.

2.9 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 **Table2.2.**

Table 2.1
Number of Reporting Mines

Sector	2019-20(P)	2020-21(P)	2021-22(E)
All Minerals*	1385	1375	1319
Metallic Minerals	602	608	545
Non-Metallic Minerals	783	767	774

P = Provisional

Table 2.2
Area Wise Status of Lease
(Frequency In Hectare)

(Other than Atomic, Hydro Carbons Energy & Minor Minerals) as on 31/03/2021(P) (All India)

Frequency (Hectare)	No. of Leases	Lease area (Hectare)
01 to 50	338	37983.89
51 to 100	56	892.75
101 to 200	-	-
201 to 300	249	14340.48
301 to 500	711	82102.59
Above 500	1960	171079.05
Total	**3314**	**3,06,398.76**

Sources: *Respective State Governments (DGMs/DMGs etc); However, the data received from respective regional offices of IBM have also been taken in account wherever necessary. (P): Provisional*

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

Table 2.3
Number of Underground Mines 2021-22(P) @ (By Principal Minerals)

Minerals	'A' Category	'B' Category	Total
Chromite	2	-	2
Copper ore	8	-	8
Gold	8	-	8
Lead & Zinc	10	-	10
Manganeseore	17	-	17
Rock Salt	1	-	1
Vermiculite	-	6	6
Total	**46**	**6**	52

@ excluding fuel, atomic & minor minerals;

'A' Category: Mechanized Mines: >150 labour in all or >75 labour in workings below ground;

'B' Category: Other than 'A' category

2.11 During the year 2021-22, mineral production was reported from 19 States of which the bulk of value of mineral production of about 97.04% was confined to 7 States only. The order was Odisha with a share of 44.11% followed by Chhattisgarh (17.34%), Rajasthan (14.10%), Karnataka (13.24%), Jharkhand (4.36%), Madhya Pradesh (2.44%), and Maharashtra (1.45%) in the total value of mineral production. Remaining 12 States have cumulative share of less than 3% of total value during the 2021-22. The contribution of States/Regions in the value of mineral production during 2021-22 is pictorially shown in **Figure 2.4**.

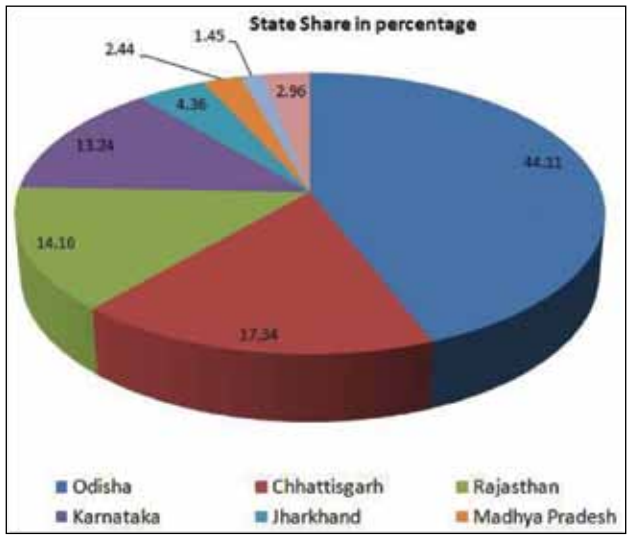


Figure 2.4: *Share of States in Value of Mineral Production 2021-22 (Excluding Atomic, Fuel Minerals, and minor minerals)*

Source: Statutory returns submitted to IBM

2.12 The States, which have indicated an increase in the value of mineral production, are Odisha (94.89%), Jharkhand (90.18%) , Karnataka (62.22%), Chhattisgarh (60.88%), Maharashtra (59.30%), Madhya Pradesh (21.92%), Bihar (21.59%), Andhra Pradesh (20.67%), Rajasthan (19.02%), Jammu & Kashmir (UT) (18.02%), Assam (14.45%), Telangana (14.29%), Himachal Pradesh (12.89%), Tamil Nadu (9.52%), Meghalaya (6.80%), Kerala (4.30%), Gujarat (3.88%) and Uttarakhand (2.57%). However, some of the principal mineral producing States revealed decrease in value of mineral production and those include Uttar Pradesh (-24.62%) and Goa (-100.00%).

2.13 All India Reserves and Resources of various minerals as on 01.04.2020, as per parameters of UNFC System are given in **Annexure 2.4**.

2.14 During the year 2021-22, the Private Sector contributed for 58.54% or Rs. 77713 crore (including metallic and non metallic) in the total value. The minerals which were wholly mined/ recovered by the private sector in 2021-22 were Garnet, Iolite, Lead conc, Limeshell, Siliceous earth, Sillimanite, Wollastonite, Zinc conc, Lead and zinc ore, Marl and Moulding sand. In 2021-22, the Private Sector accounted for sizeable 97.13% of Limestone, 77.43% of Vermiculite, 69.26% of Chromite, 60.70% of Iron Ore, 54.05% of Manganese Ore, 53.81% of Kyanite and 50.80% of Bauxite.

During the year 2021-22, the Public Sector contributed for 41.46% or Rs. 55034 crore (including metallic and non metallic) in the total value. The minerals which were wholly mined / recovered by the public sector in 2021-22 were Copper ore and concentrate, Diamond, Fluorite (graded), Rock salt, and Sulphur. In 2021-22, the Public Sector accounted for sizeable 99.08% of Gold Ore, 94.39% of Tin concentrate, 92.87% of Phosphorite, 90.75% of Selenite, 63.24% of Graphite and 54.03% of Magnesite

2.15 As per World Mineral Production, 2016-20, British Geological Survey, India's ranking in 2020 in world production in term of quantity was 2nd in Steel (crude/liquid) followed by 3rd in Zinc (slabs) and aluminium (primary);

4th in chromite and iron ore; 5th in Manganese ore; 6th in Bauxite; 7th in copper (refined); 15th in apatite & rock phosphate; and 17th in mangnesite. 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, 2020

Sector	Unit of Commodity	Production (quantity)		Contribution (Percentage)	India's rank in World order $
		World	India*		
Metallic Minerals					
Bauxite	'000 tonnes	368600	20368	5.53	6th
Chromite	'000 tonnes	31000	2863	9.24	4th
Iron ore	million tonnes	3016	204	6.76	4th
Manganese ore	'000 tonnes	49600	2688	5.42	5th
Industrial Minerals**					
Magnesite	'000 tonnes	28300	78	0.28	17th
Apatite & rock phosphate	'000 tonnes	221000	1455	0.66	15th
Metals					
Aluminium (Primary)	'000 tonnes	65400	3619	5.53	3rd
Copper (refined)	'000 tonnes	24900 1/	364#	1.46	7th
Steel (crude/liquid)	million tonnes	1857	104	5.60	2nd
Lead (refined) e##	'000 tonnes	12500 2/	214#@	1.71	3rd
Zinc (slab)	'000 tonnes	13800	715	5.18	3rd

Source: *World Mineral Production, 2016-2020, British Geological Survey for World mineral production and MCDR returns & individual plants for production with respect to India.*

** Figures relate to 2020-21.*

*** Minerals declared as minor minerals vide Government of India Notification S.O. 423(E) dated 10thFebruary, 2015 are not included due to non-availability of production with respect to India.*

$: India's rank based on production mentioned in World Mineral Production 2016-20, British Geological Survey.

1/ Figures relate to both primary and secondary refined copper, whether electrolytic or fire refined. Metal recovered from secondary materials by remelting alone is excluded.

2/ Figures relate to both primary and secondary refined lead and include the lead content of antimonial lead.

#: production of copper (refined) and lead refined during 2020 was 697 and 818 thousand tonnes, respectively, as per World Mineral Production, 2016-2020 which includes both primary and secondary production.

@: Production of lead (primary).

Note: Data in respect of World Mineral Production is on calendar year basis, however, the data on India's production is based on financial year.

Self-reliance in Minerals & Mineral Based Products

2.16 India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials that are supplied to industries, such as, iron & steel, aluminium, cement, various types of refractories, china

clay-based ceramics, glass, etc. India is self-sufficient or near to self-sufficient in bauxite, chromite, iron ore and limestone. India is deficient in kyanite, magnesite, manganese ore, rock phosphate, sillimanite, etc. which were imported 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 & semi-precious stones by the domestic Cutting and Polishing Industry, India is dependent on imports of raw uncut stones for their value-added re-exports. Degree of Self-sufficiency in Principal Minerals & Metals, 2019-20 (P) is furnished in **Table 2.5.**

Table 2.5
Degree of Self-sufficiency in Principal Minerals & Metals, 2020 - 21 (P)

Sl. No.	Commodity	Demand/Domestic Consumption ('000 tonnes)	Supply/Domestic supply ('000 tonnes)	Order of self-sufficiency (%)
Minerals				
1	Bauxite	23162	20369	88
2	Chromite	3017	2864	95
3	Iron ore	147524	204481	100
4	Kyanite	5.9	4.9	83
5	Limestone	368439	3491701/	95
6	Magnesite	437	78	18
7	Manganese ore*	6664	2688	40
8	Rock phosphate (including apatite)*	9236	1456	16
9	Sillimanite	6.7	11.1	100
Metals				
10	Aluminium (primary)	2944	3619	100
11	Copper (refined)	7202/	364	50
12	Lead (primary)	2843/	214	76
13	Zinc	5554/	715	100

Source: MCDR Returns for production and DGCI&S for export & import.

Apparent consumption = production+ import-export

: *Minerals declared as minor mineral vide Government of India Notification S.O. 423(E) dated 10th February, 2015, are not included due to non-availability of production for the year 2020-21.*

1/ Excludes production of limestone as a minor mineral, calcite & chalk and includes limeshell, limekankar& marl.

2/ Based on production of copper cathode and imports & exports of copper & alloys.

3/ Based on production of lead (primary), and imports & exports of lead & alloys.

4/ Based on production of zinc (ingots) and imports & exports of zinc & alloys.

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 are imported to meet the requirement in certain specific end-uses.

Production Trends

Metallic Minerals

2.17 The value of metallic minerals in 2021-22 at Rs. 122142 crore increased by about 69.18% over the previous year. Among the principal metallic minerals, iron ore contributed Rs 96381 crore or 78.91%, Zinc concentrate Rs. 8182 crore or 6.70%, chromite Rs. 4730 crore or 3.87%, Silver Rs 4212 or 3.45%, Bauxite Rs. 2477 crore or 2.03%, lead concentrate Rs. 2237 crore or 1.83%, manganese ore Rs. 2224 crore or 1.82%, copper (concentrate) Rs. 1095 crore or 0.90%, and Gold Rs. 601 crore or 0.49%.

2.18 The production of bauxite at 22.49 million tonnes in 2021-22 increased by 10.37% compared to the previous year. Four major companies, namely NALCO (33.12%), Utkal Alumina International Limited (26.67%), Odisha Mining Corporation (13.34%), HINDALCO (9.64%) dominated the total mining activities of bauxite of the country in 2021-22. Odisha accounted for 73.13% of the total output of bauxite during 2021-22 followed by Gujarat 8.97%, Jharkhand 8.04%, Chhattisgarh 4.30%, Maharashtra 2.85%, and Madhya Pradesh 2.71%.

2.19 The production of chromite at 3.79 million tonnes in 2021-22 increased by 33.75% as compared to the previous year. Odisha reported almost entire output of chromite (100%) in the country. Private sector producers; viz, Tata Steel Mining Ltd. (47.28%), INDIAN METALS & FERRO ALLOYS LTD. (14.78%), Ferro Alloys Corporation Ltd. (6.66%), Balasore Alloys Ltd (0.54%), cumulatively accounted for 69.26% of total production during 2021-22. Public Sector Company, Odisha Mining Corporation (OMC) reported 30.74% of the total production in 2021-22.

2.20 The production of copper concentrate at 114.42 thousand tonnes in 2021-22 increased by about 5.25% as compared to the previous year. Madhya Pradesh contributed 56.83% and Rajasthan 43.17% in total output.

2.21 The production of primary gold at 1251 kg in 2021-22 registered increase of about 10.99% as compared to the previous year. Karnataka was the leading producer of gold accounting for 99.07% of the total production. The remaining production was reported from Jharkhand.

2.22 The production of iron ore at about 253.97 million tonnes in 2021-22 registered an increase of 23.86% over the previous year. About 39.30% of the total production was shared by Public Sector Companies like NMDC (16.07%), SAIL (13.31%), Odisha Mining Corporation (9.01%), etc. The share of Private Sector was 60.70% which included JSW Steel Ltd. (12.45%), Tata Steel (11.47%), Rungta Mines (5.56%), Vedanta Ltd (2.32%) and Arecelor Mittal India private ltd (2.16%), etc. Almost the entire production of iron ore (98.62%) accrued from Odisha (53.82%), Chhattisgarh (16.27%), Karnataka (15.88%), Jharkhand (9.74%) and Madhya Pradesh (2.91%) during the year. The remaining 1.38% production was reported from Maharashtra, Rajasthan and Andhra Pradesh.

2.23 During the year 2021-22, the production of lead concentrate at 368 thousand tonnes decreased by 2.36% and that of zinc concentrate at 1594 thousand tonnes showed an increase of 5.29% over the previous year. Rajasthan accounted for the entire production of lead concentrate and zinc concentrate during the year 2021-22.

2.24 The production of manganese ore at 2.695 million tonnes in 2021-22 decreased by about 0.27% compared to that in the previous year. MOIL continued to be the largest producer of manganese ore with a share of 45.79% of the total production in 2021-22 followed by, Sandur Manganese & Iron Ores Ltd (10.58%), Tata Steel (10.45%). Of the total production of manganese ore in 2021-22, Madhya Pradesh contributed 31.50%, Maharashtra 27.14%, Odisha contributed 19.01%, Karnataka 14.10%, Andhra Pradesh 7.57%.

Non-Metallic Minerals

2.25 The value of production of non-metallic minerals at Rs 10606 crore during 2021-22 increased by 14.83% as compared to the previous year. Limestone retained its leading position by contributing 91.79% of the total value of non-metallic minerals in the year 2021-22. The other non-metallic minerals in the order of importance were phosphorite (7.18%), magnesite (0.42%), marl (0.31%), wollastonite (0.09%), graphite (0.09%), garnet (abrasive) (0.03%), siliceous earth (0.02%), diamond (0.02%), kyanite (0.02%), fluorite (0.01%), sillimanite, rock salt, moulding sand, vermiculite, selenite, limeshell, iolite.

2.26 The production of limestone was at 393 million tonnes in the year 2021-22 increased by 12.50%, as compared to that in the previous year. Limestone is widely produced in India. As much as, 91.28% of the total output in the year 2018-19 was contributed by nine principal States; viz, Rajasthan (22.32%), Andhra Pradesh (12.80%), Madhya Pradesh (12.77%), Chhattisgarh (10.66%), Karnataka (10.03%), Telangana (7.26%), Gujarat (5.99%), Tamil Nadu (5.43%), and, Maharashtra (4.01%).

2.27 The production of magnesite at 113 thousand tonnes during 2021-22 increased by 52% as compared to that in the previous year. Tamil Nadu contributed 71.38% of the total production during 2021-22. The remaining was reported from Uttarakhand (22.40%) and Karnataka (6.22%).

2.28 The production of phosphorite at 1395 thousand tonnes in 2021-22 has decreased by 4.17% as compared to that in the previous year. Rajasthan contributed 91.85% and the rest was accrued from Madhya Pradesh (8.15%).

Minor Minerals

2.29 The value of production of minor minerals was estimated at Rs 79110 crore in the year 2020-21. Telangana with share of 21.79% in the value of minor minerals produced in the country occupied the top position. Rajasthan was at second place and had a share of 19.08% in the value of minor minerals. Next in the order was Andhra Pradesh with a share of 15.32%, Maharashtra 7.94%, Uttar Pradesh 7.10%, Gujarat 6.06%, Bihar 5.04%, Kerala 4.86%, Madhya Pradesh 4.68%, Karnataka 2.42%, West Bengal 2.31% and Chhattisgarh 1.31%. The cumulative contribution of remaining States and UTs was 1.72%.

State-wise Mineral Scenario

2.30 Status of mineral rich states of India is at **Annexure 2.5.**

3

Legislative Framework, Mineral Policy and Implementation

Legislative Framework, Mineral Policy and Implementation

National Mineral Policy, 2019

3.1 National Mineral Policy, 2019 has been approved by the Union Cabinet on 28.02.2019.

3.2 National Mineral Policy, 2019 replaced the extant National Mineral Policy 2008 ("**NMP 2008**"). The impetus to review NMP 2008 came about by way of a direction from the Supreme Court vide its judgment dated 02.08.2017 in Writ Petition (Civil) No. 114/2014 titled Common Cause vs. Union of India & Others.

3.3 Objective

The aim of National Mineral Policy 2019 is to have a more effective, meaningful and implementable policy that brings in further transparency, better regulation and enforcement, balanced social and economic growth as well as sustainable mining practices.

3.4 Details

The National Mineral Policy, 2019 includes provisions which will give boost to mining sector such as:

- Introduction of Right of First Refusal for RP/PL holders;
- Encouraging the private sector to take up exploration;
- Auctioning in virgin areas for composite RP cum PL cum ML on revenue share basis;
- Encouragement of merger and acquisition of mining entities;
- Transfer of mining leases and creation of dedicated mineral corridors to boost private sector mining areas;
- Proposes to grant status of industry to mining activity to boost financing of mining for private sector and for acquisitions of mineral assets in other countries by private sector;
- Proposes to auction mineral blocks with pre-embedded clearances to give fillip to auction process;
- Proposes to make efforts to harmonize taxes, levies & royalty with world benchmarks to help private sector.

3.5 National Mineral Policy, 2019 focuses on Make in India initiative and gender sensitivity in terms of the vision. In so far as the regulation in minerals is concerned, the main focus of the policy is on ease of doing business by adopting e-Governance, IT enabled systems, awareness and information campaigns. Regarding the role of State in mineral development online public portal with provision for generating triggers at higher level in the event of delay of clearances has been suggested. NMP 2019 aims to attract private investment through incentives while the efforts would be made to maintain a database of mineral resources and tenements under mining tenement system. The new policy focuses on use of coastal waterways and inland shipping for evacuation and transportation of minerals and encourages dedicated mineral corridors to facilitate the transportation of minerals. The NMP 2019 reiterates the utilization of the district mineral fund for equitable development of project affected persons and areas. NMP 2019 proposes a long-term export-import policy for the mineral sector to provide stability and as an incentive for investing in large scale commercial mining activity.

3.6 The NMP 2019 also introduces the concept of Inter-Generational Equity that

deals with the well-being not only of the present generation but also of the generations to come and also proposes to constitute an inter-ministerial body to institutionalize the mechanism for ensuring sustainable development in mining.

3.7 Benefits

The NMP 2019 ensures sustainable development in the mining sector while addressing the issues of project affected persons especially those residing in tribal areas. It provides for devolution of mining benefits to project affected persons.

Measures taken to control illegal mining:

3.8 Illegal mining means any reconnaissance or prospecting or mining operation undertaken by any person or a company in any area without holding a reconnaissance permit or a prospecting license or, as the case may be, a mining lease as required under sub-section (1) of section 4 of the MMDR Act. Section 23C of Mines and Minerals (Development and Regulation) Act 1957, empowers the State Governments to frame rules to prevent illegal mining and the State Government may, by notification in the official gazette, make such rules for preventing illegal mining, transportation and storage of minerals and for the purposes connected therewith in the State.

3.9 There is a three-pronged strategy for prevention of illegal mining viz. constitution of task force by the State Governments at State and District Level, framing of rules under Section 23C of the MMDR Act, 1957 and furnishing of quarterly returns on illegal mining for review to the Central Government. The details of States who have constituted task force at State level, framed Rules under section 23C of the MMDR Act, 1957 and have furnished quarterly returns on illegal mining to IBM are as follows:

(i) **Constitution of State Level Task Force:** 22 State Governments have constituted the task force namely, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal. The function of the task force is to review the action taken by member departments for checking the illegal mining activities in their respective jurisdiction.

(ii) **Framing of Rules under section 23C of MMDR Act, 1957:** 22 State Governments have framed the rules under section 23C of MMDR Act, 1957 to curb illegal mining namely, Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir (UT), Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Kerala, Telangana, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal, West Bengal.

(iii) **Receipt of Quarterly returns on illegal mining:** The State Government submits quarterly returns on prevention of illegal mining to IBM. These returns contain details such as number of cases detected and action taken there on etc. IBM on receipt of the returns from the various State Governments, consolidates the information and sends it to the Ministry at the end of each quarter.

3.10 The Mineral Conservation and Development Rules, 2017 (**MCDR**) provides measures to ensure systematic and scientific mining. Rule 45 of the MCDR provides for the mining companies to submit 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.

3.11 Details of mines/traders registered with IBM as given in **Table 3.1.**

Table 3.1

Details	Registers as on December, 2022
Mining Leases*	8081
End users	5317
Traders	10250
Stockists	2860
Exporters	1552

**Mining leases including both working and non-working leases of Minor Minerals which were earlier Major Minerals before 10.02.2015.*

Note: IBM has also requested the State Governments not to issue transit passes for movement of minerals to unregistered operations.

3.12 In order to bring a check on illegal mining, the MMDR Amendment Act has made the penal provisions for illegal mining more stringent. Higher penalties and jail terms have been provided. 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

Adoption of Modern Technology for monitoring and capturing Mine data

3.13 Indian Bureau of Mines (**IBM**) has set up two GIS and Remote sensing laboratories at Nagpur & Hyderabad with technical assistance of National Remote Sensing Centre (NRSC), Hyderabad. The laboratories are fully equipped to carry out the work for monitoring the mining activities using GIS and Remote sensing software.

3.14 Necessary amendments have been brought out in the Mineral Conservation and Development Rules 2017 mandating the mineral concession holders to submit drone images & satellite imageries to IBM. Based on these images it is proposed to use technology to monitor the mining activities in the country remotely without much human interventions. It is also envisaged to approve the mining plans without physical inspection of mines by using drone images. It is also proposed to create a data bank of images of land use of the mining areas of the country and effectively plan for their systematic & scientific mine closure.

Mining Surveillance System

3.15 Mining Surveillance System (MSS) is a satellite-based monitoring system which aims to establish a regime of responsive mineral administration by curbing instances of illegal mining activity through automatic remote sensing detection technology.

- Ministry of Mines & Indian Bureau of Mines (IBM) have developed the MSS,

with assistance from Bhaskaracharya Institute for space applications and Geo-informatics (BISAG), Gandhinagar and Ministry of Electronics and Information Technology (MeitY).

- The system works on the basic premise that most minerals occur in the continuity and their occurrence is not limited to the lease area but is likely to extend in the vicinity. The MSS checks a region of 500 meters around the existing mining lease boundary to search for any unusual activity which is likely to be illegal mining. Any discrepancy if found is flagged-off as a trigger.
- The MSS is a transparent & bias-free system, having a quicker response time and capability of effective follow-up. The deterrence effect of 'Eyes watching from the Sky' would be extremely fruitful in curbing instances of illegal mining.
- A user friendly mobile app for MSS has been created and launched on 24th January, 2017 at Gandhinagar for enabling public participation in assisting the governments endeavor to curb illegal mining, which was being used by the inspecting officials to submit compliance reports of their inspections.
- The training of all the States for adoption of the MSS for minor minerals has also been done. Total 179 State Government Officers from 28 States (including one Union Territory) comprising of both Mining Engineers & Geologists have undergone training at BISAG on MSS for Minor Minerals.
- In the initial phase, a total of 296 triggers across the country covering a total area of 3994.87 hectares wherein, 47 unauthorized mining have been detected after inspection of the triggers by the state government officials.
- In the second phase, 52 major mineral triggers, have been detected from the 3280 plotted leases (Working Mines 1689 plotted out of 1694 and Non-Working Mines 1596 plotted out of 2129) across the country, out of which 45 have been verified by the State Governments and in 5 cases unauthorized mining activities have been identified.
- Similarly, in respect of minor minerals, so far, 130 triggers have been generated, out of which 106 have been verified and in 11 cases unauthorized mining activities have been identified.
- In third phase, 177 Major mineral triggers were generated out of which 89 have been verified by the State governments and in 12 cases, unauthorized mining activities have been identified.

Further in 2022-23, 61 Major mineral triggers were generated for which field verification is in process with the State governments.

Mineral Concession System

3.16 As per the Amendment to MMDR Act in 2015, the system of allocation of Mineral Concession has been changed from first come first serve basis to a transparent and non-discriminatory auction process. The Amendment also has brought in a uniform tenure of 50 years for Mining Leases.

- The Mineral (Auction) Amendment Rules, 2022 were notified on 18.02.2022. As per the amended Rules, global

positioning system has been allowed for identification and demarcation of the area where a composite licence is proposed to be granted through auction.

- The Government has further amended the Second Schedule to the MMDR Act, 1957 for specifying the rate of royalty in respect of Glauconite, Potash, Emerald, Platinum Group of Metals (PGM), Andalusite, Sillimanite and Molybdenum. This would ensure auction of blocks of these minerals/metals thereby reducing their import. Accordingly, the Minerals (Other than Atomic and Hydro Carbons Energy Mineral) Concession Rules, 2016 has been amended, vide notification dated 15.03.2022 for computation of ASP of metallic minerals, Glauconite and Potash.
- The Mineral Conservation and Development (Amendment) Rules, 2022 amended vide notification No. G.S.R. 294(E) dated 11.04.2022, to substitute different grades of iron ore in Forms in Schedule-I.
- The Central Government notified the Reimbursement of Exploration Expenditure Rules, 2022 vide notification No. G.S.R.415(E), dated 03.06.2022, in order to prescribe the manner for reimbursement of expenditure incurred towards reconnaissance or prospecting operations. These rules shall be applicable only to such concession holders or applicants who had acquired a right for obtaining a prospecting licence followed by a mining lease or a mining lease, as the case may be, under section 10A (2) (b) of the Act and whose said right has lapsed on the date of lapse.

Mines and Minerals (Development and Regulation) Act

3.17 Ministry of Mines is responsible for survey and exploration of all minerals, other than natural gases, petroleum and atomic minerals and for mining and metallurgy of metals like Iron, aluminium, copper, zinc, lead, gold, nickel etc. and also for administration of the Mines and Minerals (Development and Regulation) Act, 1957 in respect of all mines and minerals other than coal, natural gas and petroleum, but including offshore minerals. In performing its functions, the Ministry is assisted by Geological Survey of India and Indian Bureau of Mines.

The Mines and Minerals (Development and Regulation) Act, 1957is available on web link –

https://www.indiacode.nic.in/bitstream/123456789/1421/1/AAA1957___67.pdf

3.18 The details of amendments to the Mines and Minerals (Development and Regulation) **[MMDR]** Act, 1957 are as under:-

(i) The Mines and Minerals (Regulation and Development) Amendment Act, 1958 (15 of 1958) (w.e.f. 15.05.1958).

(ii) The Repealing and Amending Act, 1960 (58 of 1960) (w.e.f. 26.12.1960).

(iii) The Mines and Minerals (Regulation and Development) Amendment Act, 1972 (56 of 1972) (w.e.f. 12.09.1972).

(iv) The Mines and Minerals (Regulation and Development) Amendment Act, 1986 (37 of 1986) (w.e.f. 10.02.1987).

(v) The Mines and Minerals (Regulation and Development) Amendment Act, 1994 (25 of 1994) (w.e.f. 25.01.1994).

(vi) The Mines and Minerals (Regulation and Development) Amendment Act, 1999 (38 of 1999) (w.e.f. 18.12.1999).

(vii) The Mines and Minerals (Development and Regulation) Amendment Act, 2010 (34 of 2010).

(viii) The Mines and Minerals (Development and Regulation) Amendment Act, 2015 (10 of 2015) (w.e.f. 12.01.2015).

(ix) The Mines and Minerals (Development and Regulation) Amendment Act, 2016 (25 of 2016) (w.e.f. 06.05.2016).

(x) The Mineral Laws (Amendment) Act, 2020 (2 of 2020) (w.e.f. 10.01.2020).

(xi) The Mines and Minerals (Development and Regulation)Amendment Act, 2021 (16 of 2021) (w.e.f. 28.03.2021).

3.19 A major amendment was carried out in 2021 in the Act through the MMDR (Amendment) Act, 2021. The objectives of the MMDR Amendment Act, 2021 are:

- Fully harnessing the potential of the mineral sector,
- Increasing employment and investment in the mining sector including coal,
- Increasing the revenue to the States,
- Increasing the production and time bound operationalisation of mines,
- Maintaining continuity in mining operations after change of lessee,
- Increasing the pace of exploration and auction of mineral resources, and
- Resolving long pending issues that have slowed the growth of the sector.

3.20 Some of the major reforms brought in the MMDR Amendment Act, 2021 are as under:

(i) Removed the distinction between captive and merchant mines by providing for auction of mines in future without restriction of captive use of minerals and allowing existing captive mines including captive coal mines to sell up to fifty percent. of the minerals produced after meeting the requirement of linked plants to ensure optimal mining of mineral resources and specify the additional amount to be charged on such sale [Section 8A(7A) and Section 10B(6)].

(ii) Provided for payment of additional amount to the State Government on extension of mining lease of Government companies and specify such amount to create level playing field between the auctioned mines and the mines of a Government company [Section 8A(8)].

(iii) Provided that all the valid rights, approvals, clearances, licences and the like granted to a lessee in respect of a mine shall continue to be valid on expiry or termination of lease and such clearances shall be transferred and vested to the successful bidder of the Mining Lease selected through auction under the Act. This will ensure continuity in mining operations even with change of lessee, conservation of mineral and avoid repetitive and redundant process of obtaining clearances again for the same mine [Section 8B(1)].

(iv) Central Government has been empowered to issue directions regarding composition and utilization of Fund by

the District Mineral Foundations [Section 9B(3)].

(v) Restrictions on transfer of mineral concessions for non-auctioned mines has been removed to attract fresh investment and new technology in the sector [Omission of Section 12A(6)].

(vi) Pending cases of non-auctioned concession holders which have not resulted in grant of mining leases despite passage of a considerable time of more than five years have been closed/ lapsed. The existence of these cases was anachronistic and antagonistic to the auction regime. The closure of the pending cases would facilitate the Government to put to auction a large number of mineral blocks in the interest of nation resulting in early operationalisation of such blocks and additional revenue to the State Governments [Section 10A(2)(b)].

(vii) Central Government has been empowered to conduct auction in cases where the State Governments face difficulty in conducting auction or fails to notify the area or conduct auction [Section 10B(3), Section 10B(4) and Section 11(5)].

(viii) Provision introduced to grant short term mining lease to Government companies in situations where the auction of mines pursuant to sub-section (4) of section 8A has failed [Section 8B(1)].

(ix) The expression "without any lawful authority" occurring in section 21 of the Act has been clarified to limit its scope to the violations of the said Act and the rules made there under [Section 21(6)].

(x) Simplification of exploration regime - (i) National Mineral Exploration Trust (NMET) shall be an autonomous body; (ii) Private entities may be notified under Section 4(1) of the MMDR Act for conducting exploration; (iii) Enable funding of eligible private exploration agencies from NMET; (iv) Provision for seamless PL-cum-ML (composite licence). [Section 9C(1), Section 4(1), Section 9C(5) and Section 3(a)].

3.21 Subordinate Legislation

The following rules have been framed and notified in pursuance of the MMDR Amendment Act, 2021:

(i) The Mineral (Auction) Amendment Rules, 2021 were notified on 17.03.2021. The rules provide incentive for production & dispatch earlier than the scheduled date of commencement of production. The Mineral (Auction) Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Mineral%20Auction%20Amendment%20Rules%202021.pdf

(ii) The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Amendment) Rules, 2021 were notified on 24.03.2021. The rules provide for transfer of letter of intent for grant of mining lease or composite licence consequent to conclusion of insolvency, liquidation, or bankruptcy proceedings. The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Amendment) Rules, 2021 are available at Ministry of Mines website on web link- https://mines.gov.in/writereaddata/UploadFile/Minerals%20Concession%20Rules%202021%2031032021.pdf

(iii) The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Second Amendment) Rules, 2021 were notified on 08.04.2021. The rules provide that in respect of metals for which London Metal Exchange does not publish the daily settlement price, the monthly average price for that metal published by London Metal Exchange shall be multiplied by monthly average of reference rate for the currency in which the price is obtained. The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Second Amendment) Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Minerals%20Second%20Amendment%20Rules%202021.pdf

(iv) The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Third Amendment) Rules, 2021 were notified on 10.06.2021. The rules provide for the payment by lessee on shortfall in dispatch from the minimum dispatch requirement. The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Third Amendment) Rules, 2021 are available at Ministry of Mines website on web link- https://mines.gov.in/writereaddata/UploadFile/Minerals%20(Third%20Amendment)%20Rules%202021.pdf

(v) The Minerals (Evidence of Mineral Contents) Amendment Rules, 2021 were notified on 18.06.2021 for simplifying the exploration norms prescribed in the rules for certain category of mineral deposits and benchmarking the MEMC Rules with globally accepted classification standards. Rule notifying following-

(a) Mining Lease for limestone, iron ore and bauxite having surfacial deposit can be granted at G3 level of exploration;

(b) Reassessment of resources in respect of expired, terminated, surrendered or lapsed mines on the basis of available reports of exploration before auction;

(c) Auction of composite licence at G4 level for all minerals; and

(d) Definition of various stages of exploration, etc., exploration norms for different types of deposits and reporting template.

The Minerals (Evidence of Mineral Contents) Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/the%20Minerals%20EOMR%20Amendment%20Rules%202021.pdf

(vi) The Mineral (Auction) Second Amendment Rules, 2021 were notified on 18.06.2021. These rules implement several of the reforms of the MMDR Amendment Act, 2021. The rules specify: (a) the manner of calculation of Average Sale Price (ASP) for mineral(s) where ASP in respect of the relevant State for any month is not published by the IBM; (b) that the State Government shall not reserve any mine for captive purpose or any specific end use or partial specific end use in the auction; and (c) that auctioned captive mines may sell upto 50% of the minerals produced during

the year after meeting the requirement of attached plant subject to the payment of additional amount as prescribed under sixth schedule of the MMDR Act; (d) that bid security shall be for an amount equivalent to 0.25 per cent. of the value of estimated resources or fifty crore rupees, whichever is lower, and shall be submitted in the form of a bank guarantee or through security deposit; (e) for composite licence having such type of deposit as specified in serial number I, II and III of Part III of Schedule I to the M(EMC)R, 2015 (except those covered under Schedule II of the said rules), whose estimated quantity of mineral resources is not possible to be assessed for calculating the value of estimated resources, but the mining potentiality of the block has been identified based on the existing geoscience data, the bid security shall be fifty lakh rupees; (f) cap on Net Worth requirement for ML – Rs. 200 Cr. and for CL – Rs. 100 Cr; (g) upfront payment installments changed from existing 10%, 10% and 80% to 20%, 20% and 60%; (h) time-lines for submission of 1st installment of upfront payment for ML and for issue of LoI by the State Government; and (i) time-lines added for submission of Performance Security for CL.

The Mineral (Auction) Second Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/The%20Mineral%20Auction%202%20Amd%202021.pdf

(vii) The Mines and Minerals (Contribution to District Mineral Foundation) Amendment Rules, 2021 were notified on 25.06.2021. As per the amended rules, mining leases granted under Section 10A(2) shall pay DMF at the rate of 30% irrespective of date of grant. The Mines and Minerals (Contribution to District Mineral Foundation) Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/the%20Mines%20and%20Minerals%20CDMF%20Amendment2021.pdf

(viii) The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Fourth Amendment) Rules, 2021 have been notified on 02.11.2021. New rules have been inserted to: (a) provide manner of sale of 50% of mineral produced from the captive leases; (b) allow disposal of overburden/ waste rock/ mineral below the threshold value which is generated during the course of mining or beneficiation of the mineral; (c) revision of minimum area for grant of mining lease from 5 ha. to 4 ha., for certain specific deposits minimum 2 ha. is provided; (d) allow part surrender of mining lease area in all cases; (e) allow transfer of composite licence or mining lease of all types of mine; (f) provide for mutation of ML/ CL in favour legal heirs on death of the lessee or licencee; (g) revise interest on delayed payments from existing 24% to 12%; (h) provide rules regarding period of mining lease granted to Government companies and their payments; and (i) rationalize of penalty provisions in the rules.

The Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession (Fourth Amendment) Rules, 2021 are available at Ministry

of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/230918637715354688800316.pdf

(ix) The Mineral (Auction) Third Amendment Rules, 2021 were notified on 02.11.2021. The major amendments are: (a) Explanation inserted to further clarify that no mine shall be reserved for captive purpose in the auction, notwithstanding any order or direction to the contrary, passed by any court or authority, prior to the commencement of the MMDR Amendment Act, 2021; (b) Explanation inserted to further clarify that auctioned captive mines may sell upto 50% of the mineral produced in market, notwithstanding any order or direction to the contrary, passed by any court or authority, prior to the commencement of the MMDR Amendment Act, 2021; (c) Interest on delayed payments revised from existing 24% to 12%.

The Mineral (Auction) Third Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/The%20Mineral%20Third%20Amendment%202021.pdf

(x) The Mineral Conservation and Development (Amendment) Rules, 2021 were notified on 03.11.2021. The highlights of amendments in the Rules are as follows:

(a) Rules prescribed that all plans and sections related to mine shall be prepared by combination of Digital Global Positioning System (DGPS) or Total Station or by drone survey in relation to certain or all leases as may be specified by Indian Bureau of Mines (IBM).

(b) New Rule inserted to provide for submission of digital images of mining area by lessees and Letter of Intent holders. Lessees having annual excavation plan of 1 million tonne or more or having leased area of 50 hectare or more are required to submit drone survey images of leased area and upto 100 metres outside the lease boundary every year. Other lessees to submit high resolution satellite images. This step will not only improve mine planning practices, security and safety in the mines but also ensure better supervision of mining operations.

(c) Provision of daily return omitted to reduce compliance burden. Power of taking action against incomplete or wrong or false information in monthly or annual returns given to IBM in addition to State Govt.

(d) Allowed engagement of a part-time mining engineer or a part-time geologist for category 'A' mines having leased area below 25 hectares. This will ease compliance burden for small miners.

(e) Penalty provisions in the rules have been rationalized. Violation of 24 rules has been decriminalized.

(f) Provision of forfeiture of financial assurance or performance security of the lease holder added in case of non-submission of final mine closure plan within the period specified.

(g) Amount of financial assurance

increased to five lakh rupees for Category 'A' mines and three lakh rupees for Category 'B' mines from existing three and two lakh rupees, respectively.

The Mineral Conservation and Development (Amendment) Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/The%20Mineral%20Conservation%20and%20Development%202021.pdf

(xi) The Minerals (Evidence of Mineral Contents) Second Amendment Rules, 2021 were notified on 14.12.2021 to enable any person to suggest block for auction for Composite Licence by submitting a proposal to the State Government in the prescribed format along with available geoscience data. The Minerals (Evidence of Mineral Contents) Second Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Second%20Amendment%20Rules,%202021.pdf

(xii) The Mineral (Auction) Fourth Amendment Rules, 2021 were notified on 14.12.2021 provide that in case the area proposed by a person is put up for auction to grant a composite licence, such person shall be required to submit the bid security of only fifty per cent. of the amount specified in this clause for participating in the auction for the said area. The Mineral (Auction) Fourth Amendment Rules, 2021 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Fourth%20Amendment%20Rules%202021.pdf

(xiii) The Mineral (Auction) Amendment Rules, 2022 were notified on 18.02.2022. In order to facilitate the auction of large area blocks, global positioning system has been allowed for identification and demarcation of the area where a composite licence is proposed to be granted through auction. Further, the requirement of classification of area to be auctioned, for composite licence, into forests land, land owned by the State Government, and land not owned by the State Government has been removed. The Mineral (Auction) Amendment Rules, 2022 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/Mineral%20Auction%20Amendment%20Rules%202022.pdf

(xiv) The Mineral Conservation and Development (Amendment) Rules, 2022 were notified on 11.04.2022 for allowing reporting of the data of Iron Ore from 45% to below 51% Fe and below 45% (for Magnetite). The Mineral Conservation and Development (Amendment) Rules, 2022 are available at Ministry of Mines website on web link - https://mines.gov.in/writereaddata/UploadFile/MCDR%20Amendment%20Rules%202022.pdf

(xv) The Reimbursement of Exploration Expenditure Rules, 2022 were notified on 03.06.2022 for reimbursement of exploration expenditure of the concession holders whose rights have lapsed under Section 10A(2)(b) of the MMDR Act, 1957. The Reimbursement of Exploration Expenditure Rules, 2022 are available at Ministry of Mines website on web link- https://mines.gov.in/writereaddata/UploadFile/Reimbursem%202022.pdf

3.22 In addition to the above amendments, the Ministry of Mines has notified rescission of three rules, namely, Mineral (Non-Exclusive Reconnaissance Permits) Rules, 2015, Minerals (Transfer of Mining Leases Granted Otherwise than through Auction for Captive Purpose) Rules, 2016 and Mineral (Mining by Government Company), Rules, 2015. These rules had become obsolete in view of the amendment dated 28.03.2021 in the MMDR Act, 1957.

3.23 Vide the MMDR Amendment Act, 2021, enabling provisions have been made so that private entities may be notified under Section 4(1) of the MMDR Act for conducting exploration without prospecting licence and also for funding of eligible private exploration agencies from NMET. In pursuance of these amendments, the Ministry has accepted the scheme of accreditation of private exploration agencies developed by the QCI-NABET and issued guidelines on 12.08.2021 for notification of accredited private exploration agencies. The guidelines for notification of accredited private exploration agencies under the second proviso to sub-section (1) of section 4 of the MMDR Act, 1957 are available at Ministry of Mines website on web link - https://www.mines.gov.in/writereaddata/UploadFile/orderdated12aug2021enclosures.pdf

Ministry of Mines has amended the Second Schedule of the Mines and Minerals (Development and Regulation) (MMDR) Act, 1957 vide G.S.R. No. 204(E) dated 15.03.2022 for specifying the rate of royalty in respect of Glauconite, Potash, Emerald, Molybdenum, Platinum Group of Metals (PGM), Andalusite, Sillimanite and Kyanite. Further, Ministry of Mines has notified the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Amendment Rules, 2022 vide G.S.R. No. 205(E) dated 15.03.2022 for specifying the average sale price of Glauconite and Potash.

3.24 Auction Status

(i) The MMDR Amendment Act, 2015 instituted the system of e-auction for grant of mineral concessions for major minerals with a view to bring in greater transparency and removal of discretion in allotment.

(ii) Subsequent to the 2015 amendment, the MMDR Act was further amended in the year 2020 with the objective of maintaining sustainable mineral production in the country and in the year 2021 with the objective of inter-alia increasing employment and the investment in the mining sector, boosting mineral production, time-bound operationalization of mines, increasing the pace of exploration, and the auction of mineral resources. Further, the subordinate rules to implement the above reforms have been notified within the stipulated time.

(iii) The recent amendments in the Mineral Auction Rules have resulted in a significant increase in the auction of mineral blocks. So far, 220 blocks have been auctioned across the 10 major minerals states. It is worth noting that the number of blocks auctioned per year has increased 3 times since the reforms of 2021. From 2015-2021, in 6 years, 108 minerals blocks (Mining Lease-99, Composite License-9) were auctioned whereas since 01.04.2021, 112 blocks (Mining Lease -73, CL-39) have already been auctioned till 21.12.2022.

(iv) Largest number of mineral block auctioned is of Iron Ore (73) followed by Limestone (68), Manganese Ore (22), and Bauxite (19). The summary of Yearwise/ Mineralwise auctions is as under:

Table 3.2
Mineral-wise Auction Summary updated as on 21.12.2022

Year Mineral	Year wise/Mineral-wise Auction Summary								
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Limestone	4	5	10	5	4	9	18	13	68
Iron Ore	1	7	2	9	17	1	13*	24	73
Iron Ore & Manganese	0	0	0	0	6	0	1*		6
Gold	1	1	1	1	0	2	2	3	11
Manganese	0	1	0	1	3	0	3	14	22
Diamond	0	1	0	0	1	0			2
Bauxite	0	0	1	0	5	1	5	7	19
Graphite	0	0	0	3	2	0	1	1	7
Chromite	0	0	0	0	3	0			3
Copper	0	0	0	0	2	0			2
Kyanite	0	0	0	0	0	0	1		1
Rock Phosphate	0	0	0	0	0	0	1	2	3
Copper & Gold	0	0	0	0	0	0	1		1
Phosphorite	0	0	0	0	0	0	0	2	2
Total	**6**	**15**	**14**	**19**	**43**	**13**	**46***	**66**	**220**

***Note** :- *2 Iron Ore Block auctioned in 2019-20 in Odisha was Forfeited. The same are re-auctioned in September, 2021. Therefore, in total 222 mineral blocks were auctioned but in actual, the net figure is 220..*

(v) The summary of Year wise/ State wise auctioned blocks are as under in **Table 3.3**:

Table 3.3
List of Successful auction since 2015, updated as on 21.12.2022

Year Mineral	Year wise/Statewise Auction Summary								
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Total
Andhra Pradesh	-	1	2	2	-	-	4	11	20
Chhattisgarh	3	-	2	-	-	2	2	10	19
Gujarat	-	-	3	-	-	4	3	2	12
Jharkhand	2	1	1	3	-	-	-		7
Karnataka	-	7	-	7	4	1	08	07	34
Madhya Pradesh	-	1	-	5	2	5	4	15	32
Maharashtra	-	-	2	1	10	-	9	6	28
Odisha	1	2	2	-	25*	1	9*	2	40
Rajasthan	-	3	2	1	2	-	7	7	22
Tamilnadu	-	-	-	-	-	-	-		-
Telangana	-	-	-	-	-	-	-		-
Uttar Pradesh	-	-	-	-	-	-	-	2	2
Goa	-	-	-	-	-	-	-	4	4
Total	**6**	**15**	**14**	**19**	**43***	**13**	**46***	**66**	**220**

***Note** :- *2 Iron Ore Block auctioned in 2019-20 in Odisha was Forfeited. The same are re-auctioned in September, 2021. Therefore, in total 222 mineral blocks were auctioned but in actual, the net figure is 220..*

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

DMF is meant to address the long-standing demand of the local people in mining affected areas for inclusive growth. As per MMDR Amendment Act 2015, the funds for DMF will be met from additional contributions of 30% of royalty by existing miners and 10% of royalty by miners granted mines w.e.f. 12.01.2015. Further the MMDR Act has been amended through MMDR Amendment Act, 2021 w.e.f 28.03.2021. The sub-section (5)

and (6) of Section 9B of the MMDR Act has been amended for clarifying the rates of DMF to be paid by different categories of mines. Details are available on the web link:

https://mines.gov.in/writereaddata/UploadFile/mmdr28032021.pdf

(i) The Government has formulated Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY). The details are available at weblink- https://mines.gov.in/writereaddata/UploadFile/PMKKKY%20Guidelines.pdf

(ii) A total of Rs 71128.71 crores have been collected under DMFT till 31.10.2022.

(iii) Till October 2022, 253747 projects under different sectors have been sanctioned for various programmes / development schemes under DMF/PMKKKY. For the said projects, Rs. 64185.76 crores has been allocated and the amount of Rs. 37923.18 crores has been spent till 31.10.2022.

(iv) Under Section 20A of the MMDR Act, 1957 the Ministry of Mines issued an order on 23.04.2021 to all States to ensure that the chairman of the Governing Council and Managing Committee shall be the District Collector/District Magistrate/ Deputy Commissioner and also to include MPs, MLA and MLCs in the Governing Council of DMF Trust in the larger public interest. As per the order, amendment to DMF rules have been made by all states except for Meghalaya, Bihar, Goa, West Bengal, Telangana, Tamilnadu, Madhya Pradesh and Uttarakhand.

(v) Directions has also been issued to State Governments vide order dated 12.07.2021 regarding utilization of funds by the District Mineral Foundations. Instructions have been issued prohibiting transfer of District Mineral Foundation funds to the State exchequer or State level fund (by whatever name called) or Chief Minister›s Relief Fund or any other funds or schemes. Also, no sanction or approval of any expenditure out of the fund of the District Mineral Foundation can now be done at the State level by the State Government or any State level agency.

(vi) The Ministry of Mines has also issued directions to the states vide order dated 24.06.2022 for the preparation of a Five-year perspective plan for implementation of works using DMF funds to ensure systemic development of the mining-affected area and people. The order further directs that the DMF shall prepare a strategy for five years and the same shall be included in the perspective plan. The five-year perspective plan shall be prepared taking into account the current balance available and likely accrual to the DMF over the period of five years. The Five-year perspective plan shall be disaggregated into year-wise action plans.

Revision Applications

3.26 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 Government or any other authority. Under Rule 35 and 36 of MCR 2016

detailed procedure for filing and disposal of Revision Application has been prescribed.

3.27 Disposal of Revision Applications has public interface. In order to ensure transparency in disposal of Revision cases, a 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. The Web Link of Status of Revision Application is https://ras.nic.in/(S(qbku2rgswn05eaztpvp42r5l))/WebQuery.aspx

(ii) Final Orders are available on the website; The Web Link of Status of Revision Application is https://ras.nic.in/(S(qbku2rgswn05eaztpvp42r5l))/WebReport_MonthWiseStateWise.aspx

(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.

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

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

3.30 During 01.01.2022 to 31.12.2022, 63 Revision Applications were disposed of by Revisionary Authorities in the Ministry of Mines.

4

Revenue from Mineral Resources

Revenue from Mineral Resources

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 to the said Act and notified the same vide notification No. G.S.R. 630(E) dated 01.09.2014. Further, in exercise of the powers conferred under Section 9A(2) of the above said Act, the Central Government has amended the Third Schedule of the said Act and notified the same vide notification No. G.S.R. 631(E) dated 01.09.2014. Further, the Central Government/Ministry of Mines has also amended the Second and the Third Schedule to the MMDR Act, 1957 vide Notification No. G.S.R. 621(E) dated 02.09.2019 and G.S.R. 622(E) dated 02.09.2019, respectively. After that the Central Government/Ministry of Mines rescinds both the above said Notifications vide Notification No. G.S.R. 634(E) and GSR 635(E) dated 05.09.2019, respectively. Recently, vide notification No. G.S.R. 204(E) dated 15.03.2022 the Central Government made the amendments in the Second Schedule of the MMDR Act, 1957 for specifying the rate of royalty in respect of Emerald; Glauconite and Potash; Molybdenum; Platinum Group of Metals (PGM); Sillimanite, Kyanite and Andalusite. Royalty accrual for major minerals (other than coal, lignite & sand for stowing and minor mineral) by the various State Governments for the year 2019-20 to 2021-22(P) are given at **Table 4.1.**

4.3 Existing royalty rates for some important industrial use minerals is available at-

http://mines.gov.in/writereaddata/UploadFile/ROYALTY%20RATES%2001092014.pdf

https://www.mines.gov.in/writereaddata/UploadFile/234217.pdf

Table 4.1
State wise Royalty Accrual of Major Minerals (Other than Coal, Lignite, Sand for Stowing, Atomic and Minor Minerals) from 2019-20 to 2021-22 (P)

(Unit: Lakhs Rupees)

State	2019-20 (R)	2020-21 (P)	2021-22 (P)
Andhra Pradesh	36008.218	34098.35	41402.136
Assam	664.321	528.02	578.9
Bihar	1004.11	1079.85	710.39
Chhattisgarh	218750.55	232022.26	883872.12
Goa	509.86	7344.22	9755.24
Gujarat	21848.1	24646.037	25165.114
Haryana	NA	NA	NA
Himachal Pradesh	NA	NA	NA
J & K	NA	NA	NA
Jharkhand	115898.23	108284.79	279140.34
Karnataka	142425	150363	254214
Kerala	874.569	818.104	1060.736
Madhya Pradesh	68644	74259	148832
Maharashtra	19598.52	16582.5	30453.66
Meghalaya	NA	NA	NA
Odisha	767219.416	703461.826	1798369.459
Rajasthan	248564.87	288627.78	367596.65
Tamil Nadu	19373.806	18008.243	17936.39
Telangana	20898.28	19120.01	22473.79
Uttar Pradesh	4412.314	3804.1	2452.322
Uttarkhand	12.448	10.61212	41.15

Source: Data received from concerned state Government/DGM offices.: Provisional; R: Revised; NA: Not Available

5

International Cooperation

International Cooperation

Objectives:

5.1 Development of the mining sector is critical for a country's industrial development. India even though is endowed with many minerals is at the same time deficient in some of the important minerals. Hence it needs to enhance its geosciences expertise as well as technological abilities along with the acquisition of critical mineral assets abroad. The demand for critical and strategic minerals i.e. Cobalt (Co), Tin (Sn), Lithium (Li), Germanium (Ge), Gallium (Ga), Indium (In), Beryllium (Be), Niobium (Nb), Tantalum (Ta), Tungsten (W), Bismuth (Bi), Selenium (Se) is expected to grow exponentially due to the country's push for E-mobility and Battery Storage requirements. In order to ensure mineral security, the Ministry of Mines is making its best efforts to establish a resilient supply chain of critical and strategic minerals through acquisition of mineral assets in the source countries through its JV company KABIL. Currently, engagements are underway with select source countries such as Australia, Argentina, Bolivia and Chile etc. which are endowed with the cited critical & strategic minerals specifically Lithium & Cobalt.

5.2 The Ministry of Mines is working continuously to enhance its geological and mineral resource cooperation with mineral-rich nations in order to guarantee the uninterrupted supply of minerals. In order to achieve these objectives, International Cooperation Division has been engaging in collaboration with countries like Australia, Russia, African and Latin American countries. A number of Memorandums of Understanding (MoU) have also been signed with mineral rich countries. India also participates in various International Mining events by establishing India Pavilions. These platforms create awareness about recent reforms and opportunities in the Indian mining sector to attract foreign investment in Indian mining sector.

Memorandum of Understanding (MoUs) signed during the period

5.3 The Central Government has entered into bilateral agreements with the Governments of a number of countries to develop bilateral cooperation with countries that have abundant mineral resources and access to cutting-edge technologies in mineral exploration and development. Moreover, the Ministry of Mines is constantly endeavoring to seek greater engagements overseas in order to ensure mineral security for the country.

MoU with Argentina

5.4 A Memorandum of Understanding (MoU) between India and Argentina for cooperation in the field of Mineral Resources has been signed on 26.08.2022 at Buenos Aires by Mr. Dinesh Bhatia, Ambassador of India to Argentina & Uruguay, on behalf of India and Ms. Maria Fernanda Avila, Secretary - Ministry, Secretariat of Mining of the Ministry of Economy of the Argentine Republic, on behalf of Argentina. This MoU was signed in presence of Hon'ble External Affairs Minister Dr. S. Jaishankar and the Argentine Foreign Minister H.E. Mr. Satiago Cafiero, after the India-Argentina Joint Commission Meeting, jointly presided over by two Ministers, which was held on 26.08.2022 at Buenos Aires.

Bilateral Meetings

5.5 Several bilateral meetings were held with various countries during the year 2022-23 to strengthen further cooperation and collaboration in the fields of Mining, Geology, and Mineral Resources, including critical and strategic minerals.

5.6 A meeting was held on 07.02.2022 between Dr. Steffen Koch, Minister and Head of the Economic and Global Affairs, Embassy of the Federal Republic of Germany, New Delhi and Dr. Veena Kumari Dermal, Joint Secretary, Ministry of Mines, Government of India through virtual platform to discuss various aspects of Indo-German cooperation in the Raw Materials sector.

5.7 A meeting was held on 15.06.2022 to discuss the matters related to 2nd JWG meeting under the MoU between India and Zambia for cooperation in the field of Geology and Mineral resources.

5.8 Secretary, Ministry of Mines had two meetings through virtual mode on 27.07.2022 to discuss the critical minerals ecosystem in India with the concerned Ministries and CPSEs as well as the private companies in India.

5.9 A meeting between CSIRO, Australia headed by Dr. Rob Hough, Director, CSIRO, Mineral Resources (Australia) and Ministry of Mines headed by Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines was held on 05.09.2022 in the Ministry of Mines, Shastri Bhawan, New Delhi to discuss issues focusing on critical minerals, the essential ingredients for the technologies that powers the energy transformation and provides solutions as we strive towards achieving a Net Zero world.

Photo: 1 - Meeting between CSIRO, Australia headed by Dr. Rob Hough, Director, CSIRO, Mineral Resources (Australia) and Ministry of Mines headed by Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines was held on 05.09.2022

5.10 A meeting was held on 12.09.2022 under the Chairmanship of Shri Tarun Kapoor, Advisor to Hon'ble Prime Minister on the issues highlighted by the Indian delegation led by Shri Prahlad Joshi, Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India visit to Australia during July, 2022. Secretary (Mines) attended the said meeting through VC and made a presentation on the main issues highlighted in the brief report.

5.11 An Inter-Ministerial Committee (IMC) meeting was held under the chairmanship of Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines on 20.09.2022 to discuss the participation of Indian delegation in the International Mining events during 2022-23. During the IMC meeting, it was decided that a Government of India delegation led by Ministry of Mines will participate in the three major International Mining events i.e. IMARC-2022 (2-4 November, 2022 at Sydney, Australia), Mining Indaba 2023 (6-9 February, 2023 at Cape Town, South Africa) and PDAC-2023 (5- 8 March, 2023 at Toronto, Canada).

5.12 The 3rd meeting of Joint Working Group under the MoU between India and Australia for cooperation in the field of Mining and Processing of Critical and Strategic Minerals, was held on 01.11.2022 in Sydney, Australia co chaired by Mr Andrew Hutchinson CMFO Australia and Dr Veena Kumari Dermal, Joint Secretary Ministry of Mines, GoI.

Photo: 2 - Joint working group meeting on India Australia held on 01.11.2022 at Sydney, Australia

5.13 The 1st Meeting of Expert Committee formed by the Ministry of Mines to facilitate and formulate a policy for Critical and Strategic Minerals was held on 18.11.2022 to discuss various issues.

5.14 The 8th meeting of the Sub-Group on Mining of the Working Group on Modernization and Industrial Cooperation under the Inter governmental Russian- Indian Commission on Trade, Economic, Scientific, Technical and Cultural Cooperation was held on 14.12.2022 through video conference. The Sub-Group on Mining was Co-chaired by Dr.Veena Kumari D, Joint Secretary, Ministry of Mines from Indian side and by Mr.Vladislav Demidov, Deputy Director of the Department of Metallurgy and Materials, Ministry of Industry and Trade of Russian Federation. Both sides discussed the implementation of the Protocol of the 7th Meeting of the India- Russia Sub-Group on Mining held in New Delhi on 28.08.2018 and expressed satisfaction, nevertheless, assured to take more efforts in various fields in order to realize the full potential. The Protocol on Sub-Group on Mining was signed on 23.12.2022.

Photo: 3 - Signing of Protocol of India-Russia on Sub Group on Mining

Foreign Visits

5.15 An Indian delegation led by Secretary (Mines) visited Cape Town, South Africa from 9th to 12th May 2022 to participate 'Mining Indaba- 2022' in the conference and mining exhibition. Representatives from the Ministries of Coal, Steel, MEA and GSI including State Governments and CPSUs & SPSUs also attended this event. An Indian pavilion was setup at Mining Indaba- 2022, highlighting mineral potential, opportunities and Indian government policies regarding mining sector.

Mining Indaba -2022

Photo: 4 - Members of Indian official delegation led by Shri Alok Tandon, Secretary to the Government of India, Ministry of Mines and other participants standing with honourable Steel and Mines Minister of Odisha Government Shri Prafulla Kumar Mallik in front of Indian Pavilion at Mining Indaba 2022, Cape Town, South Africa

Photo: 5 - Government of India Pavilion at Mining Indaba 2022, Cape Town, South Africa

Photo: 6 - The members of Indian official delegation under the leadership of Shri Alok Tandon, Secretary to the Government of India, Ministry of Mines holding discussions with honourable Mr. W. Chitando, Minister of Mines and Mining Development, Government of Zimbabwe at Indian Pavilion in Mining Indaba 2022, Cape Town, South Africa

Photo: 7 - Shri Alok Tandon, Secretary to the Government of India, Ministry of Mines and other members of Indian official delegation holding talks with honourable Minister Mr. Bander Alkhorayef, Ministry of Industry and Mineral resources, Saudi Arabia.

Photo: 8 - Shri Alok Tandon, Secretary to the Government of India, Ministry of Mines delivering his speech at conference hall of Western Hotel, Mining Indaba 2022, Cape Town, South Africa

5.16 An Indian delegation led by Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines visited Australia during 30th May to 3rd June 2022 to review the progress of engagement with CMO Australia and to interact with various agencies carrying out the due diligence process for identification of lithium Blocks available for investment by India. The delegation held discussions with prospective project owners including site visits.

5.17 An Indian delegation led by Shri Pralhad Joshi, Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, Govt of India, visited Australia from 03rd to 07th July, 2022 to enhance cooperation in mining sector with Australia. Hon'ble Minister of Resources of Northern Australia, Madeleine King M P held discussion with Shri Pralhad Joshi to strengthen the cooperation in the field of strategic minerals especially lithium. The delegation also visited Tianqi Lithium Kwinana mines and Greenbushes Lithium Mine sites. The delegation also met Hon'ble Minister for Mines & Petroleum, Energy, Corrective services & Industrial Relations, Mr Bill Johnston and discussed opportunities and initiatives that can be taken in order to strengthen the sector. During the visit, the delegation visited CSIRO, an Australian body for scientific research. Hon'ble Minister of Mines also met top management officials of mining companies' in Australia and carried out discussions around multiple aspects of India-Australia cooperation to boost trade, investment and knowledge sharing.

Photo: 9 & 10- Union Minister Shri Pralhad Joshi participates in Australia-India Trade & Investment Roundtable in Sydney

Photo: 11 - A meeting with top management officials of mining companies operating in Australia

Photo: 12 - Roundtable with Australia-India Trade & Investment hosted by Minerals Council in Sydney

Photo: 13 & 14 - Greenbushes Lithium Mine Site visit, world's largest hard-rock lithium mine in Western Australia

5.18 An Indian delegation led by Additional Secretary, Ministry of Mines participated in the 18th Annual General Meeting (AGM) of the Inter-Governmental Forum (IGF) during 7th - 10th November, 2022 at Geneva, Switzerland.

5.19 An Indian delegation led by Secretary, Ministry of Mines participated in the International Mining and Resources Conference (IMARC) - 2022 event during 2nd to 4th November, 2022 in Sydney, Australia. On the sidelines of this event, Ministry of Mines, with the support of Australian side, facilitated deliberations of the Indian business delegation comprising battery manufactures with the Australian critical minerals manufacturing companies.

Photo: 15 - Secretary Mines inaugurating the India Pavilion at IMARC, 2022

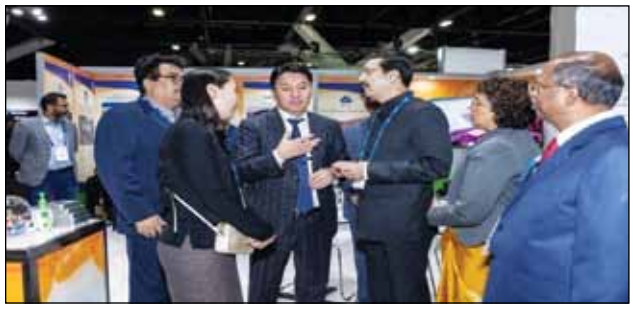


Photo: 16 - Secretary Mines discussing with Mongolian delegation at IMARC Pavilion

Photo: 17 - Felicitation of CSIRO officials after the meeting, by Secretary Mines

5.20 A delegation of Khanij Bidesh India Ltd. (KABIL) visited Argentina to evaluate and assess two prospective projects of lithium for exploration in Catamarca Province in Argentina during the period from 20th November to 3rd December, 2022.

Khanij Bidesh India Ltd. (KABIL)

5.21 Acquisition of Strategic minerals in overseas (KABIL): JV Company among NALCO, HCL and MECL named Khanij Bidesh India Limited (KABIL) has been formed on 08.08.2019 to identify, acquire, develop, process and make commercialize usage of strategic minerals in overseas locations for supply in India. KABIL is focusing on identifying and sourcing battery minerals like Lithium and Cobalt. Engagement with few companies/ projects is underway in Australia, Argentina and Chile. Brief details are as below:

Australia

- MOU with detailed collaborative framework was signed on 10.03.2022 between KABIL, India and Critical Mineral Office (CMO), Department of Industry, Science and Resources (DISER), Govt. of Australia for carrying out joint due diligence and further joint investment in Li & Co mineral assets of Australia.
- Under the agreed actions, Critical Mineral Market Scan was made by PWC, Australia in July, 2022, based on which identification of mineral assets will be done for further engagement.
- KABIL & CMO have discussed mutually and finalized the procurement methodology for engaging Commercial Advisory Services for identifying Lithium and Cobalt projects and further due diligence of projects in Australia.
- RFQ for engagement of Commercial Advisor was issued in Oct 2022 by CMO Australia. Commercial Advisor is also engaged by Jan, 2023.

Argentina

- In Oct, 2022, CAMYEN, Argentina through Indian Embassy at Buenos Aires, shared information regarding two prospective Lithium projects in la Aguada and El Indio in Catamarca, Argentina.
- A team of Geologists visited Argentina from 20.11.2022 for a period of two weeks for evaluating and assessing lithium exploration projects proposed by CAMYEN in Catamarca province. Subsequent to preliminary assessment, KABIL vide email dated 19.12.2022 expressed its interest to partner with CAMYEN for prospecting two areas identified with the objective of establishment of projects for extraction of lithium in due course of time.

Chile

- As advised by Ambassador of India in Chile, KABIL has suggested certain modifications to the draft Non-Disclosure Agreement (NDA) and shared it with ENAMI for their acceptance before signing the NDA by ENAMI and KABIL for jointly pursuing lithium mining projects in Chile.

6

Attached offices / Subordinate

Attached offices / Subordinate

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 later years, GSI diversified into various geoscientific activities, and made contributions in geosciences and resultantly, in the economic growth of India.

The key functions of GSI are creation and updation of national geoscientific information and assessment of mineral resources. GSI has taken up ground, air-borne and marine surveys, mineral exploration, multi-disciplinary geoscientific, geo-technical, geo-environmental and natural hazard studies, glaciology, seismotectonics, and fundamental research.

Organization of GSI Mission

6.2 The activities of GSI are carried out through five Missions viz. Baseline Geoscience Data Generation (Mission-I); Natural Resources Assessment (Mission-II); Geo-informatics (Mission-III); Fundamental, Multi-disciplinary Geoscience and Special Studies (Mission- IV), and Training and Capacity Building (Mission-V). Besides these, three Support Systems viz. Policy Support System (PSS), S&T Support System (STSS) and Administrative Support System (Ad. SS) have been created to provide support and cross-cutting co-ordination in GSI.

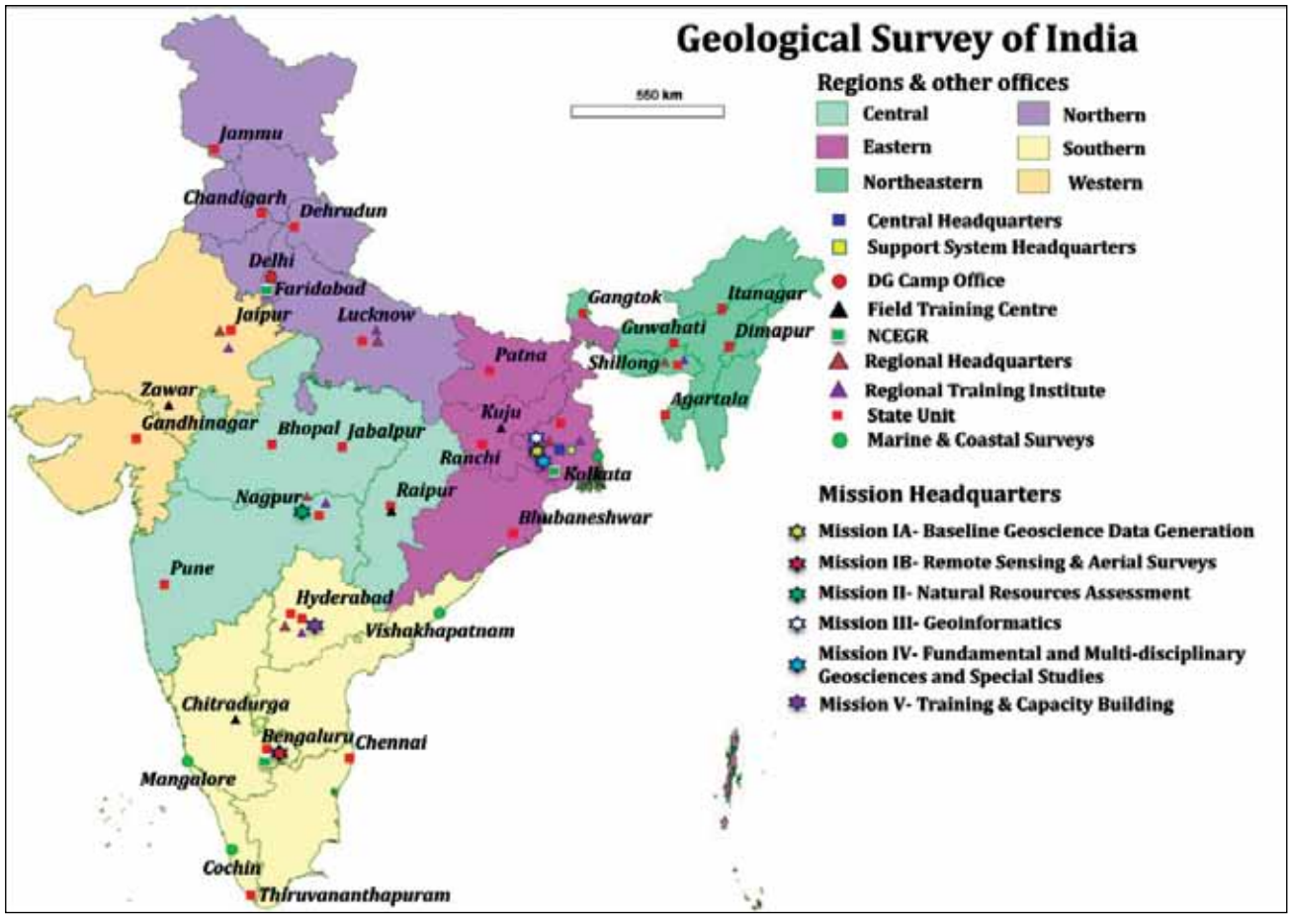


Photo 6.1 Organization of GSI Mission

MISSION - I : baseline Geoscience Data Generation

6.3 Systematic Geological Mapping

Systematic Geological Mapping **(SGM)** (1:50,000/63,360 scale) is the most fundamental and basic mapping program of GSI. The whole mappale part of the country, excluding a few patches of inaccessible and difficult terrains, has been covered under this program. Out of the total mappable area of 3.146 million sq. km of the country, 3.123 million sq. km (99.27%) has been covered and the data is available on Bhukosh.

The data generated through SGM has immense application in exploration and other activities. The data generated through this mapping activity has helped to build up the knowledge base and data base for National Geo-scientific information. Some inaccessible terrains of North Eastern parts of the country in the states of Arunachal Pradesh, Sikkim and in mountainous terrains of the Northern Himalayas in the states of Jammu & Kashmir (UT) and Uttarakhand and the Jarwa/ Sentinelese inhabited islands of Andaman & Nicobar have not yet been covered by SGM.

6.4 Specialized Thematic Mapping

Wherever it is felt that the geology is complex, and more information on a specific theme needs to be revealed, Specialized Thematic Mapping **(STM)** is taken up. This mapping is carried out on 1:25,000 or larger scale. It involves collection of multidisciplinary data, and is backed by advanced laboratory studies. Such thematic mapping will refine and update the existing geological knowledge base in greater detail in the light of available new scientific concepts and advancements in knowledge in different branches of Earth Science. STM plays a pivotal role in natural resource prognostication through generation of spin off reconnaissance mineral investigation programmes (mostly G4 stage). Till December, 2022, an area of about 0.382 million sq. km area (including 18,707 sq. km. area mapped in 2022) has been mapped.

6.5 Geochemical Mapping

The National Geochemical Mapping (NGCM), in implementation since Field Season (FS) 2001-2002, aims to create a seamless baseline geochemical base map of 64 elements on 1:50,000 scale for the entire country. However, presently 62 elements are analysed uniformly except Platinum & Palladium (Pt & Pd), which are only analysed for selective areas containing basic/ultrabasic rocks. The data helps in deriving anomalous zone(s) of elemental concentration, which may be prospective for future mineral investigation. It also finds application in environmental, agricultural, human health and other social concerns. The elemental analyses of NGCM samples are being done in the laboratories of GSI and sometimes in other government organizations like National Geophysical Research Institute **(NGRI)**, Jawaharlal Nehru Aluminium Research Development and Design Centre **(JNARDDC),** Mineral Exploration & Consultancy Limited **(MECL)** and National Metallurgical Laboratory **(NML)**.

The procedure follows international standards, which are considered benchmarks for deciding anomalous value of different elements for preparation of geochemical anomaly maps. For detailed reports visit website of GSI at www.gsi.gov.in During January to December 2022, 0.212 million sq. km was covered by NGCM with cumulative coverage of about

1.705 million sq. km area. Another 0.093 million sq km area was covered by geochemical mapping by the State Governments of Gujarat & Rajasthan under a MoU with GSI. As an outcome of NGCM programme, numbers of spin-off mineral investigation items are already taken up since field season 2013-14. Presently preparation of degree sheet wise geochemical atlas is under progress.

6.6 Geophysical Mapping

Geophysical mapping under the National Geophysical Mapping Program (NGPM) comprises ground gravity and magnetic survey on 1:50,000 scale. It aims at generating a baseline ground gravity-magnetic data and preparation of geophysical anomaly map of the country. The analysis and interpretation of the NGPM data will facilitate in deriving the crustal architecture and delineating the mineral prospective zones. The geophysical anomaly maps are integrated with other available geological data set and further mineral exploration programmes are launched in the favourable areas delineated by integration study. During the period from January to December, 2022 an area of 0.09 million sq. km was covered, with cumulative coverage of about 1.095 million sq. km area (including 0.082 million sq. km done through outsourcing).

6.7 Airborne Survey

Airborne geophysical surveys are being carried out by GSI with the fixed-wing Twin Otter Aircraft Survey System (TOASS) consisting of Magnetic and Gamma Ray Spectrometric Sensors. The survey work has been initiated on 18-12-2022 for the FS 2022-23 over Gaya-Dumka area in parts of Bihar, Jharkhand, and West Bengal. The survey is in progress.

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

GSI is executing national project of regional aero-geophysical survey titled "National Aero-Geophysical Mapping Programme (NAGMP)" since 2017 as per NMEP, 2016 to acquire uniform magnetic (horizontal gradiometry) and gamma ray spectrometer data initially over priority areas of 7.78 lakh sq.km Obvious Geological Potential (OGP) areas (in 12 blocks) through outsourcing using NMET fund in Phase-I.

The acquisition of seamless high resolution, regional data gathered through 80m flying height is aimed to delineate concealed, deep seated structure / litho-units capable of hosting mineralization, to delineate extension of the existing mineralized zone and understating of shallow crustal architecture in the context of mineral occurrence and prognostication of suitable areas for mineral targeting.

To achieve this, Project Implementation Agencies (PIA) were outsourced to provide the necessary capacity for conducting the surveys during the six to seven months flying window of each year available in India.

As part of Phase-I study under NAGMP, 5 Blocks (Block 1- 4 and 11) covering 2.68 Lakh sq. km area have been completed in the states of Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Chhattisgarh and Maharashtra and 150 potential areas have been identified for further detailed survey / mineral exploration.

Presently NAGMP is in progress in block 6 and 8 and 12429 sq km area has been covered till December, 2022 out of 163963 sq km area in these two blocks. The adjoining areas to

the OGP will be taken up under Phase II of NAGMP.

6.9 Hyperspectral/ Multispectral Remote Sensing Technique in Exploration

During FS. 2022-23, Photo Geology and Remote Sensing (PGRS) Division has taken up mapping of alteration/ mineralized zones using spectro-radiometer (1,22,464 sq. km)/ multi hazard zonation (1400 sq. km) /Seismic Hazard Micro-zonation (SHMZ) (200 sq. km)/ resolving the mismatch of lithological boundary (836 sq. km) on 1: 50,000 scale using Multispectral and Hyperspectral remote sensing data. A total of 1,24,900 sq. km area is covered by remote sensing studies in the FS 2022-23, with the objective to delineate alteration zones associated with mineralization and building up of spectral library for different litho-units and seismic and multihazard zonation studies. This has resulted in identification of several potential areas for further follow up exploration. The outcomes of the multihazards and seismic study would be the most relevant geo-scientific input for the planners and administrators for mandatory use in the comprehensive multi-hazard risk assessment and management practices for all sorts of developmental and infrastructure project in the particular terrain.

6.10 Marine and Coastal Surveys

The Exclusive Economic Zone (**EEZ**) of the country is being explored for its mineral resources by GSI, in coordination with National Institute of Oceanography (**NIO**) and National Centre for Polar and Ocean Research (**NCPOR**). GSI acquires baseline data on bathymetry [sea bottom topography], sea surface sediment distribution, gravity, magnetic, etc. within the EEZ of India. An area of 20,41,698 sq. km out of a total EEZ area of 21,59,620 sq. km (on 1:5,00,000 scale) accounting for 94.54% EEZ has already been covered by systematic seabed mapping. During the period from January to December 2022, systematic seabed mapping has been carried out over an area of 5,988 sq. km within the EEZ. GSI has also launched seabed mapping in the selected areas within the International waters since FS 2022-23 and covered an area of 52,879 sq. km area out of targeted 65,800 sq. km area for generation of baseline data with search for possible mineral occurrences in Ninety East Ridge near Equator, Indian Ocean and in the Laxmi Basin (Block-I, II and III), Arabian Sea by deploying its own research vessels.

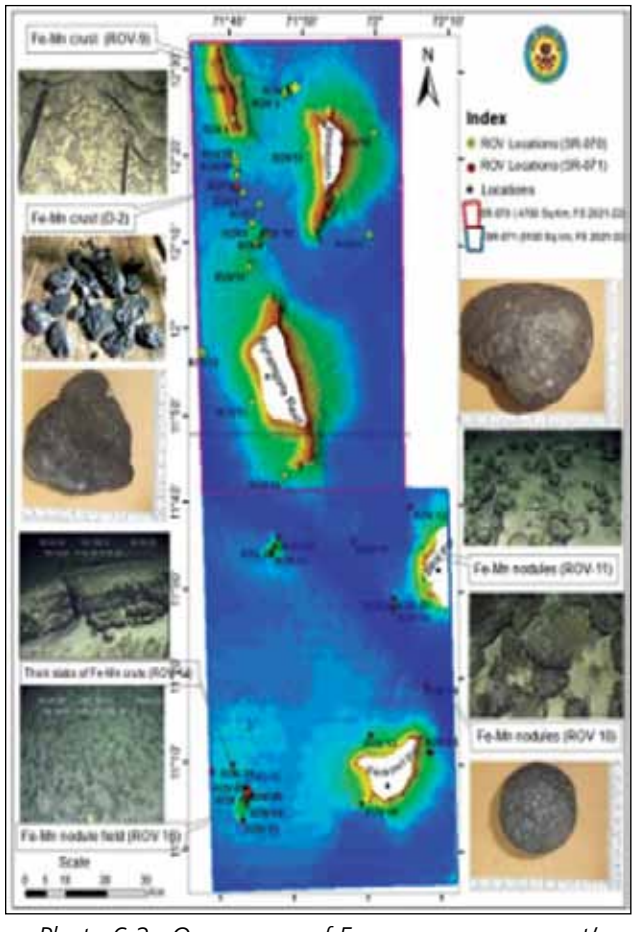


Photo 6.2 : Occurrence of Ferromanganese crust/ nodules in low elevated mounts/terraces of Lakshadweep Trough

GSI also carries out focused mineral investigations and deep sea multichannel seismic surveys in identified target areas. During the period from January to December 2022, preliminary marine mineral investigation has been carried out over 763 sq. km area within the EEZ by the Research Vessel Samudra Ratnakar with cumulative coverage of 2.15 lakh sq. km (36.48%) out of the targeted potential area of 5.89 lakh sq. km within the EEZ of India. Continuous survey since 1985 has paved the way for demarcation of prospective areas of offshore heavy minerals and construction sand within the Territorial Waters (**TW**) off east and west coasts of India. GSI has estimated an inferred resource of 78.88 million tonnes of Total Economic Heavy Minerals (**TEHM**), considering seabed sediment up to 1m below seafloor and cut off wt. % of heavies ≥ 3 within the TW off India. Further close grid surveys are being conducted in selected areas to augment the offshore heavy mineral resources within the Territorial Waters of India. A total of 745.323 million tonnes of construction-grade sands have been estimated from four sectors off Kerala within the west coast of India with maximum sub surface depth of 2m and having sand content >80. GSI could demarcate 12,767 sq. km. potential zones with 1,15,538 million tonnes reconnaissance resource of high-grade lime mud and lime sand within the EEZ off Gujarat and Maharashtra. Besides these, occurrences of phosphate bearing sediments have been identified off Tamil Nadu coast.

Fe-Mn crusts/nodules have also been identified, in the Andaman Sea and in the Arabian Sea, within the EEZ of India. Fe-Mn crust and nodule exploration cruises taken up so far in the Arabian Sea revealed that the occurrences of seamount associated crusts and nodules along the flanks of reefs and small seamounts in the northern part of the Laccadive Ridge system could be demarcated within 1500 m water depth.

MISSION - II : Natural Resources Assessment

6.11 Mineral Resource Assessment

The mineral exploration activities of GSI have been prioritized keeping in view the thrust areas identified by Government of India and State Governments. GSI carries out 'reconnaissance survey' [G4], 'preliminary exploration' [G3] and 'general exploration' [G2] following the guidelines of United Nations Framework Classification (UNFC) 1997 and Minerals (Evidence of Mineral Contents) Amendment Rules, 2021.

During FS 2022-23, a total of 322 mineral exploration programs were taken up by GSI, which include 15 projects on 'offshore mineral investigation', 271 projects on Mineral Exploration [21 on Ferrous Minerals, 36 on Precious Metals and Minerals, 148 on Non-Ferrous and Strategic Minerals, 66 on industrial and Fertilizer Minerals] and 13 projects on Natural energy resources [10 coal, 1 lignite, 1 shale gas and 1 geothermal], 15 Regional Mineral Targeting (RMT) projects, 6 R&D projects and 2 projects on Uncover (India).

6.12 Natural Energy Resources [Coal and Lignite

GSI has handed over 16 (G3/G2) reports to the State Governments in 2022. Out of these, there are 2 blocks each of limestone, copper, bauxite, molybdenum, PGE, potash, iron & manganese and 1 block each of iron and basemetal.

GSI has also handed over 50 potential G4 stage blocks in phase-III in the month of March, 2022 and 50 potential G4 stage blocks in phase-IV in the month of July, 2022 for auction as Composite Licence to the State Governments.

6.13 Natural Energy Resources (Coal & Lignite)

In 2022-23 (till December 2022), GSI has augmented total coal resources of 10568.63 million tonnes (6692.94 MT G2, 581.52 MT G3, 3294.17 G4) in various coalfields including Rajmahal-Birbhum coalfield, Pench valley coalfield (Madhya Pradesh), Wardha Valley, Godavary Valley, Mand-Raigarh (Chhattisgarh), Singrauli coalfield, Ib River coalfield, Sonhat coalfield and Talcher coalfield (Orissa). Lignite resource of 525.29 million tonne has been augmented from Punam Singh Ki Dhani block, Rajasthan and Tiruppulani block from Ramnad Sub-basin, Tamil Nadu.

6.14 Geothermal Studies

During FS 2022-23, one project has been taken up in Odisha to delineate and define the geothermal resource character and the work is in progress.

MISSION - III : Geo-informatics

Geoinformatics aims at comprehensive management and effective utilization of all geoscientific information so as to deliver accurate, up-to-date and comprehensive products and services, and provide crucial support to all missions of the organization as well as the stakeholders. The mission is actively involved in maintenance and management of the IT infrastructure, archival of the datasets, policy making and planning for inclusive IT enablement of the organization.

6.15 Mission III A: Data Repository and Management, Advanced Spatial Data System, IT Infrastructure & Connectivity OCBIS

IT Infrastructure & Connectivity OCBIS

The Online Core Business Integrated System (OCBIS) portal is an integrated enterprise portal connecting all users, core processes, data and support systems in a web-based platform. This became operational in 2017-18 across all GSI offices.

The OCBIS portal consists of 13 Core Modules (with 29 processes), 4 e-Gov applications (with 69 processes) and 14 Support Modules (with 27 processes). The Enterprise Portal highlights the current Field Season programme and its progress in real-time, the Geoscientific Repository "Bhukosh", Mission Details, Recent circulars, Virtual Museum and Laboratory facilities. Two separate windows on Geo Tourism/Geoheritage Sites Map of India (Photo 6.3) and Rock Texture Atlas (Photo 6.4) have been introduced. Till date 1380 publications, 20 coffee table books, 2880 maps and 21679 progress reports have been disseminated to users. The OCBIS portal can be viewed from the link: https://www.gsi.gov.in/webcenter/portal/

Photo 6.3 : Geo-Heritage Sites Map of India

Photo 6.4 : Rock Texture Atlas

The Bhukosh geoscientific data repository provides OGC Compliant Map Services with latest Geodata base (.gdb) and Map Exchange Document (.mxd) covering 20 themes like Geology, Geophysics, Geomorphology, Geochemistry, Mineral, Geochronology, Geothermal, Tectonic, Seismotectonic, Landslide Inventory, NLSM, Meteorites, Glacial retreat etc. which facilitate the users to visualise, query data, create maps, print with dynamic legend and download. A total of 147 geospatial layers with 13005896 features are available. The site also hosts metadata for 9082 geophysical datasets (Airborne-7141 sets, Ground-964 sets and Marine-977 sets). Till date 1005 Geophysical datasets and 89308 Geospatial layers have been downloaded by external registered users. Dataset download by external user is almost 4.4 times of internal GSI user and total login count at Bhukosh is 394035. This is available in the link: https://bhukosh.gsi.gov.in/Bhukosh/Public

The network infrastructure and related services have continuously been upgraded as per industry standard and based on organisational requirements. The meetings/ trainings conducted over video conference have increased exponentially over couple of years. IT infrastructure facility at GSI allows officials to update the field data in GSI server right from data collection site through its own custom build field device. As a technological advancement and ease of doing business GSI has already conceptualized WLAN & SDWAN technology and these will be implemented very shortly across all GSI offices.

6.16 Mission III B: Publication & Library

The GSI publications available in OCBIS portal are categorized as Memoirs, Bulletin Series A, B & C, Records, Special Publications, Miscellaneous Publications, Catalogues, Palaeontologia Indica and Indian Journal of Geosciences (in-house quarterly journal of GSI).

A Memoir contains detailed reports on complete surveys and investigations detailing either with a particular region or with a particular mineral in one or more regions. Records mainly cover brief outline of activities of GSI of different Regions and CHQ. The Bulletin Series A contains work done under economic geology projects. Engineering geology. Ground water works are dealt under Bulletin Series B and Bulletin Series C documents the basic data generated by various laboratories/ specialised divisions. Special publications include the proceedings of various symposia and seminars organised by GSI as well as a set of papers dedicated to a particular field of study in earth science or of some special projects. Miscellaneous publication is a consolidated document on Geology and mineral resources of different states of India. E-News gets released from different Regions and CHQ annually or biannually. Newsletters of GSI are being prepared and uploaded in GSI portal on monthly basis.

Total 32 scientific publications in form of Bulletin series, Special Publications, Misc. Publications, Records and quarterly journals have been released during January 2022 to December 2022.

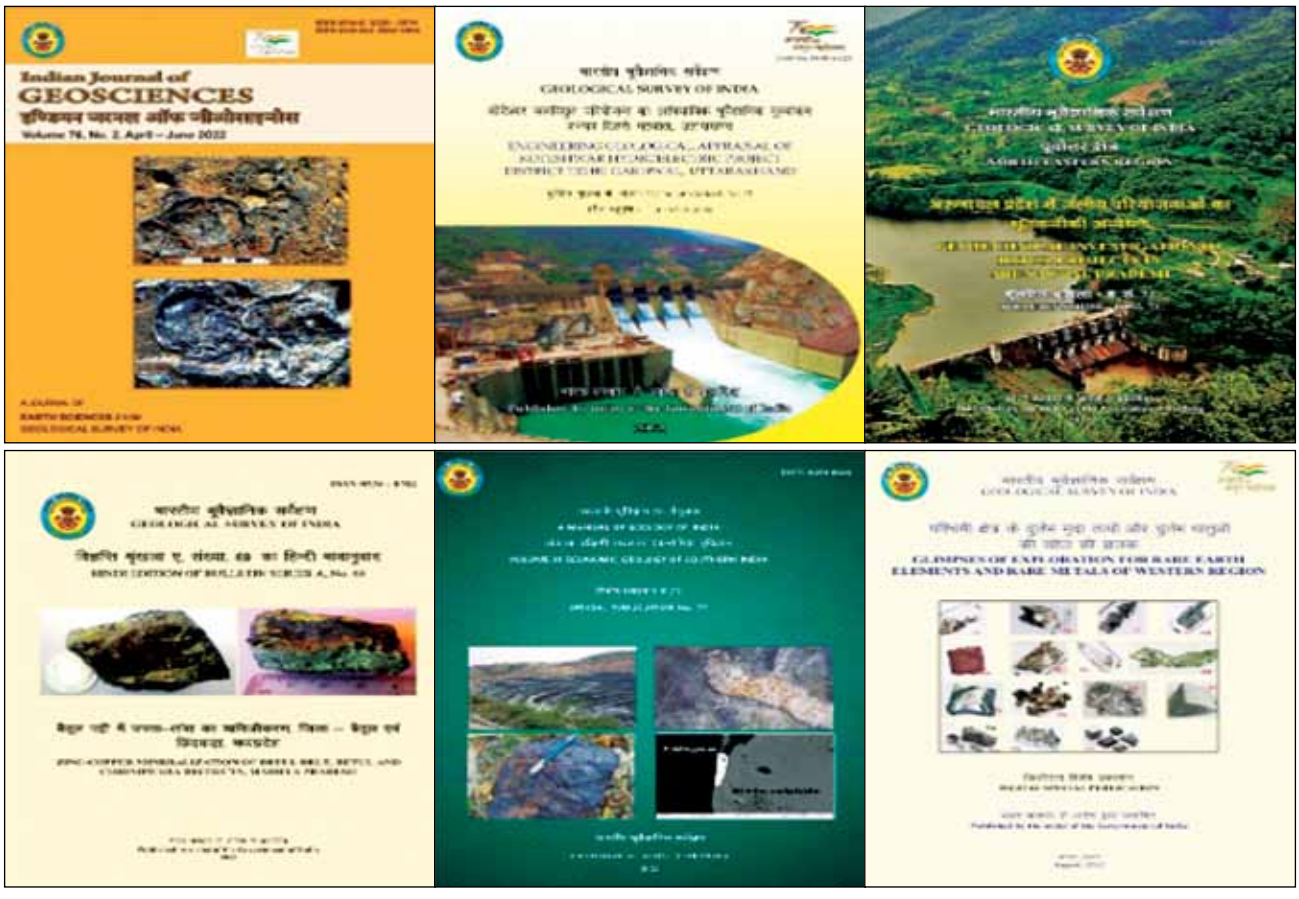


Photo 6.5 : Glimpses of GSI Publications available in OCBIS Portal [viz. Memoir, Bulletin Series, Records, Palaeontologia India and Indian Journal of Geosciences]

6.17 Mission - III C: Map, Geoinformatics & Data Integration

This mission is mandated to prepare scrutiny and disseminate both analog and digital geological maps / databases for the entire country. This mission also includes compilation of maps like Geological Quadrangle Maps (GQM), District Resource Maps (DRM), Geological and Mineral Maps of States, Mineral Belt Maps (MBM), Coal Field, TW Maps etc.

Mission III C is presently attending to the following projects:

- Geology and Mineral resources Map of India (1:2M)
- Coal Field Map of Singrauli and Tatapani-Ramkola
- Geo-Tourism map of Central India and Geotourism Maps of Rajasthan, Gujarat and Daman & Diu.
- Creation of commodity wise GIS database in Maharashtra, Chhattisgarh, Madhya Pradesh, Bihar, Odisha, Jharkhand, Sikkim, Andhra Pradesh, Telangana & Karnataka.
- 67 nos. of DRMs: (4 nos. of MP, 6 Nos. of Chhattisgarh, 6 Nos. of Maharashtra, 6 Nos. of West Bengal, 2 Nos. of Sikkim, 1 no. of Nagaland, 6 Nos. of Arunachal Pradesh, 6 nos.. of Assam, 9 Nos. of Uttar Pradesh, 2 Nos. of UT: Jammu & Kashmir (UT), 6 nos. of Tamil Nadu, 13 nos. of Karnataka)
- 3 nos. of Geological Quadrangle Maps (62H, 63L and 63O) of NR
- Mineral Belt Maps: MBM of Krol and Tal groups of Himachal Pradesh, MBM for Manganese in Andhra Pradesh and MBMs of WR
- Updation of the 1:50K database for NER.
- Compilation and preparation of a separate geo-database for Thematic Geological Maps in 1:25K scale using STM data.
- Synthesis and collation of All India National Geochemical Map data (NGCM) and National Geophysical Map data (NGPM) on 1:50,000 scales and their uploading on Bhukosh (OCBIS Geoportal).
- Geotourism/Geoheritage Sites Map of India consisting of 90 nos. of Geotourism sites has been prepared and digitally launched for all on 15.07.2022.
- A total 26 nos. of TW & CZ Maps (Scale 1:50,000 scale) have been approved and published during the period.
- Creation of National Geoscience Data Repository (NGDR): GSI has taken a lead role in the process of setting up of the National Geoscience Data Repository (NGDR) through outsourcing using NMET fund for benefit of all stakeholders wherein all geoscientific data will be made available at one platform. The work order for the National Geoscience Data Repository (NGDR) project was issued to BISAG-N by GSI on 10.02.2022 and since then a total 5409 nos. of reports of GSI has been handed over in phased manner to BISAG-N for digitization, of which BISAG-N has digitized 1640 nos. of reports and handed over 1264 nos. of reports to GSI for scrutiny. Out of 1264 nos., a total of 513 nos. of reports have been scrutinized by at GSI while 272 nos. scrutinized reports have been uploaded in the NGDR portal.

Photo 6.6: Web interface of the newly developed NGDR portal

6.18 MISSION - IV: Fundamental, Multi-disciplinary Geoscience and Special Studies

The National Mission–IV, with Headquarters at Kolkata, in the recent years has made significant contributions to the various aspects of geosciences by adapting state-of-the art technologies and infrastructure and has given a different orientation to geo-scientific research and development.

Mission IV activities has gone paradigm shift with robust R&D infrastructure in the form of National Centre of Excellence in Geoscientific Research (NCEGR) situated in Kolkata, Bangalore and Delhi NCR (Faridabad) and six regional laboratories across the country and that have dominantly taken up projects focussed on sustainable societal development as well as Research & Development work. These centres are well equipped with state-of-the-art laboratories and trained geoscientists.

The Mission IV activities of GSI are structured under three sub-missions viz. 1. Geotechnical Geohazards Management (M-IVA), 2. Climate Change & Eco systems, Polar Studies, Environmental Geology, Medical Geology & Bio-geohazards (M-IVB), 3. Fundamental Geosciences Research and Development (M-IVC).

During FS 2022-23, 164 items were taken up under Mission-IV which includes 83 items of M-IVA, 38 items of M-IVB and 43 items of M-IVC. The major activities pursued by GSI in M-IVA centre around developmental and societal issues related to Geotechnical projects, Landslide studies and Seismo-tectonic studies.

6.19 Geotechnical Geohazards Management (M-IVA).

During 2022-23, under landslide study, the research project on 'Development and implementation of regional landslide early warning system at two sites Darjeeling Himalaya in West Bengal and Nilgiris hills in Tamil Nadu' was in continuation of the LANDSLIP project initiated in 2017. As part of its endeavour to expand the prototype framework for a regional landslide early forecasting system in India,

GSI issued experimental landslide forecast bulletins during monsoon period on daily basis for Darjeeling and Kalimpong district, West Bengal and Nilgiris district, for Tamil Nadu from June, 2022 and landslide forecast bulletin also began to be issued for Rudraprayag district, Uttarakhand w.e.f. 01.08.2022. The issuance of bulletin for Darjeeling, Kalimpong and Rudraprayag was closed by the end of October 2022 after the end of the SW monsoon, whereas it will be issued for the Nilgiris district, Tamil Nadu up to 31.01.2023. The evaluation of the various components of model is under progress by GSI. As per the approved strategy plan, similar LEWS experimentation in 10 landslide prone states will be carried out up to 2025. During 2022-23, projects have been initiated in Himachal Pradesh, Kerala, Karnataka, Sikkim, Assam, Nagaland, Meghalaya and Mizoram. The augmentation of essential infrastructure for establishing a state-of the-art landslide forecasting facility at GHRM Centre, Kolkata is under progress, which will enable GSI, in near future, to operationalize landslide forecasting in India. In landslide sector, GSI has already prioritized its investigations on meso scale (1:10,000) and site specific (1:1000/2000) scales for generating more detailed scientific inputs for directly using the same in detailed developmental planning and site-specific landslide mitigations. During 2022-23, GSI has taken up 34 meso-scale (1:10k) projects and has also taken up detailed site-specific landslide investigations for five active landslides. In the ongoing National Landslide Susceptibility Mapping (NLSM) program, GSI has completed macro-scale (1:50k) landslide susceptibility mapping for 4.3 lakh sq. km area spreading over 18 landslide-prone States/UTs by 31.03.2022. GSI has already uploaded the above GIS enabled landslide susceptibility map data of 3.63 lakh sq. km. areas on its Bhukosh map portal (https:// bhukosh.gsi.gov.in/Bhukosh/Public) for free downloading and use by all stakeholders and the community. The remaining susceptibility map of Arunachal Pradesh (71000 sq. km) will be uploaded by March 2023. Along with the 1:50k landslide susceptibility map, the vital geodata also contains 87,500 landslide incidences as polygons and 30,881 field validated landslides as landslide inventory points with detailed geoparametric attributes. The national level landslide geodatabase of GSI is now also mirrored with the GIS map portal services of the National Disaster Management Authority (NDMA) through Web Map Service (WMS) for integrating the same vital geodata with an aim to use it for landslide disaster management plans by different landslide prone States/UTs. GSI has also undertaken a pilot R&D project on Monitoring of landslide and ground movements using satellite based InSAR and ground based 3D-Terrestrial Laser Scanner (TLS) around Mangan, Sikkim.

Seismotectonic studies are being done through Geodynamic Studies Division (GSD) and Seismo-Geodetic Data Receiving and Processing Centre (SGDRPC) situated at Kolkata. They are carrying out real time recording, monitoring and scientific study of earthquakes through its pan India network of GPS-GNSS stations and seismograph observatories established across the country. A number of 34 Permanent GPS-GNSS stations have already been installed in different parts of the country and data from these locations are being analysed to monitor long term crustal movement and establish strain model by GSD. GSD is carrying out a campaign mode GPS survey in parts of the Andaman Islands to understand the ongoing crustal deformation and dynamicity of the existing

fault system. GSD is also providing technical support to the Earthquake Geology divisions of various Regional offices of GSI from where campaign mode GPS studies are being carried out in parts of the Himachal Himalaya, Central Indian Tectonic Zone and North Bengal. One multidisciplinary research project titled "Geological, Geophysical, Geotechnical and Geothermal investigation in and around Shri Badrinath Dham Temple Precinct Development area" has been completed and the report was shared with the stakeholder.

SGDRPC is doing acquisition, processing and analysis of Real-Time Seismo-Geodetic data collected from ten (10) broadband seismic observatories. Detailed Micro-Earthquake (MEQ) survey in parts of North Bihar is going on to understand the seismicity pattern, nature and distribution of seismogenic sources. Geophysical survey will be taken up for the 13th Mile landslide on J.N. Road, East Sikkim District, Sikkim and Gayabari (14th Mile) landslide on NH-55, Darjeeling District, West Bengal during FS 2022-23.

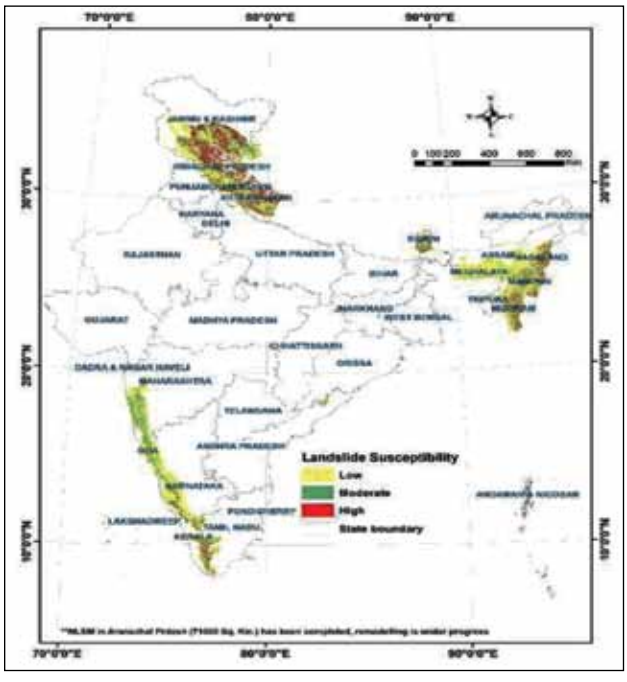


Photo 6.7: Landslide Susceptibility map of parts of India

6.20 Climate Change & Eco systems, Polar Studies, Environmental Geology, Medical Geology & Bio-geohazards (M-IVB)

Under M-IVB, glaciology projects are being pursued to study the recessional pattern and mass balance of the glaciers in Higher Himalayas, identify the potentially areas for high Glacial Lake Outburst Flood (GLOF) risk and update the inventory of Himalayan glaciers. Polar researches are mainly devoted to Ice Sheet Dynamics, both in Arctic and Antarctic, with special reference to climate change. In the Antarctic region, study of hard rock geology and thematic mapping of the Archaean-Precambrian terrains are being carried out. Under the public good geosciences and societal cause projects, geogenic contamination of surface/ sub-surface water with Arsenic (As), Fluoride (F), Lead (Pb) and other toxic elements are being studied under Environmental Geology programs in Nagaland, Meghalaya, Bihar, Jharkhand, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Andhra Pradesh and Rajasthan.

6.21 Fundamental Geosciences & Research (M-IVC)

In M-IVC, the fundamental research in three principal branches of geosciences viz., Petrology, Palaeontology, and Geochronology & Isotope Geology is being carried out. The other branches are Meteorite and Planetary sciences, Gemmology, Himalayan Geology, Volcanology, Quaternary geology and Experimental petrology. GSI has been declared as the Nodal agency and curator of all Meteorite Falls and Finds within the Indian Territory. The Gemology Laboratory, NCEGR, Kolkata is extending paid (as per SoC) services to public in identifying purity of gems and

precious stones including diamond.

Out of 166 standard items, carried out during FS 2022-23, outcome of 82 items would have direct societal benefits and 14 projects exclusively taken as R&D items for aiding/ boosting the mineral exploration activities of GSI.

Mission - V : Training and Capacity Building

6.22 Human Resource Development

Geological Survey of India Training Institute (GSITI) is presently conducting training programmes at nine centres across India. These are 1) Hyderabad, 2) Nagpur, 3) Lucknow, 4) Kolkata, 5) Shillong, 6) Jaipur, 7) Chitradurga (Karnataka), 8) Kuju (Jharkhand) and 9) Raipur (Chhattisgarh). The Hyderabad Centre is designated as the headquarters for all other eight centres imparting field training and has specialized divisions for laboratory and classroom trainings.

In total, during January to December 2022, 238 training courses were conducted for 11,790 participants. In the remaining part of FS 2022-23, more than 19 training programmes are contemplated that include three Induction/ Orientation training programmes for newly inducted Group-A Officers of Geology, Geophysics and Chemical streams of GSI. Along with these, one international course has been proposed for about 20 participants in Geographic Information System under Indian Technical and Economic Cooperation (ITEC) programme sponsored by MEA, Government of India. As a part of 75 week-long celebrations in commemoration of 75 years of India's Independence (Azadi ka Amrit Mahotsav), from January to December 2022, GSITI organized 89 field based, laboratory-based, e-Lecture/Training sessions from its HQ-Divisions, Regional Training Divisions and Field Training Centres. GSITI could outreach 8208 participants pan India under the Azadi ka Amrit Mahotsav programme.

PSS: Policy Support System

6.23 Central Geological Programming Board (CGPB)

The Central Geological Programming Board (CGPB) is the apex body at the national level under the chairmanship of Secretary (Mines) to coordinate the geoscientific activities including geological mapping, mineral exploration in the country. Similarly the State Geological Programming Boards (SGPB) in every State to coordinate the geoscientific activities in the States, complementing the CGPB and to interface with CGPB and GSI.

GSI is the Nodal Department (Member Secretary) and the State Geology and Mining Departments, Central Government Agencies, PSUs, other Ministries and industry representatives are the participating members.

Under the chairmanship of Secretary, Ministry of Mines, Govt. of India, CGPB meeting is being organized annually to discuss the geological programs and the related issues and concerns of the State Governments, central institutes and other stakeholders working in mineral exploration and other geoscience fields. The annual Field Season Program (FSP) of GSI is also placed before the august gathering to avoid duplication of work.

Activities of the CGPB Secretariat

1. Coordination with the Regional HoDs, DDGs of State Units, GSI and State DGMs for holding SGPB meetings in respective States.

2. Coordination and scheduling of meetings of CGPB sub-committees (I to XII).
3. Compilation of Action Taken Report and new agenda items received from the stakeholders for the main CGPB meeting.
4. Compilation of the minutes of all SGPB & CGPB committee meetings for circulation amongst the stakeholders.
5. Planning and organisation of the annual CGPB meeting.
6. Preparation and circulation of minutes of the annual meeting.
7. Coordination among all stakeholders, the Ministry & GSI.

Outcome of 61st CGPB along with focus/ main agenda of 61st CGPB Meeting

The 61st meeting of the Central Geological Programming Board (CGPB) was held on 24.03.2022 at A.P. Shinde Symposium Hall, NASC Complex, Indian Council of Agricultural Research (ICAR), Pusa, New Delhi under the Chairmanship of Shri Alok Tandon, IAS, Secretary, Ministry of Mines, Govt. of India. Shri Pralhad Joshi, Hon'ble Minister, Parliamentary Affairs, Coal & Mines, Government of India graced the occasion as Chief Guest, Shri R.S. Garkhal, Director General, GSI, Shri Sanjay Lohiya, Additional Secretary, Ministry of Mines and Dr. S. Raju, Director General, GSI has also shared the dais on the occasion. Senior officers of Ministry of Mines, Geological Survey of India (GSI), members from other Central Ministries, State Directorates of Mining and Geology, representatives from private mining industries, PSUs, Mining associations and other stakeholders were also actively participated in this meeting.

The Hon'ble Minister of Mines handed over seven (07) mineral exploration geological reports (G2 & G3 stage) to representatives from 3 State Govts., i.e., Odisha, Rajasthan and Chhattisgarh and fifty (50) geological memorandums of potential G4 mineral blocks for auction as Composite License (CL) to the representatives from 11 State Govts., i.e., Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu and Telangana. Seven publications and video on offshore marine exploration by GSI was also released by the Hon'ble Minister of Mines.

A total number of 45 new agenda items were obtained from various stakeholders including State Governments, Central Agencies, PSUs, Private Sectors and GSI for discussion in the 61st CGPB meeting. The agenda were mainly focussed upon the issues of obtaining forest clearances from MoEF&CC for taking up mineral exploration programmes by the States, fixation of rate of royalty of Molybdenum, declaration of non-metallic industrial minerals like calcite, dolomite and dunite as major minerals, monitoring the activities of private exploration agencies where the funding is being done by NMET and sharing of their geological reports with State/Central Govt., sterilization of beach sand minerals in the coastal stretches of Tamil Nadu, Kerala, Andhra Pradesh and Odisha, etc. The outcome of 61st CGPB Meeting are summarized as under:

- A total of 983 scientific programmes were approved for the FS: 2022-23 of GSI during the meeting. Out of the 983 programmes, 32 programmes were formulated on the request of State Governments/SGPB committee recommendations/CGPB committee recommendations.

- Apart from the above, GSI has also proposed 36 programmes in collaboration with universities/agencies and under sponsorship of different Govt. authorities etc.
- The issue of overlap areas of CBM blocks & coal blocks in different coalfields has been resolved and presently there is no overlap area in CBM block (either relinquished or under relinquishment).
- The newly accredited Notified Exploration Agency (NEA) can submit mineral exploration proposals to NMET for consideration of funding.

Salient points of 18th CGPB Committee meetings

The 18th CGPB Committee Meetings (I to XII) were conducted in the months of September and October, 2022. The salient points of 18th CGPB Committee meetings are as follows:

- A committee has been suggested to be constituted for formulation of a SOP for the preservation of core to be followed by the agencies working in leasehold area.
- The CGPB Committee-II (Precious Metals & Minerals) released the first version of the publication on Gold in India.
- The draft of updated base document of CGPB Committee-III (Non-Ferrous and Strategic Minerals) and CGPB Committee-IV (Industrial & Fertilizer Minerals) was prepared and circulated amongst the stakeholders for comments/ suggestions.
- MoU was signed between GSI and BISAG-N on 08.02.2022 for developing National Geoscience Data Repository (NGDR). Development of Geo-spatial portal and mineral exploration reporting template (MERT) is in advanced stage.
- AMD was requested to finalise the policy document on data sharing with GSI.
- NMDC expressed interest in collaboration for data sharing with Geoscience Integration Division of RSAS, GSI.
- The stakeholders were requested for providing their comments on the compendium published on "Active Fault Mapping".
- Emphasis was laid upon the digitisation of all the data available with GSI to help out State Government stakeholders and other organizations.
- Rock Texture Atlas and Geo Tourism/ Geo-Heritage Sites Map of India has been published by GSI and uploaded on GSI Portal.
- IBM has started doing mine planning using drone and satellite surveys to study the land use, impact of mining activities and mitigative measures.
- Collaboration held between GSI and NGRI, especially for near surface and deep concealed mineral resources with an aim strengthen National inventory.

Salient points/outcome of SGPB meetings held during the period

The salient points/outcome of SGPB meetings held during the year 2022 are as follows:

- DGM, Haryana proposed that the Kaliana Flexible sandstone in Charkhi Dadri District, Haryana needs to be preserved as a Geo-heritage site.

- Geological Wing, Himachal Pradesh was requested by GSI to expedite the constitution of a committee for defining proper guidelines to address the mitigation measures to check soil erosion and landslide in identified areas,
- Total 10 no. of blocks of limestone, bauxite/laterite minerals will be handed over to Auction Cell, CGM Gujarat for further processing.
- CGM Gujarat has proposed to collaborate with MECL in their exploration work through NMET fund for copper, lead, zinc and gold minerals in Masabar-Desar block, district Vadodara and Panchmahal, Gujarat.
- MECL expressed interest towards supporting drilling works for in-house exploration of DGM, Madhya Pradesh.
- MoU to be finalized between CMPDI and DMG, Bihar for providing services or coal exploration experts to DMG, Bihar.
- Emphasis was given on arsenic, fluoride, mercury and uranium-based studies which were being observed as serious contaminants in groundwater in the State of Bihar to prepare a seamless map of the entire State by GSI with respect to these elements.
- DMM West Bengal was requested by GSI to develop Weather Monitoring Stations apart from the already existing Weather Stations of Darjeeling Siliguri by taking inputs of soil, weather, rainfall etc.
- The potential major mineral blocks to be upgraded to G-2 level by DG (Odisha).
- Deep drilling in Ib valley coal field to be taken up by DG (Odisha).
- Updation of data regarding decorative and dimension stones in the hard rock terrains of Odisha is being done by DG (Odisha) for the preparation of maps by GSI.
- IBM was suggested by DG (Odisha) for fixation of Annual Sale Price of all grades of bauxite (low alumina and high silica).
- A comprehensive report on seismic microzonation of Greater Dimapur City, Nagaland, prepared by the collaborative works of DGM Nagaland, CSIR-NEIST, Jorhat and Nagaland State Disaster Management Agency (NSDMA) is now available to user agencies for planning purposes.
- As part of the preparation for the 62nd CGPB meeting, the Action Taken Reports (ATR) on the minutes of the 61st CGPB meeting and the new agenda items for the 62nd CGPB meeting are being obtained from the stakeholders. The CGPB Secretariat is in constant touch with the stakeholders for the purpose along with being in readiness for looking after the other necessary preparatory activities to be attempted for organising the meeting.

Photo 6.8: Lighting of the lamp during the inauguration of the 61st CGPB meeting

Photo 6.9: Shri Pralhad Joshi, Hon'ble Minister of Mines addressing the participants during the 61st CGPB meeting

Photo 6.10: Releasing of GSI Publications by the dignitaries on the Dias

Photo 6.11: Shri Pralhad Josh, Hon'ble Minister of mines handing over Geological reports to State Government representatives.

6.23 Quality Management (QM) Cell of GSI

The activities pertaining to Quality Management (QM) in GSI involve formulating modus operandi in the form of Standard Operating Procedures (SOP) for different technical activities for improving the quality of services provided by GSI, NABL accreditation of GSI laboratories to ensure customer satisfaction as well as for meeting international standards, and ensuring the quality of FS proposals and GSI reports through external peer review.

As per the mandate, during 2022, GSI had undertaken external peer review of 20% reports of FS 2018-19 & 2019-20 submitted during FS 2019-20 & 2021-22 respectively.

FS 2018-19: Out of 698 standard reports submitted by the six Regions, Central facilitates (CHQ) and Marine and Coastal Survey Division, Mangalore of GSI, 140 reports were randomly selected domain-wise through OCBIS for external peer review. These reports were classified theme-wise and sent to the external experts of respective domain for peer review. Presently, GSI is in the process of receiving the reports of FS 2018-19 back with comments and suggestions from the peer reviewers and after receiving back all the externally peer-reviewed reports they will be critically examined by a collegium comprising top level officers of GSI, wherever necessary, based on the recommendations of the external reviewers.

FS 2019-20: Out of 624 standard reports submitted by the six Regions, Central facilitates (CHQ) and Marine and Coastal Survey Division, Mangalore of GSI, 126 reports were randomly selected domain-wise through OCBIS for external peer review. These reports have been classified theme-wise and are being sent to external experts of the respective domains, for peer review.

FS 2020-21: Process of External Peer Review for the GSI reports pertaining to FS 2020-21 has been initiated. Random selection of

20% reports through OCBIS is over and list of external experts for external peer review is under preparation.

For ensuring the quality of the projects taken up in by GSI, External Peer Review (EPR) of 20% of the new items proposed by the six Regions of GSI, M&CSD and Central Facilities, CHQ for FS 2022-23 was undertaken. External Peer Review was held at six Regional Headquarters and M&CSD, Mangaluru. The EPR of Central Facilities was clubbed with that of the Eastern Region. A total of 157 FSP proposals / items of FS 2022-23 were put through the process of EPR.

During the year 2022, Standard Operating Procedure SOPs for Aster Data Processing and Marine & Coastal Survey Division (MCSD) were drafted and approved to keep the quality of their work at par with the international standards.

6.24 International Cooperation

The activities of GSI in the field of International Cooperation include bilateral collaborative programs with various foreign governmental organisations and scientific agencies, participation in international seminars/ symposia, facilitation of foreign visits to India for programs/trainings, and visit of officers abroad. The above activities are overseen by the International Affairs Division, GSI, CHQ.

During the period from 01.01.2022 to 31.12.2022, the division was actively engaged in providing and facilitating necessary technical and associated inputs/comments/agenda points/action taken report/note/talking points to Ministry of Mines, from time to time. During the period, GSI took part in collaboration with other countries for knowledge sharing and technological up-gradation, facilitated service for participation of GSI officers in international seminars/ symposia, foreign visits of GSI officers for international conference/trainings, maintained continuous correspondence and communication with different countries and Ministry of Mines for exploring possibilities in new areas of cooperation and collaboration.

6.25 Bilateral Collaborative Activities

GSI continued its participation in bilateral cooperation and collaborative programs with other countries on several geoscientific disciplines for mutual benefits. Activities are being taken up as per the signed Memorandum of Understandings (MoUs) with various countries.

Agreement/Memorandum of Understanding (MoU) signed during this period

i) **ToR between GSI and Geoscience Australia (GA):** Third Term of Reference (ToR) extension has been signed on 11.10.2022 to continue the collaboration with GA as well as enhancing the experience on mineral exploration. The main purpose of the ToR is 1) exchange experience on critical mineral exploration as well as concentration in ores and sample analysis, 2) establishing National Drill Core Library with the help of GA, 3) acquiring technical knowledge from GA on magnetotelluric and deep reflection seismic data collection, processing and interpretation undertaken by GSI, 4) two workshops hosted by GA on geochronology and mineral system/ mineral potential and 5) necessary training from GA.

Photo 6.12: Dr. S Raju, Director General, GSI signing the Term of Reference (TOR) under MoU between GSI and Geoscience Australia and signed ToR shown virtually by Dr. S. Raju, Director General, GSI. Dr. S.P. Shukla, Deputy Director General, IA&IOC and Shri Indranil Chakraborty, IA was also present on the occasion.

ii) **Extension of MoU with SJVN Limited on construction stage geotechnical services for Arun-3 HEP, Nepal:** The Geological survey of India, Ministry of Mines and SJVN Limited under Ministry of Power, mutually signed Memorandum of Understanding (MoU) on 16th day of June 2020 for an initial period of one year (up to 15.06.2021) pertaining to geotechnical studies for providing possible engineering geological solutions of various problems that will arise from time to time during construction stage in Arun-3 hydroelectric project, Nepal. As the construction stage of the Arun-3 HEP is still continuing, both SJVN Limited and GSI have mutually agreed and signed the extension of MoU for a further period of one-year w.e.f. 16th day of June 2022 to 15th day of June 2023.

iii) **MoU with SJVN on Hydroelectric Projects in Nepal:** MoU between Geological Survey of India, Ministry of Mines and SJVN Limited, Ministry of Power, Government of India on activities related to DPR, Pre-Construction and Construction Stage Geotechnical Services for Lower Arun and Arun-4 Hydroelectric Projects (HEPs) on Arun River in Nepal, was signed on 07.09.2022 through virtual mode.

Bilateral Meetings

i) **India-Australia [Geoscience Australia (GA)]:** An interactive meeting between the Geological Survey of India (GSI) and Geoscience Australia (GA) under the MoU was held through videoconferencing on 13.10.2022. The meeting was organised to discuss the modalities of the implementation of the 3rd Term of Reference (TOR) between two organisations, particularly with reference to critical mineral targeting, RMT project, Digital Core Library, DSRS and MT surveys in India.

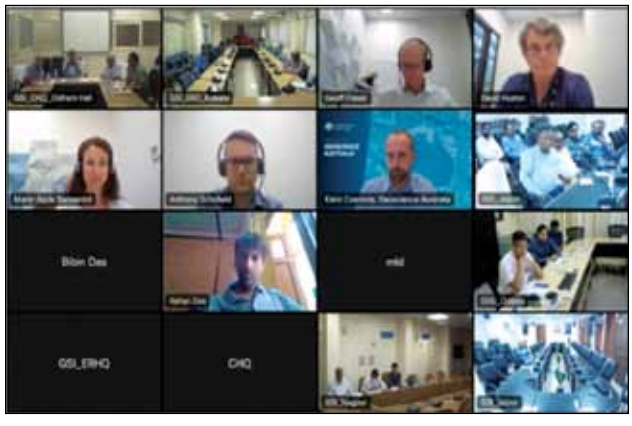


Photo 6.13: Flash of the meeting between Geological Survey of India and Geoscience Australia

ii) **India-Finland (Geological Survey of Finland -GTK, Finland):** MoU between the GSI, Ministry of Mines of the Republic of India and the Geological Survey of Finland (GTK), Finland was signed on 03.12.2020. The MoU envisages cooperation in the field of Geology and Mineral Resources for an initial period of five years. Consequently, two online meetings were conducted between GSI and GTK officials. The first interactive meeting between Geological Survey of India (GSI) and Geological Survey of Finland (GTK) under the GSI-GTK, Finland MoU was held virtually on 17.05.2022 to discuss on pertinent points for exploring the possibility of collaboration in Urban and Engineering geology. Lot of discussions were held between members of two organizations regarding accuracy of predicting the subsurface geology indicating unfavorable zone consisting of weak/shear zones at an early stage (DPR stage) for construction of any underground structure in tectonically complex terrain.

Photo 6.14: Glimpse of meeting between GSI and GTK, Finland on 17.05.2022

Subsequently, another interactive meeting between Geological Survey of India (GSI) officers with representatives of Geological Survey of Finland (GTK) under the MoU was also held through videoconferencing on 18.05.2022 to discuss on possible cooperation in field of Geochemical mapping and Geochemical Atlas preparation. During the meeting, a detailed and elaborated discussion about Nation-wide Geochemical Mapping programmes of Finland and Geochemical Atlas of Finland as well as the status of National Geochemical Mapping of India, GSIs' practice of NGCM project, sample methodology, analyzed elements and detection limits and analytical techniques etc. was held.

Photo 6.15: Glimpse of meeting between GSI and GTK, Finland on 18.05.2022

iii) **India- Russia (Rosgeologia- ROSGEO):** In pursuance of the Memorandum of Understanding (MoU) between Geological Survey of India (GSI) and ROSGEO two interactive online meeting were held. The First Interactive meeting between GSI officers with representatives of Joint Stock Company, ROSGEOLOGIA (ROSGEO) was held virtually on 20.01.2022. Detailed discussions were held regarding i) possible cooperation in Ni-PGE Exploration in continental flood basalts of Deccan Volcanic Provinces, considering similarity of Siberian & Deccan volcanic provinces and possibility of Mineralization ii) joint

formulation of possible projects in the field of Aero-geophysical and Ground Geophysical Survey, including machine learning, data acquisition; interpretation and preparation of possible model of mineralization and crustal model iii) boundary mapping of marine polymetallic nodules and encrustation, 2 polymetallic sulphide and phosphorite exploration, drilling of sea mounts and platforms in verifying the subsurface continuity of phosphorite occurrences and machine learning for AUV and 2D Seismic surveys iv) training and capacity building of two organizations.

Photo 6-16: Glimpse of the First Virtual Interactive Meeting between Gelogical survey of India (GSI), India and Joint Stock Company, ROSGELOGIA (ROSGEO), Russian Federation

Subsequently another virtual interactive meeting was conducted on an interactive virtual meeting was held on 14.02.2022. In the meeting necessary discussion was held on commercial issues/ procedures like tendering and procurements of GSI. During the meeting ROSGEO apprised the capabilities of ROSGEO in various geophysical surveys for mineral prospecting both in land and ocean apart from onshore seismic and marine seismic survey as well as laboratory studies and resource assessment. They further informed that the geophysical data processing, interpretation and modelling are mostly done in Russian processing centers presently, but creation of processing center in India through 100% subsidiary and registration by Daughter Company of ROSGEO is under process. GSI team has briefed ROSGEO about local and global tendering process for aero-geophysical survey, published tender for blocks-13 to 16 on GEM portal and upcoming tenders for Block-16 to 19. ROSGEO has shown keen interest to participate in both type (local and global) of tenders through Indian subsidiary partners.

Photo 6.17: Glimpse of the second interactive meeting between GSI officers and representatives of Joint Stock Company, Rosgeologia (Rosgeo)

iv) **Interactive meeting between GSI officials and representatives of Geological, Mining and Metallurgical Institute (INGEMMET), Peru:** A virtual meeting was held on 20.04.2022 between GSI and Geological, Mining and Metallurgical Institute (INGEMMET), Peru for exchanging talks on some specific topics as requested by Peruvian side to explore possible areas of mutual cooperation between two organizations for drawing up Inter-Institutional Cooperation Agreement. Discussion was focused on three topics, viz. 1) Geostatistics and satellite information processing applied to mineral resources

prospecting, 2) Coordination on research topics on metallogeny and mineral deposits and 3) Geological Risk Management - use of satellite imagery for geological hazard identification as proposed by Peruvian counterpart. GSI side emphasized on joint work in the field of exploration for Porphyry type of Cu-Mb-Au deposits in Central Indian Tectonic (CITZ) region. INGEMMET side expressed their keen interest on all proposed areas of cooperation as discussed in the meeting; accordingly, an inter-institutional cooperation agreement has been finalized.

Photo 6.18: Glance on the Virtual Interactive Meeting between Geological Survey of India (GSI) and Geological, Mining and Metallurgical Institute (INGEMMET), Peru on formulation of Inter-Institutional Cooperation Agreement.

v) Meeting between DG, GSI and Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia at CHQ, Kolkata CISRO meeting: A meeting was held between Dr. S. Raju, Director General and Andrew Jenkin, Research Director, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia in the chamber of the Director General, CHQ, Kolkata on 21.09.2022 for collaboration with CSIRO in the fields of critical minerals, mineral beneficiation techniques and setting up of National Core Library with state-of-the-art infrastructure and technology in lines with that in Australia.

Photo 6.19: Glimpse of the meeting between GSI and CSIRO officials

vi. Meeting with the Minister of Education of Finland at the Embassy of Finland on 17.11.2022, which was attended by Dr. L.P. Singh, Deputy Director General, NCEGR, Faridabad. GTK, Finland has shown interest in a meaningful collaboration including training and exchange program for geoscientists from GSI. Ms. Johanna Koponen, Senior Ministerial Adviser, Secretariat for International Relations, Ministry of Education and Culture, Finland Government conveyed that Finland Government is looking forward to attract young talent from India to visit Finland and get trained in different domains. The willingness of Finland Government is to trained students/young professionals and also conveyed that as far as the exchange program under the MoU is concerned, the Joint Working Group (JWG) will be identifying the areas in which GSI would like its geoscientists to be trained. Further, the GSI official also opinioned that one of the probable areas for collaboration could be in the area of Big Data Analysis which may aid in finding new target area for mineral exploration. The Minister of Education of Finland conveyed that her Ministry and the Government of Finland is looking forward for implementation of this MoU

and will extend all the required support.

vii. **Meeting with Morocco:** A virtual meeting has been conducted between GSI and Moroccan counterpart on 06.04.2022, where in the detailed discussion on the training on different topics was carried out and the all relevant queries of Moroccan side were replied.

viii. **1st JWG meeting between India and Bolivia:** Dr. Mathew Joseph, DDG, Shri Dattatreya Shankarshastri Jeere, Director attended the meeting on 07.04.2022 through virtual mode.

ix. **The online preparatory meeting** under the Chairpersonship of Dr. V. K. Dermal. JS, Mines for the upcoming 3rd JWG meeting between Government of India and Government of Peru was attended by three officers from GSI on 05.12.2022.

India-USA (Florida International University -FIU)

A joint fieldwork between FIU scientist (Prof. Neptune Srimal) and GSI officers was undertaken in the Ladakh UT between 21 July and 18.08.2022 under the MoU. Field traverses were taken in different sectors like Karzog-Tso Morari-Puga-TsoKar-Sumdo-Mahe sections, Turtuk-Bogdang-Waris Lungpa sections, Darbuk- Shyok-Upper Shyok River (along DBO road) Tangtse-Pangong-and Tangtse-Parna Valley. Adequate field samples were collected from the above mentioned stretches. Out of these, a number of samples have been selected for petrographic studies and geochemical analysis in the first stage. On the basis of these studies, samples will also be selected for geochronological studies. The salient objective of the present field work was to reappraise the tectonic model of the India-Asia collision zone in Ladakh (UT)- Karakoram and relate the pre- and post-collisional magmatism of the India- Asia collision zone to develop a new tectonic model through laboratory analysis/ study. In this regard, planning has been done to continue the study in more focused areas, based on the findings of the work done this year.

Other international activities

International Affairs division continued its endeavour towards providing and facilitating necessary technical and associated inputs/ comments/agenda points/action taken report/ note/talking points to Ministry of Mines, from time to time, regarding 5th India-Azerbaijan IGC, 13th Session of India Uzbekistan Inter-Governmental Commission (IGC), India and Mongolia in Mining Sector, updated status of MoU, cooperation in the field of Geology and Mineral Resources between India and Zambia, 1st India-Central Asia Summit, 12th Session of India-Tajikistan Joint Commission, 5th India-Canada Annual Ministerial Dialogue, 10th Session of India- Oman Joint Commission Meeting (JCM), India-Algeria Joint Commission Meeting (JCM), 19th Session of India- Romania Joint Economic Committee (JEC), Indo-Russian Inter-Governmental Commission, 2nd JWG between India and Malawi, Future Form-2023, BRICS Geological Platform Israel, Zambia, South Africa, Argentina, Brazil and Paraguay, Argentina, Morocco, UAE, Australia, Angola.

International Visits/Workshops/ Seminars/ Symposiums/ Exhibitions

1. Shri Lalit Mohan Singh Maura, Deputy Director General, Geological Survey of India visited as part of the Indian delegation led by Dr. Alok Tandon, Secretary, Ministry of Mines to South

Africa to participate in 'Mining Indaba-2022' at Cape Town, South Africa, during 9th to 12th May, 2022. Various bilateral meetings were held with the representatives of Government of Zimbabwe, South Africa and Saudi Arabia. Dr. Veena Kumari, Joint Secretary, Ministry of Mines and Shri Lalit Mohan Singh Maura, DDG, GSI also discussed with the representatives from Ministry of Mining and Geology, Republic of Senegal regarding cooperation in the field of geological survey and mining opportunities particularly in strategic minerals, phosphate, gold and PGM.

2. Shri Praveen Kumar, Sr. Geologist, NR, SU: J&K, GSI and Shri Dharmendra Kumar, Sr. Geologist, EPE Division, DGCO, New Delhi visited Nepal during 10th May to 13th May, 2022 for investigation of all the components including dam, HRT & Power House Complex of Arun-III Hydroelectric Project, Nepal for geotechnical investigation and rendering necessary site specific suggestions.

3. Dr. S. Raju, D.G., GSI during 1st July 2022 to 7th July 2022 visited Australia as part of the high level official delegation led by Hon'ble Minister for Coal, Mines and Parliamentary Affairs comprising representative from Ministry of Mines, Ministry of Coal, and Geological Survey of India. The programme of the delegation included various bilateral meetings with Australian federal/ provincial Governments and with CEO's of critical mining companies and visit to mines site and critical mineral processing facilities.

4. Dr. S. Raju, Director General, Geological Survey of India visited Busan, South Korea to participate in two-day conference (28-29 July, 2022) organized by 37th IGC and formally handing over the 36th IGC Presidential Cup over to the President, 37th IGC. The DG, GSI also discussed with the Korean counterparts regarding the scientific cooperation with GSI.

5. Dr Pradeep Singh, Director (Tech.), Ministry of Mines and S/Shri R. Balaji, Director, Mission III-IT, CHQ, Kolkata and Dattatreya Shankarshastri Jeere, Director, RSAS, Bangalore participated in the Landmark Digital Forum 2022 held at Nusa Dua Convention Center, Bali, Indonesia on August 25 and 26, 2022. The digital forum in Bali, Indonesia was an important E&P business & technology event for discussion on collective progress and layout journey ahead in driving values from digital solutions which could be applied to NGDR as well as GSI Areo-Geophysical data. The Digital Forum provided an opportunity for gaining knowledge on the digital capabilities being delivered in cloud, application of AI in solving complex challenges and opportunities in Energy Transition.

6. Dr. G. Nagendran, Director, MCSD, Mangalore participated in the Sea Tech Week 2022 held at Brest, France 26th – 30th September 2022. The visit provided opportunities for GSI scientist to explore Indo-French cooperation on blue economy, marine science and technology, besides gaining knowledge in advances in research and innovation etc.

7. Shri Janardan Prasad, Additional Director General and HOD, Geological Survey of India, Southern Region, Hyderabad attended the 18th AGM,

Geneva, Switzerland from 7th to 10th November 2022, organized by the Inter-Governmental Forum (IGF) on Mining, Minerals, Metals and Sustainable Development under the aegis of the United Nations Conference on Trade and Development (UNCTAD), as part of the Indian delegation headed by Shri Sanjay Lohiya (IAS), Additional Secretary, Ministry of Mines, Government of India. The IGF is one of the most important global events for the Mineral and mining sector in connection with the understanding latest development in mining technology, exploration, R & D adopted in critical minerals. Shri Prasad met with representative delegates from the member countries to understand their organizational set-up and work culture compared to GSI, besides held discussions with members of Brazil regarding REE exploration and the Joint Working Group with the Brazilian Team and members of Iran regarding any possibility of assistance in mineral exploration in Iran.

8. S/Shri Karthikeyan Annamalai, Sr. Geologist and Nevin C. G., Sr. Geologist, NCEGR, Bangalore participated in In-Plant training on SEM-EDS for twenty one working days from 17th October to 14th November 2022 at Tescan, Brno, Czech Republic. It is to be mentioned that EDS-SEM based Automated Mineralogy Solution along with accessories, software and sample preparation unit set has already been supplied to NCEGR, Bangalore, GSI, and installed at GSI, NCEGR, and Bangalore. The training provided an opportunity to the GSI scientists in understanding the various techniques of the analysis on the state-of-art instrument.

9. Shri Dinesh V. Ganvir, Deputy Director General (DDG), Geological Survey of India (GSI) visited Australia as part of an Indian delegation headed by Shri Vivek Bharadwaj, Secretary to the Government of India, Ministry of Mines, to Sydney, Australia from 31st October to 4th November 2022, to attend the 3rd Joint Working Group meeting on 01.11.2022 and participate in 'International Mining and Resources Conference (IMARC-2022) during 2nd - 4th November, 2022, held at Sydney, Australia.

10. Dr. Sandip Kumar Roy, Director, National Mission-II, HQ Mineral Resource Assessment, Central Region, GSI, Nagpur visited Buenos Aires for two weeks, from 20th November to 3rd December 2022, as part of the team led by CEO, KABIL for evaluating and assessing two prospective projects of lithium for exploration in Catamarca Province of Argentina including the critical mineral exploration projects proposed by CAMYEN.

11. Dr. Satya Prakash Shukla, DDG, IA & IGC, CHQ, GSI, Kolkata and Shri Manoj Kumar Patel, DDG and RMH-II, GSI, ER, Kolkata attended the Global Mining Summit (GMS) concurrently with the International Mining Machinery Exhibition (IMME) being organized by CII from 16th November 2022 – 19th November 2022 at Kolkata. The officers also attended the Australian Resource Investment Seminar on 17.11.2022.

6.26 Collaborative Projects with Other Organisations

During the year 2022, GSI has taken up nine (09) collaborative projects with different organisations and institutes like CSIR-NGRI; Directorate General of Hydrocarbons (DGH), GOI; IIT Bombay; Centre for Earth, Ocean and Atmospheric Sciences (CEOAS), University of Hyderabad (UoH), Hyderabad, Telangana; Bhabha Atomic Research Centre (BARC), Mumbai; Directorate of Mines, Odisha; IIT Khargapur; Archaeological Survey of India (ASI); The Energy and Resources Institute, School of Advanced Studies (TERISAS), New Delhi.

STSS: Scientific & Technical Support System

6.27 ISO certification of Chemical Laboratories & Central Headquarters

The Central Chemical Laboratories (XRF and ICPMS laboratories) at CHQ, the Regional Chemical Laboratories at NRO, SRO, WRO, CRO, ERO & NCEGR Faridabad along with SU: Chemical Laboratories at Pune, Bhubaneswar and Chennai have been accredited by National Accreditation Board for Testing and Calibration Laboratories, Government of India as per ISO/IEC 17025:2017. For an accredited laboratory to maintain its accreditation status, it is mandatory that the laboratory continue to comply with the requirements of ISO/IEC 17025: 2017 and NABL specific criteria(s) for applicable field(s). The Re-assessment of all the Regional laboratories have been done in the field of Testing as per ISO/IEC 17025:2017. All the laboratories have been participating in Proficiency Testing (PT) GeoPT Program and Inter Laboratory comparison on regular interval, and the performance of the laboratories were found satisfactory, i.e. Z score within ± 2.

6.28 Modernization program in GSI

The state of the art instrumental facilities of GSI mainly operate under the aegis of National Centre of Excellence in Geoscience Research (NCEGR) with main centre at Kolkata and satellite centres at Bangalore and Faridabad. Existing Laboratory instruments like EPMA, SEM, XRD, Raman Spectroscope, Gemmology, Fluid inclusion, TL - OSL Dating, Radiocarbon Dating, Isotope Ratio Mass Spectrometer (IRMS), Laser Ablation Inductively Coupled Plasma Mass Spectrometer (LA-Q-ICPMS) and Laser Ablation Multi-collector Inductively Coupled Plasma Mass Spectrometer (LA-MCICPMS) laboratories are operating successfully along with fundamental laboratories such as petrology and palaeontology. State-of the art technology is also being used in GHRM Centre, CHQ, Kolkata in the domains of GPS-Geodesy, landslide and INSAR.

In the seamless endeavour to establish GSI as a world premier geoscientific institute, modernization programme to improve the functioning of GSI in its different spheres of geoscientific activities has been continued during 2022-2023. The modernization programme not only aims for upgradation of the existing analytical facilities/capabilities for generating, processing, interpreting geoscience data but simultaneously to introduce latest technical knowhow, support operational activities of GSI as well as procure/ plan high end machineries and scientific equipment in different domains in a phased manner.

High-Resolution Secondary-Ion-Mass Spectrometer (HRSIMS) instrument IMS 1300 HR3 along with accessories and with all ancillary

items has been commissioned in the G&IG Division, NCEGR, Kolkata. This advanced facility is only 2nd in India and has the potential to analyse different isotopic systems for geological applications in high resolution which will be helpful in mineral targeting studies (with the help of selected isotopes such as Sulphur, Oxygen and Carbon), studies related to public good geosciences (such as environmental, paleoclimate etc.), meteorite study etc. At present calibration/protocol development/standardisation for different light isotopic systematics are in progress and shortly the laboratory will be ready to cater the needs of GSI for the approved FSP programs.

During this period, procurement of high end machineries such as EPMA, ICPMs, AAS-GTA, XRD and DGPS is in progress for generation of high-quality geoscientific data and to augment the existing laboratories at NCEGR, Faridabad. Proposal of procurement of items like campaign mode GPS, Terrestrial Laser Scanner, drone, LAT module software GAMMA (for INSAR processing), Slope stability software etc are in queue.

The SEM laboratory, GSI Kolkata is in the process of procuring one FESEM, with Secondary Electron detector SE, Back-scattered Electron detector BSE and Cathodoluminescence CL detectors. FESEM with EDS will be advantageous in studies in the domain of mineral exploration, shale gas exploration, landslide and engineering geology, meteorite and planetary science research apart from petrology and palaeontology. As a part of the up-gradation of the Palynology, Microfossil and Invertebrate Processing Laboratories, procurement of Fume Chamber, Thin section grinding and polishing machine, Centrifuge and up-gradation of Inverted Biological Microscope with digital camera attachment is in process. An advanced Stereozoom Microscope for the Microfossil Laboratory have also been proposed. Further, procurement of X-Ray Diffractometer with ancillary units for Mineral Physics Division, Kolkata is under process.

Besides the above mentioned major high end instruments, various other geological, chemical, geophysical, geotechnical and drilling instruments are also in the procured/ planned stages for FY 2022-2023, with optimum utilization of the fund.

Photo 6.20: High-Resolution Secondary-Ion-Mass Spectrometer (HRSIMS), GSI, NCEGR, Kolkata

Photo 6.21: SEM-EDS Laboratory, GSI, NCEGR, Bangalore

6.29 Internal Resource Generation

In the year 2022, total Rs. 1,00,35,138 (Rupees one crore thirty-five thousand one hundred thirty eight) only has been generated as Internal Resource and Rs. 16,98,355 (Rupees sixteen lakh ninety eight thousand three hundred fifty five) only collected as

Service Tax and Cess by way of undertaking various commercial activities such as sponsored commercial geotechnical works; multidisciplinary & fundamental research; sale of maps, unpublished reports; providing analyses of samples (petrological/ chemical/ mineral physics/ geotechnical Labs.), EPMA studies and gem testing etc.

6.30 Activity-wise budget expenditure of GSI against the approved budget grant during FY 2021-22 and the activity wise total BE grant and expenditure till December, 2022 of FY 2022-23 is given in **Annexure 6.1**.

6.31 Human Resource

Out of the total sanctioned strength of GSI i.e. 9401 as on 31.12.2022, 5831 posts are occupied. The group-wise and category-wise details of personnel as on 31.12.2022 are given in **Table 6.1.**

Table 6.1

Statement showing category wise details of sanction & filled up strength in GSI as on 31.12.2022

Statement Showing category-wise details of existing staff of GSI as on 31.12.2022								
Class	**Sanctioned Strength**	**Men in position**	**SC**	**ST**	**OBC**	**No.of Women**	**PH**	**Total (SC, ST , OBC, Women, PH)**
Group-A	3441	2722	465	211	805	790	28	2299
Group-B (Gaz.)	912	537	124	61	127	101	11	424
Group-B (NG) (Min.)	915	627	96	67	60	131	11	365
Group-B (NG) (Tech.)	1027	330	50	36	17	20	4	127
Group-C (Min.)	672	401	62	31	73	66	7	239
Group-C (Tech.)	1434	449	62	47	77	22	8	216
MTS (Erstwhile Gr-D)	1000	765	193	111	122	132	28	586
Total	**9401**	**5831**	**1052**	**564**	**1281**	**1262**	**97**	**4256**

6.32 Public Relation and Media Management

PR and media cells have been operational in all the regional headquarters of GSI in coordination with CHQ, Kolkata. Highlights of GSI activities and achievements are being shared regularly with media using press releases, social media posts, influencer programs, talk shows etc. There is steady increase in the Visibility of GSI's activities and achievements in all the media platforms throughout the year. Emphasis is being given to social media for

dissemination of information as it provides direct and instant connect to the large number of tech-savvy young audience across the length and breadth of the country. GSI gained about 33,430 new followers across all social media platforms. Total 'Reach / Impressions' in social media including Facebook, Twitter, Instagram, YouTube LinkedIn and Koo together has touched the figure of around 15,60,000. Number of 'Engagement received' (people commented, shared posts)/ Videos Viewed) is around 1,30,000. The major events covered in these news impressions were mostly related with the activities being undertaken under the aegis of **Azadi Ka Amrit Mahotsav, Har Ghar Tiranga, Special Campaign 2.0, Swachhata Pakhwada** being celebrated across the country in general and contribution of GSI in nation building in the last 75 years since independence in particular. The information projected in social media and print/electronic media were specific in terms GSI achievements/contribution in the field of mineral augmentation, base line geological data generation and public good geosciences in context of natural hazards, groundwater contamination, other environmental issues affecting the general public. Different tools like press release, influencer activity, story generation, short videos and social media creatives were employed for wider dissemination of information and outreach. GSI achieved multiple coverage in about 08 languages having various news items/ specific information in print media, apart from these also got coverage in online portal and media platforms.

The public relation and media management has helped GSI to reach the masses in a faster and more effective manner and has further enhanced the visibility of GSI.

UNCOVER (India) Projects

6.33 Three pilot scale projects (1) Northern Transect (2) Southern Transect (3) Eastern Transect are taken up by Geological Survey of India involving Geology and Geophysics team of officers. Project "Uncover (India)" is being executed to probe for deep seated/concealed mineral deposits.

NORTHERN TRANSECT

6.34 Searching for concealed and deep-seated mineral deposits below unclassified sediments in parts of Aravalli and Bundelkhand Cratons in parts of Rajasthan, Madhya Pradesh and Uttar Pradesh (Phase-I & Phase-II).

Project Uncover (India), Northern Transect was taken as a pilot project to explore possibility of targeting concealed and deep-seated mineral deposits in parts of Aravalli and Bundelkhand cratons falling in parts of Rajasthan, Madhya Pradesh and Uttar Pradesh. The first phase of the project spanned from FS 2016-17 to FS 2019-20. Multidisciplinary approach was adopted to assess the potentiality of about 30,000 sq. km area. Several gravity and magnetic anomalies with anomalous hydrogeochemical signatures for basemetal were detected below the sand covered areas of Churu-Jhunjhunu districts as well as Dausa districts of Rajasthan. Along with areas below unconsolidated cover several potential areas were identified for further study in the Neem-Ka-Thana copper belt of Rajasthan for REE-RM as well as associated basemetal mineralisation.

The second phase of the project spanned for two years starting from FS 2020-21 to FS 2021-22. Under Phase-II, about 3900m drilling have been carried out in six boreholes

to test the geophysical and geochemical anomaly zones in Churu sector as well as Dausa sector of Rajasthan. The boreholes drilled in Churu Sector of Rajasthan have brought out existence of meta-sedimentary sequence below a sand cover depth of about 90m to 100m. The existence of metasedimentary sequence far away of the established continuity of North Delhi Fold Belt has opened up new search space for potential basemetal deposits in these areas. Along with metasedimentary sequence the boreholes drilled in Churu sector have also brought out diorite-granodiorite sequence occurring as intrusive within these metasediments. Thick pyrite dominated sulphides have been intersected within the granodiorite sequence in boreholes. The mineral chemistry studies of the indicator minerals as well as the detailed litho-geochemistry have indicated possibility of having porphyry type settings below a significant cover depth.

A potential area of about 70 sq. km was identified in the Dausa sector in the first phase of the project. The regional geophysical studies carried out during first phase of work is followed by detailed electrical surveys like SP and IP study of 2.5 sq. km area within partly covered terrain to target possible partly and/ or concealed mineralization present in the area. The results show a moderate to low SP zone with moderate IP signature near Gujar-Guwara village whereas a strong IP anomaly has been recorded near the village Gadarwada Gujran lying in toposheets no 54A/08, 12. The boreholes drilled in Dausa sector of Rajasthan have intersected copper mineralization below alluvium cover. The three boreholes drilled in a single profile near Gujar-guwara village to test the surface as well as subsurface continuity of mineralization have intersected sulphides in the form of mostly chalcopyrite and pyrite as dominant sulphide phases with minor amount of bornite and chalcocite in the shallow zone. The first borehole, RJDUBH-01 drilled to target the anomaly zone at shallow level have intersected two (02) Cu lodes having assay value of 7m X 0.22% Cu and 3m X 0.21% Cu respectively. The analysis of borehole RJDUBH-02 planned to test the anomaly zone at further deeper level has given five (05) Cu zones having assay value 4m X 0.27% Cu, 4m X 0.10% Cu, 5m X 0.25% Cu, 3.5m X 0.11% Cu, 6m X 0.28% Cu upto a drilled depth of 70m from surface. Along with copper, anomaly zone for gold (Au) has also been intersected with assay value of 4.5m X 0.16 ppm.

The detailed geophysical study in the Gadarwada-Gujran area has indicated presence 600m long conductive zone below dune sand cover. Two boreholes were planned and drilled to test the high chargeability zone falling within moderate hydrogeochemical Cu anomaly. The borehole RJDUBH-04 intersected veins, smears and dissemination of pyrrhotite-pyrite rich zone within the staurolite bearing quartz-biotite schist host from 100 m to 220 m along the borehole. The small copper bearing zones has given assay value of 1m X 0.24% Cu and 2m X 0.29% Cu. Minor chalcopyrite has been intersected at 228 m and 313m along the borehole. The fifth borehole has also intersected minor Cu zones along with smears, veins and minor dissemination of pyrite-pyrrhotite and rare bornite and chalcopyrite. The assay value received in small Cu zone is 1m X 0.12% Cu.

As a follow up of the Uncover Phase-I as well as Phase-II projects, two G3 projects for REE-RM investigation in Neem-Ka-Thana copper belt and one G3 project for basemetals investigation have been taken up during FS 2022-23.

Photo 6.22: Bornite and associated sulphides in core samples of Bhrjdubh-I in Gujar-guwara, Dausa district, Rajasthan

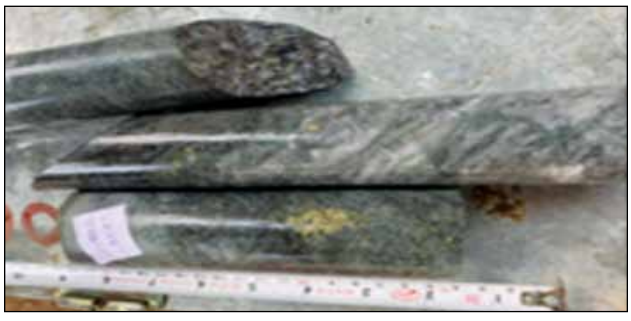


Photo 6.23: Chalcopyrite in BH RJDUBH-02 at 85.20m depth in Gujar-guwara, Dausa district, Rajasthan

Photo 6.24: Chalcopyrite in BH Rjdubh-04. at 130m depth in Gadarwada-Gujram area, Dausa district, Rajasthan

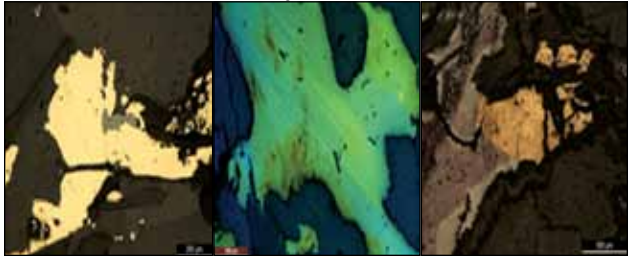


Photo 6.25: Photomicrographs showing presence of chalcopyrite, bornite and covelite in boreholes of Gujar-guwara and Gadarwada-Gujram area, Dausa district, Rajasthan

6.35 Expanding Mineral Exploration Search Space in Buried Terrains by Specialized Geo-chemical Surveys & Integration Geoscience for Creation of Buried Topography, Predictive Geological Map, Foot printing of Geochemical Signals in Parts of Hanotiya, Vijainagar, Raila, and Jaiswanpura, Rajasthan.

The study area comprises rocks of Bhilwara Supergroup belonging to Archaean and Palaeoproterozoic age. The rock types in the area covered are represented by biotite-schist and gneisses with thin intercalatory bands of quartzite, calc silicate rock, calc amphibole quartzite and amphibolite.

Based on the analytical results samples collected during FS 2020-21 and 2021-22, 06 potential areas were identified for further detailed studies. The blocks are, Hanotiya, Sathana, Lambia-Chipiyan Khera, Mangras-Nimbahera, Raila-Jaswantpura and Devpura-Nanakpura areas. Drilling was carried out in these selective locations to test the host rock of anomalies obtained in the hydro geochemical samples and also to establish the sub-surface geology of the area and updation of predictive geological map of the study area. Total six boreholes namely RJABH-01 to RJABH-06 were drilled during FS 2022-23 with total meterage of 1200m.

All the sub-surface data and litho units intersected in the boreholes have been used for updating the predictive geological map of the study area. The project is under execution during FS 2022-23.

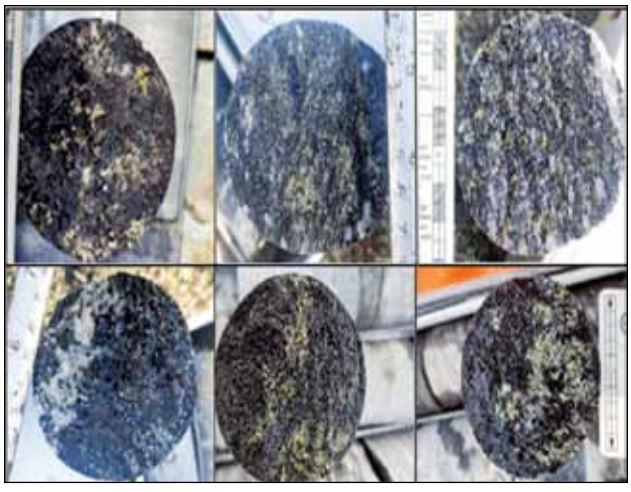


Photo 6.26: Photographs of drilled cores showing different sulphide phases

6.36 Expanding Mineral Exploration Search Space in Buried Terrains by Specialized Geo-chemical Surveys & Integration Geoscience for Creation of Buried Topography, Predictive Geological Map, Foot printing of Geochemical Signals in Parts of Salasar, Sujangarh, Ladnun, Nimbi Jodha area.

The study area covers an area of approximately 2100 sq. km in parts of Churu, Nagaur and Sikar Districts of Rajasthan. The study area has scanty outcrops of various rock types which represent the Delhi Supergroup, Malani Igneous Suite, Marwar Supergroup and quaternary sediments, mostly exposed in stone quarries.

During FS 2022-23, based on the geophysical derivative anomalies and hydro-geochemical anomalies, a total seven boreholes were drilled in the investigated area with total meterage of 1010 meters to understand the host rock and disposition of causative body under thick sand cover. The project is under execution during 2022-23.

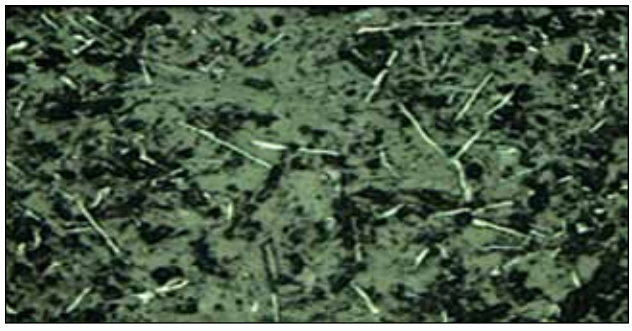


Photo 6.27: Photomicrographs showing presence of chalcopyrite, bornite and covelite in boreholes of Gujar-guwara and Gadarwada-Gujran area, Dausa district, Rajasthan

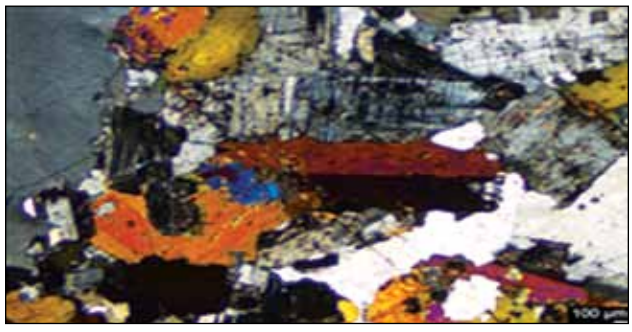


Photo 6.28: Photographs of drilled cores showing different sulphide phases

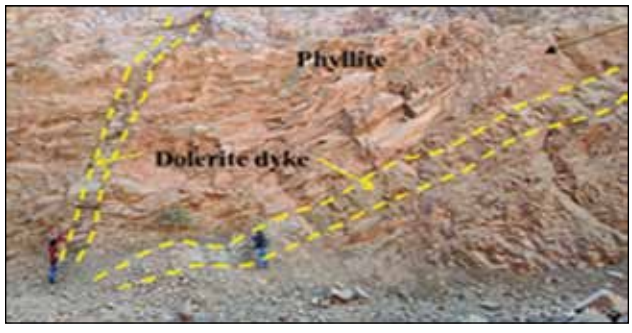


Photo 6.29: Photomicrograph of Needles of magnetite in dolerite dyke from Sarothiya (10X)

Photo 6.30: Photomicrograph of Twinned hornblende, microcline in Diorite, from RJCN07, Bobasar Bidawatan

SOUTHERN TRANSECT

6.37 Deep Crustal Mapping across Western and Eastern Dharwar Cratons for searching concealed and deep-seated mineral deposits, in parts of Andhra Pradesh and Karnataka (PHASE-II).

Project Uncover-Phase-II has focused mainly on the integration of geology, geophysics and high-end lab data in order to search deep-seated mineralization across the Southern Transect. The detailed geophysical studies carried out at the Tumbiganur, Ramasagaram and Thimasamudram blocks in the south of the Sandur schist belt and in Shirunj & Doni block in Gadag schist belt to know sub-surface signature. On the basis of Phase-I work a deep scout borehole (BH-APAB-1) up to 686.5m at Bhadrampalli in the Penakacherla schist belt has been drilled to know deep-seated signature of data integration of geology and geophysics (Photo 6.33). This borehole intersected the sulfide zones at different depths, mainly 163-169m, 399-406m and 680-684m. Moreover, Au values up to 0.91 ppm (by MIBK-AAS) with Au grains up to 10 microns have been reported by EPMA in a few samples (n=5) from the 163-169m zone.

The detailed geophysical survey work at the Tumbiganur block revealed the ENE-WSW, NE-SW and NW-SE trending magnetic lineaments in the covered terrain (thick soil-cover). To validate the concealed geophysical anomaly a vertical borehole (BH-APAT-1) up to 300m was drilled to intersect the intersection point of magnetic lineaments. The borehole intersected mafic enclaves at several depths. The EPMA and SEM studies reveal discrete Au and PGE grains in a few samples in borehole no. APAT-1. The litho samples of gabbro collected from Gooty area, from central part of the transect, showing Cr-spinel and PGE grains in SEM studies. Therefore, an inclined test scout borehole up to a depth 65.5m has been drilled in the Gooty area (BH-APAG-1) and the borehole intersected a 6.5m gabbroic body in association with granitic country rock. Detailed sampling is under process.

In the Gadag schist belt a semi-regional geophysical and geological mapping on a 1:12,500 scale was carried out in Shirunj-Yelisurur area in and around western lode. The country rocks are exposed in the adjacent area, mainly comprised of meta-basalt and pillowed meta-basalt, intruded by variable dimension of sheared quartz veins, are the host for gold mineralization. The EPMA and ore petrography studies show the presence of gold grains in association with Co-Ni-bearing arsenopyrite. The presence of Ni in close association with gold also reveals a deep mantle signature. The Fluid inclusion study in quartz veins from adjoining Champian, Hosur and Venkatpura shafts dump in the western lode by Raman spectroscopy shows the presence of aqueous-carbonic with a domain at CO_2, Graphite and other favourable volatiles like N2 (?), also support the deep-seated signature of the mineralized fluids in the western lode.

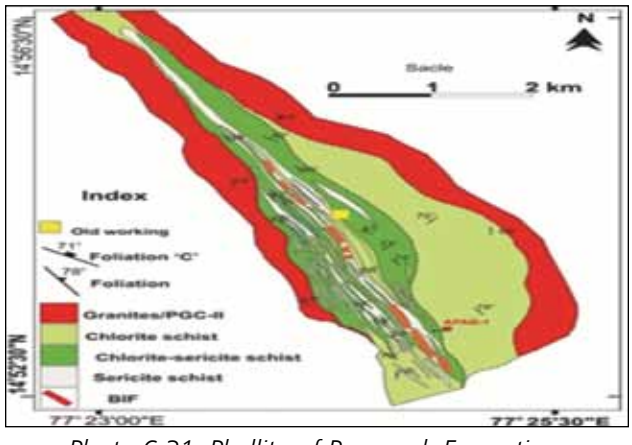


Photo 6.31: Phyllite of Punagarh Formation, Delhi supergroup, traversed by Dolerite dykes near Sarothiya area

EASTERN TRANSECT

6.38 Mapping of deep crustal architecture a cross Singhbhum Craton and North Singhbhum Mobile Belt covering parts of West Bengal, Jharkhand and Odisha for study of mineral system and to target deep-seated mineralizing environment.

The Eastern Transect spans over three distinct terrains of Eastern Indian shield which are, Singhbhum Craton, North Singhbhum Mobile Belt (NSMB) and Chotanagapur Granite Gneissic Complex (CGGC). The interfaces of these terrains are marked by trans-crustal shear zones, viz. Singhbhum Shear Zone (SSZ) between Singhbhum Craton and NSMB and South Purulia Shear Zone (SPSZ) between NSMB and CGGC. During the course of the work, emphasis was given to nickel potentiality mapping of the ultramafics-dominated volcano-sedimentary belts of Iron Ore Group. Two major splays of SSZ were also mapped within the Dhanjori basin. Analysis of NGCM data has brought out a few new areas for exploration of REE minerals in addition to the known REE prospects in Proterozoic granitoids of NSMB and CGGC. The Gravity-Magnetic data collected along the 160km transect line are being used in conjunction with NGPM data to make crustal models and map discontinuities. Semi-regional gravity and magnetic survey in the central part of Dhanjori basin is going on with an objective of locating basemetal deposits along the identified splays of SSZ.

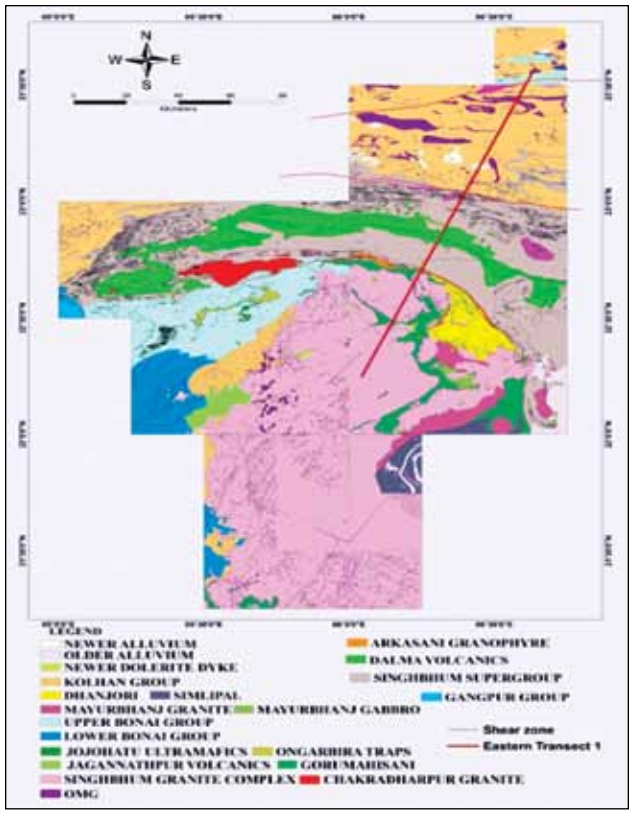


Photo 6.32: Rhyolite of Malani Igneous Suite in quarry section near Lodsar area

Indian Bureau of Mines (IBM)

6.39 The Mineral Policy Conference held in January 1947 resulted in the enactment of the Mines and Minerals (Regulation and Development) Act, 1948, the first legal framework in independent India for the regulation and development of mines. The Mines and Mineral (Regulation and Development) Act, 1948 received the assent of the Governor General on 08.09.1948. The Act empowered the Central Government to regulate mines and oilfields and mineral development on the lines contemplated in the Industrial Policy Resolution of the 6th of April 1948. The deliberations of the conference led to the establishment of the Indian Bureau of Mines in March 1948 as the main regulatory agency for monitoring and supervising mining activity in the country.

6.40 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, 1988/2017 and Mineral Concession Rules, 1960/ 2016 and Environmental (Protection) Act, 1986 and Rules made there under.

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

6.42 Vision for IBM

The National Mineral Policy, 2019 (NMP) has envisioned on strengthening the regulatory mechanism by incorporating e-governance, including satellite and remote sensing applications, evaluations of miners in terms of their comparative performance on suitable development framework and enforce commitment on part of the mining companies to adopt sustainable development. Accordingly, the vision envisaged is: "IBM to perform as a National technical regulator and to discharge the developmental functions for the sustainable development of the mineral industry and to work as repository of database on mines and minerals".

6.43 Mission

1. To ensure effective regulation of Indian Mineral Sector which promotes long term benefits for its sustainable growth.
2. To provide capacity building to State regulatory agencies and also to provide quality technical assistance to the mineral industry, and
3. To work as data bank on mines and minerals and to disseminate mineral information for policy formulations.

6.44 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.

6.45 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 03.11.2014. Charters of functions of IBM are available at https://ibm.gov.in/index.php?c=pages&m=index&id=65&mid=23870

6.46 Key Activities and Functions of IBM

In light of the role and charter of IBM, the key functions being performed by IBM can be broadly classified as (i) Regulatory Functions, and (ii) Developmental Functions. The same are available at: https://ibm.gov.in/writereaddata/files/06232020153619Functions%20and%20activities%20Indian%20Bureau%20of%20Mines.pdf

Organizational set up of IBM

6.47 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. During the year 2017, IBM opened two new skill development centres for sustainable mining practices at Udaipur and Kolkata.

IBM has modern mineral processing laboratory and pilot plant at Nagpur and well-equipped Regional Mineral Processing Laboratories and pilot plants at Ajmer, Bengaluru.

6.48 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;
- **Scheme No. 4.** Collection, processing, dissemination of data on mines and minerals through various publications
- **Scheme No. 5.** Mining Tenements System (under implementation)

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

(i) Minerals Development & Regulation Division (MDRD);

(ii) Mineral Processing Division (MPD);

(iii) Technical Consultancy, Mining Research and Publication Division;

(iv) Mineral Economics Division;

(v) Mining and Mineral Statistics Division; and

(vi) Planning and Coordination Division.

Performance relating to various regulatory and development functions of IBM during the year 2022-23 (up to December 2022) is given hereinafter. The same is also enclosed at **Annexure 6.2**.

6.50 Inspection of Mines

During the year 2022 (January to December), 1248 inspections for enforcement of the provisions of Mineral Conservation and Development Rules (MCDR) 2017 and for examination of mining plans/ review of mining plan / mine closure plans were carried out. Consequent to inspection of mines, 1379 violations were pointed out to 662 mines during 2022 as against 2007 (pointed out to 959 mines) violations in 2021. Total 553 violations were rectified during the year. So far, for the reporting period, 4 cases (including cases launched in previous years also) were decided in favor of IBM in the year 2022. Mining operations were suspended under Rule 11(2) of MCDR 2017 in 41 mines for not carrying out mining operations in accordance with the approved mining plan/ review of mining plan and recommended 26 cases for suspension of leases to State Government for non-submission of online returns/ discrepancies in submitted returns.A list of principal violations observed during inspection of mines for the year 2021 and 2022 are given at **Table 6.2** & Inspection of Mines carried out by IBM during the year 2022 is given in **Table 6.3.**

Table 6.2

Principal Violations of MCDR, 2017 detected by IBM during 2021 and 2022 (Jan. to Dec. 2022)

Rule No	No. of Violations Pointed out 2021	No. of Violations Pointed out 2022, (Jan. to Dec. 2022)	Rule description
11(1)	508	368	Rule11 (1) - Mining operations in accordance with mining plans
11(3)	06	00	Rule 11 (3) - Submission of Review of Mining Plan / Scheme of mining
20	03	00	Rule 20 - Notice of opening of mine
23	01	00	Rule 23 - Submission of progressive mine closure plan
26 (2)	234	83	Rule 26 (2) - Responsibility of the holder of mining lease to submit yearly report
27(2)	03	76	Rule 27(2) - Submission of Financial assurance
28(1)	21	8	Rule 28 (1) - Notice of temporary discontinuance of mining operations
31(4)	47	24	Rule 31(4) - Maintenance of plans and sections
33	83	50	Rule 33 - Copies of plans and sections to

Rule No	No. of Violations Pointed out 2021	No. of Violations Pointed out 2022, (Jan. to Dec. 2022)	Rule description
35, 36, 37, 38, 39, 40, 41, 42, 43, 44	308	49	Protection of environment : Rule 35, 36, 37, 38, 39, 40, 41, 42, 43, 44 - Sustainable mining, removal and utilization of topsoil, Storage of overburden, waste rock 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)	79	75	Rule 45 (5) (b) - Submission of Monthly Return
45(5)(b)	79	75	Rule 45 (5) (b) - Submission of Monthly Return
45(5)(c)	82	27	Rule 45 (5)(c) - Submission of Annual Return
55(1)(c)(i)	50	15	Rule 55(1)(c)(i) - Employment of Whole time Mining Engineer/Geologist
55(1)(c)(ii)	65	11	Rule 55(1)(c)(ii) - Employment of Part time Mining Engineer/Geologist
Others	438	508	
Total	2007	1379	

Table 6.3
Inspection of Mines carried out by IBM during 2022 (January to December, 2022)

S.No.	State	No. of inspection
1	Andhra Pradesh	99
2	Assam	0
3	Bihar	0
4	Chhattisgarh	103
5	Goa	23
6	Gujarat	128
7	Haryana	0
8	Himachal Pradesh	37
9	J & K	4
10	Jharkhand	52
11	Karnataka	128
12	Kerala	1
13	Madhya Pradesh	221

S.No.	State	No. of inspection
14	Maharashtra	88
15	Manipur	0
16	Meghalaya	22
17	Odisha	109
18	Punjab	0
19	Rajasthan	88
20	Sikkim	0
21	Tamil Nadu	95
22	Telangana	35
23	Uttaranchal	6
24	Uttar Pradesh	9
25	West Bengal	0
	Total	**1248**

Mining Plan, Review of Mining and Mine Closure Plan

6.51 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 dated 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 Review of Mining Plan 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 & rehabilitation of land and control on ground vibration, surface subsidence and restoration of flora.

Indian Bureau of Mines has been mandated to exercise the power stipulated under clause (b) of sub section (2) of section 5 of the MMDR Act 1957 and in accordance with the Rules 15, 16 & 17 of the Minerals (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 for processing and approval of Mining Plan. In line with the initiative undertaken by the Government of India for ease of doing business a new system for preparation & submission of Mining Plan /Review of Mining Plan / Modified Mining Plan has been launched under MTS. With the launch of Mining Plan Approval system (MPAS), the entire process of approval of mining plan has become online in digital form. The lessee can submit his mining plan, on the click of the mouse and the process has become simpler and less time consuming. Refer to **Table 6.4.**

6.52 Till the year, 2022 (January to December), Financial Bank Guarantees for a value of Rs. 35,60,37,80,481/- i.e, Rs. 3560.378 Crores of Rupees (As per revised per hectare rate of Rule 27(1) of MCDR, 2017) have been collected.

6.53 During the year 2022 (January to December, 2022), 27 mining plans were approved and 3 not approved, 107 review of Mining Plan were approved and 14 not approved and 13 final mine closure plans approved and 2 were not approved. State-wise break-up is given at **Table 6.4.**

Table 6.4
State-wise Mining Plans/Review of Mining Plans/Final Mine Closure Plans approved by IBM during the year 2022 (January to December 2022)

S. No	State	Mining Plans		Review of Mining Plan		FMCP	
		Approved	Not Approved	Approved	Not Approved	Approved	Not Approved
1	Assam	0	0	2	0	0	0
2	AP	1	0	10	0	3	0
3	Jharkhand	1	1	2	1	2	0

S. No	State	Mining Plans		Review of Mining Plan		FMCP	
		Approved	Not Approved	Approved	Not Approved	Approved	Not Approved
4	Bihar	0	0	0	1	0	0
5	Chhattisgarh	9	0	19	0	1	2
6	Delhi	0	0	0	0	0	0
7	Goa	0	0	2	1	0	0
8	Gujarat	3	1	48	4	1	0
9	Himachal	2	0	1	0	1	0
10	Haryana	0	0	0	0	0	0
11	J & K	0	0	3	0	0	0
12	Karnataka	1	0	12	2	1	0
13	Kerala	0	0	0	0	0	0
14	MP	0	0	0	0	0	0
15	Maharashtra	1	0	0	1	0	0
16	Meghalaya	0	1	2	0	0	0
17	Manipur	0	0	0	0	0	0
18	Odisha	9	0	5	1	4	0
19	Rajasthan	0	0	0	0	0	0
20	Sikkim	0	0	0	0	0	0
21	Tamilnadu	0	0	0	2	0	0
22	Telangana	0	0	1	1	0	0
23	Uttar Pradesh	0	0	0	0	0	0
24	Uttaranchal	0	0	0	0	0	0
25	West Bengal	0	0	0	0	0	0
	Total	**27**	**3**	**107**	**14**	**13**	**2**

6.54 Monitoring of mining activities using Digital Aerial (Drone and Satellite) Images:

Government of India, Ministry of Mines has amended Mineral Conservation and Development Rules, 2017 in the year 2021 requiring submission of digital aerial images (Drone/Satellite) by the mineral concession holders/preferred bidders to Indian Bureau of Mines (IBM). Every lessee shall submit digital aerial image to IBM. Every lessee shall submit digital aerial image to IBM on or before 1st day of July every year. Further, all mine plans are required to be submitted along with the digital aerial images. The Standard Operating Procedure for submission of digital aerial images to IBM by lessee has been laid down by IBM in April 2022 and made available on IBM website. Till November 2022, the mineral concession holders have submitted their digital aerial images for 611 leases. These digital images are being validated to ensure submission of data as per the SOP. The validation of 229 leases and the analysis of 42 mines have been carried out using GIS till November 2022.

For capacity building of IBM officials to process the drone and satellite image data on GIS platform, necessary hands on training on "Basics of GIS & Processing of Drone Survey Data" has been commenced from March 2022.

A road map has been carved out to train all the technical officials of the Minerals Development and Regulation Division through a series of in-house training program to develop expertise in analysing the aerial images and to make appropriate use of these images in inspection of mines and approval of mining plans. Till November 2022, eleven training programs over 96 days involving 105 nos. of technical officers have been provided. The training has been conducted at GIS & Remote Sensing Centre, IBM, Nagpur.

6.55 Geographic information system and Remote sensing centre has been established in Indian Bureau of Mines which is functional since December 2018. The following activities have been carried out on GIS platform.

1. Preparation of Mineral Maps

The activity of updation of Multi Mineral Lease holds Maps on GIS platform has been completed in March 2022. During the period of January to March 2022, Georeferencing & projection of 09toposheets, Vectorisation of 09toposheets, plotting of 125 mining leases and attachment of mine data of Assam, Meghalaya, Manipur, Kerala, Haryana, Himachal Pradesh, West Bengal states and Jammu & Kashmir (UT) were completed.

Up to March 2022, georeferencing, projection and vectorization of all the 561 identified to posheets having major mineral lease holds were completed. Creation of geodatabase in respect of 21 States and one UT viz. Goa, Andhra Pradesh, Kerala, Rajasthan, Madhya Pradesh, Gujarat, Chattisgarh, Telangana, Tamil Nadu, Odisha, Jharkhand, Maharashtra, Karnataka, Bihar, Haryana, Himachal Pradesh, Assam, Meghalaya, Manipur, Uttaranchal & West Bengal states and Jammu & Kashmir (UT) were completed. The geological layer has been imported from the GSI Bhukoshfor all the states and integrated with corresponding GIS database. Plotting of boundaries of 3890 major mineral mining leases is completed and is available on a geospatial platform. Attachment of mine data in respect of the leases has also been accomplished

2. Generation of Land use classification map of mining leases on GIS platform:

An activity to generate land-use classification map of mining leases on GIS platform has been started since September 2020. The information of land-use area has been sought from the lessee through regional offices of IBM in .shp/.kml format. The activity involves plotting of land-use classification map on GIS platform checking & correcting KML or SHP file, conversion of KML file to SHP file, calculation of area of each land-use feature in attribute table and attachment of mine data to land-use attribute table.

Upto December 2022, the land-use data has been received for 1229 mining leases out of which processing of data on GIS platform for all 1229 mining leases has been completed.

The geospatial database of land-use

was created from the lease-wise details of land put to use for mining activity. This database can be used to generate customized maps & reports viz. state-wise, district-wise, mineral-wise, feature-wise, etc. for land-use classification by query analysis on GIS platform.

Photo: 6:33: Drone Image of a Mine Superimposed by GI8 layers

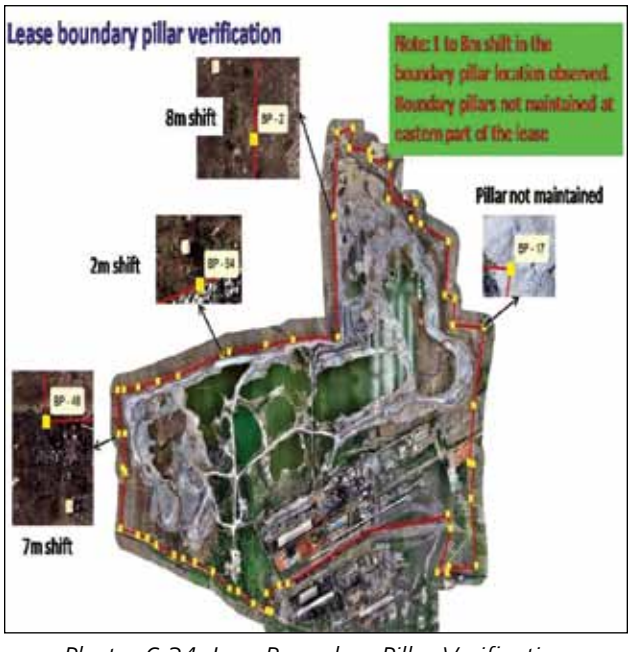


Photo: 6:34: Less Boundary Pillar Verification

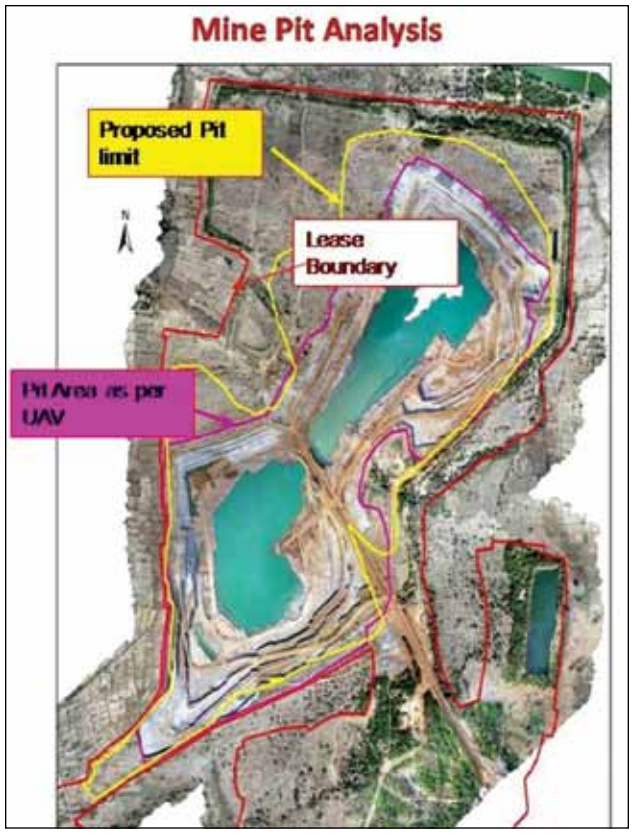


Photo: 6:35: Mine Pit Analysis

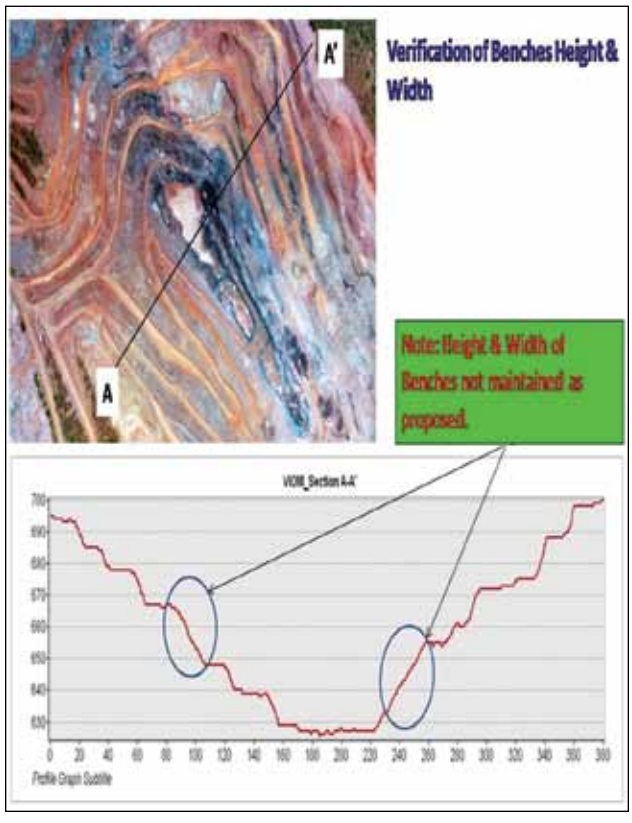


Photo: 6:36: Verification of Benches Height & Width

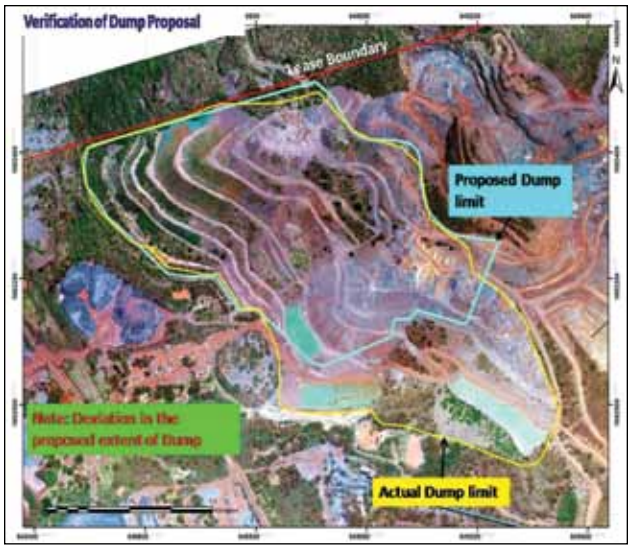


Photo: 6:37: Verification of Dump Proposal

Photo: 6:38: Mine Reclamation & Rehabilitation Analysis

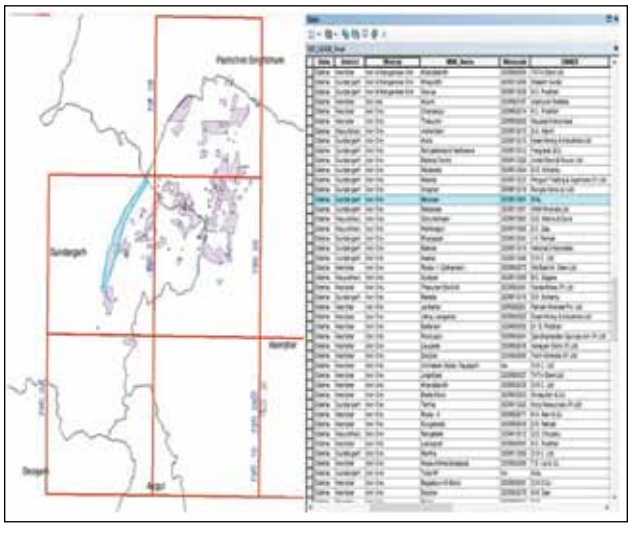


Photo: 6:39: Geospatial Database of Mining Leases of Odisha State

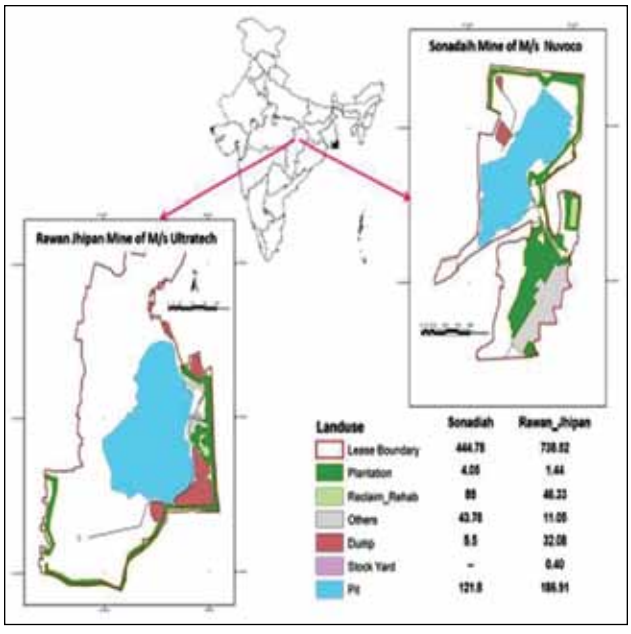


Photo: 6:40: Geospatial Map Showing Land Use of Different Mines

Mineral Beneficiation

6.56 Mineral beneficiation studies including mineralogical testing and chemical analysis intimately relates to both conservation and development of mineral resources. During the year 2022 (up to 31st December 2022), 46 ore dressing investigations, 19,989 chemical analysis, 2,705 mineralogical examinations and 01 in-plant study were completed.

Beneficiation studies of Mineral deposits set for auction

6.57 As per the amended Act, all exploration reports need to be made UNFC (2009) compliant before auctioning of mineral blocks, for which mineral beneficiation study is an important aspect. The exploration indicates only the geological aspect. Beneficiation study indicates the viability of the block for commercial operations in view of feasibility and economics. Thus, beneficiation study has paramount and crucial role for the development of mineral deposits in India.

6.58 Since the year 2016, IBM has been carrying out bench scale beneficiation studies on all G2 Level of exploration samples of GSI, MECL and state DGM's. Till date studies on 123 nos.G2/G1 Level samples of GSI, 15 nos. G2/G1 level sample of MECL and 06 Nos. G2/G1 level sample of State DGM's have been completed. Besides, studies on 10 blocks of GSI , and 1 block of MECL and 1 block of State DGM's are on progress.

6.59 National Mineral Inventory (NMI)

Quinquennial updation of NMI as on 01.04.2020 for 46 major minerals was completed from 1st January 2022 to 31st October 2022. The work involved processing, generation of outputs and preparation of comparative statements for finalization of NMI as on 01.04.2020 in respect of 46 major minerals. A Publication titled "National Mineral Inventory as on 01.04.2020– At a glance" was completed and uploaded in IBM Website. Work on another publication "National Mineral Inventory as on 01.04.2020 – An Overview" is under progress. In this context, 10 out of the 46 Chapters are likely to be finalized till 31.12.2022.

6.60 Projections or estimates for the Period January to March 2022

Finalisation of 36 remaining chapters of the publication "National Mineral Inventory as on 01.04.2020– An Overview" will be completed and it will be published and uploaded in IBM Website by March 2023 after finalization of master pages of all 46 chapters.

Statistical Publications

6.61 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 from the mining sector, rent, royalty and cess on minerals, etc. from other agencies is compiled regularly by IBM.

6.62 The statistical publications released during the year 2022 (up to December 2022) include Monthly Statistics of Mineral Production (MSMP) up to advance release of March 2022, Statistical Profiles 2020-21. IMIG 2018-19 is under progress.

Consultancy Service

6.63 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. During the year 2022, Report of Regional Mineral Development study for effective utilization of low grade iron ore fines dumps (as available) in M/s. SAIL, Bhilai and Rajhara sector (Chhattisgarh) which has been taken up in 2021 has been completed & report under finalization.

6.64 In 2022, under to formulate appropriate Scheme for implementation of provision of NMP 2019, compilation of best Mining Practices in the form of Technical Publication, the 03 Sample cases have been submitted for approval.

Technical Publications

6.65 Indian Mineral Year Book (IMYB) is a flagship publication of IBM which is brought out in three (3) volumes. It consists of Part I having as many as 11 General Chapters, Part II consists of 18 Reviews on metals and alloys and Part III consists of 30 mineral reviews. This publication covers information on minerals and mineral-based commodities, their development, production, resources/ reserves, consumption, trade and policy. It also includes world scenario. IMYB provides a status report of Mining and Mineral Industry in India on an annual basis. This publication has wide readership-both National as well as International.

Total 59 reviews of IMYB 2020 (Advance Release) in respect of General/Metals & alloys/ Mineral were prepared, technically edited, finalized and sent to Publication section for print-release after consolidation of all chapters with the statistical data. Total 59 reviews of IMYB 2020 (Advance Release) were uploaded on IBM Website.

6.66 Preparation of IMYB, 2021, was taken up for three separate volumes, viz. Volume-I for General Reviews, Volume-II for Metals & Alloys and Volume-III for Mineral Reviews. Total 2 reviews of IMYB 2021 (Advance Release) were uploaded on IBM Website. Preparation of remaining reviews is under progress.

6.67 Half yearly Bulletins on mineral information (April- 2021 to September 2021 & October 2021 to March 2022) and yearly Bulletin on Mining Lease and Prospecting Licenses 2021 are released.

(i) Bulletins on Mineral information (BMI) (April 2021 to September 2021) is available at https://ibm.gov.in/writereaddata/files/02102022160716BMI_APR_SEPT_2021.pdf

(ii) Bulletins on Mineral information (BMI) (October 2021 to March 2022) is available at

https://ibm.gov.in/writereaddata/files/09152022174822BMI_2022.pdf

(iii) Bulletin on Mining Lease and Prospecting Licenses 2021 is available at https://ibm.gov.in/writereaddata/files/10312022163546MLPL_2021.pdf

Training

6.68 IBM is discharging its roles and responsibilities through a mandated charter of functions. In the wake of recent policy initiatives and statutory amendments, IBM needs to enhance its skills in various advanced technologies for mine regulation and development.

Method envisaged for carrying out Training

6.69 The training imparted to IBM personnel is of 2 to 3 days which is being held at Headquarter and its regional offices as well as at two skill development centre located at Udaipur and Kolkata. Nominations are sought in advance. After approval of Competent Authority, training programme is organized through Classroom lectures / presentation by the faculties drawn from IBM as well as Industry.

In the backdrop of Covid Pandemic, presently the trainings are being conducted online. In last couple of years, IBM personnel had attended training programmes in outside organizations / institutes like GSITI, Kolkata National Remote Sensing Centre, Hyderabad.

Accordingly, further training programme, wherever necessary, will be conducted in association with these organizations / institutions. Further, through bilateral cooperation with other Countries, capacity building programme will be taken up.

Skills for which Training required for other stakeholders connected to IBM are:

6.70 Implementation of provisions of MMDR Amendment Act, 2015 and subordinate legislation framed there under; preparation of Mining Plan/Mining Scheme, including Mine Closure Plan, Mine Reclamation and Rehabilitation; Sustainable Development Framework and Star Rating System for Mines; Mining Surveillance System; Mineral Resources as per United Nations Framework Classification (UNFC); Technological improvements and innovative advances in the areas of mineral processing and beneficiation.

6.71 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. Presently on-line training programmes are conducted in the backdrop of COVID Pandemic. During the year 2022 (January 2022 to December, 2022), 14 online programmes have been conducted in which a total of 212 IBM Personnel, 595 Industry Officials and 21 State Govt Officials participated.IBM has imparted training and capacity building programmes to 1126 numbers of its own employees and 1586 numbers of Industry Officials and State Government Officials during the years 2018-19 to 2022-2023 (up to December, 2022). IBM makes its presence in the meetings as organized by GSI/ MECL for its active participation, towards synergic approach. Further, IBM officials are participating in various Training Programmes conducted by other Institutes. IBM is routinely organizing training programmes on the Basics of Geographic Information System and Processing of Drone Survey data on GIS platform at GIS centre, IBM, Nagpur for IBM officers every month Since April 2022 and up to December, 2022, 105 officers have been trained.

6.72 IBM had initiated its efforts to upload its training modules on iGOT platform during 2020-21 by identifying lectures under different modules and with regard to videography of the same. As per the Ministry's letter No. A-33/2//2021-ESTT. Dated 05.07.2022 regarding uploading of training courses on iGOT portal, three topics/modules are identified for IBM for lecture videos i.e. (a) Mining reforms, (b) process of Mining lease to LoI& (c)Mining plan Approval. Therefore, IBM has initiated the process for preparing the lecture videos through training centre& expertise available in IBM, and prepared training videos related to the topics, however, due to large file size the lecture video could not be uploaded to the portal. Further, preparation of more lecture videos is in progress.

Measures for Abatement of Pollution and Environmental Protection

6.73 The IBM undertakes inspections/ studies for the enforcement of provisions of MCDR, 2017 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 topsoil, 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. While approving the mining plans, Review of mining plan 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.

Revenue Generation

6.74 IBM generates revenue through processing of mining plans/ review of mining plans, compounding fees & fines, consultancy, training, statutory processing and sale of publications &data etc. Revenue generated during the year 2022 (January to December 2022) is Rs. 1434.84 Lakhs.

Computerization

6.75 The Regional (Except Raipur &Gandhinagar RO) /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. Proposal for connecting Raipur & Gandhinagar RO with said system along with VC facility is under process. 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 is operational.

6.76 The Web Portal of IBM i.e. https://www.ibm.gov.in provides information on IBM's history, functions, organization, divisions of IBM and its activities, jurisdiction of regional and zonal offices, services offered by IBM. The upgradation of existing web portal is going on, which facilitates stakeholders with updated and faster information.

6.77 The domain https://ibmreg.nic.in is functional for grant of IBM Registration number and https://ibmreturns.gov.in is also functional for facilitating the stake holder to submit the monthly and annual returns online and for further communications with stake holders in case of refer back cases.

6.78 After introduction of online submission of returns system consequent to the amendments to Rule 45 of MCDR, 1988 vide notification No. 75(E) dated 09.02.2011, 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.

6.79 The month-wise monthly returns submitted online are given in Table 6.5.

Table 6.5
Month-wise Returns submitted online (up to November, 2022)

Sl. No.	Month	No. of monthly returns received online
1	Jan-22	1997
2	Feb-22	1994
3	Mar-22	1987
4	Apr-22	1946
5	May-22	1931
6	Jun-22	1931
7	Jul-22	1926
8	Aug-22	1918
9	Sep-22	1943
10	Oct-22	1939
11	Nov-22	1917

6.80 Mineral Wise Summary of Mining Lease (excluding Atomic, Hydro Carbon Energy and Minor Minerals) as on 31.03.2021(P) (All India) is given in **Annexure 6.3.**

Mining Tenement System

6.81 Mining Tenement system (MTS) is a flagship project of Indian Bureau of Mines and it's a unique online based application. With MTS, IBM envisions digitizing its internal processes of the core modules which in turn can induct a workflow-based system to increase the efficiency and transparency in its charter of functions. As part of this project, IBM also envisions conducting enhancements, wherever applicable. During the National Mining Conclave held on 12.07.2022 in New Delhi. The following three modules were launched by the Hon'ble Minister Mines, Coal and Parliament Affairs

Module1: Registration under Rules 45 of MCDR 2017

Module2: Monthly and Annual Return filing under Rule 45 of MCDR 2017

Module3: Mining Plan Approval System (MPAS) for submission of Mining Plan in the online module.

With the launch of Mining Plan Approval system (MPAS), the entire process of approval of mining plan has become online in digital form. The lessee can submit his mining plan, on the click of the mouse and the process has become simpler and less time consuming. This will be step forward toward digital India mission. Detailed Project Report (DPR) for development of remaining modules is under progress.

Sustainable Development Framework

6.82 **Star Rating System:** The Star Rating System is a good governance initiative, designed as a tool for mapping of mining footprints from the view point of Sustainability. The Star rating has been mandated by Rule 35 of Mineral Conservation and Development Rules (MCDR), 2017. Every holder of a mining lease is required to submit online, its self-assessment report before the 1st day of July every year for the previous financial year to IBM.

6.83 All the mine operators are mandated to achieve at least three-star rating within a period of four years with effect from the date of notification of the Rules (i.e. 27.02.2017) or four years from the date of commencement of mining operations, as the case may be and thereafter maintain the same on year-on-year basis, failing which mining operations are liable to be suspended.

6.84 Based on evaluation of the performance of mining lease holders on the various parameters encompassed by the principals of the Sustainable Development Framework (SDF), validation of self-assessed templates is carried out by IBM and accordingly final ratings are awarded. Selected five star rated mines are recommended for award by Technical Evaluation Committee.

6.85 The selected lease holders of five star rated mines are felicitated during National Conclave on Mines & Minerals held from time to time. The details of year wise awards given to 5 Star rated mines since 2014-15 are given below in **Table 6.6**:

Table 6.6:

Performance Year	No. of 5 Star Rated mines selected for award	Felicitation held on
2014-15	9	4-5 July, 2016, Raipur (Chhattisgarh)
2015-16	32	15 February, 2017, New Delhi
2016-17	57	20 March, 2018, New Delhi
2017-18	57	23 November, 2021, New Delhi
2018-19	52	23 November, 2021, New Delhi
2019-20	40	23 November, 2021, New Delhi
2020-21	40	12th July 2022, New Delhi

6.86 During the year 2022-23 (till 31.12.2022), 1179 online templates for the performance of year 2021-22 have been filed by the lessees. Validation of the submitted templates for final evaluation is under progress and so far in 430 leases field verification has been completed. The entire process will be completed by 31.03.2023.

Mining Surveillance System

6.87 Mining Surveillance System (MSS) is a satellite-based monitoring system which aims to establish a regime of responsive mineral administration by curbing instances of illegal mining activity through automatic remote sensing detection technology. Detailed information on MSS is given in Chapter 3 of this report.

Human Resources

6.88 The total sanctioned personnel strength of IBM is 1477. The present filled-in strength is 666 as on 31.12.2022. The cadre-wise employment position in IBM as on 31.12.2022 is given in **Table 6.7.**

Table 6.7
Employment of Personnel in IBM as on 31.12.2022

Sl No.	Group	Sanctioned	Filled	Vacant	SC	ST	OBC	EWS	Women	PH
1.	GROUP 'A'	459	151	308	19	06	34	00	06	00
2.	GROUP 'B'	240	93	147	12	06	12	00	11	02
3.	GROUP 'B' (Non-Gaz)	262	135	127	11	05	30	03	26	06
4.	GROUP 'C'	516	287	229	50	20	90	02	37	08
	Total	**1477**	**666**	**811**	**92**	**37**	**166**	**05**	**80**	**16**

Foreign Visits of IBM officers

Shri Shailendra Kumar, RCOM (Hyderabad) and Shri Deb Durlabh Dash, SMG (Raipur) visited El-Salvador during the period from 03.10.2022 to 07.10.2022 as team members to suggest remedial measures for systematic closure of abandoned gold and silver mines at El-Salvador. Report on the remedial measures was submitted on 21.11.2022.

Photo: 6:41: IBM team meeting with the Maria Luisa Breve, Minister of Ministry of Economy, El-Salvador.

7

Central Public Sector Undertakings

Central Public Sector Undertakings

National Aluminium Company Limited (NALCO)

Introduction

7.1 National Aluminium Company Limited (NALCO) is a Schedule 'A' Navratna CPSE established on 07.01.1981 having its registered office at Bhubaneswar. It is one of the largest integrated Bauxite - Alumina - Aluminium - Power Complex in the Country. At present, Government of India holds 51.28% of paid up equity capital. The Company has been operating its captive Panchpatmali Bauxite Mines for the pit head Alumina refinery at Damanjodi in the District of Koraput in Odisha and Aluminium Smelter & Captive Power Plant at Angul. As a part of green initiative, NALCO has installed 198 MW Wind Power Plants at various locations in India and 800 kWp roof top Solar Power Plants at its premises to join hands for carbon neutrality. From the days of first commercial operation since 1987 the Company has continuously earned profits for last 35 years. Despite the Global COVID-19 pandemic, NALCO has posted highest ever sales revenue of Rs.14,181 Crore and highest ever PAT of Rs. 2,952 Crore in FY 2021-22. The Company achieved full capacity production of 4.6 lakh tonne, with all 960 Pots in operation in its Aluminium Smelter for the first time since inception in FY 2021-22. The Company has also achieved highest ever Bauxite production of 75.11 lakh tonne in FY 2021-22.

For details please visit: https://nalcoindia.com/investor-services/annual-reports/

7.2 With its consistent track record in capacity utilization, technology absorption, quality assurance, export performance and posting of profits, NALCO is an example of India's industrial might.

Photo 7.1
NALCO Corporate Office, Bhubaneswar

7.3 The Company is the lowest cost producer of Alumina & Bauxite in the world as per Wood Mackenzie Report.

7.4 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'89. The Company is listed at Bombay Stock Exchange (BSE) since 1992 and at National Stock Exchange (NSE) since 1999. Besides, ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007/ ISO 45001 & SA 8000:2014 certification; the Company has also adopted ISO 50001:2011 standards for energy management system & ISO 27001:2013 security infrastructure, applications and users.

7.5 The Company has diversified to renewable energy sector by commissioning 198 MW wind power plant in four different places in AP, Rajasthan (2 locations) and Maharashtra to reduce carbon foot print. Moving ahead, the Company has also utilised the available roof top space in Corporate Office, Township and NRTC (NALCO Research & Technology Centre) at Bhubaneswar and Alumina Refinery, Damanjodi for setting up of 800 kilowatt peak (kWp) solar power plant.

Existing Operations & their Locations

Bauxite Mines

7.6 The Company has its fully mechanised open cast Bauxite Mines which is one of the most sophisticated and eco-friendly mining operations to be found worldwide, situated on Panchpatmali plateau in Damanjodi, Koraput, in the State of Odisha. North & Central blocks of Panchpatmali mine is being presently operated at 100 % capacity i.e. 6.825 million tonne per annum. Bauxite production from new mine i.e. South block of Panchpatmali Mines started at 4th quarter of FY 2017-18 with leased capacity of 3.15 million tonne per annum. The mined-out bauxite is transported from the Mine to Refinery by a 14.6-km. long single-flight, multi-curve, variable-speed cable belt conveyor of 1800 TPH capacity.

Photo-7.2
Panchpatmali mine

Alumina Refinery

7.7 The Alumina Refinery is located at Damanjodi, Odisha, approximately 14 km from the Bauxite Mines 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.

7.8 The present normative capacity of Alumina Refinery is 21 lakh tonne per annum. 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 i.e. 5% of the total sale is also sold in domestic market.

Photo-7.3
Aluminium Smelter, Angul

Aluminium Smelter

7.9 The Aluminium Smelter is located at Angul, Odisha and approx. 5 km away from the captive thermal power plant. The Aluminium produced at the Smelter is transported to Vizag port, Kolkata Port and Paradeep port by rail/road for export. Aluminium in the forms of ingots, sow ingots, tee ingots, billets, wire rods, alloy ingots, flat products and chequered sheets are also sold in the domestic market through its stockyards located across the country.

Photo-7.4
Aluminium Smelter

7.10 The Aluminium Smelter entered into production progressively from 1987. The present capacity of Smelter is 4.60 lakh tonne 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 the casting units, where Aluminium can be cast into ingots, sow ingots, tee ingots, billets, wire rods, cast strips, alloy ingots and rolled products.

Captive Power Plant

7.11 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. 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 (Bharatpur) coalfields, enabling transport of the critical and bulk requirement of coal.

Photo-7.5
Captive Power Plant

7.12 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 a small amount of power to the Alumina Refinery through wheeling.

Wind Power Plants

7.13 1st wind power plant of capacity 50.4 MW in Gandikota, Andhra Pradesh was commissioned in December, 2012 and the 2nd wind power plant of capacity 47.6 MW at Ludarva site, in Jaisalmer, Rajasthan was commissioned in January, 2014. The 3rd & 4th wind power plants of capacity 50 MW at Devikot site, Jaisalmer, Rajasthan and the 50.4 MW Wind Power Plant at Sangli, Maharashtra were commissioned in September, 2016 & December, 2016 respectively.

Photo-7.6
Wind Power Plant, Jaisalmer

Rooftop Solar System

7.14 NALCO utilised the entire available roof top space in Corporate Office, Township and NRTC at Bhubaneswar for setting up of 630 kilowatt peak (KWp) solar power plant. Also, 170 KWp Roof-top Solar PV Plant had been installed at Mines & Alumina Refinery, Damanjodi. The total installed Roof-top Solar PV Plant capacity now stands at 800 KWp.

Photo-7.7
Roof Top Solar facility

Port Facilities

7.15 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.

Photo -7.8
Port Facility, Vizag

Performance of NALCO

7.16 Physical performance, financial performance and sales performance are presented at **Table 7.1, Table 7.2** and **Table 7.3.**

Table 7.1:
Physical Performance of NALCO

(in lakh tonne)

Product	2018-19 Actual	2019-20 Actual	2020-21 Actual	2021-22 Actual	2022-23 (Target)	2022-23 (Actual up to Dec' 2022)	2022-23 (Expected)
Bauxite	72.31	73.02	73.65	75.11	74.50	54.18	74.50
Alumina Hydrate	21.53	21.61	20.86	21.22	21.61	15.33	21.23
Aluminium Metal	4.40	4.18	4.19	4.60	4.60	3.44	4.60

Table 7.2
Financial Performance of NALCO

(in Rs. crore)

Sl. No.	Particulars	2018-19 Actual	2019-20 Actual	2020-21 Actual	2021-22 Actual	2022-23 Expected achievement
1.	Income *	11,825	8,744	9,102	14,478	Shall be submitted after Annual Audit 2022-23
2.	Operating Cost**	8,607	7,983	7,173	9,664	
3.	Interest & Transaction Loss	2	6	7	23	
4.	Depreciation & Amortization	476	530	606	837	
5.	Profit before Income tax and Dividend	2,740	226	1,316	3,955	

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

Table 7.3
Sales Performance of NALCO

(in lakh tonne)

Sales	2018-19 Actual	2019-20 Actual	2020-21 Actual	2021-22 Actual	2022-23 Target	2022-23 (Actual up to Dec'2022)	2022-23 Expected achievement
Total Alumina/ Hydrate Sale	13.18	13.04	12.28	12.33	12.40	9.01	12.40
Aluminium Export	0.39	0.57	1.92	1.33	0.60	0.17	0.60
Domestic Aluminium Sale	4.02	3.39	2.31	3.24	4.00	3.30	4.00
Total Aluminium Sale	4.41	3.96	4.23	4.57	4.60	3.47	4.60

Ongoing Projects

7.17 The major activities during FY 2022-23 (till Dec'22) pertaining to various projects of NALCO are as under:

a) 5th Stream Refinery:

- As of Dec'2022, 33 nos. of orders (out of 34 LSTK & Works packages) amounting to an order value of about Rs. 3, 653 Crores have been placed. Award of work for balance 01 nos. project contract are in tendering stage.
- Tenders floated for 107 nos. of bought out items out of 115 items, which shall be supplied to works contractors as free issue for erection / installation. Order placed for 105 items at a value of about Rs.660 Crore.
- Site work for awarded packages / works is under execution. Overall project progress as on end of December'22 is 47.7%.
- The work progresses of various packages/works are being monitored closely at various levels to expedite the execution.

b) Development of Pottangi Bauxite Mines:

- Obtaining various statutory clearances required for opening of mine is under progress:
- **Forest Clearance (FC):**
  - ❖ The Forest Diversion Proposal was considered for Stage – I FC in FAC meeting held on 09.12.2022 and FAC (Forest Advisory Committee) recommended Stage-I Forest Clearance. Order is awaited from MoEF&CC.
  - ❖ Pending Stage-I FC, EC is held up with MoEF&CC, GoI and CTE is held up with OSPCB.
  - ❖ Dept. of Steel & Mines, Govt. of Odisha has issued extension

of reservation period in favour of NALCO up to 25.04.2023 before which FC & EC have to be obtained to execute the Mining Lease deed.

c) Bauxite Transportation System from South Block of Panchpatmali Mines:

- So far, 08 nos. of order (out of 09 LSTK & Works packages) have been placed.

d) Utkal D Coal Mines:

- FC, EC received, Mining lease deed executed in Mar'21, Mine opening permission obtained from Coal Controller.
- MDO has been appointed on 11.02.2022 for Utkal D & E Coal Mines operations. Coal mining agreement signed with MDO.
- Disbursement of R&R benefits is under progress.
- The Mining Operations in Utkal D Coal mines has commenced.

e) Utkal E Coal Mines:

- EC available, Stage-II FC obtained, Grant order on Mining lease received from GoO.
- Land acquisition status:
  - ❖ The entire Private land of 220.74 Ha acquisition/allenea-tion is completed in favour of NALCO.
  - ❖ Out of 139.09 Ha of Govt land, 20.36 Ha is pending for lease deed execution.
  - ❖ Out of 20.36 Ha, registration of 6.74 Ha land by IDCO in favour of NALCO is to be done. For balance 13.56 Ha of Govt. land, permissive possession certificate to be issued in favour of NALCO by Collector, GoO.

f) JV with GACL for setting up of 2.7 Lakhs TPA caustic soda plant in Gujarat:

NALCO has formed a JV Company with GACL named "GACL-NALCO Alkalies& Chemicals Private Ltd. (GNAL)" to set up a 2.7 lakh TPA Caustic Soda Plant along with 130 MW Captive Power Plant at Dahej in Gujarat with an objective of raw-material security and to reduce import dependency. Caustic Soda Plant (CSP) was commissioned and started production of Caustic Soda from 17.05.2022. The first batch of caustic soda supply from GNAL was received by NALCO in Aug 2022. Overall project execution – 98.40 % (Up to Dec'2022). In CSP, 06 Electrolysers are commissioned out of total 08 Electrolysers. Balance two electrolyser units will be commissioned progressively.

g) Angul Aluminium Park in JV with IDCO:

NALCO has formed a JV Company with Odisha Industrial Infrastructure Development Corporation (IDCO) for establishment of Angul Aluminium Park Private Ltd. (AAPPL) for promotion of downstream industries to manufacture Conductors, Extrusions, Castings, Foils & other aluminium products. NALCO to facilitate by supplying primary metal i.e. aluminium. Land acquisition is completed. Constructions of boundary

wall and approach road have been completed. The execution of the project is being carried out by the JV Company. Modalities for metal transfer from NALCO to AAPPL have been prepared. The Standard Operating Procedure (SOP) for supply of molten metal to the Units in the Park has been finalized. Administrative building, Aluminium development centre & internal roads of the Aluminium Park have been completed. Other Infrastructure development works including construction of road from smelter plant to park for metal transfer are in progress..

h) Aluminium alloy manufacturing plant in JV with MIDHANI:

NALCO has constituted a Joint Venture Company named Utkarsha Aluminium Dhatu Nigam Limited (UADNL) with Mishra Dhatu Nigam Ltd. (MIDHANI) in Aug'19 for establishment of High End Aluminium Alloy Plant for use in Defence, Aerospace and Automobile sectors reducing import dependency for such alloys under Make in India initiative of Govt. of Andhra Pradesh has allotted 110 acres of land for the project and boundary wall construction work is completed. Till date, NALCO has contributed Rs 20 Cr equity to the JVC. Environment Clearance (EC) for the project was obtained on 08.07.2021. Consent for Establishment (CFE) obtained on 05.08.2021. M/s MECON Ltd has been appointed as EPCM consultant on 03.02.2022 for establishing the facility of Aluminium Alloy Flat Rolling Plant for UADNL. Global Open Tender for the 1st Package (Aluminium Melting & Casting Facilities) floated and single bid received is under technical and commercial evaluation. As advised by UADNL Board, a market research consultant was engaged in Sep, 2022 for study of the latest demand supply scenario and potential business opportunities for high end Aluminium alloy slabs, billets and flat rolled products. Consultant has submitted the interim report in Nov'2022, which is under study by UADNL. Draft Technical specification and Tender preparation for Package-02 (Hot & Cold Rolling Facilities) is under the process of finalization.

i) Acquisition of Strategic minerals in overseas (KABIL):

JV Company among NALCO, HCL and MECL named Khanij Bidesh India Limited (KABIL) was formed on 08.08.2019 to identify, acquire, develop, process and make commercial use of strategic minerals in overseas locations for supply in India and thus boost "Make in India" initiative of Government of India. At present, KABIL is focusing on identifying and sourcing battery minerals like Lithium and Cobalt. Engagement with few Government agencies, companies/ projects is underway in Australia and Argentina. NALCO has paid Rs.12.00 Crore towards equity contribution in the JV company, till Dec'22.

j) Brownfield Expansion of Smelter (Capacity: 0.5 million TPA):

Detailed Project Report (DPR) for the project has been prepared. Rs. 107 crore released to IDCO for land acquisition. Process for alienation of Govt. land in favour of NALCO is in progress. GoO issued 4(1) notification to conduct Social Impact Assessment **(SIA)** study for

acquisition of private land of 82.54 acres for brownfield expansion of Aluminium smelter. Public hearing for SIA study in three villages in Angul dist. conducted. SIA report was prepared and submitted to Dist. Admn. Expert group meeting held on 12.10.2022 under the chairmanship of ADM, Angul evaluated the SIA report and recommended for acquisition of land.

k) Captive Power Plant Expansion Project:

Consultant has been appointed for preparation of DPR for 4 x 350 MW Captive Power Plant. Draft DPR has been prepared. For finalization of power sourcing, tender floated for engagement of Consultant for evaluating options like setting up a new CPP or expansion of existing CPP or long-term sourcing of power from IPP/ JV/ Third Party. Bids received are under evaluation.

Information Technology (IT)

7.18 Information Technology (IT) is increasingly occupying a central role in the business functions at NALCO. Leveraging technology for better business process management has always been the prime focus area at NALCO. IT enabled initiatives were taken up during the year to add immense value to the business.

7.19 Digital enablement

Since, 2010 NALCO has implemented Enterprise Resource Planning (ERP) integrating all the business functions such as sales & distribution, finance & controlling, materials management, human resource, plant maintenance and production planning to ensure uniformity in process, improved information availability and transparency for information based decision making. NALCO is in the process of implementing Payroll in ERP.

For improved transparency, speed and accountability NALCO has implemented electronic file handling system (e-Office) across all plants and offices.

For secure and ready access to digitized documents, the e-Office Knowledge Management System has been implemented. This system enables a secure and controlled environment for sharing of documents.

7.20 Employee self-service

NALCO has digitally enabled employee centric services such as payroll, attendance, and income tax including work flow based self-service applications like appraisal, leave, loans, perquisites, tour, medical reimbursements and probation confirmation. Computerized Hospital management system has been deployed at Company owned hospitals at Angul and Damanjodi to ensure timely medical care for employees and associates.

7.21 Digital enablement for stakeholder

NALCO has introduced online vendor bill tracking system, Contract labour management system, Recruitment Portal and a series of mobile apps for the benefit of stakeholders.

7.22 Cloud based services

E-procurement of goods & services are carried out through GeM Portal, Supplier Relationship Management (SAP SRM) and Central Public Procurement Portal (CPPP).

7.23 Governance

For governance and monitoring, online web-

based applications such as capital expenditure monitoring, fund monitoring, compliance management system, bill tracking system, vigilance complaint management system, etc. are in place. These have resulted in timely monitoring and efficient management of capital expenditure, cash flow, statutory compliances and capital proposals.

7.24 Analytics

To harness the power of data, analytics and visualization dashboards have been deployed for monitoring Production, Sales & Distribution and Human Resource Management.

7.25 IT Infrastructure

Following IT infrastructure are in place to ensure uninterrupted service:

i. Primary Data Center is located at Corporate Office, Bhubaneswar. Data Center uses server virtualization technologies, and hosts all Centralized Applications including ERP and e-Office. Disaster Recovery Data Center is located in a separate seismic zone.

ii. Plants and Offices are interconnected with dual MPLS circuits from different service providers for uninterrupted access to applications and services hosted at Corporate Data Center. The WAN bandwidth has been enhanced to cater to the increased load triggered mainly by Covid-19 practices. For increased network availability across locations a pilot testing on state-of-the-art SDWAN technology was conducted.

iii. Each plant location and Corporate Office have Gigabit Ethernet LAN with Firewall. The Corporate Data Center has gateway protection solutions additionally.

iv. Multi channel video conferencing solution for effective communications between all business units.

7.26 Cyber Security

The Data Centre and the Disaster Recovery site have been certified as ISO 27001:2013 complaint. The scope covers the full arena of IT Security for IT infrastructure, Applications and Users. IT infrastructure and application security is ensured with network gateway and endpoint security solutions. Implementation effectiveness is further assured with application and security audits & Mock drills wherein observations were documented for improvement and implemented.

Action Taken on Pollution Control and Environment

7.27 NALCO as a responsible corporate Business Organisation, has given maximum thrust on environment management and pollution control ensuring a cleaner greener and safer environment at all our production units and its periphery. All production units are certified to International Standards on Environmental Management Systems (ISO14001) as well as Occupational Health and Safety Management Systems (ISO 45001) affirming commitment to comply proactively with continual improvement. Further to have cleaner and greener surroundings in all its operating units, 5 S Principle has been adopted and massive plantation is taken up in and around the plant. All Productions units are running with Valid Consents, licenses, authorizations under different statutes

7.28 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 and modify its policies and strategy accordingly. Our Revision of Sustainable Development policy is an apt step in this direction. A sustainable development report is published by NALCO every year aligned with the international Global Reporting Initiatives (GRI) Standards.

7.29 In our endeavour to keep our environment clean and green we have made capital investment for upgrading our pollution control infrastructure, indulged in massive plantation & afforestation drive and have created awareness around our dwelling for a better planet**.** 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 encourages active participation of its employees in environmental functions like Earth Day, World Environment Day, Vanamahotsav, Chemical Disaster Prevention Day, Ozone Day, National Pollution Prevention Day etc.

The unit Specific major improvements taken up in the field of environment management at different units of NALCO during the year 2022-23 are as follows:

a) Bauxite Mines:

- 1,10,773 nos. of trees were planted in and around Mines. Further, 5000 nos. of fruit bearing seedlings were distributed to local villagers to improve awareness about plantation among the villagers.
- 7000 square meter of grass-turfing was carried out inside the Mines as per the target.
- Panchpatmali Bauxite Mine hosted the 23rd Mines Environment & Mineral Conservation Week being organized every year under the aegis of Indian Bureau of Mines, Bhubaneswar Region.

b) Refinery Plant

- ESP (Electro Static Precipitator) revamping of Unit # 1, 3 & 4 boiler are taken up. Unit #4 ESP revamping work completed.
- Fuel additive with HFO (Heavy Fuel Oil) at Calciners and hydrate dewatering agent in hydrate filtration are being used for getting lower specific oil consumption norm and thus less GHG (Green House Gas) emission.
- Both the Sewerage Treatment Plant at Refinery Township has been revamped with technological up gradation work.
- Water from Ash Pond and Red mud Pond is recycled for complete utilization and percentage of reclamation is more than 100%.
- Used filter cloth and used waste cotton generated from plant is being disposed to co-processing cement plant authorized by Central Pollution Control Board (CPCB)
- Discarded asbestos (hazardous waste) is being disposed to Common Hazardous Waste

Treatment, Storage & Disposal Facility (CHWTSDF) at Sukinda, Jajpur.

- Four rain water harvesting facilities are in use inside and outside the plant premises, Work for installation of another 03 nos. of rain Water Harvesting units of capacity 16200 cubic meter at township is in progress.
- During the Yr. 2022-23 (till Dec'22) total 16,006 no. of plantation has been done
- Periodical Dam Inspection has been carried out by Internal Dam Management committee and External Dam Experts.

c) Smelter Plant:

- As a part of Hazardous waste management, 1704 MT of Carbon Area hazardous waste was disposed to common Secured Landfill. 20197 MT of dross, and 3462 MT of carbon portion of spent pot lining were disposed to the agencies authorized by OSPCB (Odisha State Pollution Control Board) during April 2022 to Dec' 2022.
- To monitor fugitive emission, online laser based fluoride gas monitoring systems have been installed. This monitoring system detects fugitive fluoride levels continuously inside pot rooms, so that instantaneous corrective action can be taken.
- Installation of online monitoring system of SO2 emission from Bake oven stacks done.
- Three Numbers of HD IP camera installed at the roof top of plant to monitor any abnormal emission remotely which are also connected to the server of Pollution Control Board- Odisha.
- To prevent land contamination Construction of Concrete Platform along with garlanding drain completed at Scrap & Salvage yard for storage of cut pins etc.
- To develop green belt 3278 Nos. of sapling planted inside Smelter Plant with distribution of 10800 Nos. of sapling to outside periphery villages, during Apr to Dec 2022.

d) Captive Power Plant:

- Stack emission is maintained within the specified norm as prescribed by SPCB. To further improve stack emission, revamping of 1st 4 fields of ESPs of Unit-5 & Unit-6 has been carried out during annual overhauling of the unit.
- CPP, NALCO is continuously achieving more than 100% Ash utilization after commissioning of most coveted Lean slurry project (LSP) of ash disposal to allotted mine void of South Bharatpur. The ash utilization for the year 2022-23 (up to Dec'2022) is 119.16%.
- CPP, NALCO has implemented incentive scheme of Rs 150/MT to Brick manufacturer to enhance ash utilization. In the year 2022-23 (Up to Dec'2022) around 4.62 lakh MT of dry ash has been supplied to Brick manufacturer.

- In the year 2022-23(Up to December' 2022) around 4.72 lakh MT of pond Ash has been supplied to NH for road construction. Further follow up is being done with National highway & State high way to enhance utilization of Pond ash in upcoming project for using in road and flyover construction.
- Consent to Establish (CTE) has been received from State Pollution Control Board (SPCB) in Nov'2022 for construction of 5th phase ash mound by increasing height of Ash Pond-II from 115 to 123 MRL (Meter reduced level).
- To further reduce the turbidity of ash slurry recycle water from Ash pond & mine void another Clariflocculator of 3000 m3/hr capacity has been installed and commissioned on 22-11-2022 inside plant .The recycle water after treatment is being re-used for ash slurry making & other use in plant .
- Zero discharge has been achieved with respect to industrial effluent, ash pond overflow water and sewerage treatment plant treated water which has been certified by State Pollution Control Board.
- During the FY 2022-23 (Up to Dec 2022), 1,07,38,584 cubic meter of mine void overflow water was recycled back to plant and re-used in plant purpose.
- During FY 2022-23 (Up to Dec'2022) 30,05,400 cubic meter of water from rain water harvesting system was recycled and re-used.
- CPP NALCO has planted 1600 Nos. of plant in the year 2022-23 (Up to Dec'2022). The plantation done since its inception is covering around 34.20 % of total area.

Energy Conservation

7.30 NALCO is having Energy Management System in its energy intensive Production Units i.e. Refinery, Smelter & CPP and certified to International Standard on Energy Management System (ISO 50001). Unit wise energy conservation measures taken up during FY 2022-23 are as follows:

a) Mines

- On-Grid roof top PV solar power plant with 130 KWp (2 x 35 Kwp + 2 x 30 KWp) capacity has been installed & commissioned over 04 nos. of buildings on 19.06.2021. The plant has generated 0.09 MU (up to Dec 2022 in FY 2022-23) of energy from renewable (solar) energy source, which has thereby reduced drawl from non-renewable sources/ grid. Process for addition of another 50 KWp on grid Roof top plant is also in advance stage.
- For reduction in energy consumption towards illumination along Mine haulage roads the modifications are being carried out as per Lean six sigma project. The modification & replacement for FY 2022-23 till Dec 2022 has led to approx. saving of 0.048 MU of electricity. The project has a potential of annual energy saving up to 0.32 MU.
- Reduction of HSD oil consumption has been achieved by addition

of fuel additives in HEMM, modification in methodology of operations, optimum selection of HEMM for bauxite generation and modification in methodology of loading of excavated ore in Central Block Sector-2 area. Approx. **337 KL** of HSD oil has been saved owing to the same in FY 2022-23 till December 2022.

b) Alumina Refinery

- Use of dewatering aid for reduction in moisture in feed hydrate to Calciners for reducing fuel oil consumption & use of Thermol (Fuel oil additive) to reduce fuel requirement in Calciner is going on as per requirement.
- Replacement of conventional lights and incandescent bulbs with LED tubes and bulbs at all major roads and public buildings.
- Installation of 630 kva energy efficient lighting transformer
- Installation of 50 nos of movement sensors in office rooms for auto switch- off of power supply.
- Rectification of steam loss from faulty steam traps and arresting bypass line steam leakages of Evaporation area.
- Replacement of conventional profile heating elements in air pre heater with advanced profile heating elements in Boiler-3 & 4 for better Boiler efficiency.
- Reduction of heat loss from boiler furnace & associated steam header by revamping insulation cladding in Boiler1, 2, 3.

c) Smelter

- Graphitization of cathode to reduce specific DC energy consumption in pot line, saving @ 55kwh/MT of hot metal, is going on. Out of total 919 pots in operation, 853 pots are graphitized.
- A pilot project i.e. "Development of low energy cell technology for Smelter plant (AP2XN)" had been taken up with an objective to reduce specific energy consumption under the development co-operation agreement between Rio Tinto/ Alcan, Canada and NALCO. 15 pots in Pot line -3 were under trial operation. After trial, it was found that there is an energy saving of 150 KWH/MT of hot metal compared with reference pots. NALCO has planned to go for trial of AP2XN technology in 45 number of pots. For this project 45 sets of side slabs are being procured for which GTE exemption is awaited.
- Installation of 2nd Anode Slot cutting Machine at Rodding Shop–2 is in progress, with DC Energy saving potential @140 kwh/MT of hot metal. Commissioning will be completed by March, 2023.
- Energy Saving device in breaker assembly has been incorporated in 2 pots on trial basis with an objective to reduce consumption of compressed air. Retrofit Energy saving cylinder have been tested successfully in 45 Pots (180 cylinders). The

compressed air saving achieved are 61.04% as per the extensive tests conducted in June 22. Procurement process is on to incorporate in more number of pots.

d) Captive Power Plant:

- Renovation & Modernization of existing Air-Preheater in Unit-5 with advanced profile heating element, double sealing arrangement and VFD drives, completed in November 2022. This has resulted in increase in boiler efficiency due to reduction in air leakage and increased heat transfer.
- De-staging of existing Condensate Extraction Pump (CEP) from 7 stages to 6 stages completed in CEP-B of Unit-7, in November 2022, which resulted in reduction of power consumption by 40 kW per Unit.
- Chemical cleaning of condensers in Unit # 7 was carried out in August 2022. Improvement in condenser vacuum near to design value has been achieved, thereby resulted saving in coal consumption.
- The old inefficient High Pressure Heater HPH-6 in Unit-5 has been replaced with new HPH in November 2022. After replacement the feed water temperature to boiler has increased to near design value, which resulted in improvement of unit efficiency.

Research & Development (R&D)

7.31 Since inception 40 patents have been filed out of which 25 have been granted and 7 have been commercialized. Research Advisory Committee (RAC) meetings are being held periodically to review the R&D activities of the company.

- NALCO in its pursuit towards organizational growth through sustained development in process, product and technology is fully functional in its new R&D Centre named as "NALCO Research and Technology Center (NRTC) "at Gothapatana, Bhubaneswar with state of the art research and development facility, to achieve excellence in the fields of Bauxite, Alumina, Aluminium, Power and allied areas of research including down streams at national and international levels, progressively. Samples received from outside are being analyzed on chargeable basis for generating revenue and samples from NALCO's different units are being analyzed as and when required.
- R&D Trials with Grain Refiner for Electrical Application in Wire Rod facility of Cast House Smelter Plant was conducted. Improvement in UTS (10%) observed without any significant reduction in % Elongation and % IACS Conductivity.
- High pure nano-alumina for solar cell anti-reflection coatings and reinforcing Aluminium was taken up as a collaborative project. Increase in efficiency (~7%) was observed and nanoparticles reinforced Aluminium by a hot injection method showed increase in Hardness of ~10 %.
- MOU renewed with BARC R&D on Development of Chemical Methods and Technologies for Value Added Processes and Products in Aluminium Industry. Project on "Development of scacrificial bricks from red mud for core catcher of nuclear thermal power plants" commenced.

- Project on "Development of process and suitable medium for selective extraction of Gallium from Plant liquor and setting up a demo plant in Refinery" with BARC is in progress.
- Mou signed with Bhubaneswar City Knowledge Innovation Cluster Foundation (BCKICF) to create a strong Science and Technology ecosystem using industry-academia partnership .
- MOU signed with Soft ware Technology park of India (STPI) for industry 4.0 related projects.
- A bench scale study, jointly by 3 R&D institutes (JNARDDC, CSIR-NML and CSIR-IMMT) and 3 industries (NALCO, HINDALCO and VEDANTA) for 'Technology development for holistic utilization of red mud for extraction of metallic values & residue utilization' is in progress.
- Development of a process for Spent Pot line Carbon (hazardous waste) treatment and recovery of valuables is in progress with JNARDDC & IMMT.
- A project on Aluminium air battery development is in progress with CSIR-CECRI.

Procurement

7.32 Against mandatory target of 25% procurement from MSEs, NALCO has achieved 32.41% for the FY 2022-23 till December'22 (against 31.22% in FY 2021-22)

7.33 Total procurement by the Company from MSEs for the FY 2022-23 till December, 2022 including SC/ ST MSEs & Women owned MSEs is Rs. 647.51 crore (against Rs. 713.80 crore in FY 2021-22) out of which procurement from SC/ST MSEs is Rs.6.52 crore (against Rs. 5.94 crore in FY 2021-22) & women owned MSEs is Rs. 26.22 crore (against Rs. 33.21 crore in FY 2021-22)

7.34 Total procurement by the Company through GeM portal is Rs. 2407.36 crore in FY 2022-23 till December, 2022 (against Rs. 3121.44 crore in FY 2021-22).

7.35 Total 112 nos. of reverse auction done in FY 2022-23 till December, 2022 (against 52 nos. in FY 2021-22) and notional cost reduction due to reverse auction is Rs. 29.32 crore (against Rs. 44.51 crore in FY 2021-22).

Industrial Relations

7.36 Industrial Relations

During the year 2022-23, the Company continued to maintain a conducive and cordial Industrial relation climate. The year 2022-23 passed off as yet another year with zero man-days loss on account of labour disputes. Compliance of applicable Labour Laws, adherence to Government Guidelines and consultative decision making, continued to remain the core strengths in dealing with employee benefits and welfare issues. As always, zero tolerance to indiscipline continued to remain the hallmark of IR philosophy.

MoU rating of NALCO during the last five financial years

Year	Composite Score	Grade
2017-18	91.88%	Excellent
2018-19	96.04	Excellent
2019-20	44.70	Fair*
2020-21	90.75	Excellent
2021-22	95.03	Excellent

**Due to abnormally low LME Aluminium Price during the year and impact of COVID-19 pandemic during last quarter of FY 2019-20 affected the financial performance of the Company.*

Aluminium Industry in India

7.37 The Indian primary Aluminium industry consists of three major players i.e. National Aluminium Company Limited (NALCO), Hindalco Industries and Vedanta Ltd., having a total production capacity of 4.1 million tons. The total production of Primary Aluminium metal during FY 2021-22 was about 4.03 million tons and in FY 2022-23, it is expected to expand to 4.09 million tons. During 2021-22, the total domestic sales of primary metal by the major primary producers, i.e., NALCO, Hindalco and Vedanta was 1.57 million tons, which is likely to grow to 1.84 million tons during the current fiscal, as per current trend.

7.38 A study conducted by CRU has revealed that global aluminium demand will increase significantly by 2030 and that the aluminium sector will need to produce an additional 33.3 Million tons to meet demand growth in all industrial sectors – from 86.2 Million tons in 2020 to 119.5 Million tons in 2030. The study details demand across key industrial sectors and regions in a post-Covid economy. Transportation, construction, packaging and the electrical sectors are the four key sectors that will drive demand, accounting for 75% of the total metal required. Two-thirds of this growth is expected to come from China, which will require 12.3 Million tons, the rest of Asia adding a further 8.6 Million tons, North America 5.1 Million tons and Europe 4.8 Million tons. Together, these four regions alone will account for more than 90 per cent of the additional aluminium required globally.

According to the report, decarbonisation policies plus a shift from fossil fuels in the transport sector will see an increase in EV production to 31.7 Million tons in 2030 (compared to 19.9 in 2020). Renewable energy demands will also see a rise in demand for aluminium for solar panels, as well as replacing existing copper cabling for power distribution. In total, the electric sector will require an additional 5.2 Million tons by 2030. The construction sector will require an additional 4.6 Million tons by the end of the decade. Urbanisation will account for 44% of growth, coming from Asia (excluding China). Aluminium packaging will rise from 7.2 Million tons in 2020 to 10.5 Million tons in 2030, driven by an increase in the popularity of canned drinks across North America, Europe and China. A surge in demand for environmentally friendly packaging combined with new products is also behind the increase.

7.39 A unique combination of properties makes aluminium one of the most versatile engineering and construction materials. It is light in mass, yet some of its alloys have strengths greater than that of structural steel. It has high resistance to corrosion under the majority of service conditions, and no colored salts are formed to stain adjacent surfaces or discolor products with which it comes into contact, such as fabrics in the textile industry and solutions in chemical equipment. It has no toxic reaction. It has good electrical and thermal conductivities and high reflectivity to both heat and light. The metal can easily be worked into any form and readily accepts a wide variety of surface finishes. The mass of aluminium is roughly 35 percent that of iron and 30 percent that of copper. Commercially pure aluminium's usefulness as a structural material is somewhat limited due to low tensile strength. By working the metal, as by cold rolling, its strength can be approximately doubled. Much larger increases in strength

can be obtained by alloying aluminium with small percentages of one or more other elements such as manganese, silicon, copper, magnesium or zinc.

7.40 Aluminium prices have been extremely volatile for the last couple of years. During the period of Covid lockdown, prices plunged to multi-year lows due to a weak industrial demand. But prices rebounded with strength in 2021 as increased economic activities boosted the demand for industrial commodities. However, since the Russian invasion of Ukraine, aluminium has lost its steam shedding prices to a one-and-a-half-year low. Prices on the benchmark London Metal Exchange has corrected significantly from its all-time high tested in March. The increased geopolitical risks associated with the war adversely weighed on industrial activities across the globe. Developments in China, which accounts for half of the global aluminium production, also dominated the price action. The prolonged Covid lockdown and the country's zero-Covid policy have further weakened the demand for the metal. The Chinese government imposed restrictions on heavy industries with a plan to reduce carbon emissions, which had an impact on prices. Incessant power shortages in the country also disturbed the supply chain of the commodity this year. The Russian-Ukraine war took global fuel prices to record highs, disrupting smelting activities in key producers. Strengthening of the dollar in the wake of monetary tightening also had a negative influence on the demand for the metal. The dollar gained significantly after an aggressive rate hike by the US Federal Reserve. On the price front, an immediate turnaround is least expected due to feeble demand from China and the rest of the world. However, the trend may not continue much longer. Supply constraints are likely to anchor prices in the medium to long term. Production bottlenecks in Europe due to high energy prices and a government-implemented hard cap on smelting capacity in China may increase supply constraints and support prices later.

7.41 The Indian Aluminium industry has remained resilient in FY 2022-23, with demand remaining strong. Aluminium's key end-uses including real estate, packaging, transport, and beverage cans continue to perform well despite economic headwinds. Although retail inflation spiked as a result of Ukraine war, it has now fallen to a four-month low of 5.88 % in Nov'2022 from 7.41% in September on tighter monetary policy and softening commodity prices. The Indian real estate sector appears resilient to rising prices as home sales continue to trend upward. In Jul-Sep 2022, home sales in India's seven largest cities were up 4% q/q and up 41% y/y. New unit launches in the seven cities increased 14% q/q in Apr-Jun 2022, showing a 45% y/y increase. The seven cities are in the New Capital Region (NCR) including Delhi, Mumbai Metropolitan Region (MMR), Bengaluru, Pune, Hyderabad, Kolkata, and Chennai. Average house prices increased by 4-7% y/y in Jul-Sep 2022, driven by an increase in input costs and a post-Covid-19 demand recovery.

7.42 The total domestic production of Aluminium metal by Aluminium producers in the year 2019-20 to 2022-23 (till December, 2022) is given at **Table 7.4**

Table 7.4
Production of Aluminium in India

(Figs. in Tons)

Sl No.	Producer	2019-20	2020-21	2021-22	2022-23 (up to Dec 2022)
1	NALCO	4,18,373	4,18,522	4,60,000	3,44,464
2	HINDALCO	13,12,541	12,40,917	13,03,517	10,20,813
3	VEDANTA GROUP	18,87,965	19,70,477	22,69,083	17,13,712
	Total	**36,18,879**	**36,29,916**	**40,32,600**	**30,78,989**

(Note: Production figures pertaining to other primary producers are based on available market data)

7.43 The sales figure of Aluminium (Domestic Sales of Aluminium & Export Sales of Aluminium in India are given in **Table 7.5 and Table 7.6**

Table 7.5
Domestic Sales of Aluminium

(Figs. in Tons)

Sl No.	Producer	2019-20	2020-21	2021-22	2022-23 (up to Dec 2022)
1	NALCO	3,38,864	2,30,643	3,23,809	3,29,353
2	HINDALCO	5,84,937	4,80,279	6,38,702	5,02,259
3	VEDANTA GROUP	6,24,601	6,36,378	6,05,510	5,65,988
	Total	**15,48,402**	**13,47,300**	**15,68,021**	**13,97,600**

(Note: Domestic sales figures pertaining to other primary producers are based on available market data)

Table 7.6
Export Sales of Aluminium

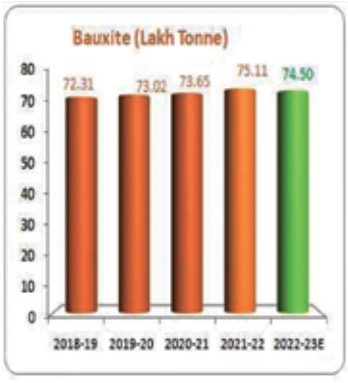
(Figs. in Tons)

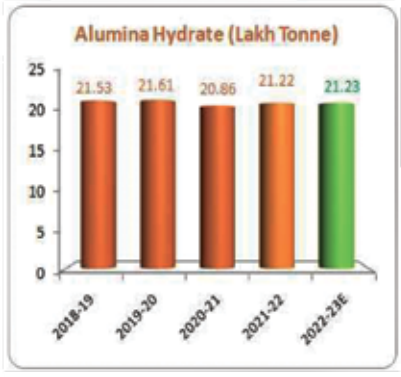
Sl No.	Producer	2019-20	2020-21	2021-22	2022-23 (up to Dec 2022)
1	NALCO	56,898	1,92,174	1,33,085	17,318
2	HINDALCO	7,06,567	7,80,206	6,67,233	5,06,506
3	VEDANTA GROUP	12,41,276	13,56,740	16,64,724	11,41,030
	Total	**20,04,741**	**23,29,120**	**24,65,042**	**16,64,854**

(Note: Export sales figures pertaining to other primary producers are based on available market data)

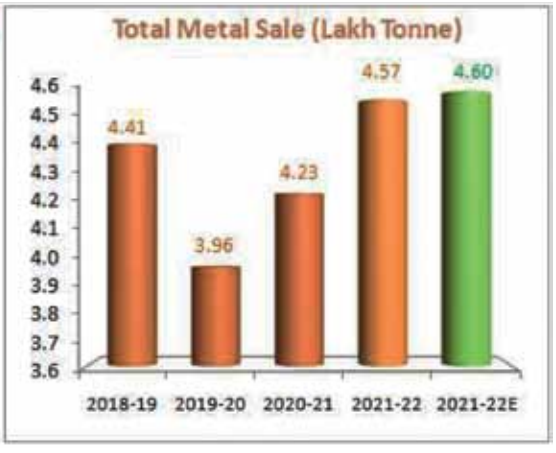
7.44 Trends of Production & Sales Parameters

Production





Sales



Awards & Accolades during FY 2022-23

The Company for its stellar performance has been recognized by various reputed institutions. Some of those are:

1. Alumina Refinery unit of NALCO won APEX India Green Leaf Award 2021 for Environment Excellence in May'2022.
2. NALCO's Panchpatmali Central & North Bauxite Mines received "Five Star Rating" Award at 6th National Conclave of Mines & Minerals held at New Delhi in July'2022.
3. Business Excellence instituted by CII-EXIM (Export-Import) under European Foundation for Quality Management (EFQM) Criteria has awarded three production units of NALCO in Nov'2022 at the CII Excellence Summit held at Bangalore as stated here under:

- Alumina Refinery bagged the Platinum category award for the 4th consecutive year. In addition to this, being recognised with as consistent progressive performer, a special jury award has also been bagged by the unit.
- Panchpatmali Bauxite Mines conferred with Gold Plus category award in recognition of the initiatives taken for Business Excellence.

- Captive Power Plant, Angul conferred with Gold Plus category award in recognition of the initiatives taken for Business Excellence.

Hindustan Copper Limited (HCL)

Introduction

7.45 Hindustan Copper Limited (HCL), a Miniratna Category-I, 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 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 converting of refined copper metal into continuous cast rod (CCR) as downstream product. HCL has acquired assets of Jhagadia Copper Limited (JCL) 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 66.14 % equity owned by the Government of India.

7.46 Highlights of Financial year 2022–23

- The Company has achieved a Profit Before Tax of Rs. 381.72 crore and a highest ever net Turnover of Rs. 1812 crore in FY 2021-22.
- Hindustan Copper Ltd paid dividend of Rs. 112.17 crores (approx) to its shareholders & out of which Rs. 74.20 crore paid to Goverment of India for FY 2021-22 being 30.01% of PAT in compliance of DIPAM Guidelines.
- HCL was felicitated as sectoral star at the Fortune India's "The Next 500: Breaking News Frontiers event at New Delhi on 24.06.2022 for its outstanding rising performance in the Metal Industry.
- HCL launched a platform on 15.07.2022 in Kuilisuta village, Jharkhand to promote micro enterprises for craftsmen in various user segments of copper especially with a mission to revive Dokra craft, on of the earliest known methods of metal casting using lost-wax casting technique, reflecting the beauty of life in its various forms, in observance of the iconic week of Azadi ka Amrit Mahostav from 11.07.2022 to 17.07.2022.

Photo -7.9

- The Hon'ble Vice President of India, Shri Jagdeep Dhankar, Along with the Second lady of India, Dr Sudesh Dhankar and Shri Vivek Bharadwaj, IAS, Secretary (Mines) Govt. of India visited Khetri Copper Complex (KCC) on 19.11.2022.

- Hon'ble Minister of Parliamentary Affairs, Coal & Mines, Shri Pralhad Joshi & Shri Alok Tandon, IAS, Secretary, Ministry of Mines, Govt. of India visited HCL'S Corporate Office at Kolkata on 16.09.2022 & 22.09.2022 and took the review of company's overall performance and had also inspected the HCL'S intiative towards Special Campaign 2.0 at corporate office.
- Shri Vivek Bharadwaj, IAS, Secretary, Ministry of Mines, Govt. of India visited HCL's Corporate Office at Kolkata on 20.10.2022 and took the review of company's overall performance and had also inspected the HCL's initiative towards Special Campaign 2.0 at Corporate Office.
- Shri Vivek Bharadwaj, IAS, Secretary, Ministry of Mines, Govt. of India graced the inauguration of India Pavilion at IMARC-2022 at Sydney, Australia. CMD, HCL also participated at the event along with other dignitaries.

Photo -7.10

- Shri Alok Tandon, IAS, Secretary, Ministry of Mines, Govt. of India, and Shri Prafulla Kumar Mallik, Hon'ble Minister of Steel and Mines, Odisha, inaugurated the Indian Pavilion in Mining Indaba 2022 at Cape Town, South Africa on 09.05.2022, of which HCL was the nodal organization.

Photo -7.11

- MoU rating of the HCL for the FY 2020-21 was declared by DPE on 18.01.2022 as 'Very Good'.
- Indian Copper Complex (ICC), Ghatsila unit of HCL, supplied Copper Strips for the construction work of Shri Ram Temple at Parkota and Development of infrastructure facilities at Shri Ram Janmbhoomi Complex at Ayodhya, UP.
- International Yoga day was celebrated in Kolkata on 21.06.22 in which HCL was the nodal organization to make arrangement for 500 participants to take part in Yoga program. The program was a grand success in which GSI, NALCO, IBM & MECL officials at Kolkata have taken part.
- At the 9th National Conclave on "Diversity in Management - Development of Women Executives" held at Institute of Public Enterprises, Hyderabad, Smt. Sampa Chakrabarty Lahiri, AGM (CC & Admin.) Hindustan Copper Limited, was awarded with the "Women of Excellence Award 2021".
- Letters of appointment were distributed to the selected Doctors (4 nos.) for the mining units of HCL after the launch of mission recruitment drive by Hon'ble

Prime Minister of India, Shri Narendra Modi on 22.10.2022. Further company has started recruitment of 84 Nos. GET (Graduate Engineer Trainee) in various technical discipline, the appointment of which will be distributed on 22.12.2022.

- The Company has been rated ICRA A1+ (the best possible rating on short term scale) & ICRA AA+ (stable) (the second-best rating on long term scale) for its borrowing limits.
- The Govt of Madhya Pradesh vide order dated 25.05.2022 has extended the validity of Malanjkhand copper mining lease till 27.08.2043 as per Mineral (Mining by Government Company) Rules, 2015.
- One-day knowledge sharing session titled "Evolution of Exploration, Mining, Metallurgy and Usage of Copper in India in 75 Years & Future Directions" was organized by HCL on 16.07.2022 at Ghatsila, to discuss topics covering almost the entire spectrum of the copper industry, that is exploration and exploitation of copper ore, extraction of copper and emergent usage of copper in health sector. Renowned experts from the relevant fields of Industry and Academicals shared their valuable insights on the topics.
- An ambulance was handed over to the Collector of Balaghat district under CSR by Malanjkhand Copper Project MP, to cater to the medical emergencies of the local community.

Photo -7.12

7.47 Awards and Accolades:

Shri Arun Kumar Shukla, CMD, HCL, has been awarded the MGMI Award of Excellence for Non-Coal Mining for the year 2021-22 in Kolkata on 25.09.2022 by the Mining, Geological and Metallurgical Institute of India for his outstanding contribution in Non-Coal Mining Industry.

- Malanjkhand Copper Project, has won the overall performance 1st prize in Mine Environment & Mineral Conservation Week 2021-22 along with being 1st in Systematic & Scientific Mining, Waste Dump Management and Mineral Beneficiation and 3rd in Reclamation and Rehabilitation.
- Celebration of Metalliferous Mines Safety Week 2021-22 under the aegis of Directorate General of Mines Safety Nagpur Region has been organized. The list of prizes won by MCP unit during the celebration of Metalliferous Mines Safety Week 2021-22 are as follows.
- 1st Prize in overall category, Mine plan & record.
- 1st Prize in Vocational Training & First Aid.
- 1st Prize in occupational health & safety and Welfare Amenities.
- 2nd Prize SMP & Emergency Preparedness.

Photo -7.13

- Prizes won by Khetri Copper Complex (KCC) in Fully Mechanised Group B (Underground Mines) Category in the 32nd Mines Environment & Mineral Conservation Week 2021-22, Ajmer Region: -
    - Khetri Copper Mine: -
        1. Environmental Monitoring: 1st Prize
        2. Afforestation: 3rd Prize
        3. Reclamation & Rehabilitation: 3rd Prize
        4. Overall Performance: 3rd Prize
    - Kolihan Copper Mine: -
        1. Waste Dump Management: 2nd Prize
        2. Mineral Conservation: 3rd Prize
- 60th Metalliferous mine safety week competition held on dated 17.11.2022 and 18.11.2022 Kendadih and Surda Mine respectively. In various trade test Surda Mines won 1st, 2nd & 3rd and Kendadih Mine won 1st and 2nd prize.
- The Copper Mines of Hindustan Copper limited have been awarded the National Safety Awards (Mines) for the year 2020, 2019, 2018 and 2017 on 08.03.2022 by Hon'ble Minister of Labour & Employment, Shri Bhupender Yadav, in the categories of LAFP (Longest Accident Free Period) and LIFRM (Longest Injury Frequency Rate per Lakh Manshift).
    1. Malanjkhand Copper Mine (LAFP-Type-4): Runner, 2020
    2. Khetri Copper Mine (LAFP-Type-6): Runner, 2019
    3. Khetri Copper Mine (LIFRM-Type-6): Winner, 2018
    4. Kolihan Copper Mine (LIFRM-Type-6): Runner, 2018
    5. Kolihan Copper Mine (LIFRM-Type-6): Winner, 2017

7.48 Present capacities of HCL's Mines, Smelters and Wire Rod plant are given in **Table7.7, Table 7.8** and **Table 7.9.**

Table 7.7
Ore Mining Capacity of HCL

Location of Mines	Ore Capacity (million tonnes per annum) (As per Mining Plan)
Khetri Copper Complex (KCC), Rajasthan	1.8
Malanjkhand Copper Project (MCP), M.P.	2.5
Indian Copper Complex (ICC), Jharkhand	0.9
Total	**5.2**

Table 7.8
Refined Copper Production Capacity of HCL

Location of Smelters	Refined Metal Capacity (Tonnes per annum)
Indian Copper Complex (ICC), Jharkhand	18,500*
Gujarat Copper Project (GCP), Jhagadia	50,000*
Total	**68,500***

**The rated capacity as per record is 50,000 tonnes per annum however it was never operated at full capacity.*

Table 7.9
Production Capacity of Wire Rod Plant of HCL

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

7.49 The capital structure of the Company as on 31.12.2022 is given in **Table 7.10**.

Table 7.10
Authorized Capital Structure of HCL

Location of Smelters	Refined Metal Capacity (Tonnes per annum)
a) Authorized Capital:	
i) 180 crore equity shares of Rs. 5/- each	Rs. 900 crore
ii) 20 lakh preference shares ofRs.1000/- each	Rs .200 crore
Total	**Rs. 1,100 crore**
b) Issued, Subscribed and Paid-Up Capital	Rs. 900 crore
i) 96, 70,24,020 equity shares of Rs. 5/- each	Rs. 483,51,20,000

7.50 Physical performance details of HCL are as under:

Table 7.11
Physical Performance of HCL

Product	Actual for the previous 2 years		Target for FY 2022-23	Actual from 1st April'22 to 31st Dec'22	Projection for the period Jan' 2023-Mar'2023
	FY 2020-21	FY 2021-22			
Ore Production ('000 Tonnes)	3273	3570	4240	2292	900
Metal in Concentrate (MIC) (Tonnes)	23866	24741	30000	18283	6300
Refined Copper (Cathode) (Tonnes)	Nil	621	-	3.26	*
Wire rod (Tonnes) (Tolling)	1360	1241	-	4512**	3000**

** As per the business plan of the Company, concentrate of MCP, KCC and ICC origin are being sold directly in the market.*

** Production of wire rod (Tonnes) is based on tolling of 3rd party cathodes.*

7.51 Financial performance details of HCL are as under:

Table 7.12
Financial Performance of HCL

(₹ in crore)

Sl No	Details	Actual for the previous 2 years		For the Period Apr'22 to Sep'22 (Limited Review)
		FY 2020-21	FY 2021-22	
1.	Turnover	1760.84	1812.21	550.17
2.	Net Profit/ (Loss) before Tax (PBT)	86.90	381.72	110.42
3.	Net Profit/ (Loss) after tax (PAT)	109.98	373.78	82.97

(*) HCL being a listed Company, price sensitive data cannot be disclosed unless the audited result is published.

7.52 Sales Performance

Sales performance details of HCL are as under

Table 7.13
Sales Performance of HCL

Product	Actual for the previous 2 years		Target for FY 2022-23	Actual from 1st April '22 to 31st Dec22'	Projection for the period Jan' 23-Mar' 23
	FY 2020-21	FY 2021-22			
Total Copper Sales (MT)	32997	25807	30000	16151	5906

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.

7.54 The Company has plans to increase its mining capacity from current level of around 4.0 million tons per annum to 12.2 million tons per annum in phase –I (under implementation) and from 12.2 million tons per annum to 20.2 million tons per annum in phase-II through expansion of existing mines, re-opening of closed mines and opening of new mines. During financial year 2021-22, HCL has achieved an ore production of 3.57 million tonnes.

7.55 HCL carried out surface exploration drilling in FY 2021-22 to the tune of 11700 meters (From January 2022 till December, 2022). Apart from this, Geophysical Exploration carried out at Kolihan Mining Leases, validation of the same is being carried out by drilling. New tenders for surface exploration drilling at Surda & Khetri Mining Lease are in approval stage.

7.56 Details of depth exploratory drilling in different mines of HCL for financial year 2022-23 is as under:

Sr. No.	Mining Area	Exploration in FY 2022-23 (In meter)
1.	Ghatsila	10850
2.	Khetri	850 & Geophysical Exploration
	Total	**11700 and Geophysical Exploration**

Above exploration work was funded by HCL through its own resources.

7.57 R&D ACTIVITIES:

(i) Study for modification of mining method from track mining to trackless mining by introduction of higher capacity diesel trackless equipment at Khetri block of Khetri Mine has been done.

(ii) M/s IIT Kharagpur has conducted stability analysis of rib pillars lying between 124 mRL and 184 mRL in Kolihan mine of KCC to ensure the stability of stopes and surrounding area in underground mines.

(iii) The initiative has been taken to overcome the problem of deterioration in metallurgical results and improvement in recovery front of KCC concentrator plant by an expert agency M/s IBM, Nagpur.

(iv) Steps being taken for assessment of stability of rooms and pillar stoping method of 350 m of Kendadih copper mines at ICC Unit, Jharkhand and preparation of 3D subsidence prediction of Kendadih, Surda & Rakha mining lease are underway.

(v) A study has been taken up through National Institute of Rocks Mechanics (NIRM) for assessment of safety and stability of the open pit mine benches and underground mine developments at various stages of mining and related operations by 3D modeling and Numerical simulation at MCP unit.

(vi) A study has been taken up using geophysical survey methods and numerical simulation modeling for seepage network mapping along the mines and surrounding areas at MCP unit, to identify potential sources of water infusion and potential threats with the progress of the mining operations.

(vii) To ascertain extension of the copper ore bodies in the Kolihan mine of Khetri Copper project upto about 1000m vertical depth, geophysical survey program using combination of various methods like gravity, magnetic, TEM, IP survey has been taken up along with drilling program for recommendations of validation of geophysical survey.

7.58 ENERGY CONSERVATION:

i. 800 KWp solar plant at KCC under RESCO model is under implementation. Installation of plant has been completed and commissioning of same will be done shortly.

ii. Step taken to replace old technology-based motor generator to new technology DC drives for KCC mines service winder. It will save approximately Rs. 1 Crore per year in electricity bills.

iii. Procurement of new 4 Nos. air compressor of 1500 cfm is under way at KCC by replacing old high energy consuming energy compressor.

iv. HCL has already installed Rooftop and Ground mounted Solar Panels (856.5 KWp) towards its commitment for utilization of clean and green energy. This solar generation has also saved carbon dioxide generation as compared to conventional source of energy.

v. "IE3 energy efficient motors" has been made the standard specification, for motor procurement, across all applications in the units of HCL.

vi. HCL has replaced High wattage conventional lights by LED lights, maximum energy saved by all units.

7.59 Harvesting Renewable Energy

The project for design, supply and installation of solar power plant of various capacities under RESCO model of MNRE has been carried out till date across HCL with the help of M/s REIL. Out of total 856.5 KWp solar plant implementation in HCL till date 795 KWp carried out under RESCO model and remaining under CAPEX mode.

7.60 Environment

i. Safety zone plantation was done with around 1750 nos. saplings have been completed during April'2022 to December'2022 in Khetri Copper Complex including mines, plant and township areas.

ii. Safety zone plantation was done with 200 nos. saplings at Kendadih, Rakha Mine, Mosabani Concentrator Plant and 1000 Nos. of fruit bearing tree saplings distributed to local villagers at ICC unit.

iii. Digital flow meter with telemetry system has been installed at Surda & Kendadih Mine of ICC unit for quantification of dewatered mines water.

iv. High efficiency wet dust collector (Roto clone) has been revived at Mosabani crusher area of ICC which is reducing the suspended particulate matter emission.

v. Ambient air monitoring, recycled surface water and ground water quality monitoring of Mosabani Concentrator plant carried out by NABL and MoEF&CC Certified agency as per CTO.

vi. The Mosabani concentrator plant, ICC unit has been granted EC for capacity of 0.9 MTPA from Ministry of Environment, Forest and Climate change (MoEFCC) issued by State impact assessment authority (SEIAA), Jharkhand on 28.06.2022.

vii. Consultancy contract awarded to M/s Engineers India Ltd, New Delhi for strengthen and capacity enhancement of MCP tailing dam. Meanwhile, new spillway has been constructed at tailing dam to accommodate more tailings.

viii. Online water monitoring station for tailing dam seepage water installed at MCP.

ix. Plantation of 3000 nos. sapling of perennial species inside mine lease boundary is in award stage to M/s MPVVN Ltd (PSU of Govt. of Madhya Pradesh) at a total cost of Rs.24.29 lakhs (including chain link fencing & 3 years of maintenance period) at MCP.

x. Rain water harvesting installed across all units of HCL.

xi. HCL emphasizes prevention and minimization of waste generation at source. Re-use and recycling of waste

is given prime importance. The waste which is generated beyond the above set practices is disposed in a safe and environmentally sound manner as per the guidelines prescribed by the Pollution Control Boards.

Photo -7.14

Shri Sree Kumar, ED, Unit Head and other Senior Officials participating in Plantation Drive at Copper Club, Khetri Copper Complex, Rajasthan, on occasion of HCL Foundation Day

7.61 Information Technology (IT) Initiatives

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**

  Maintaining ERP (Oracle eBiz Suite R12.1.3) 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.

- **On-Line Performance Management System**

  On-Line Performance Management system of Executive in Grade E0 to E7 has already been implemented and is functioning smoothly.

- **E-Procurement/EPS**

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

- **On-line Recruitment**

  On-line recruitment module developed and is in operation at HCL. It is well-integrated with payment gateway to accept the online forms for recruitment. Through the module HCL can operate multiple online recruitment processes in parallel. VIDEO Conferencing Video Conferencing implemented throughout HCL, to reduce the TA & DA bills against executive tours. Also, Executives facilitated to interact with external agencies from their place.

- **Bill Tracking and Payment Status for Vendors**

  On-line Bill tracking and Payment status system implemented through our website for vendors to track their bills and payment released against their bills as on date against various contracts.

- **Digital Board implementation**

  For better flow of information related to Board & its Board subcommittee meetings, digital board software from M/s DESS TECHNOLOGY LTD. is under implementation. This software will help to keep the records of Boards & its committee meeting online and database will be kept in Server. Training for the same has been done & software will get live soon.

7.62 Sustainable Development

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 2022-23:

1. New underground (u/g) mine at MCP which is under development below the existing open cast mines will have special features like backfilling of voids by using copper ore tailings (Known as paste fill technology). The back-filling operation of u/g void will avoid the surface disposal of copper ore tailings reducing thereby the pollution load due to solid waste generated by the project.
2. Significant progress has been done towards implementation of roof top solar plant across the organization.Total 856.50 KWp solar plant implementation completed till date under RESCO & CAPEX model. Additional 800 KWp solar plant at KCC under RESCO model is at commissioning phase.
3. Covering top soil through plantation at the waste rock dump.
4. Waste management initiatives including waste reduction.
   I. The sale process of over-burden waste rock at MCP which has been accumulated during the course of open cast mining in last 40 years has been started after taking due approval from Govt. of Madhya Pradesh. This will be used as substitute of aggregate and hence will reduce the pollution load of the project.
   II. Electronic waste, Spent Oil and Hazardous waste are disposed through parties authorized by Pollution Control Board.
   III. The tailing from the existing ponds of Mosabani concentrator plant at ICC are being used for back filling of mines on regular basis resulting in further space for further storage of tailing even after enhancement of production. The old tailing paddocks are being revived to create additional space for tailing storage.
5. Water conservation by recycling of mine water and adoption of rain water harvesting system across the Units has been implemented.

7.63 MoU Ratings Achieved by HCL

Year	Grade
2018-2019	Very Good
2019-2020	Poor
2020-2021	Very Good
2021-2022	Under Evaluation

Reserves & Resources:

7.64 India has very limited known reserves of copper ore exploitable for copper production. The total resources of copper ore in the country as on 1.4.2015 are estimated at 1511.50 million tonnes with about 12.16 million tonnes of copper metal. Of these 207.77 million tonnes (13.74%) fall under Reserve category containing 2.73 million tonnes of copper metal and the balance 1303.73 million tonnes (86.25%) are 'Remaining Resources' containing 9.42 million tonnes of copper metal.

7.65 Rajasthan is credited with 813.33 million tonnes ore (53.81%) containing 4.48 million tonnes of copper metal, Jharkhand 295.39 million tonnes ore (19.54%), containing 3.28 million tonnes of copper metal, Madhya Pradesh 283.43 million tonnes ore (18.75%), containing 3.42 million tonnes copper, and the rest 7% are accounted for by other states namely Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal. India's share of world reserve is around 0.31% only. According to United States Geological Survey (USGS), total global copper reserves amount to 880 million tonnes (Mt) of copper (The World Copper Factbook 2022). Globally, Chile has the largest reserves of copper followed by Australia, Peru, Russia, Mexico, USA, Indonesia, China are the other countries.

7.66 The mean undiscovered totals for porphyry and sediment-hosted deposits are 3,100 million tons and 400 million tons respectively, resulting in a global total of 3,500 million tons of copper. With identified copper resources currently estimated at 2,100 million tons, total copper resources (undiscovered + identified) are estimated at 5,600 million tons (Source: The World Copper Factbook 2022). HCL hold around two-fifths of the copper ore reserves in India. HCL as on 1.4.2022 has reserves (proved & probable) of 165.50 million tonnes ore (average grade 1.32%) and total reserve and resources of 631.85 million tonnes ore (average grade 0.99 %) spread over seven mining leases.

7.67 Price of Copper

The domestic price of copper is linked to London Metal Exchange (LME) price. The price of MIC is derived based on the LME price after adjustment of ruling TC/RC (Treatment & Refining Charge). The TC/RC is market driven dynamic parameter which depends on supply and demand of copper in the international market.

The year wise average LME price per tonne of copper is as indicated below:

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.

Copper Industry in India

7.69 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.

7.70 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.

7.71 Currently, three major players dominate the Indian copper industry. Hindustan Copper Limited (HCL) in Public Sector (Annual Refining Capacity: 0.68 lakh tonnes), M/s Hindalco Industries Ltd. (Annual Refining Capacity: 5.00 lakh tonnes) and M/s Sesa Sterlite Ltdin private sector (Annual Refining Capacity: 2.16 lakh tonnes), having current total installed refined copper capacity in the country is 7.85 lakh tonnes. It is reported that M/s Kutch Copper Limited promoted by M/s Adani Group is installing custom copper smelter refinery complex named as Kutch Copper Limited of capacity 1 million tonnes in a phased manner.

Current year production is given below:-

Commodity	Number of Factories	Installed Capacity (tonnes per annum)	Production during FY 2021-22	Production during the period (Apr'22 to Oct'22)
Cathode Production				
a) HCL	3	68,500	621	Nil
b) Sesa Sterlite Ltd.	1	2,16,000	1,37,000	91,000
c) Hindalco Ind. Ltd. (Unit: Birla Copper)	1	5,00,000	3,95,000	2,32,000
Total	**5**	**7,85,000**	**5,32,621**	**3,23,000**

#Source: Monthly Summary on Non – Ferrous minerals & Metals, Ministry of Mines

Refined Copper Consumption

7.72 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, smart city, Housing for all, ambitious plan of harnessing renewable energy resources, electric vehicles, Infrastructure development, AtmaNirbhar Abhiyan and Make in India spells good news for copper industries. The per capita copper consumption in India is expected to increase from the current level of 0.6 Kg to 1 kg in coming years. The average per capita copper consumption in the world is 3.2 kg.

7.73 Copper is essential to EV technology and its supporting infrastructure, and the increase in the electric vehicles in the market will have a substantial impact on copper demand. If India's per capita copper consumption moves

towards the per capita copper consumption levels in the rest of the world, India's copper market has the potential for significant growth.

7.74 ICSG reported that World copper mine production was expected to increase by 5% in 2022 and 2023 respectively. World refined copper production was expected to rise by 4.3% in 2022 and 3.6% in 2023. World refined copper balance projections indicated surpluses of about 140,000t for 2022 and of 350,000t in 2023.

7.75 The global demand for copper continues to grow, world refined usage has more than tripled in the last 50 years, thanks to expanding sectors such as electrical and electronic products, building construction, industrial machinery and equipment, transportation equipment, and consumer and general products.

7.76 Demand of copper is increasing due to progress of implementation of electric vehicle worldwide with associated charging infrastructure, decarbonization policy push by US and EU and more and more emphasis on green energy to mitigate climate change. The antimicrobial properties of copper are finding newer application in view of global pandemic situation. Copper being the green metal has been considered as a core driver for moving the global economy toward net zero emissions. Copper has been termed as new oil. As the global economy moves toward net zero carbon emissions through energy transition, the role of Copper remains pivotal as the most efficient conductive material, indispensable for capturing, storing and transporting the green energy.

Photo -7.15
Shri Pralhad Joshi, Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines, being welcomed by Shri Arun Kumar Shukla, CMD, to HCL Corporate Office in Kolkata

Photo -7.16
Shri Vivek Bharadwaj, IAS, Secretary, Ministry of Mines, being greeted by Shri Arun Kumar Shukla, CMD, HCL

Photo -7.17
Shri Arun Kumar Shukla, CMD, HCL, being felicitated with the MGMI Award of Excellence for Non-Coal Mining for the year 2021-22

Photo -7.18
The Hon'ble Vice President of India, Shri Jagdeep Dhankhar, along with the Second Lady of India, Dr Sudesh Dhankhar, Shri Vivek Bharadwaj, Secretary, Ministry of Mines, Shri Arun Kumar Shukla, CMD, HCL, and other senior officials at Khetri Copper Complex (KCC), HCL's Unit in Jhunjhunu, Rajasthan.

Photo -7.19
The Second Lady of India, Dr Sudesh Dhankhar, on her visit to Khetri Copper Complex

Mineral Exploration and Consultancy Limited (MECL)

Introduction

7.77 Mineral Exploration and Consultancy Limited (MECL), a Miniratna Category-I CPSE under Ministry of Mines is the premier notified exploration agency in the country mandated to carry out detailed exploration of all the minerals.

7.78 MECL undertakes detailed exploration on behalf of mineral rich States for various minerals through National Mineral Exploration Trust (NMET) fund as well as contractual basis for other agencies including Public Sector, Private Sector and State Government(s) on mutually agreed terms and conditions. It has added 197 billion tonnes of mineral resources to National Mineral Inventory up to December, 2022.

7.79 The authorized share capital and paid up equity of the company are Rs.125.00 crore and Rs.119.55 crore, respectively. The equity is fully held by Government of India. The Company's registered office & operational headquarter is at Nagpur, which includes modern geological, geophysical & geochemical laboratories, regional maintenance centre etc. The pan India operation involving exploration of minerals at remote location are controlled & monitored from Nagpur. The details of office locations are available at www.mecl.co.in.

7.80 Since its inception, MECL has carried out detailed exploration under Promotional Scheme of Government of India for ferrous, non-ferrous, base metals precious, industrial and other minerals on behalf of Ministry of Mines and a total of 10.50 billion tonne of resources have been established. Details are available at www.mecl.co.in.

7.81 Pursuant to the Mines and Minerals (Development and Regulation) Amendment Act, 2015, and after establishment of NMET, MECL is taking up exploration work for State Governments through NMET.

7.82 MECL is also engaged in regional exploration of Coal & Lignite on behalf of Ministry of Coal. The exploration projects have been finalized by the Core Group of Committee on Energy Minerals and Resources, Group V of Central Geological Programming Board (CGPB). So far, a total of 57.73 billion tonne of Coal and 32.65 billion tonne of Lignite resources have been established by MECL on behalf of Ministry of Coal.

7.83 On contractual basis, MECL undertake exploration for PSUs, State Governments, Private agencies etc. The CMPDIL is the major client of MECL for Coal exploration which is being done thorough MoU. For the year 2022-23, CMPDIL awarded around 2.50 lakh metres of exploratory drilling for Coal exploration. So far, on contractual basis a total of 83.15 billion tonne of Energy mineral resources and 8.04 billion tonne of Non-energy mineral resources have been established by MECL.

Physico-Financial Performance 2020-21, 2021-22 and 2022-23 (Anticipated)

7.84 The physical performance in drilling and geological reports for 2020-21, 2021-22 and 2022-23 (Anticipated) is given in **Table-7.14** and the financial performance is given in **Table-7.15**

Table – 7.14
Physical Performance of MECL

Items	2020-21	2021-22	2022-23		
	Actual	Actual	MoU Target	Actual (Up to December, 2022)	Anticipated Up to March'2023 (2022-23)
Drilling (Mtrs)	6,39,395	2,62,277	2,00,000	1,34,219	2,00,000

Table No. 7.15
Financial Performance of MECL

(Rs.in crore)

Details	2020-21	2021-22	2022-23		
	Actual	Actual	MoU Target	Actual (Up to December, 2022)	Anticipated Up to March'2023 (2022-23)
Total Revenue #	449.26	237.62	210.00	120.25	210.00
Operating Cost*	237.06	196.49	187.44	30.27	187.44
Depreciation and DRE	11.13	12.64	12.00	9.20	12.00
Net Profit After Taxes	149.79	20.21	18.02	-7.77	18.02

 # Including other income

**Excluding Depreciation and DRE*

7.85 Enhancement of Drilling Productivity of MECL is given in **Table 7.16**

Table No. 7.16
Enhancement of Drilling Productivity of MECL

Year	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Productivity (m/d/m)*	465	539	542	562	570	442

**Meter drill per month.*

Dividend Paid

7.86 MECL has paid a dividend of Rs. 33.95 crore to Government of India for the year 2021-22.

MoU Performance

7.87 MoU rating of MECL during last 2 years is given in **Table 7.17.**

Table No. 7.17

Year	Composite Score	Rating
2019-20	95.99	Excellent
2020-21	83.29	Very Good

Achievements

7.88 MECL Achievements during 2022-23:

(i) During the year 2022-23 (Till Dec-22), MECL has submitted 14 nos. of Geological Reports of different minerals commodities e.g. Lignite, Copper, Iron ore, Manganese, Graphite, Potash, etc. and added 4749.57 million tonnes of resources to National Mineral Inventory out of which 8 Geological Reports have been submitted to NMET.

(ii) Memorandum of Understanding (MoU) signed between Geological Survey of India (GSI), Kolkata and Mineral Exploration and Consultancy Limited, Nagpur to supplement GSI in exploratory drilling in Coal and Lignite.

(iii) Under modernization program, MECL has taken steps on advent of Technological Innovations and adoption of advanced software and equipment etc. such as DATAMINE Studio-RM, Geovia Minex & Geo SURPAC (Dassault System, France), Arc GIS, ERDAS IMAGINE, Slimhole Geophysical logging system, Core scanner, XRF, ICP MS, ICP OES etc.

(iv) Under strategic diversification program, to increase sustainability and profitability MECL is diversifying its activities in both areas viz. business level and corporate level diversification. Further MECL is also providing consultancy to State Government for technical support to study the feasibility of mineral block for its auction purpose. MECL is also providing geochemical analysis services as a referee agency to various State Governments, CPSEs and other agencies.

Perspective on Non-Energy Minerals:

7.89 During the year 2022-23 exploration for various minerals has been carried out by MECL in 32 blocks on behalf of National Mineral Exploration Trust (NMET). Out of these, Geological Report of 8 blocks has been submitted and work is in progress in remaining 24 blocks. A total of 294.53 million tonnes of mineral resources have been added to National Mineral Inventory.

Action Taken on Abatement of Pollution and Environment:

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

Socio-economic studies. Report of Baseline Environmental Studies are annexed with all the Geological Reports. These reports are handed over to State Govt. along with Geological Reports. This data is used for Environmental Impact Assessment (EIA) studies during and/or after mining.

7.91 For helping the exploration/exploitation 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 G-2 level Geological Report of various exploration projects. As per the guidelines of MoEFCC, MECL is preparing the baseline environmental report since 1993.

7.92 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. Some of the important objectives of the policy are as follows:

- 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.
- To use non-polluting and environment friendly technologies
- To maintain the machineries in excellent condition and ensure minimum impact of its operation on environment.
- To ensure compliance of Environment Clearance (EC) and Forest Clearance (FC) conditions and other statutory conditions issued by regulatory authorities from time to time for environment protection.
- To conserve the natural resources by ensuring minimum wastage an optimum consumption of fuel oil, lubricant oil, water and electricity.
- To develop awareness on environmental responsibilities among employees and encourage adherence to sound & healthy environmental practices.

The detailed policy is available on www.mecl.co.in.

Research & Development Projects

7.93 MECL has recently procured one digital drill core scanner. It provides reliable system for high resolution scanning of drill cores for mineral assemblage study and assessment. Foreseen to provide important docket for digital core library and application of Machine Learning and Artificial Intelligence for mineral exploration.

7.94 MECL has also procured Handheld XRF analyser. It is used to test the chemical composition of mineral on location for immediate lab quality results for determent of next course of action.

Information Technology (IT)

7.95 MECL being a service and consultancy organization has a well-equipped Information Technology Centre to support the access,

analyze and process the enormous amount of technical data. Using available I.T. Infrastructure, Data processing of Geological reports for the blocks explored by MECL, under Promotional (MOM / MEF), Contractual exploration and NMET were carried out for the financial year 2021-22 (Up to December 2022). Other block GR data collection, database preparation, interpretation and validation are going on as per schedule to support timely submission of reports. 9 GRs (COAL) were submitted to CMPDIL and 4 GRs (COAL / LIGNITE) were submitted to MOC / NMET.

7.96 SAP ERP- "Khanij Sanjeevani" Implementation and Support in MECL:

As a part of its plan to use digital technology tools to enhance its capabilities, MECL has successfully implemented the ERP (Enterprise Resource Planning) solution of SAP. The ERP solution is implemented to automate the business processes/ operations of MECL in the areas of finance & costing, marketing, drilling, exploration, project management, sample preparation & testing, materials & stores, procurement and Human Resource Management. To facilitate the access to the ERP solution and ensure business continuity, MECL has installed a latest state of the Data Center for hosting the ERP solution, networked all its offices and project sites, and has provided the necessary client side hardware like PCs/ Laptops and printers to all the users of the ERP solution. The ERP solution is implemented to provide the following business benefits/ business objectives.

- Enhancing Customer focus in terms of timely completion of drilling/exploration activities, accuracy in billing and reconciliation.
- Improving the Efficiency of operations – efficient usage of machines, tools and accessories.
- Proactively Ensuring Transparency / compliance to all the stake holder requirements and government regulations.

MECL has conceptualized plan for implementing a Business continuity process for the ERP solution. Detailed specifications for Disaster Recovery (DR) system are formulated. Procurement of an agency for providing DR services is completed during the year and Installation and commissioning of DR services is completed.

1. **Virtual Meeting Solutions:** With the rapidly evolving workplace, most of the meetings are now a days organized in virtual mode. Video Conferencing is now a regular feature for interacting with Ministry of Mines and other Government Agencies, like DPE and other PSU's. Video Conferencing is being used for interacting with Project Managers of all MECL Locations, by the management. Also other regular in-house meetings, trainings, competitions, progress review and ERP trainings, etc. are being done through Video Conferencing. WebEx is also being used for the purpose. M/s Power Grid Corporation, was procured, as an alternate arrangement for Video Conferencing, for emergency, in case of failure of M/s BSNL Internet Connectivity.
2. **LAN Infrastructure** installation in Zonal office & other locations is completed. Now these locations are equipped with latest FTTH Broadband Internet Connectivity.

3. IT infrastructure hardware and software (Server, Desktop, Laptop, UPS, workstation, plotter, printer, scanner, antivirus, AutoCad, Surpac, Minex, ERP software and other 3rd party software) were procured and installed in the organization as per requirement. Maintenance of hardware and software is done through AMC and in house as per requirement.

4. Provided information to Ministry of Mines, regarding IT related queries on Networking Security, Website security, Quarterly submission of IT-Security Report, CERT-In Guidelines, Cyber Security and Crisis Management Plan, Roadmap of IPV6, etc.

5. **Web Applications:** MECL website has been updated time to time with latest updates in the contents. Following in house developed software applications developed before are maintained and enhanced as per requirement: "MECL Connect", "CLIP", "MinexP", "MyPlot", "GPL" etc. Following software applications were developed in house and are running successfully: "Vigilance Clearance System", "NDC", "Quarter Management", "DPR" etc.

6. MECL has renewed NIC Email accounts, of the domain mecl.co.in which is provided to all its executives. Management of the Email accounts is being done through Delegated Admin Console in-house.

7. A number of DSC's (Digital Signature Certificates) were procured during the year for various e-procurement, income tax and other related activities.

8. Renewed cloud server services from NIC.

9. Upgraded and refinement was carried out in in-house developed browser based package "MyPlot" for Coal GR Plates Processing and Management. Enhancements in all in-house developed packages are carried out timely as per requirement. Currently this Myplot package is used for Coal GR processing and Management.

10. Currently legacy software "MINEXP" (based on legacy technologies) mostly used for Coal Geological Report Data processing have been transformed to new software based on latest Operating System and newplatforms like Java, Oracle and other latest technologies. The new application overcomes complexities and issues in legacy applications and also provides new functionalities.

11. CCTV Camera along with its monitoring equipment was procured for surveillance in Utility Complex.

Business Development Activity

7.97 Through Business Development & Commercial Division, rigorous efforts are being continued to generate/obtain more works from both private and public sectors through competitive Techno-commercial offers and MoU route as well as bilateral negotiations. As a result, during the financial year 2022-23, the total value of order book stood provisionally at Rs. 311.66 Cr upto 31.12.2022. This includes contractual work of various clients such as NALCO, RSMML, HCL, NMDC, FAGMIL, Adani etc. and NMET funded work and promotional coal exploration work on behalf of Ministry of Coal (MOC).

7.98 Memorandum of Understanding (MoU) signed between Geological Survey of India

(GSI), Kolkata and Mineral Exploration and Consultancy Limited, Nagpur to supplement GSI in exploratory drilling in Coal and Lignite.

7.99 Efforts were made to reach out to all prospective clients viz. Government, PSU and private sector for securing business for the company for sustainable growth. The efforts are ongoing and perpetual.

7.100 The new diversified areas are given below:

- MECL has been appointed as Program manager for RSMML for feasibility study of solution mining of Potash deposits of Rajasthan state through engagement of consultants.
- Efforts are in progress to supply drilling accessories manufactured in-house by CMC, Nagpur to external agencies across India in support of "Make in India" and "Atmanirbhar Bharat" mission of Govt. of India.
- Deployment of officers of MECL to state DMG's/DGM's for providing technical support for Mineral Auctioning Regime.
- MECL was appointed as "Referee laboratory" by CIMFR and QCI for analysis of Referee Coal samples for various power companies.
- MECL has acquired Digital Core Scanner System, which is a reliable system for capturing of exploratory drill core images at very high resolutions providing a unique 360° processing capability. MECL is approaching State Governments & Mining companies for providing its services. which will be beneficial for creating digital core library and sustainable mining in future.
- MECL has also associated with GSI to augment their capacity in carrying out baseline geological data collection under NGCM & NGPM Program.

7.101 Participation in exhibitions/events related to Exploration and Mining:

1. "8th Indian National Exhibition Cum Fair 2022": at Kolkata from 24th to 28th February, 2022.
2. "Govt. Achievements & Schemes Expo 2022": at New Delhi from 25th to 27th February, 2022.
3. "Shining Maharashtra" 2022: at Phaltan Dist. Satara, Maharashtra from 25.03.2022 to 27.03.2022.
4. 9th Asian Mining Summit Exhibition 2022: at Kolkata from 04.04.2022 to 07.04.2022
5. MECL has participated in AKAM Mega Show 2022: held at Mahatma Mandir Convention Centre, Gandhinagar from 06.06.2022 to 12.06.2022.
6. Government Achievement & Scheme Expo 2022: at Pragati Maidan, New Delhi from 15.06.2022 to 20.06.2022.
7. Garavi Gujarat 2022: at Mehsana-Gujarat from 08.07.2022 to 10.07.2022.
8. Aspiring Haryana: at Hissar- Haryana from 28.07.2022 to 30.07.2022.
9. 9th Indian National Exhibition Cum Fair 2022: at Kolkata 04.08.2022 to 08.08.2022.
10. 25th National Exhibition 2022: at Kolkata from 24.08.2022 to 27.08.2022.
11. National Seminar & Exhibition 2022: at Udaipur, Rajasthan from 26.08.2022 to 28.08.2022.

12. Jaipur Expo-2022: at Jaipur, Rajasthan from 22.09.2022 to 24.09.2022.
13. MINCON-2022: 25th National Exhibition 2022: at Kolkata from 24.08.2022 to 27.08.2022 at Nagpur from 14.10.2022 to 16.10.2022.
14. CII Global Mining Summit 2022: at Kolkata from 16.11.2022 to 17.11.2022.
15. EGCON 2022: 25th National Exhibition 2022: at Kolkata from 24.08.2022 to 27.08.2022 at Kolkata from 16.11.2022 to 17.11.2022.

Photo -7.20
MECL stall has been awarded as the "Best Stall" in Aspiring Haryana 2022

7.102 Organising various activities under "Azadi Ka Amrit Mahotsav":

- Participated in "Vigyan Sarvatra Pujyate: Science Exhibition 2022": at VNIT Nagpur from 22nd and 28th February, 2022.
- Workshop on Income Tax & TDS on 22.02.2022.
- Celebrated International Women's Day on 08.03.2022.
- Organized Rangoli Competition on 08.03.2022.
- Participated in MSME-Expo 2022: at MIDC, Hingna Nagpur from 12.03.2022 to 14.03. 2022..
- Blood Donation Camp on 14.03.2022.
- "हास्यकविसम्मेलन"on 25.03.2022.
- One-day workshop on Artificial intelligence/Machine Learning & Drone Applications in Mineral Sector in association with IIT Kharagpur Alumni Foundation on 09.04.2022.
- Extempore Speech Competition on 06.05.2022.
- Quiz Competition on the occasion of "World Environment Day" on 03.06.2022.
- Showcased posters and banners on the occasion of "World Environment Day" on 05.06.2022.
- Tree Plantation drive on the occasion of "World Environment Day" on 12.06.2022.
- Geological Survey of India (GSI), Mineral Exploration and Consultancy Ltd. (MECL) and Gondwana Geological Society (GCS) jointly conducted a one-day seminar titled 'Geology and Mineralisation of Mahakoshal Group- future perspective and recent Amendments in MEMC and Auction Rules', on 24.06.2022.
- Blood Donation Camp under Ministry of Mines Iconic Week on 13.07.2022 with total count of Blood Donors as 58 nos.
- Mobile Health Check-up at following locations under Ministry of Mines Iconic Week on 17.07.2022.

Sl. No.	Name of Projects	Nos. of Beneficiaries
1	Lachhamangarh Project	258
2	Rakha - Chapri	141
3	Bolangir Project	431
4	Veeranam project	310
5	CHQ Nagpur-Bhandara	390
	Total	**1530**

- Knowledge Sharing Session" on 07.08.2022. Dr. D. K. Sinha, Director, Atomic Mineral Division (AMD) was invited as chief guest of this session.
- Health Talk on Ayurveda to commemorate "Ayrveda@2047" and the 7th Ayurveda Day on 01.10.2022.
- Plog Run (Jogging and Trash picking at MECL Campus) with the theme "Azadike 75 saal, fitness rahebemisaal" on 02.10.2022

Photo -7.21
Shri Ghanshyam Sharma, CMD (I/C) and Shri Arvind Kumar, Director (Technical), planting trees during Tree Plantation Drive at MEC

Photo -7.22
MECL has signed MOU with Madhya Pradesh Government

Photo -7.23
MECL has organized Mobile Health Check-up under "Iconic Week" of AKAM on 17.07.2022

Manufacturing Unit

7.103 MECL has a well-equipped central workshop and manufacturing unit at Nagpur to cater to the needs of drilling and to provide engineering support to field operations. It carries out repairing/ overhauling of drilling 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 manufacturing of drill tubular. During 2022-23 (up to December 2022) a total of 8536 items were manufactured, which include 493 TC bits and 8043 other drill accessories. The in house manufacturing of above accessories has resulted in timely supply of item required for drilling operations well in time. Thereby reducing the idle hours of drill rigs. This adds to MECL's cost optimization and enhanced operational profit. Further, this is also a Make in India initiative of MECL to develop in house capabilities.

Energy Conservation

7.104 MECL is replacing age old drill rigs with new Hydrostatic drill rigs which are fuel efficient, high performance capacity and have resulted in conservation of energy. By induction of hydrostatic drill rigs the consumption of HSD has reduced by 5 to 10 percent with respect to productivity. The company has also set up POL Norms for all types of drilling machineries and is maintained effectively based on energy conservation factors. Corrective measures like fuel pump and nozzles calibration of each drill rig, tappets setting etc. are being carried out regularly for enhancing the fuel efficiency, carbon emission reduction and thereby resulting considerable energy saving. All the conventional and CFL lights are being replaced with energy efficient

LED bulbs and tube lights. 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.

Bharat Gold Mines Limited (BGML): -

7.105 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 First Right of Refusal (FROF) 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.

7.106 Meanwhile, MM (DR) Act was amended during 2015 and many changes had taken place. As per the amended Act lease which was acquired through auction can only be transferred, hence the Cabinet decision of 2006 could not be implemented; it was decided to explore the possibilities of revival of BGML after Techno-Economic Feasibility Study (TEFS). A Monitoring Committee was constituted for supervising all the work regarding suggesting a way forward for BGML by doing legal review, asset Valuation, TEFS, Techno-Economic Feasibility Report (TEFR) etc.

7.107 Accordingly, Mineral Exploration & Consultancy Limited (MECL) was given the tasks of exploration of dumps and & two unmined blocks in KGF, MECL submitted its report in 2018. During the year of 2020-21 the work of exploring Bettraswamy block of BGML was assigned to MECL. This Ministry had also assigned "Non-Ferrous Technology Development Center (NFTDC) for study of extraction of gold from tailing dumps of BGML. The Techno Economic Feasibility Study Report (TEFR) for tailing dumps of BGML and the geological report of MECL were received and given to Management Consultant hired for reviewing the legal status, undertake valuation of the assets and financial due diligence for recommending possible alternatives for BGML. The Management Consultant has submitted its report. Accordingly, Ministry of Mines is exploring future course and other viable options in respect of BGML.

7.108 There has been a long pending issue of Record of Rights, Tenancy and Crops (RTC) and Mutation of the 12109 acres and 28 guntas of BGML land in Kolar Gold Fields. So far, BGML has received RTC and Mutation over an area of 9060 acres. Besides, around 3049.28 acres of land is in process for mutation/RTC in favour BGML.

7.109 Alongside, Ministry is considering transfer of 49 acres and 28 ″guntas of BGML land to South Western Railway for the construction of Marikuppam-Kuppam new Broad Gauge Railway Line, which will benefit local people. On the advice of the Ministry, BGML is the process of hiring Transaction Advisor to assist the company in auction of its tailing dumps.

8

Science, Technology and Autonomous Bodies

Science, Technology and Autonomous Bodies

Research & Development

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 Research and Development (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), (iii) one-time capital component for up-gradation of R&D facilities of Jawaharlal Nehru Aluminium Research Development & Design Centre and National Institute of Rock Mechanics.

Science & Technology Programme (R&D component)

8.2 The underlying principle behind R&D component is to foster utilisation of the available mineral resources judiciously, economically efficiently and in an 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, which 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. Ministry of Mines has launched SATYABHAMA (Science and Technology Yojana for Aatmanirbhar Bharat in Mining Advancement) Portal for Science and Technology Programme Scheme of Ministry of Mines. The SATYABHAMA Portal can be accessed at https://research.mines.gov.in/.

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 2022-23, 29 project proposals have been recommended by PERC for approval of SSAG. Out of these 29 Project Proposals, SSAG examined 10 project proposals and deferred 19 projects to be examined in next SSAG Meeting. 8 projects, which are considered as relevant to the identified priorities, have been approved by SSAG for grant-in-aid by the Ministry under S&T programme. The details are available at research.mines.gov.in.

Information Education and Communication (IEC) Component

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. During 2022-23, a grant of Rs. 10 lakhs was given to Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur for organizing 26th International Conference on Non-ferrous Metals-2022 (ICNFM-2022), Nagpur.

8.6 The detailed guidelines are available at https://research.mines.gov.in/.

"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-the-art research facilities in the country. Apart from the initiatives of the public and private enterprises in the mining sector, R&D activities are also being pioneered by the two autonomous bodies functioning under Ministry of Mines i.e. (i) Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur and (ii) National Institute of Rock Mechanics (NIRM), Bengaluru. During the financial year 2022-23 (till 10.01.2023), grant to the tune of Rs. 400 lakhs has been released to JNARDDC and Rs. 242 lakhs has been released to NIRM 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 two autonomous institutions under Ministry of Mines till 10.01.2023 is given in **Table 8.1 and Table 8.2** respectively

Table 8.1
Grants for Creation of Capital Assets

Institute	Amount (Rs.in crore)
JNARDDC	4
NIRM	2.42

Table 8.2
Grant-in-aid-Salaries

Institute	Amount (Rs.in crore)
JNARDDC	5.70
NIRM	4.74

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

8.9 JNARDDC is a Central Government Autonomous Body under Ministry of Mines. This "Centre of Excellence" was set up in 1989 with a view to provide major R&D support system for the emerging modern aluminium industry in India.

8.10 JNARDDC is an ISO/IEC-17025:2017 NABL accredited lab and is also recognized as a scientific & industrial research organization by the Department of Scientific & Industrial Research, Ministry of Science & Technology, and 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, aluminium, aluminium alloys as well as to develop technical know-how for the basic engineering process and downstream areas. Centre provides training to the personnel employed in the Indian aluminium industries.

8.12 JNARDDC has made key contributions in the areas of beneficiation, characterization, technological evaluation, upgradation of bauxites, Bayer process modeling, reduction of energy consumption and environmental pollution in smelter, development of alloys, product development, effective utilization of aluminium industry residue such as red mud, dross, spent pot lining and scrap for both primary and secondary industry. The annual reports are available at http://www.jnarddc.gov.in/en/rti/rti_annual_report.aspx

8.13 Major activities

Major activities: The Centre completed three projects and thirteen R&D projects are in progress for various government and non-government organization. The details are mentioned in **Annexure – 8.1**. JNARDDC signed MoUs with various GSI regions for trace element analysis in soil and sediments. MoUs were also signed for technical collaboration with CCOST, Chhattisgarh Govt, CSIR-AMPRI Bhopal, PRIMUS SAM Pvt Ltd., IISSSC Kolkata etc

8.14 Designated Sector Expert

JNARDDC is the designated aluminium sector expert for the following key authorities: -

- **NITI Aayog** -
    - REE (Rare Earth Element) extraction from red Mud and coal fly ash
    - Strategy paper on Resource efficiency in aluminium sector
- **Bureau of Energy Efficiency** (**BEE**), Ministry of Power –
    - Aluminium Sector expert for "National Mission for Enhanced Energy Efficiency"-PAT 2/3/4 cycle
- **(BIS)** Bureau of Indian Standards
    - Guidelines for Al-scrap
    - Standard for aluminium alloys & Products
- **MoM (Ministry of Mines) –**
    - National Non-ferrous Metal Scrap Recycling framework
    - Circular Economy Actions for non-ferrous primary and secondary sector
    - NFMIMS (Aluminium, Copper, Lead & Zinc import monitoring system)
    - Inter-Ministerial Committee for Import Substitution in Aluminium Sector
- **Metal Recycling Authority (MRA)**
    - JNARDDC is nominated Metal Recycling Authority (MRA) by Ministry of Mines - to carry out the non-statutory functions earmarked for MRA as stipulated in the "National Non-Ferrous Metal Scrap Recycling Framework 2020"
- **Referee Lab for Coal**
    - JNARDDC is nominated referee lab for coal sample analysis of third party sampling of coal by CSIR-CIMFR, Dhanbad.

8.15 Seminars and Conferences

- 26th International Conference on Non-ferrous Metals (ICNFM-2022); Radisson Blu, Nagpur on 8-9 July 2022 was co-organized by JNARDDC; www.nonferrousmeet.net/

Photo: 8.1

- 10th International IBAAS Conference & Exhibition- Raipur; IBAAS- JNARDDC 2022 September 14-17, 2022 and one day Brainstorming session on Non-Ferrous Metal Recycling was co-organized by JNARDDC : https://www.ibaas.info/

Photo: 8.2

Photo: 8.3

- 40th International Conference and Exhibition, ICSOBA 2022 was organized by the International Committee for Study of Bauxite, Alumina & Aluminium during 10-14 Oct 2022 at Radisson Blu Park, Athens, Greece. Director, JNARDDC participated and delivered the keynote lecture on "Framework to Drive Resource Efficiency and Circular Economy in Indian Aluminium Sector".

Photo: 8.4

Photo: 8.5

8.16 Patent

One patent was filed for the "process for beneficiation and enrichment of rare earth elements in bauxite residue" vide no. 202221024081 dated 25.04.2022.

Five patents were granted for various innovative process and products developed by JNARDDC.

SN	Patent details
1	A process for preparing smelter grade alumina: Granted vide no. 404896 on 29.08.2022 **Inventors:** S B Rai, M J Chaddha, M T Nimje, R J Sharma, K J Kulkarni & K R Rao (JNARDDC)
2	Process for preparation of low ferric alum from waste or low grade aluminium dross Granted vide no. 406384 on 12.09.2022 **Inventors :** Dr Upendra Singh, J Mukhopadhyay, (JNARDDC) & Binuta Patra and P Bandopadhyay (NALCO)
3	"A process for conversion of Hazardous 1st Cut SPL Waste of Aluminium Industries into Non Hazardous Material by Converting Inorganic Toxic Cyanide to Non Toxic Species by Selective Heat Treatment and Recovery of Sodium, Fluoride and Carbon Value Granted vide no. 407276 on 21.09.2022 **Inventors :** M T Nimje, Mohamed Najar, Anupam Agnihotri, (JNARDDC) & A S P Mishra (VEDANTA)
4	A process for selective leaching of iron from alumina hydrate Granted vide no. 407793 on 28.09.2022 **Inventors :** Dr Mohamed Najar, M T Nimje, S P Puttewar, Anupam Agnihotri (JNARDDC) & Subrat Kar, V Krishna Kumari P K Behera, (NALCO)
5	A Light Weight Foamed Geopolymer (LWFGEOP) and its preparation Granted vide no. 409005 on 12.10.2022 **Inventors:** Dr Mohamed Najar, Mukesh Chaddha, Pravin Bhukte, Numanuddin Azad, Shama Wadsariya, Suresh Puttewar, Anupam Agnihotri (JNARDDC) & Saket Jain (Swarnalatha Holdings)

8.17 Technology Transfer to Shakti Plastics, Mumbai

Chemical delamination process was developed by JNARDDC for Multi-Layer Plastic Waste (MLPW) that enables improved purity of materials for making quality products from multilayers of rejects. JNARDDC transferred the developed recycling process to M/s Shakti Plastics, Mumbai for processing different types of MLPs they collect from various collection centers across the country for recycling. A patent for the process has already been filed vide no. 201921050658 on 08.12.2019.

Photo: 8.6

❖ **Inauguration of new facilities / labs**

Shri Vivek Bharadwaj, IAS, Secretary to the Government of India, Ministry of Mines inaugurated Three new lab facilities (i) GEO-Analytical Lab equipped with carbon Sulphur analyzer, direct mercury analyzer & TCLP (ii) Reference Materials for the Analysis of Aluminum and Aluminum Alloys and (iii) Unit for AlF3 and Silica (SiO2) recovery from coal fly ash.

Photo: 8.7

Photo: 8.8

❖ **Awards / Recognition**

- Scientific excellence award to Dr Upendra Singh HoD (Analytical) in the 26th International Conference on Non-ferrous Metals (ICNFM-2022); Radisson Blu, Nagpur on 8-9 July 2022

Photo: 8.9

- 2nd prize for the poster presented on "Preparation of poly-aluminium chloride; a bench scale study": Jyoti Pendam, Sonali Thwrani, Mayur Tirpude, Dr. Upendra Singh and Dr A Agnihotri at ICNFM-2022
- First prize in IBAAS-2022 Raipur for the paper "Synthesis of 3N pure Alpha- Nano Alumina from Aluminium Foil by Dr Priyanka Nayar, Dr Pooja Yadav, Sandeep Kowe, Jyoti Pendam, Dr Upendra Singh & Dr Anupam Agnihotri.

8.18 Finances

The Centre is likely to surpass the Internal revenue generation target of Rs. 13 crore in 2022-23. A revenue budgetary grant of Rs. 7.60 crore for salary component and Rs. 4 crore for creation of capital assets was allocated by Ministry of Mines in 2022-23 for the Centre.

National Institute of Rock Mechanics

8.19 National Institute of Rock Mechanics (NIRM)

- Provides customized scientific solutions based on Rock Mechanics, Rock Engineering and allied sciences in

the field of mining, hydel and critical infrastructure sectors.

- The scientific services of the institute pertain to mapping, imaging, testing, design, excavation and monitoring of rockmass of major underground structures to ensure their sustenance and durability.

The NIRM scientific solutions are tailor-made to the geoscientific and geoengineering problems faced in mining, civil and infrastructure projects in the country. The scientific and technical services of NIRM have been widely recognised and accepted by the industry.

NIRM has been in the service of the nation over more than three decades, the foundation of NIRM rock engineering and rock mechanics studies at various projects in the country have been augmented with the addition of modern equipment and a team of experienced and dedicated scientific workforce.

NIRM combines industry specific applied research activities in providing solutions for a wide range of rock engineering and rock mechanics challenges faced during excavation and construction.

8.20 NIRM Specialised areas

Key area of NIRM activities are

1. **Site Characterisation investigation**– engineering geological, engineering geophysical, geotechnical in-situ investigation, seismotectonic studies
2. **Design and Excavation** – surface and underground mine design, excavation engineering, controlled blasting, numerical modelling, design of hill slopes
3. **Advanced Monitoring** – microseismic monitoring, engineering seismological investigation, slope stability monitoring, conventional instrumentation
4. **Testing Services** - laboratory testing of rock samples & wire ropes and in-situ testing of various mining accessories using NDT technique.

NIRM has 10 specialised functions working from its head office at Bengaluru, one testing laboratory continues to provide physico mechanical properties of rock and mechanical tools from its registered office at Kolar Gold Fields, Karnataka. In order to cater to the demands of the industry and increase number of geo scientific projects, NIRM provides training, conducts basic and advanced lecture programmes to upgrade the skills of its scientific workforce continuously and impart awareness and skills to industry partners, associates for the benefit of the industry executives.

Latest trends : NIRM technical staff are introduced to latest trends in safety practices, underground construction measurements and monitoring systems and major civil structures monitoring. Ten scientific staff were imparted such training related to various functions of rock engineering and rock mechanics.

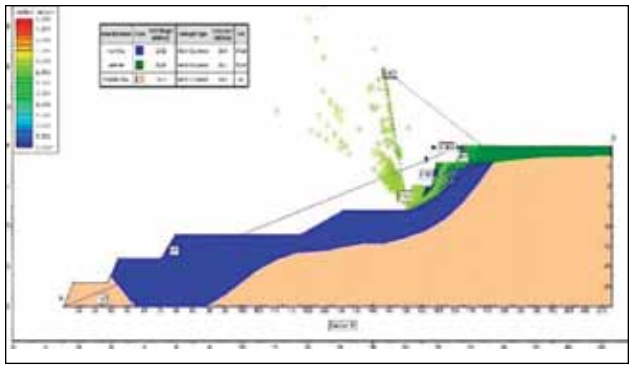
Industry Training : NIRM also trains industry engineers, associates in scientific projects through on site training and virtual online programmes. NIRM successfully conducted advanced lectures series through AKAM (75 years of Indian Independence) technical weekly lectures with the participation of industry experts and scientists of the organisation. NIRM also imparted skills on basic awareness and practices required for monitoring Skills for which training required for other stakeholders connected to mining and infrastructure

sectors.

8.21 NIRM contributions and solutions in service of the Nation: NIRM has been making significant contributions to the development of safe and economic practices for mining industry operations from underground and surface in coal, metal and opencast mines. The intellectual inputs of NIRM are focussed for reducing mining hazards by modifying/ monitoring the mining methods and adopting best safety practices, while enhancing/ sustaining the rate of production. During the current reporting period, many innovative techniques were used to solve the industry problems. Some of the important contributions are below:

- **NIRM scientific solutions are recognised** by various industries and this has brought enquiries from abroad as well for rock mechanics and rock engineering related investigations and solutions. Bhutan, Nepal, Myanmar, Gulf are some of the regions where NIRM has found such opportunities. NIRM is associated with civil and hydel projects in Bhutan and Nepal for more than 2 decades now.

Photo: 8.10



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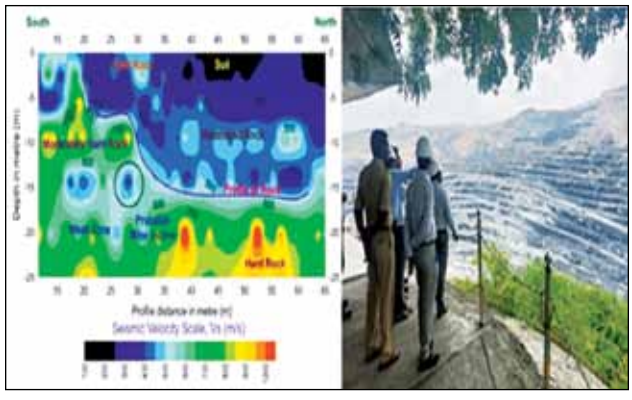
Glimpses of NIRM solutions in underground and slope stability



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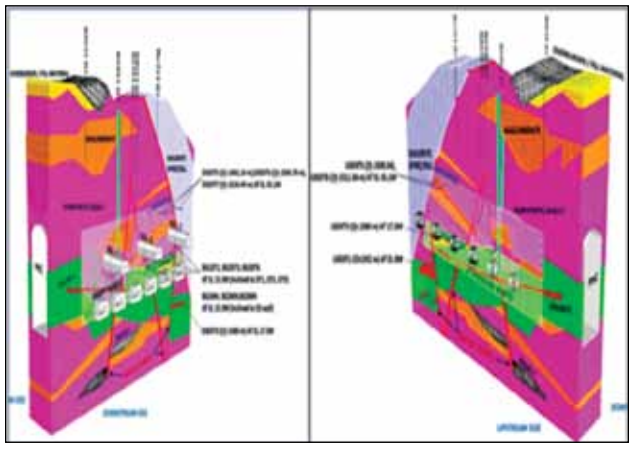

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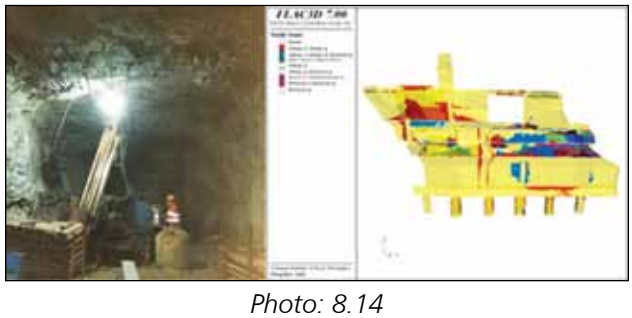

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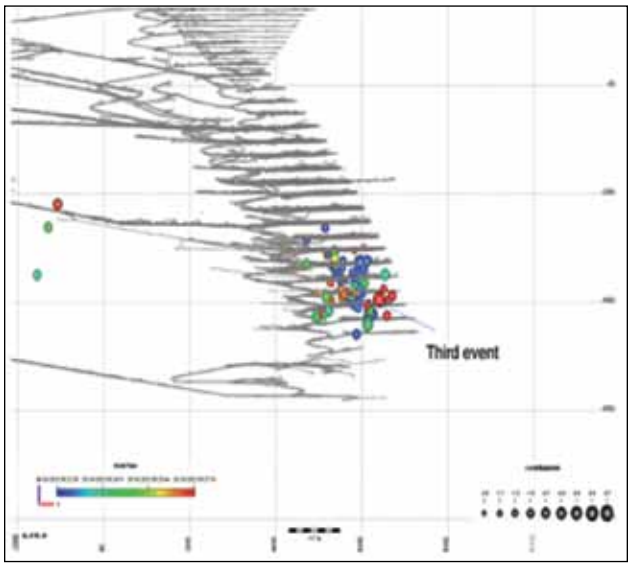


Photo: 8.16

8.22 List of major projects during Jan - Dec 2022 include:

1. Engineering geological investigations of underground Lift Packages-1, 5, 8 & 16 Includes Tunnels between Packages 1 to 16 of PalamuruRanga Reddy Lift Irrigation Scheme, Telangana State.
2. Engineering geological investigations of Railway Tunnel Near Sathya Sai Prasathi Nilayam (SSPN) Station of Bangalore - Dharmavaram Broad Gauge (BG) Railway Track.
3. Geophysical Investigations at Bridge Locations between Km20.00 and Bilaspur-Beri in connection with Bhanupali-Bilaspur-Beri New Rail Line Project.
4. Geophysical investigations for tunnelling for track doubling in the Trivandrum-Kanyakumari segment of Southern Railways.
5. Geophysical investigations to study the rock mass condition around the sink holes and abandoned coal workings in the Umaria District, Madhya Pradesh.
6. Stability monitoring of powerhouse complex at Tala Hydropower plant (THP), DGPC, Bhutan using Micro seismic Monitoring.
7. Instrumentation data analysis & yearly report submission at Chikla mine, MOIL.
8. Geotechnical study on pit and dump of Mines ML NO 2677, M/s Vedanta Limited, Iron Ore Karnataka, Chitradurga Mines.
9. Determination of in situ rock mechanics parameters at the right bank of the proposed dam area of Arun-3 H.E. Project, Nepal.
10. Determination of in situ shear parameters of rock mass at the proposed Lower Kopili hydroelectric project, Assam.
11. 3D Numerical Modelling of Powerhouse Complex for Sunni Dam Hydroelectric Project (382 MW), Himachal Pradesh.
12. Guidance and support to Micro seismic monitoring at Rampura Agucha Mine, Hindustan Zinc Ltd.

13. Blast Design for Graded Material to Construct Break Water for Vizhinjam, Thiruvananthapuram, HOWE Engineering Projects (India) Pvt. Ltd.
14. Ground vibration and Air Overpressure Study due to blasts carried out at different construction components of Luhri-I (210MW) Hydroelectric Project, Rampur, Himachal Pradesh.
15. Blast Design for Graded Material to Construct Break Water for Vizhinjam, Thiruvananthapuram, HOWE Engineering Projects (India) Pvt Ltd.
16. Seismotectonic studies (feasibility study) for Site located near OSCOM, IREL, Chhatarpur, Odisha.

8.23 NIRM projections/estimates: From 01 January 2022 till 30 November 2022

NIRM completed 66 projects worth 16.60 crores. Further upto 31.03.2023, NIRM likely to add 20 more projects in the field of mining, civil and critical infrastructure sectors till 31.03.2023 in its endeavour to deliver rock mechanics and rock engineering solutions to various challenges being faced by these industries.

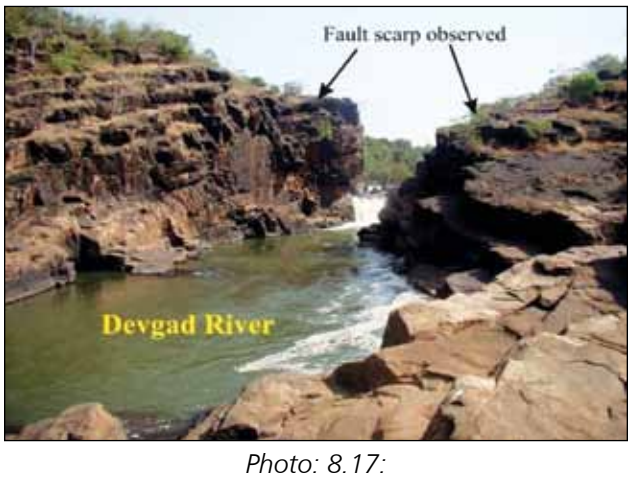


Photo: 8.17:
The fault scarp and associated water fall observed in the Devgad River Maharashtra

National Mineral Exploration Trust (NMET)

8.24 The National Mineral Exploration Trust (NMET) was established by the Central Government by notification dated 14th August, 2015 in pursuance of sub section (1) of Section 9C of Mines and Minerals (Development & Regulation) Amendment Act, 2015 with the objective to expedite mineral exploration in the country. The NMET Rules were also notified on 14.08.2015. As per the Act, the holders of Mining Lease and Prospecting Licence-cum-Mining Lease shall pay to the Trust, a sum equivalent to 2 percent of the royalty paid in terms of the Second Schedule of the Act to the State Government, simultaneously with payments of royalty.

8.25 NMET has two-tier structure. The overall control, periodical reviews and policy directions of the Trust vest with the Governing Body (GB) and the Executive Committee (EC) is managing, administering and supervising the day-to-day activities of the Trust. The GB is chaired by Hon'ble Minister of Mines and the EC is chaired by the Secretary, Ministry of Mines. Besides, a Technical-cum-Cost Committee (TCC) has also been constituted to evaluate the technical as well as cost parameters of the project proposals submitted by Notified Exploration Agencies (NEAs) for NMET funding. The TCC recommends the suitable proposals to EC for approval.

8.26 The total NMET fund accrued as on 30.11.2022 is ₹ 4266 Cr. and total expenditure of NMET till 30.11.2022 is ₹ 520 Cr., out of which ₹ 75 Cr. has been incurred during the financial year 2022-23 (till 30.11.2022).

8.27 During the year, a total of 12 meetings of TCC, four meetings of EC and one meeting of GB were held. A total of 49 projects including

27 no. of mineral exploration projects, one base line geo sciences project, one Deep seated mineral Prognosis and four Projects of Financial assistance for procurement were approved by the EC with estimated cost of ₹ 180.55 Cr. Since establishment, a total of 238 projects have been approved by EC for NMET funding, out of which 213 projects are of mineral exploration, 19 projects for baseline geo sciences data generation, one Project of National Geoscience Data Repository (NGDR), one Project of Deep seated mineral Prognosis by geophysical techniques and four Projects of financial assistance. Out of 213 mineral exploration projects carried out by Notified Exploration Agencies (NEAs), 130 projects have been completed so far. Among these, nine blocks (one Limestone block of Madhya Pradesh, one Limestone block of Chhattisgarh, two Limestone blocks of Rajasthan and one Limestone block of Karnataka; three Iron blocks of Odisha and one Manganese block of Maharashtra) have been auctioned.

8.28 National Aero-Geophysical Mapping Program (NAGMP) with Magnetic-Gradiometry and Radiometric Surveys has been taken up by GSI through NMET Fund to acquire uniform aero-geophysical data, initially over the areas of Obvious Geological Potential (OGP) followed by coverage of whole country by engaging Project Implementing Agencies (PIA) with an objective to (1) Acquire high resolution baseline aero-geophysical data, (2) Identify new target areas for mineral prognostication, (3) Understanding sub surface geological and structural set up. The OGP area has been divided into Blocks-1 to 12 and Blocks-13 to 22 for acquisition of baseline geoscience data.

Under NAGMP, the survey and data acquisition work of OGP Blocks-1, 2, 3, 4 and 11 have been completed. Based on integration of these aero-geophysical data with archived geophysical, geological and known mineralization data, a total of 110 potential blocks have been identified for follow up action. The Survey work and data acquisition over OGP Blocks-6 and 8 are in progress. The objective of aero-geophysical survey is to cover the whole OGP areas at a short time span and to quickly identify areas to be taken up for more detailed heli borne surveys. This will serve as an important tool for enhancing exploration work for mineral sector and also make available the aero-geophysical data for various stake holders through the National Data Repository to provide aid to exploration activities.

National Geoscience Data Repository (NGDR) project has been approved by EC and Geological Survey of India (GSI) has been declared as nodal agency for implementation of the project. The work of NGDR is under progress. The National Geoscience Data Repository (NGDR) creation project was conceptualized by the Ministry of Mines (MoM) as part of the National Mineral Exploration Policy (NMEP), 2016. The vision of the project is to conceptualize a comprehensive, multi-purpose program in order to make available all geological, geochemical, geophysical and mineral exploration data in the public domain on a digital geospatial platform. This will include baseline geo-science data and collate all mineral exploration information generated by various central and state government agencies and mineral concession holders and maintain these on a Single Point of Truth (SPOT). NGDR will function as a single window system for on-demand mineral exploration and baseline geosciences data repository over an interoperable platform. The greater goal of this initiative is to increase the investment attractiveness of the mining sector in India.

The National Geophysical Mapping Program (NGPM) was initiated in 2002-03 by GSI, which is systematically generating gravity and magnetic data in a station density (one station/2.5 sq.km) to cover the entire country with preference to OGP areas. The OGP area was taken on priority with a view to identify potential zones for mineral occurrences. This will pave way to target concealed/ deep seated deposits to augment mineral resources. The mapping will lead to the preparation of 1mGal gravity and 50nT magnetic anomaly contour maps of the country. One NGPM project has been approved by EC to carry out gravity and magnetic survey over priority areas. The work is under progress.

8.29 To incentivise States for auction of mineral blocks, the following provisions have been made for the State Governments;

- a sum of ₹ 20 lakh will be released to each state where mineral blocks are available for auction for FY 2021-22,
- ₹ 20 lakh incentive for each successful auction of mineral block,
- 50% of amount paid to Transaction Advisor, subject to a maximum of ₹ 5 lakh for each block which was put up for auction but could not be successfully auctioned.

An amount of ₹ 21.02 crore has been paid in this regard to 20 States.

Further, for faster implementation of NMET approved projects, release of advance funds to DMGs/DGMs of State Governments, Central PSEs and State PSEs has been initiated and fund is being released in three installments viz.1st instalment of 40% of the approved project cost along with sanction order, 2nd installment of 40% and 3rd and final installment.

8.30 "Rashtriya Khanij Vikas Puraskar" has been initiated by the Ministry of Mines for incentivizing States for grant of early clearances for mines and for facilitating early start of production in States who take initiative to increase mineral production in the country under three categories: (i) Iron ore, limestone & bauxite, (ii) Other minerals, (iii) Minor Mineral (Other than sandstone, gravel) like mica, granite, marble etc. In this regard, an amount of ₹ 17 Cr. was given as award from NMET fund to the states of Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha and Rajasthan for combined performance of two financial years i.e. 2019-20 and 2020-21.

8.31 NMET has formulated and circulated schemes to provide financial assistance for procurement of machinery/equipment/ instruments/upgradation of existing software and other latest technology and instruments in Central Government organizations and State DGMs/DMGs aimed at strengthening technical infrastructure. Under this scheme, three projects of Central Government organisations worth ₹ 37.18 Cr. and one project of State DGMs/DMGs worth ₹ 0.25 Cr. have been approved so far.

8.32 To facilitate, encourage and incentivize private sector participation in all spheres of mineral exploration, with focus on deep seated minerals, NMET has formulated and circulated a scheme of Partial Reimbursement of Exploration Expensesfor holders of Composite Licenses (CL) which are granted through auction for exploration of minerals specified in the scheme. Under this scheme, reimbursement will be done as per NMET SoC for expenses towards geological mapping etc. up to 50% of direct cost with ceiling of 0.50 Cr.;expenses towards geophysical investigations up to 50% of direct cost with

ceiling of 1 Cr.; expenses towards exploratory drilling up to 50% of direct cost with ceiling of 2.5 Cr.

8.33 Further, with an objective to lay down the mechanism for engagement of Notified Private Exploration Agencies (NPEAs) in mineral exploration and enable funding of these through National Mineral Exploration Trust (NMET) or State Governments, NMET has formulated and circulated a scheme. This scheme contains three modes of engagement of NPEAs notified by Ministry of Mines viz. Mode-A, Mode-B & Mode-C.

National Non-ferrous Metal Scrap Recycling Framework, 2020

8.34 India is one of the fastest growing economies in the world. Strong domestic demand coupled with several reforms that the government has undertaken are on track to maintain the economic growth momentum going forward. As non-ferrous metals find widespread applications across the economy, the current policy measures provide a tremendous opportunity for the development of the Indian non-ferrous metals industry in the future.

8.35 One of the key challenges faced by the non-ferrous metals industry is its heavy dependence on import of metal scrap. A major share of metal scrap demand is served by imports owing to the underdeveloped metal scrap collection, segregation and processing infrastructure in the domestic market. The material recycling rates in India are well below global standards and is mostly conducted in the informal sector. Thus, strengthening material recycling, including metal recycling, under the formal sector can provide a good opportunity to cut down scrap imports.

8.36 At the core of an effective material recycling eco system is a systematic, organized and user-friendly collection, segregation and sorting process. Strengthening this value chain by segregating waste at source and then channelizing the disaggregated scrap through a network of scrap pickers and collectors and eventually to the scrap recycler through appropriate policy interventions would earn rich dividends.

8.37 In this context, Ministry of Mines has published the National Non-Ferrous Metal Scrap Recycling Framework, 2020 in January, 2021 to promote a formal and well-organized recycling ecosystem by adopting energy efficient processes for recycling leading to lower carbon footprints and to work towards sustainable development and inter generational equity. Major objectives of the framework include: to minimize the effect of end-of-life products on landfills and environmental pollution by promoting an environmentally sound processing and recycling system for secondary industry; to work towards economic wealth creation, job creation and increased contribution to GDP through metal recycling; to shift towards a circular economy in the coming years for base metals, critical raw materials and other essential materials, etc. The framework can be accessed at:

https://mines.gov.in/writereaddata/UploadFile/NFMScrapRecyclingFramework3.pdf

9

Corporate Social Responsibility

Corporate Social Responsibility

National Aluminium Company Limited (NALCO)

9.1 Periphery Development & CSR Initiatives

- CSR policy of NALCO is compliant with schedule –VII (section 135) of Companies Act 2013 and DPE Guidelines. The Company allocates 2% of average net profit of last 3 financial years as CSR fund as per Companies Act, 2013.
- Accordingly, for FY 2022-23, CSR expenditure of the company amounts to Rs. 3052.16 lakh till end December 2022 against mandated amount of Rs. 3664.00 lakhs for the year.

9.2 Highlights on CSR activities for the financial year 2022-23 are furnished below:

i) Health Care Initiatives

1. **Mobile Health Unit (MHU) Services:** Basic health care facility at the door step in around **250** periphery villages in operation districts of Angul and Koraput by 8 MHUs. Annual reach of the program is around **1.0 lakh** patients.
2. OPD center with specialized services and free medicines operating at Angul addressing the health needs of people in the periphery.
3. Swachhata Pakhwada observed during 16th to 30th Nov' 2022. Swachhata/ Cleanliness being a National drive, ***hygiene kits*** containing hand wash, soap, and sanitary napkins along with refreshments were distributed among the children in Govt. Girls High Schools and with a sensitizing talk on menstrual Hygiene in order to promote the importance of hygiene and sanitation in the day today life.
4. Promotion of Yoga, on the eve of 8th International Yoga Day: Mega event was organized for 6000 participants from different section of society including 3000 students from government schools & colleges.
5. **Activities in response to COVID-19 Contribution to PM Care Fund** : Rs. 10 crore has been contributed in current Financial Year.

ii) Education Initiatives

1. Under residential education program, till the academic year 2022-23, 1100 tribal students from Maoist dominated periphery villages of Koraput district sponsored in 3 reputed residential schools to get education in residential mode. 66 students are supported to continue higher education like diploma, ITI, 12th and graduation
2. In complementing the national program "Beti Bachao, Beti Padhao" NALCO Ki Ladli has been launched to give financial support to meritorious student from class 8th to 10th since FY 2015. Till date 816 girls are supported to complete their high school level
3. Infrastructural support has been extended to most educational institutes in operation in the district of Angul and Koraput, in Ganjam,

Nuapada and Gajapati districts of Odisha

4. Infrastructural support in the form of school boundary, additional class rooms, auditorium, class room furniture etc. are being supported in the peripheral schools

5. Inauguration of 300 Smart Classrooms in 110 schools across Odisha.

iii) Activities ensuring Safe Drinking Water

1. Piped water system established in 24 water scarce peripheral villages of Angul.

2. Supply of drinking water through tankers in 27 peripheral villages benefiting 55,000 people during summer

3. 3.5 lakh water bottles distributed to visitors/pilgrims during the world famous car festival.

iv) Initiatives under Rural Development

1. Better infrastructure lead to better life. Thus, village infrastructures are being strengthened. More than 35 villages are now connected with roads and thereby making the villagers accessible to different facility of Govt including health and education

2. Drains, culverts Pidhas, community centers, mandaps etc. are being established to enhance the quality of life in the periphery villages.

v) Livelihood promotion:

Livelihood promotion through vegetable cultivation has been given importance since a couple of years for ensuring additional income for poor families. In this connection of vegetables seeds like Cabbage, Chilli, Brinjal, Cauliflower & Radish were distributed among the 155 farmers from different SHGs operating in NALCO periphery villages.

Seeing the growing interest of the local community in the livestock management as alternative source of income generation NALCO is planning for livelihood promotion through livestock activities in convergence with District Administration. In this regard, 10 SHGs have been identified in Damanjodi & Pottangi area for the same. It is decided that 50% contribution of SHGs for these activities will be borne by NALCO and other 50% will be made from Govt line dept. Out of ten, 4 SHGs are interested in poultry farming and remaining six in goatery. The interest list has already shared with Chief District Veterinary Office (CDVO), Koraput in this regard.

vi) Iconic City Projects:

a) Development of Gandhi Park:

Gandhi Park has been established in the religious city of Puri to make the city more attractive and to attract more number of visitors. The Park has an open gym, children's corner musical water fountain and pathways for jogging and other facilities.

b) Battery Operated Vehicles:

Ten number of BOVs are being plied from Jagannath Ballav Math to Shree Jagannath Temple for the

elderly, pregnant women and sick. Similarly, 2 no of BOVs are running each at Puri and Bhubaneswar railways station and one at Cuttack railway station for the easy commutting of elderly, pregnant women and sick passengers.

Vii) Initiative for Sustainable Environment

Large scale plantation have been undertaken after the Fani cyclone in Chandaka Dampara Wildlife Sanctuary to restore the green coverage. From F.Y 2019-20 to F.Y 2022-23, Rs. 325.39 lakh has been spent.

9.4 Training & Development

In order to enhance the functional and behavioural competency of its employees and to align the individual need with the business objective of the organization towards increasing production and productivity as well as to improve business culture in the organization, there has been an unstinting effort by the Company to impart skill and behavioural training to its employees. In its commitment for corporate social accountability and good corporate governance, the company also imparts skill development training to contract workers, apprentices, students from managerial and technical institutes as well as for local populations.

As regards regular employees, the Company has imparted training to 4355 employees with 14611 training man-days during the year 2022-23 (up to December 2022). Further, 255 executives were given virtual as well as external training from MDI(Gurgaon), NHRD, INC-WMC New Delhi, IIT- Kharagpur, Institute of Directors (IOD) Hyderabad, MGMI, Kolkata, C-DAC Pune, CII, IFTDO, IICA, SP Jain School of Global Management, Mumbai, SCOPE. NPC, DPE, NSE, ICW Group, ICC, IIMM, PRDA, IMI, ISTD, NFSU, IRLM, CVC etc. on management development programme during 2021-22 during covid pandemic scenario.

There were 967 apprentice trainees were engaged during the year 2022-23 (up to December 2022) which is 17.62% of employees (i.e. employee strength is 5486) of the company. As a part of corporate responsibility and industry academic interface, 195 students from different technical and management institutes across the country had undergone summer internship programme in various functional disciplines at corporate office during the pandemic through virtual mode.

Hindustan Copper Limited (HCL)

9.5 HCL's CSR Policy revolves round the principles laid down in the Sustainable Development Goals (SDGs), Companies Act, 2013, Company (Corporate Social Responsibility) Rules, 2014 and Department of Public Enterprise Guidelines on CSR.

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

CSR expenditure during last two financial years and current financial year

(Rs. in lakhs)

Financial Years	Required Spent (2 % of average net profit (PBT) of last three FYs)	Spent
2020-21	-*	73.69
2021-22	-*	79.61
2022-23	-*	66.42* (till Nov'22)

9.7 For FY 2022-23, an amount of Rs 167.73 Lakhs inclusive of carry forward [the unspent amount of Rs 18.07 Lakhs of FY 2021-22] has been allocated for CSR Projects. The allocation has been done for important ongoing projects having direct impact on communities around company's operation. Major projects are as under:

- Drinking Water
- Health Camps and Nutrition
- Livelihoods
- Plantation and Sports
- Conservation of Environment
- Rural Development Projects

The projects are being implemented in the target communities with the help of State Government, NGO and other agencies.

Mineral Exploration & Consultancy Limited (MECL)

9.8 MECL has drawn a long term Corporate Social Responsibility (CSR) Policy.

9.9 During the period (April to December 2022)- (FY 2022-23), an amount of Rs. 31.25 Lakhs have been spent under CSR fund towards grand success of "8th International Yoga Day and Education for improving the health and living condition of needy people of the society of all category i.e., General / SC / ST / OBC. The expected CSR activities to be carried out between 01.12.2022 to 31.03.2023.

9.9.1 Promoting Healthcare

a) Procurement of 05 nos. Ambulance for Government PHC / Hospitals situated to nearby areas of MECL Drilling / Exploration Projects viz (i) Bharusari Project, Udaipur, Rajasthan (ii) Rakha and Chapri Project, East Singhbhum, Jamshedpur, Jharkhand (iii) Malangtoli Project, Joda, Odhisa (iv) Kehduli Project, Jhunjhunu, Rajasthan and (v) Chief Medical Officer, Sultanpur U.P.

b) Procurement of Medical Equipment / Medicines / Nutrition etc for Government PHC / Hospitals situated to nearby areas of MECL Drilling / Exploration Projects viz (i) Waghoda Manganese Project, Chhindawara, MP (ii) Bolangir Project, Bolangir, Odisha and (iii) GorhiMahloi Project, Dist- Raigarh, Chattisgarh.

c) Procurement of Fully Automated Anesthecia Workstation for Cancer Relief Society's Rashtra Sant Tukdoji Cancer Hospital and Research Centre, Nagpur, Maharashtra.

d) Procurement of Industrial Water Purifier Along With Water Cooler (Capacity Of 100 Lph) for i) Smt. Rukminibai Dhawad Vidyaniketan High School, Dabha, Nagpur, Maharashtra and ii) Ku. Ramraoji Dhawad Smriti, Amchi Shala (Uchh Prathmik) Dabha, Nagpur, Maharashtra.

e) Procurement of 01 No. School Van, Equipment for Health Care and Setup of Smart Class for PwDs.

f) Procurement of 100 nos. Stainless Steel Insulated Containers Hot Case for Annamrita Foundation, Nagpur, Maharashtra.

9.9.2 Promoting Environment Sustainability:

a) Procurement of 20 Nos. of Solar Street Light for Pratapgarh, District Uttar Pradesh.

b) Health Talks were conducted on the occasion of under the "Ayurveda @ 2047" campaign on 01.10.2022 and was widely attended by MECL employees.

c) Creche facility with well-equipped rest room, air conditioning, soft toys, and water facility has been continued at MECL premises at Gurukul for female employees and their children.

d) MECL is an equal opportunity employer for women employees where the service rules are uniformity applicable to both male and female employees. The company is successfully running its creche facility. The women employees in the Company are provided Maternity benefits as per rules.

e) Laws relating to protection of dignity and safety of women in the workplace are being adhered to. The ratio of male to female employees turned out to be 15:1 in the financial year 2022-23 (data as on 05.12.2022).

f) The company has in place an Anti-Sexual Harassment policy in line with the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013. Internal Complaints Committee (ICC) has been set up to redress complaints received regarding sexual harassment. All employees (permanent, contractual, temporary, trainees) are covered under this policy. Number of complaints received is NIL and number of complaints disposed off is NIL as on 05.12.2022.

9.9.3 Citizen's Charter

Dr. Ch. Sreerama Murthy, General Manager (HR) has been nominated as Nodal Officer w.e.f. 01.06.2014 and the same has been intimated to the Ministry along with the required details.

10

Progressive Use of Hindi

Progressive Use of Hindi

Introduction

10.1 The Ministry of Mines continues to take steps to ensure compliance of the Official Language Policy of the Government of India in the Ministry of Mines as well as in its attached / subordinate offices and PSUs. The compliance of Section 3(3) of the Official Languages Act, 1963 is ensured. As per rule 5 of Official Languages Rules, 1976, during the year out of the 1225 letters received (upto Sep. 2022) in Hindi 424 letters were for information only and replies thereof were not required and the remaining 801 letters were replied to in Hindi.

Hindi Advisory Committee

10.2 Hindi Advisory Committee is a high level committee to administer the implementation of Official Language policies. This Committee is constituted under the chairmanship of Hon'ble Minister of Mines. Apart from the Hon'ble Members of Parliament, many linguists are also included in the Committee. This Committee oversees the Official Language policies of the Government and its implementation in the Ministry and the offices under its administrative control and gives due advice to the offices concerned for necessary action. After the term of the previous Hindi Advisory Committee of the Ministry ended in 2019 and the formation of the new Lok Sabha, the draft resolution for the reconstitution of the Committee in 2020 was sent to the Department of Official Language, Ministry of Home Affairs for approval and nomination of non-official members. Formal approval was obtained from the Department of Official Language and the Ministry of Mines issued resolution for the constitution of a new committee. It was constituted on 13.04.2022.

Official Language Implementation Committee (OLIC)

10.3 Official Language Implementation Committee (OLIC) has been constituted in the Ministry under the chairmanship of Economic Advisor. Meeting of the Official Language Implementation Committee is required to be organized every quarter in which the quarterly progress reports of the sections and attached/ subordinate offices of the Ministry are reviewed and also the measures to encourage the progressive use of Official Language Hindi are discussed meaningfully. In the last meeting of Official Language Implementation Committee (OLIC) held under the chairmanship of Economic Advisor, the progress of use of Hindi in official work in various sections was reviewed and officers representing different divisions/sections were asked to increase correspondence in Hindi with offices located in region 'A' and region 'B' and to achieve other targets set by the Department of Official Language in the Annual Program for the year 2022-23.

10.4 As per the directives of Government of India, Ministry of Home Affairs, Department of Official Language, the Official Language Implementation Committee has been constituted in all the Offices of Geological Survey of India under the chairmanship of the administrative head of the office and regular meetings are being held in every quarter. During the period, the meeting of the Official Language Implementation Committee of Central Headquarters was held on 28.04.2022, 22.07.2022 and 21.11.2022.

Town Official Language Implementation Committee (TOLIC).

10.5 As per the instructions issued by the

Department of Official Language, Ministry of Home Affairs, Town Official Language Implementation Committee (TOLIC) is constituted in every city having 10 or more Central Government offices. In this context the Geological Survey of India, Central Headquarters is designated as the head of the Town Official Language Implementation Committee, Kolkata and the Director General, GSI is the ex-officio Chairman of this committee. 62 offices of Kolkata are included in this Committee.

10.6 Geological Survey of India, Central Headquarters is nominated as Head of Town Official Language Implementation Committee, Kolkata-3 and the Director General, GSI is ex-officio Chairman of this committee. The half-yearly meeting of the committee was held on 24.05.2022 and 14.11.2022 under the chairmanship of the Director General, GSI, in which half-yearly Hindi reports from July to December 2022 and January to June 2022 respectively were reviewed. Similarly, NRO office is the Head of Lucknow TOLIC and its meetings are being conducted as per the prescribed calendar of the Official Language Department.

Official Language Inspection

10.7 According to the Annual Program for the year 2022-23, of the Department of Official Language, Ministry of Home Affairs, the Ministry/Departments are required to conduct Official Language inspection of at least 25% of the offices located outside the headquarters. Official language inspection of two subordinate / attached offices of the Ministry of Mines –GSI, CHQ, Kolkata and Hindustan Copper Limited (HCL), Corporate Office, Kolkata has been done by the Ministry till December 2022. During these inspections, the status of progressive use of Official Language Hindi in both the above offices was reviewed and suitable suggestions were given in the context of achieving the target set in the Annual Program 2022-23.

10.8 Official Language Inspection of subordinate offices is carried out by all the Regional Headquarters of Geological Survey of India with a view to evaluate the use of Hindi in various offices of the Geological Survey of India. Official Language Inspection of 05 subordinate Offices has been done by GSI, CHQ, Kolkata during this period. Besides, Regional Headquarters are also conducting Official Language Inspection of their respective State Units and Operational Offices.

Inspection by the Committee of Parliament on Official Language

10.9 Parliamentary Committee on Official Language inspected IBM, Chennai on 22.02.2022, GSI SU: Chandigarh, Punjab, Haryana & Himachal Pradesh on 11.04.2022, IBM, RCOM Dehradun on 14.05.2022, GSI, SU : Uttarakhand, Dehradun on 14.05.2022, GSI, NR, Jammu and Kashmir (UT) & Laddakh (UT) on 01.07.2022, ADG, GSI, WR, Jaipur on 24.08.2022, IBM, Bengaluru on 04.11.2022 and GSITI Hyderabad on 07.11.2022. While appreciating the status of correspondence in Hindi in these organizations, the Committee suggested measures to improve the usage of Hindi in other areas of official work. Necessary actions on assurances given to the Committee were taken by the offices concerned.

Implementation Measures of Official Language Policy

10.10 In order to ensure the compliance and implementation of the Official Language Policy, in addition to various incentive schemes, workshops are also organized from time to time in the Ministry. To facilitate working in Hindi, all the computers of the office have been made Unicode enabled and commonly used administrative terminology, abbreviations, dictionary etc. have been made available bilingual on the ministry website.

Training, Workshops and Seminars

10.11 The offices of Geological Survey of India are organizing Hindi Workshop on regular basis as per the directives of Government of India, Ministry of Home Affairs and Department of Official Language. The details of Hindi Workshops organized at the Geological Survey of India, CHQ, and Kolkata are as follows:

- On 19.05.2022, a workshop was organized on the subject of technical development in official language.
- On 22.09.2022, a workshop was organized on the subject of Hindi typing on computer through speech to text.
- A joint workshop was organized on 29.11.2022 in which the officials of the CHQ, Kolkata and the officials of the member offices of TOLIC, Office-3 participated. In this workshop, training was given to fill the inspection questionnaire of the Honorable Parliamentary Committee on Official Language. The next Hindi workshop is proposed from January to March 2023.

10.12 To provide Hindi training to all personnel of GSI within the time-limit prescribed by the Department of Official Language, Ministry of Home Affairs, officials are being nominated for Prabodh, Praveen, Pragya and Parangat classes under Hindi Teaching Scheme. These classes are held twice a year i.e. January-May and July-November. In addition, intensive training classes for Hindi language training are also being organized. Typists and stenographers are being nominated in a phased manner for Hindi typing and stenography training.

Regional Geology Technical Official Language Seminar was organized by the Southern Regional Headquarters in February 2022, in which a total of 32 research papers were presented by the officials of the Geological Survey of India, Southern Region, Hyderabad and its state units.

Regional Geology Technical Official Language Seminar was organized by the Central Regional Headquarters in June, 2022, in which a total of 26 research papers were presented by the officials as well as retired officials of Geological Survey of India, Central Region, Nagpur and its state units.

Organizing Official Language Fortnight/Month

10.13 In the Ministry of Mines from 16th September, 2022 to 30th September, 2022 Hindi Fortnight was organized. 60 Winners of the various competitions held during this period were awarded cash prizes. Also on the occasion of Hindi Divas messages of Hon'ble Minister of Home Affairs, Shri Amit Shah, Hon'ble Minister of Mines Shri Pralhad Joshi and Cabinet Secretary were also circulated with the aim to increase and promote Hindi in the official work.

Hindi fortnight was organized at Geological Survey of India, CHQ Kolkata from 19.09.2022 to 29.09.2022, under which various competitions such as: Hindi typing, Hindi essay writing, Hindi dictation, Hindi noting and drafting, Hindi Poetry recitation and Hindi quiz etc. were organized. The participants were awarded and felicitated at the closing ceremony. Along with this, the officials who made excellent contribution in the promotion of official language Hindi were also felicitated by mementos on this occasion.

Translation work

10.14 Translation work accomplished for the matter related to the meetings of Standing Committee, Audit Paras, Cabinet Notes, Annual Report, Parliament Questions and material relating to Demand for Grants during the year. Approximately 2,92,581 words were translated in Hindi excluding regular translation work during the year 2022 (till December 2022) as against 2,74,581 words translated in 2021-22.

10.15 Regarding implementation of Section 3(3) of Official Language Act, the Gazette Notifications, Summaries, Office Orders, Circulars, Tender Notices, RTI Materials, documents to be presented in the house of Parliament and other correspondence of GSI were translated from English to Hindi and vice versa as per the requirement. Accordingly, compliance of Rajbhasha Niyam 1976, Rule 5 was also ensured. In addition to that, Abstracts of reports related to various survey programs of the Geological Survey of India were also translated into Hindi. Hindi translation of the material related to geo-heritage sites, compiled and studied by the GSI, was completed.

In-House magazine

10.16 The in-house magazines are regularly published by the subordinate/attached offices of the Ministry. Out of which the in-house Hindi magazines *Bhumanthan* by GSI, CHQ, *Bhugaurav* by GSI WR, *Sabarmati* by GSI, WR, Gujarat *Akansha* by GSI SR, Tamralipi Golden *Jubilee* by HCL, *Chetna* by GSI, TI *Lichchhavi* by State Unit Bihar, *Tamralipi II* by HCL, *Dhauli* by GSI, SU: Odisha, Bhubneshwar, *Akshar* by NALCO, *BhaumaKairali* by GSR, Kerala and Lakshadweep, *Vasudha* by Karnatak and Goa, Bengaluru GSI, *Chetna* 21st and 22nd Volumes by GSITI, Hyderabad are prominent. The magazines can be accessed on the website of the Ministry https://mines.gov.in/UserView/index?mid=1684.

10.17 In-house Hindi magazines namely **'BHOOMANTHAN'** 9th edition of GSI, CHQ, Kolkata; **'BHOOGAURAV'** 20th edition of WR, Jaipur; **'BHOOSANDESH'** 9th edition of NR, Lucknou, **'NARMADA'** 9th edition of CR, Nagpur, **'CHETANA'** 21th edition of GSITI, Hyderabad; **'VIHANG'** 12th edition of RSAS, Bangalore; **'SABARMATI'** 5th edition of SU: Gujrat, Gandhunagar, **'MARUVANI'** 1th edition of SU: Rajasthan, JAIPUR, **'DHAULI'** 16th edition of SU: Oddisha; **'MARKANDAYA'** 3rd edition of SU: Punjab, Haryana & Himachal Pradesh, Chandigarh have been published. Besides, monthly e-news related to the Training Institute is being published in Hindi. In addition, the Institute has published a compilation of activities related to Bhuvisamvad project, training calendar and course material on geology for the Chemist and course material on remote sensing and digital image processing was published in official language Hindi.

Special Intiative taken by attached/ Sub-ordinate Offices and PSUs of the Ministry for promoting use of Hindi in official Work

10.18 Implementation of Hindi Incentive Schemes in Geological Survey of India (GSI):

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 Prabodh, Praveen, Pragya, 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.
- Officers and employees who have made outstanding contributions for the propagation of Official Language Hindi are honoured on Hindi Day.

10.19 Portal of GSI in Bilingual Form

As per the policy of the Government of India, necessary steps have been taken to make the web portal of GSI in Bilingual form. A sub-folder reflecting the activities of department pertaining to Hindi work in the department also made available in the portal. The work is in progress.

10.20 Review of Quarterly Progressive Report (QPR) of Regions

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. In addition to that the QPRs of sub-ordinate Offices are being reviewed by the concerned Regional Offices.

After every quarter, the Deputy Director General and Rajbhasha Adhikari, CHQ reviews the QPR of all offices through video conferencing with the Rajbhasha Adhikari and Officials of the Hindi cadre and discuss the status of the Official Language. During the said period video conferencing was organized on 11.02.2022 and 20.12.2022.

10.21 All India Annual Official Language Review Meeting

Under the aegis of CHQ, All India Annual Official Language Review Meeting and Hindi Workshop was organized in State Unit: Gujarat, Gandhinagar on 7-8 July, 2022 in which the annual assessment report of the year 2021-22 of all the offices of GSI was reviewed. In this review meeting, appreciation certificates were given to 10 offices of GSI for their excellent contribution in official language implementation. Along with this, certificates were also given to 14 Hindi In - house magazines published by various offices of GSI.

Photo 10.1: Glimpses of the program organized during 1st January 2022 to 31st December 2022

10.22 Indian Bureau of Mines (IBM)

Indian Bureau of Mines is implementing the policy of official language of the Govt. of India in the headquarters as well as all Subordinate offices of IBM very effectively. IBM has its headquarters at Nagpur, Maharashtra which falls in 'B' region. Six subordinate offices of IBM fall in 'A', one subordinate office falls in 'B' region and the rest of the 07 Subordinate offices fall in 'C' region. All the subordinate offices of IBM have achieved all the targets mentioned in Annual Programme of the Department of Official language. During 2022-23, the details of the progress and achievement related to Hindi implementation are as follows:-

10.23 Meetings of the Departmental Official Language Implementation Committee:-

The 121st, 122nd, and 123rd meetings of the Departmental Official Language Implementation Committee were held on 06.04.2022, 08.07.2022, and 07.10.2022, respectively. In all regional offices, the meetings of the Departmental Official Language Implementation Committee are regularly held and reports are sent to the headquarters.

10.24 Award for Original Noting and Drafting Hindi Encouragement Plan by Indian Bureau of Mines (IBM): For the Year 2020-21, under the Original Noting and Drafting Hindi Encouragement Plan, 76 persons of 18 Offices of Indian Bureau of Mines were awarded**.**

Publication of Khan Bharti: During 2022, Indian Bureau of Mines has brought out its Hindi House Magazine namely '*Khan-Bharti*'.

10.25 National Aluminium Company Limited (NALCO)

- Progressive use of Hindi is being implemented as per provision of Official Language Act, 1963 and Official Language rules 1976.
- NALCO also holds the Chairmanship position of TOLIC, Bhubaneswar and Angul. Scheduled meetings have been organized at both the locations involving all local PSUs Offices. In this regard, Company's efforts have been appreciated in the meetings by the representatives of RIO, Government of India.
- Hindi workshops were organised on 27.04.2022 and 23.09.2022.
- The website of the company is being regularly updated in bilingual; Hindi and English.
- In order to encourage the member offices for implementation of the official language, while ensuring the participation of the member offices; General Knowledge and Hindi quiz competitions were organized on 22.06.2022. Necessary arrangements were also made to telecast the same on Doordarshan.
- Hindi Fortnight 2022 was observed at Corporate Office, Production Units and Regional Offices of the company to encourage the use of Hindi in official work and various competitions were organised among employees and students.
- During the Hindi Day celebrations held on 14.09.2022, 'Kavi Sammelan' was organised at Mines and Refinery Complex, Damanjodi.

- On the occasion of Hindi Fortnight 2022, the official language knowledge and picture expression competitions were organized on 23.09.2022 under the banner of TOLIC (U).
- On the occasion of Hindi Fortnight – 2022, Employees were rewarded with Shankar Dayal Singh Smriti Puraskar.
- Faculty assistance on Unicode and tools and techniques of Hindi computing was provided to the member offices of TOLIC, Bhubaneswar.
- Meetings of Official Language Committee were organized under the Chairmanship of concerned Office Heads.

10.26 Hindustan Copper Limited (HCL)

- During the year 2022-23, from 14th to 28th September, 2022 Hindi Diwas / Week/ Fortnight was organized in all the Units / Offices including the Corporate Office of HCL. During this period, various programs were organized to promote the propagation of the Official Language. In HCL, on this occasion, Hindi Competitions on various subject, like Hindi Essay Writing, Translation and Hindi Noting-drafting Competition were organized for non-Hindi speaking and Hindi speaking employees separately and Passage Reading Competition only for Non-Hindi speaking employees. A Hindi typing competition on computer was also organized. The winning participants of all the competitions were encouraged by giving prizes and certificates in the closing ceremony.
- Hindustan Copper Limited has been awarded the **First Prize** by Town Official Language Implementation Committee (Undertaking), Kolkata in the category of Corporate Office for the best performance in the field of Official Language during the year 2021-22.
- The meeting of the Official Language Implementation Committee is held regularly in HCL. In addition, Hindi workshop is also organized. Nomination of participants from Hindustan Copper Limited is ensured for various competitions organized by various CPSEs for promotion of Official Language under the aegis of Town Official Language Implementation Committee.
- In order to enhance the knowledge and arouse the interest in the official language Hindi among the officers/ employees of the company, a Hindi word and its sentence is prepared every day in bilingual form and displayed on the notice board for everyone to read and follow.
- The progressive use of Hindi is being reviewed regularly at the Board meetings of Company. The Company's in-house journal "**Tamralipi**" is published in Hindi and English and distributed among employees regularly. The recruitment advertisement is also published bilingual. At the time of superannuation, all the employees are given Service Certificate in Hindi. The Hindi translation of Annual Report, MoU, Outcome Budget and various other jobs of the Company were done in year 2022-23.

10.27 Mineral Exploration and Consultancy Limited (MECL):

- The Official Language Implementation Committee of MECL was held, under the chairmanship of CMD.

- MECL as an active member of Nagpur Town Official Language Implementation Committee (Ka-1) participated, in each of its meetings Senior Hindi officers attended the meeting. MECL contributed Rs. 12000/. for hindi program.
- For the last five years, MECL's in-house magazine "MAC Samachar" has been receiving first prize. MECL received Second prize for implementation of official language. Hindi Translator from MECL has also received "RajbhashaVishist Seva Samman" by NARAKAS (Ka-1), Nagpur.
- Chairman MECL has constituted, Hindi Inspection Committee with two high level members to oversee the progress made in the implementation of Hindi. On the basis of inspection data received every quarter, each office/Division directed to compile with the orders/ suggestions/ and submit a report directly to CMD. Senior Hindi officers personally visit various divisions to take stock of Hindi progress and provide all necessary assistance.
- During this period, One-day Hindi workshops were organized online/offline in which total 58 personnel were given training in Hindi on official language policy etc.
- On September 14, 2022, MECL participated in the All India Official Language Conference and also celebrated Hindi Day in Surat, Gujarat. Various 06 online / offline Hindi competitions were organized during this period. The winners were awarded by the Director (Tech.) on the occasion of Hindi fortnight on September 29, 2022.
- A total of 816 pages have been translated during this period which includes important Executive summary of geological reports, office orders, circulars, Press Releases, Tender Notices, prevailing proforma & Annual Report etc.MECL's website www.mecl.co.in is also available in bilingual mode.
- MECL In-house magazine "MEC Samachar" is circulated/published entirely in Hindi. During the Vigilance Awareness Week, a magazine named "Chetna Pravah" is published by the Vigilance Division in every November of the year in which various articles of the personnel are published.
- For working in Hindi in the prescribed quantity in the Corporation, Rs. 500/- per month cash payment scheme is applicable in which cash rewards have been given to 205 employees who submit claims every month.
- As per the instructions of the Ministry of Mines, In the memory of Late Shri Shankar Dayal Singh, since 2012, an annual cash prize scheme i.e. first, second, third and a consolation prize is being implemented as an incentive to the employees who use Hindi the most in official work every year.
- To promote Hindi, a Hindi competition is successfully organized by MECL every year at Nagpur city level under the aegis of NARAKAS (Ka-1).
- A booklet containing a collection of standard Hindi notes, a list of internal telephone numbers, a list of common words/phrases used in Hindi have been printed on the main and back cover of the file covers. Routine types of letters

and proforma used in different divisions have been made in Hindi. This increases the Hindi knowledge of the personnel and they use these words in Hindi correspondence.

- Letters are issued on the last Monday of every month to do most of their official work in Hindi only. Hindi literature books are available in abundance for the promotion of Hindi.

10.28 Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDC)

JNARDDC continued its efforts to promote the progressive use of Hindi. The Centre celebrated Hindi Pakhwada during 12th - 26th September 2022 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.

- **Azadi ka Amrit Mahotsav**

  The Hon'ble Prime Minister Shri Narendra Modi Ji launched the Azadi ka Amrit Mahotsav under which a series of events organized by the Government of India to commemorate the 75th anniversary of Independence. The Mahotsav will be celebrated as a peoples' movement across the country. The following events were undertaken under AKAM.

- ***Online lecture series to 75 colleges***

  JNARDDC, Nagpur is conducting an online lecture series on "Aluminium - From Mine to Metal" to selected departments of NITs, IITs, regional and reputed colleges (75 colleges).

- ***Health checkup camp Phase-1 (07.04.2022)***

  JNARDDC in alliance with Lok Kalyan Diagnostics, Nagpur organized a health check-up camp in JNARDDC premises on 07.04.2022 as a part of the Azadi Ka Amrit Mahotsav events.

- ***Iconic Week celebration – Mass Plantation Program (15.07.2022)***

  The Iconic Week mass Plantation program on 15.07.2022 was inaugurated by Chief Guest- Ms Nirupama Kotru, IRS, Joint Secretary & Financial Advisor, Ministry of Coal & Mines.

Photo 10.2

- ***75 kms Cycling event (31.07.2022)***

  A "75 kms Cycling Event" with more than 100 cyclist was conducted on 31.07.2022 by JNARDDC.

Photo 10.3

- ***Har Ghar Tiranga (13th - 15th August 2022)***

  JNARDDC distributed the national flag to all employees and staff during 'Har Ghar Tiranga' campaign which was undertaken under the aegis of Azadi Ka Amrit Mahotsav during 13th - 15th August 2022 to encourage employees and staff to bring the Tiranga home and to hoist it to mark the 75th year of India's Independence.

Photo 10.4

- ***'COVID Vaccine Amrit Mahotsav' campaign (15th July – 30th September 2022)***

  Under the campaign JNARDDC encouraged its employees and staff to avail free precaution doses at all Government COVID Vaccination Centres.

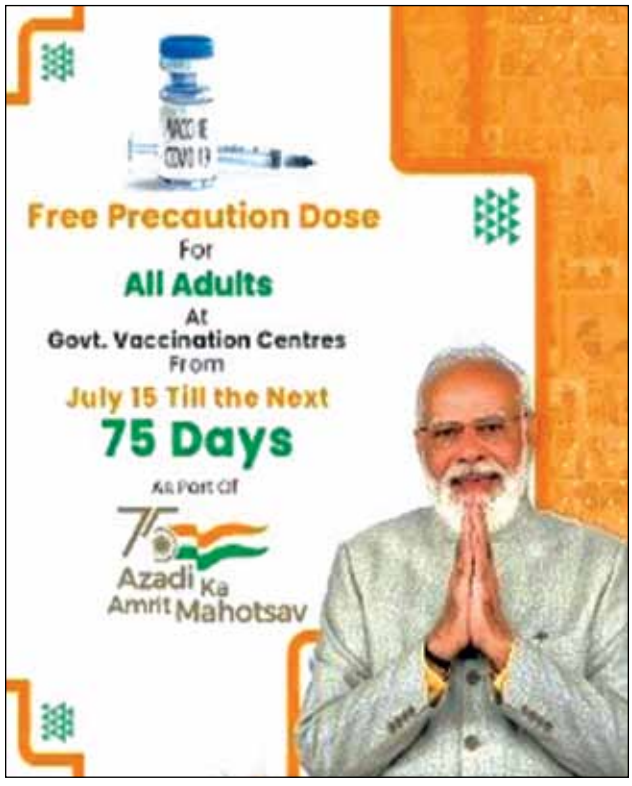


Photo 10.5

- ***India Freedom Run 2.0 (31.08.2021)***

  Rashtriya Ekta Diwas was celebrated on 31.10.2022 in JNARDDC, Nagpur.

11

Exploration Activities in the North-Eastern Region

Exploration Activities in the North-Eastern Region

Geoscience Activities in the North-Eastern Region

Introduction

11.1 Geopolitically the North Eastern Region (NER) is comprised of eight states i.e., Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Sikkim and Tripura. The region has a unique geomorphology and geological setup. 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. The rocks ranging in age from Precambrian to Recent age are exposed here

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

11.2 The major activities of North Eastern Region (NER), Geological Survey of India (GSI) include baseline data generation through geological, geochemical & geophysical mapping, mineral exploration, compilation and generation of different types of maps and publications, fundamental researches & societal works like landslide/ geotechnical/ earthquake studies. GSI is continually striving for the development of NER states through augmentation of above activities and helping the states of NER in training, capacity building by providing free courses to a number of officers of State DGMs of NER. GSI, NER provided technical and scientific assistance by arranging very high-end instrument analyses like EPMA (Electron Probe Micro-Analyzer) and SEM (Scanning Electron Microscopy) of the representative samples of the DGMs.

Geological Mapping on 1:25,000 scale

11.3 During FS 2021-22, a total of ten items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including two RP items have been taken up in NER of which two items were taken up in Arunachal Pradesh, one in Assam, three in Manipur-Nagaland, three in Meghalaya and one in Sikkim. During the period from 1st January 2022 to 31st March, 2022, an area of 1130 sq. km and 70 Line km in STM and RP items had been covered respectively **(Annexure – 11.1)**.

11.4 During FS 2022-23, a total of six items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including two RP items have been taken up in NER of which two items are being executed in Arunachal Pradesh, one in Assam, two in Meghalaya and one in Sikkim. During the period from 1st April 2022 to 31st December, 2022, an area of 718 sq. km have been covered **(Annexure – 11.2).**

Geochemical Mapping (GCM)

11.5 Geochemical Mapping (GCM) is being carried out by GSI in different parts of NER to generate the baseline regional geochemical data with elemental distribution pattern. This is being done with the objective of identifying the targeting areas for search of mineral deposits.

Photo 11.1: Banded migmatite, Jun Rongphar, Assam.

Photo 11.2: Pegmatite, Langchitung N, Assam.

11.6 A total of 17 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern had been taken up during the FS 2021-22 in parts of Arunachal Pradesh, Assam, Meghalaya, Tripura & Mizoram and Manipur-Nagaland. An area of 7565 sq. km has been covered during the period from 1st January 2022 to 31st March 2022 **(Annexure – 11.3)**.

11.7 Total 30 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern is being executed during the FS 2022-23 in parts of Arunachal Pradesh, Assam, Manipur-Nagaland, Meghalaya and Tripura & Mizoram. An area of 10965 sq. km has been covered during 1st April 2022 to 31st December 2022. **(Annexure – 11.4)**

Geophysical Mapping (GPM)

11.8 Geophysical Mapping (GPM) is taken up with an objective to prepare gravity-magnetic anomaly maps so as to delineate sub surface geological structures. These studies along with the geological and geochemical maps help in postulating conceptual models to focus on potential/probable target areas of interest for mineral exploration in deep as well as shallow levels.

11.9 As a part of FS 2021-22 two GPM Items had been executed by GSI, NER. During the period 1st January 2022 to 31st March 2022, in the two GPM items executed in parts of North & West Garo Hills districts, Meghalaya and Goalpara districts, Assam and East, West & South Garo Hills Districts, Meghalaya, a total area of 1620 sq. km had been covered during the period. **(Annexure – 11.5)**.

11.10 Two GPM items in North, West & Southwest Garo Hills districts, Meghalaya and West, South and Southwest Garo Hills districts, Meghalaya is being executed during FS 2022-23 and an area of 960 sq. km have been covered during the period from 1st April 2022 to 31st December, 2022 **(Annexure – 11.6)**.

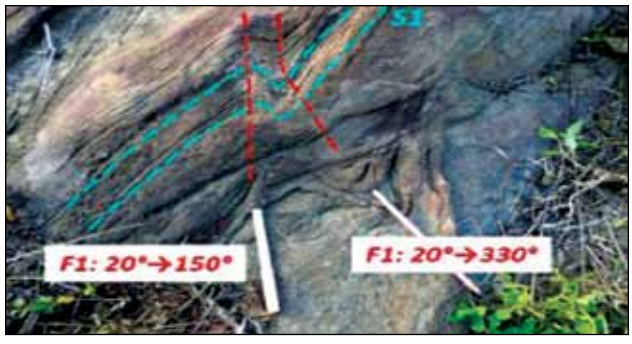


Photo 11.3: Z-type folds in migmatite, Samelangso.

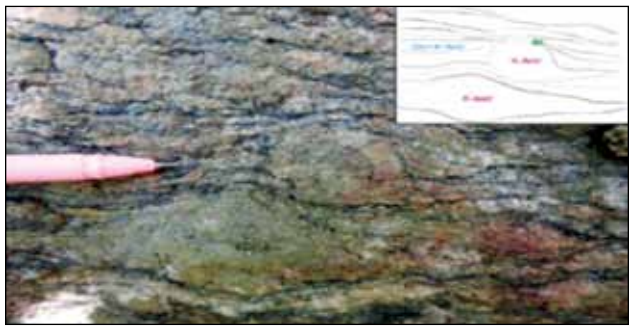


Photo 11.4: Z-type folds in migmatite, Samelangso.

Photo Geology and Remote Sensing (PGRS)

11.11 One item of Photo Geology and Remote Sensing (PGRS) had been taken up on 1:50,000 Scale during FS 2021-22 in West Garo Hills District Meghalaya using ASTER and Landsat 8 OLI data. The primary objective of

this item was to locate bauxite rich zones. So that follow up exploration items may be proposed. The total target of 700 sq. km had been completed during the period from 1st April 2021 to 31st December 2021. Therefore, during the period from 1st January 2022 to 31st March 2022 limited field checks were taken up to validate the work.

Photo 11.5: Bauxite with pisolitic structure developed over the gneissic rocks of AMGC, near Asimgiri area, Garo Hills, Meghalaya.

Photo 11.6: Economically potential white Clay/ pinkish mottled Clay developed over AMGC and Mylliem Granitoid, Meghalaya.

11.12 In similar lines two items of Photo Geology and Remote Sensing (PGRS) is being executed on 1:50,000 Scale during FS 2022-23 in North, South, East, West Garo hills & West Khasi hills District Meghalaya using ASTER data. A total area of 3300 sq. km has been completed during the period from 1st April 2022 to 31st December 2022 **(Annexure – 11.7).** Field validation and sampling is also being carried out to zero in on targeted bauxite cappings over the alumina rich Precambrian Gneissic Rocks of Garo Hills. The findings will led to formulation of exploration programmes for bauxite.

Mineral Exploration in NER

11.13 The major mineral resources in NER that are partially explored include coal, limestone, dolomite, graphite, lateritic bauxite, clay, quartzite, sillimanite etc. Besides, occurrence of low grade iron ore, base metal sulphides and minor incidences of nickel, cobalt, lithium, vanadium, molybdenum, gallium, gold, tin, tungsten, Platinum Group of Elements (PGE) and Rare Earth Elements (REE) are reported.

GSI has given special thrust on the mineral exploration and development activities in North Eastern Region through resource appraisal of various mineral commodities including minerals in which our country is deficient. The entire activity is being planned to be supplemented by baseline data generation through geochemical mapping, geophysical mapping, specialized thematic mapping in order to generate concurrent synthesis of database to help in delineating areas for prognosticated mineral search. During recent time impetus has been given on critical and strategic commodities like Vanadium, graphite, REE, Molybdenum and lithium to meet the demand of industry for green energy.

The Geological Survey of India has, in addition to the accredited programmes in exploration work, also accorded priority for creation of multi-thematic database for data dissemination to invite and attract private investments in mineral sector.

GSI NER is engaged in the detailed exploration of minerals like gold, graphite, vanadium, REE,

molybdenum, nickel, shale gas, phosphate, lithium, limestone, coal, chromium and tungsten etc. Mineral exploration is carried out through Large Scale Mapping on 1:12,500 scale (LSM), Detailed Mapping on 1:2000/4000 scale (DM) and Drilling activities.

During FS 2021-22, a total of sixteen items (5 G3 and 11 G4 Item) and in FS 2022-23, a total of twenty three items (5 G3 and 18 G4 Item) have been taken up in the states of Arunachal Pradesh, Assam, Meghalaya, Manipur and Nagaland of North East India. The commodity-wise and stage – wise details of the projects are given in **(Annexure – 11.8)**.

During the period from 1st January, 2022 to 31st December, 2022, an area of 687.5 sq. km of LSM, 15.31 sq. km of DM and 3249.45 m of Drilling has been carried out.

Photo 11.7: Malachite stain in carbonaceous phyllite, Thumbin area, Arunachal Pradesh

Photo 11.8: Tourmaline bearing pegmatite vein, Khazalang area, Arunachal Pradesh

Photo 11.9: Iron coated type of phosphatic nodules of Kopili Formation from north of Jadigiri village, Meghalaya

Photo 11.10: Porous concretionary laterite, Champai area, Manipur

Publications by GSI, NER

11.14 During FS 2022-23, the following items on Publications and Maps have been taken up:

i. Publication of Bulletin Series-B: Seismic Hazard Assessment of selective towns of North East India.

ii. Publication of Records of GSI, Vol. 156, Pt. 4 (Extended Abstract for F.S. 2021-22 of North Eastern India).

iii. Geotourism sites of North East India.

Creation of stratigraphic database for North Eastern Region by revisiting the existing discrepancies in 1:50K map and updation in Bhukosh.

Details publications and maps were released during FS 2022-23 as a part of Public Goods Geoscience:

i. Release of Special Publication on the Geotourism Site of North East India as a part of celebration of Azadi ka Amrit Mahotsav on 15.07.2022.

ii. The Geotechnical Investigation of Hydel projects in Arunachal Pradesh, Bulletin Series -B, no.73 vide item no. M3BPUB/NC/NER/2017/27255, FS 2017-18.

iii. The Records Vol 153 and 154, pt.4 Extended abstracts of progress reports of the North Eastern Region (ARUNACHAL PRADESH, ASSAM, MANIPUR, MEGHALAYA, MIZORAM, NAGALAND, SIKKIM AND TRIPURA) vide FIELD SEASON: 2018-2019 and 2019-2020.

iv. Release of Publication of Miscellaneous Publication No. 30 Pt IV, Vol. 2 (II) (Geology and Mineral Resources of Meghalaya, 3rd edition) during the visit of DG GSI, to GSI NER on dated 17.11.2022.

v. Release of Limestone deposit of Litang Valley, Jaintia Hills District, Meghalaya, Vol-I (2nd edition): Bulletin Series –A, No-63 during the visit of DG GSI, to GSI NER on dated 17.11.2022.

vi. Seven GQMs for the degree sheets 78K, 83D, 84A, 78P, 92A, 83G and 83L were published and uploaded in OCBIS.

vii. Four District Resource Maps of Manipur (Chandel, Churchandrapur, Pherzawl and Tengnoupal districts) and three Geological Quadrangle maps of degreesheets 82H (Upper Subunsiri), 83M (Tinsukia-Tidap) and 82P (Parighat) were released.

viii. Geological Quadrangle map of 78O (Shillong quadrangle) and DRMs of South Sikkim; Papum pare and lower Subansiri district of Arunachal Pradesh were uploaded.

State maps of Assam, Tripura, Mizoram and Nagaland on 1: 1million scale along with the Geological and Mineral Resource Map of NER (2M) were vetted by ADG and HOD NER and submitted for approval from Map, CHQ.

Photo 11.11: Release of Special Publication on Geotourism Sites of North East India on the occasion of celebration of Azadi Ka Mahotsav on 15.07.2022.

Research and Development

Petrological Studies

11.15 Two Research items had been undertaken during FS 2021-22 (a) Petrogenetic evolution of Mayodia ophiolite with special reference to the subduction tectonics of Indian plate in Eastern Arunachal Himalaya to understand detailed petrological and geochemical characterization of different litho units of Mayodia Ophiolite and to correlate Mayodia ophiolite with other Tethyan ophiolites for evolutionary mechanism and (b) Petrological characterization and petrogenesis of Chromite and associated ultramafic rocks of ophiolite in Manipur to comprehend petrological and mineralogical characterization of the ophiolitic suits of rocks and to re-evaluate the tectonic setting of Manipur ophiolite belt in the light of modern concepts.

11.16 During current FS 2022-23, two research items are being executed, one in Khetabari Formation of Bomdila Group, Arunachal Pradesh to delineate the mode of occurrence and genesis of vanadium in the carbonaceous phyllite. This item is dedicated towards working out the petrogenesis of the Vanadium Prospects of Arunachal Pradesh. Another item is taken up around Rongjen-Nongchram fault for petrological characterization and petrogenesis of early Cretaceous dyke swarm (emphasizing lamprophyre) of Garo Hills areas, Meghalaya. The Items also envisages to work out the possibilities of diamond mineralization in the lamproite dyke swarms of Garo Hills of Meghalaya.

Photo 11.12: Field photograph of carbonaceous phyllite (~ 20 m), Deed, Arunachal Pradesh. The carbonaceous phyllites are the source of Vanadium.

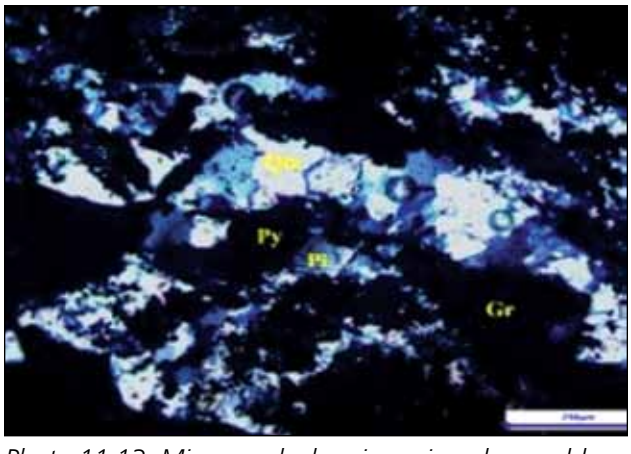


Photo 11.13: Micrograph showing mineral assemblage in carbonaceous phyllite, Pakro block, Arunachal Pradesh.

Photo 11.14: Field photograph of Lamprophyre with in the pink biotite gneiss of AMGC [Loc. Garo Hills, Meghalaya].

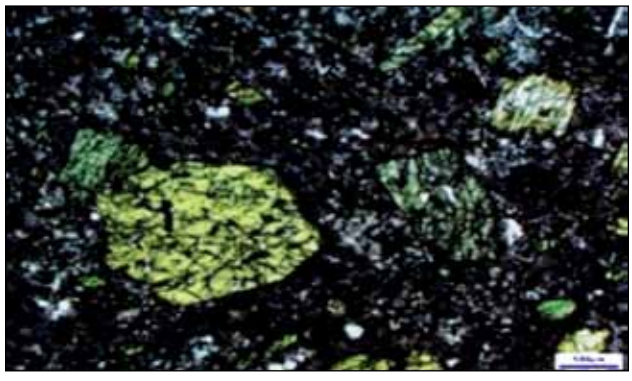


Photo 11.15: Field photograph of Olivine and clinopyroxene phenocrysts in Spessartite (Lamprophyre) [Loc. Garo Hills, Meghalaya].

Photo 11.16: Field photograph of partially preserved humerus bone fossils from Mawphuli, near Ranikor, South West Khasi Hills District, Meghalaya.

Paleontological Studies

11.17 During FS 2021-22, two Research items had been taken up the Paleontology Division, GSI, NER viz., (1) Study of the mega-invertebrate fauna from the Surma Group in Garo Hills Meghalaya and North Cachar Hills of Assam and their paleoenvironmental and palaeobiogeographical significance

and (2) Palaeontological studies of Oceanic Pelagic sediments, Disang and Barail Group sediments in Ukhrul and Chandel Districts of Manipur and its implication on constraining the stratigraphic age.

11.18 During FS 2022-23, two research items are being executed viz., (1) Taxonomic study of Sauropods from the Upper Cretaceous Mahadek Formation of Meghalaya (2) Study of the mega-invertebrate fauna from the Surma Group in Garo Hills Meghalaya and North Cachar Hills of Assam and their paleoenvironmental and palaeobiogeographical significance. The paleontological item in Meghalaya has been very successful and few fossil remains of Dinosaurs have been reported. These finds are the first reporting of Dinosaur fossil from this part of the country.

Geotechnical Investigations

11.19 Presently the country is committed towards clean energy/green energy. North Eastern Region has a huge role towards this commitment as it has huge hydropower generation potential. Northeastern states of India's, with their mountainous topography and perennial streams, have the largest hydropower potential of our country. Together, Arunachal Pradesh, Sikkim, Assam, Meghalaya, Manipur, Mizoram, Nagaland and Tripura account for almost 40 percent of the total hydropower potential of the country. Arunachal Pradesh among the other states has the maximum potential. The state producing hydro power from river basins like Kameng, Subansiri, Siang, Lohit and Dibang. The total production is about 35,000 MW at 60% load factor (CEA) i.e. about 90% of the total hydropower resources of NER. GSI, NER is intimately associated with the development of all the hydel power projects in NER. GSI NER conducts geotechnical studies at various stages of geotechnical investigation to identify suitable sites for locating dams, powerhouses, selecting tunnel alignments and suggesting remedial measures during construction.

Besides, Hydro-Electric project, GSI also carried out geotechnical investigation of various transport and communication projects. The North East is located at a crossroads between three major economies–East Asia, South Asia and Southeast Asia. Therefore, development of transport and communication system is quite important for the development of our country.

11.20 During the FS 2021-2022, Engineering Geology Division, GSI, NER has taken 3 DPR stage geotechnical investigations of Katakhal Irrigation Project, Hailakandi District, Assam, Haora & Champaicherra Irrigation Project, West Tripura District, Tripura and Tlawng Hydroelectric Project, Aizawl District, Mizoram. Slope stability study along Joram-Koloriand Road, Kurung Kumey District, Arunachal Pradesh has also been investigated during the period.

11.21 During the FS 2022-23, GSI, NER has taken up 6 DPR stage Geotechnical Investigation projects viz., Tlawng HEP, Aizawl District, Mizoram, Madhura Irrigation Project, Cachar District, Assam, Buroi Irrigation Project, Biswanath District, Assam, Mebo Irrigation Project, East Siang District, Arunachal Pradesh, Mat Sakewi HEP, Mizoram, Haora and Champaicherra Irrigation Project, West Tripura District, Tripura and one construction stage project of Lower Lopili Hydroelectric Project, Dima Hasao and West Karbi Anglong districts, Assam. Besides this, slope stability assessments in Meghalaya & Manipur and geotechnical assessment of traffic tunnel, bridge, railway

line in Assam, Manipur, Meghalaya and Nagaland were also investigated.

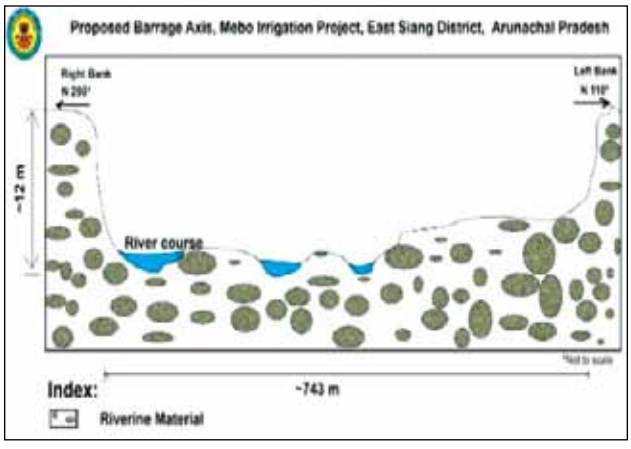


Photo 11.17: Proposed Barrage Axis, Mebo irrigation project, East Siang District, Arunachal Pradesh

Photo 11.18: Field photograph of front portion of cut and cover tunnel section of Dimapur-Kohima new BG railway line, Nagaland.

Photo 11.19: Field photograph showing sliding of slope forming material at the edges of road along Lumding-Badarpur section, Assam

Landslide Hazard Studies

11.22 During FS 2021-22, Six (6) National Landslide Susceptibility Mapping (NLSM) items, ten (10) Mesoscale Landslide Susceptibility Mapping items and two (2) Site Specific landslide studies had been executed. Eight (8) of the Meso-scale items had been taken up on the request of State Governments and one item falls under vulnerable sites identified/ prioritized in National Landslide Risk Mitigation Strategy Document of NDMA 2019. NLSM projects had been completed in North Eastern Region during FS 2021-22.

11.23 During FS 2022-23, Twelve (12) Mesoscale Landslide Susceptibility Mapping items have been taken up out of which nine (9) items have been taken up on the request of State Government. Further GSI has taken up the following project in NER:

- Development of experimental system of rainfall threshold based regional landslide forecasting in Assam, Meghalaya, Mizoram, Nagaland.
- Development and validation of experimental Landslide forecasting system in Sikkim
- Monitoring of landslide and ground movements using satellite-based InSAR and ground-based 3D Terrestrial Laser Scanner (TLS) around Mangan, in Sikkim.
- Primary objective of all the landslide items is sustainable development of the entire region.

Photo 11.20: Panoramic view of the Angbreshu landslide, Tengnoupal district, Manipur.

Photo 11.21: Panoramic View of the Challong landslide, Chandel district, Manipur.

Earthquake Studies

11.24 Two regular items had been taken up in NER on Seismic Microzonation and earthquake studies during FS 2021-22 on the request of the State government of Tripura and Mizoram. The Seismic Microzonation of two towns of Dharmanagar and Champhai had been carried out. The work involved integrated studies of seismic source, seismic response through geological, geotechnical and geophysical parameters and their relation to seismic susceptibility following guidelines of GSI, 2017.

11.25 Two regular items are being executed in NER on Seismic Microzonation and earthquake studies in the current FS 2022-23 on the request of the State government of Tripura and Assam. The Seismic Microzonation of two towns of Dharmanagar, Tripura and Tinsukia, Assam has been taken up. The item is being carried out in line with the guidelines of GSI, 2017.

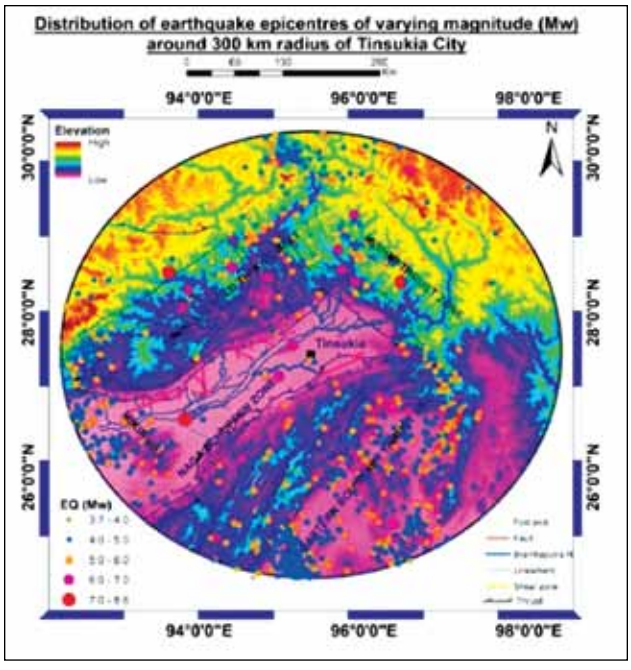


Photo 11.22: Distribution of earthquake epicenters of varying magnitude around 300 km radius of Tinsukia city

Environmental Geology

11.26 During FS 2021-22, the following five projects had been undertaken on environmental Geology:

i. Chemical, Mineralogical and lead isotopic characterization of road dust of Guwahati city in different seasons.

ii. Geo-environmental hazard study of flood and erosion-prone river banks areas in Morigaon District of Brahmaputra River in Assam.

iii. Integrated geo-environmental appraisal of Guwahati city to assess the causes and remedies of urban flood.

iv. Geo-environmental studies to constrain the extent of arsenic, fluoride and other associated heavy metal contamination in water around Dimapur and Kohima city, Nagaland.

v. Geo-environmental appraisal to ascertain the impact of erosion caused by the Gumti River along Dumboor, Kurmachhara Amarpur, Udaipur, Telkajila and Sonamura subdivisions of Tripura.

11.27 During FS.2022-23, the following five projects are being undertaken on environmental Geology:

i. Geo-environmental hazard study of flood and erosion-prone Brahmaputra river banks areas in Morigaon and Nagaon Districts of Assam.

ii. Integrated geo-environmental appraisal of Guwahati city to assess the causes and remedies of urban flood.

iii. Geo-environmental impact of coal mining around Changki-Mangkolemba area, Mokokchung District, Nagaland.

iv. Geo-environmental appraisal and river hazard zonation map to ascertain the societal impact of pollution, erosion, shifting and flooding caused by Manu River in Kailashahar, Kumarghat and Longthari valley sub-divisions in Unakoti and Dhalai districts of Tripura.

v. Geo-environmental appraisal in parts of East Garo Hill, West Khasi Hills, Meghalaya Goalpara & Kamrup, Assam with special emphasis on fluoride and other toxic elemental contamination.

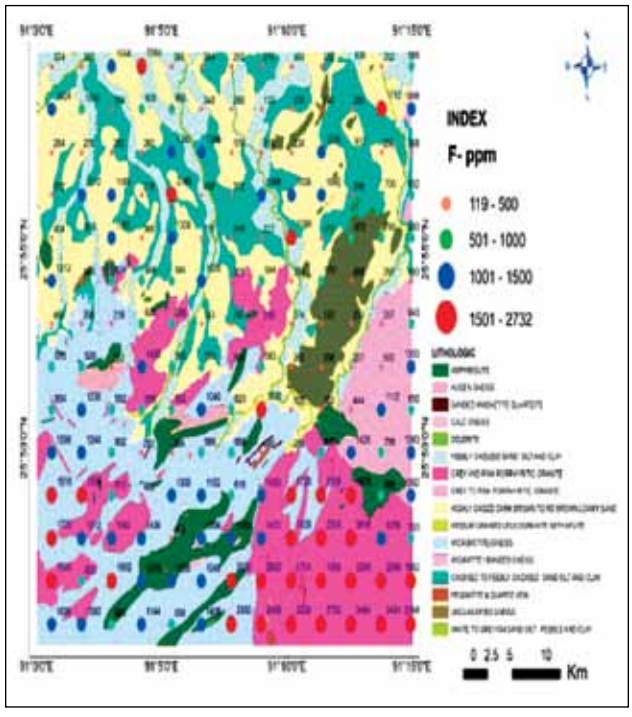


Photo 11.23: Fluorine distribution map of Jowai area superimposed on geological map. Investigation being carried out to understand the fluoride dispersal pattern and its impact on anthrosphere of the area.

Photo 11.24: Bank erosion affecting the settlement and road in and around Manikpur village, Tripura. Study being carried out for remedial measures.

11.28 Budget and expenditure of the North Eastern Region for the Financial Year 2022-23 is given in **Table-11.1** (Rs. in crore)

Table-11.1

Sl. No.	Name of Activities	BE (2022-23) for NER	Actual Expenditure in NER (F.Y. 2022-23 up to December, 2022)
1	2	3	4
1	Survey & Mapping (M-I)	0.60	1.12
2	Mineral Exploration (M-II)	1.35	2.75
3	Information & Dissemination (M-III)	0.54	0.30
4	Research & Development (M-IVC)	0.37	0.40
5	Investigation (M-IVB)	0.45	0.39
6	Human Resource Development (M-V)	0.08	0.14
7	Tribal Area Sub Plan (TASP) *	0.00	1.87
8	Modernisation & Replacement (MV & ME)	0.60	0.98
9	Direction & Administration / ASA / Other Exp.	60.51	64.81
	Grand Total	**64.50**	**72.76**

Indian Bureau of Mines

Work done by Indian Bureau of Mines in North Eastern Region

11.29 The Regional Office of Indian Bureau of Mines (IBM) at Guwahati continued to undertake inspection of mines and studies on development of resources in North-Eastern Region. During the year 2022 (1st January to 31st December 2022), 22 nos. of inspections were carried out for enforcement of provisions of MCDR, 2017 and for processing and disposal of mining plan/review of mining plan. The details of inspections, results and follow

up actions thereof are given below:-

Parameter	Details
No. of inspections	Total - 22 Nos. MCDR– 18 Nos. MP/RoMP/FMCP– 04 Nos. Check-up/Others–00 Nos.
No. of violations issued	13 Nos.
No. of rules violated	31 Nos. [Rule 11(1), 11(4), 12(4), 14(3),31(4), 33, 35(2), 45(7), 55(1)(3), & 56(2) of MCDR 2017]
No. of show cause notices issued	01 Nos. (incl. notices issued on the basis of office scrutiny)
No. of mines where violations not complied even after issue of show cause notice	9 Nos. (In process of its compliance) - 9 Nos.
Action taken: Court case – Suspension –	 0 Nos. 0 Nos.

Work Carried Out by MECL in North Eastern Region

11.30 MECL has been associated with mineral exploration activities and geo-technical studies for the development of mineral industry in the North Eastern Region since 1977. 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 projects 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 Khasi Hill district.

11.31 On behalf of Directorate General of Hydrocarbon, Government 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. A total of 932 million tonnes of Oil Shale deposit have been established in the study area.

11.32 MECL is keen for development of North Eastern States. Hence with focus on North Eastern Region to augment exploration, MECL has signed MoU with Government of Assam and taken exploration for Coal in Khotarda block, Mikir hills district is under progress.

12

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

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

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.

Welfare of Women and other Sections

12.3 Internal Complaint Committees (ICC) have been constituted to look into cases of sexual harassment of women at work place for Ministry of Mines as well as organizations under its administrative control in accordance with The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

12.4 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. The complaints received in She-Box portal are disposed on priority basis as per extant rules/ guidelines.

12.5 The Geological Survey of India (GSI), attached office of Ministry of Mines and Indian Bureau of Mines (IBM) subordinate office under Ministry of Mines have also undertaken a number of activities for the welfare of Scheduled Caste (SC)/Scheduled Tribe (ST), Other Backward Class (OBC), persons with disabilities (PWD) and other weaker sections of the Society.

12.6 Measures have been undertaken for officials belonging to SC, ST, OBC and PwD communities for strict compliance of filling all the posts against vacancies reserved for them as per order issued by the Govt. of India/ MoM/DoP&T from time to time. Reservation has been followed strictly in case of their employment/promotions wherever applicable.

12.7 SC/ST/OBC cell have been established in Headquarters as well as in the respective Regional offices under supervision of the Liaison Officer to address difficulties faced by these communities and also to initiate appropriate measures for resolving their issues.

12.8 The total strength of employees in the Ministry of Mines (Secretariat) and the representation of SC/ST/OBC and other weaker sections during the year 2022 may be given in **Table 1.1**.

National Aluminium Company Limited (NALCO)

12.9 The Company follows the Presidential Directives issued from time to time on reservation of SC/ST persons in employment. The Company has constituted cells exclusively for the welfare of SC/ST employees at its Corporate Office and Units. Periodic meetings are held at Complex level and Corporate level to discuss issues related to SC/ ST employees.

The following concession/relaxations are given to SC/ST candidates in the matter of direct recruitment.

(a) Age relaxation of 5 years.

(b) Exemption from payment of application fee.

(c) Re-imbursement of travelling expenses for attending both written test and interviews.

(d) Relaxation of experience up to one year.

(e) Relaxation in qualifying marks for eligibility.

(f) Relaxation of 10% marks both in written test and interview (for posts requiring interview).

- 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 rung 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 has also been constituted under the control of the respective Liaison Officers to ensure prompt disposal of grievances and representations of SC/ST employees.
- 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 (PWDs)

The Company has been making efforts to achieve representation of PWDs (Divyangs) in all posts in Group: A, B, C & D as per Section-34 of the Rights of Persons with

Disabilities Act, 2016. From 19.04.2017 onwards, 4% of vacancies are being reserved for persons with disabilities as provided in the Act. As on 31st December, 2022, there are 97 Persons with Disability in employment of the Company in various identified posts. An 'Equal Opportunity Policy' as required under the Act has been formulated and the same has been widely circulated in addition to web-hosting. The different facilities/establishments of the Company have been made accessible as required under the Rights of Persons with Disabilities Act, 2016 and the 'Accessible India' campaign. However, these are being constantly monitored to bring about further improvement in the facilities.

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. The Company as on 31.12.2022 has 325 nos. of women employees at different levels and categories.

12.13 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.

Manpower Strength in NALCO

12.14 National Aluminium Company Limited (NALCO)

Employment of SC/ST/Ex-SM/PWD/LDP/ Minorities in the Company as on 31.12.2022 is given in **Table 12.1**

Table 12.1

Group	Total No of Employees	SC	ST	EX-SM	PWD	LDP	Minority
Executives	1567	240	147	0	33	24	61
Non-executives	3647	597	872	9	64	1488	127
Total	**5214**	**837**	**1019**	**9**	**97**	**1512**	**188**
		35.55%					

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

12.15 Employees Participation in Management over the years has been the backbone of harmonious Industrial Relations in the Company. The successful operation of various Bi-partite 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

12.16 Internal Committees have been constituted and amended from time to time in all the Units/Offices of the company for the prevention of sexual harassment of women in

work place, the details of the Committees and their members are available in the employee section of HCLs website. A provision in this regard has also been incorporated in the Conduct, Discipline and Appeal Rules of HCL.

Representation of SC/ST and OBC

12.17 The representation of SC, ST and OBC employees out of the total manpower of 1359 as on 31.12.2022 is 18.91%, 11.40% and 18.32% respectively.

12.18 Other Welfare Measures:

- HCL has renewed the Contributory Post-Retirement Medical Scheme (CPRMS) for eligible Retired Employees (including Spouse) / Surviving Spouse of retired / deceased employees and is operational for a period of 01 (one) year w.e.f 01.01.2022. The willing employees retiring in the year 2022 can also join the CPRMS-2022 scheme.
- The retired employees of the Company and their spouses are extended medical treatment at the Company's Hospitals at the Projects.
- The Company also extends support to 'Mahila Samity' and other institutions / NGOs in their endeavor to run 'Health Camps' for the local population under CSR programme.
- In the townships of the Company located at Khetri, Malanjkhand and Ghatsila as well as in other places of work, the employees of different caste, creed, religion, live together and celebrate all religious festivals with pomp and gaiety.
- The Company maintains Cultural Clubs for the employee at all the production Units.

Industrial Relations :

12.19 Industrial Relations situation in all the Units of the Company continued to be harmonious and peaceful during the year 2022-23.

Redressal of Public Grievances

12.20 All grievances are received from Centralized Public Grievance Redressal and Monitoring System's (CPGRAMS) website of https://pgportal.gov.in. The grievances are being regularly monitored and are suitably disposed off. During April-December 2022, 107 public grievances were received and there was previous carry forward of 12 grievances as on 01.04.2022. Total 113 cases were disposed-off during the year and as on 31.12.2022.

12.21 Status of implementation of the Rights of Persons with Disabilities Act, 2016

During last few years, there has been limited recruitment in the company. Therefore, there was hardly any scope of fresh inductions of physically challenged persons. In addition, the mining operations of the Company being hazardous in nature, the scope of engagement of physically challenged persons is limited. The number of physically challenged persons employed in the Company as on 31.12.2022 is as under:-

Table 12.2

Group	Number of Persons with Disabilities (PwDs)
A	16
B	0
C	6
D	7
Total	**29**

Human Resource Development

12.22 Training and Development of all levels of employees is given due priority by HCL to increase efficiency and 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.

Manpower Strengthin HCL

12.23 The manpower strength of the Company as on 31.12.2022 is 1359, details of which are given in **Table 12.3**.

Table 12.3

Category	SC	ST	OBC	General	Total
Executives (Nos.)	77	22	102	303	504
Non-Executives (Nos.)	180	133	147	395	855
Total (Nos.)	**257**	**155**	**249**	**698**	**1359**

Mineral Exploration & Consultancy Limited (MECL)

Welfare of SC/ST, Women and Weaker section

12.24 The category wise employment position including General /SC /ST /OBC /Minorities /Women (As on 31.12.2022) in the company is given in **Table-12.4**

Table – 12.4
Employment of Personnel as on 01.01.2023

Group	Total No. of employees	General	SC	ST	O.B.C	EWS	Minorities	Women
A	256*	135	35	13	70	03	13	23
B	27	09	06	02	10	00	00	00
C	585	200	108	34	238	05	21	31
D	-	-	-	-	-	00	-	-
Total	**868***	**344**	**149**	**49**	**318**	**08**	**34**	**54**

**Excluding Directors & CVO.*

12.25 Employment under all categories (Group-wise) including General/ EWS/ SC/ ST/ OBC/ Minority/Women from 01.01.2022 to 31.12.2022:

Group	Gen	SC	ST	OBC-NCL	EWS	Total	Minority	Women
A	-	1	-	-	-	1	-	-
B	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-	-
Total	**-**	**1**	**-**	**-**	**-**	**1**	**-**	**-**

12.26 MECL is an equal opportunity employer for women employees where the service rules are uniformly applicable to both male and female employees. The company is successfully running its creche facility. The women employees in the Company are provided Maternity benefits as per rules.

12.27 The company has in place an Anti-Sexual Harassment policy in line with the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013. Internal Complaints Committee (ICC) has been set up to redress complaints received regarding sexual harassment. All employees (permanent, contractual, temporary, trainees) are covered under this policy. Number of complaints received is NIL and number of complaints disposed off is NIL as on 31.12.2022.

12.28 In line with the Rights of Persons with Disability Act, 2016, MECL has implemented Equal opportunity Policy as per directive of Ministry of Social Justice & Empowerment.

Indian Bureau of Mines (IBM)

Reservation of Vacancies for Persons with Disabilities

12.29 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, B and C posts. As on 31.12.2022, 14 physically handicapped persons were under employment in IBM.

Welfare Activities for SC/ST, Women, Minorities and PWD's

12.30 Women employees constitute about 12 per cent. Training is imparted to women employees in the field of technical as well as administrative matters.

12.31 An Internal Complaints Committee constituted under the provisions of Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 is active in Indian Bureau of Mines to redress the complaints, if any, of the victims of sexual harassment at work place in a time bound manner with proactive approach strictly within the stipulations of the Act.

Jawaharlal Nehru Aluminium Research Development and Design Centre

12.32 The Centre is following the various government guidelines w.r.t PWD, SC, ST and OBC reservation.

Geological Survey of India (GSI)

12.33 The Geological Survey of India, an attached office of the Ministry of Mines, has undertaken a number of activity for welfare of the SCs/STs/OBCs/PWDs & other weaker sections and is following the rules and regulations as issued by the DoP&T from time to time so far as recruitment through SSC and UPSC is concerned.

12.34 SC/ST Cells have been set-up under the direct control of the Liaison Officers at different Regional offices of the Department including CHQ to secure their representation in employment, to address difficulties faced by them and also for their welfare measure. The Liaison Officers designated for the purpose are acting as Nodal Authority in this regard. The Meetings are being arranged from time to time at different offices. The Reservation Rosters are also being maintained properly at the end of each and every Cadre Controlling

Authority. The yearly inspection of rosters are being carried out by the concerned Liaison Officers of the different Regional offices to ensure prescribed representation of the SC/ ST/OBC/PWD & other weaker sections in employment/promotion, wherever applicable.

Women's Welfare

12.35 Internal Complaint Committee (ICC) has been constituted in different Regional offices of GSI including CHQ to look into the cases of sexual harassment of women at workplace.

12.36 The total strength of employees in the GSI and the representation of SC/ST/OBC and other weaker sections during the year 2022 is given in **Table 6.1**.

13

Budget and Audit Paras

Budget and Audit Paras

Budget Allocation for the year 2022-23 and 2023-24

13.1 Budgetary support under Revenue and Capital is obtained for different schemes implemented by Geological Survey of India (**GSI**), Indian Bureau of Mines (**IBM**), and the S&T programme. Revenue provision is also obtained for GSI, IBM, Secretariat (Proper), Grants-in-Aid to Autonomous bodies, etc. A brief summary of Demands for Grants (2022-23) is given in the **Table13.1**.

Table 13.1
Summary of Demands for Grants

(Rs.in crore)

Sl. No.	Name of the Organisation	2021-22		2022-23		2023-24
		BE	RE	BE	RE	BE
1	Secretariat (Proper)	41.50	43.96	43.64	43.64	45.00
2	Geological Survey of India	1181.58	1174.78	1205.17	1251.91	1308.60
3	Indian Bureau of Mines	110.00	103.14	113.00	105.25	122.48
4	Grants to MECL	0.00	0.00	10.00	0.00	0.00
5	Bharat Gold Mines Limited- Grants	5.84	5.84	6.00	6.70	6.70
6	S&T Programme/ Other Programme (6.1 to 6.6)	27.90	27.28	30.19	32.45	28.82
6.1	NIRM	9.95	9.95	9.42	9.17	6.38
6.2	JNARDDC	10.90	10.90	12.70	11.60	11.37
6.3	IC	0.40	0.43	0.35	0.35	0.37
6.4	NMA	0.65	0.00	0.70	1.33	0.70
6.5	Other Research Programme	6.00	6.00	7.02	10.00	10.00
7	NMET	100.00	125.00	100.00	250.00	400.00
	Total	**1466.82**	**1480.00**	**1508.00**	**1689.95**	**1911.60**

Note: *An additional amount of Rs. 2.05 crore (SCSP- Rs. 1.35 crore and TSP- Rs. 0.70 crore) has been provided to GSI vide IFD re-appropriation dated 16.12.2022 over BE/RE 2022-23. Hence available RE grant with GSI is Rs. 1253.96 crore.*

Geological Survey of India (GSI)

13.2 For FY 2023-24, GSI has been allotted an outlay of Rs. 1308.60 crore (Rev. - Rs. 1236.50 Cr. & Capital- Rs. 72.10 Cr.) in BE stage. Out of this total allotted budget grant of Rs.1308.60 crore, Rs. 65.30 crore has been allotted for all activities of NER. The allotted outlay for Establishment Expenditure is Rs.836.50 crore with major salary, allowances & LTC components of Rs.810.00 crore and Rs.105.30 crore for administrative support activities & other expenditure. The allotted outlay for GSI Missions (I to V) activities is Rs.294.70 crore and Capital outlay is Rs.72.10 crore for modernization & replacement activities of GSI. Activity-wise details of budget provision are summarized below-

a. Under 'Survey & Mapping' head (Mission-I) an amount of Rs. 135.00 crore has been allocated for operation and maintenance of three GSI vessels for 2023-24 to Shipping Corporation of India (SCI), operation & maintenance of the TOASS airborne Survey System, execution of ground survey projects e.g. Specialized Thematic Mapping (STM), Geochemical Mapping (GCM), Geophysical Mapping (GPM) etc.

b. Under 'Mineral Exploration' (Mission-II), Rs 63.00 crore has been allocated for execution of the mineral exploration programmes of GSI including payment towards the outsourced drilling. Every year GSI is taking up G4, G3 and G2 stage exploration programmes (as per UNFC) with a view to augment resources for various mineral commodities including energy minerals (coal & lignite) in different parts of the country.

c. Under 'Information & Dissemination' (Mission-III), Rs 23.60 crores has been allocated out of which Rs. 3.00 crore has been allocated for printing & publication of journals, maps, reports etc. and Rs. 20.60 crore has been allocated fo digital equipments which includes payments related the operation / maintenance of OCBIS and other miscellaneous activities under IT in all offices of GSI.

d. Under Mission-IV, Rs. 16.50 crore has been allotted for 'Research & Development' activity; Rs. 3.40 crore has been allotted for multi disciplinary Specialized investigations' and Rs. 0.10 crore has been allotted for polar studies in Antarctica.

- Under 'Research & Development' head fund has been provisioned for taking up fundamental research and development programmes, AMC of the laboratory instruments and equipment of GSI and also for the expenditures towards procurement of laboratory consumables.
- Under 'Specialized Investigations' & 'other exploration (Antarctica)' heads funds have been provisioned for execution of field work of Geotechnical investigation on societal issues, landslide studies, seismological studies, environmental studies, climatology, glaciology etc. and expedition to Antarctic, Arctic regions, miscellaneous expenditure related to AMC and maintenance of seismic and Geo-technical laboratories.

e. Under 'Training (Human resource development)' Head (Mission-V), Rs. 2.10 crore has been allocated for carrying out various training courses e.g. orientation courses, thematic refreshers course, promotion linked training programme, courses for international participants for capacity building of GSI personnel as well as geoscientists from other geological institutes.

f. As per the mandatory guidelines of Government of India, Rs. 17.50 crores has been allocated under 'Tribal area Sub Plan (TSP)' head and Rs. 33.50 crore has been allocated under 'Scheduled Caste Sub Plan (SCSP)' head for welfare service to the ST/SC people indirectly by utilization of the funds under mandated Mission-I, II, IV & V field activities falling in Scheduled Tribe and Scheduled Caste dominated areas in different parts of the country.

g. Under 'Modernisation & Replacement' head, capital grant of Rs. 72.10 has been allocated out of which Rs. 2.00 crore has been allocated for procurement of motor vehicles to carry out field activities, Rs. 55.00 crore for procurement of machinery and equipment to improve the capabilities in the field as well as GSI laboratories with an aim to generate quality earth science data contemporary in nature, Rs. 15.00 crore for procurement of information, computer, telecommunication (ICT) equipment for digital transformation of GSI's activities and Rs. 10.00 crore for furniture and fixtures.

h. Under the Administrative Support Activities, Rs. 105.30 crore has been allocated out of which Rs 73.00 crore has been allocated to meet the expenditure on domestic & foreign travel expenses, office expenses, rent, rates and taxes for land & building, professional services and Rs. 32.30 crore has been kept under 'Other Expenditure' head which includes minor civil & electrical works and repair & maintenance of different GSI buildings, supply & material, clothing & tentages, advertisement & publicity and other revenue expenditure.

i. Under 'Establishment Expenditure' Rs.836.50 crore has been allocated out of which Rs. 500.00 crore has been allocated under Salary head, Rs. 300.00 crore for allowances, Rs. 10.00 crore for leave travel concession and remaining fund has been allocated for various establishment expenditures such as wages, rewards, medical treatment. The distribution of outlay for the allotted budget grant for 2023-24 is given in the **Table 13.2**.

Table 13.2
Final Allotted Total grant 2023-24

(Rs. in lakhs)

GEOLOGICAL SURVEY OF INDIA			
Head	**GSI**	**NER**	**Total**
Establishment Expenditure			
Administrative Support (Object Class I)			
Salary	46550.00	3450.00	50000.00
Allowance	28000.00	2000.00	30000.00
Leave Travel Concession	850.00	150.00	1000.00
Wages	1700.00	0	1700.00
Rewards	200.00	0	200.00
Medical treatment	750.00	0	750.00
Total	**78050.00**	**5600.00**	**83650.00**
Administrative Support Activities (ASA) (ASA) (Object Class III)			
Domestic Travel Expenses (DTE)	3750.00	250.00	4000.00
Foreign Travel Expenses (FTE)	100.00	0	100.00
Office Expenses (OE)	2450.00	250.00	2700.00

GEOLOGICAL SURVEY OF INDIA			
Head	**GSI**	**NER**	**Total**
Rents, Rates and Taxes (RRT) for land & building	370.00	30.00	400.00
Professional Services	98.00	2.00	100.00
Total (A)	**6768.00**	**532.00**	**7300.00**
Other Expenditure (Object Class III)			
Materials & Supplies	76.00	4.00	80.00
Advertising & Publicity	145.00	5.00	150.00
Minor civil & electrical works	2500.00	0	2500.00
Repair & Maintenance	100.00	0	100.00
Other Revenue Expenditure	390.00	10.00	400.00
Total (B)	**3211.00**	**19.00**	**3230.00**
Total ASA + Total Other Expenditure (A +B)	**9979.00**	**551.00**	**10530.00**
Other Central Expenditure			
Activities / Mission			
Survey & Mapping (Mission-I) (Object Class III)			
Wages	470.00	30.00	500.00
Fuels and Lubricants	82.00	8.00	90.00
Other Revenue Expenditure	12885.00	25.00	12910.00
Total	**13437.00**	**63.00**	**13500.00**
Mineral Exploration (Mission-II) (Object Class III)			
Wages	1440.00	60.00	1500.00
Fuels and Lubricants	780.00	20.00	800.00
Other Revenue Expenditure	3940.00	60.00	4000.00
Total	**6160.00**	**140.00**	**6300.00**
Information Dissemination (Mission-III) (Object Class III)			
Other Expenditure			
Printing and Publication	296.00	4.00	300.00
Digital Equipment	2060.00	0	2060.00
Total	**2356.00**	**4.00**	**2360.00**
Spl. Investigation (Mission-IV A & B) (Object Class III)			
Wages	128.00	12.00	140.00
Fuels and Lubricants	32.00	8.00	40.00
Other Revenue Expenditure	150.00	10.00	160.00
Total (C)	**310.00**	**30.00**	**340.00**
Other exploration (Antarctica) (Mission-IV B) (Object Class III)			
Other Revenue Expenditure (D)	10.00	0.00	10.00
Total Spl. Investigation + Antarctica (C+D)	**320.00**	**30.00**	**350.00**

GEOLOGICAL SURVEY OF INDIA			
Head	**GSI**	**NER**	**Total**
Research & Development (Mission-IVC) (Object Class III)			
Wages	108.00	12.00	120.00
Material &Supplies	638.00	12.00	650.00
Fuels and Lubricants	30.00	0	30.00
Other Revenue Expenditure	830.00	20.00	850.00
Total	**1606.00**	**44.00**	**1650.00**
Training (Mission-V) (Object Class III)			
Training Expenses	202.00	8.00	210.00
Tribal Sub Plan (TSP) (Object Class V)			
Other Revenue Expenditure	1750.00	0.00	1750.00
Scheduled Caste Sub Plan (SCSP) (Object Class V)			
Other Revenue Expenditure	3350.00	0.00	3350.00
Total (Revenue)	**117210.00**	**6440.00**	**123650.00**
Capital Expenditure (Object Class VI)			
Motor Vehicle	200.00	0	200.00
Machinery & Equipment	5450.00	50.00	5500.00
Information, Computer, Telecommunication (ICT) equipment	1460.00	40.00	1500.00
Furniture and Fixture	10.00	0	10.00
Total (Capital)	**7120.00**	**90.00**	**7210.00**
GRAND TOTAL (Revenue + Capital)	**124330.00**	**6530.00**	**130860.00**

Indian Bureau of Mines (IBM)

13.3 The Demands for Grants i.e. sanctioned Budget Estimates for the Financial Year 2022-23 is Rs.113.00 crores including Rs.16.23 crores under IBM Activities and Rs.96.77 crores under Establishment. Head-wise cum Scheme-wise breakup of Activities & Establishment Budget is given in **Table 13.3**.

Table 13.3

(Rupees in Lakhs)

SL. No.	Object Heads	Establish-ment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Sch. No.5	Other Heads	NER	Total Ac-tivities	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
Revenue Section :-											
1	Salary	8480.00	60.00	20.00	5.00	5.00	-	-	130.00	220.00	8700.00
2	Wages	12.00	1.00	1.00	1.00	1.00	-	-	0.50	4.50	16.50
3	Overtime Allowance	0.10	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.10

SL. No.	Object Heads	Establish-ment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Sch. No.5	Other Heads	NER	Total Ac-tivities	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
4	Medical Treatment	170.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00	170.00
5	Domestic Travel Ex-penses	135.00	10.00	5.00	5.00	5.00	-	-	1.00	26.00	161.00
6	Foreign Trav-el Expenses	5.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00	5.00
7	Office Ex-penses	255.00	10.00	10.00	10.00	15.00	-	-	2.00	47.00	302.00
8	Rent, Rates & Taxes	50.00	20.00	0.00	0.00	0.00	-	-	7.00	27.00	77.00
9	Publications	0.00	0.00	0.00	10.00	0.00	-	-	0.00	10.00	10.00
10	Other Ad-ministrative Expenses	0.50	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.50
11	Supplies & Materials	4.00	1.00	0.00	0.00	0.00	-	-	0.00	1.00	5.00
12	P.O.L.	0.00	11.00	1.00	2.00	1.00	-	-	0.00	15.00	15.00
13	Advertising & Publicity	0.00	3.00	0.00	0.00	0.00	-	-	0.00	3.00	3.00
14	Minor Works	290.00	30.00	15.00	15.00	0.00	-	-	0.00	60.00	350.00
15	Professional Services	20.00	5.00	0.00	5.00	0.00	-	-	0.00	10.00	30.00
16	Subsidies	0.40	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.40
17	Other Charg-es	255.00	10.00	10.00	10.00	15.00	-	-	1.50	46.50	301.50
18	Mining Tene-ment System (OAE)	-	-	-	-	-	500.00	-	0.00	500.00	500.00
19	Training (OAE)	-	-	-	-	-	-	10.00	0.00	10.00	10.00
20	Swachhta Action Plan (OC)	-	-	-	-	-	-	10.00	0.00	10.00	10.00
21	Information Technology (OE)	-	-	-	-	-	-	56.00	1.00	57.00	57.00
22	Special Com-ponent Plan for Scheduled Castes (OC)	-	-	-	-	-	-	135.00	0.00	135.00	135.00
23	Tribal Area Sub Plan (OC)	-	-	-	-	-	-	70.00	0.00	70.00	70.00
Total (Revenue)		**9677.00**	**161.00**	**62.00**	**63.00**	**42.00**	**500.00**	**281.00**	**143.00**	**1252.00**	**10929.00**

SL. No.	Object Heads	Establish-ment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Sch. No.5	Other Heads	NER	Total Ac-tivities	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
24	Works Out-lay (Major Works)	-	-	-	-	-	-	1.00	-	1.00	1.00
25	Motor Ve-hicles	-	-	-	-	-	-	1.00	-	1.00	1.00
26	Machinery & Equipments	-	-	-	-	-	-	350.00	-	350.00	350.00
27	Other Capi-tal Expendi-ture (NER)	-	-	-	-	-	-	-	19.00	19.00	19.00
Total (Capital) :-		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**352.00**	**19.00**	**371.00**	**371.00**
GRAND TOTAL:		**9677.00**	**161.00**	**62.00**	**63.00**	**42.00**	**500.00**	**633.00**	**162.00**	**1623.00**	**11300.00**

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

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

3 Scheme No.3 - Technological upgradation and modernisation.

4 Scheme No.4 - Mines and minerals through various publications.

5 Scheme No.5 - Computerization online register on mining tenemant system.

**BE for the Year 2022-23 approved vide Ministry's Letter No. 1/07/2021-IF(539) dated 05.01.2022.*

13.3.(1) The Revised Estimates for the Financial Year 2022-23 is Rs.103.20 crores including Rs.12.8350 crores under IBM Activities and Rs.19.3650 crores under Establishment received vide Ministry's letter No.01/04/2022-IF(548) dated 05.01.2023. Head-wise cum Scheme-wise breakup of Approved Revised Estimates under Activities & Establishment is furnished below:-

(Rupees in Lakhs)

SL. No.	Object Heads	Establish-ment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Sch. No.5	Other Heads	NER	Total Activities	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
Revenue Section:-											
1	Salaries	7790.00	60.00	10.00	5.00	5.00	0	0	130.00	210.00	8000.00
2	Wages	12.00	1.00	1.00	0.00	1.00	0	0	0.50	3.50	15.50
3	Overtime Allowance	0.00	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00
4	Medical Treatment	140.00	0.00	0.00	0.00	0.00	0	0	0.00	0.00	140.00
5	Domestic Travel Expenses	135.00	10.00	5.00	5.00	5.00	0	0	1.00	26.00	161.00
6	Foreign Travel Expenses	20.00	0.00	0.00	0.00	0.00	0	0	0.00	0.00	20.00
7	Office Expenses	255.00	10.00	10.00	10.00	15.00	0	0	2.00	47.00	302.00
8	Rent, Rates & Taxes	50.00	20.00	0.00	0.00	0.00	0	0	7.00	27.00	77.00
9	Publications	0.00	0.00	0.00	8.50	0.00	0	0	0.00	8.50	8.50
10	Other Administrative Expenses	0.50	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.50

SL. No.	Object Heads	Establish-ment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Sch. No.5	Other Heads	NER	Total Activities	Grand Total
1	2	3	4	5	6	7	8	9	10	11	12
11	Supplies & Materials	4.00	1.00	0.00	0.00	0.00	0	0	0.00	1.00	5.00
12	P.O.L.	0.00	6.00	1.00	1.00	0.00	0	0	0.00	8.00	8.00
13	Advtertising & Publicity	0.00	3.00	0.00	0.00	0.00	0	0	0.00	3.00	3.00
14	Minor Works	290.00	30.00	15.00	15.00	0.00	0	0	0.00	60.00	350.00
15	Professional Services	35.00	5.00	0.00	5.00	0.00	0	0	0.00	10.00	45.00
16	Subsidies	0.00	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00
17	Other Charges	305.00	10.00	10.00	10.00	15.00	0	0	1.50	46.50	351.50
18	Mining Tenement System (OAE)	0	0	0	0	0	392.00	0	0.00	392.00	392.00
19	Training (OAE)	0	0	0	0	0	0	5.00	0.00	5.00	5.00
20	Swachtta Action Plan (OC)	0	0	0	0	0	0	10.00	0.00	10.00	10.00
21	Information Technology (OE)	0	0	0	0	0	0	56.00	1.00	57.00	57.00
22	Special Component Plan for Scheduled Castes (OC)*	0	0	0	0	0	0	0.00	0.00	0.00	0.00
23	Tribal Area Sub-Plan (OC)*	0	0	0	0	0	0	0.00	0.00	0.00	0.00
Total (Revenue) :		**9036.50**	**156.00**	**52.00**	**59.50**	**41.00**	**392.00**	**71.00**	**143.00**	**914.50**	**9951.00**
Capital Section :-											
24	Works Outlay (Major Works)	0	0	0	0	0	0	0.00	0.00	0.00	0.00
25	Motor Vehicles	0	0	0	0	0	0	0.00	0.00	0.00	0.00
26	Machinery & Equipment	0	0	0	0	0	0	350.00	0.00	350.00	350.00
27	Other Capital Expr.(NER)	0	0	0	0	0	0	0	19.00	19.00	19.00
Total (Capital) :-		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**350.00**	**19.00**	**369.00**	**369.00**
Grand Total:-		**9036.50**	**156.00**	**52.00**	**59.50**	**41.00**	**392.00**	**421.00**	**162.00**	**1283.50**	**10320.00**

Rs.15.00 lakhs re-appropriated from the O.H. 'Medical Treatment - Estt.' To the O.H. 'Professional Services- Estt.' and Rs.65.00 lakhs from the O.H. 'Mining Tenement System (Sch. No.5)- Activities to the O.H. ' Foreign Travel Expenses' Rs.15.00 lakhs & 'Other Charges' Rs.50.00 lakhs under Establishment vide re-appropriation order No.4 dated 24.11.2022.

**Rs.135.00 lakhs under SCPSC and Rs.70.00 lakhs under TASP has been transferred to GSI vide Ministry's re-appropriation order No.5 dated 16.12.2022.*

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

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

3 Scheme No. 3 - Technological upgradation and modernisation.

4 Scheme No. 4 - Mines and minerals through various publications.

5 Scheme No. 5 - Computerization online register on mining tenemant system.

Audit

13.4 There is no pending CAG para pertaining to Ministry of Mines, GSI and IBM as on 31.12.2022. However, The status of Audit Paras raised by Internal Audit is furnished as under:-

One CAG para related to GSI Captioned "Unfruitful Expenditure of Rs. 81.88 crore towards procurement of Helicopter and Geophysical Survey System" has been approved by the o/o Director General of Audit (Mines), Kolkata for inclusion in CAG's Audit Report (Civil -2022).

Month-wise status of Internal Audit Paras 2022-23

(For the month of December, 2022)

Organization	Audit para pending as on 01.12.2022	Para raised during the Month 12/2022	Para Settled		Paras Pending as on 31.12.2022
			Upto the Period 20-21	For the period 21-22	
GSI	588	--	-	377	211
IBM	61	--	--	05	56
Sectt. Proper	21	--	--	--	21
PAO	39	--	03	--	36
Total	**360**	**--**	**09**	**27**	**324**

MONTH-WISE STATUS OF AUDIT PARAS 2022-23
MINISTRY OF MINES

Month	Para O/S at the Begining of Month	Para Raised During Month*	Para Settled#	Para O/S at the End of Month
April, 2022	583	0	332	251
May, 2022	251	0	0	251
June, 2022	251	0	0	251
July, 2022	251	21	2	270
August, 2022	270	6	22	254
September, 2022	254	99	6	347
October, 2022	347	18	28	337
November, 2022	337	67	44	360
December, 2022	360	0	36	324
	Total	**211**	**470**	**2645**

Status of Outstanding Audit Paras as on 31.12.2022
Ministry of Mines

Sl. No.	File No.	Name of Unit	Current F.Y. (2022-23)	One year old including current F.Y.(2022-23)	Two year old (2019-20)	Three year old (2018-19)	Four year old (2017-18)	Five year old (2016-17)	More than five year old	Total
1	12	US (Cash), M/o Mines			3	2	1		11	17
2	100	US (Cash), M/o Mines						1	3	4
3	83	Dir, GSI, CHQ, Kolkata							1	1
4	83A	Controller of Stores, Kolkata							2	2
5	101	DGCO, Pushpa Bhawan		3		1			2	6
6	102	Dir, RSAS, GSI, Bengulure								0
7	38	Dir,GSI, Training Inst, Hyderabad		12						12
8	57	PAO, IBM, Nagpur			4	1	1	1	1	8
9	37	PAO,GSI Hyderabad					1		3	4
10	11	Pr. Cum PAO, M/o Mines			1		0		1	2
11	92	PAO, GSI, Shillong					4	1	6	11
12	15	PAO, GSI, Jaipur					0		2	2
13	48	PAO, GSI, Nagpur			2				1	3
14	21	PAO, GSI, Bengaluru					2		2	4
15	27	PAO, Lucknow						1	1	2
16	73	PAO, CAO, Kolkata								0
17	75	Dir., GSI, Eng. Drilling Division, Kolkata								0
18	81	NERM-IIB, Coal Drilling Division, Kolkata							1	1
19	82	DDG, GSI, M-IIB, Coal, Kolkata						1	3	4
20	89	DDG, GSI, SU: Orissa, Bhubaneshwar								0
21	26	DDG, GSI, SU: Jharkhand Ranchi		3						3
22	88	DDG, GSI, ER, SU: Bihar, Patna			1					1
23	78	DDG, GSI, SU: Sikkim & A&N, Kolkata		7			1		3	11
24	74	DDG, GSI, ER, HQ, Kolkata							2	2
25	46	GSI, SU: T.N. Chennai		7						7
26	47	GSI, SU: Kerala, Trivendrum								0

Sl. No.	File No.	Name of Unit	Current F.Y. (2022-23)	One year old including current F.Y.(2022-23)	Two year old (2019-20)	Three year old (2018-19)	Four year old (2017-18)	Five year old (2016-17)	More than five year old	Total
27	22	Director, SU: Karnataka, Goa								0
28	41	Dir, GSI, Geographics Div. Hyderabad		8					1	9
29	43	Dir, GSI,SU: Andhra, SR, Hyderabad		14						14
30	45	Dir, GSI, Engeering Division SR Hyderabad		1					2	3
31	40, 44	DDG, Gsi, SR, HQ, Hyderabad							15	15
32	25	DDG,GSI, Marripalam, Vizag				2				2
33	23	DDG, GSI, Marine & Coastal survey Division, Mangalore								0
34	24	Dir., GSI Marine& Coastal Survey Division, Coachin								0
35	79	Dir., OPEC-I, Marine and Coastal Survey Division, Kolkata							1	1
36	17	GSI, Drilling Division WR, Jaipur			1				2	3
37	20	DDG, GSI, SU: Gujrat			1		3		1	5
38	18	DDG, SU: Rajasthan						1	1	2
39	19	DDG, WR HQ, GSI Jaipur			5				4	9
40	35	DDG, GSI, J&K Jammu		10					1	11
41	30	DDG, Drilling Division, Lucknow		4						4
42	33	DDG, SU: HP & Punjab, Chandigarh								0
43	28	DDG, NR, Lucknow		7					1	8
44	29	DDG, SU: Lucknow			2					2
45	36	DDG, GSI, SU: J&K, Kashmir			0				0	0
46	31	Dir, GSI, Geographics Div. NR, Lko								0
47	34	DDG, GSI, SU: UK, Dehrdun		5						5
48	14	DDG, NCEGR, GSI, Faridabad		2					1	3
49	51	DDG, GSI,CR, SU: Maharashtra, Nagpur		7		0				7

Sl. No.	File No.	Name of Unit	Current F.Y. (2022-23)	One year old including current F.Y.(2022-23)	Two year old (2019-20)	Three year old (2018-19)	Four year old (2017-18)	Five year old (2016-17)	More than five year old	Total
50	53	Director, GSI, Operation Pune		3					3	6
51	56	Dir, GSI,MP, Jabalpur			3		1			4
52	55	DDG, SU: Chattishgarh		18					1	19
53	49	DDG, HQ, CR, Nagpur		9						9
54	54	DDG, SU: MP, Bhopal			1					1
55	50	Dir, GSI,CR, ENG. Drilling Division Nagpur								0
56	93	GSI, Drilling Division, NER, Shillong		5						5
57	98	DDG, GSI, NER, Shillong		9					1	10
33	99	Dir, GSI , SU: Tripura, Mizoram								0
58	95	Dir, GSI, Assam, Guhawati						1		1
59	97	DDG, GSI, Arunachal Pradesh, Itanagar							3	3
60	96	Dir, GSI, SU: Manipur, Nagaland, Dimpur								0
61	90	Dir, GSI, SU: sikkim, Gangtok								0
62	58	CGM (HQ), Nagpur		7						7
63	67	RCOM, Goa				1				1
64	65	RCOM, Kolkata				4				4
65	70	RCOM, Dehradun								0
66	64	RCOM, Bengaluru		7						7
67	63	RCOM, Chennai		1						1
68	71	RCOM, Jabalpur		12			1			13
69	72	RCOM, Udaipur			1					1
70	60	RCOM, IBM				1			1	2
71	110	RCOM, IBM, Bhubaneshwar								0
72	69	RCOM, IBM, Ajmer								0
73	68	RCOM, IBM, Ranchi		6		1		2		9
74	66	RCOM, Hyderabad								0
75	105	MMPLPP, Nagpur		8		2			1	11
76	62	Controller of Mines, Nagpur								0
		Total		**175**	**25**	**15**	**15**	**9**	**85**	**324**

14

Miscellaneous

Miscellaneous

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 NIC is implementing various decision support system required for better planning, monitoring and decision making. The key advantage for the MIS websites/applications is to reduce the Ministry's workload and increase overall transparency in its function. The computerization has been done in the area of Science and Technology Schemes, Mineral Concession information and Data Repository, Registration under Rule 45 of MCDR, Revision Applications, e-indent, Conference Hall Booking. A dashboard depicting production, performance and other relevant information of Ministry and its offices is developed. Detailed Analytic based Comprehensive dashboard is being developed. NIC in the Ministry is working on to Re-engineering Ministry's website (https://mines.gov.in) using latest state of art CMS driven technology in open source. The following MIS operational:

a) Dashboard of Ministry of Mines (http://dashboard.mines.gov.in)

b) Satyabhama – a Web Portal for Science and Technology Schemes (https://research.mines.gov.in)

c) Mineral Concession Information and Data Repository System (https://mcas.nic.in)

d) Revision Application System (RAS) (https://ras.nic.in)

e) Registration under Rule 45 of MCDR Rules 2017 (https://ibmreg.nic.in)

f) Intra-mines Web portal (Covers e-Indent of various stationary items and cleaning material, online booking of Conference Rooms and Service Request). This service is operational on Local Area Network of the Ministry.

g) Non-Ferrous Metal Import Monitoring System (NFMIMS)

h) IBM Registration System under Rule 45 of MCDR Rules 2017 based on Form 'K"

Support for e-Governance Applications

14.3 The following e-Governance applications have been implemented and supported by NIC in the Ministry:

- Public Financial Management System
- eOffice and SPARROW
- eVisitor 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 kind of trouble shooting is done by NIC to facilitate the smooth functioning of internet on user machines with the help of FMS team of the Shastri Bhawan Network Centre.

Wi-fi Support

14.5 Ministry of Mines has been made wi-fi enabled by NIC-Mines team. Form processing for wi-fi connection and device configuration is done by NIC Mines Team. As on date, more than 14 wi-fi access points are installed in the Ministry covering 'A' and 'D' Wings. Trouble shooting of wi-fi related problems is done on regular basis.

Videoconferencing Support

14.6 Videoconferencing of the Ministry Officials with the State Governments, Subordinate Offices, PSUs and PRAGATI VC is being facilitated by the NIC-Mines team. There are 9 VC studios operational in Ministry of Mines. To cater to the excessive demand of VC, 5 exclusive Web VC rooms (Links) have been created for Ministry of Mines to organise VC from any remote location having internet connectivity. Approximately 800 VC meetings have been conducted over the video conferencing system of NIC.

Email/VPN Cloud Support

14.7 Email requests of the Ministry Officials are processed by NIC Mines Team as and when required. Requests related to Virtual Private Network (VPN) accounts to access the e-office from networks other than NIC net are also processed through NIC team of Ministry of Mines. NIC also Managing Cloud Hosting of various websites of Ministry.

IT support to Associated Offices of the Ministry

14.8 Besides the routine coordination work at Ministry of Mines, the team is also extending support to all the associated offices of the Ministry (through NIC staff deputed at various locations) such as:

i. Indian Bureau of Mines (IBM) – for Registration System and for conducting video conferencing sessions with the Ministry.

ii. Geological Survey of India (GSI) – for conducting video conferencing sessions with the Ministry.

iii. PSUs of Ministry of Mines - for conducting video conferencing sessions with the Ministry.

E-Office

14.9 The e-office is cloud enabled e-Goverance application that can be deployed/ hosted in any data centre or in any cloud identified by the organisation. The e-office is being implemented in the Ministry of Mines from May, 2013.

14.10 The following modules have been successfully adopted:

- **eFile (File Management System)–** eFile, an intergral part of eoffice suite is a system designed for the Government departments, PSUs and Autonomous bodies to enable a paperless office by scanning, registering and routing the inward correspondences along with creation of file, noting, refrencing, correspondence attachment, draft for approvals and finally movement and tracking of files as well as receipts. efile (File Management system)– The older version of eoffice was 7.0. The New Version of eoffice is eFile – 7.2.5 released on 13.5.2022. New Features added in new version of eoffice are provision of Requesting, Initiating, Revising and Completing the review along with

Remarks on file(s). No. of new efiles during the year 1st January 2022 to 23th November 2022 is 3679. efile MIS reports has been upgraded to version 7.1.13 eFiles can be now sent to across Ministeries.

- eoffice has been implemented at IBM HQ Nagpur, Central Zone & Nagpur Regional Office with effect from 01.10.2022, and at all the Regional/ Zonal /RODL offices of IBM with effect from 01.12.2022.
- SPARROW system for online filing of immovable property return from 01.01.2023 has been implemented at IBM.
- **eHRMS:** (Human Resource Management System) eHRMS was implemented in the Ministry from 01.08.2019. Latest Version of eHRMS running in this Ministry is 4.1.5. Manav Sampada (appropriate name for Human Capital, being the most important factor for the success of any Government, Organization, or Company) is a standard ICT solution for the Government Sector, addressing maximum requirements of State Goverments related to personnel management. The first and basic objective of Manav Sampada is to provide a generic and product based solution to the State/Central Government organizations for better management of personnel through electronic service record. It further assists the top management in knowing the exact number of employees, the retirement pattern and additional requirements in coming year for planning recruitments, funds required for retiring employees, reallocation of surplus employees to other Departments/Organisations within the State, ACR/Property Return status, seniority lists etc.

Website of Ministry

14.11 Website of Ministry of Mines is developed and maintained by third party with the technical help of 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. Website of the Ministry (https://www.mines.gov.in) is "Guidelines for Indian Government Websites" (GIGW) compliant.

eSamiksha

14.12 eSamiksha 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 issues, observations made by Cabinet, recommendations made by 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 eSamiksha portal and replies to the issues raised by the Ministries/Departments and State Governments are taken up on priority basis and status is uploaded on eSamiksha portal every month. Ministry of Mines has been regularly monitoring the follow-up action in respect of eSamiksha portal.

Skill Development

14.13 The Ministry of Mines (MoM) with cooperation of the Ministry of Skill Development and Entrepreneurship (MSDE) has undertaken steps for skill development for increasing productivity and accelerated, sustainable and inclusive growth in the mining sector. The process of skill development started with signing of Memorandum of Understanding (MoU) by MoM, along with its PSUs (NALCO, HCL and MECL), with MSDE and the National Skill Development Corporation (NSDC). The apprenticeship training initiative undertaken by the CPSEs for the last 3 years is given in **Table 14.1.**

Table 14.1
Apprenticeship Training

Name of CPSE	No. of apprentices engaged in 2019-20	% of total manpower	No. of apprentices engaged in 2020-21	% of total manpower	No. of apprentices engaged in 2021-22	% of total manpower	No. of apprentices engaged in 2022-23 (till Nov 2022)	% of total manpower
NALCO	808	13.02%	895	15.41%	1135	20.56%	967	17.62%
HCL	308	4%	168*	2.39%	128*	1.93%	124$**	1.76%
MECL	73	3.9%	51	2.7%	65	2.7%	04**	0.2%

**Operations at Indian Copper Complex, Ghatsila, Jharkhand and at Taloja Copper Project, Taloja, Maharashtra suspended.hence no apprentice engaged and the same has been informed to respective Regional Directorate of Skills Development & Training (RDAT).*

$ Notification for engagement of 290 Trade Apprentices issued and applications are invited from 22/11/2022 till 12/12/2022, subsequently shall be completed soon.

***Since, Apprentices were engaged in March 2022, the next Apprenticeship engagement cycle is scheduled for Feb-March 2023, where approximately 45 Apprentices are to be engaged at 2.5% of manpower strength.*

Skill Plan for the next 5 years

14.14 The skill development initiative of Ministry of Mines has focus on following:

a) Advanced training for adoption of technology towards augmented exploration.

b) Application of remote sensing data for mines surveillance including usages of GIS platform.

c) Training on health, safety and environmental issue for safe and sustainable mining practices.

d) Operation of plants & machinery for open cast and underground mining with primary objective of enhancing productivity.

e) Training on acquisition, processing and interpretation of geo-scientific data involving fundamental and applied research.

Geological Survey of India (GSI)

14.15 Employees of GSI need skill development and capacity enhancement through field and hands-on training in the domains of Geological, Geophysical and Geochemical Map-

ping; techniques of Mineral Investigation and 3D-Statistical Modelling of Mineral Resources; Geo-scientific data handling techniques and integration; Fundamental and Advanced Research Methodologies in Geo-sciences and Public-Good Geosciences; Processing and interpretation of Aero geophysical data as well as Multi-seismic marine data; Techno-administration including Grievance and Vigilance, HR Management and Financial Management, Gender Sensitization etc.

14.16 Methods envisaged for carrying out training are Field demonstration at relevant geological sites; Hands-on training at geo-scientific laboratories; Classroom training on Geoscientific techniques and their advancements; Classroom trainings on Administration and Management; Domain-specific (Basic, Refresher and Advanced) training through classroom lectures, at field sites as well as in the laboratories; Training in collaboration with reputed agencies/academic institutes.

14.17 Skills for which training required for other stakeholders connected to GSI are Geoscientific investigations, Mineral Investigation techniques and 3D-Modelling of Mineral Resources; Operation of geo-scientific equipment and relevant software in domain of geosciences; Imparting Basic, Refresher and Advanced training in a specific domains through lectures, laboratory demonstrations and field sites demonstration.

14.18 Between January and December 2022, 3297 personnel from GSI and 447 personnel from stakeholder organizations connected to GSI like State DGMs, State and Central Organzations engaged in geoscitific investigations have been trained mainly through online/offline/blended mode. In addition, 8480 participants from different academic institutions across the country are trained under different outreach programmes like Azadi Ka Amrit Mahotsav.

Indian Bureau of Mines (IBM)

14.19 Indian Bureau of Mines (IBM), according to its charter of functions, needs to enhance its skills in various advanced technologies for mine regulation and development.

14.20 The IBM personnel are imparted trainings at Headquarter for 2-3 days and at its regional offices as well as at two skill development centres located at Udaipur and Kolkata. Training is given through Classroom lectures / presentation by the faculties drawn from IBM as well as Industry. In the backdrop of Covid Pandemic, presently the trainings are being conducted online. In last couple of years, IBM personnel had attended training programmes in outside organizations / institutes like GSITI Kolkata, National Remote Sensing Centre, Hyderabad, CDAC Hyderabad. Accordingly, further training programme wherever necessary will be conducted in association with these organization / institutions. Further, through bilateral cooperation with other countries, capacity building programme will be taken up.

14.21 Skills for which training required for other stakeholders connected to IBM: So far IBM has organised total 14 training programmes & imparted training and capacity building to 219 numbers of its own employees, 595 numbers of industry personnel and 21 State Government officers during the year 2022. IBM is routinely organizing training programmes on the Basics of Geographic Information System and Processing of Drone

Survey data on GIS platform at GIS Centre, IBM, Nagpur for IBM officers every month. Since April 2022 and up to Nov., 2022, 105 officers have been trained. IBM makes its presence in the meetings as organized by GSI/MECL for its active participation, towards synergic approach. Further, IBM officials are participating in various Training Programmes conducted by other Institutes.

14.22 IBM had initiated its efforts to upload its training modules on iGOT platform during 2020-21 by identifying lectures under different modules and with regard to videography of the same. As per the Ministry's letter No. A-33/2/2021-ESTT. Dated 05.07.2022 regarding uploading of training courses on iGOT portal, three topics/modules are identified for IBM for lecture videos i.e. (a) Mining reforms, (b) process of Mining lease to LoI (c) Mining plan Approval. Therefore, IBM has initiated the process for preparing the lecture videos through training centre & expertise available in IBM and prepared training videos related to the topics, however, due to large file size the lecture video could not be uploaded to the portal. Further, preparation of more lecture videos is in progress.

Mineral Exploration & Consultancy Limited (MECL)

14.23 Employees of MECL need training for skills in areas of Drilling & Exploration, Diamond Core Drilling Skill Enhancement, 3D ore body modelling through Surpac and datamine, Mud Technology, use of software like Minex, Surpac, AutoCAD, Datamine, Exploration for REE & Rare Earth Metals, use of high-end equipment DGPS-(PPK) system, Advanced Drilling Technology, Advances in Geosciences for Exploration of Minerals, JORC for Estimation of Mineral Resources, etc.

14.24 MECL, have provided traning to 247 employees as per the following details:

No. of employees trained from January-November 2022	Estimated No. of Employees to be trained during January-March 2023
247	**25**

National Aluminium Company Limited (NALCO)

14.25 Skills for which training is required for employees of NALCO are Behavioural skills– Leadership, Labour Laws, EQ, legal drafting skill, etc.; Functional skills- (i) Safety, (ii) Electrical, (iii) PLC skill, (iv) O&M of Testing and safety of materials handling equipment, (v) Digitisation skill- PLC & System Automation, etc.

14.26 Working as per international standard- (i) SA 8000, (ii) Internal Audit, (iii) Productivity improvement & measurement, (iv) Quality management, Project execution skill of employees, Contract handling skill for employees, Presentation skill for employees, Communication skill for employees, Negotiation skill for employees, e-procurement, inventory management.

14.27 Method for imparting training: In house through internal faculties, external faculties of national repute, from premier management/ technical institute etc and through equipment provider.

Hindustan Copper Limited (HCL)

14.28 Skills for which training required for employees of HCL are Mines Refresher Training, Fire Fighting Training, First Aid Training, Safety Training, Soft Skills Training, Fitters, Mechanics, Riggers, Welders, Mine

Surveyor Assistant, Loader & hauling operation, Blasters, Winding engine operators for underground shaft, Mining mate, HEME operators, Drilling machine operators, Ball Mill operations for beneficiations, Pump operators for mine dewatering, etc.

14.29 Method for imparting training: Training by own faculty at the Vocational Training Centers in Khetri Copper Complex (KCC), Malanjkhand Copper Complex (MCP), Indian Copper Complex (ICC). Training imparted In-House through Internal and External Faculties as well as sending employees to various Centre of Excellence.

14.30 Skills for which training required for other stakeholders connected to HCL are Loader & hauling operation, Blasters, Winding engine operators for underground shaft, Electrician, Mechanical, Fitter, Welder, General Technician, Machinist, Crane Operator, Carpenter, Plumber, Draftsman, Turner.

National Institute of Rock Mechanics (NIRM)

14.31 NIRM technical staffs are introduced to latest trends in safety practices, underground construction measurements and monitoring systems and major civil structures monitoring. Ten scientific staff were imparted such traning related to various functions of rock engineering and rock mechanics.

NIRM also trains industry engineers, associates in scientific projects through onsite traning and virtual online programmes.

14.32 NIRM deals with civil mining and infrastructure industries. The skills required for the Non Destructive Testing (NDT) services involve following:-

- **Rock mechanics and Rock engineering:** Instrumentation Installation and monitoring, statiscal software analysis, microseismic analysis, MATLAB, AUTO-CAD, Rhinoceros software, GOS and Remote sensing data processing, Computerised AZccounting, Mines induced seismology, Minex, Surpac, AutoCAD, Datamine, Mud Technology, Jerk Technology for the estimation of Minerals, etc. Advance training mine planning & design, Numerical Modelling and Analysis, Material & Rock Testing, upskilling certification courses, Safety & Rescue Courses.
- **NDT Test:** Reverse Bend Testing, Torsion Testing, Impact Testing, Compression Test, Tensile Strength, Visual Testing, Dye-Penetrant Test, Magnetic Particle test, Ultrasonuc Testing, Vibration Test, Noise analysis, IR Thermography, Wire Rope Defectograph, Soil/Rock Testing.

Redressal of Public Grievances

14.33 Department of Administrative Reforms & Public Grievances (DAR&PG) has implemented a web based Centralized Public Grievance Redressal and Monitoring System (CPGRAM) vide which grievances pertaining to concerned Ministries / Department are forwarded for redressal. A Joint Secretary has been designated as the Nodal Officer of Public Grievances. During the period 1st January, 2022 to 31st December, 2022, 1992 Public Grievances were received and 34 pending cases were brought forward from the year 2021. A total of 1997 Public Grievances have been disposed of during the period and the remaining cases have been referred to the concerned Organization / Authority for taking further necessary action in the matter.

14.34 Details of action taken on the public grievances of this Ministry and its attached / subordinate offices during the year 2022 (from 01st January 2022 till 31st December, 2022) are given in **Table 14.2**.

Table 14.2

Organization	No. of public grievances pending as on 31.12.2021	Public grievances received during 01.01.2022 to 31.12.2022	Disposed cases during 01.01.2022 to 31.12.2022	Pending cases as on 31.12.2022
Ministry of Mines	34	1992	1997	29
Geological Survey of India (GSI)	10	1051	1059	02
Indian Bureau of Mines (IBM)	3	70	67	6
National Aluminium Company Limited (NALCO)	2	46	48	Nil
Hindustan Copper Limited (HCL)	5	136	135	6
Mineral Exploration & Consultancy Limited (MECL)	0	9	8	1
JNARDDC	0	0	0	0
NIRM	0	1	1	0

Vigilance Cases

14.35 During the year 2022 (from 01st January, 2022 till 31st December, 2022) details pertaining to Vigilance Division of this Ministry and its attached/ subordinate offices are given in **Table 14.3**

Table 14.3

Organization	No. of complaints pending as on 31.12.2022	Complaints received during 01.01.2022 to 31.12.2022	Disposed cases during 01.01.2022 to 31.12.2022	Pending cases as on 31.12.2022
Ministry of Mines, New Delhi	09	20	19	10
Geological Survey of India	08	49	56	1
Indian Bureau of Mines	02	26	25	03

14.36 The details of disciplinary cases arising from vigilance complaints during the year 2022 (from 01st January, 2022 till 31st December, 2022) are given in **Table 14.4.**

Table 14.4

Organization	No. of Disciplinary cases	Nature of the penalty recommended	Status (as on 31.12.2022)
Ministry of Mines, New Delhi	4	Major: 4 Minor: 0	Disciplinary proceedings underway
Geological Survey of India	NIL	NIL	NIL
Indian Bureau of Mines	NIL	NIL	NIL

14.37 Vigilance Awareness Week was observed from 30th October, 2022 to 6th November, 2022 in the Ministry as well as in Subordinate / Attached offices of the Ministry. During the week, Essay, Quiz and debate competitions related to vigilance activities were organized in Ministry.

Geological Survey of India (GSI)

14.38 A glimpse of Vigilance activities carried out at GSI during 01th January 2022 to 31st December 2022.

a) The main focus of Vigilance Division has been to promote a culture of Preventive Vigilance. Accordingly, six chief technical examiner (CTE) type inspections were carried out. Further, a list of potentially sensitive sections were prepared and the said sections were inspected by a teams of officers chosen from the other Divisions / Sections. Total 165 nos. of such Inspections were carried out. The outcome of the inspections in appropriate cases, was shared with the Competent Authority for system improvement. To promote awareness on Vigilance Trainings / workshops were organised. Guidelines issued by the CVC from time to time have been circulated through online portal for wide dissemination amongst employees.

b) Vigilance Awareness Week– 2022 has been observed from 31st October 2022 to 06th November 2022 on theme "Corruption free India for a developed Nation" as advised by Central Vigilance Commission. During the said occasion various workshops / discussions and competitions amongst the employees on pertinent topics were organised. GSI also held 05 Awareness Gram Sabha in remote villages to percolate the message of vigilance awareness amongst the larger sections of the society. Grievance Redressal Camp, Vendors' Meet were also arranged in GSI offices.

c) GSI has appointed two Independent External Monitors (IEMs) to oversee the implementation of Integrity Pact as per Standard Operating Procedure (SOP) circulated by Central Vigilance Commission (CVC). Meetings with the IEMs are held every quarter.

d) GSI is in the process of introducing e-office in all its offices throughout the country. Once implemented, it would digitally

record the movements of files/documents on real time basis, which may be preserved for future and retrieved if required. In GSI, provision exists to lodge whistle blower complaints by the employees directly to CVO through online mode. Vigilance status of the employees are maintained online and Vigilance Clearance is processed through online mode. Annual Immovable Property Returns are examined on random basis. For faster processing, an online system for generating provision of 'Exception Report in AIPR' has been developed in GSI.

14.39 Vigilance Section Indian Bureau of Mines (IBM)

(i) Complaints handled by Vigilance Section, IBM

a) Number of Complaints received: 26

b) Number of Complaints disposed: 23

c) Number of Complaints under scrutiny (as on 31.12.2022) : 03

(ii) Inspections carried out by CVO, IBM

a) Inspection of Balaghat Manganese Mines, M/s MOIL Ltd., Village Bharwelli, District Balaghat, Madhya Pradesh carried out on 28.03.2022.

b) Inspection of Malanjkhand Copper Mines, M/s Hindustan Copper Ltd, P.O. Malanjkhand, District Balaghat, Madhya Pradesh carried out on 29.03.2022.

(iii) Following 05 Nos. of MPLN / RMPLN scrutinized under CTE Type examination during the period Jan'22 to Dec.'22.

Sl.No.	CTE Type examinations
1.	CTE type examination Bade Bacheli Tin Mine of M/s Precious Minerals and Smelting Ltd. in Village / Tahsil Bade Bacheli, District Dantewada, Chattisgarh under Raipur Regional office of IBM, over an area of 7.739 hect., was examined on 13.01.2022 and 02.02.2022, no procedural lapses were found.
2.	CTE type examination– Khetri Copper Mine of M/s Hindusthan Copper Limited in Village: Gothra, Banwas, Tahsil: Khetri, District Jhunjunu, Rajasthan, under Ajmer Regional office of IBM over an area of 395.07 hect., was examined on 15.03.2022, no procedural lapses were found.
3.	CTE type examination– Kallakudi & Kovandakurich Limestone Mine of M/s Dalmia Cement (Bharat) Limited in Village :Kallakudi & Kovandakurich, Taluka: Lalgudi, District Trichy, Tamilnadu under Chennai Regional office of IBM over an area of 13.29.5 hect., no procedural lapses were found.
4.	CTE type examination – Barwas Limestone Mine of M/s Baswas Mines, Partners S/Shri Bahadur Singh, Karan Singh &Parvesh Kumar in Village Barwas, Tahsil: Paonta Sahib, District Sirmour, Himachal Pradesh under Dehradun Regional office of IBM over an area of 4.157 hect., no procedural lapses were found.
5.	CTE type examination – Umsoo Mootang Block II Limestone Mine of M/s Dalmia Cement (Bharat) Limited in Village Thangskai, P.O. Lumshong, Distrct East Jaintia Hills, Meghalaya over an area of 4.90 hect.. In the case it is observed that copy of Review of Mining Plan has not been forwarded to the concerned State Government. This procedural lapse is observed in the processing of the mining plan document. Clarification in the matter has been asked from the concerned Regional Office of IBM.

(iv) 01 Procurement / AMC file of EPABX (Karel DS-200 System) was scrutinised during the period.

14.40 Following preventive activities were carried out by this office during the period:

a) During the period Agreed List / ODI list were prepared for the year 2022.

b) In total 192 Annual Immovable Property returns for the year ending 31.12.2021 in respect of employees of IBM were scrutinized by this office, no adverse observations were made.

c) 02 Training Programs for New Entrants as well as Mid-Career Training for the officers and Staff of IBM were organized.

d) In 02 cases system improvement were suggested by this office.

e) Various rules guidelines in pertinent matters as issued from time to time by DOPT, CVC, etc. have been circulated through Head of Office, IBM to all Zonal & Regional Offices of IBM.

f) Various programs such as Essay, Debate, Quiz, Poster, Slogan, Speech competitions were organized in all the Zonal / regional / Sub-Regional Offices of IBM on the occasion of Vigilance Awareness Week, 2022. On the occasion of Vigilance Awareness Week – 2022, Vigilance team organised a Gram Sabha on 10.11.2022 at Kadholi Gram Panchayat, Kadholi, Nagpur, Maharashtra on the theme "Corruption free India for a developed Nation" as an outreach activity.

g) CVO, IBM administered Integrity Pledge to citizen of gram panchayat and address the gathering on Vigilance Awareness and its role in prevention of corruption in the society and how to address the grievances to make the Country Corruption Free. During the Gram Sabha CVO, IBM awarded talent students of Kadholi School and Sarpanch with Momento.

Swachh Bharat Abhiyan

Ministry of Mines

14.41 Ministry of Mines and PSUs/Attached offices under the Ministry of Mines organized the following Swachhta 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

(iv) 16.06.2016 to 31.06.2016

(v) 16.12.2017 t0 31.12.2017

(vi) 16.10.2018 to 31.10.2018

(vii) 16.11.2019 to 30.11.2019

(viii) 16.11.2020 to 30.11.2020.

(ix) 16.11.2021 to 30.11.2021.

(x) 16.11.2022 to 30.11.2022.

Activities under Swachh Bharat Mission

14.42 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

14.43 The Ministry has ensured all those items which were old/ unserviceable to keep specific space marked by CPWD. The Ministry does not have any condemned vehicle in its premises.

Seepage of condensed water of ACs

14.44 Ministry of Mines has ensured that water seeping through ACs are properly drained out without any accumulation.

Proper cabling of cable TV/dish antenna wires

14.45 All the electrical cables/TV cables have been placed inside the conduit pipes and it is ensured that there are no loose wires hanging around. The false ceilings in the corridors have been strengthened.

Fire safety measures

14.46 Instruction has been issued to ensure that all electrical points are switched off after closing of the office.

Daily Sanitization of Premises of Ministry of Mines

14.47 Ministry of Mines has ensured that daily sanitization of corridors, rooms and lift lobby in premises of Ministry of Mines, Shastri Bhawan is conducted.

14.48 JNARDDC undertook special campaign for cleanliness of all labs and office premises, toilets etc. Swachatha Pakhwara was observed in Nov 2022 with a view to encourage the zeal of the above program. In the current year JNARDDC has undertaken the following activities under Swachta Action Plan (i) Re-carpeting of office road of technical complex (ii) Mass Plantation programs (iii) Review and disposal of files of record room (iv) Renovation of Guest House and sanitation facilities (v) Disposal of scrap.

Photo: 14.1

The 800 metres cement road of JNARDDC was inaugurated by Ms Nirupama Kotru, IRS, Joint Secretary & Financial Advisor for Ministry of Coal & Mines in July 2022.

Right to Information Act, (RTI)

Ministry of Mines

14.49 The Ministry of Mines and its subordinate office, attached office, Autonomous Bodies and Public Sector Undertaking (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**. 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 year 2022 (1st January, 2022 to 31st December, 2022), the Ministry received 726

applications under the RTI Act, which were timely responded. 51 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, First Appeals and Second Appeals w.r.t. the Ministry and its office is given at **Table 14.5**, **Table 14.6** and **Table 14.7** respectively.

14.50 Indian Bureau of Mines (IBM) has appointed Central Public Information Officers and Appellate Authorities. During the year 2022 (1st January 2022 to 31st December 2022), the Bureau received 316 applications under the RTI Act, which were timely responded. 27 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, First Appeals and Second Appeals w.r.t. IBM is given at **Table 14.5**, **Table 14.6** and **Table 14.7** respectively.

Table 14.5
RTI Application/Request Status (w.e.f. 1st January, 2022 to 31st December, 2022)

Organizations	Previous Pendency as on 01.01.2021	No. of cases				Pendency			
		No. of RTI / Requests / Applications received during the period	Disposal	Information denied under section 8 (1), 9, 11, 24 & other of RTI Act	Balance	0-3 Months	4-6 Months	7-9 Months	10-12 Months
Ministry of Mines (Sect.)	2	726	711	12	3	3	0	0	0
GSI	29	630	618	22	12	12	0	0	0
HCL	25	316	333	6	8	8	0	0	0
IBM	17	291	224	68	16	16	0	0	0
JNARDDC	4	280	282	150	2	2	0	0	0
MECL	1	97	97	0	1	1	0	0	0
NALCO	0	4	4	1	0	0	0	0	0
NIRM	0	20	20	0	0	0	0	0	0

Table 14.6
RTI Appeals Status (w.e.f. 1st January, 2022 to 31st December, 2022)

Organizations	No. of cases					Pendency			
	Previous Pendency	No. of 1st Appeals received during the period	Disposal	No. of Appeals rejected/ information denied under Section	Balance	0-3 Months	4-6 Months	7-9 Months	10-12 Months
Ministry of Mines (Sect.)	0	51	49	0	2	2	0	0	0
NALCO	4	78	74	0	4	4	0	0	0
HCL	1	27	27	0	1	1	0	0	0
MECL	1	62	60	2	1	1	0	0	0
IBM	1	32	33	24	0	0	0	0	0
GSI	0	11	11	0	0	0	0	0	0
NIRM	0	1	1	1	0	0	0	0	0
JNARDDC	0	4	4	0	0	0	0	0	0

Table 14.7
CIC Second Appeal Status (w.e.f. 1st January, 2022 to 31st December, 2022)

Organizations	No. of Cases				
	Previous Pendency	No. of 2nd Appeals filed in CIC	Decided		
			In favour of Appellant	In favour of Organization	Balance
Ministry of Mines	0	6	0	6	0
NALCO	0	5	3	2	0
HCL	0	11	0	11	0
MECL	0	15	9	6	0
IBM	0	10	3	7	0
GSI	0	1	0	1	0
NIRM	0	0	0	0	0
JNARDDC	0	0	0	0	0

Government e-Market (GeM) Portal

14.51 Ministry of Mines has been procuring various items it needs through GeM portal those which are available on GeM. During Financial Year 2021-22, the Ministry procured items worth Rs.4.11 crore through GeM. Total 461 orders were placed on the GeM portal during financial year 2021-22 by the Ministry of Mines.

Azadi ka Amrit Mahotsav

Blood donation phase-2 (07.01.2022)

14.52 The phase-2 of blood donation camp was organized in JNARDDC premises on 7th Jan 2022 was highly successful with 54 employees and staff donating blood in the camp conducted by the State Government Medical College & Hospital (IGGMCH).

Photo: 14.2

14.53 NIRM has successfully conducted advanced lectures series through Azadi ka Amrit Mahaostav (AKAM) (75 years of India Independence) technical weekly lectures with the participation of industry experts and scientists of the organisation.

ANNEXURES

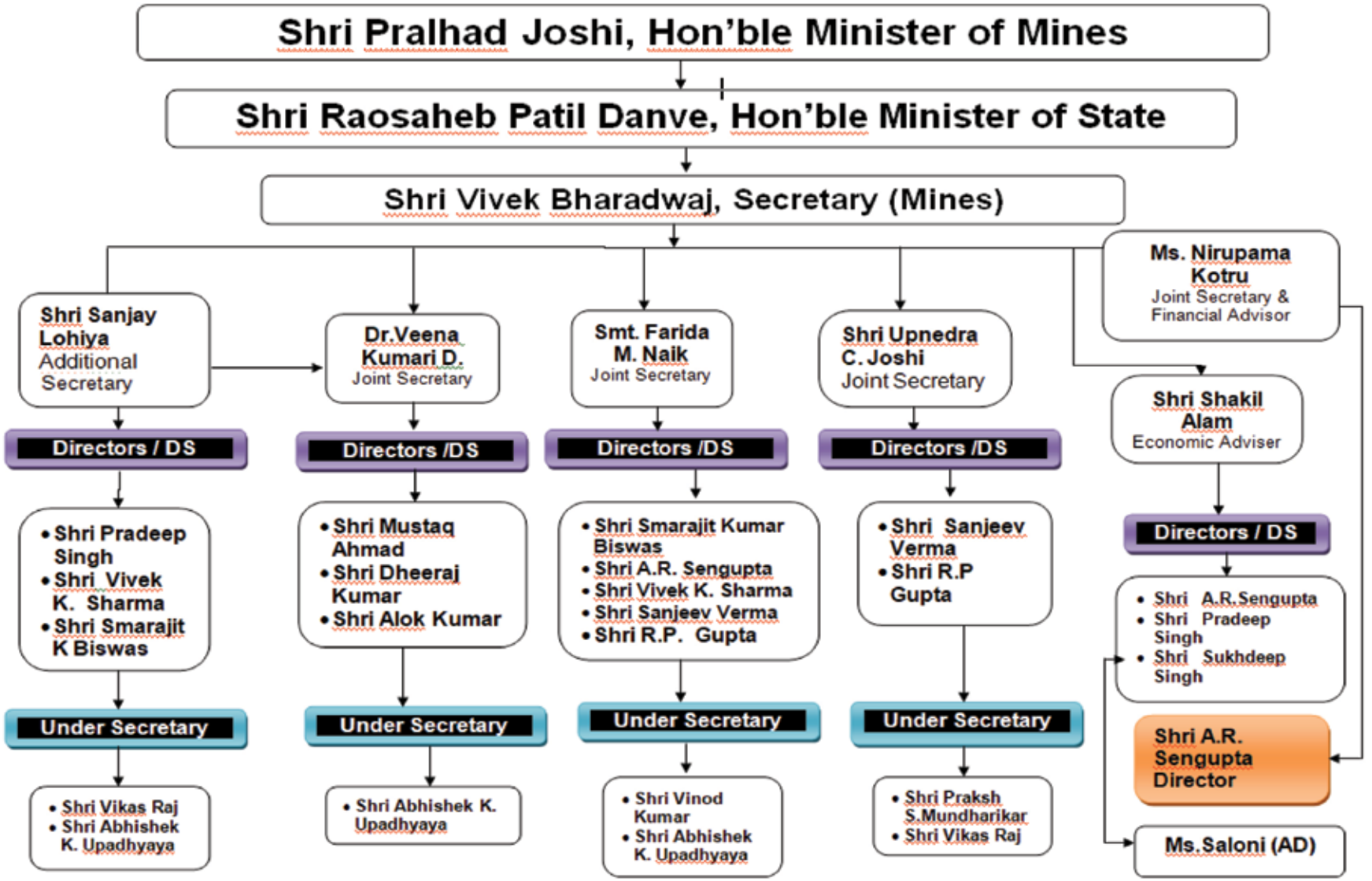
Annexures

Annexure 1.1	Organizational Structure Of Ministry Of Mines
Annexure 1.2	AKAM Iconic Week Program (11th to 17th July, 2022)
Annexure 1.3	Daily expenditure report for COVID-19 – DMF funds
Annexure 1.4	Increasing Efficiency in Decision Making in Government
Annexure 2.1	Production of selected minerals, 2017-18 to 2021-22 (P) (excluding Atomic & Fuel Minerals)
Annexure 2.2	Export of Ores & Minerals from 2017-18 to 2021-22
Annexure 2.3	Import of Ores & Minerals from 2017-18 to 2021-22
Annexure 2.4	Reserves/Resources of Minerals as on 1.4.2020
Annexure 2.5	Scenario of Mineral Rich States (Excluding Atomic, Fuel Minerals & Minor minerals)
Annexure 6.1	Year wise / activity-wise financial performance of GSI against the approved budget outlay during F.Y. 2021-22 and BE grant and expenditure till December, 2022 and projection of expenditure in last quarter (January, 2023 to March, 2023) of F.Y. 2021-22 and fund utilization during calendar year 2022
Annexure 6.2	Performance related to various regulatory and development functions of IBM during the year 2022 (as on 31.12.2022)
Annexure 6.3	Mineral Wise Mining Lease (Other than Atomic, Hydro Carbons Energy and Minor Minerals) as on 31.03.2021(P)(All India)
Annexure 8.1	Detailed time lines and outcomes of ongoing and completed projects of JNARDDC, Nagpur
Annexure 11.1	During FS 2021-22, a total of ten items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including two RP items have been taken up in NER of which two items are taken up in Arunachal Pradesh, one in Assam, three in Manipur-Nagaland, three in Meghalaya and one in Sikkim. During the period from 1st January 2022 to 31st March, 2022, an area of 1130 sq. km and 70 Line km in RP items have been covered.

Annexure 11.2	During FS 2022-23, a total of six items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including two RP items have been taken up in NER of which two items are taken up in Arunachal Pradesh, one in Assam, two in Meghalaya and one in Sikkim. During the period from 1st April 2022 to 31st December, 2022, an area of 718 sq. km have been covered.
Annexure 11.3	Total 17 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern have been taken up during the FS 2021-22 in parts of Arunachal Pradesh, Assam, Meghalaya Tripura & Mizoram and Manipur-Nagaland. An area of 7565 sq. km has been covered during the period from 1st January 2022 to 31st March 2022.
Annexure 11.4	Total 30 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern have been taken up during the FS 2022-23 in parts of Arunachal Pradesh, Assam, Manipur-Nagaland, Meghalaya and Tripura & Mizoram. An area of 10965 sq. km has been covered during 1st April 2022 to 31st December 2022.
Annexure 11.5	Two GPM items in North & West Garo Hills districts, Meghalaya and Goalpara district, Assam and East, West & South Garo Hills Districts, Meghalaya has been taken up during FS 2021-22, an area of 1620 sq. km have been covered during the period 1st January 2022 to 31st March 2022.
Annexure 11.6	Two GPM items in North, West and South west Garo Hills districts, Meghalaya has been taken up during FS 2022-23 and an area of 960 sq. km have been covered during the period from 1st April 2022 to 31st December, 2022.
Annexure 11.7	Two items of Photo Geology and Remote Sensing (PGRS) is taken up on 1:50,000 Scale during FS 2022-23 in North, South, East, West Garo hills & West Khasi hills District Meghalaya using ASTER data and an area of 3300 sq. km has been completed during the period from 1st April 2022 to 31st December 2022
Annexure 11.8	Details of mineral exploration items taken up in NER during FS 2021-22 and 2022-23.
Annexure 14.1	List of Nodal Officers, CPIOs and Appellate Authorities in Ministry of Mines

Annexure 1.1

ORGANIZATIONAL STRUCTURE OF MINISTRY OF MINES



Annexure 1.2


Government of India
MINISTRY OF MINES
Iconic Week
Azadi Ka Amrit Mahotsav
AKAM Iconic Week Program
11th to 17th July, 2022
Monday, 11 July 2022
Event 1: Quiz Competition for Ministry Officials on the History of India's Freedom Struggle by the Ministry of Mines
Event 2: 6th National Conclave on Mines and Minerals
Tuesday, 12 July 2022
Wednesday, 13 July 2022
Event 3: Conduct of 'Prabhat Pheri' by Employees of HCL, Holding Banners and Posters Highlighting the Contribution of Freedom Fighters and Martyrs in the Struggle of India's Independence
Event 4: Conduct of 'Blood Donation Camp' by MECL
Event 5: Inauguration of State-of-the-Art Smart Classrooms set up in Government Schools by NALCO
Thursday, 14 July 2022
Friday, 15 July 2022
Event 6: Launch of Programme by HCL to Promote Micro Enterprise in Various User Segments of Copper
Event 7: One-Day Programme by GSI to Propagate the Activities and Achievements of GSI amongst the General Mass including School Children
Event 8: Special Plantation Drive by JNARDDC
Event 9: Online Brainstorming Session by NIRM with Academia and Industry to Identify and Evolve Strategies for Future Collaborative Work on Development of New Tools and Techniques
Event 10: 'Seminar' By HCL on Key AKAM Pillars of Ideas@75, Actions@75 and Resolves @75
Saturday, 16 July 2022
Sunday, 17 July 2022
Event 11: Mega Blood Donation Camps by NALCO in Operational Locations
Event 12: Mobile Medical Health Checkup Camp by MECL
Event 13: Audio-Visual Creative by HCL on the Role of Copper in Contemporary World along with History of Copper Mining in India
Monday-Sunday, 11-17 July 2022

Annexure 1.3

Daily expenditure report for COVID-19 – DMF funds

(till October 2022)

S. No.	Name of State	DMF fund available as on 28th March 2020 (Rs.in crore)	DMF fund available as on 31st March 2021 (Rs.in crore)**	Cumulative amount spent on activities related to COVID-19 since 28 Mar 2020 (Rs. in crore)
1.	Andhra Pradesh	623.12	278.68	139.79
2.	Assam	77.50	-	0.65
3.	Bihar	84.50	-	0.00
4.	Chhattisgarh	1190.04	1707.59	101.09
5.	Goa	187.89	-	30.53
6.	Gujarat	153.52	83.68	26.23
7.	Haryana	20.24	-	0.00
8.	Himachal Pradesh	135.66	-	0.43
9.	Jharkhand	2056.85	-	22.85
10.	Karnataka	1281.64	1211.64	204.52
11.	Kerala	2.00	-	0.00
12.	Madhya Pradesh	1297.65	1185.56	9.24
13.	Maharashtra	687.99	-	59.50
14.	Odisha	3274.18	6418.90	461.91
15.	Punjab	26.16	-	0.65
16.	Rajasthan	2020.08	2625.28	60.03
17.	Tamilnadu	98.93	99.60	17.92
18.	Telangana$	1001.20	-	334.08
19.	Uttar Pradesh	383.22	423.22	11.29
20.	Uttarakhand	74.39	110.62	10.16
21.	West Bengal	17.70	-	0.46
Total		14694.46	14144.77	1491.33

Note: *Total balance available in DMF as on 28 March 2020 is 14694.47 cr. and 30% of this comes as approx. 4408 cr.*

** As per D.O. No. 7/2/2020-MIV dated 28.03.2020 Rs 334.08 crore from 19 districts has been transferred top Chief Minister's relief fund.

Annexure 1.4

Increasing Efficiency in Decision Making in Government

Sr. No.	Reform	Status	Remarks
1.	Channel of Submission and delegation of powers	Implemented	Ministry of Mines has reviewed its channel of submission vide its O.O. A-50/8/2021-Estt. dated 09.06.2021 while delegating the power of final disposal authority to lower functionaries, wherever deemed feasible.
2.	Digitization of Central Registration Units	Implemented	Ministry of Mines has fully digitized CRU with adequate technology and manpower.
3.	Adoption of e-office version 7.0	Implemented	Ministry of Mines is currently running all its file related work on the E-office version 7.2.5.
4.	Operationalization of Desk Officer system	Implemented	Ministry of Mines has implemented Desk Officer System by converting two of its erstwhile sections in to desks and designating the head of sections as desk officers.

Annexure 2.1

Production of MCDR Mineral for Last Five Year (2017-18 to 2021-22 (P))

(Value in ₹ Crore)

Minerals	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)		2022-23(P) (till Nov'22)	
		Production	Value	Production	Value	Production	Value	Production	Value	Production	Value	Production	Value
Bauxite	Tonne	22786106	15784174	23689619	17836033	21825227	16299333	20380548	16793447	22493947	24767048	15246904	18085373
Chromite	Tonne	3480941	32037005	3970691	36850747	3929260	32134395	2830413	21862796	3785625	47298073	1946757	26970543
Copper Concentrate	Tonne	141988	7706612	143668	8846151	124586	8448405	108718	8533354	114421	10951112	72687	14984759
Copper Ore	Tonne	3678002	0	4134702	0	3952472	0	3272915	0	3569632	0	1969247	0
Gold Ore	Tonne	549683	0	567291	0	595511	0	437669	0	491160	0	367553	0
Gold Primary	Kg	1650	4770022	1672	5267696	1742	6495723	1127	5475470	1251	6011677	783	4019657
Iron Ore	Tht	201424	347131038	206495	453465828	244083	496430578	205042	527292469	253974	963813280	155954965	472361780
Lead & Zinc Ore	Tonne	12613866	0	13752295	0	14479032	0	15455342	0	16338461	0	10672079	0
Lead Concentrate	Tonne	306398	11429413	358369	16316914	351746	18260832	376923	18810483	368040	22366174	242016	15478063
Manganese Ore	Tonne	2599814	19907475	2832314	21640166	2910186	18849100	2703313	17415460	2695991	22240539	1646974	13823278
Silver	Kg	557691	21179042	679386	25824756	609340	25616104	705796	42664424	647140	42123586	239147	14539158
Tin Concentrate	Kg	16758	11347	21212	14627	15530	10337	16865	10413	26383	32129	28912	38697
Zinc Concentrate	Tonne	1539657	49799273	1456804	56083827	1446824	60438504	1513996	63127101	1594087	81815820	1056202	58619162
Metallic Mineral			**509755402**		**642146745**		**682983311**		**721985416**		**1221419438**		**638920469**
Apatite	Tonne	0	0	0	0	0	0	0	0	0	0	0	0
Diamond	Carats	39699	374110	38437	539062	28816	352472	13917	147696	266	18051	320	49864
Fluorite (Graded)	Tonne	1314	8646	1079	8117	1315	8844	1052	8018	1237	8831	511	2692
Garnet	Tonne	158276	1618904	123404	1746757	568	1775	7114	26378	8182	29880	7085	23780
Graphite	Tonne	33649	28229	39030	36233	34674	55907	35386	87147	57264	95192	43839	87843
Iolite	Kg	0	0	73	684	90	579	16	73	27	191	0	0
Kyanite	Tonne	7818	23277	4889	15757	3498	12728	4925	9251	9432	17578	2702	5160
Limeshell	Tonne	14765	51445	7534	27780	4600	18730	0	0	100	220	100	238
Limestone	Tht	340417	80995698	379975	89584489	359464	88890081	349120	86484948	392760	97349554	260589866	68914769
Magnesite	Tonne	195055	593650	146875	408287	102554	351947	74661	314677	113495	450169	71560	307130
Marl	Tonne	1969796	331290	1890308	349420	2148854	412464	2216414	417183	1853481	326499	908444	194895
Moulding Sand	Tonne	7100	1804	14805	4145	12905	3766	14363	4150	16843	5080	13882	4365
Phosphorite	Tonne	1515645	3668267	1421086	3883571	1400189	4731314	1455829	4694525	1395079	7616477	1209183	7684857
Rock Salt	Tonne	47	421	17	160	130	1447	486	14156	286	6125	313	1801
Selenite	Tonne	469	939	2906	5812	2154	4206	402	602	756	1021	328	443
Siliceous Earth	Tonne	86662	53164	80237	50206	19367	11710	23823	14686	31783	21209	16066	8782
Sillimanite	Tonne	81638	671690	69919	564498	13221	37903	11110	13987	3432	7973	1049	2891
Sulphur	Tonne	825173	0	890400	0	900942	0	737337	0	880857	0	442623	0
Vermiculite	Tonne	6054	7075	2992	3708	2774	3347	1260	2157	3061	3768	1474	926
Wollastonite	Tonne	153049	126025	184063	172013	124757	139695	103902	122210	108383	99265	66724	93847
Non-Metallic Mineral			88554632		97400699		95038914		92361845		106057083		77384284

Source: MCDR return
(P) : Provisional

Annexure 2.2

Export (including Re-export) of Minerals for the period 2017-18 to 2021-22

(Value in ₹ '000)

Commodity	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Abrasive (natural)	TON	49815	427973	80436	1380074	92241	1568206	23411	376713	14106	236450
Alabaster	TON	4	41	12	129	27	256	4	184	++	11
Alumina	TON	1361379	32961498	1389105	46982487	1330038	30900409	1265941	28280781	1487035	47334417
Andalusite	TON	6	327	100	2659	19	1240	9	476	18	1233
Antimony Ores & Conc.	TON	4	290	++	6	--	--	--	--	--	--
Arsenic Sulphide (natural)	TON	25	280	25	212	++	69	277	1697	51	505
Asbestos	TON	132	943	1112	33914	1001	31011	299	11991	1906	68026
Ball Clay	TON	157737	357087	213999	497944	153658	398714	170915	410109	266680	664037
Barytes	TON	1652974	9308879	2114610	11781173	2221693	12896670	1010894	6261470	1874837	11075666
Bauxite	TON	1529308	2705037	1509738	3045300	524229	1421269	240841	951442	378081	1005256
Bentonite	TON	1599605	4825168	1693046	5846662	1647485	5674970	1557484	5215656	1585962	5850483
Borax	TON	3130	261790	2353	238103	2977	359860	2996	414601	4725	656472
Building And Monumental Stones Nes	TON	8073663	10402292	9137308	10806105	12612479	15692854	13134116	24200968	13295779	24912268
Calcite	TON	38637	289088	39251	303449	36433	273950	23867	155049	24789	163372
Chalk	TON	682	4295	1199	7736	1317	8022	1104	6155	1129	7557
Chromite	TON	81835	1743015	39273	1337693	33898	867910	2872	71979	2625	89710
Clay (others)	TON	37615	367334	44195	428742	50365	476744	45346	402787	49635	361745
Coal(ex Ligbite)	THT	1504	8783039	1305	9500065	1045	5929549	2943	5736794	1314	11233701
Coal,gas Water Etc. (except Gaseous Hydrocarbons)	TON	37	1121	++	100	--	--	--	--	++	2
Coal:lignite	THT	1	263660	2	254653	3	319838	2	234709	1	203336
Cobolt Ores & Conc.	TON	++	4	1	4496	2	9478	--	--	--	--
Coke	TON	90400	1624502	101863	2205464	111507	2383337	207412	4771075	1299461	41017403
Copper Ores & Conc.	TON	61005	3805458	181642	16627621	212659	20450948	82463	7689376	34827	3964549
Corundum (natural)	TON	--	--	101	2149	--	--	62	137	89	241
Diamond		**	1620221004	**	1758167200	**	1400336074	**	1258209200	**	1893641728

Commodity	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Diatomite	TON	52235	456663	27893	273001	4302	72842	3240	69439	1964	58544
Dolomite	TON	73424	377097	78010	308053	91431	349684	95892	349090	113380	391843
Earth Clay	TON	5827	63589	3650	38825	2652	18037	3881	22220	3775	53782
Emerald (cut & Uncut)		**	17756469	**	23026249	**	17387875	**	5316603	**	10808861
Felspar (cut & Uncut)		**	303032	**	338518	**	203185	**	198059	**	254062
Felspar (natural)	TON	544666	2708371	655913	3310611	640709	3225696	705280	3931135	763219	4194510
Fire Clay	TON	4115	30574	4665	40928	5172	41898	5324	43606	4473	45578
Flint	TON	824	7683	790	10393	1195	8014	406	2953	570	5837
Fluorspar	TON	468	15317	533	23410	1368	51562	474	22436	844	43463
Garnet(Cut And Uncut)		**	416710	**	494842	**	366806	**	280824	**	378455
Garnet(abrasive)	TON	157223	2346630	104344	1783920	74697	1254539	76799	1265586	81270	1433741
Granite	TON	6524816	92485124	6811728	102014060	6678131	102248504	7522159	113279766	7572368	126460352
Graphite(natural)	TON	907	77567	402	22960	607	32629	716	42994	764	46963
Gypsum	TON	161245	593845	175269	684490	151722	578922	213061	723888	220634	765738
Iron Ore	THT	24204	94901382	16149	92626090	36625	186092710	57723	362556021	26494	241480427
Kaolin	TON	214470	1010904	446358	1709970	431536	1929478	287260	1610489	339591	2398327
Kieselguhr	TON	124	2577	61	1341	113	2399	27	917	28	516
Kyanite	TON	166	3404	283	4872	143	2627	252	9033	1655	15376
Lead Ores & Conc.	TON	++	52	37	2007	3	202	9	1076	12	1595
Limestone	TON	2812253	4102283	3883757	4947503	3760402	4656567	3528973	42939083	12160342	4551537
Magnesite	TON	9575	188589	6268	204287	5453	147073	5477	171020	5384	173809
Manganese Ore	TON	44167	508784	55845	138120	58198	254643	82363	974940	113606	588189
Marble	TON	355888	7669802	385241	8757384	310613	9010909	295085	10082272	324267	11352007
Mica	TON	155095	6193290	152494	6200102	116854	4909143	144121	5733785	151706	6594832
Molybdenum Ores & Conc.	TON	7	1922	6	81	3	3023	45	43181	++	120
Natural Gas	TON	179552	6315313	73574	3802681	52408	2202387	17992	658242	3	883
Nickel Ores & Conc.	TON	++	19	50	1619	++	++	--	--	20	5183
Niobium Or Tantalum Ores & Conc.	TON	++	213	++	790	361	943	++	217	++	18
Ochre	TON	4515	69098	3491	65042	2934	72045	4126	71626	6085	103351
Other Minerals Nes	TON	1670505	2298250	3817136	5538145	3643829	4587040	3842874	4244574	3419980	5523312

Commodity	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Precious & Semi-precious Stones (cut & Uncut):total		**	12656407	**	14493857	**	12083066	**	23463605	**	50616826
Preciuos Metal Ores & Concentrates	KG	116000	792	50001	484	--	--	260175	5435	26253	1265
Quartz And Quartzite	TON	556434	4305607	793394	5702081	944041	6087293	772127	6213690	965159	7559270
Rock Phosphate	TON	395	598	1651	46794	257	2015	825	5602	540	11316
Salt (Other Than Common Salt)	TON	9969597	9402723	12755381	14627311	11681705	13681149	8260913	10571743	8863780	13393717
Sand (excl. Metal Bearing)	TON	32444	419870	3390	24451	1894	32610	1178	13630	619	17107
Sandstone	TON	933456	12329001	1032376	13570942	795763	10434171	794445	11220825	691771	11282294
Silica Sand	TON	2745	22157	3152	27793	2391	14934	43061	63008	825	4928
Sillimanite	TON	16193	171835	9984	111874	1025	14961	4998	94359	3120	64355
Slate	TON	86295	1954266	80536	2180250	61143	1983349	66335	2453970	68569	2733090
Steatite	TON	244757	3580880	259520	3764807	250649	3583316	283303	4364076	324593	5201974
Sulphur (exc. Sub-limed Precipited& Colloidal)	TON	573855	4254428	479650	4332470	802175	3872834	802713	4328627	1290620	21010532
Tin Ores & Conc.	TON	++	3	++	54	++	1	--	--	--	--
Titanium Ores & Conc.	TON	355474	6010133	359971	6566847	246203	4995763	246534	5348323	215910	6155343
Tungsten Ores & Conc.	TON	30	29880	34	43180	--	--	--	--	13	7139
Vanadium Ores & Conc.	TON	--	--	10	2320	10	10801	--	--	--	--
Vermiculite	TON	454	5092	583	7251	634	7902	853	11573	1263	21780
Witherite	TON	8	319	++	87	++	156	++	104	++	128
Wollastonite	TON	12478	224919	13786	279115	14582	298591	13716	311809	11705	282266
Zinc Ores & Conc.	TON	1206	31460	2078	71169	317	15828	399	20716	1762	46757
Zirconium Ores & Conc.	TON	308	31130	89	4469	1	78	++	21	++	180
Total		**	1994690178	**	2191682036	**	1896831578	**	1966539540	**	2578629646

Source: DGCI&S, Kolkata; data as on 11.11.2022 P: Provisional, -- :Nil, ++ : Negligible **: Not additive

Annexure 2.3

Import (including Re-import) of Minerals for the period 2017-18 to 2021-22

(Value in ₹ '000)

Commodity	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Abrasive (natural)	TON	5386	68021	4941	74317	4234	59872	3221	55212	3718	78311
Alabaster	TON	1145	28996	1378	39474	1040	32801	826	27872	1572	59681
Alumina	TON	2224197	60483412	2856524	102946453	1844483	49829384	2334786	57491719	2549567	82447635
Andalusite	TON	14374	318253	14263	355232	17618	425962	15217	428831	10419	344730
Antimony Ores & Conc.	TON	5257	1093067	7496	1609649	7656	1265983	5977	1072406	4555	1499919
Arsenic Sulphide (natural)	TON	20	1155	7	557	7	995	4	570	18	2119
Asbestos	TON	357182	11603678	364107	12253121	361163	12432333	308506	11851124	437511	16631390
Ball Clay	TON	197847	1514693	175253	1579468	126794	1115239	65828	765439	93855	1134427
Barytes	TON	10983	237166	11498	266740	15436	427967	11691	313860	16577	523859
Bauxite	TON	1461494	7727096	2254595	13364136	2246681	10817757	3034041	13709540	3009079	18963241
Bentonite	TON	48964	657246	57232	868080	72618	882272	90933	1019395	142010	2131123
Borax	TON	160134	4753975	181625	5886234	176421	5644322	194448	6337254	223368	7973967
Building And Monumental Stones Nes	TON	103826	418406	201754	850408	47971	523956	16327	360034	44482	422105
Calcite	TON	74152	353344	71713	346401	63458	302799	67643	374975	41688	290721
Chalk	TON	6988	36764	254	6143	105	4131	66	2661	64	2197
Chromite	TON	160504	2981860	162663	3154448	124693	2065047	156211	2257733	245710	4232459
Clay (others)	TON	24338	302247	17482	319967	20961	317309	12562	241521	14245	279441
Coal(ex Ligbite)	THT	208254	1384845577	235355	1709323903	248545	1527478152	215260	1160506410	208636	2288189160
Coal,gas Water Etc.(except Gaseous Hydrocarbons)	TON	2	30	--	--	--	--	--	--	--	--
Coal:lignite	THT	++	1335	1	8171	1	5170	1	5746	1	9495
Cobolt Ores & Conc.	TON	--	--	1	4476	2	9253	++	325	1	6917
Coke	TON	4589015	91542188	4933340	120756969	2912775	61067396	2463036	44821773	2501153	81047701
Copper Ores & Conc.	TON	1488163	278344776	823938	121462018	821555	86675247	415136	59071579	1018934	223814328
Corundum (natural)	TON	1	29	--	--	--	--	1	79	++	10
Diamond		**	1902035830	**	1779709897	**	1487354319	**	1283511854	**	2056382187

Commodity	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Diatomite	TON	2426	88318	3647	139462	4950	152229	7099	212766	1787	94373
Dolomite	TON	5360752	5636083	5869534	6743265	5539814	6555288	3505151	5075300	5510404	9682992
Earth Clay	TON	42	1844	18	4254	2	343	3	450	2	247
Emerald (cut & Uncut)		**	77934749	**	36592287	**	24403510	**	7997796	**	16560915
Felspar (cut & Uncut)		**	48136	**	96750	**	83631	**	8094	**	22005
Felspar (natural)	TON	16752	147951	9490	100613	8198	101216	13187	78978	2795	54485
Fire Clay	TON	1765	110852	1293	88521	1896	100241	2326	100595	898	58418
Flint	TON	4431	56232	6886	76018	6279	62362	9209	85170	8611	83205
Fluorspar	TON	221816	3958979	265443	7281833	239589	7225937	220573	6090596	286224	7792038
Garnet(Cut And Uncut)		**	335897	**	169836	**	184466	**	97335	**	183591
Garnet(abrasive)	TON	2256	21243	422	6410	391	6189	345	14712	140	1789
Granite	TON	60340	1760531	61960	1940629	56169	1846960	37304	1320021	35032	1279464
Graphite(natural)	TON	39861	1487949	47057	2328880	41405	1863220	40153	1808218	54047	2651642
Gypsum	TON	5740955	8254201	6186253	9473416	5460746	8415195	4762012	7372934	5632758	11823817
Iron Ore	THT	8706	42293972	12807	59136708	1245	9409772	766	8445221	6683	35389345
Kaolin	TON	192539	2787449	229733	3581700	231662	3933899	237144	4431804	223127	5048415
Kieselguhr	TON	++	98	42	3994	66	9247	10	1543	++	64
Kyanite	TON	620	17806	997	27590	1112	33476	1238	42080	1668	53418
Lead Ores & Conc.	TON	2220	149369	1499	85468	3283	166725	5473	325104	5325	255224
Limestone	TON	20827698	29016419	24397169	36665171	25639508	37429909	22797801	32911759	27582767	49014650
Magnesite	TON	229629	5268653	464365	11120844	365053	9468163	364577	7657838	510898	13106490
Manganese Ore	TON	3627741	50633965	2784473	48484512	4316572	41282100	4058590	55242138	6500149	96424799
Marble	TON	1164244	22696789	997194	20190596	951361	17923694	645253	12032307	1073654	21110673
Mica	TON	4311	1079666	3684	1172720	3645	1280925	2987	1252020	3338	1319896
Molybdenum Ores & Conc.	TON	9169	8149457	11028	13606784	7901	9809780	9177	8848441	9114	15470962
Natural Gas	TON	20176813	523664504	21544664	738878610	24416607	684667281	25054872	583289424	23417029	1005206968
Nickel Ores & Conc.	TON	--	--	++	169	++	204	37	6404	106	16165
Niobium Or Tantalum Ores & Conc.	TON	185	228699	156	264455	16	21764	2	489	2	488
Ochre	TON	58	14580	38	11796	188	35754	391	82224	648	149495
Other Minerals Nes	TON	536327	2082743	683347	2821858	641544	2995670	544580	2325905	678649	4316773
Petroleum (crude)	THT	218104	5630977106	226452	7981583190	220869	7281122511	188182	4396561618	220034	9139168005

Commodity	Unit	2017-18		2018-19		2019-20		2020-21		2021-22(P)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Precious & Semi-precious Stones (cut & Uncut):total		**	46165230	**	48292001	**	41191154	**	47935435	**	128825205
Preciuos Metal Ores & Concen-trates	KG	15298	3363976	201	159	273	736	10743	48509	799178	2376644
Quartz And Quartzite	TON	976	22059	1662	54632	1155	40682	1098	50333	7792	211384
Rock Phosphate	TON	7702634	45457006	7519155	56379205	7654867	54205952	7781423	53709109	9659818	104667349
Salt (Other Than Common Salt)	TON	67555	291750	78712	472879	65263	466170	98042	645494	69549	512396
Sand (excl. Metal Bearing)	TON	361956	530106	390328	843983	198862	502131	57812	400291	5121	348319
Sandstone	TON	203	4161	48	973	28	693	16	480	130	2691
Silica Sand	TON	130184	475197	60896	400142	21392	218841	21356	238740	57095	527973
Sillimanite	TON	17	1028	99	2403	609	10781	606	11571	801	13972
Slate	TON	138	9621	225	6867	111	3818	49	3784	109	5741
Steatite	TON	4546	249142	7028	324573	5809	325939	5332	344649	9978	407255
Sulphur (exc. Sublimed Precipi-ted& Colloidal)	TON	1206432	10628791	1346775	15219696	1235102	8239656	1463291	10948268	1895211	35362092
Tin Ores & Conc.	TON	57	56979	6	1259	++	206	2	899	++	299
Titanium Ores & Conc.	TON	163690	3297466	97307	3013231	138042	3965292	78747	3440562	111653	5292058
Tripoli Earth	TON	++	8	8	238	19	1116	--	--	19	1174
Tungsten Ores & Conc.	TON	350	23609	461	64520	447	69234	121	9104	151	14800
Vanadium Ores & Conc.	TON	491	89745	2658	451825	7006	349104	999	77967	5869	436744
Vermiculite	TON	321	7415	610	16154	416	11024	696	17234	1096	25520
Witherite	TON	--	--	++	96	7	263	++	10	--	--
Wollastonite	TON	11461	156397	26483	331612	22616	294800	24049	370375	30625	675667
Zinc Ores & Conc.	TON	--	--	1422	38776	101	2667	804	9530	720	24772
Zirconium Ores & Conc.	TON	83781	6202746	76077	8084381	56166	6073420	68675	6993378	94839	11260337
Total		**	**10285285816**	**	**12991864206**	**	**11515303006**	**	**7913202918**	**	**15513800326**

Source: DGCI&S, Kolkata; data as on 11.11.2022 P: Provisional; -- :Nil; ++ : Negligible; **: Not additive

Annexure 2.4

Reserves/Resources of Minerals as on 1.4.2020 (P) : India

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Andalusite	000 tonnes	0	0	0	0	0	0	0	0	58040	56210	11800	126050	126050
Antimony														
Ore	tonne	0	0	7503	7503	0	0	592	0	0	10588	0	11180	18683
Metal	tonne	0	0	75	75	0	0	5.92	0	0	174	0	179.92	254.92
Apatite	tonne	27715	0	1680	29395	499149	0	0	2281521	11481250	5801338	1017646	21080904	21110299
Asbestos	tonne	0	0	0	0	2488022	3113446	4062376	100687	2527959	10557777	57800	22908067	22908067
Bauxite	000 tonnes	560865	15553	70076	646493	268398	128409	316835	526286	843058	2044653	184116	4311754	4958248
Borax	tonne	0	0	0	0	0	0	0	0	0	0	74204	74204	74204
Chromite	000 tonnes	40635	15229	22672	78535	52696	10545	44395	1630	53008	70440	20435	253150	331685
Cobalt (Ore)	million tonnes	0	0	0	0	0	0	0	30.63	2	0.28	12	44.91	44.91
Copper														
Ore	000 tonnes	128267	20045	15580	163891	83102	111376	41368	135884	340902	778987	5360	1496979	1660870
Metal	000 tonnes	1664.12	313.64	183.81	2161.57	873.59	428.09	246.48	1655.35	2748.95	4051.37	31.69	10035.52	12197.09
Diamond	carat	847400	0	159	847559	0	0	0	304601	1524317	29047514	0	30876432	31723991
Diatomite	000 tonnes	0	0	0	0	634	0	0	0	0	2251	0	2885	2885
Emerald	Kg	0	0	0	0	0	0	0	0	0	0	55869	55869	55869
Fluorite	tonne	228393	163860	11988	404241	9340556	771934	768573	1727945	6239589	1578067	161575	20588239	20992480
Garnet	tonne	8539521	50946	5	8590472	1835546	1624128	4622014	138905	10226601	28066885	902574	47416654	56007126
Gold														
Ore(Primary)	tonne	20271400	3420000	36700	23728100	4498133	3821500	1741321	9658248	109446798	238863938	126476333	494506270	518234370
Metal(Primary)	tonne	79.26	13.44	0.06	92.76	16.93	9.11	5.64	22.05	159.41	236.26	65.1	514.5	607.26
Ore(Placer)	tonne	0	0	0	0	0	0	0	0	2552000	23569000	0	26121000	26121000
Metal(Placer	tonne	0	0	0	0	0	0	0	0	2.29	3.57	0	5.86	5.86
Graphite	tonne	4386467	0	4176944	8563411	7964326	3461288	6166401	796464	10679490	31827080	142165128	203060176	211623587
Iron Ore (Haematite)	000 tonnes	4559856	508158	1141020	6209034	3181005	2404790	2005363	1010483.61	1805532	4827512	2614185	17848870	24057905
Iron Ore (Magnetite)	000 tonnes	71930	385	130508	202823	307652	16082	72127	1513168	2036982	6383274	695507	11024791	11227614
Kyanite	tonne	393358	331193	122314	846865	1331061	940452	1864398	561680	3577402	96560462	0	104835455	105682321
Lead & Zinc														
Ore	000 tonnes	28791	63331	11153	103275	4627	23663	13784	51613	196911	368094	4530	663222	766497

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Lead Metal	000 tonnes	503.70	1188.47	208.02	1900.19	140.42	534.83	286.02	1117.33	2283.43	6607.77	0	10969.80	12869.99
Zinc Metal	000 tonnes	2356.56	4592.03	489.46	7438.05	448.15	1121.12	599.62	3540.38	5840.74	14080.66	101.65	25732.32	33170.37
Lead+Zinc Metal	000 tonnes	0	0	0	0	0	0	0	0	0	120.76	22.37	143.13	143.13
Limestone	000 tonnes	14701910	1065305	3261256	19028470	7665106	6442697	9261072	7528921	32250068	135833401	9579524	208560789	227589259
Magnesite	000 tonnes	57934	6354	1782	66070	80983	24858	40132	59010	59652	128104	309	393047	459118
Manganese Ore	000 tonnes	61510	6081	7450	75041	76106	51162	80580	29600	61205	117986	11944	428583	503624
Marl	tonne	50825000	17210000	110000	68145000	26474477	4189000	0	0	0	390000	0	31053477	99198477
Molybdenum														
Ore	tonne	0	0	0	0	0	1500000	0	2382000	3269204	19884394	167800	27203398	27203398
Contained MoS2	tonne	0	0	0	0	0	1050	0	1599.54	1733.29	12457.39	50.34	16890.56	16890.56
Nickel Ore	million tonnes	0	0	0	0	0	21	21	31	53	63	0	189	189
Perlite	000 tonnes	0	0	0	0	140	683	595	0	0	0	988	2406	2406
Platinum Group of Metals (PGM)	tonnes of metal contained	0	0	0	0	0	0	0	0	11.66	7.4	1.86	20.92	20.92
Potash	million tonnes	0	0	0	0	0	0	0	0	18151	4125	814	23091	23091
Pyrite	000 tonnes	0	0	0	0	27129	0	32597	9590	77729	1527356	0	1674401	1674401
Rare Earth Elements (REE)	tonne	0	0	0	0	0	0	0	0	430353	26042.49	3332	459727.49	459727.49
Rock Phosphate	tonne	27103158	0	3772935	30876093	13669080	29796846	34526541	2879833	3539750	186657066	9308275	280377392	311253485
Rock Salt	000 tonnes	0	3860	0	3860	3360	940	4620	0	0	0	0	8920	12780
Ruby	Kg	0	0	0	0	0	429	3296	0	0	1623	0	5349	5349
Sapphire	Kg	0	0	0	0	0	0	0	0	0	450	0	450	450
Sillimanite	tonne	7968445	3655	290200	8262300	503301	23406	20549508	4771654	17630364	16115664	4411195	64005091	72267391
Silver														
Ore	tonne	61604192	67971000	40870828	170446020	2330000	18445543	53914460	41320000	70926000	211261729	0	398197732	568643752
Metal	tonne	2155.3	4981.73	570.04	7707.07	172.2	824.44	663.67	3881.88	4575.73	12442.92	0	22560.84	30267.91
Sulphur (Native)	000 tonnes	0	0	0	0	0	0	0	0	0	210	0	210	210

Mineral	Unit	Reserves				Remaining Resources								Total
		Proved	Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Tin														
Ore	tonne	2075	0	25	2101	22594540	3213	31330134	168457	561080	29063370	0	83720794	83722895
Metal	tonne	963.19	0	10.8	973.99	33384.66	1116.41	54089.46	813.29	231.63	13147.46	0	102782.91	103756.9
Titanium	tonne	15914697	64860	19068	15998625	10928991	91828	0	2610618	49666080	344212444	3598565	411108526	427107150
Tungsten														
Ore	tonne	0	0	0	0	2230000	0	173063	23276152	23259954	23912049	16581246	89432464	89432464
Contained WO3	tonne	0	0	0	0	3568	0	450	19298.8	16994.84	99772.15	4566.28	144650.07	144650.07
Vanadium														
Ore	tonne	0	0	0	0	276530	1720000	4108100	0	232000	18297225	0	24633855	24633855
Contained V2O5	tonne	0	0	0	0	1106.12	2835	6032.4	0	487.2	54133.29	0	64594.01	64594.01
Vermiculite	tonne	1562108	0	28888	1590996	76900	71397	25956	9800	20179	552279	8716	765227	2356223
Wollastonite	tonne	2388641	190739	101598	2680978	4563016	1245009	8559760	0	3325042	4597200	137461	22427488	25108466
Zircon	tonne	669466	0	0	669466	422758	4225	0	140926	39300	1019770	47456	1674435	2343901

Note : Figures rounded off.P : Provisional

Annexure 2.5

Scenario of Mineral Rich States

(Excluding Atomic, Fuel Minerals & Minor minerals)

(Value in ₹ '000)

Sl. No.	State	Value	Reporting Mines	Share of the State in country's production of MCDR minerals
1	ANDHRA PRADESH	11818506.27	108	VERMICULITE (77%),LIMESTONE(13%),MANGANESE ORE(8%)
2	ASSAM	537696.42	2	
3	BIHAR	367151.35	1	
4	CHHATTISGARH	230232151	114	MOULDING SAND(100%),TIN CONCENTRATE(100%),IRON ORE(16%),LIMESTONE(11%),BAUXITE(4%)
5	GOA	0	28	
6	GUJARAT	6776292.86	147	MARL(49%),BAUXITE(9%),LIMESTONE(6%)
7	HIMACHAL PRADESH	2972536.904	24	ROCK SALT(100%),LIMESTONE(3%)
8	JAMMU & KASHMIR	354825.3	17	
9	JHARKHAND	57898728.16	45	KYANITE(31%),IRON ORE(10%),BAUXITE(8%),GOLD PRIMARY(1%),GOLD ORE(1%),COPPER ORE(1%)
10	KARNATAKA	175715632.7	132	LIMESHELL(100%),GOLD ORE(99%),GOLD PRIMARY(99%),KYANITE(54%),IRON ORE(16%),MANGANESE ORE(14%),LIMESTONE(10%),MAGNESITE(6%)
11	KERALA	345424.46	1	
12	MADHYA PRADESH	32392632.36	263	DIAMOND(100%),COPPER ORE(68%),COPPER CONCENTRATE(57%),MANGANESE ORE(31%),LIMESTONE(13%), PHOSPHORITE(8%), IRON ORE(3%),BAUXITE(3%)
13	MAHARASHTRA	19196908.77	73	FLUORITE (GRADED)(100%),SILLIMANITE(100%),MANGANESE ORE(27%),KYANITE(15%),LIMESTONE(4%),BAUXITE(3%),IRON ORE(1%)
14	MEGHALAYA	2872707.8	16	LIMESTONE(2%)
15	ORISSA	585505025.5	128	CHROMITE(100%),IOLITE(100%),BAUXITE(73%),IRON ORE(54%),GRAPHITE(37%),MANGANESE ORE(19%),LIMESTONE(2%)
16	RAJASTHAN	187238614.6	90	LEAD & ZINC ORE(100%),GARNET(100%),LEAD CONCENTRATE(100%),SELENITE(100%),SILICEOUS EARTH(100%),WOLLASTONITE(100%),
				ZINC CONCENTRATE(100%),SILVER(100%),PHOSPHORITE(92%),COPPER CONCENTRATE(43%),COPPER ORE(31%),LIMESTONE(22%)
17	TAMIL NADU	6843868.032	88	MAGNESITE(71%),GRAPHITE(63%),MARL(51%),VERMICULITE(23%),LIMESTONE(5%)
18	TELANGANA	5683187.706	39	LIMESTONE(7%)
19	UTTAR PRADESH	675447.24	2	LIMESTONE(1%)
20	UTTARAKHAND	49175.352	1	MAGNESITE(22%)

Source: MCDR Returns

Annexure 6.1

Year wise / activity-wise financial performance of GSI against the approved budget outlay during F.Y. 2021-22 and BE grant and expenditure till December, 2022 and projection of expenditure in last quarter (January, 2023 to March, 2023) of F.Y. 2022-23 and fund utilization during calendar year 2021

(In crore)

	F.Y. 2021-22						F.Y. 2022-23					Calendar Year 2022	
	Total BE Grant	Total RE Grant	Expenditure (April, 21 to Dec, 21)	Available RE Grant from Jan,21 to Mar, 2021	Expenditure from Jan, 21 to Mar, 2021	Total Expenditure	Total BE Grant	Total RE Grant	Expenditure (April, 22 to Dec, 22)	% of expenditure till Dec. 2022 against RE	Projection of expenditure for last quarter (Jan,23 to Mar,23)	Budget from Jan, 2022 to Dec, 2022	Expenditure from Jan, 2022 to Dec, 2022
Activities	**1**	**2**	**3**	**4 (2-3)**	**5**	**6 (3+5)**	**7**	**8**	**9**	**10 (9/8*100)**	**11 (8-9)**	**12 (4+9)**	13 (5+9)
Survey & Mapping (Mission-I)	131.40	95.00	77.42	17.58	17.51	94.93	108.92	115.75	99.58	86.03	16.17	117.16	117.09
Mineral Exploration (Mission-II)	51.00	54.60	36.20	18.40	18.27	54.47	52.70	63.00	48.15	76.43	14.85	66.55	66.42
Information Dissemination (Mission-III)	56.60	50.20	29.28	20.92	19.40	48.68	45.50	35.00	23.32	66.63	11.68	44.24	42.72
Spl. Invest & Other Exploration (Antarctica) (Mission-IV)	2.40	3.05	1.99	1.06	0.98	2.97	3.48	3.08	2.1	68.18	0.98	3.16	3.08
R&D (Mission-IV)	12.60	10.55	7.51	3.04	2.87	10.38	15.50	16.37	11.93	72.88	4.44	14.97	14.80
HRD (Mission-V)	2.00	8.30	0.68	7.62	7.62	8.30	2.00	2.00	1.68	84.00	0.32	9.30	9.30
Tribal Area Sub Plan (TSP)	14.40	17.50	14.73	2.77	2.75	17.48	20.00	20.70#	14.54	70.24	6.16	17.31	17.29
Schedules Caste Sub Plan (SCSP)	27.60	31.56	27.76	3.80	3.79	31.55	31.10	32.45#	31.17	96.06	1.28	34.97	34.96
Administrative Support Activities (ASA)	94.97	88.61	75.75	12.86	11.79	87.54	99.86	90.26	81.03	89.77	9.23	93.89	92.82
Establishment Expenditure	722.71	759.71	627.80	131.91	131.48	759.28	768.61	817.85	681.5	83.33	136.35	813.41	812.98
Total Revenue Fund	**1115.68**	**1119.08**	**899.12**	**219.96**	**216.46**	**1115.58**	**1147.67**	**1196.46**	**995**	**83.16**	**201.46**	**1214.96**	1211.46
Capital (Modernization & Replacement)	**65.90**	**51.30**	**34.87**	**16.43**	**16.09**	**50.96**	**57.50**	**57.50**	**31.3**	**54.43**	**26.20**	**47.73**	47.39
(Rev + Capital) GSI fund	**1181.58**	**1170.38**	**933.99**	**236.39**	**232.55**	**1166.54**	**1205.17**	**1253.96**	**1026.3**	**81.84**	**227.66**	**1262.69**	1258.85
% of Fund utilized against RE						99.67%							
Rev. Fund re-appropriated by MOM from RE grant		4.40											
Total (Rev + Capital)		**1174.78**											

Total RE grant received Rs. 1251.91 for FY 2022-23. An additional amount of Rs. 2.05 crore (SCSP- Rs. 1.35 crore and TSP- Rs. 1.35 crore) has been provided to GSI vide IFD re-appropriation dated 16.12.2022 over BE/RE 2022-23.

Annexure 6.2

Performance related to various regulatory and development functions of IBM during the year 2022-23 (January to December 2022)

Sl. No.	Item	Annual Target	Achievement
1	Inspections (MCDR/ MP/RMP/FMCP)	1200	1248
2	Updating of National Mineral Inventory (NMI) adopting UNFC.	Release of NMI for all the minerals	Compilation of NMI as on 01.04.2020 in all respects and preparation of "NMI at a Glance" as on 01.04.2020 is completed and the same is uploaded on IBM website. For the publication "NMI an Overview as on 01.04.2020", drafting of 10 chapters is in progress.
3	Sudoor Drushti	Use of Drone Technology.	A register of receipt of drone/ satellite data submitted by the lessees under rule 34A of MCDR 2017 is being maintained at IBM. As on December, 2022 as many as 634 mining leases data was received. The drone /satellite data is also being checked with the requirements mentioned in SoP for submission of drone/satellite data. 105 officers of Regional Offices and IBM Head Quarter have been imparted training on the Basics of GIS and Processing of Drone Survey data conducted in Eleven Batches.
4	MSS	Generation of Triggers, sending to State Govt. for field verification	In third phase in 2021-22, 177 Triggers for Major Minerals have been generated and sent to respective state Governments for field verification. So far field verification reports in respect of 81 triggers for major minerals have been received out of which unauthorized mining in twelve cases of major minerals have been confirmed by the state governments.
5	Generation of Land use classification of mining leases on GIS platform:	As per Ministry's direction, the information on Land use classify cation in shape/ KML files received from the lessee through Regional Offices was processed on GIS platform & finalized for each lease separately.	Cumulative progress so far up to December 2022 is: i)Total valid data received (.kml/.shp file) from lessee- 1229 Nos. (899Nos. Working; 330 Nos. Nonworking) ii)Data processed in GIS- 1229 Nos.

Sl. No.	Item	Annual Target	Achievement
6	OD Investigations	42	46
7	Chemical Analysis (No. of radicals)	---	2
8	Mineralogical Studies	22900	19989
9	In Plant Studies/ Plant visits	---	01
10	Technical Consultancy & Mining Research Activity	---	Compilation of the information gathered by IBM through its ROs on the best practices being adopted by the lease holders on various aspects of mining is being processed in the form of Technical Publication.
11	Training programmes by IBM.	18	14
12	Selection of system integrator	Development of MTS	Returns and Registration modules of Mining Tenement System (MTS) have successfully put on live from 1st May onwards accommodating the submitted returns for the month of April 2022 onwards. Registration, Returns and Mining Plan Modules were launched in 6th Mining Conclave on 12.7.2022. DPR in respect of the other modules is in progress and they will become operational in phased manner.

Annexure 6.3

Mineral Wise Mining Lease

(Other than Atomic, Hydro Carbons Energy and Minor Minerals) as on 31/03/2021(P) (All India)

Sl. No.	Mineral	No. of Leases	Lease area (Hect.)
1	Amethyst	2	5.83
2	Apatite	1	13.47
3	Aquamarine	1	24.29
4	Bauxite	352	26082.24
5	Borax	1	159.00
6	Chromite	24	7629.79
7	Copper ore	13	4198.05
8	Diamond	2	275.96
9	Emerald	1	46.32
10	Epidote	1	4.05
11	Flint stone	2	11.78
12	Fluorite	10	326.24
13	Garnet	30	176.95
14	Gold	10	6934.25
15	Graphite	38	1557.85
16	Iolite	5	61.79
17	Iron ore	359	56020.35
18	Kyanite	18	635.85
19	Lead & zinc ore	8	7098.20
20	Limeshell	22	1719.69
21	Limestone	1960	171079.05
22	Magnesite	35	2308.65
23	Manganese ore	249	14340.48
24	Marl	5	857.29
25	Moulding sand	5	28.94
26	Perlite	1	144.88

Sl. No.	Mineral	No. of Leases	Lease area (Hect.)
27	Rock phosphate	8	1694.01
28	Rock salt	1	8.12
29	Ruby	1	27.66
30	Sapphire	1	673.40
31	Semi-precious stones	17	276.85
32	Siliceous earth	39	271.57
33	Sillimanite	1	4.64
34	Stibnite	1	40.47
35	Tin	15	319.17
36	Vermiculite	56	892.75
37	White shale	4	146.18
38	Wollastonite	15	302.70
	Total	**3314**	**306398.76**

Sources: Respective State Governments (DGMs/DMGs etc); However, the data received from respective regional offices of IBM have also been taken in account wherever necessary.

(P): Provisional

Annexure 8.1

Detailed time lines and outcomes of ongoing and completed projects of JNARDDC, Nagpur

Completed projects:

S. No.	Project Title	Outcomes
1.	**S-33:** Utilization of aluminium dross to achieve zero waste – A bench scale study project. **(S&T Mines)** (Dec 2019 : 2 ˝ yrs)	A bench scale process for preparation of Poly Aluminium Chloride (PAC) from waste aluminium dross and to prepare castable refractory from residual dross for industrial applications to achieve zero waste was successfully developed under this project. Preparation of PAC from aluminium dross will provide alternative source to primary material and reduction in waste disposed to landfills.
2.	**S-31:** Bench scale study on extraction of pure Silica and smelter grade Aluminium Fluoride from Coal Fly Ash (CFA) **S&T (Mines)** (March 2019: 3 yrs)	Coal Fly Ash (CFA) is one of the solid waste generated in thermal power plants during the process of power generation. India's commercial energy demand is met through the country's vast coal reserves and the coal fly ash generating from all coal-based thermal power plants are accumulating over the years which typically contains 27-31% alumina (Al2O3), 56-60% silica (SiO2) and 9-13% oxides of elements (Ca, Mg, Na, Fe, Ti etc.). Pure silica is used in structural materials, microelectronics (as an electrical insulator, semiconductors etc.), and as components in the food and pharmaceutical industries. JNARDDC successfully undertook bench scale studies (0.5-1 kg CFA) for extraction of pure silica and aluminium fluoride by treating CFA with appropriate mineral acid. Draft final report under preparation.
3.	**P-64 :** Development and Supply of an Instrument for Instantaneous Onsite Measurement of Bath Parameters. BALCO, Korba (Mar 2022 : 3 mts)	JNARDDC has developed unique equipment capable of simultaneous measurement of vital bath parameters which will prove to be a boon to the aluminium smelters. Measurement time is around 5 minutes and all bath parameters are instantly available which otherwise are measured separately and requires sufficiently long time (12-14 hrs). The real time bath parameters information made available by the Instrument can easily be coupled

S. No.	Project Title	Outcomes
		with the other known pot operating conditions such as noise, voltage modifiers and state of feed control which helps in improved energy efficiency, current efficiency ultimately leading to enhanced cell performance. Plant conditions were studies and equipment design was customized to meet Balco's requirements. The instrument has been successfully handed over to BALCO with plant trials, fine-tuning, demonstration / validation (50 measurements) and training to operators.

Ongoing projects :

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
1.	**S-34:** Production and certification of certified reference materials (CRMs) for the analysis of aluminium alloy **S&T (Mines)** (Dec-2019: 3 yrs)	The main objective of the project is to produce certified reference materials (CRMs) for aluminium alloys at JNARDDC for the benefit of the aluminium industry and to provide import substitute. AA6063 candidate reference material was produced in-house through extrusion Statistical analysis of discs (prepared from candidate material) carried out as per ISO guide 35 confirmed that they are chemically homogenous and suitable for next step in CRM manufacturing. Process of acquiring ISO 17034 Accreditation has been initiated. Inter-Laboratory comparison of AA6063 candidate discs is in progress. For developing CRMM for other alloys, a prototype casting set up, designed and fabricated in-house, for casting of defect free material suitable for CRM manufacturing has been installed. Casting trials and optimization of parameters are in progress. This will be an import substitute to high quality CRMs for aluminium sector.	Dec-2022

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
2.	**S-35** : Geo-technological evaluation of Bauxite and Laterite deposits of Chhattisgarh State by using Geospatial technology under Smart Mining 4.0 *(with Chhattisgarh Council of Science & Technology, Government of Chhattisgarh, Raipur)* (Mar 2022 : 2 yrs)	At present there is limited geo-technological information about Chhattisgarh bauxite and laterite deposits to confirm utilization for metallurgical and non-metallurgical applications. Accordingly, JNARDDC has joined hands with Chhattisgarh Council of Science & Technology, Government of Chhattisgarh, Raipur to undertake this project. The project outcome will lead to creation of a digital database which will be highly useful to identify suitable deposits for industrial applications using geo-informatics technology. It will assist the state govt in auctioning of blocks. Efforts will be made to make the database available through Mobile APP.	Mar-2024
3.	**S-36 :** Solid-state recycling of aluminium chips (waste) for production of billets for pilot scale extrusion (Mar 2022 : 2 yrs)	The aim of this project is to utilize aluminium swarf/ chips (waste) of AA6063 and AA2024, which are generated during machining of components, for the production of aluminium billets for extrusion.	Mar-2024
4.	**S-37 / P-63:** Technology Development for Holistic Utilization of Red Mud for Extraction of Metallic Value & Residue Utilization *[with NML, Jamshedpur, IMMT, Bhubaneshwar, NALCO, HINDALCO & VEDANTA] under aegis of NITI Aayog* (Oct 2021 : 3yrs)	Under the NITI Aayog initiative the primary industries and 3 R&D labs have joined hands for development of feasible processing options for all metal extraction from red mud and for further research, development and commercialization to other industries. R&D organizations (CSIR-IMMT, CSIR-NML and JNARDDC) and Aluminium Industries- (NALCO, HINDCLO Industries Ltd and Vedanta Ltd.) have joined hands to deal with issues related to holistic utilization of red mud for extraction of metallic values and residue utilization. Bauxite residue (red mud) is produced in the process of alumina extraction from bauxite. Bayer's process is the principal industrial means of processing bauxite to produce alumina (aluminium oxide). Statistically, production of 1-ton alumina generates 1-1.5 tons of red mud depending upon the mineralogical composition of the	Oct-2024

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
		bauxite and extraction efficiencies. India is the fourth-largest producer of aluminium in the world with a share of around 5.3% of the global aluminium output, hence, the development of red mud's effective handling, storage, usage and management is necessary for the welfare of the global community. Further, bauxite mining and subsequent aluminium production is concentrated in Odisha with ~67% of the total annual production of alumina and ~64% of annual production of aluminium in the country. There have been scattered efforts across India on red mud's utilization. However, a holistic utilization hasn't been quite dealt with. Rare Earth Elements (REEs) are strategic elements crucial for sustainable energy systems. NITI Aayog has identified red mud to be one of rich secondary source of REEs and has recommended adopting a holistic approach for the utilization of red mud. Thus, apart from extraction ofREEs, attempts will also be made to extract iron, alumina and titania present in red mud.	
5.	**S-38 :** Red mud valorization to achieve zero waste, conversion of residue into diagnostic x-ray shielding tiles after recovery of scandium *(with CSIR-AMPRI, Bhopal) :* (Mar 2022: 2 yrs)	The main objective of this project is to convert red mud into economically valuable very high energy X-ray and gamma ray shielding blocks, which is suitable for building radiation therapy bunkers, nuclear power plants, food sterilization plants, etc., and thereby to promote the zero-waste concept.	Mar-2024
6.	**S-39 :** Development of medium strength Al-Mg-Si (AA6082 based) alloy for high end strategic applications (extruded or drawn tubes) *(with IIT Gandhinagar)* (May 2022 : 2 yrs)	Aluminium tube industry is currently battling with low strength of the finished product using AA6082 alloy – This project aims to develop medium-strength Al-Mg-Si (AA6082) based alloy with optimized composition and heat treatment schedule and achieve higher mechanical properties. Developing material for domestic space, aerospace and defence applications and the better material available as a domestic product will allow more future products to be developed domestically as AatmaNirbhar Bharat Mission.	May-2024

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
7.	**S-40 :** Un-diluted Recycling of Cast Aluminium Alloys Containing High Fe Impurity Suitable for SMEs *(with BML MUNJAL University and SNR Sons Charitable Trust)* (May 2022 : 2 yrs)	Presently the standard operating procedure to convert the Fe rich ß-phase inter-metallics in aluminium alloys is not available. Research on Fe reduction have been limited to lab scale of 3-5kg capacities and there is no technology which claims to take advantage of the Fe-impurity without diluting Fe-concentration in the recycled alloy. Hence JNARDDC with its partners has undertaken this project to address this need of the aluminium recycling industry to enhance the Fe tolerance of aluminium alloys. Removal of Fe in recycled aluminum will improve mechanical and metallurgical properties and will reduce the cost by about 15% when compared to dilution with primary aluminium. The findings will evolve the technical know-how for Fe reduction/ modification for recycling zorba and assorted turnings scraps to suit SME's and Aluminium scrap recycling industries.	May-2024
8.	**S-41 :**Production of Onyx grade ATH (sodium bicarbonate route) using low-grade bauxite from Kutch region of Gujarat. S&T(Mines) (With Kalinga Institute of Industrial Technology, KIIT, Bhubaneshwar and industry partner - NIKNAM Chemicals Pvt. Ltd) (Jul 2022 : 2 yrs)	Kutch bauxite deposits of Gujarat is a low grade ore due to low alumina with high iron and silica content. Hence it remains unutilized as it cannot be used for alumina production. Conventionally, Bayer's process is used worldwide to produce aluminium hydroxide, commonly called aluminium trihydrate (ATH), which is mainly used as chemical feedstock apart from its use in aluminium manufacture. However, ATH obtained from Bayer's route are generally coarser in size which limits their utilization for non-metallurgical applications such as abrasives, adhesives, cement, glass, ceramics, refractories, catalysts, fire retardant products, cosmetics, toothpaste, antacids, paints, pigments, printing ink, etc. Hence these products are prepared by grinding (energy-intensive unit operation) the Bayer precipitates followed by size classification as per the product specification. To avoid such energy-intensive unit operation and to obtain finer particle size	Jul-2024

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
		alternative technologies are being investigated. Keeping these in mind, the present project aims to develop a novel process of obtaining onyx grade ATH through the bicarbonate process. The innovative process may have multiple technical and operational advantages to produce onyx grade ATH which is used in the manufacture of solid surface cast polymers/ synthetic marble application. Validation of the product ATH for synthetic marble/onyx application shall also be undertaken.	
9.	**N-47:** Development of Process for 4N High Pure Alumina (HPA) and Substrate Making for its Validation in LED applications, NALCO Bhubaneshwar *(Jointly with IIT Bhubaneshwar& Anna University)* *(Mar2021:2˝yrs)Bhubaneshwar (Jointly with ARAI Pune)* (Jan 2022 :2 yrs)	Objective of the project is to optimize the suitable process for preparation of 4N high pure alumina, processing of HPA for sapphire, wafer preparation (through crystal growth, cutting and polishing) for subsequent validation in LED. The demand for LED lighting in India is mostly driven by its adoption in metro cities, mainly because of better awareness and higher socio-economic growth. In order to deal with the problem, the government has listed the electronics industry as a priority sector under its Make in India campaign. Preliminary study on cost economics of the process to evaluate its further commercialization will also be carried out.	Sep-2023
10.	**N-48 :** Development of DC cast Al Alloy for Yoke in automobile applications, NALCO Bhubaneshwar *(Jointly with ARAI Pune)* (Jan 2022 :2 yrs)	Under this project it is proposed to develop a modified AA6xxx (Al-Mg-Si based) alloy which can be commercially produced using DC casting. Further, it is proposed to develop the alloy with specific reference to the aluminium yoke (also called weld-yoke or end yoke) which connects to the propeller shaft for transmission of power. In India steel is majorly used for yoke or shaft in SUVs. Hence it is proposed to replace steel with aluminium based material for light weighting of the automobiles. JNARDDC will develop the material suitable for the weld yoke and ARAI will do the prototype production by forging, testing, validation and we both will jointly approach OEMs for adaption/approval of the same before tier-1 manufacturers can start manufacturing.	Jan-2024

S. No.	Project Title with timeline	Outcomes / Remarks	Completion target
11.	**N-49:** Demonstration cum heat treatment, leaching-recycling and liming study of JNARDDC-NALCO process (by utilizing 50-60 kg batch of 1st cut SPL) *NALCO, Bhubaneshwar* (Dec 2021 : 9 months)	Based on the success of bench scale studies (1 kg) with NALCO for detoxification of 1st cut SPL and recovery of caustic and fluoride this project has been undertaken for heat treatment of hazardous waste (1st cut SPL) for destruction of leachable cyanide using 50-60 kg batch. The successful completion of the project will lead to set up of mass balance for safe disposal of toxic waste and its gainful utilization.	Nov-2022
12.	**P-61:** TPN:59025 Instrument for Realtime measurement of anode current distribution of aluminium electrolysis cell, DST, New Delhi (Mar 2021 : 2 yrs)	The aim of this project is to develop a system which is capable to of measuring the current of all the anodes of an aluminium electrolysis in a potline and transfer the data through Wi-Fi in the control room. The system will incorporate master unit which will capture the current data through radio frequency from the slave data acquisition units installed in all the sixteen anodes of a pot. The system will be designed to accomplish uninterrupted monitoring by eliminating the use of batteries and introducing the induced power supply for individual data acquisition unit. Development of this instrument will be a major breakthrough as online anode current distribution measurement will help to observe changes in current distribution with changing conditions in the cell for a period and in turn will help in understanding the cell phenomena and troubleshooting the problems, which will lead to improved cell efficiencies and reduction in cell instabilities.	Mar-2023
13.	**P-62 :** TPN:59031 Instrument for Instantaneous and onsite measurement of aluminium electrolysis bath parameters : DST, New Delhi (Mar 2021: 2 yrs)	JNARDDC is mandated to develop the equipment capable of simultaneous measurement of vital bath parameters (Operating temperature, Superheat temperature, % Free alumina, Liquidus temperature, % Excess AlF3 and Bath ratio/Cryolite ratio) which will be robust, automated, safe, user friendly and will provide accurate measurement data. The real time bath parameters information made available instantly (against traditional long time required) will be useful in controlling and enhancing the cell performance.	Mar-2023

Annexure 11.1

During FS 2021-22, a total of ten items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including two RP items have been taken up in NER of which two items are taken up in Arunachal Pradesh, one in Assam, three in Manipur-Nagaland, three in Meghalaya and one in Sikkim. During the period from 1st January 2022 to 31st March, 2022, an area of 1130 sq. km and 70 Line km in RP items have been covered.

FS: 2021-22

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st January, 2022 to 31st March, 2022
1	STM	Specialised Thematic Mapping in Guntung-Lumdung-Seppa-Pachi area for establishment of litho-tectonic interrelationship among various lithounits and economic potentiality in East Kameng and parts of Pakke-Kessang Districts of Arunachal Pradesh.	Arunachal Pradesh	130 sq. km
2	STM	Specialised Thematic Mapping in Koloriang-Sarli-Sakehugu-Damin areas to establish tectonic setting, geochemistry and geochronolo-gy of Se La and Bomdila groups and to pre-cisely constrain the age of metamorphism of both the Groups in KurungKumey District, Arunachal Pradesh and to assess the econom-ic potentiality of the study area.	Arunachal Pradesh	144 sq. km
3	STM	Specialised Thematic Mapping in and around Silimkhowa, Bura Langpho & Naga Langso areas of Karbi Anglong District, Assam to decipher the contact relationship between Assam Meghalaya Gneissic Complex and Shillong Group of rocks with special empha-sis on their tectono-metamorphic history.	Assam	173 sq. km
4	STM	Specialised thematic mapping to decipher the tectono-stratigraphy and constrain the age of the Naga Metamorphic rocks around Nimi-Saramati area, Nagaland.	Nagaland	110 sq. km
5	STM	Specialized Thematic Mapping for delinea-tion and characterization of Main Central Thrust (MCT) by traverse mapping in parts of Sheyam-Lachen-Lachung section, North Dis-trict, Sikkim	Sikkim	114 sq. km

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st January, 2022 to 31st March, 2022
6	STM	Specialized Thematic Mapping in and around Purr-Pungro-Chipur areas of Kiphire and Tuensang Districts, Nagaland to characterize ophiolite suite of rocks and delineate the associated mineralization.	Nagaland	114 sq. km
7	RP	Specialized Thematic Mapping of Assam Meghalaya Gneissic Complex (AMGC) in parts of Rongram-Agalgre-Jengjal, West Garo Hills district, Meghalaya to unravel the tectono-metamorphic evolution of the western part of AMGC.	Meghalaya	100 sq. km
8	STM	Specialized Thematic Mapping to establish the nature of eastern boundary of Shillong Basin and to classify the granite gneisses and granitoids of Assam Meghalaya Gneissic Complex (AMGC) in and around Nongbah, Namdong, Nartiang & Mynso areas, West Jaintia & East Khasi Hills Districts.	Meghalaya	115sq. km
9	RP	Specialized thematic mapping to establish the depositional environment of Mahadek Formation around Ranikor, Lawbah, Mustoh and Dawki areas in South West and East Khasi Hills, East and West Jaintia Hills districts of Meghalaya.	Meghalaya	70 L km
10	STM	Specialized thematic mapping in and around Tengnoupal area to study Ophiolite suite along with associated mineralization, Oceanic Pelagic and associated sediments, Tengnoupal and Chandel District, Manipur	Manipur	130 sq. km

Annexure 11.2

During FS 2022-23, a total of six items of Systematic Thematic Mapping (STM) on 1:25,000 scale, including two RP items have been taken up in NER of which two items are taken up in Arunachal Pradesh, one in Assam, two in Meghalaya and one in Sikkim. During the period from 1st April 2022 to 31st December, 2022, an area of 718 sq. km have been covered.

FS: 2022-23

Sr. No.	Item Type	Title of the Item	State	Achievement between 1st April, 2022 and 31st Dec, 2022
1	STM	Specialised Thematic Mapping in Kol-oriang-Sarli-Sakehugu-Damin areas to establish tectonic setting, geochemistry and geochronology of Se La and Bomdila groups and to precisely con-strain the age of metamorphism of both the Groups in Kurung Kumey District, Arunachal Pradesh and to assess the economic po-tentiality of the study area.	Arunachal Pradesh	95 sq. km
2	STM	Specialised Thematic Mapping to estab-lish tec-tonic setting, geochemistry and geochronology of Lumla Formation with respect to Se La and Bomdila groups and assess economic potentiali-ty in Tawang-Lumla areas,Tawang District, Aru-nachal Pradesh	Arunachal Pradesh	200 sq. km
3	STM	Specialized Thematic Mapping in Be-lughat-Samelangso areas of Karbi An-glong district, As-sam to delineate differ-ent litho units of AMGC, Shillong Group and to establish structural impli-cation of Kaliyani shear zone for possible min-eralization.	Assam	125 sq. km
4	RP	Specialised Thematic Mapping around Phutama-ti-Jangrapara-Dandarigiri area to unravel the tectono-metamorphic evo-lution in northwestern part of AMGC, West Garo Hills district, Megha-laya.	Meghalaya	105 sq. km

Sr. No.	Item Type	Title of the Item	State	Achievement between 1st April, 2022 and 31st Dec, 2022
5	RP	Specialised Thematic Mapping to establish the lithofacies variation and depositional settings of Mahadek Formation around Ranikor, Lawbah, Mustoh and Dawki areas in South West and East Khasi Hills, East and West Jaintia Hills Districts of Meghalaya.	Meghalaya	60 sq. km
6	STM	Specialized Thematic Mapping for delineation and characterization of Main Central Thrust (MCT) by mapping in parts of West & South Districts, Sikkim.	Sikkim	133 sq. km

Annexure 11.3

Total 17 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern have been taken up during the FS 2021-22 in parts of Arunachal Pradesh, Assam, Meghalaya Tripura & Mizoram and Manipur-Nagaland. An area of 7565 sq. km has been covered during the period from 1st January 2022 to 31st March 2022.

FS. 2021-22

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st Jan, 2022 to 31st March, 2022
1	NGCM	Geochemical Mapping in toposheet no. 78K/7 in West Garo Hills District, Meghalaya.	Meghalaya	367sq. km
2	NGCM	Geochemical Mapping in toposheet no. 78K10 in East Garo Hills District, Meghalaya.	Meghalaya	536 sq. km
3	NGCM	Geochemical mapping in Toposheet No. 83G/02 covering parts of Nagaon, Karbi Anglong and Dima Hasao Districts of Assam.	Assam	531 sq. km
4	NGCM	Geochemical mapping in Toposheet no. 83J/13 covering parts of Mon, Long-leng districts, Nagaland, Charaideo, and Sivasagar districts of Assam.	Manipur	424 sq. km
5	NGCM	Geochemical mapping in Toposheet nos. 83N/1 & 2 in parts of Mon District of Nagaland.	Nagaland	772 sq. km
6	NGCM	Geochemical mapping in toposheet no. 79M/10 covering parts of Udaipur, Jam-puijala in South Tripura and Gomati districts of Tripura.	Tripura	277 sq. km
7	NGCM	Geochemical mapping in toposheet no. 79M/11 covering parts of Matabari, Bagafa in Gomati and South Tripura districts of Tripura	Tripura	332 sq. km
8	NGCM	Geochemical mapping in toposheet no. 79M/14 and 79M/15 covering parts of Karbuk, Pilak, Purba Raima in South Tripura district of Tripura.	Tripura	581 sq. km

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st Jan, 2022 to 31st March, 2022
9	NGCM	Geochemical mapping in toposheet no. 79M/5 and 78P/8 covering parts of Agartala and Khowai districts, Tripura.	Tripura	538 sq. km
10	NGCM	Geochemical mapping in toposheet no. 83G/3 covering areas of parts of Dima Hasao District of Assam.	Assam	555 sq. km
11	NGCM	Geochemical mapping in toposheet no. 83G/4 covering parts of Cachar, Dima Hasao Districts of Assam and Tamenglong District of Manipur. (Only 1 sq. km falls in Tamenglong District, Ma-nipur.)	Assam	618 sq. km
12	NGCM	Geochemical mapping in toposheet no. 83I/09 covering parts of Lepa Rada and Upper Subansiri districts of Arunachal Pradesh.	Arunachal Pradesh	394 sq. km
13	NGCM	Geochemical mapping of part of toposheet 78A/10 covering parts of North District, Sikkim.	Sikkim	68sq. km
14	NGCM	Geochemical mapping in Toposheet no. 83 J/14 in parts of Longleng, Mon & Mokokchung Districts of Nagaland.	Nagaland	470 sq. km
15	NGCM	Geochemical Mapping in toposheet no. 78K/02 in West Garo Hills District, Meghalaya and a small part of Goalpara District, Assam.	Meghalaya	386 sq. km
16	NGCM	Geochemical mapping in toposheet num-ber 78K/6 in parts of West and East Garo Hills districts of Meghalaya.	Meghalaya	319sq. km
17	NGCM	Geochemical mapping in Toposheet No. 78K/11 covering parts of East and South Garo Hills districts, Meghalaya.	Meghalaya	397 sq. km

Annexure 11.4

Total 30 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern have been taken up during the FS 2022-23 in parts of Arunachal Pradesh, Assam, Manipur-Nagaland, Meghalaya and Tripura & Mizoram. An area of 10965 sq. km has been covered during 1st April 2022 to 31st December 2022.

FS. 2022-23

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st April, 2022 to 31st December, 2022
1	NGCM	Geochemical mapping in toposheet nos. 83E/5 & 83E/9 covering parts of Lower Subansiri districts of Arunachal Pradesh.	Arunachal Pradesh	260 sq. km
2	NGCM	Geochemical mapping in toposheet no.82P/16 covering parts of Lower Dibang Valley district, Arunachal Pradesh.	Arunachal Pradesh	369 sq. km
3	NGCM	Geochemical mapping in toposheet no. 78M/14 covering parts of Tawang district of Arunachal Pradesh.	Arunachal Pradesh	420 sq. km
4	NGCM	Geochemical mapping in toposheet no. 92A/01 covering parts of Lohit district of Arunachal Pradesh.	Arunachal Pradesh	280 sq. km
5	NGCM	Geochemical mapping in toposheet nos. 83I/1 and 83I/ 5 covering parts of Kamle and Upper Subansiri districts of Arunachal Pradesh.	Arunachal Pradesh	260 sq. km
6	NGCM	Geochemical mapping in Toposheet No. 83D/13 covering parts of Cachar District, Assam.	Assam	412 sq. km
7	NGCM	Geochemical mapping in toposheet no. 83B/13 and 83B/14 covering parts of Sonitpur and Nagaon Districts of Assam and East Kameng District of Arunachal Pradesh.	Assam	556 sq. km

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st April, 2022 to 31st December, 2022
8	NGCM	Geochemical mapping in toposheet no. 83F/16 covering parts of Golaghat & Karbi Anglong districts of Assam and Wokha district of Nagaland	Assam	364 sq. km
9	NGCM	Geochemical mapping in toposheet nos.83B/9 and 83B/10covering parts of Sonitpur and Nagaon Districts of Assam and West Kameng district of Arunachal Pradesh.	Assam	448 sq. km
10	NGCM	Geochemical Mapping in parts of toposh-eet no. 78G/14 & 78 G/15 in West Garo Hills District, Meghalaya.	Meghalaya	198 sq. km
11	NGCM	Geochemical mapping in parts of Toposh-eet No. 78K/04, 8, 12, 16 & 78O/04 cov-ering West Garo Hills, South Garo Hills & South West Khasi Hills districts, Meghalaya.	Meghalaya	276 sq. km
12	NGCM	Geochemical mapping in Toposheet No. 78K/3 covering parts of West Garo Hills districts, Meghalaya	Meghalaya	176 sq. km
13	NGCM	Geochemical mapping in Toposheet no. 83G/15 in parts of Tamenglong, Senapati districts of Manipur and Peren District of Nagaland	Manipur-Nagaland	436 sq. km
14	NGCM	Geochemical mapping in Toposheet no. 83G/16 in parts of Senapati and Kangpokpi districts, Manipur	Manipur-Nagaland	422 sq. km
15	NGCM	Geochemical mapping in toposheet no. 83L/4 in parts of Tengnoupal and Chandel districts of Manipur.	Manipur-Nagaland	412 sq. km
16	GCM	Geochemical mapping in T.S. No. 83H/15 in parts of Bishnupur, Kakching and Churachandpur districts of Manipur	Manipur-Nagaland	420 sq. km

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st April, 2022 to 31st December, 2022
17	NGCM	Geochemical mapping in Toposheet no. 83H/16 in parts of Churachandpur and Chandel districts of Manipur.	Manipur-Nagaland	420 sq. km
18	NGCM	Geochemical mapping in Toposheet no. 83J/04 in parts of Wokha and Kohima districts of Nagaland and Golaghat District of Assam	Manipur-Nagaland	500 sq. km
19	NGCM	Geochemical mapping in Toposheet no. 83J/08 in parts of Kohima, Mokokchung, Zunheboto, and Wokha Districts of Nagaland	Manipur-Nagaland	420 sq. km
20	NGCM	Geochemical mapping in Toposheet no. 83J/12 in parts of Mokokchung, Tuensang, and Zunheboto districts, Nagaland	Manipur-Nagaland	520 sq. km
21	NGCM	Geochemical mapping in Toposheet No. 83J/11 in parts of Mokokchung, Tuensang, and Longleng districts, Nagaland	Manipur-Nagaland	500 sq. km
22	NGCM	Geochemical Mapping in toposheet no 83D/12, covering parts of Kolasib & Mamit Districts of Mizoram; Hailakandi district of Assam.	Tripura-Mizoram	364 sq. km
23	NGCM	Geochemical Mapping in toposheet no 83D/16, covering parts of Aizawl, Kolasib & Saitual Districts of Mizoram; Pherzawl district of Manipur.	Tripura-Mizoram	256 sq. km
24	NGCM	Geochemical Mapping in toposheet no. 84A/15, covering parts of Aizawl & Serchhip districts, Mizoram.	Tripura-Mizoram	312 sq. km
25	NGCM	Geochemical Mapping in toposheet no.84A/11, covering parts of Aizawl, Mamit & Lunglei districts, Mizoram.	Tripura-Mizoram	340 sq. km

Sr. No.	Item Type	Title of the Item	State	Target Achieved from 1st April, 2022 to 31st December, 2022
26	NGCM	Geochemical Mapping in toposheet no.84A/13, covering parts of Aizawl and Saitual districts, Mizoram.	Tripura-Mizoram	288 sq. km
27	NGCM	Geochemical Mapping in toposheet no.84A/14, covering parts of Aizawl, Saitual & Serchhip districts, Mizoram.	Tripura-Mizoram	256 sq. km
28	NGCM	Geochemical mapping in toposheet no. 83D/08 covering parts of North Tripura district of Tripura, Karimganj and Hailakandi districts of Assam and Mamit district of Mizoram.	Tripura-Mizoram	356 sq. km
29	NGCM	Geochemical mapping in toposheet no. 83D/04 covering parts of North Tripura and Unakoti districts of Tripura.	Tripura-Mizoram	348 sq. km
30	NGCM	Geochemical mapping in toposheet no. 84A/01 & parts of 84A/02 covering parts of North Tripura, Dhalai and Unakoti districts of Tripura.	Tripura-Mizoram	376 sq. km

Annexure 11.5

Two GPM items in North & West Garo Hills districts, Meghalaya and Goalpara district, Assam and East, West & South Garo Hills Districts, Meghalaya has been taken up during FS 2021-22, an area of 1620 sq. km have been covered during the period 1st January 2022 to 31st March 2022.

FS: 2021-22

Sr. No.	Item Type	Title of the Item	State	Achievement between 1st Jan, 2022 and 31st March, 2022
1	NGPM	Geophysical mapping in toposheet nos. 78K/5 & 78K/9 covering parts of North & West Garo Hills dis-tricts, Meghalaya and Goalpara dis-trict, Assam.	Meghalaya and Assam	740 sq. km
2	NGPM	Geophysical mapping in Toposheet nos. 78 K/6 & 78 K/10 covering parts of East, West & South Garo Hills Districts, Meghalaya.	Meghalaya and Assam	880 sq. km

Annexure 11.6

Two GPM items in North, West and South west Garo Hills districts, Meghalaya has been taken up during FS 2022-23 and an area of 960 sq. km have been covered during the period from 1st April 2022 to 31st December, 2022.

FS. 2022-23

Sr. No.	Item Type	Title of the Item	State	Achievement between 1st April, 2022 and 31st Dec, 2022
1	NGPM	Ground Gravity-Magnetic Survey under National Geophysical Mapping Pro-gramme in Toposheet Nos. 78K/ 1 & 2 covering parts of North, West and Southwest Garo Hills	Meghala-ya	510 sq. km
2	NGPM	Ground Gravity-Magnetic Survey under National Geophysical Mapping Pro-gramme in Toposheet Nos. 78K/ 3 & 7 covering parts of West, South and Southwest Garo Hills districts, Meghalaya.	Meghala-ya	450 sq. km

Annexure 11.7

Two items of Photo Geology and Remote Sensing (PGRS) is taken up on 1:50,000 Scale during FS 2022-23 in North, South, East, West Garo hills & West Khasi hills District Meghalaya using ASTER data and an area of 3300 sq. km has been completed during the period from 1st April 2022 to 31st December 2022

FS: 2022-23

Sr. No.	Item Type	Title of the Item	State	Achievement between 1st April, 2022 and 31st December, 2022
1	PGRS	Alteration zone mapping in West Garo Hills, East Garo Hills, North Garo Hills districts, Meghalaya using ASTER data falling in toposheets no. 78K/1, 78K/2, 78K/5, 78K/6, 78K/7, 78K/9, 78K/10, 78K/11.	Meghala-ya	1600 sq. km
2	PGRS	Alteration zone mapping in East Garo Hills, South Garo Hills &West Khasi Hills disticts, Meghalaya using ASTER da-ta falling in toposheets no. 78K/5, 78K/6, 78K/7, 78K/9, 78K/10, 78K/11, 78K/13, 78K/14, 78K/15.	Meghala-ya	1700 sq. km

Annexure-11.8

Details of mineral exploration items taken up in NER during FS 2021-22 and 2022-23.

FS: 2021-22

Sl. No.	Title	State	Commodity
1	Preliminary Exploration for Vanadium, and associated min-erals around Sito-Sikhe areas, Lower Subansiri District, Arunachal Pradesh.	G3	Vanadium
2	Reconnaissance Survey for vanadium, graphite, REE, and base metals, in and around Kaying Village, West Siang dis-trict, Arunachal Pradesh.	G4	Vanadium, graph-ite, REE, and base metals
3	Reconnaissance survey for vanadium, graphite and associ-ated elements in Talangriang-Pakba-Jamin areas of Kra-Daadi District, Arunchal Pradesh.	G4	Vanadium, graph-ite
4	Reconnaissance survey for Lithium, tin & tungsten miner-als in Nafra area, West Kameng District, Arunachal Pra-desh.	G4	Lithium, tin & tungsten
5	Preliminary Exploration for Graphite and Vanadium miner-allsation in Radhpu block, Lower Subansiri District, Aru-nachal Pradesh.	G3	Graphite and Va-nadium
6	Recconnaisance survey for Tantalum and Caesium in Sep-pa area, East Kameng District, Arunachal Pradesh.	G4	Tantalum and Caesium
7	Preliminary Exploration for Vanadium, Graphite and asso-ciated minerals around Pakro block, PakkeKessang district, Arunachal Pradesh.	G3	Vanadium, Graphite
8	Reconnaissance survey for REE mineralisation in and around Lakhojan area, Karbi Anglong district, Assam.	G4	REE
9	Preliminary exploration for molybdenum and associated mineralization in the area between Helagog-Khaloibari, Kamrup Metropolitan District, Assam.	G3	Molybdenum
10	Reconnaissance survey for phosphatic nodules in shales of Kopili Formation in Siju Block, South Garo Hills District, Meghalaya.	G4	Phosphatic nod-ules
11	Reconnaissance survey for basemetal mineralization in Jalwagiri and Gambil area, East Garo Hills district, Megha-laya.	G4	Basemetal

Sl. No.	Title	State	Commodity
12	Reconnaissance survey Reconnaissance survey for basemetal and polymetalicmineralisation along Barapani Shear Zone in and around Mawlyndep-Mawmin-Nongbsap villages, East Khasi Hills District, Meghalaya.	G4	Basemetal and polymetals
13	Reconnaissance survey for tungsten and associated mineralization around Kyrdem area, in parts of East Khasi Hills district, West Jaintia Hills District and Ri-Bhoi District, Meghalaya.	G4	Tungsten
14	Reconnaissance survey for nickeliferous laterite in Manipur-Nagaland Ophiolite Belt exposed at Chalwa-Kwatha area, Tengnoupal District, Manipur.	G4	Nickeliferous lat-erite
15	Reconnaissance survey for nickeliferous laterite in Naga-Manipur Hills Ophiolite around Champhai-Hermon area, Manipur.	G4	Nickeliferous lat-erite
16	Preliminary exploration for Graphite and Vanadium mineralisation in Kalamati area, West Siang District, Arunachal Pradesh.	G3	Graphite and Va-nadium

FS: 2022-23

Sl. No.	Title	UNFC Stage	Commodity
1	Reconnaissance survey for phosphorite mineralisation in meta-sedimentary sequence of Bomdila Group in Menga area, Upper Subansiri District, Arunachal Pradesh.	G4	Phosphorite
2	Reconnaissance survey for Lithium from deep seated brine pools in and around Pullung, Paniduriya, Borduria and Kaimoi area of Tirap district, Arunachal Pradesh.	G4	Lithium
3	Reconnaissance survey Vanadium, Graphite and basemetal mineralisation in the metasedimentary sequence of Bomdila Group of rocks in and around Dabagamlin and Yomcha areas, Leparada District, Arunachal Pradesh.	G4	Vanadium, Graphite and basemetals
4	Preliminary Exploration for Vanadium, Graphite and associated minerals around Pakro block, PakkeKessang district, Arunachal Pradesh	G3	Vanadium, Graphite

Sl. No.	Title	UNFC Stage	Commodity
5	Preliminary Exploration for Vanadium, and associated minerals around Sito-Sikhe areas, Lower Subansiri District, Arunachal Pradesh	G3	Vanadium,
6	Preliminary exploration for limestone in Sikilangso Block, Dima Hasao district, Assam.	G3	limestone
7	Preliminary exploration for REE and associated minerals in Krawgaon block, Jashora Alkaline Complex, West KarbiAnglong district, Assam.	G3	REE
8	Reconnaissance survey for Mo, REE and associated minerals in and around Magursila area, Kamrup (Metro) District, Assam.	G4	Mo, REE
9	Preliminary investigation for placer gold in Geruamukh block, Dhemaji District, Assam. (G3)	G3	Gold
10	Reconnaissance survey of Tungsten and associated mineralization in Rongjeng-Darugri-Nongchram Block, East Garo Hills, District, Meghalya	G4	Tungsten
11	Reconnaissance survey of REE and associated elements in parts of Seinduli Pluton in West Khasi Hills district, Meghalaya	G4	REE
12	Reconnaissance survey for REE, lithium and associated mineralization around Amjong, Umtrai and Umlaber area, Rhi-Bhoi district, Meghalaya.	G4	REE, lithium
13	Reconnaissance survey for lithium and associated mineralisation in and around Williamnagar-Nengkhra area, East Garo Hills District, Meghalaya. (G4)	G4	Lithium
14	Reconnaissance survey for Polymetallic- molybdenum, tungsten, REE, lithium and associated mineralization around Mylliem and Lailynkhwir area, East Khasi Hills dis-trict, Meghalaya. (G4)	G4	Molybdenum, Tungsten, REE, Lithium
15	Reconnaissance survey for lithium bearing brine waters in and around Hutsu, Satuza and Phor areas, Phek District, Nagaland	G4	Lithium

Sl. No.	Title	UNFC Stage	Commodity
16	Reconnaissance survey for REE in Girujan Clay around Jharnapani, Dimapur District, Nagaland	G4	REE
17	Reconniasance Survey for Cr, Ni, PGE and associated minerals around Kamjong-Pihang-Bhungpa villages, Manipur Ophiolite Belt, Kamjong District, Manipur.	G4	Cr, Ni, PGE
18	Reconnaissance survey of coal around Satsukba and Sahaphumi area of Mokokchung District, Nagaland	G4	Coal
19	Reconnaissance survey for vanadium and graphite mineralisation in the metasedimentary sequence of Bomdila	G4	Coal
20	Reconnaissance survey for reappraisal for sillimanite, lithium and associated mineralization in Mangsang- Niangbrakithim Block, East Garo Hills, District, Meghalaya	G4	Sillimanite and Lithium
21	Reconnaissance survey for limestone in Khongjiri and Khongka area, Kiphire District, Nagaland	G4	Limestone
22	Reconnaissance survey for REE and associated minerals in Anjakpani-Rionpahar area of Diju valley, Nogaon and Karbi Anglong districts, Assam.	G4	REE
23	Reconnaissance survey for REE and associated minerals in and around PaschimNagaon and Sonaikuchi areas, Kamrup (Metro) and Morigaon Districts, Assam.	G4	REE

Annexure 14.1

List of Nodal Officers, CPIOs and Appellate Authorities in Ministry of Mines

Nodal Officer (RTI)	CPIO (RTI)	ACPIO (RTI)
Shri A. R. Sengupta, Deputy Secretary Room No.: 309-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. :23381172 E-mail : ar.sengupta@nic.in	**Sh. Prakash S. Mundharikar Under Secretary** Room No.: 303, D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No.: 23384225 E-mail: prakash.m69@nic.in	**Ms. Preetha Sacheendran, Section Officer** Room No.: 101-D Wing, III Floor, Shastri Bhawan, New Delhi – 110 001 Tel No.: 23384225 Email: preetha.sachin@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
1.	**Sh. Vinod Kumar Under Secretary** Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : -23383956 E-mail : vinod.kr71@nic.in	Administration (including Cash, Library & Records), R & I	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in
		Establishment	**Shri A.R. Sengupta, Director** Room No.: 309-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. :23381172 E-mail : ar.sengupta@nic.in
		ACC/ Board level postings for PSU/ Attached Offices/ Subordinates Offices/ Autonomous Bodies	**Shri R. P. Gupta, Director** Room No.: 101-D Wing, Ist Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23388487 E-mail: rp.gupta01@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
2.	**Sh. Prakash S. Mundharikar** **Under Secretary** Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384225 E-mail : prakash.m69@nic.in	Vigilance	**Sh. Sanjeev Verma, Director** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. : 23070260 E-mail: sanjeev.verma79@gov.in
		Metal-III (Copper & related matters), (HCL, etc.)	
		Public Grievance Parliament	**Shri A.R. Sengupta, Director** Room No.: 309-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. :23381172 E-mail : ar.sengupta@nic.in
3.	**Sh. Ajay Kumar Kadian** **Under Secretary** Room No.: 314-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23070376 E-mail : ajay.kadian@nic.in	Mines IV Section: (RAKIA) Matter related to RAKIA Arbitration	**Shri. Dheeraj Kumar, Deputy Secretary** Room No.: -307 D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388061 E-mail: dheeraj.kumar83@gov.in
		Mines IV Section: Sand Mining & Auctions Monitoring (Including 2020 MLs), DMF, PMKKKY	
		International Cooperation (including KABIL, G20 Matters etc)	**Shri Alok Kumar, Deputy Secretary** Room No.: -101 A Wing, Ist Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23381631 E-mail: aalok.kumar@nic.in
4.	**Sh. Vikas Raj** **Under Secretary** Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel. No: 23070375 E-mail : vikas.raj@nic.in	Mines I: (Exploration Matters) (MECL, GSI), All Technical matters including exploration and Survey, National Geo-science Award, Budget, FSP etc.	**Shri Pradeep Singh, Director** Room No.: 306-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23385329 E-mail dirtech.mom@nic.in
		IGC	

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
		Mines II: (GSI Establishment matters)	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in
		Metal-I (Aluminium & Bauxite matters), (NALCO, KABIL etc.)	**Sh. Sanjeev Verma, Director** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
		Metal- IV (S & T) (Science and Technology projects & institutions) including NIRM, & JNARDDC	**Shri R. P. Gupta, Director** Room No.: 101-D Wing, Ist Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23388487 E-mail: rp.gupta01@nic.in
5.	**Sh. Abhishek Kumar Upadhyaya** **Under Secretary** Room No.: 314-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : -23384743 E-mail : ak.upadhyaya@nic.in	Mines III Section: (IBM Matters), IBM Estt. & Budget Matters, MTS, MSS, Star Rating etc.	**Shri Smarajit Kumar Biswas, Director** Room No.: 312-D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23387223 E-mail: smarajit.kr@gov.in
		Coordination	
		Information Technology/ Website/ Social Media & Advanced technology (AI/ Robotics) etc.	**Sh. Sanjeev Verma, Director** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi-110001 Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
6.	**Smt. Preetha Sacheendran** **Section Officer** Room No.: 101-D Wing, I Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23382859 E-mail : preetha.sachin@nic.in	Revision Cell	**Shri R. P. Gupta, Director** Room No.: 101-D Wing, Ist Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23388487 E-mail: rp.gupta01@nic.in
7.	**Smt Garima Kadian Section Officer** Room No.: 301-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384225 E-mail: g.kadian@gov.in	Mines V Section: Policy, DGFT matters, Illegal Mining (all cases except Beach Sand Minerals), Royalty Study Group	**Shri. Dheeraj Kumar, Deputy Secretary** Room No.: -307 D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388061 E-mail: dheeraj.kumar83@gov.in
8.	**Sh. Arun Bhatia Section Officer** Room No.: 302-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384070 E-mail : arun.bhatia@nic.in	Mines VI Section: (Act, Legislation & Policy issues) Legislation & legal matters, All Rule & Policy related work LIMBS (All Legal cases) Monitoring and Coordination of all legal matter. Mines VI Section: Offshore Mining, OAMDR related work and Illegal mining of Beach Sand Minerals	**Shri Mustaq Ahmad, Director** Room No.: 313-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383576 E-mail: mustaqahmad.dad@gov.in
9.	**Sh. Dileep Kumar Meena** **Section Officer** Room No.: 112-F Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23385206 E-mail : dileep.kr52@nic.in	Metal-II (Other Metals related matters), (BGML, HZL etc.)	**Shri Sanjeev Verma, Director** Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No. : 23070260 E-mail: sanjeev.verma79@gov.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
10.	**Sh. Sunil Kumar** **Administrative Officer** Room No.: 114-F Wing, I Floor, Shastri Bhawan, New Delhi – 110 001 Tel No.: 23071006 E-mail: nmet-mines@gov.in	NMET Cell	**Shri Vivek Kumar Sharma, Director** Room No.: -308 D Wing III Floor, Shastri Bhawan, New Delhi - 110001 Tel No.: - 23388345 E-mail: vksharma.ofb@gov.in
11.	**Sh. Ashok Kumar Prasad** **Assistant Director** Room No.: 305-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383085 E-mail: ashokk.prasad@nic.in	Official Language Section Hindi	**Shri Sukhdeep Singh, Joint Director** Room No.: 315-A, D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23073046 E-mail: sukhdeep.singh1@gov.in
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