Ministry of Mines
National Mineral Exploration Trust

Minutes of the 46th Technical-cum-Cost Committee [TCC] meeting held on 27th and 28th October, 2022 through videoconferencing at Ministry of Mines, Shastri Bhawan, New Delhi

The 46th 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 27th and 28th October, 2022 at Ministry of Mines, Shastri Bhawan, New Delhi through videoconferencing. 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 two projects 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 conveyed that the NMET secretariat is in process of finalising the cost of machinery/ laboratory equipment/ instruments through inputs from GSI and IBM. The cost arrived will kept as the basis for cost evaluation of the projects for financial assistance for procurement of machinery/ laboratory equipment/ instruments etc.

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-

46.1. Technical evaluation of new project proposals:

46.1.1. Preliminary exploration (G3) of graphite occurrence around Bandhabhuin area (1.00 sq. km), District: Dhenkanal, Odisha. [Implementing Agency: DGM, Odisha]

a. The Bandhabhuin graphite block is the eastern extension of the Dhandatopa Graphite belt of Eastern Ghat Mobile Belt (EGMB). The area is mostly soil covered with intermittent exposures of migmatised-khondalite, basic granulite, garnetiferous quartzite & quartzo-feldspathic gneiss. Graphite mineralization has been observed along the contact of khondalite and basic granulite/granite gneiss.

b. It has been submitted that the proposed Bandhabhuin block has been explored at G4 stage during the FS: 2019-20 & 2021-22 by Directorate of Geology, Odisha [DG, Odisha] which is located 100m SE of Karabira Graphite block. The Karabira Graphite Block was explored by DG, Odisha at G4, G3 and G2 stage and was proved as a potential graphite block.

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c. Directorate of Geology, Odisha has drilled three vertical boreholes with 123m drilling in FS: 2021-22 over the anomalous zones (850mx350m) identified through geophysical survey in the Bandhabhuin graphite block. Based on this, 26m cumulative thickness of graphite occurrences with was recorded in the block. Considering the potentiality of the block through geophysical survey, scout drilling and its geological set up, DG, Odisha has proposed to take up G3 stage exploration in Bandhabhuin graphite Block.

d. It has been submitted that the geological map (1:4,000 Scale), regional geological map (1: 25,000), SP anomaly map (1: 4,000 scale), solid geology map (1: 25,000), magnetic anomaly first derivative map (1: 25,000), satellite image interpreted litho-structural map (1: 25000) data is available for the area.

e. The proposal was sent to GSI for their considered comments, in response to this GSI has conveyed that no investigation for graphite have been carried out in the proposed block. The proposed block is not falling within the block boundary/coordinates of areas being explored during the current FSP/proposed for the next FSP.

f. As the SP anomalies are encouraging and the occurrences of graphite was verified by DG, Odisha, the committee opined that the G3 stage exploration may be taken up by deploying first level (30m vertical depth) and second level (60m vertical depth) drilling over the anomalous zones. Total 700m drilling in 10 boreholes may be carried out in both first and second level of drilling.

g. The committee suggested that the second level drilling may be taken up only in case of encouraging results of first level drilling. The profile lines should be perpendicular to the SP anomaly.

h. The outcome of project will be reviewed after completion of first level drilling in six months.

The committee recommended the proposal for approval of EC for Preliminary exploration (G3) of graphite occurrence around Bandhabhuin area (1.00 sq. km), District: Dhenkanal, Odisha with an estimated cost of ₹166.17 Lakh (including GST) in time schedule of 10 months for carrying out the proposed work and submission of report as per annexure- 2A & 2B.

46.1.2. Reconnaissance survey (G4) for coal in North of Ghutra block (31.56 sq. km), Sonhat coalfield District: Korea, Chhattisgarh. [Implementing Agency: CMPDI]

The proposal was withdrawn by the CMPDI.

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46.1.3. Reconnaissance survey (G4) for diamond in Tikrapara block (100.00 sq. km), Districts: Mahasamand and Gariabandh, Chhattisgarh. [Implementing Agency: NMDC]

a. Geologically the area is represented by the rocks of Dongargrh granitoids overlain by the sandstone, shale, limestone, siltstone sequence of Pairi Group. The Pairi Group is overlain by the Indravati Group of rocks. The Amphibolites of Tonidongar Group are exposed at the base of Dongargarh granitoids and the enclaves of Amphibolites are found in granitoids.

b. It has been conveyed that a number of kimberlite susceptible minerals have been reported from the proposed block by M/s Rio Tinto Exploration Pvt. Ltd. during 2002-05. The findings of pyrope garnet and chromite grains coincide with kimberlite field. In view of this, the NMDC has proposed to take up G4 stage exploration in the proposed area.

c. The proposal was sent to GSI for their considered comments, in response to this GSI has submitted that the G4 stage studies was carried out by GSI in Field Season: 2014-15 over 700 sq. km area covering entire Chhattisgarh administrative part of Toposheet nos. 64L/5 & 64L/6 which includes the proposed Tikrapara block of NMDC. Seven zones were identified by PGRS studies and four zones (T3, T4, T13 and T14) were identified by integrated studies by AMSE Wing in toposheets 64L/5 & 6. Two kimberlitic indicators minerals (Magnesio chromites) have been recovered from the area. Based on studies, GSI had recommended to narrow down the target area and for further identification of the source rock if any.

d. In view of above, the committee opined that the location of heavy mineral occurrences be marked on the geological map and the resultant map be overlapped on geophysical map of the block. Based on this, source rock for heavy minerals may be demarcated for further exploration.

e. The committee further opined that the outcome of the G4 stage geological investigation carried out by GSI during FS: 2014-15 may be collated before envisaging exploration in the block. The drainage map may be also prepared for the proposed block. Committee suggested that a G3 stage exploration may be taken up in the area, if required.

In view of above Committee suggested to collate all geological data of GSI and M/s Rio Tinto and submit a revised proposal for G3 stage exploration in the proposed block, if required.

46.1.4. Reconnaissance survey (G4) for copper and associated minerals in Sitapur block (adjoining to Shitalpani block) of 5.00 sq. km. area, Malanjkhand copper belt, District: Balaghat, Madhya Pradesh. [Implementing Agency: MECL]

a. The proposed Sitapur block was discussed in 43rd TCC meeting held on 28th and 29th July, 2022 wherein the committee suggested to establish resource and auction

possibility of adjoining Shitalpani block, explored by MECL during 2001-2003 before before proceeding for exploration in the current Sitapur block through NMET funding.

b. It is pertinent to mention that an in-situ resource of 0.36 MT with 0.37% Cu at 0.2% Cu cut-off was established by MECL in Shitalpani block (2.00 sq. km) which is adjoining to proposed Sitapur block.

c. The DGM, Madhya Pradesh conveyed that the Shitalpani block has been considered for auctioning of Composite License (CL) during the 10th phase of auctioning by Government of Madhya Pradesh.

d. The Committee opined, as the resource and grade of copper in the adjoining Shitalpani block is dismal, it may be appropriate to wait for the auctioning of Shitalpani block before considering exploration over Sitapur block under NMET funding.

Keeping in view the dismal grade and resource of copper in the adjoining Shitalpani block, the Committee suggested to wait for the auctioning of Shitalpani block before taking up exploration in the proposed Sitapur block.

46.1.5. Reconnaissance survey (G4) for PGE, Chromium, Nickel, Cobalt in Chandiposh block (111.00 sq. km) District: Sundargarh, Odisha. [Implementing Agency: MECL]

a. The project proposal was recommended in 38th TCC meeting held 24th and 25th February, 2022 for approval by EC. In 23rd EC meeting held on 11th March, 2022, EC Members suggested that the chemical analysis for Platinum Group Elements (PGE) (Pt, Pd, Rh, Ru, Os, Ir) are needed to be rechecked and ultramafic rock for PGE mineralization needs to be mentioned in the project proposal. MECL may resubmit the project proposal after modification to TCC.

b. Accordingly, MECL has resubmitted modified project proposal for technical and financial evaluation.

c. Chandiposh area is located in the south-eastern part of Sundargarh district, Odisha. The supracrustal rocks belonging to Archean Bonai granite (3.1 Ga) are exposed in the Bonai-Chandiposh-Gurundia sector. Geologically the older sequence comprising fuchsite quartzite, quartz schist, mica schist, amphibolite, chlorite schist and basic and ultrabasic intrusive has been placed under Group-I sequence. The litho-members of this sequence occur as mega-enclaves within the Bonai Granite. The younger sequence (Group-II) overlies the Bonai Granite with a prominent basal polymictic conglomerate and comprises mainly slate, phyllite, quartzite and amphibolite.

d. It has been submitted that a massive, greyish and greenish, hard and compact ultramafic rock in the form of sill trending NNE-SSW is exposed over a length of about 2.5 km and width of about 25m within the low-grade metasedimentary sequence belonging to the Iron Ore Super Group near Chandiposh. Another sill-like body trending NE-SW with a strike length of 1.75 km with average width of 300m is exposed near and south of Jamardih.

e. The host rocks into which the ultramafic sills are intrusive includes quartzite, metagreywacke, quartz-mica schist and chlorite schist. Though, the ultramafic rock is fairly homophanous both along and across the body, a faint gravity induced primary layering/stratification is discernible at places. The occurrences of audesite, rhyolite, rhyodocite, ignimbrite and anorthosite have been reported by GSI in 1993.

f. It has been submitted that during field visit by MECL a total 12 bedrock samples were collected from the exposed rock body. Out of which 4 ultramafic/ mafic rock samples were analysed for PGE. The samples have been analysed in MECL laboratory as well as Lucid Laboratory. The MECL laboratory reported Ir (10.27ppm to 11.27ppm), Ru (9.98ppm to 25.6ppm) and Os (5.7ppm to 50.3ppm) whereas the LUCID laboratory reported Ir (5.2ppm to 6.3ppm), Ru (6.3ppm to 18.2ppm), Os (6.5ppm to 25.7ppm)

g. The proposal was sent to GSI for their considered comments, in response to this GSI has submitted that nearly 32.00 sq. km of the MECL proposed block is overlapping with GSI work on High Mg rich rock during FS: 1998-99. The proposed block is not falling within the block boundary/coordinates of areas being explored during the current FSP/proposed for the next Field Season Programme (FSP).

h. Based on detailed deliberations the committee opined that geological mapping (1:12,500 scale) and 50 cu.m trenching along with the magnetic survey (50m station interval and 500m space interval) for 600 station points may be taken up over the expected ultramafic body of about 15.00 sq. km along with geological mapping and sample collection.

i. The review of the work progress will be done after 8 months.

The committee recommended the proposal for approval of EC for Reconnaissance survey (G4) for PGE, Chromium, Nickel, Cobalt in Chandiposh block (111.00 sq. km) District: Sundargarh, Odisha with an estimated cost of ₹89.90 Lakh (including GST) in time schedule of 12 months for carrying out the proposed work and submission of report as per annexure- 3A & 3B.

46.1.6. Reconnaissance survey (G4) for manganese ore in Taljuri-Gunchadihi block (75.00 sq. km) District: Balangir, Odisha. [Implementing Agency: MECL]

a. It has been submitted that the proposed Taljuri-Gunchadihi block falls in the north and north-west of pre-explored Babja, Thakurpali & Uchhabpali, Dandapani, Rengali, Tabalbanji, Antapali, Kumiapali, Biarpali, Dungaripali and Khagsabahal Cluster of Manganese blocks. Resource of manganese and graphite was already established in the adjoining 12 blocks. MECL has established 3.53 MT manganese resource with average grade of 22.56% Mn at 18% cut-off and 9.01 MT Mn resource at 17.35% Mn at 10% Mn cut-off. Besides this, 1.33 MT graphite resource was also established at 4.17% Fixed Carbon (FC) in the said blocks.

b. It is expected that the similar geological set-up will continue in the proposed block. Keeping this in view, MECL has proposed to take up G4 stage exploration over an area of 75.00 sq. km in Taljuri-Gunchadihi block.

c. Manganese ore bodies occur as bands, lenses, pockets, veins, tabular bodies and disseminations within the khondalite group of rocks. It has been submitted that the MECL has collected seven bedrock samples from Taljuri, Gunchadihi, Thelkuchhapar, Barhajhula and Dandapani villages. The analyses of these bedrock samples show >10% Mn with range from 16.21% to 37.17% of Mn.

d. The exploration area lies in the northern part of the Eastern Ghats Super Group of rocks belonging to the meta-sedimentary sequence of Precambrian Khondalite. The sequence is comprised of pelitic, psammitic and calcareous formations, representing Khondalite, quartzite and calc-silicate rocks.

e. The proposal was sent to GSI for their considered comments, in response to this GSI has submitted that the reconnaissance survey has been proposed to be taken up during FS: 2023-24 over Dumerjharan and Balipali blocks. About 50% area of the proposed block of MECL overlaps with the proposal of GSI envisaged for implementation during FS: 2023-24.

f. Keeping the above in view, the committee suggested MECL to modify the overlapping area after discussion with GSI, Bhubaneswar and Directorate of Geology, Odisha. If deemed fit, a revised proposal may be submitted in next TCC meeting.

The committee suggested to modify the overlapping area after discussion with GSI, Bhubaneswar and Directorate of Geology, Odisha. A revised proposal may be submitted, if deemed fit.

46.1.7. Reconnaissance survey (G4) for PGE, Nickel, Chromite & associated basemetal mineralization in Yentem-Ningthi area (79.00 sq. km), District: Kamjong (Ukhrul), Manipur. [Implementing Agency: MECL]

a. Geologically the block area is exposed by NNW-SSE trending Ultramafic body belonging to the ophiolite suite of rocks of the Naga-Manipur Hills ophiolites overlying the sedimentary rocks of Disang Group. GSI in 1988-89 had established three lithounits viz., harzburgite, serpentinised harzburgite and serpentinites in the ultramafics with pockets of chromite associated with serpentinised harzburgite. In the proposed study area, the Ultramafic bodies are thrusted over the sedimentary and podiform chromite has been reported from the area.

b. It has been submitted that the Manipur ophiolites predominantly consist of well-preserved mantle derived sequence of peridotites with podiform chromites along with basic rocks and pelagic sediments.

c. During FS: 2009-12, GSI has carried out investigation for PGE in ophiolite belt of Manipur and reported PGE values, Pt (2.5-20ppb), Pd (2.5-5ppb), Ir (5-330ppb), Ru (35-840ppb) and Rh (5-35ppb) in chromite. The occurrence of metallurgical grade chromite and high value of Nickel (upto 7910ppm) and Cr (upto 2852ppm) was also reported by GSI in Manipur ophiolite.

d. Subsequently, during FS: 2019-20, GSI has carried out Reconnaissance survey (G4 stage) for Cr, Ni and basemetal in Gammon-Yentem area. Chromite bearing peridotite

shows Cr_2O_3 value ranging from 31.11% to 53.53%. Besides this, trench samples in Gamnom area shows high values of Nickel 1.07%-1.79%. One sample indicated 1.41% Ni. Total 21 red soil samples indicated Fe_2O_3 values from 10% to 43.75% and Al_2O_3 values from 0.2-14.66%.

e. Various previous investigations of the surrounding area have shown high contents of Cr, Ni and associated metals. Copper-Nickel mineralization is hosted within the suite of altered basic and ultrabasic rocks and chromite mineralization is hosted by harzburgitic rock occurring in the ophiolitic sequence.

f. The proposal of MECL was sent to GSI for their considered comments, in response to this GSI has submitted that the proposed block does not have any overlapping with the earlier explored blocks of GSI as well as during the current FS: 2022-23.

g. Based on detailed deliberations the committee suggested to modify the block boundary by including the northern part and excluding western part of the block. Accordingly, the block boundaries have been modified by MECL.

h. The Committee opined that a further G3 stage project may also be envisaged either by GSI or MECL over the block area explored by GSI in the northern side of the proposed block.

i. The Committee recommended to take up G4 stage exploration in the proposed modified block (73.00 sq. km) by deploying remote sensing, geological mapping (1:12,500 scale), trenching (50 cu.m) and sample collection. The outcome of the project will be reviewed after six months.

The committee recommended the proposal for approval of EC for Reconnaissance survey (G4) for PGE, Nickel, Chromite & associated basemetal mineralization in Yentem-Ningthi area (73.00 sq. km), District: Kamjong (Ukhrul), Manipur with an estimated cost of ₹127.04 Lakh (including GST) in time schedule of 12 months for carrying out the proposed work and submission of report as per annexure- 4A & 4B.

46.1.8. Preliminary exploration (G3) for glauconite in Tipa North block (10.11 sq. km), District: Rohtas, Bihar. [Implementing Agency: MECL]

a. It has been submitted that the proposed Tipa North block is surrounded by Akbarpur-Shapur, Chutia-Nauhatta, and Pipardih-Bhurwa blocks explored up to G3 stage. In Akbarpur-Shapur block three mineralised zones with average thickness of 45m was established by GSI in FS: 2017-18 whereas glauconite resource of 141.73 MT and 60.42 MT respectively was established in the other two blocks.

b. MECL had also collected two sample from the proposed area, wherein analytical results of samples show 1.77% K_2O and 3.68% K_2O.

c. Geologically the area is represented by the Kheinjua shale, Bargwan limestone, Basuhari sandstone (Glauconitic), and Rohtas limestone Formations belonging to Kaimur and Semri Groups of Vindhyan Supergroup. The glauconitic sandstone is exposed as residual mounds of different shapes and sizes in the area. It has been

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submitted that the K_2O ranges from 2.24% to 6.3% in the glauconitic sandstone and is nascent to slightly evolved.

d. The proposal was sent to GSI for their considered comments. In response to this, GSI informed that two resource bearing reports (G3) and three Geological Memorandum (GM) have been handed over to the Government for auctioning of blocks. It was also submitted that the adjoining Nawara-Nawadih and Pipradih-Bhurwa blocks were explored by GSI and resource bearing report/ geological memorandum was handed over to Government of Bihar for auctioning.

e. GSI also informed that a preliminary exploration (G3 stage) project has been proposed by GSI for FS: 2023-24 and will be submitted shortly for approval of competent authority which is almost completely overlapping with the proposed block of MECL.

f. It has been submitted that all adjoining blocks have been explored by GSI for fertilizer mineral, hence priority may be given to GSI for exploration of Balbhadrapur Khandaul block which overlaps the Tipa North block of MECL.

g. Keeping the above in view, the committee opined that the GSI, MECL and DGM, Bihar may jointly discuss the matter and ensure that exploration may be taken up by only one agency to avoid duplication.

Based on detailed deliberations, the committee suggested that the matter may be discussed among GSI, SU: Patna, MECL and DGM, Bihar State and it is to be ensured that there should not be any duplication of work in the Tipa North block.

46.1.9. Reconnaissance survey (G4) for REE mineralization in Rudrawathi block (117.37 sq. km), District: Tiruppur, Tamil Nadu. [Implementing Agency: MECL]

a. Geologically the granulite-gneiss terrain of central Tamil Nadu is divided into three distinct litho-tectonic domains, viz. northern Nilgiri-Sittampundi domain, central Dharapuram domain and southern Kodaikkanal domain. The block is represented by hornblende-biotite gneiss with enclaves of pyroxene granulite of Migmatite Gneissic complex belonging to central Dharapuram domain.

b. It has been submitted that few sporadic occurrences of Allanite have been observed in the pegmatite and quartz veins exposed in east of Suryanallur and north-west of Sirukkinar localities. It is pertinent to mention that the Allanite is a most common rare earth mineral of sorosilicate group and vital for REEs.

c. It has been conveyed that the high geochemical anomaly of TREE has been observed in the geochemical data collected by GSI from the proposed block. Based on Allanite occurrence and TREE geochemical anomaly, MECL has proposed to take up G4 stage reconnaissance survey in the proposed block.

d. The proposal was sent to GSI for their considered comments. In response to this, GSI has submitted that Northern part of proposed block is overlapping with RMT investigation proposed to be taken up in FS: 2023-24.

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e. GSI has also conveyed that the toposheet no 58F/5 and 58F/9 have been covered under NGCM program and geochemical anomaly data is available for the entire area.

f. The Directorate of Geology and Mining, Government of Tamil Nadu informed that some parts of the proposed block area fall under lease hold for minor minerals.

g. Based on detailed deliberations the committee suggested that:

   i. *All available geological and geochemical data acquired by GSI may be collated by MECL.*

   ii. *Contour map of LREE and HREE may be prepared on the basis of geochemical data of GSI. The anomalous REE unit cells may be marked to demarcate the possible potential loci for further exploration.*

   iii. *Lease hold area may be excluded from the proposed block area.*

   iv. *The localities of Allanite occurrences reported by earlier worker may be included in the block.*

In view of the observations made at para (g) above, the committee suggested to submit the revised proposal after attending the comments/suggestions.

46.1.10. Preliminary exploration (G3) for gold in Kudrikonda-Palavanahalli area (68.31 sq. km), Shimoga schist belt, District: Devanagere, Karnataka. [Implementing Agency: MECL]

a. Geologically the area is represented by a narrow schist band (1.5 to 2.0 km width) of Shimoga schist belt. This schist band is bound by the Honnali Gneiss in the north and the Savalanga Granite in the south. The schist band is comprised of an interlayered meta-sedimentary sequence represented by quartz-chlorite schist, ferruginous phyllite, quartzite and banded ferruginous quartzite with intermediate to acid volcanics now seen as chlorite-actinolite schist and quartz-sericite schist. The western part of the schist belt is occupied by meta-sedimentaries whereas the north-eastern part by meta-andesite/meta-basalt.

b. The area is known for several old workings and mineralization is associated with sheared meta-basalt carrying quartz carbonate veins. It has been submitted that the quartz veins are considered as the carrier of gold in Kudrikonda area. The probable zone of mineralization is marked by wallrock alteration in the form of carbonitisation, sericitisation and silicification and fuchsite intergrowth within quartz vein.

c. It has been submitted that the low altitude EM data is available for the area and may be considered for demarcation of potential zones.

d. Based on detailed deliberations, the committee opined that the north-western part of the block area (2.74 sq. km) may be considered for magnetic and SP survey with 300 nos. of soundings points. In case of encouraging results in north-western part the entire block may be considered for G3 stage exploration with drilling.

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e. The committee opined that the proposal may be considered for G3 stage preliminary exploration (Phase-I) and in case of encouraging results in north-western part, the exploration may be taken up in north-eastern part as G3 stage preliminary exploration (Phase-II). The project will be reviewed after completion of geophysical work.

The committee recommended the proposal for approval of EC for Preliminary exploration (G3) [Phase-I] for gold in Kudrikonda area (2.74 sq. km) area for geophysical survey in Shimoga schist belt, District: Devanagere, Karnataka with an estimated cost of ₹116.99 Lakh (including GST) in time schedule of 6 months for carrying out the proposed work and submission of report as per annexure- 5A & 5B.

46.1.11. Reconnaissance survey (G4) for Copper, Lead, Zinc and Gold in Tarichar Khurd block (101.00 sq. km), District: Niwari, Madhya Pradesh. [Implementing Agency: MECL].

a. The proposal was discussed in the 38th TCC meeting wherein the Committee has reserved its decision for want of clarification on the background information, geological milieu, and analytical results.

b. The same project was again discussed in 39th TCC meeting wherein the Committee suggested to collect some of the samples from the proposed area and analyze them at the laboratory of MECL and in case of encouraging results, the project may be resubmitted in the next TCC.

c. Proposal was recommended in 40th TCC meeting 27th and 28th April, 2022 for approval of EC, however, EC in its 24th meeting held on 18th May, 2022 deferred the proposal and suggested MECL to take comments from GSI regarding the feasibility for further exploration work in the proposed area.

d. In reference to the directives of EC, MECL has sought comments from GSI, State Unit: Bhopal wherein GSI has conveyed that the area is potential and G4 stage exploration may be taken up by MECL. In view of this MECL has resubmitted the proposal.

e. It is pertinent to mention that the MECL has taken up reconnaissance survey (G4 stage) for Copper, Lead and Zinc in Laron block, District: Jhansi, Uttar Pradesh and reported values of Cu (6.23ppm-214.64ppm), Pb (<1ppm-123.04ppm), Zn. The TCC committee has reviewed the findings of Laron block and opined that the analytical results are not encouraging hence project may be concluded. The proposed Tarichar Khurd block is in similar geological set-up to that of Laron block.

Keeping in view the comments of GSI on potentiality of the Tarichar Khurd block, the committee suggested to put up the proposal for consideration of EC for approval of Reconnaissance survey (G4) for Copper, Lead, Zinc and Gold in Tarichar Khurd block (101.00 sq. km), District: Niwari, Madhya Pradesh with an estimated cost of ₹49.35 lakh including GST in a time schedule of 12 months for carrying out the proposed work and submission of geological report as per annexure- 6A and 6B.

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46.1.12. Financial assistance for procurement of laboratory scale mineral processing equipment's, characterisation and analysis instruments for Regional Mineral Processing Laboratory, Bengaluru. [Implementing agency: IBM, Nagpur]

a. It has been submitted that the replacement of existing equipment's and addition of new facilities are of utmost importance for processing of precious, strategic, and critical minerals to meet the requirements of exploration agencies for auctioning of mineral blocks and for effective R&D on different low grade & complex ores.

b. Keeping this in view, IBM has proposed to procure the following instruments/ software's for Regional Mineral Processing Laboratory, Bengaluru:

I. MINERAL PROCESSING EQUIPMENTS

(i) High Intensity Magnetic Separator Induced Roll "Lift Type" Laboratory Model: Rs. 35.0 lakh

(ii) High Temperature Furnace 1600° C with gas inlet provision: Rs. 30.0 lakh

(iii) Hindered Bed Separator with feed pump and necessary accessories: Rs. 40.0 lakh

(iv) Electrostatic Plate Separator: Rs. 35.0 lakh

(v) Spiral HG and MG configuration (each 1 No.): Rs. 30.0 lakh

(vi) Hydro-cyclone test rig assembly to test with different types of hydrocyclones with product and tailing handling pumps with different cyclone arrangements: Rs. 95.0 lakh

(vii) Leaching circuit with autoclave for pressure leaching and solvent extraction unit: Rs. 20.0 Lakh

(viii) Column Flotation Cells: Rs. 40.0 lakh

(ix) Flotation Cells - Rougher 3 cells (0.5 m^3 each) and Scavenger 1 cell (0.5 m^3) circuit with feed pumps, 2 conditioning tanks with agitator, along with flotation product and tailing pumps, reagent dosing system and pilot scale filtration system for concentrator and tails: Rs. 175.0 lakh (*For Replacement of existing facilities*)

II. MINERALOGY INSTRUMENT & EQUIPMENTS

(i) Thermogravimetry and Differential Thermal Analyser (TG-DTA): Rs. 90.0 lakh

(ii) Rock Cutting-cum-Automatic Thin Section Preparation equipment along with accessories and ancillary units: Rs. 45.0 lakh (*For Replacement of existing facilities*)

III. CHEMICAL ANALYSIS INSTRUMENTS

(i) Inductively Coupled Plasma Optical Emission Spectrophotometer (ICP-OES) with microwave digesting system: Rs. 90.0 lakh

(ii) Carbon and Sulphur Analyzer: Rs. 35.0 lakh

(iii) Handheld XRF: Rs. 40.0 lakh

Total= Rs. 800.0 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

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modernization of instrumental facilities through infusion of state-of-the-art technology will enhance the capacity of IBM for ores assessment. The committee opined that the proposed R&D facilities will form a strong base for beneficiation study on exploration samples.

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, Bengaluru as detailed at para (b) above, except handheld XRF 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).

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.

46.1.13. Financial assistance from NMET funds to procure machinery/ laboratory equipment/instruments etc. aimed at enhancing the exploration activities. [Implementing agency: DGM, Assam]

a. The DGM, Assam has sought financial assistance for procurement of the following items:

1. Geologist field kit [backpack, notebook, magnifying glass, water bottle, tracking shoes, rain guard, umbrella, advanced hand lens, extension board, sample bag, solar light, power bank] (15 nos.) at the cost of Rs. 3.0 lakh
2. Tablet for field geologist (15 nos.) Rs. 3.0 lakh
3. Laptop (7 nos.) Rs. 5.0 lakhs
4. DSLR Cammera with Lens (3 nos.) Rs. 1.5 lakh
5. External HDD (15 nos.) Rs. 1.0 lakh
6. Printer (3 nos.) Rs. 1.5 lakh
7. Digital toposheet (6 nos.) Rs. 5.0 lakh
8. GIS software (1 no.) Rs. 13.0 lakh
9. Satellite Imagery (6 nos.) Rs. 0.4 lakh
10. Magnetic Susceptibility meter with analysis software (1 no.) Rs. 3.5 lakh
11. Handheld XRF (3 nos.) Rs. 25.5 lakh
12. Pocket Magnetic Susceptibility meter (1 no.) Rs. 1.0 lakh
13. Acid Bottles (10 nos.) Rs. 1000/-
14. Portable Core Drilling Machine (Bagpack) (3 no.) Rs 8.0 lakh
15. Jack Hammer (3 nos.) Rs. 3.0 lakhs
16. Surveyor Field Kit (6 nos.) Rs. 0.3 lakh
17. DGPS (1 no.) Rs. 16.0 lakhs
18. DGPS controller (1 no.) Rs. 2.5 lakh
19. Desktop with UPS (1 no.) Rs 0.7 lakh
20. EPSON Colour Printer (1 no.) Rs. 1.42 lakh
21. Printer Cartridge (1 no.) Rs 18,000/-
22. Portable Toilet (5 nos.) Rs 0.9 lakh
23. Swiss cottage tent (3 nos.) Rs 2.1 lakh
24. Water purifier (10 nos.) Rs 0.3 lakh

25. Trolly (3 nos.) Rs 0.3 lakh
26. Folding table (10 nos.) Rs 0.7 lakh
27. Visiting folding chair (20 nos.) Rs 0.5 lakh
28. Portable diesel generator 5KVA capacity (3 nos.) Rs 0.9 lakh
29. Staff field kit (10 nos.) Rs 0.5 lakh
30. Desktop (1 no.) Rs 1.0 lakh

Total= Rs. 103.36 lakhs

b. The committee assessed the requirement of instruments/software facilities for DMG, Assam 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) DSLR Camera with lens (3 nos.)
(ii) Digital toposheets (6 nos.)
(iii) GIS software (1 no.)
(iv) Magnetic Susceptibility meter with analysis software (1 no.)
(v) Handheld XRF (2 nos.)
(vi) Portable Core Drilling Machine (Bagpack) (3 nos.)
(vii) DGPS set (1 no.)

for DMG, Assam to strengthen the exploration activities in the State of Assam. 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, Assam in consent with the competent authority of Department /State Financial Wing.

46.2. Review of the Geological report/Ongoing projects

46.2.1. Preliminary exploration (G3) for potash in Bharusari block, District: Hanumangarh, Rajasthan. [Implementing Agency: MECL]

a. The project was recommended in 24th TCC meeting held on 7th, 8th and 9th October, 2020 and approved in 17th EC meeting held on 5th November, 2020 at an estimated cost of ₹1,754.23 lakh and time schedule of 18 months.

b. MECL informed that a total of 7,868m drilling has been completed in 12 boreholes over an area of 14.16 sq. km. It has been observed that total 7 (seven) halite cycles i.e. H1, H2, H3, H4, H5, H6 and H7 have been intersected in the boreholes drilled in Bharusari block.

c. The thickness of Halite cycle H2 is maximum, whereas the thickness of Halite cycle H6 is minimum. Halite cycles H1, H2 and H4 shows the presence of potash bands although Halite cycle H2 is the most promising halite cycle having the maximum number of potash zones followed by H4 Halite cycle and H1 Halite cycle.

d. The resource estimated in the block based on the data of 12 boreholes of MECL and 5 boreholes of GSI at 2%, 3% and 5% K cut off with minimum thickness of 1.00 m by area of influence method. The details are given below-

Cut-off category	Gross inferred resource (333) [Million Tonnes (MT)]	Net inferred resource (333) (MT)	Grade (% K)	Gross reconnaissance resource (334) (MT)	Net reconnaissance resource (334) (MT)	Grade (% K)
2% K	138.965	111.172	3.06	64.609	51.688	3.04
3% K	49.738	39.791	4.28	22.007	17.606	4.30
5% K	12.839	10.272	5.58	5.324	4.259	5.65

Cut-off category	Total gross inferred + reconnaissance resource (MT)	Grade (% K)	Total net inferred+ reconnaissance resource (MT)	Grade (% K)	Average Grade (% K_2O)
2% K	203.57	3.05	162.860	3.05	3.69
3% K	71.745	4.29	57.397	4.29	5.19
5% K	18.163	5.60	14.531	5.60	6.78

e. A total 7411.782 MT halite resource with average grade of 32.21% Na & 0.50% K has been estimated in 14.17 sq. km area of the Bharusari block.

f. In 42nd TCC meeting held in June, 2022, the committee opined that the Potash (K) grade is very low (<3% K) and chemical analysis are also not encouraging in any boreholes. No further chemical analysis of samples is required.

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

46.2.2. General exploration (G2) for copper in Mundadevta-Dharkhuli South Jharia block, District: East Singhbhum, Jharkhand. [Implementing Agency: MECL]

a. The project was recommended in 27th TCC meeting held on 07th and 08th January, 2021 at an estimated cost of ₹967.70 Lakh with timeline of 18 months. The project was approved in 18th EC meeting held in February, 2021.

b. The progress of work in Mundadevta-Darkhuli-South Jharia copper block was reviewed in the 35th TCC meeting held in November, 2021 wherein the additional drilling of 177m was approved by the committee and in 43rd TCC meeting held in July, 2022 approved the additional cost of ₹33.40 Lakh.

c. MECL informed that total of 5,112m drilling has been carried out.

d. Resource estimation for copper ore mineralization has been done on the basis of total 12,471m drilling data (GSI: 7359.06m in 65 boreholes + MECL: 5112m in 23 boreholes) in the block area. Mineralized zones delineated with 0.5% Cu and 1.00% Cu cut-off

grades separately considering minimum stopping width (MSW) of 2.00m as true width and 3.00m.

e. Total net estimated resource of the block at 0.5% Cu cut-off remained at 1.75MT whereas the total resource at 1.0% Cu cut-off grade is estimated at 0.63MT. The detail summary of net estimated resources is given below:

Resource at 0.50% Cu cut-off grade:

Block	Cut-off Grade (% Cu)	Total Net Resource (Tonnes)		Net Total Resource (Tonnes) (332 + 333)	Average Grade (Cu %)	Total Metal Content (Tonnes)
		(332)	(333)			
Mundadevta-Darkhuli	0.50	1351317.71	223405.02	1574722.73	0.97	15274.81
South Jharia	0.50	168346.79	6476.81	174823.60	0.87	1520.97
		1519664.50 (1.52 MT)	**229881.83 (0.23 MT)**	**1749546.33 (1.75 MT)**	**0.96**	**16795.64**

Resource at 1.00% Cu cut-off grade:

Block	Cut-off Grade (% Cu)	Total Net Resource (Tonnes)		Net Total Resource (Tonnes) (332 + 333)	Average Grade (Cu %)	Total Metal Content (Tonnes)
		(332)	(333)			
Mundadevta-Darkhuli	1.00	512672.17	65404.52	578076.69	1.48	8555.54
South Jharia	1.00	63474.66	1778.59	65253.25	1.32	861.34
		576146.83 (0.57 MT)	**67183.11 (0.06 MT)**	**643329.94 (0.64 MT)**	**1.46**	**9392.62**

f. It has been submitted that the copper bearing lodes are disposed in a plunging synform and occurring at shallow depth. Based on estimation of resource the block may be suitable for auctioning by amalgamating the present block with adjoining potential blocks, available if any.

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

46.2.3. Reconnaissance survey (G4) for Emerald in Rajgarh block, District: Ajmer, Rajasthan. [Implementing Agency: MECL]

a. The project was recommended in 34th TCC meeting held in October, 2021 and approved in 22nd EC meeting held in December 2021 with estimated cost of ₹97.20 lakh for a time period of 14 months.

b. MECL has carried out large-scale geological mapping (1:12,500 scale) and reported about 9 km long curvilinear altered ultramafic bodies. These altered utramafic bodies comprise talc-chlorite schist, talc-tremolite schists, altered peridotite, and occur as small, disconnected more or less continuous belt having ellipsoidal to circular shape.

c. In 43rd TCC meeting held in July, 2022 the project was reviewed by TCC and it was observed by the committee that the gem variety of Beryl is reported from the

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demarcated potential zone (5 sq. km area). The committee suggested for rigorous sampling in the block area for targeting emerald host rock. It was also suggested to consult with the field geologists of GSI working in the similar area for emerald exploration.

d. Accordingly, MECL and GSI, Western Region, Jaipur carried out a joint field visit on 16th and 17th September, 2022. It is pertinent to mention that the host rock of known Rajgarh emerald mine is a hydrothermally altered schistose talc biotite/ phlogophite metasomatic zone. Hence, similar zones have to be delineated and mapped in larger scale, preferably 1:1,000 or 1: 500 scale as the zones is 1-5m in thickness.

e. GSI suggested collecting at least 20 nos. of samples from established and probable zones of emerald mineralization for whole rock analysis and petrographic studies. Some of the beryl samples collected from Rajgarh area may be tested through XRD for emerald characterization.

f. After detailed deliberations the committee opined that the potential emerald zones may be marked. Committee further suggested to complete all the assigned targets and submit the geological report, and in case of encouraging results, next stage of exploration may be planned.

The committee noted the suggestions of GSI and asked MECL to carry out exploration as per the approved work components.

46.2.4. Preliminary exploration (G3) for copper and associated minerals in Thakurdih-Charakmara block, District: East Singhbhum, Jharkhand. [Implementing Agency: MECL]

a. The project was recommended in 36th TCC meeting held on 23rd and 24th December, 2021 and approved in 23rd EC meeting held on 11th March, 2022 with estimated cost of ₹388.59 lakh for a time period of 12 months.

b. MECL informed that as per the approved work component, initial five boreholes for first level of drilling of 600m has been completed in Charakmara block and IP, resistivity and magnetic survey of 60 line km have been completed in three area [area-1, area-2 & area-3].

c. Three boreholes of 1st level of MECL and 2 boreholes of GSI spaced at 100m apart intersected mineralized zones varying in width from 0.90m to 2.05m with grade range from 0.28% to 2.05% Cu and 0.25% Ni at about 60 m vertical depth.

d. Based on review of work progress, committee suggested to drilled three (3) nos. of boreholes for second level in Charakmara block to confirm the depth persistence of mineralized zones up to vertical depth of 120m from the surface and three (3) nos. of boreholes for first level in area-1 and 3 up to vertical depth of 60m from the surface.

The committee noted the outcome of the exploration and suggested to drilled three (3) nos. of boreholes for second level in Charakmara block up to vertical depth of 120m

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and three (3) nos. of boreholes for first level in area-1 and 3 up to vertical depth of 60m from the surface.

46.2.5. Reconnaissance survey (G4) for sillimanite in Chippilangso block, District: Karbi-anglon, Assam. [Implementing Agency: MECL]

a. The project was recommended in 34th TCC meeting held on 28th and 29th October, 2021 and approved in 22nd EC meeting held on 22nd December, 2021 with estimated cost of ₹379.47 lakh for a time period of 18 months.

b. MECL informed that geological mapping at 1:12500 scale has been done and two sillimanite quartz band are encountered. The prograde metamorphic alumina-rich lithology of Sillimanite quartz schist surrounded by gneissic terrain are reported.

c. The DGM, Assam has reported sillimanite content in the rock, and classified the resource into four categories, Viz. Grade-1 (99% sillimanite), Grade-2 (70% sillimanite), Grade-3 (40% sillimanite) and Grade-4 (25% sillimanite).

d. A Sillimanite quartz schist band [20mX17m] with Al_2O_3% range from 22.46% to 14.13% and another Sillimanite quartz schist band [65mX70m] with Al_2O_3% range from 19.36% to 14.53% Al_2O_3 with Grade-4

e. A total of 44 nos. of trench samples have been collected in the block and analysed for SiO_2, Al_2O_3, Fe_2O_3, TiO_2, MgO & K_2O. The analytical range of Al_2O_3: 14.13-22.46%; SiO_2: 64.02-77.74%; Fe_2O_3: 1.11-2.72%; TiO_2: 0.29-0.53%; K_2O: 3.5-7.44%.

f. The committee opined that the chemical analysis is not showing encouraging results and suggested to conclude the exploration work. The block is not potential for further mineral exploration.

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

46.2.6. Reconnaissance survey (G4) for manganese ore and graphite in Larambha-Kanaital & Pudapadar-Bharatbahal blocks (135 sq. km), District: Balangir, Odisha. [Implementing Agency: MECL]

a. The project was recommended in 38th TCC meeting held on 24th and 25th February, 2022 and approved in 23rd EC meeting held on 11th March, 2022 with estimated cost of ₹193.51 lakh for a time period of 18 months.

b. It has been conveyed that the geological mapping on 1:12,500 scale and bedrock/ channel sampling have been completed. A total 93 no. of bed rock / channel samples have been analysed for Mn, SiO_2, P_2O_5, Fe_2O_3, MnO_2. Out of these 65 nos. of samples having the Mn% more than 10% which range from 10.09% to 42.71% Mn with an average grade of 23.50% Mn.

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c. A total of 10 samples has been analysed for graphite mineralisation, out of which 4 samples having more than 2% FC, ranging between 2.60 to 6.56% FC with an average grade of 4.74% FC.

d. Based on chemical analysis for manganese and graphite, committee suggested to carry out the approved geophysical survey work and 2nd review will be done after completion of geophysical survey and chemical analysis of trench samples.

The committee noted the outcome of the progress of mineral exploration work and suggested to carry out approved geophysical survey and trenching work.

46.2.7. Reconnaissance survey (G4 stage) for Iron Ore in Lengupara area, Goalpara district, Assam. [Implementing Agency: DGM, Assam]

a. The project was recommended in 38th TCC meeting held on 24th and 25th February, 2022 and approved in 23rd EC meeting held on 11th March, 2022 with estimated cost of ₹328.47 lakh for a time period of 12 months.

b. Initially, the magnetic survey with 100 stations was recommended by the committee through inhouse capacity. Now, DGM, Assam requested to carry out magnetic survey through outsourcing.

c. The Committee agreed to carry out the magnetic survey through outsourcing without any additional cost. The cost for magnetic survey work will be reimbursed as per the actual or SoC of NMET.

The committee agreed and approved to carry out the magnetic survey through outsourcing without any additional cost.

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

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List of TCC members attended 46th Technical-cum-Cost Committee (TCC) meeting of NMET held on 27th and 28th October 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	Not attended
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 via videoconference
11	Shri Ravi Kumar Gupta, General Manager (Finance), HCL	TCC Member	Not attended
12	Shri P. K. Maharana, Dy. General Manager (Finance), NALCO	TCC Member	Attended via videoconference
13	Shri Vinay Pal, ACAO (Finance), GSI	TCC Member	Not attended/ On leave

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Annexure-1

List of participants attended 46th Technical-cum-Cost Committee (TCC) meeting of NMET held on 27th and 28th October, 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 Manoj Kumar Patel DDG and RMH-II, GSI	m.patel1@gsi.gov.in	9040011231	Member, TCC
7	Shri Santosh Kumar Adhikari Chief Mining Geologist, IBM	skadhikari@ibm.gov.in	7588690545	Member, TCC
8	Shri Vivek Kumar Sharma Director, NMET	vksharma.ofb@gov.in	7024570055	Member, TCC
9	Shri P. K. Maharana, DGM (F), NALCO	pmaharana@rediffmail.com	8500669500	Member, TCC
10	Shri Suresh Chander Director, GSI	suresh.chander@gsi.gov.in	9493860963	Member Secretary, TCC
11	Shri Maneesh Khar Director, GSI	nmet-mines@gov.in	9462036108	NMET
12	Dr. Deshraj Trivedi Senior Geologist	nmet-tcc@gov.in	9419244294	NMET
13	Shri Subhash Kumar Senior Geologist	nmet-mines@gov.in	9868302624	NMET
14	Shri P. C. Mishra, Joint Director (Geology)	directorgeology_odisha@yahoo.in	9861465695	DGM, Odisha
15	Dr. R. P. Singh, Manger (Geology)	gm.exploration.cmpdil@gmail.com	8987789047	CMPDI
16	Dr. Ch Sravan Kumar, DGM (Geology)	sravankumar@nmdc.co.in	9490760005	NMDC
17	Shri P. Ravindran, DGM (Exploration)	gm-exploration@mecl.co.in	7907649392	MECL, Nagpur
18	Smt. Aruna V., Joint Director	geomine@nic.in	9176610967	DGM, Tamil Nadu
19	Shri Vinod Badgey, Suptg. Geologist	geology.dgm@mp.gov.in		DGM, MP
20	Dr. Dillip R. Kanungo Director (OD)I/c	codo@ibm.gov.in	8237047897	IBM, Nagpur
21	Shri H. P. Harish, Deputy Director (Plan)	dir-mines@karnataka.gov.in	9611951313	DGM, Karnataka
22	Smt. Barnalee Nath, Joint Director (Geology)	dgmassam@gmail.com	9435104508	DGM, Assam

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Annexure-2A

Estimated cost for Preliminary exploration (G3) of graphite occurrence around Bandhabhuin area (1.00 sq. km), District: Dhenkanal, Odisha.

[Block area- 1.00 sq. km; Nos. of Borehole- 10; Borehole depth range- 50-80m; Completion Time- 10 months]

S. No.	Item of Work	Unit	Rates as per NMET SoC (2020-21)		Estimated cost of the Proposal		Remarks
			Soc-Item-Sl. No.	ESC Rate (Rs.)	QTY	Amount (Rs.)	
A	**DRILLING (Outsourced)**						
1	Drilling	m	2.2.1.4a	11,500	700	80,50,000	
2	Drill Core Preservation	per m	5.3	1,590	215	3,41,850	
					Sub Total- A	**83,91,850**	reimbursement of outsource component will be made as per Para 3 of NMET-SoC
B	**GEOLOGICAL WORK**						
1	Survey Party days (One Surveyor Charges)	day	1.6.1a	8,300	30	2,49,000	
2	Labours (4 Nos) Base rate - Rs. 326*4=1304/-	day	5.7	1,304	30	39,120	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
3	Charges for one Geologist per day at HQ	day	1.2	9,000	60	5,40,000	
4	Geological Mapping, Core Logging (Charges for one Geologist per day at field)	day	1.2	11,000	90	9,90,000	
5	Labours (4 Nos) Base rate - Rs. 326*2=652/-	day	5.7	652	120	78,240	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
6	Sampler days	day	1.5.2	5,100	20	1,02,000	
7	Labours (4 Nos) Base rate - Rs. 326*4=1304/-	day	5.7	1,304	20	26,080	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- B	**20,24,440**	

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C	LABORATORY STUDIES						
1	**Chemical Analysis**						
i)	**Primary check samples**						
	Primary samples for 11 radicals (Al2O3, SiO2, P, S, Fe, FC, Na2O, K2O, Ash, Moisture and LOI)	Nos	4.1.1	8,157	150	12,23,550	
	X-RD Studies	Nos	4.5.1	4,000	10	40,000	
	ICPMS/ICP-AES (34 elements Analysis)	Nos	4.1.14	7,731	10	77,310	
ii)	**Check samples Internal (10%)**						
	Check samples for 9 radicals (Al2O3, SiO2, P, S, Fe, FC, Ash and LOI)	Nos	4.1.1	8,157	15	1,22,355	
ii)	**Check samples External (10%)**						
	Check samples for 9 radicals (Al2O3, SiO2, P, S, Fe, FC, Ash and LOI)	Nos	4.1.1	8,157	15	1,22,355	
iii)	**Composite Samples**						
	Composite samples for 9 radicals (Al2O3, SiO2, P, S, Fe, FC, Ash and LOI)	Nos	4.1.1	8,157	10	81,570	
2	**Physical Analysis**						
i)	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii)	Petrographic studies	Nos	4.3.4	4,232	10	42,320	
iii)	Preparation of polished section	Nos	4.3.2	1,549	10	15,490	
iv)	Mineragraphic studies	Nos	4.3.4	4,232	10	42,320	
v)	Digital Photographs	Nos	4.3.7	280	10	2,800	
vi)	Bulk density	Nos		1,568	5	7,840	
					Sub Total- C	**18,01,440**	
					Total A+B+C	**1,22,17,730**	
E	Preparation of Exploration Proposal	One number (5 Hard copies with a soft copy)	5.1	2% of the approved project cost or 3.8 lakh whichever is lower.		2,44,355	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.

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F	Geological Report Preparation	5 Hard copies with a soft copy	5.2	For the project cost exceeding ₹ 50 lakh but less than 150 lakh: A Minimum of ₹2.5 lakh or 5% of the work whichever is more.	6,10,887	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
G	Tender Processing Cost		2.3	2% of the approved project cost or 5 lakh whichever is lower.	2,44,355	will be reimbursed when copy of signed agreement/tender for outsourced component will be submitted.
H	Operational charges	Para 3 of SoC			7,54,389	will be reimbursed as per point 3 of NMET-SoC after recalculation when actual cost of outsourcing component will be provided. The copy of contract agreement for outsourced component and work completion report are also required to reimburse the operational charge
I	Peer review Charges	As per EC decision			10,000	
	Total Estimated Cost without GST				**1,40,81,715**	
	GST @18%				25,34,708.65	GST will be reimbursed as per actual and as per notified prescribed rate
	Total Estimated Cost with GST				**1,66,16,423.35**	***or say Rs. 166.17 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) of graphite occurrence around Bandhabhuin area (1.00 sq. km), District: Dhenkanal, Odisha.

S. No.	Activities	Unit	Months										
			1	2	3	4	5	6	Review	7	8	9	10
1	Camp Setting	Month											
2	Core Drilling (1 rigs)	m.											
3	Survey days	day											
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.**													

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Annexure-3A

Estimated cost for Reconnaissance survey (G4) for PGE, Chromium, Nickel, Cobalt in Chandiposh block (111.00 sq. km) District: Sundargarh, Odisha.

[Block area- 111.00 sq. km; 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 (1:12,500 scale)**						
i	Charges for one Geologist per- HQ	day	1.3	9,000	60	5,40,000	
ii	Charges for one Geologist-Field	day	1.3	11,000	150	16,50,000	
iii	Labour (2 Nos) Base rate - Rs.437	day	5.7	437	300	1,31,100	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
iv	Charges for one Sampler per day for geochemical, channel and core samples	one sampler per day	1.5.2	5,100	20	1,02,000	
v	Labours (4 Nos) Base rate - Rs. 437/-	day	5.7	437	80	34,960	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- A	**24,58,060**	
B	**PITTING AND TRENCHING**						
i	Trenching (1m x 2mx 3410 m)	Cu m	2.1.1	3,330	50	1,66,500	
					Sub Total- B	**1,66,500**	
C	**GEOPHYSICAL SURVEY**						
i	Magnetic Survey	per station	3.2a	1,800	600	10,80,000	
ii	Charges for one Geophysicist per day at field	day	3.18	11,000	45	4,95,000	
iii	Charges for one Geophysicist per day at HQ	day	3.18	9,000	20	1,80,000	

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iv	Surveyor Work	days	1.6.1a	8,300	45	3,73,500	
v	4 labours/ party (Rs 437/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	437	180	78,660	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- C	**22,07,160**	
D	**LABORATORY STUDIES**						
1	**Chemical Analysis**						
I	**Primary & Check Samples from Surface outcrop**						
i	**Primary samples**						
	a. For Ni, Co, Cr, Cu	Nos	4.1.7a	2,506	75	1,87,950	
	b. For PGE	Nos	4.1.5d	11,800	75	8,85,000	
	c. For Au by fire assay	Nos	4.1.5a	2,380	10	23,800	
ii	**Internal check samples (5%)**						
	a. For Ni, Co, Cr, Cu	Nos	4.1.7a	2,506	4	10,024	
	b. For PGE	Nos	4.1.5d	11,800	4	47,200	
	c. For Au by fire assay	Nos	4.1.5a	2,380	1	2,380	
iii	**External check samples (10%)**						
	a. For Ni, Co, Cr, Cu	Nos	4.1.7a	2,506	8	20,048	
	b. For PGE	Nos	4.1.5d	11,800	8	94,400	
	c. For Au by fire assay	Nos	4.1.5a	2,380	1	2,380	
II	**Primary & Check Samples from Trench**						
i	**Primary samples**						
	a. For Ni, Co, Cr, Cu	Nos	4.1.7a	2,506	50	1,25,300	
	b. For PGE	Nos	4.1.5d	11,800	50	5,90,000	
	c. For Au by fire assay	Nos	4.1.5a	2,380	10	23,800	
ii	**Internal check samples (5%)**						
	a. For Ni, Co, Cr, Cu	Nos	4.1.7a	2,506	3	7,518	
	b. For PGE	Nos	4.1.5d	11,800	3	35,400	
	c. For Au by fire assay	Nos	4.1.5a	2,380	1	2,380	

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iii	**External check samples (10%)**						
	a. For Ni, Co, Cr, Cu	Nos	4.1.7a	2,506	5	12,530	
	b. For PGE	Nos	4.1.5d	11,800	5	59,000	
	c. For Au by fire assay	Nos	4.1.5a	2,380	1	2,380	
2	**Physical & Petrological Stusies**						
i	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii	Complete petrographic study report	Nos	4.3.4	4,232	10	42,320	
iii	Preparation of polish section	Nos	4.3.2	1,549	10	15,490	
iv	Complete mineragraphic study report	Nos	4.3.4	4,232	10	42,320	
v	Digital Photographs	Nos	4.3.7	280	10	2,800	
vi	Whole Rock Analysis	Nos	4.1.15a	4,200	5	21,000	
	Sub Total- D					**22,78,950**	
E	**Total A to D**					**71,10,670**	
F	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	For the projects having cost exceeding Rs. 50 lakhs and less than Rs. 150 lakhs - A minimum of Rs. 2.5 lakhs or 5% of the value of work whichever is more		**3,55,534**	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
G	**Peer review Charges**		**As per EC decision**			**10,000**	
H	**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		**1,42,213.40**	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.
I	**Total Estimated Cost without GST**					**76,18,417**	GST will be reimbursed as per actual and as per notified prescribed rate
J	**Provision for GST (18% of J)**					**13,71,315.04**	
K	**Total Estimated Cost with GST**					**89,89,732**	***or Say Rs. 89.90 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.							

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Annexure-3B

Scheduled time for Reconnaissance survey (G4) for PGE, Chromium, Nickel, Cobalt in Chandiposh block (111.00 sq. km) District: Sundargarh, Odisha.

S. No.		Months/Days	1	2	3	4	5	6	7	8	Review	9	10	11	12
1	Geological Mapping	months													
2	Survey days	days													
3	Geophysical Work	months													
4	Pitting & Trenching	cu.m													
5	Geologist days	days													
6	Sampling days	days													
7	Laboratory Studies	months													
8	Geologist Party days, HQ	days													
9	Report Writing with Peer Review	months													
Note:	1. Commencement of project may be reckoned from the day the exploration acreage is available along with all statutory clearances.														
	2. Time loss on account of monsoon/agricultural activity/forest clearance/local law & order problem may be additional to above time line.														

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Annexure-4A

Estimated cost for Reconnaissance survey (G4) for PGE, Nickel, Chromite & associated basemetal mineralization in Yentem-Ningthi area (73.00 sq. km), District: Kamjong (Ukhrul), Manipur.

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 (1:12,500 scale)**						
i	Charges for one Geologist-Field	day	1.2	11,000	150	16,50,000	
ii	Labour (2 Nos) Base rate - Rs.443/-	day	5.7	443	300	1,32,900	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
iii	Charges for one Sampler per day for geochemical, channel and core samples	one sampler per day	1.5.2	5,100	20	1,02,000	
iv	Labours (4 Nos) Base rate - Rs. 443/-	day	5.7	443	80	35,440	Amount will be reimbursed as per the notified rates for unskilled labour by the Central Labour Commissioner or respective State Govt. whichever is higher
				Sub Total- A		**19,20,340**	
B	**TRENCHING**						
i	Trenching	Cu m	2.1	3,330	50	1,66,500	
				Sub Total- B		**1,66,500**	
				Total- A to B		**20,86,840**	
C	**Additional Rate for exploration work in North Eastern States and Hilly Terrain of Himalaya**		para 5 of SoC	3.35 times higher than the normal SoC		**69,90,914**	Field activities in Remote and inaccessible terrain existing in north eastern states
D	**Charges for one Geologist per- HQ**	day	1.2	9,000	60	**5,40,000**	

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E	**LABORATORY STUDIES**						
1	**Chemical Analysis**						
(i)	**Primary & Check Samples (Bedrock/soil/stream sediment)**						
a	**Primary samples**						
	a) PGE by ICPMS	Nos	4.1.5d	11,800	100	11,80,000	
	b) Ni, Cr, Co & Mo by AAS	Nos	4.1.7a	2,506	100	2,50,600	
b	**Internal Check samples (5%) & External check samples (10%)**						
	a) PGE by ICPMS	Nos	4.1.5d	11,800	15	1,77,000	
	b) Ni, Cr, Co & Mo by AAS	Nos	4.1.7a	2,506	15	37,590	
(ii)	**Primary & Check Samples from Trench**						
a	**Primary samples**						
	a) PGE by ICPMS	Nos	4.1.5d	11,800	40	4,72,000	
	b) Ni, Cr, Co & Mo by AAS	Nos	4.1.7a	2,506	40	1,00,240	
b	**Internal Check samples (5%) & External check samples (10%)**						
	a) PGE by ICPMS	Nos	4.1.5d	11,800	6	70,800	
	b) Ni, Cr, Co & Mo by AAS	Nos	4.1.7a	2,506	6	15,036	
(iii)	**Composite samples :** 34 elements analysis by ICP-MS method	Nos	4.1.14	7,731	15	1,15,965	
2	**Petrological Stusies**						
i	Preparation of thin section (Surface+Bh Core)	Nos	4.3.1	2,353	15	35,295	
ii	Complete petrographic study report (Surface+Bh Core)	Nos	4.3.4	4,232	15	63,480	
iii	Digital Photographs	Nos	4.3.7	280	10	2,800	
					Sub Total- E	**25,20,806**	
E					**Total C + D + E**	**1,00,51,720**	

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F	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	For the projects having cost exceeding Rs. 50 lakhs but less than Rs. 150 Lakh - A minimum of Rs. 2.5 lakhs or 5% of the value of work whichever is more	**1**	**5,02,586**	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
J	**Peer review Charges**		**As per EC decision**			**10,000**	
K	**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	1	**2,01,034**	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.
L	**Total Estimated Cost without GST**					**1,07,65,340**	
J	**Provision for GST (18% of J)**					**19,37,761**	GST will be reimbursed as per actual and as per notified prescribed rate
K	**Total Estimated Cost with GST**					**1,27,03,102**	***or Say Rs. 127.04 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-4B

Scheduled time for Reconnaissance survey (G4) for PGE, Nickel, Chromite & associated basemetal mineralization in Yentem-Ningthi area (73.00 sq. km), District: Kamjong (Ukhrul), Manipur.

S. No.		Months/Days	1	2	3	4	5	6		7	8	9	10	11	12
1	Geological Mapping	months													
2	Survey days	days													
3	Geophysical Work	months													
4	Pitting & Trenching	cu.m													
5	Geologist days	days													
6	Sampling days	days													
7	Laboratory Studies	months													
8	Geologist Party days, HQ	days													
9	Report Writing with Peer Review	months													
Note:	1. Commencement of project may be reckoned from the day the exploration acreage is available along with all statutory clearances.														
	2. Time loss on account of monsoon/agricultural activity/forest clearance/local law & order problem may be additional to above time line.														

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Annexure-5A

Estimated cost for Preliminary exploration (G3) [Phase-I] for gold in Kudrikonda area (2.74 sq. km) area for geophysical survey in Shimoga schist belt, District: Devanagere, Karnataka.

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.	Amount (Rs)	
A	**GEOLOGICAL WORK (1:12,500 scale)**						
i	Charges for one Geologist- Field	day	1.2	11,000	20	2,20,000	
ii	Charges for one Geologist per- HQ	day	1.2	9,000	10	90,000	
iii	2 labours/ party (Rs 443/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	443	40	17,720	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- A	**3,27,720**	
B	**GEOPHYSICAL SURVEY**						
i	Electro Magnetic survey (profiling/sounding)	Sounding	3.7a	21,197	300	63,59,100	
ii	Charges for one Geophysicist per day at field (2 Geophysicist)	day	3.18	11,000	120	13,20,000	
iii	2 labours/ Geophysicist (Rs 443/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	443	240	1,06,320	
iv	Charges for one Geophysicist per day at HQ	day	3.18	9,000	60	5,40,000	
v	Surveyor Work	days	1.6.1a	8,300	60	4,98,000	
vi	4 labours/ party (Rs 443/day/labour) (As per rates of Central Labour Commissioner)	day	5.7	437	240	1,04,880	
					Sub Total- B	**89,28,300**	

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C				Total A to B		92,56,020	
D	Geological Report Preparation		5.2	For the projects having cost exceeding 50 lakhs but less than 150 lakh:- A minimum of 2.5 lakh or 5% of the value of work whichever is more and 3,000/- per each additional copy.		4,62,801	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
E	Peer review Charges		As per EC decision			10,000	
F	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		1,85,120.40	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.
G	Total Estimated Cost without GST					99,13,941.40	
H	Provision for GST (18% of I)					17,84,509.45	GST will be reimbursed as per actual and as per notified prescribed rate
I	Total Estimated Cost with GST					1,16,98,450.85	***or Say Rs. 116.99 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-5B

Scheduled time for Preliminary exploration (G3) [Phase-I] for gold in Kudrikonda area (2.74 sq. km) area for geophysical survey in Shimoga schist belt, District: Devanagere, Karnataka.

S. No.		Months	1	2	3	4	5	6
1	Camp Setting	months						
2	Geophysical Work	months						
3	Camp winding	months						
4	Report Writing with Peer Review	months						

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Annexure-6A

Estimated cost for Reconnaissance survey (G4) for Copper, Lead, Zinc and Gold in Tarichar Khurd block (101.00 sq. km), District: Niwari, Madhya Pradesh.

[Total block area- 101.00 sq. km; Schedule timeline- 12 months]

S. No.	Item of Work	Unit	Rates as per NMET SoC		Estimated Cost of the Proposal		Remarks
			SoC-Item -Sl No.	Rates as per SoC	Qty.	Total Amount (Rs.)	
A	**GEOLOGICAL WORK**						
a	Charges for Geologist per day at HQ for monitoring, data processing etc.	day	1.3	9,000	30	2,70,000	
b	Charges for Geologist per day at field for mapping, channel sampling and logging	day	1.3	11,000	140	15,40,000	
c	Labour (2 Nos)Charges [associated with Geologist (Field)]; Base rate - Rs.437/-	day	5.7	437	280	1,22,360	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
d	Charges for Sampler per day for geochemical, channel and core samples	one sampler per day	1.5.2	5,100	25	1,27,500	
e	Labours (4 Nos) Charges (associated with Sampler); Base rate - Rs. 437/-	day	5.7	437	100	43,700	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
					Sub Total- A	**21,03,560**	
B	**PITTING AND TRENCHING[$]**						
1	Trenching	Cu m	2.1.1	3,300	150	4,95,000	
					Sub Total- B	**4,95,000**	
C	**LABORATORY STUDIES**						
1	**Chemical Analysis**						

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I	**Primary & Check Samples from Surface outcrop and steam sediments (BRS/Channel samples/Stream Sediments)**						
i)	**Primary samples**						
	a. For 34 elements (Cu, Pb, Zn, Cd, As, Sb, Bi, Co, Ni, Mo, U, As, Fe, Mn, Si, Al, Ca, Mg, S, Nb, Ta) by ICP-Ms	Nos	4.1.14	7,731	100	7,73,100	
	b. For Au & Ag by fire assay	Nos	4.1.5a	4,760	5	23,800	
ii)	**Internal check samples (5%)**						
	a. For 34 elements (Cu, Pb, Zn, Cd, As, Sb, Bi, Co, Ni, Mo, U, As, Fe, Mn, Si, Al, Ca, Mg, S, Nb, Ta)	Nos	4.1.14	7,731	5	38,655	
	b. For Au & Ag by fire assay	Nos	4.1.5a	4,760	1	4,760	
ii)	**External check samples (10%)**						
	a. For 34 elements (Cu, Pb, Zn, Cd, As, Sb, Bi, Co, Ni, Mo, U, As, Fe, Mn, Si, Al, Ca, Mg, S, Nb, Ta)	Nos	4.1.14	7,731	10	77,310	
	b. For Au & Ag by fire assay	Nos	4.1.5a	4,760	1	4,760	
II	**Primary & Check Samples from Trench**						
i)	**Primary samples**						
	a. For Cu, Pb, Zn	Nos	4.1.7a	2,506	75	1,87,950	
	b. For Au & Ag by fire assay	Nos	4.1.5a	4,760	5	23,800	
ii)	**Internal check samples (5%)**						
	a. For Cu, Pb, Zn	Nos	4.1.7a	2,506	4	10,024	
	b. For Au & Ag by fire assay	Nos	4.1.5a	4,760	1	4,760	
iii)	**External check samples (10%)**						
	a. For Cu, Pb, Zn	Nos	4.1.7a	2,506	8	20,048	
	b. For Au by fire assay	Nos	4.1.5a	4,760	1	2,380	
2	**Physical & Petrological Stusies**						
i)	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	
ii)	Complete petrographic study report	Nos	4.3.4	4,232	10	42,320	
iii)	Preparation of polish section	Nos	4.3.2	1,549	10	15,490	
iv)	Complete mineragraphic study report	Nos	4.3.4	4,232	10	42,320	
v)	Digital Photographs	Nos	4.3.7	280	20	5,600	
					Sub Total- C	**13,00,607**	
D					**Total A to C**	**38,99,167**	

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E	**Geological Report Preparation**	5 Hard copies with a soft copy	5.2	For the projects having cost less than Rs. 50 lakhs - A minimum of Rs. 1.5 lakhs or 5% of the value of work whichever is more		**1,94,958**	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
F	**Peer review Charges**		As per EC decision			**10,000**	
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		**77,983**	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.
H	**Total Estimated Cost without GST**					**41,82,109**	
I	**Provision for GST (18% of J)**					**7,52,780**	GST will be reimburse as per actual and as per notified prescribed rate
J	**Total Estimated Cost with GST**					**49,34,888**	***or Say Rs. 49.35 Lakh***
Notes-							
	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-6B

Schedule timeline for Reconnaissance survey (G4) for Copper, Lead, Zinc and Gold in Tarichar Khurd block (101.00 sq. km), District: Niwari, Madhya Pradesh.

			1	2	3	4	5	6		7	8	9	10	11	12
1	Camp Setting	Month													
2	Geological Mapping & Sampling	days													
3	Pitting and Trenching	Cu M													
4	Geologst Man days	Party days													
5	Sampler Man days	Party days													
6	Camp Winding	Months													
7	Laboratory Studies	Nos.													
8	Report Writing with Peer Review	Months													
Note: 1. Commencement of project may be reckoned from the day the exploration acreage is available along with all statutory clearances.															
2. Time loss on account of monsoon/agricultural activity/forest clearance/local law & order problem may be additional to above time line.															

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