Ministry of Mines
National Mineral Exploration Trust

Minutes of the 45th Technical-cum-Cost Committee (TCC) meeting held on 26th and 27th September 2022 through video conferencing at Ministry of Mines, Shastri Bhawan, and DGCO-GSI, Pushpa Bhawan, New Delhi

The 45th Technical-cum-Cost Committee [TCC] meeting of National Mineral Exploration Trust [NMET] was held under the chairmanship of Shri Janardan Prasad, Additional Director General, Geological Survey of India [ADG, GSI] and Chairman, TCC, NMET on 26th and 27th September 2022 at Ministry of Mines, Shastri Bhawan, and DGCO-GSI Pushpa Bhawan, New Delhi through video conferencing. The TCC members and representatives of Exploration Agencies [EAs] participated through their respective VC nodes. The list of participants is in **annexure-1**.

Shri Suresh Chander, Director, GSI and Member Secretary, TCC NMET, welcomed Shri Janardan Prasad, ADG, GSI & Chairman, TCC; Members of the TCC and participants representing various EAs. He conveyed that total 13 new project proposals including three for financial assistance for procurement of machinery/laboratory equipment/ instruments etc. have been received from different EAs for technical cum cost evaluation by the committee.

Shri Vivek Kumar Sharma, Director, NMET welcomed Chairman, TCC; Members of the TCC and participants representing various EAs. He emphasized that Ministry of Mines is focusing to enhance the exploration activities and aimed to strengthen the analytical capacities of State DGMs through providing financial assistance for procurement of machinery/laboratory equipment/ instruments etc. He requested to all the TCC members to evaluate the proposals of State Government for financial assistance through NMET funding.

Shri Janardan Prasad, ADG, GSI, and Chairman, TCC welcomed the members and other participants from various EAs. The proceeding of the meeting was initiated as per the circulated agenda.

Agenda-wise discussions are summarised as follows.

45.1: Technical evaluation of new project proposals:

45.1.1. Preliminary exploration (G3) for graphite in Lamer-Panga block- C (14.98 sq. km), District: Kalahandi, Odisha. [Implementing Agency: OMECL]

and

45.1.2. Preliminary exploration (G3) for graphite in Lamer-Panga block- B (10.768 sq. km), District: Kalahandi, Odisha. [Implementing Agency: OMECL]

a) The Lamer-Panga block- C is situated in the south east direction whereas the Lamer-Panga block- B is situated towards eastern side of the Lamer-Panga block- A already approved during the 44th TCC meeting.

b) Geologically the area is exposed by Eastern Ghats Supergroup of rocks represented by khondalite and charnockite rocks with their associated pegmatites and quartz veins.

c) Khondalite group of rock is represented by quartzites, garnetiferous-quartzites, garnet-feldspar-biotite-sillimanite± graphite gneiss / schist, calc granulite and migmatites whereas the charnockite group of rock is represented by porphyroblastic granite gneiss. In the proposed block, the graphite is associated with meta-sedimentaries as quartz-graphite schist bands of limited extensions.

d) The block area was explored by GSI during 1983-84 for Graphite in Balangir, Phulbani and Kakahandi district. The lithounits present within the block are granite gneiss, calc granulite, pyroxene granulite (Basic charnockite), khondalite and quartzite. GSI had demarcated one prominent Barabandha - Loharsada graphite zone. Further, within the Barabandha - Loharsada zone GSI had delineated 16 graphite mineralization patches in and around Barabandha village which comes within this proposed block.

e) The Fixed Carbon ranging from 3.94% to 15.36% and 5.96% to 16.48% have been reported by GSI in the Lamer-Panga block- B and block- C respectively.

f) The proposal was sent to GSI for their considered comments. In response to this GSI has submitted that the G4 stage exploration for Graphite was carried out by GSI during FS 1983-84 in Kandhenjhula-Darrhamunda, Sargimunda-Banipali, Dhurgiamunda, Dhourakhaman- Rengali and Mahanilaha-Dudukamal zones in Bolangir and Belgaon-Barabandha-Mansara area of Kalahandi district. The proposed G-3 blocks of OMECL are not falling within the block boundary /coordinates of area being explored during the current FSP.

g) Based on detailed deliberations the committee opined that both the blocks (B and C) may be clubbed into one block and a revised proposal may be submitted in the next TCC.

h) The committee opined that the exploration activities may be confined only in the two mineralized zones trending in northwest-southeast direction. Initially Self potential survey may be conducted over the potential zones. The block area may be mapped on 1:4,000 scale. The south-western part of the block- C may be excluded from the proposal, as the area is devoid of graphite occurrences.

The committee suggested to submit the revised proposal after combining two blocks (B and C) and excluding the south-western part of the block- C wherein Khondalite bodies are not exposed.

45.1.3. Reconnaissance survey (G4) for Manganese and associated minerals in Damodarpur area (62.00 sq. km), District: East Singhbhum, Jharkhand. [Implementing Agency: CMPDI]

a) The proposed area is represented by the rocks of Singhbhum Group and Dalma volcanogenic sequence. Mica schist with hornblende schist represents the Singhbhum Group whereas the Dalma Group is represented by phyllites/ carbon phyllite, quartzites, quartz schists, tuff and volcanic agglomerate intruded by several younger

intrusive. Number of ferruginous, deformed and brecciated quartz veins are intruded within the Singhbhum and Dalma rocks.

b) It has been submitted that the G4 stage exploration have been carried out by GSI in 2016-17, 2018-19, 2019-20 in Niponitola-Chamta-Bangora and Sasandih-Jilingdungri blocks situated in western side of the proposed block. The occurrences of Manganese (0.15% to 17.97%) and P2O5 (2.64% to 3.74%) have been reported by GSI from the Niponitola-Chamta-Bangora and Sasandih-Jilingdungri blocks.

c) It has been submitted that the Bouguer Gravity anomaly of the area ranges from -14.3m Gal to -11.3m Gal. Higher Bouguer gravity anomaly zone trending in NW-SE direction has been observed. CMPDI has submitted that during the field visit in proposed block, lithology similar to adjoining GSI block has been observed at several places in strike continuity.

d) The proposal was discussed in the 42nd TCC meeting held in June 2022 wherein the committee suggested to collect and analyse some of the samples for manganese and in case of encouraging results the proposal may be resubmitted in the next TCC.

e) In view of above, CMPDI has analysed nine samples from the area. MnO (0.84% to 8.03%) and P_2O_5 (1.37% to 3.85%) have been recorded from the samples whereas in one sample exceptional high value of MnO (25.97%) has been recorded.

f) Based on detailed deliberations the committee opined that the Mn values observed from the area are not encouraging, hence it may not be appropriate to take up G4 stage exploration in the proposed area.

Keeping the above in view, the committee suggested not to take up exploration in the proposed Damodarpur area as the very low values of Mn (0.84% to 8.03%) have been recorded.

44.1.4. Reconnaissance survey (G4) for basemetal in Amargarh block (30.50 sq. km), District: Bhilwara, Rajasthan. [Implementing Agency: DMG, Rajasthan]

a) The project proposal was discussed in 42nd TCC meeting held in June 2022 wherein the committee opined that the proposal needs to be verified by DMG, Rajasthan and a consent/request in accordance with the OM dated 24.08.2021 of NMET needs to be submitted. It was also suggested that Department of Mines and Geology, Government of Rajasthan has to submit consent letter to carry out exploration through NMET fund by Rajasthan State Mineral Exploration Trust (RSMET). Now DMG, Rajasthan has submitted the proposal.

b) It has been submitted that GSI had carried out exploration near Jhikari village and drilling was conducted in 8 boreholes during 1972-74. MECL has also carried out G4 stage exploration during 2019 through NMET fund (recommended in 6th TCC meeting held in December 2016 and approved in 4th EC meeting held in February 2017) and planned three boreholes out of which only one borehole could be drilled, rest two boreholes could not be drilled due to unavailability of NOC from forest department.

c) It has been submitted that several old workings have been observed in ferruginous brecciated chert bands and dolomite. Few of these old working is very deep. Slagheap and retorts can be seen around Kankariya Khera and Badha-ka-Talab area indicating ancient smelting activates.

d) The proposal was sent to GSI for their considered comments. In response to this GSI has submitted that based on findings of MECL and DGM work, a systematic G3 stage exploration may be proposed over the potential area, if any. However, available data do not support the potentiality of the area for further basemetal investigation in Amargarh block.

e) It is pertinent to mention that the Amargarh NERP block was allocated to MECL for exploration. MECL has drilled one borehole and submitted that the block is not potential and there is no strike continuity of mineralisation in the area. Geophysical data obtained by MECL was also not encouraging.

After detailed deliberations, the committee opined that the block area was sufficiently explored and it was deciphered that the block is not potential hence the proposal may not be taken up for further exploration.

44.1.5. Reconnaissance Survey (G4) for copper in Bhagal block (17.519 sq. km.), District: Chittaurgarh, Rajasthan. [Implementing Agency: DMG, Rajasthan]

a) The proposal was discussed in 42nd TCC meeting held in June 2022 wherein the committee opined that the proposal needs to be verified by DMG, Rajasthan and the consent/request in accordance with the OM dated 24.08.2021 of NMET needs to be submitted. It was also suggested that Department of Mines and Geology, Government of Rajasthan has to submit consent letter to carry out exploration through NMET fund by Rajasthan State Mineral Exploration Trust (RSMET). Now DMG, Rajasthan has submitted the proposal for NMET funding.

b) The proposal was sent to GSI for their considered comments on duplication of work, if any. In response to this, GSI has submitted that the proposed block is falling in the extension area of already explored Bhagal copper prospect by GSI and subsequently by MECL. It has been conveyed that the proposed Bhagal block falls within the approved RMT Hamirgarh project of GSI, WR for FS 2022-24 hence the exploration in the proposed block by DMG, Rajasthan will be duplication of work.

c) It has been submitted that the total estimated resources of G2 stage is 9.23 MT with 0.735% of copper at 0.5% Cu cut off but when this block was put up for auction none of the entrepreneur shown interest. In view of this, DMG Rajasthan has proposed to take up G3 level exploration in the adjoining block so that a combined big block may be put up for auction.

Based on detailed deliberations, the committee opined that the block area is being covered by GSI under Regional Mineral Targeting project for the FY 2022-24 and there

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may be duplication of work. In view of this the committee suggested not to take up exploration in the Bhagal block and wait for the outcomes of RMT project.

44.1.6. Reconnaissance Survey (G4) for copper and gold in Devtalai block (5.1 sq. km), District: Bhilwara, Rajasthan. [Implementing Agency: DMG, Rajasthan]

a) The proposal was discussed in 42nd TCC meeting held in June 2022 wherein the committee opined that the proposal needs to be verified by DMG, Rajasthan and the consent/request in accordance with the OM dated 24.08.2021 of NMET needs to be submitted. It was also suggested that Department of Mines and Geology, Government of Rajasthan has to submit consent letter to carry out exploration through NMET fund by Rajasthan State Mineral Exploration Trust (RSMET). Now DMG, Rajasthan has submitted the proposal for NMET funding.

b) The proposal was sent to GSI for their considered comments. In response to this, GSI has submitted that a detailed work was already carried out by GSI and MECL in the proposed area. Based on their findings, 1.58 MT reserve of copper at 0.50% Cu cut-off was estimated with 1.26% Cu grade and 503268.58 grams of associated gold was also assessed with an average grade of 0.54 g/t Au. The total reserve of copper under 0.20% Cu cut-off is 2.48 million tonnes with 0.95% Cu grade & associated gold being 579238.84 grams with an average of 0.44 g/t Au.

c) DMG, Rajasthan conveyed that the block was previously proposed for ML auction and NIT was published on 16/12/2021 and again 18/02/2022 but no one showed interest for this block, may be due to small mineral resource. Keeping this in view, the area has been proposed for further detailed exploration to enhance the mineral resources.

d) It is pertinent to mention that MECL recommended that the gap persist in most of the sections in reserves proving up to 200m (up to 150 mRL). Only in one section, the reserve is accounted up to 145 mRL. As the lodes are dipping at a very low angle, the assumption of 30m from intersection for probable category and next 30m for possible category, a total of 120m dip influence between two intersections. One extra set of boreholes for deeper intersection may be helpful in deciphering the continuity of the lodes upto 150 mRL (i.e. 200 m vertical depth).

The committee suggested to take up exploration in the adjoining area and a combined block may be developed for auctioning. Alternatively, deep boreholes in gap areas, if warranted, may be proposed in the revised proposal.

44.1.7. Reconnaissance survey (G4) for copper in Karoli block (2.75 sq. km), District: Rajsamand, Rajasthan. [Implementing Agency: DMG, Rajasthan]

a) The proposal was discussed in 42nd TCC meeting held in June 2022 wherein the committee opined that the proposal needs to be verified by DMG, Rajasthan and the consent/request in accordance with the OM dated 24.08.2021 of NMET needs to be submitted. It was also suggested that Department of Mines and Geology, Government of Rajasthan has to submit consent letter to carry out exploration through NMET fund

by Rajasthan State Mineral Exploration Trust (RSMET). Now DMG, Rajasthan has submitted the proposal for NMET funding.

b) The proposal was sent to GSI for their considered comments. In response to this GSI has submitted that a G4 stage exploration was carried out by GSI in the area during FS: 2013-14 for Phosphorite.

c) NMET Secretariat informed that in 7th TCC meeting held in December, 2016, the project proposal titled "Karoli-Nathdwara Area, District- Udaipur & Rajsamand, Rajasthan" was recommended and approved in 4th EC meeting held in February 2017.

d) It is pertinent to mention that the block was explored by MECL under NERP block and concluded that the block is not potential.

The committee opined that the lodes are of very limited lateral extent and pinches at shallow depth in the area. The committee opined that the findings of MECL needs to be perused before conceiving exploration in Karoli block, if required.

44.1.8. Reconnaissance survey (G4) for basemetal and silver in Sindesar block (36.88 sq. km), District: Rajsamand, Rajasthan. [Implementing Agency: DMG, Rajasthan]

a) The proposal was discussed in 42nd TCC meeting held in June 2022 wherein the committee opined that the proposal needs to be verified by DMG, Rajasthan and the consent/request in accordance with the OM dated 24.08.2021 of NMET needs to be submitted. It was also suggested that Department of Mines and Geology, Government of Rajasthan has to submit consent letter to carry out exploration through NMET fund by Rajasthan State Mineral Exploration Trust (RSMET). Now DMG, Rajasthan has submitted the proposal for NMET funding.

b) The proposal was sent to GSI for their considered comments. In response to this, GSI has submitted that the systematic G3 stage exploration was carried out by GSI and amalgamated block was already handed over to DMG, Rajasthan for auction excluding the ML area of HZL. At present, in the proposed Sindesar Block, GSI is not carrying out any exploration work.

c) It is pertinent to mention that three blocks within the proposed block have already been explored by GSI at G3 stage of exploration.

d) NMET Secretariat informed that, Ministry of Mines has issued letter (No. M.VI-16/80/2022-Mines VI) dated 5th September, 2022 for clarification regarding auction of blocks wherein if first attempt is annulled due to insufficient participation of bidders, the State Government may consider for second attempt for auction of annulled block as per the Mineral (Auction) Rules 2015 and amended letter.

Based on detailed deliberations the committee opined that the available geoscientific data may be reassessed. As the area was sufficiently explored by GSI at G3 stage of exploration, and amalgamated block was handed over to DGM, Rajasthan. The block may be considered for auctioning.

44.1.9. Preliminary exploration (G3) for phosphorite in Kachaldara East block (5.60 sq. km), District: Jhabua, Madhya Pradesh. [Implementing Agency: MECL]

a) The proposal was discussed in the 44th TCC meeting wherein the committee suggested to modify the block area and the area exposed or underlain by dolomitic limestone and basalt only may be proposed for G3 stage of exploration. A modified proposal, if required may be submitted in next TCC meeting. Now MECL has submitted revised proposal for preliminary exploration (G3) over 5.6 sq. km.

b) Geologically the area is exposed by the Aravalli Group of rocks represented by phosphate-bearing dolomitic limestone-chert, quartzite, phyllite, feldspathic quartzite, gneissic feldspathic rocks and quartz veins.

c) Dolomitic limestone is known for phosphate bodies in the area. Prominent outcrops are noticed between Amlamal and Rambhapur area. The dolomites contain an older inter-bedded phosphate horizon at places overlain by younger formations including another younger phosphate horizon, brown cherts, phyllites and powdery limestones.

d) It has been submitted that GSI had identified eight phosphorite blocks viz., Amla, Amlamal, Kelkua, Kelkua Nala, Khatamba North, Khatamba South, Rassori and Piploda in Aravalli supergroup of rocks in 1972. GSI and MECL had explored the northern part of the proposed blocks i.e., Khatamba block and Kelkua Nala block which were auctioned by state DGM, Madhya Pradesh. The proposed block is adjacent to previous explored block and falls in the extension of phosphorite-bearing cherty dolomite rock. In view of this, MECL has proposed to take up G3 stage exploration in the block area.

e) The proposal was sent to GSI for their considered comments wherein GSI has submitted that the GSI had carried out preliminary survey (G4 stage) in the Amliyamal-Piploda block area, however preliminary exploration (G3 stage) may be taken up in the Kachaldara East block.

f) It has been submitted that three mineralization zones are expected to be found in the block out of which one mineralized zone is persistent all along the block whereas other two are lensoidal in nature.

g) The Committee opined that geological mapping on 1:5000 scale, a total 10 boreholes with 500m meterage with average 50m depth may be planned over the mineralised zone at 400m x 400m grid interval. A total of 50 nos. of BRS, 250 nos. of core samples and one sample for ore beneficiation will be carried out. The outcome of exploration will be reviewed after six months.

The committee recommended the proposal for approval of EC for Preliminary exploration (G3) for phosphorite in Kachaldara East block (5.60 sq. km), District: Jhabua, Madhya Pradesh with an estimated cost of Rs. 180.77 Lakh (including GST) in time schedule of 12 months for carrying out the proposed work and submission of report as per annexure- 2A & 2B.

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45.1.10. Reconnaissance survey (G4) for glauconitic sandstone in Pindra SW extension block (40.0 sq. km), District: Satna, Madhya Pradesh. [Implementing Agency: MECL]

a) Geologically the area is represented by Archaean granite and rocks of Vindhyan Supergroup (Semri, Kaimur, Rewa and Bhander groups). The Kudwari and Bansakar sandstones of Semri Group and Itwa and Banbiha sandstone of Rewa Group have been considered as potential horizons for glauconite.

b) It has been submitted that GSI had established 266 MT potash resource with 4.90% K_2O in Pindra North block (12 sq. km). Additionally, two 10(A)2(B) blocks, namely, Chitrakoot-2 explored by M/s. Nagur Minerals Pvt. Ltd. and Chitrakoot-3 explored by M/s Mobile Trading and Investment Pvt. Ltd. have proved mineable potash reserve estimated viz. 50.46 MT and 85.51 MT respectively in the area.

c) Considering the consistency of glauconitic sandstone in the Pindra North block, the MECL has proposed to take up G4 stage exploration in the gap area, Pindara SW extension block.

d) The proposal was sent to GSI for their considered comments. In response to this GSI has submitted that the Pindra SW Extension G4 block is partly overlapping with the G3 stage project carried out by GSI during the 1984-88 titled "Investigation for Potash in the Glauconitic Sandstone, Majhgawan Area, Satna District, M.P."

e) In addition to this proposed block is also overlapping with "Exploration for diamond in the panna diamond belt, Madhya Pradesh. Phase-I (Agnor block) and Prospecting for kimberlite/lamproite in Panna Dimond belt, Madhya Pradesh. Keeping this in view the overlapping area covered under G3 stage by GSI has been excluded.

f) MECL proposed to take up 500m drilling in 10 boreholes with average depth up to 50m at 1600m x 1600m grid pattern.

h) Based on detailed deliberations the committee recommended to take up G4 stage exploration in the proposed area by deploying 500m drilling in 10 boreholes. A total of 200 nos. of core samples, 5 nos. of XRD and 5 nos. of specific gravity will be carried out. The outcome of exploration will be reviewed after six months.

Keeping in view the expected continuity of glauconitic sandstone in the proposed block the committee recommended the proposal for approval of EC for Reconnaissance Survey (G4) for glauconitic sandstone in Pindra SW extension block (40.0 sq. km), District: Satna, Madhya Pradesh with an estimated cost of Rs. 117.43 Lakh (including GST) in time schedule of 12 months for carrying out the proposed work and submission of report as per annexure- 3A & 3B.

45.1.11. Financial assistance for procurement of laboratory scale mineral processing equipment's, characterisation and analysis instruments for modern mineral processing laboratory, IBM, Nagpur. [Implementing Agency: IBM]

a) It has been submitted that the existing Mineral Processing facilities at Indian Bureau of Mines, (IBM) Nagpur are 20-25 years old. Majority of the instruments and equipment's are old and unserviceable. Due to the maximum use of the existing instruments and equipment's in processing and analysing a large number of ores and

by natural wear and tear, the efficiency of instruments have been reduced, demand frequent repairs. The instruments are not energy efficient and inadequate to meet the present demands of mineral beneficiation.

b) In view this, IBM has sought financial assistance for procurement of following instruments:

1. Laboratory Scale Mineral Processing Equipment's

(i) Wet High Intensity Magnetic Separator (WHIMS) [Rs. 140 Lakh]
(ii) Air Jig for Dry Separation [Rs. 100 Lakh]
(iii) Flotation Column [Rs. 50 Lakh]
(iv) Air Pulsated Batac Jig (for wet separation) [Rs. 50 Lakh]
(v) Leach Column [Rs. 30 Lakh]
(vi) Electrostatic Separator [Rs. 60 Lakh]
(vii) High Intensity Disc Magnetic Separator (Dry) [Rs. 30 Lakh]
(viii) Electrophoretic Cell for Zeta Potential [Rs. 50 Lakh]
(ix) Slurry Rheometer [Rs 30 Lakh]
(x) BET Surface Area Analyzer [Rs. 40 Lakh]
(xi) LAARMANN Flotation Cell with External Air Supply (for Roughing and Cleaning) [Rs. 40 Lakh]

2. Mineralogy- Characterization Instrument

(i) Field Emission Scanning Electron Microscope with Energy Dispersive Spectrometer (FE-SEM with EDS) along with Carbon Coating Machine and ancillary units [Rs. 300 Lakh]
(ii) Digital X-Ray Diffractometer with Solid State Detector, Search Match Software, PDF-4 Mineral Data and ancillary units [Rs. 200 Lakh]

3. Chemical Laboratory – Analysis Instruments

(i) Fire Assay Assembly along with accessories [Rs. 40 Lakh]
(ii) Proximate Analyzer along with accessories [Rs. 35 Lakh]

Total Rs. 1,195 Lakh

c) The committee assessed instruments/ equipment's/ software requirement of IBM and opined that the ore beneficiation, mineralogical characterization studies and chemical analysis of ores are vital for economic feasibility assessment of mineral deposits. The modernization of instrumental facilities through infusion of state-of-the-art technology will enhance the capacity of IBM for assessment of ores.

The Committee in-principally agreed to recommend the proposal for approval of EC towards procurement of equipment's/software's for Indian Bureau of Mines, Nagpur as detailed at para (b) above, to strengthen the beneficiation activities in the country. However, the committee could not evaluate the cost/expenditure to be incurred in procurement of instruments/equipment's/software's due to non-availability of approved Schedule of Charges (SoC).

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The Committee therefore opined that due process of procurement as per extant GOI Financial rules be followed by IBM, Nagpur in consent with the competent authority of Department /Administrative Ministry/ IFD, Ministry of Mines.

45.1.12. Financial assistance for procurement of machinery/ laboratory equipment/instruments etc. for enhancing the exploration activity by DMG, Karnataka. [Implementing Agency: DMG, Karnataka]

a) It has been submitted that the State Government of Karnataka has allocated Rs 5.00 Crore in financial year 2021-22 towards strengthening of exploration activities in the State. The WD-XRF instrument is under procurement through State Government budget provision.

b) The DMG, Karnataka submitted that there is still requirement of fund for procurement of high-end instruments for increasing the pace of mineral exploration activities in the State. The Department of Mines and Geology, Karnataka has requested for financial assistance to procure the following instruments through NMET fund:
   (i) ICP-MS (1 no.) [Rs. 200 Lakh]
   (ii) Fusion head machine (1 no.) [Rs. 45 Lakh)
   (iii) Press pellet machine (1 no.) [Rs. 15 Lakh]
   (iv) Microwave Digestive System (1 no.) [Rs. 20 Lakh]
   (v) Vibratory cup Mills (2 nos.) [Rs. 20 Lakh]
   (vi) Geosoft Oasis Montaj (1 no.) [Rs. 100 Lakh]
   (vii) Rock cutting polishing and mounting unit (1 no.) [Rs. 50 Lakh]

   Total Rs. 450 Lakh

c) The committee assessed the requirement of instruments/software facilities for DMG, Karnataka and opined that the strengthening of analytical capacities is vital for increasing the pace of exploration in the State which may lead to development of new auctionable mineral blocks.

The Committee in-principally agreed to recommend the proposal for approval of EC towards procurement of equipment's/software's viz.,

- ***(i) ICP-MS (1 no.)***
- ***(ii) Fusion head machine (1 no.)***
- ***(iii) Press pellet machine (1 no.)***
- ***(iv) Vibratory cup Mills (1 no.)***
- ***(v) Rock cutting polishing and mounting unit (1 no.)***

for DMG, Karnataka to strengthen the exploration activities in the State of Karnataka. However, the committee could not evaluate the cost/expenditure to be incurred in procurement of instruments/equipment's due to non-availability of approved Schedule of Charges (SoC).

The Committee therefore opined that due process of procurement as per extant GOI/ State Financial rules be followed by DMG, Karnataka in consent with the competent authority of Department /State Financial Wing.

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45.1.13. Financial assistance for procurement of machinery/ laboratory equipment/ instruments etc. for enhancing the exploration activity of DGM, Maharashtra. [Implementing Agency: DGM, Maharashtra]

a) The DGM, Maharashtra has submitted that at present 17 drilling machines are available in the department out of which 11 drilling machines could be deployed for various mineral exploration activities in State and 6 drilling machines are not in working condition hence are being listed for write-off. The annual drilling meterage achieved through the available drilling machines is about 12,000m to 15,000m.

b) It has been submitted that the upgradation of existing geochemical laboratory is vital for enhancing analytical facilities in the State for fruitful utilization of available machine capacities.

c) There is urgent requirement of microscopes for petrological studies as the old machines and microscopes are not operational.

d) In view of this DGM, Maharashtra has requested for financial assistance to procure the following instruments through NMET fund:

A. Petrological Laboratory

(i) Rock cutting machines floor mounted (2 nos.) [Rs. 3.60 Lakh]
(ii) Section grinding / polishing machines-single disc (01 no.) [Rs. 1.40 Lakh]
(iii) Section grinding /polishing machine-double disc (01 no.) [Rs. 1.80 Lakh]
(iv) Section mounting Press-spring type (01 no.) [Rs. 0.165 Lakh]
(v) Core cutting machine (01 nos.) [Rs. 3.5 Lakh]
(vi) Nokon LV100N Pol Trinocular Research Microscope with imaging system and Pelcon automatic point counter (01 no) [Rs. 25.2 Laakh]
(vii) XMET8000 Expert Geo handheld XRF Analyzer (02) [Rs. 100 Lakh]

Sub Total Rs. 135.66 Lakh

B. Analytical Facilities

(i) Coal Analysis Proximate [Thermo Gravimetric Analyzer (TGA) (1 no.) [Rs. 40 Lakh]
(ii) Coal analysis Ultimate [CHNS Analyser and Bomb Calorimeter] (1 no.) [Rs. 55 Lakh]
(iii) Mineral and rock Analyses [ICP-MS and Microwave Digester] (1 no.) [Rs. 190 Lakh]
(iv) Sample preparation equipment's [Crusher, Vibratory cup mill, Pulveriser and core splitter] [Rs. 30 Lakh]
(v) WD-XRF Upgradation [GEO QUANT software and XRD (X-ray diffraction)] [Rs. 145 Lakh]

Sub Total Rs. 480 Lakh

C. Drilling equipment's and accessories

(i) Drilling rigs, equipment's and accessories amounting Rs. 15,41,25,000/-.

S. No.	Particulars	Quantity in Nos.	Rate Per Unit (Approx)	Total Amount (Rs.)
1	Drilling Rio Truck Mounted (600)	3	1,50,00,000	4,50,00,000
2	Drilling Rig Tractor Mounted	2	80,00,000	1,60,00,000

3	Receprocating Pumping Set (Trolly Mounted)	2	10,00,000	20,00,000
4	Centrifugal Pumping Set (Multi Stage 2 Cylinder)	4	90,000	3,60,000
5	Generator Set	3	1,00,000	3,00,000
6	Truck (Double Cabin)	10	25,00,000	2,50,00,000
7	Tractor Mounted Loader Back Hoe	3	15,00,000	45,00,000
8	Jeep (Dual Cabin Pickup)	5	10,00,000	50,00,000
9	Jeep (Four Wheel Drive)	5	12,00,000	60,00,000
10	Car	2	8,00,000	16,00,000
11	HQ Water Swivel	40	45,000	18,00,000
12	NQ Water Swivel	40	40,000	16,00,000
13	NW Water Swivel	40	40,000	16,00,000
14	4" Casino 5' Long W/C	20	10,000	2,00,000
15	4" Casino 3' Long W/C	20	8,000	1,60,000
16	4" Casing 2' Long W IC	20	7,000	1,40,000
17	4" Casing I' Long W IC	20	6,000	1,20,000
18	NX Casing 5' Long W/C	20	9,000	1,80,000
19	NX Casing 3' Long W/C	20	7,000	1,40,000
20	NX Casing 2' Long W/C	20	6,000	1,20,000
21	NX Casing I' Long W/C	20	5,000	1,00,000
22	NQ Drill Rod 3 Mtr. Long	400	15,000	60,00,000
23	6" Casing Plug To NW Box	20	10,000	2,00,000
24	5" Casing Plug To NW Box	20	8,000	1,60,000
25	4" Casing Plug To NW Box	20	7,000	1,40,000
26	NX Casing Plug To NW Box	20	6,000	1,20,000
27	NW Rod Jar Coller R.H.	20	9,000	1,80,000,
28	BW Rod Jar Coller R.H.	20	7,000	1,40,000
29	NQ Core Barrel 3 Mtr. Long	40	45,000	18,00,000
30	NQ Lock & Guide Coupling	40	5,000	2,00,000
31	HO Core Lifter	100	400	40,000
32	NQ Core Lifter	200	300	60,000
33	HQ Core Lifter Case	100	500	50,000
34	NQ Core Lifter Case	200	400	80,000
35	48" Pipe Wrench	10	20,000	2,00,000
36	36" Pipe Wrench	30	15,000	4,50,000
37	24" Pipe Wrench	30	8,000	2,40,000
38	18" Pipe Wrench	30	6,000	1,80,000
39	NX Casing Diamond Bit (Ori.)	100	15,000	15,00,000
40	NX Casing Diamond Bit (Imp.)	100	18,000	18,00,000
41	NX Casing Diamond Shoe Bit (Ori.)	50	15,000	7,50,000
42	NX Casing Diamond Shoe Bit (Imp.)	50	18,000	9,00,000
43	NQ Diamond Core Bit (Imp. Turbo)	300	60,000	1,80,00,000
44	HQ Diamond R/Shell	50	15,000	7,50,000
45	NQ Diamond R/Shell	100	12,000	12,00,000
46	Water Tanker PVC	10	12,000	1,20,000

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47	Plastic Trapolin (12 X 12)	200	5,000	10,00,000
48	Plastic Water Can	400	2,000	8,00,000
49	Mining Helmet	50	1,500	75,000
50	Tool Box Complete Set	20	15,000	3,00,000
51	Turffer (Heavy Duty)	3	50,000	1,50,000
52	HQ Core Box (G.I.)	200	1,000	2,00,000
53	NQ Core Box (G.I.)	600	700	4,20,000
54	Battery 12 Volt 80 Oham	30	6,000	1,80,000
55	Battery 12 Volt 88 Oham	40	7,000	2,80,000
56	Battery 12 Volt 100 Oham	15	8,000	1,20,000
57	Battery 12 Volt 150 Oham	15	10,000	1,50,000
58	Truck Tyre, Tube & Flap (Front) 9 X 20	30	15,000	4,50,000
59	Truck Tyre, Tube & Flap (Rear) 9 X 20	60	16,000	9,60,000
60	Tata Sumo Radial Tubeless Tyre (215/75R15)	60	6,000	3,60,000
61	Training For Drilling & Repairing Crew	50	30,000	15,00,000
			Grand Total	**15,41,25,000**

Sub Total Rs. 1541.25 Lakh
Grand Total Rs. 2156.91 Lakh

e) The committee assessed the requirement of instruments/ equipment's/ software facilities for DGM, Maharashtra and opined that the strengthening of analytical, petrological and drilling capacities are vital for increasing the pace of exploration in the State which may lead to development of new auctionable mineral blocks.

The Committee in-principally agreed to recommend the proposal for approval of EC towards procurement of following equipment's/ software's:

A. Geological and sample processing items/instruments-

- ***(i) Rock cutting machines floor mounted (1 no.)***
- ***(ii) Section grinding /polishing machine-double disc (1 no.)***
- ***(iii) Section mounting Press-spring type (1 no.)***
- ***(iv) Core cutting machine (1 no.)***
- ***(v) Pol Trinocular Research Microscope with imaging system and Pelcon automatic point counter (1 no.)***
- ***(vi) XMET8000 Expert Geo handheld XRF Analyzer (1 no.)***

B. Chemical laboratory instruments-

- ***(i) ICP-MS (1 no.)***
- ***(ii) Crusher (1 no.)***
- ***(iii) Vibratory cup mill (1 no.)***
- ***(iv) Pulveriser (1 no.)***

C. Drilling activities instruments/items-

- ***(i) Drilling rig Truck Mounted (600m capacity) (1 no.)***

(ii) Drilling rig Tractor mounted (1 no.)
(iii) Reciprocating pump set (trolly mounted) (1 no.)
(iv) Centrifugal pumping set (Multi stage 2 cylinder) (2 nos.)
(v) NQ drill rode 3 m long (225 nos.)
(vi) 6" casing plug to NW box (20 nos.)
(vii) NQ core barrel 3m long (10 nos.)
(viii) NX Casing Diamond bit (30 nos.)

However, the committee could not evaluate the cost/expenditure to be incurred in procurement of instruments /equipment's/ software's due to non-availability of approved Schedule of Charges (SoC).

The Committee therefore opined that due process of procurement as per extant GOI/ State Financial rules be followed by DGM, Maharashtra in consent with the competent authority of Department /State Financial Wing.

45.2. Review of the Geological report/Ongoing projects

45.2.1. Detailed exploration (G1) for Lignite in Veeranam Sub-Block-III, District: Cuddalore, Tamil Nadu. [Implementing Agency: MECL]

a) The proposal for exploration of lignite in Veeranam block was approved in 4th EC meeting held on 21st February, 2017 at the cost of ₹6,763.44 Lakhs (excluding tax). The work commenced on 22nd February, 2017 with a time schedule of 36 months i.e. to be completed by 21st February, 2020.

b) TCC in its 6th meeting held on 2nd and 3rd December 2016 suggested that the block should be divided in 4 sub-blocks and initially the work should be taken up in two sub-blocks with cost revision. On the recommendation of 6th TCC meeting, the EC in its 5th meeting held on 6th October, 2017 accorded in-principle approval for entire block.

c) In 22nd TCC meeting held on 13th and 14th November 2019, the revised cost estimates of ₹67.43 Cr and timeline for each sub-block was recommended and approved in 15th EC meeting held on 28th November 2019.

d) MECL informed that the exploration work in sub-block-III have been completed and geological report was submitted for peer review. SO far 2,792m (12BHs) and 14,253m (70BHs) drilling has been completed in Veeranam block III.

e) Based on drilling (6 boreholes by GSI, 2,792m (12 BHs) and 70 boreholes by MECL), a net in-situ resource of 145.48 MT [Proved category (95.85 MT), indicated category (24.77 MT) and Inferred category (24.86MT)] have been established over lignite development area of 20.81 sq. km with an average grade of 2550 K. cal./kg. (Lignite B Grade) have been assessed.

f) It was informed that all the comments of peer reviewer for Veeranam block-III have been attended and incorporated in geological report.

The committee noted the outcome of the exploration and suggested to submit the geological report to NMET secretariat.

45.2.2. General exploration for coal in Marwatola Sector-I & II Block, Sohagpur Coalfield, District: Umaria, Madhya Pradesh. [Implementing Agency: CMPDI]

a) It has been submitted that the project was recommended in 30th TCC held in June 2021 and was approved in 20th EC held on 24.06.2021. However, the exploration activities commenced immediately after receiving forest permission in March 2022.

b) So far 5,882m drilling has been completed against the set target of 6,680m in 15 boreholes. Geophysical studies of 5,870m against the target of 6,680m has also been completed. Accordingly, other components have also been completed as per approved NQT.

c) It has been submitted that the total coal recovery in the block is about 183m and the Band-by-Band samples analyses has been increased. Keeping this in view, the analyses of additional 237 samples for ash + Moisture, 294 samples for housekeeping and two samples for special test has been proposed by CMPDI. Besides this, CMPDI has requested for sample preparation charges for 417 samples under band-by-band analyses.

d) After detailed deliberations the committee opined that that the sample preparation charges for band-by-band analyses cannot be recommended as the said charges were not included in the initial proposal during deliberations of the project in 30th TCC meeting in June 2021. The committee, however recommended for approval of additional analyses of Ash + Moisture 237 samples, housekeeping 294 samples and special tests for 2 samples.

Based on detailed deliberations the committee approved total cost for additional samples and analysis are Rs. 2,45,710/- [additional samples of 237 nos. for band-by-band at the cost of Rs 1,65,900/-, housekeeping samples 294 nos. at cost of Rs 33,810/- and Special test for 2 samples at cost of Rs 46,000/-].

45.2.3. General exploration for coal in Marwatola Sector-III & IV Block, Sohagpur Coalfield, District: Umaria, Madhya Pradesh. [Implementing Agency: CMPDI]

a) It has been submitted that the project was recommended in 30th TCC held in June 2021 and was approved in 20th EC held on 24.06.2021. However, the exploration activities commenced immediately after receiving forest permission in March 2022.

b) So far 3,674m drilling has been completed against the set target of 4,620m in 13 boreholes. Geophysical studies of 3,670m against the target of 4,620m has also completed. Accordingly, other components have also been completed as per approved NQT.

c) It has been submitted that the total coal recovery in the block is about 68m. It has been conveyed that there is requirement of analyses of additional 8 samples for ash +

Moisture, and 25 samples for housekeeping. Besides this, CMPDI has also requested for charges of sample preparation for band-by-band analyses for 138 samples.

d) After detailed deliberations the committee opined that that the sample preparation charges for band-by-band analyses cannot be considered as the said charges were not included in the initial proposal during deliberations of the project in 30th TCC in June 2021. The committee, however recommended the proposal for approval of additional analyses charges for Ash + Moisture (8 samples) and housekeeping (25 samples).

Based on detailed deliberations the committee approved total cost for additional samples and analysis are Rs. 12,246/- [additional samples of 8 nos. for band-by-band at the cost of Rs 4,896/- and housekeeping samples of 25 nos. at cost of Rs 7,350/-].

45.2.4. Reconnaissance survey [Cluster-5] (G4) for limestone in Ramapuram Block, District- Suryapet, Telangana. [Implementing Agency: TSMDC]

45.2.5. Reconnaissance survey [Cluster-7] (G4) for limestone in Jiwangi-1 and Jiwangi-2 Blocks, District- Vikarabad, Telangana. [Implementing Agency: TSMDC]

45.2.6. Reconnaissance survey [Cluster-8] (G4) for limestone in Malkapur Block, District- Vikarabad, Telangana. [Implementing Agency: TSMDC]

Detailed discussion for Para 45.2.4, 45.2.5 and 45.2.6

a) The DGM, Telangana had submitted total 15 limestone blocks (as detailed in table below) for mineral exploration for G4, G3 and G2 stage through NMET fund. During 14th TCC meeting held in May 2018, recommend to club all 15 limestone blocks block into 8 clusters for reconnaissance survey (G4) and after completion of G4 stage exploration and thereafter the decision on further stage of exploration will be taken up.

b) The proposal for exploration from G4 stage to G2 stage in all the clusters was approved by EC in its 8th meeting held on 12th June 2018. The details of 15 blocks and 8 clusters is given in the table below:

S. No.	Cluster	Block Name	G4 (₹ Lakh)	G3 (₹ Lakh)	G2 (₹ Lakh)	Total Cost (₹ Lakh)
1	Cluster-1	Mellacheruvu Block	63.32	73.30	125.58	655.82
2		Mallareddy Gudem Block		80.06	107.15	
3		Yepal Madhavaram Block		86.27	120.14	
4	Cluster-2	Mattampally-1 Block	47.90	72.61	120.04	394.23
5		Mattampally-2 Block		61.21	92.47	

6	**Cluster-3**	Raghunathapalem-1 Block	47.55	72.26	120.03	390.17
7		Raghunathapalem-2 Block		59.62	90.71	
8	**Cluster-4**	Wazigudem Block	43.72	77.68	129.81	430.37
9		Veerappagudem Block		70.68	108.48	
10	**Cluster-5**	Ramapuram Block	33.81	51.93	109.74	195.48
11	**Cluster-6**	Dondapadu Block	47.90	70.68	125.48	396.87
12		Kothagudem Block		51.93	100.88	
13	**Cluster-7**	Jiwangi-1 Block	47.55	41.57	81.10	308.05
14		Jiwangi-2 Block		47.96	89.87	
15	**Cluster-8**	Malkapur Block	34.31	47.26	124.31	205.88
		Total	**366.06**	**965.02**	**1645.79**	**2976.87**

c) TCC in its 25th meeting held in November, 2020 reviewed **Cluster-2** consisting of Mattampally Block-1 and Mattampally Block-2 limestone blocks and **Cluster-6** consisting of Dondapadu and Kothagudem limestone blocks wherein the committee had suggested not to take up further stage of exploration [G3 and G2 stage] in the blocks.

d) TCC in its 41st meeting held on 30th and 31st May 2022 reviewed **Cluster-1** consisting of Mellacheruvu, Mallareddy Gudem & Yepal Madhavaram limestone blocks; **Cluster-3** consisting of Raghunathapalem-1 & Raghunathapalem-2 limestone blocks; **Cluster-4** consisting of Wazigudem & Veerappagudem limestone blocks wherein the committee had suggested not to take up further stage of exploration [G3 and G2 stage] in the blocks.

e) Now, TSMDC has presented the outcome of G4 stage exploration work of cluster-5, 7 and 8.

f) **Cluster-5:** It has been submitted that 36.29 sq. km area of the block falls in State of Andhra Pradesh, whereas 19.58 sq. km falls in the State of Telangana and the drilling has not been carried out in the area falling in Andhra Pradesh State. TSMDC has also submitted that some of the block area falls in private land too. It has been conveyed that most of the assigned targets for G4 stage work have been achieved. Two boreholes have been drilled in the area and average grade of 46.05% CaO, 15% SiO_2 and 0.45% MgO has been recorded from the analyses of boreholes samples. The 675 MT cement grade limestone resource has been established in the area by surface area method whereas 3.77MT resource has been established through area of influence method.

g) **Cluster-7:** It has been conveyed that most of the assigned targets have been achieved by TSMDC. 58.5m drilling in four boreholes against the target of 200m (4 boreholes) have been completed. Out of four boreholes, three boreholes have encountered cement grade limestone with CaO (45.36%), SiO_2 (15.14%), and MgO (0.5%). It has been conveyed that some part of the cluster falls in the leasehold area. It was also informed that the extensive quarrying work of cement grade limestone is taking place in the cluster, hence no potential blocks were delineated for further detail work.

h) **Cluster-8:** It has been conveyed that most of the assigned targets have been achieved by TSMDC. 85.5m drilling in two boreholes have been completed against the target of 100m (2 boreholes). The average grade of CaO (47.77%), SiO2 (10.29%) and MgO (0.47%) have been recorded from the borehole sample. Total 941 MT cement grade limestone resource has been established in the area by surface area method whereas 4.25 MT resource has been established through area of influence method. It has been conveyed that some part of the cluster falls in the leasehold area. Taking into consideration the outcome of exploration activities, latest leasehold/ lease free status,

forest area status and overburden ratio, it has been conveyed that the further exploration activities in the area may not be viable in the block area.

i) The Committee noted the outcome of limestone exploration and suggested that blocks may be put up for auction in light of recent amendments in Mineral (Auction) Second Amendment Rules, 2021 and Minerals (Evidence of Mineral Contents) Amendment Rules, 2021 for Composite Licence (CL).

j) The committee also opined that a clarification be sought from the State Government of Telangana for allocating a leasehold area for exploration.

k) In view of the above observations the committee suggested not to take up further stage of exploration in cluster-5, 7 and 8.

The committee expressed his dis-satisfaction for taking up exploration in cluster-5 [Ramapuram block] as more than 50% area falls in the jurisdiction of Andhra Pradesh State. It was also suggested not to take up further exploration in the block.

The committee suggested to submit the geological report. A copy of geological report may also be sent to State of Andhra Pradesh.

For cluster-7 [Jiwangi-1 and 2 block] and cluster-8 [Malkapur block], the committee expressed his concern over leasehold area in proposed block and suggested that a clarification be sought from the Department of Mines and Geology, Government of Telangana for allocating leasehold area for exploration.

Committee suggested that no further exploration be carried out in cluster-7 [Jiwangi-1 and 2 block] and cluster-8 [Malkapur block]. Committee suggested to demarcate the leasehold area on geological map and to submit the geological report to NMET.

45.3. Financial assistance through NMET fund to State DGMs/DMGs for procurement of machinery/ laboratory equipment/ instruments etc. to enhance the instrumental capacities in field of mineral exploration.

a) NMET vide letter F. No. 6/9/2015-NMET/294 dated 23.3.2022 and F. No. 6/9/2015-NMET/71 dated 8.6.2022 conveyed to all State DGMs/DMGs that the proposals on strengthening of technical infrastructure of State DGMs/DMGs will be considered by NMET for financial assistance.

b) The proposals of State DGMs/DMGs towards procurement of machinery/ laboratory equipment's/ instruments/ hardware/ software and other necessary infrastructure excluding building construction, staff car, laptop, computer will be considered by NMET to enhance the exploration activities in the country. The specific proposals in this regard should be submitted by concerned DGMs/DMGs to NMET in soft and hard copy within one month from the date of issue of this letter [F. No. 6/9/2015-NMET/71 dated 8.6.2022].

c) In this regard, proposals have been received from State DGMs/DMGs towards procurement of various instruments/ equipment/ software etc. Some of the proposals were also discussed in 43rd TCC meeting held in July 2022.

d) Keeping the above in view, the committee considered all the proposals and after detailed deliberations, it has been opined that a comprehensive list of instruments/ equipment/ software may be finalised for providing financial assistance to State DGMs/DMGs. The compiled list at annexure-4 covers major domains of exploration activities; however, the list cannot be considered *sensu-stricto* for consideration of proposals for financial assistance.

e) The committee recommended the list of instruments/ equipment/ software etc. as per **annexure-4** for consideration of EC.

45.4. The meeting ended with concluding remarks of the chairman and vote of thanks by the Director and member secretary, TCC, NMET.

List of TCC members attended 45th Technical-cum-Cost Committee (TCC) meeting of NMET held on 26th and 27th September 2022 through videoconferencing

S. No.	Name/Designation	Status	Remarks
1	Shri Janardan Prasad, Addl. Director General & HoD, GSI	Chairman, TCC, NMET	Attended via videoconference
2	Shri Ranjan Kumar Sinha, Controller General (Retd.), IBM	TCC Member	Attended via videoconference
3	Shri Naeem Ahmad, General Manager-Exploration (Retd.), CMPDI Ltd.	TCC Member	Attended via videoconference
4	Dr. Anjani Kumar, Dy. General Manager (Exploration) & HoD-Planning (Retd.), MECL	TCC Member	Attended via videoconference
5	Shri B. Saravanan, Additional Director, Atomic Minerals Directorate for Exploration and Research	TCC Member	Attended via videoconference
6	Shri Hemraj Suryavanshi, Addl. Director General (Retd.), GSI	TCC Member	Attended via videoconference
7	Shri Manoj Kumar Patel, Deputy Director General and RMH-II, GSI	TCC Member	Attended via videoconference
8	Shri Santosh Kumar Adhikari, Chief Mining Geologist, IBM	TCC Member	Attended via videoconference
9	Shri Vivek Kumar Sharma, Director, NMET, Ministry of Mines	TCC Member	Attended in person & videoconference
10	Shri Suresh Chander, Director, GSI	Member Secretary, TCC, NMET	Attended in person
11	Shri Ravi Kumar Gupta, General Manager (Finance), HCL	TCC Member	Attended via videoconference
12	Shri P. K. Maharana, Dy. General Manager (Finance), NALCO	TCC Member	Not attended
13	Shri Vinay Pal, ACAO (Finance), GSI	TCC Member	Attended via videoconference

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Annexure-1

List of participants attended 45th Technical-cum-Cost Committee (TCC) meeting of NMET held on 26th and 27th September 2022 through videoconferencing

S. No.	Name/Designation	Email ID	Contact No	Organisation
1	Shri Janardan Prasad ADG & HoD, GSI	janardan.prasad@gsi.gov.in	7763800788	Chairman, TCC
2	Shri Ranjan Kumar Sinha Controller General (Retd.) IBM	sinhark57@rediffmail.com	9421777637	Member, TCC
3	Shri Hemraj Suryavanshi ADG (Retd.), GSI	hemrajgsi@gmail.com	7477042176	Member, TCC
4	Shri Naeem Ahmed GM (Retd.), CMPDI	ahmadnaeem17@yahoo.co.in	8588092153	Member, TCC
5	Dr. Anjani Kumar DGM (Retd.), MECL	anjanikumar1957.ak@gmail.com	9975350576	Member, TCC
6	Shri B. Saravanan AMD, Hyderabad	addldir-op1.amd@gov.in	8987571606	Member, TCC
7	Shri Manoj Kumar Patel DDG and RMH-II, GSI	m.patel1@gsi.gov.in	9040011231	Member, TCC
8	Shri Santosh Kumar Adhikari Chief Mining Geologist, IBM	skadhikari@ibm.gov.in	7588690545	Member, TCC
9	Shri Vivek Kumar Sharma Director, NMET	vksharma.ofb@gov.in	7024570055	Member, TCC
10	Shri Ravi Kumar Gupta GM (F), HCL, Kolkata	ravi_g@hindustancopper.com	9433274328	Member, TCC
11	Shri Vinay Pal, ACAO (Finance), GSI	vinay.pal@gsi.gov.in	8527368161	Member, TCC
12	Shri Suresh Chander Director, GSI	suresh.chander@gsi.gov.in	9493860963	Member Secretary, TCC
13	Shri Maneesh Khar Director, GSI	nmet-mines@gov.in	9462036108	NMET
14	Dr. Deshraj Trivedi Senior Geologist	nmet-tcc@gov.in	9419244294	NMET
15	Shri Subhash Kumar Senior Geologist	nmet-mines@gov.in	9868302624	NMET
16	Shri Shailendra Sinha Director (Geology)	omecloffice@gmail.com	9937388703	OMECL
17	Dr. P. K. Nayak, Sr. Manager (Geology)	omecloffice@gmail.com	6372651516	OMECL
18	Dr. R. P. Singh, Manger (Geology)	gm.exploration.cmpdil@gmail.com	8987789047	CMPDI
19	Shri S. N. Dodiya Additional Director (Geology),	adgudaipur.mg@rajasthan.gov.in		DMG, Rajasthan
20	Shri Alok Prakash Jain Additional Director (Geology),	adgjaipur.mg@rajasthan.gov.in		DMG, Rajasthan
21	Shri P. Ravindran, DGM (Exploration)	gm-exploration@mecl.co.in	7907649392	MECL, Nagpur
22	Dr. Dillip R. Kanungo Director (OD)I/c	codo@ibm.gov.in	8237047897	IBM, Nagpur
23	Shri H. P. Harish, Deputy Director (Plan)	dir-mines@karnataka.gov.in	9611951313	DGM, Karnataka
24	The Deputy Director, Geology	director@mahadgm.gov.in		DGM, Maharashtra
24	Shri K. Rajasekhar Reddy General Manager (Mining)	tsmdcltd@gmail.com	8008558580	TSMDC, Hyderabad

Annexure-2A

Estimated cost for Preliminary exploration (G3) for phosphorite in Kachaldara East block (5.60 sq. km), District: Jhabua, Madhya Pradesh.

[Block area- 5.60 sq. km; Nos. of Borehole- 10; Borehole depth range- 50m; Completion Time- 12 months]

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs)	
A	**GEOLOGICAL WORK**						
1	**Mapping (1:5,000), Borehole logging, sampling & report writing**						
a	Charges for one Geologist per day at HQ	day	1.3	9,000	60	5,40,000	
b	Charges for two Geologists per day at field	day	1.3	11,000	120	13,20,000	
c	Labour for Geologist (2 Nos) Base rate - 443	day	5.7	443	240	1,06,320	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
d	Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	40	2,04,000	
e	Labours for Sampling works (4 Nos) Base rate - Rs. 443	day	5.7	443	160	70,880	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
2	**SURVEY (on 1:2000 Scale)**						
a	Block Boundary Demarcation and Bore Hole Fixation and determination of co-ordinates & Reduced Level of the boreholes by DGPS	Per Point of observation	1.6.2	19,200	11	2,11,200	10 BH Points +1 Base station
b	Charges of one Surveyor (1 Party)	one surveyor per day	1.6.1a	8,300	20	1,66,000	

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c	Labours (4 Nos) Base rate - Rs.443	day	5.7	443	80	35,440	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- A	**26,53,840**	
B	**DRILLING**						
1	Drilling up to 300m (Hard rock)	m	2.2.1.4a	11,500	500	57,50,000	
2	Land / Crop compensation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	10	2,00,000	Amount will be reimbursed as per actuals or max. Rs. 20000 per BH with certification from local authorities
3	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	10	20,000	
4	Transportation of Drill Rig & Truck associated per drill	Km	2.2.8	36	1,200	43,200	
5	Monthly Accommodation Charges for drilling Camp (1 Rigs)	month	2.2.9	50,000	4	2,00,000	
6	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
7	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
8	Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	1,10,100	Road making will be considered as per the requirement and reimbursed accordingly.
9	Drill Core Preservation	per m	5.3	1,590	275	4,37,250	will be reimbursed as per actual
					Sub Total- B	**72,60,550**	
C	**LABORATORY STUDIES**						
i	**Primary samples (Bedrock/Channel samples)**						
	a. For 10 radicals i.e. SiO2, Al2O3, Fe2O3, CaO, MgO, K2O, MnO, TiO2, P2O5 & LOI	Nos	4.1.3	9,805	50	4,90,250	
ii	**Check samples Internal (5%) and External(10%)**						
	a. For 10 radicals i.e. SiO2, Al2O3, Fe2O3, CaO, MgO, K2O, MnO, TiO2, P2O5 & LOI	Nos	4.1.3	9,805	8	78,440	

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iii	**Primary samples (BH Core)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3, MgO and LOI	Nos	4.1.3	9,805	250	24,51,250	
iv	**Check samples Internal (5%) and External(10%)**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3, MgO, and LOI	Nos	4.1.3	9,805	38	3,72,590	
v	**Composite Samples**						
	a. For 5 radicals i.e. P2O5, SiO2, Al2O3, Fe2O3, MgO and LOI	Nos	4.1.3	9,805	50	4,90,250	
	b. Trace element study by ICP-MS (34 elements) Ti, V, Cr, Ni, Ga, Cr, Co, Cu, Pb, Zn, Ba, Sr, Rb, Zr, Y, Nb, Ce, Nd, Ta Cd, Sb, Sc, As, Th, U	Nos	4.1.14	7,731	10	77,310	
vi	**Petrological samples (Bh Core Samples)**						
	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
	Study of Thin Section	Nos	4.3.4	4,232	10	42,320	
	Digital Photographs	Nos	4.3.7	280	10	2,800	
vii	**Specific Gravity**	Nos.	4.8.1	1,605	10	16,050	
viii	**Beneficiation Study**	Nos	N.A	3,35,033	1	3,35,033	will be reimbursed as per actual
					Sub Total- C	**43,79,823**	
D					**Sub Total- (A to C)**	**1,42,94,213**	
E	**Geological Report Preparation**		5.2	For the projects exceeding Rs. 50 Lakhs but less than Rs. 150 Lakhs: A Minimum of Rs. 2.5 lakhs or 5% of the work whichever is more.	1	**7,14,711**	
G	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	5 Hard copies with a soft copy	5.1	2% of the Cost or Rs. 3.8 Lakhs whichever is lower		**3,00,178**	
H	**Peer review Charges**		As per EC decision			**10,000**	
I	**Total Estimated Cost without GST**					**1,53,19,102**	

J	**Provision for GST (18% of GST)**	**27,57,438**	GST will be reimbursed as per actual and as per notified prescribed rate
K	**Total Estimated Cost with GST**	**1,80,76,541**	***or say Rs. 180.77 Lakh***
Note - If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execution of the project by NEA on its own, a Certificate regarding non outsourcing of any component/project is required.			

Annexure-2B

Scheduled time for Preliminary exploration (G3) for phosphorite in Kachaldara East block (5.60 sq. km), District: Jhabua, Madhya Pradesh.

S. No.	Activities	Unit	Months											
			1	2	3	4	5	6		7	8	9	10	11	12
1	Camp Setting	Month													
2	Geological Mapping	sq. km													
3	Core Drilling (1 rigs)	m.													
4	Survey days	day													
5	Geologist days	day							Review						
6	Sampling days, Core Sampling	day													
7	Camp Winding	Month													
8	Laboratory Studies	Nos.													
9	Beneficiation Study														
10	Geologist days- HQ	day													
11	Report Writing / Peer review	Month													
*** Commencement of project will be reckoned from the day the exploration acreage is available along with all statutory clearances**															
***Time loss on account of monsoon/agricultural activity/forest clearance/ local law & order problems will be addition to above time line.**															

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Annexure-3A

Estimated cost for Reconnaissance Survey (G4) for glauconitic sandstone in Pindra SW extension block (40.0 sq. km), District: Satna, Madhya Pradesh.

[Block area- 40.0 sq. km; Nos. of Borehole- 10; Borehole depth range- 50m; Completion Time- 12 months]

S. No.	Item of Work	Unit	Rates as per NMET SoC 2020-21		Total Cost of the Project		Remarks
			SoC- Item- S. No.	Rates as per SoC	Qty.	Total Amount (Rs)	
1.0	**Geology & Survey**						
1.1	Geologist man days for Geological Mapping in 1:12500 scale (Field)/Sampling	days	1.3	11,000	100	11,00,000	
1.2	Labour Mapping (Field) (2 workers per geologist)	per day	5.7	431	200	86,200	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner (Rs. 431/- per day) or respective State Govt. whichever is higher
1.3	Sampling man days	day	1.5.2	5,100	30	1,53,000	
1.4	4 labours/ party (Rs 431/day/labour) (As per rates of Central Labour Commissioner) for sampling work	day	5.7	431	120	51,720	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner (Rs. 431/- per day) or respective State Govt. whichever is higher
1.5	Determination of co-ordinates and Reduced Level (RL) of boreholes by DGPS	Nos.	1.6.2	19200	11	2,11,200	10 BH Points +1 Base station
					Sub Total- 1	**16,02,120**	
2.0	**Drilling**						
2.1	Drilling -Medium hard rock (100m to 300m)	m	2.2.1.3a	10,100	500	50,50,000	
2.2	Land / Crop compensation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	10	2,00,000	As per actuals as certified by local authorities subject to a maximum of 20,000 per borehole

2.3	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	10	20,000	
2.4	Transportation of Drill Rig & Truck associated per drill (for 1 rig)	Km	2.2.8	36	1200	43,200	1200 Km to and fro for one rig
2.5	Monthly Accommodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	3	1,50,000	
2.6	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
2.7	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
2.8	Road Making (Flat Terrain)	Km	2.2.10a	22,020	5	1,10,100	
2.9	Drill Core Preservation	per m	5.3	1,590	230	3,65,700	will be reimbursed as per actual
					Sub Total- 2	**64,39,000**	
3.0	**Laboratory Studies**						
3.1	Primary + Check Sample - 4 radicals viz. K_2O, SiO_2, Al_2O_3 & Fe_2O_3	per sample	4.1.7a	2,506	230	5,76,380	
3.2	Chemical Analysis (Composite) for 12 radicals viz. K_2O, Na_2O, CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3, SO_3, P_2O_5, Mn_2O_3, TiO_2, and LOI.	per sample	4.1.7a & b	4,851	20	97,020	
3.3	Specific Gravity determination	per sample	4.8.1	1,605	5	8,025	
3.4	XRD Study	per sample	4.5.1	4,000	5	20,000	
					Sub Total- 3	**7,01,425**	
4.0	**Geologist man days (1 No.) for geological map & Report (HQ)**	days	1.2	9,000	60	**5,40,000**	
Total	**(1.0 to 4.0)**					**92,82,545**	
5.0	**Preparation of Exploration Proposal**	Nos	5.1	2% of the cost or Rs. 3.80 lakh - whichever is lower	1	**1,94,933**	EA has to submit the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC- NMET in its meeting while clearing the proposal.

6.0	**Geological Report Preparation**	Nos	5.2	For the projects having cost exceeding Rs. 50 Lakhs but less than Rs. 150 Lakhs: A Minimum of Rs.2.5 lakhs or 5% of the value of work whichever is more and Rs. 3000/- per each additional copy.	1	**4,64,127.25**	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
7.0	**Report Peer Review Charges**	**Lump sum**	**As per EC decision**		**1**	**10,000**	
Total Estimated Cost without GST						**99,51,606**	
Provision for GST (18%)						**17,91,289**	GST will be reimburse as per actual and as per notified prescribed rate
Total Estimated Cost with GST						**1,17,42,895**	***or say Rs. 117.43 Lakh***
Note - If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execution of the project by NEA on its own, a Certificate regarding non outsourcing of any component/project is required.							

Annexure-3B

Scheduled time for Reconnaissance Survey (G4) for glauconitic sandstone in Pindra SW extension block (40.0 sq. km), District: Satna, Madhya Pradesh.

S. No.	Activities	Unit	Months											
			1	2	3	4	5	6		7	8	9	10	11	12
1	Camp Setting	Month													
2	Geological Mapping	sq. km													
3	Core Drilling (1 rigs)	m.													
4	Geologist days	day													
5	Sampling days, Core Sampling	day													
6	Camp Winding	Month													
7	Laboratory Studies	Nos.													
8	Geologist days- HQ	day													
9	Report Writing / Peer review	Month													
*** Commencement of project will be reckoned from the day the exploration acreage is available along with all statutory clearances**															
***Time loss on account of monsoon/agricultural activity/forest clearance/ local law & order problems will be addition to above time line.**															

Annexure-4

List of the items to be considered for financial assistance to State DGMs for procurement of machinery/ laboratory equipment/ instruments etc.

A. Field equipment's

1. Digital Camera
2. Brunton compass
3. Geologists Hammer
4. Handheld GPS
5. UV Lamp
6. Handheld XRF
7. Scintilometer

B. Sample processing/ preparation

1. Rock cutting, Polishing and mounting unit
2. Pulverizer
3. Stereo zoom microscope
4. Polarizing microscope
5. Transmitted and reflected light research microscope with software attached camera

C. Chemical and petrological laboratory

1. WD-XRF
2. Fusion bead machine
3. Press pellet machine
4. AAS
5. Fire Assay
6. ICP-MS
7. Hot Plates
8. Muffle Furnace/Proximate Analyzer
9. Air Oven
10. Bomb Calorimeter

D. Software for map preparation and data analysis

1. GIS softwares
2. Surfer
3. Corel Draw

E. Drilling activities

1. Drilling Machine upto 1000m capacity.
2. Hydrostatic truck mounted drill machine with 600m to 1000m capacity.
3. Bits, drill rods, casing, core barrel (for one year requirement for one time)
4. Pumps (pressure/mud)
5. Core splitter/core splitter hydrostatic

F. Survey

1. DGPS
2. Total Station
3. Borehole camera
4. Resistivity-Potential Meter