भारत सरकार
GOVERNMENT OF INDIA
भारतीय भूवैज्ञानिक सर्वेक्षण
GEOLOGICAL SURVEY OF INDIA

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No. ...../NMH-III/GSI/14th CGPB Com XI/2018 Date: 10-7-2018

From:
Additional Director General &
National Mission Head-III & the Convener
CGPB Committee XI
Geological Survey of India,
29, Jawaharlal Nehru Road,
Kolkata - 700 016

To:
All Members/ Permanent Invitees
of CGPB Committee XI

Sub: Announcement: 14th Meeting of CGPB Committee-XI (Geoinformatics and Data Management)

Sir,

The 14th Meeting of **CGPB Committee-XI** on Geoinformatics and Data Management is scheduled to be held on **30th August, 2018** at 10-30 A.M. in the Conference Hall of 15 A & B, Kyd Street, Central Headquarters, GSI, Kolkata – 700 016. All members and permanent invitees of CGPB Committee-XI are requested to kindly make it convenient to attend the said meeting. Participation of all the member Organizations/Regions is highly desired to achieve the goals and objectives of the committee.

List of members, terms of reference and Minutes of the 13th Meeting of CGPB Committee-XI are attached in continuation of this document. Action Taken Report as per action points in the minutes may please be submitted to the Additional Director General & NMH-III & Convener of CGPB Committee-XI, GSI, 29, J. L. Nehru Road, Kolkata–700 016 by **31st July, 2018**. A soft copy in MS Word may also be sent to the email cgpbcom11@gsi.gov.in.

A brief related review of the work for the period Aug17-Jul18 of respective Departments/Divisions and Agenda items if any may also be sent by **31st July, 2018.**

All the stakeholders of CGPB Committee-XI have to register through GSI OCBIS Portal. It is requested that the members/stakeholders who have not yet registered, may kindly visit on OCBIS Portal and register through *external sign up* (https://www.gsi.gov.in/webcenter/portal/OCBIS/RegistrationPage). Once registered, kindly arrange to send Name, Mobile no, Organisation Name & full Address and email Id, so that the list may be updated on GSI OCBIS Portal.

Yours faithfully

10/7/18.

(V. Aneel Kumar)
Director(TC), M-III & Member Secretary
for Convener, CGPB Committee XI
Mobile: 09848822402

Copy for information to,
1. The Deputy Director General (PSS-P & M) & Member Secretary, CGPB, GSI, CHQ, Kolkata
2. The Director, CGPB Secretariat, DGCO, GSI, New Delhi

10/7/18.

(V. Aneel Kumar)
Director(TC), M-III & Member Secretary
for Convener, CGPB Committee XI

Composition for the CGPB Committee XI
(Geoinformatics and Data Management)

Convenor: Additional Director General & NMH-III, GSI, Kolkata

Member Secretary: Director, TC, Mission-III, CHQ, Kolkata

Members:

1. Director (Technical), Ministry of Mines
2. Indian Bureau of Mines
3. MECL
4. Ministry of Earth Sciences
5. DST (Member Secy. Dealing with Geology Earth).
6. Atomic Mineral Division
7. Directorate of Geology and Mining of all States and Union territories
8. ONGC
9. SOI
10. NRSC
11. NNRMS
12. NGRI
13. CGWB
14. Directors of GSI associated with programmes on Geoinformatics and data management, Director (Research and Analysis) and Director (CGPB), GSI.

Permanent Invitees:

i. DDG(NIC) dealing with GIS
ii. Technical Director (NIC) Ministry of Mines
iii. AMD (NIC)
iv. One representative of each State to be nominated by Secretary (Information Technology) of the State
v. NSDI
vi. NRDMS
vii. IMD
viii. NDMA
ix. MHA

Terms of Reference for Committee of the CGPB for XI (Geoinformatics and Data Management)

1. To promote use of information technology in geoscientific activity, develop Geoinformatics with a strong spatial and attribute database.
2. To facilitate coordination among geoscientific agencies to develop common standards and sharable databases under the NSDI architecture; and encourage wide and easy dissemination of geoscientific information through internet based technologies.
3. GSI and other central agencies including NNRMS, and state DGMs to work together to create a distributed national geological information system.
4. To review and adopt standards and protocols for developing the system (including metadata).
5. To coordinate with Mining Tenement & Registry System being developed by IBM.
6. To formulate policy and advice CGPB for providing access to quality and unique geospatial and non-spatial data.
7. To develop new methodologies for sophisticated management of data through the use of domain enriched software to produce 3D and modelling outputs.
8. To review the work done so far relating to the activity domain of the Committee, with reference to GSI Portal.
9. The Committee shall have power to co-opt other institutions as invitees as felt necessary for fruitful deliberation of the Committee.

Extract from the Gazette of India, Extraordinary, Part 1 – Section 1,
Page 46-48 No. 109 New Delhi, Friday, March 13, 2009

Minutes of the 13th Meeting of the Central Geological Programming Board (CGPB) Committee-XI on Geoinformatics and Data Management, held at Kolkata on 1st September, 2017

The 13th meeting of CGPB Committee-XI was held on 1st September 2017 at Conference Hall, 15A & B, Kyd Street, CHQ, GSI, Kolkata, under the chairmanship of Shri Brij Kumar, Additional Director General and National Mission Head-III of Geological Survey of India and Convenor of the CGPB Committee- XI. The meeting was graced by the presence of Shri N. Kutumba Rao, Director General, GSI as the Chief Guest. Delegates from different Govt. organisations & PSUs viz; DGMs/CGMs of Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Nagaland, Odisha, Uttarakhand, Ministry of Earth Science, National Centre for Seismology, NDMA, NSDI-DST, Atomic Minerals Directorate for Exploration and Research, IBM, MECL, CGWB, CSIR-NGRI and SOI have attended the said meeting. The List of participants is given at Annexure-I.

13.01.01	Welcome Address by Member Secretary	Dr. S.K. Kulshrestha, Director, M-III and Member Secretary of CGPB Committee-XI welcomed all the delegates to the 13th meeting of CGPB Committee – XI.
13.01.02	Address by Chairman	Shri Brij Kumar, ADG & NMH-III and Convenor of the meeting welcomed all the delegates and presented a summary of the activities of Mission – III of GSI and its importance to the stakeholders. He briefed about the flagship OCBIS project and its successful implementation. He also gave an account of the successful compilation of All India Unified Legend for 1:50K map series, uploading status of digitized mineral exploration reports, release of the updated version of Quaternary Geology Atlas and various other publications that are made available for the stakeholders.
	Address by Chief Guest	Shri N. Kutumba Rao, Director General, GSI and Chief guest welcomed all the delegates to the meeting and expressed his happiness over participation of different member organisation. He also highlighted the significance of the meeting in a broader way. He requested all the members to formulate data sharing policies and accordingly make data available in the public domain for the benefit of the society and effective utilisation of national resources.
13.01.03	Brief account on the activities of M-III by Member Secretary	Dr. S.K. Kulshrestha, Director, M-III and Member Secretary gave a brief account of the various activities undertaken by M-III in GSI, including the successful implementation of OCBIS, the availability of BHUKOSH (Integrated Spatial Data Management System), the completion of digitization of M-II reports, the release All India Unified Legend, up-datation of Seismo-tectonic Atlas. He also gave an account of the various ongoing projects like, the OneGeology Project which involves participation of 119 countries across the globe, digitization status of M-I and M-IV reports and the publication of 22 in-house publications of GSI. He emphasised on the need of data sharing among various organisations.
13.01.04	**Discussions and confirmation of minutes of 12th Meeting of CGPB Committee – XI.**	
	Issue-1	**All geological, geochemical, geophysical and mineral exploration data needs to be made available in public domain on a digital geospatial platform. Accordingly, a National Geoscience Data Repository (NGDR) will be set up**

		by GSI. This will collate all baseline and mineral exploration information generated by various central and state government agencies and also mineral concession holders and maintain these on a geospatial database. This database will be made available in public domain through an appropriate mechanism. GSI will build up capacity for collating, processing and interpretation of geosciences information. **(Proposal from Ministry of Mines)** All the member organization need to give input to the National Geoscience Data repository. **Action Taken** : **AMD**: Data sharing with NGDR is in two modes viz., 1) Information made available in Public Domain. 2) Shareable data on payment basis. Dr. Dinesh Gupta, ADG & NMH IB, discussed about the data sharing policy of AMD in public domain. The Ministry of Defence (MoD) has already agreed upon the sharing of Gravity Data upto 20 mGal for restricted area and 1 mGal for non-restricted area and magnetic data upto 5nTesla for non–restricted and 100nT for restricted area. However these guidelines are not followed by AMD. In the view of above, Dr. Gupta requested AMD to follow the guidelines already issued by MoD for sharing of data. The Chairman also emphasised that AMD needs to share data with GSI as per the MoD guidelines. **(Action AMD)** **DGM, Maharashtra State:** Data compilation is under progress and it will be shared with NGDR shortly. **DGM, Odisha State**: The geological, mineral exploration and mineral resources data are available in public domain (www.odishaminerals.gov.in) Smt. Sushree Anupama Jena informed that high resolution airborne geophysical data for 78000sq. Km area has already been shared with GSI.
	Issue No.2	**As desired by Secretary Mines, MECL intends to digitise and upload all geological reports prepared on behalf of Ministry of Mines to GSI portal.** **Action Taken** : **MECL**: MECL has initiated the process of digitization of reports and 80 reports were prepared on behalf of Ministry of Mines and subsequently uploaded in MECL website. **AMD:** The shareable data is hosted in the public domain on AMD website (http://amd.gov.in). **DGM, Maharashtra State**: All available geological reports and maps of the exploration activities carried out so far are being digitised and uploaded in public domain in phases.

	Issue no 3	**All member organisations to submit their Data Dissemination Policy and Negative list at the earliest.** **Action taken:** **DGM, Odisha State**: DGM, Odisha shares its exploration data to other agencies on a requirement basis. There is no data dissemination policy of the Directorate. **GMU Uttarakhand**: Uttarakhand will prepare and launch negative list pertaining to the state of Uttarakhand and thus requires discussions, assistance and co-operation from GSI and CGPB-XI Committee members. The Member secretary asked all the members of the organisations who have not submitted their Data Dissemination Policy and Negative list, to submit the same at the earliest as per the requirements of National Mineral Exploration Policy 2016. **(Action : All Members)**
	Issue no 4	**Members to interact and motivate themselves on taking mutually beneficial projects.** **Action taken:** **AMD**: Letter of consent for a better synergy between GSI and AMD was signed on 19th September, 2016. **DGM, Odisha**: The geological exploration projects are being finalized in the State Geological Programming Board in consultation with members of organisations. Dr. S. K. Kulshrestha, Director (G) & Member Secretary emphasised the need for framing of data sharing policy for all member organisations and also informed that the member organisations may send a letter to the ADG & NMH-III, requesting for providing a service link to share data in OCBIS. **(Action: All Members)** Shri O.P Mishra Scientist (F), NCS emphasised on the need of sharing digital data with various stake holders. The Chairman requested the member organisations to provide the information pertaining to their projects well in advance to GSI, so that duplication of work can be avoided. **(Action: All Members)** After due deliberations and concurrence on the members of the house, the Member Secretary declared the confirmation of the Minutes of the 12th meeting of CGPB Committee-XI.
13.01.05	Briefing of the activities of Mission - IIIA	Shri Debashis Saha, Dy. Director General, M-IIIA welcomed all the participants and briefed about the OCBIS project of GSI. He informed the house that all the modules of OCBIS barring few are operational form 1st April 2017. All the relevant data in digital format are shared though Bhukosh in the OCBIS portal. Some modules that have not been fully operational are the Claims and IFMS module, wherein some suggestions have been received from users and those are being implemented. These modules will also be made operational shortly. On a query raised by Shri O.P Mishra regarding certifying authority for the operationalization of various modules, Shri

		Debashis Saha informed that the OCBIS project is monitored by PWC Ltd as an independent body. In response to a query on sustainability of OCBIS, Shri Saha informed the house that necessary trainings are being imparted for development of the 2nd line of experts.
13.01.06	Briefing of the activities of Mission - IIIB	Shri G. P. Gupta, Dy. Director General, M-IIIB made a presentation on the activities of M-IIIB of GSI. A total of 7 no. of publications have been released in 2017 and are available in OCBIS portal of GSI. He requested the member organisations to consult the publications available on portal. Shri J. S. Mehta, Director, CGPB Secretariat suggested that for wider publicity of GSI's in-house journal i.e, Indian Journal of Geosciences, necessary steps may be taken through advertisement in popular journals like Current science and Journal Geological Society of India.
13.01.07	Briefing of the activities of Mission - IIIC	Shri G. Gonnade, Dy. Director General, M-IIIC presented various activities of M-IIIC (Map, Geoinformatics and Data Integration). He briefed on the creation of theme based compiled Geological map on Granite/Granitic Complex of India on 1:250K scale, OneGeology Project, various map services available through BHUKOSH on GIS platform, revision of Siesmotectonic Atlas of India and its Environs (SEISAT) into updated digital version in GIS platform and the compilation of All India Unified Legend up to Lithounit level. Shri O. P Mishra opined that the earthquake data available with National Centre of Seismology can be incorporated to the Seismic event database published in the OCBIS from various sources.
	Presentation by Member organisations	
13.01.08	National Spatial Data Infrastructure-DST	Dr. D. Dutta, Scientist- G gave a presentation on "Strategies for Geo-informatics & Data Management- DST/NSDI Perspective." The Action Plan 2017-18 are as follows: • Maintenance of the GSI Data Node of NSDI. • Finalization of the documentation on Data Content Standards in respect of Surface Geological Mapping. • Setting up of the National Data Registry Node - Development and operational provision of geological data registers. • Upgradation of OGC compliant Metadata Catalogue service NSDI-GSI Data Node. • Provision of WMS for the existing data sets as per the provisions of the NDSAP-2012 and development of related applications. • Geo-spatial data re-engineering for the provision of GIS process-able data through WFS/GML. • Application development using the data registers for end user agencies/ ministries by use of CSW/ WMS/ WFS and WPS.

13.01.09	Indian Bureau of Mines	Dr. Sudhakar T.L, Senior Mining Geologist, IBM, Nagpur presented an overview of Mining Tenement System (MTS) to be adopted by IBM for Life Cycle analysis of Mineral Concession for major minerals. The primary objectives of MTS: • Automation in the mining sector. • Will cover the entire life cycle of a mine from exploration to closure. • Will be capable to provide real time information leading to transparency and effectives of the system. The overall business benefits include: • Harmonization of Processes across States for OAS, Transit Pass, DMF, NMET, Grant of RP, PL and ML. • Best Practices of Ore Accounting across states incorporated like Security Paper, RTO interface. • Ease of Doing Business in the Sectors across states w.r.t Methods, Documentation, Compliance. • Central Repository of Data which can be used for Multi-Dimensional Reports for the Stakeholders. Phase- I Module will be go live by 31st Oct 2017 and Phase- 2 by 31st March 2018. The concept of MTL was appreciated by the house and IBM was congratulated by the members of the house for the initiation of a system aiming at transparency in mining sector.
13.01.10	DGM; Odisha State	Dr. Sushree Anupama Jena, Geologist presented the activities of Geoinformatics and Data Management in the Directorate of Geology, Odisha. She gave an elaborate account of the activities as well as the future plans of the organisation, which are jotted below: • The recent works are being stored in a digital database and the old data which includes exploration reports and maps etc. are being digitized. • The High Resolution Aeromagnetic Survey was conducted over 75,000 sq km area of the hard rock terrain in Odisha covering 109 Survey of India 50K toposheets. The airborne survey generated a large amount of Magnetic, Radiometric and DEM data over 3, 30,000 line km. • Most of the interpreted data are stored in a GIS database. Solid Geology Maps for mineral exploration, Hydrogeology Target Maps for Groundwater exploration and about 36 layers of interpreted geological data over 75,000 sq km exist in the database. • The preparation of district wise Mineral Brochure is in progress. So far 30 District Mineral Brochures have been completed. • Raw and processed data of the Aerogeophysical (Magnetic, Radiometric and Topography) Survey conducted over 75000 sq km has been shared with GSI, (State Unit) Odisha.

		• Both Self Potential and Prospecting data generated through geophysical prospecting have been shared with AMD for their field use. • The Directorate has procured SURPAC software for 3D modelling of deposits. • In future the Directorate aims to digitize all the available geological reports and maps and subsequently to upload them in public domain in phases for reference of user agencies. The chairman emphasised on the need of providing information about the projects like preparation of mineral resource maps of districts, as GSI also takes up preparation of District Resource maps (DRM). Dr. Jena informed to the house that the DRMs prepared by GSI are used as the base map and are further updated as per the mineral data available with the Directorate. **(Action : All State DGM's)** **Shri Ashok Kumar, Dy. Director General, M-V informed that SURPAC software has been purchased recently by Training Institute, Hyderabad and therefore the officers from the DGMs may avail the training on 3D modelling in SURPAC. The schedule of trainings is available in GSI portal.**
13.01.11	DGM; Chhattisgarh State	Dr. Sanjay Khare, Dy. Director (G) presented on "Khanij: Online Portal of Chhattisgarh State". The mining facts about DGM, Chhattisgarh are as follows: • Chhattisgarh has vast reserves of all important minerals. • There are 249 mining lease of major minerals and about 1700 mining leases of minor minerals in the state. An amount to the tune of Rs. 4140 crores revenue has been generated through minerals in the financial year 2016-17. • Government of Chhattisgarh has taken a number of policy decisions in mining sector. DGM, Chhattisgarh has followed all requisite modalities for new leases as per the amendment in MMDR, Act 1957 adopted e-Auction process for both major and minor minerals. • A Web Based Integrated Mines and Minerals Management System, "***Khanij Online***"(***https://khanijonline.cgstate.gov.in***) was introduced which was inaugurated by the Hon'ble Chief Minister of Chhattisgarh on 21st June, 2017. The chief objectives of Khanij Online are: • To simplify Mineral administration by Strictly following all Central and State mining Acts & Rules through this robust IT process • To regulate and control the mining, quarrying and transportation activities • For end-to-end tracking of minerals, from being produced, transported and received by industries • Enhance Revenue & curb leakages

		• Enact IT based standard operating procedure • Transparency and reliability • Ease of Doing Business for Stakeholders The chairman congratulated the DGM of Chhattisgarh State for adopting the system to bring about transparency in the system that is desirable to realise the dream of corruption free India. He also suggested that other state DGMs may also adopt similar system to bring transparency. If necessary, necessary help can be taken from DGM Chhattisgarh. **(Action: All state DGM's)**
13.01.12	Geological Survey of India	Shri Basab Mukhopadhyay, Director (G), GSI made presentation on Bhukosh, OCBIS and NGDR. The journey of GSI through time from hard copies to the present Bhukosh database was briefly discussed. The type of data availability and also the formats in which they can be downloaded for use by the stake holders was elaborated upon. The NGDR is a new initiative by GSI with the following objectives: • The objective is to collate, process and deliver all baseline and mineral exploration information generated by various central and state agencies, mineral concession holders and maintain these on a geospatial database – structured and non-structured and their availability on a single interface. • **NGDR requires all mineral exploration and baseline geoscience** data that supports mineral exploration. • NGDR accommodates all exploratory drill hole data in geospatial format along with borehole geochemistry, borehole geophysics, depth of mineralization zone etc., carried out by Central and State Govt. Agencies, PSUs, Private Explorers. • Aerogeophysical, Ground geophysical, Surface geochemistry, Surface geological data collected by all Central and State Govt. Agencies and PSUs. Private Explorers also required to be appended to NGDR. • Collection of Mineral Exploration data from all stake holders, **safe storage and dissemination of valuable Geoscientific data** of the entire country **at one place.** **The type of data that would go into NGDR are as follows:** All mineral exploration data including the data that supports discovery of mineral deposits (baseline geoscience data) include, • Exploratory boreholes (depth of mineralization, location, geophysical logs, geochemistry etc.) • Geological maps (DM, LSM, 1: 50K/ 25K etc) with structural data. • Surface Geochemical maps (raw, processed and interpreted). • Aerogeophysical data (raw, processed and interpreted). • Remote Sensing data (raw, processed and interpreted). • Ground geophysical data (raw, processed and interpreted). • Any other data that led to identification of a mineralized

		zone. **Format of data to be provided by other agencies:** • Entire Geological Report in pdf format (text content in pdf) • Geological Maps in pdf, tiff, shape files • Ground geophysical data - raw and processed (georeferenced high resolution images). • Surface Geochemical data (stream sediment, soil, pit, trench, slope wash etc.) in excel file with geographic coordinates. • Borehole data in excel file with depth, azimuth; and down depth lithological, structural and analytical data. • Photographs in jpg, png etc. • Aero geophysical data in raw and processed (georeferenced high resolution images of rectified and corrected maps) The value additions envisaged by the creation of NGDR would be: • NGDR will accommodate, organize and retrieve mineral exploration data of all State Geology Departments also. • All historical Mineral Exploration data and ongoing exploration activity by the State Governments will be kept in the NGDR. • Mineral Exploration data of PSUs and Private agencies will also be kept in this portal. • The entire data sets can be visualized, processed for mineral targeting. • All bore hole data sets on a common platform along with all attribute data sets to encourage 3D modelling in future which will lead to discovery of new mineral deposits. • Scope for including the data of AMD, NGRI etc. that is useful for mineral targeting also to be reflected in NGDR. Shri O. P. Mishra, opined that a system of network of networks may also be thought of, wherein, the other agencies can place their data in their respective domains and in turn GSI would provide system to bring other agencies into the main network. Shri Mukhopadhyay informed that GSI intends to simplify the process by adopting the latest technology & ICT infrastructure and requires assistance and co-operation from other agencies for sharing of their data which will enable GSI for putting those in the public domain.

13.01.13	Geological Survey of India	Dr. Pradip Mukherjee, Sr. Geologist, GSI gave a talk on All India Unified legend of 1:50K map series. He stressed upon the successful compilation of the unified legend for the entire country up to litho-unit level and required modalities for the incorporation of a 16- digit geometric id for litho-units to bring about various successions in order, keeping stratigraphical aspects in view. He informed that several mismatches in the dataset were spotted and subsequently have been rectified with the use of geometric id. The effort of automation of the legend with the use of 16 digit geometric id and rectification of errors in the dataset was appreciated by the house.
13.01.14	Concluding remarks by Shri J.S. Mehta, Director, CGPB Secretariat, DGCO, GSI, New Delhi	Shri J. Mehta Director, CGPB Secretariat, DGCO concluded the 13th CGPB Meeting with the following remarks: • The data sharing of AMD should be followed as per MoD guidelines. • A committee may be constituted to address some pending issues and requested ADG and NMH-III to constitute the same. • To avoid duplication of work, the member agencies need to inform about the projects during SGPB meetings. • The efforts of the DGMs towards automation of mining activities are well appreciated. • A uniform format for data to be shared in public domain may be prepared for all the agencies for project: NGDR. • The data available in public domain can be utilised in integration of data to locate the probable target sites for mineralisation.
13.01.15	Vote of thanks	Shri S. K. Kulshrestha, Director (TC), Mission III and Member Secretary thanked all the delegates for their active participation in the meeting.

Annexure-I

List of Participants in the 13th Meeting of CGPB Committee XI

Sl. No.	Name	Designation	Organization	Phone/Email
1.	Shri N. Kutumba Rao	Director General	Geological Survey of India	dg.gsi@gov.in n.rao3@gsi.gov.in 08138020770
2.	Shri Brij Kumar	ADG & NMH-III, Convener	NMH-III, GSI	hodm3@gsi.gov.in brijkumarhw@gmail.com 09419121115
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13.	Dr. S. K. Kulshrestha	Director (G) & Member Secretary	TC, M-III, CHQ, GSI	s.kulshrestha@gsi.gov.in 09413330658
14.	Dr. J.S. Mehta	Director (G)	CGPB Secretariat, GSI	jsmgsi14@gmail.com 09650072299
15.	Dr. C. Joshi	Director (G)	PSS-Planning & Monitoring-4, GSI	joshich@gmail.com 9420212107
16.	Shri P. K. Sinha	Director (G)	Southern Region, GSI	praveen.sinha@gsi.gov.in 09490032864
17.	Shri Monoj Maitra	Director (G)	Eastern Region, GSI	monoj.maitra@gsi.gov.in 09433050447
18.	Shri S. S. Dutta	Director (G)	Western Region, GSI	s.dutta3@gsi.gov.in 09163805775
19.	Shri Asit Saha	Director (G)	Mission-IIIA, GSI	asit.saha@gsi.gov.in 09432012109

20.	Shri Debkumar Bhattacharyya	Director (G)	Mission-IIIA, GSI	debkumar@gsi.gov.in 09830031059
21.	Shri Basab Mukhopadhyay	Director (G)	Map-II, GSI	basab.mukhopadhyay@gsi.gov.in 09836230594
22.	Shri V. Aneel Kumar	Director (G)	Mission-IIIA, GSI	v.kumar1@gsi.gov.in 09848822402
23.	Smt. Rina Verma	Director (G)	ASDS, DGCO, GSI	gsiverma@gmail.com 08800761100
24.	Shri Niladri Hazra	Suptdg. Geologist	Central Region, GSI	niladri.hazra@gsi.gov.in 08961866870
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26.	Smt. Jaya R. Chavhan	Suptdg. Geologist	North Eastern Region, GSI	jayac2610@rediffmail.com 08794359062
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30.	Smt. Rosy Samantaray	Sr. Geologist	M-IIIA, CHQ, GSI	rosy.samantaray@gsi.gov.in
31.	Shri Pralay Mukherjee	Sr. Geologist	M-IIIA, CHQ, GSI	pmkidak@gmail.com
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