REVISED

GOVERNMENT OF INDIA
Ministry of Mines, National Mineral Exploration Trust

Minutes of the 18th Technical-cum-Cost Committee (TCC) meeting of NMET held on 26th and 27th November 2018, Ambedkar Conference Hall, GSI, Kolkata

The 18th meeting of Technical-cum-Cost Committee (TCC) of National Mineral Exploration Trust (NMET) was held at Ambedkar Conference Hall, GSI, CHQ, Kolkata on 26th and 27th November 2018 under the chairmanship of Shri D. Mohan Raj, Addl. Director General & Head, National Mission-II, GSI, Nagpur and Chairman TCC, NMET. The list of participants is at **Annexure-1A & 1B.**

Sh Manoj Kumar, Director and Member Secretary, NMET welcomed all participants and apprised the house of salient points of 10th EC relevant to TCC and requested the chairman to take over the proceedings.

Shri D. Mohan Raj, ADG, GSI & Chairman, TCC once again welcomed all the participants and requested all the NEAs to avoid the time overrun in execution of the projects to the best of their efforts.

- He also stated that ongoing projects for any kind of review must be presented in the provided format as approved in the 10th EC.
- He also called all the State DGMs to facilitate the forest and other administrative / statutory clearance and help resolve local issues, if any, required by the implementing agencies.
- He also called for participation of the State DMGs in TCC meeting pertaining to projects to be discussed irrespective of the agency. He requested the concerned NEAs may also communicate with concerned DMGs in this regard.
- He also stressed the need for the participation of GSIs DDG / Director of the State units of respective states for clarity in the area proposed to be taken up is already work done and other details. The member secretary must take note of it to invite them for the meeting, prior to that the proposal should be shared with them to have correct information of the area.
- **The NMET funded projects, after successful completion of the work in all respect have to submit the final report as per the templates/format of NGDR. The reports after external peer review have to be submitted to the TCC-NMET for final vetting and approval for resource etc. The TCC-NMET will in turn recommend and forward the reports to the Executive Committee / Competent Authority for final approval.**
- **A final approved copy of all the reports should be submitted to the Chairman, NMET and to the Director NMET for record.**
- **The reports have to be mandatorily made available in the public domain. As the NGDR is under finalization, these reports must be uploaded by the NMET Secretariat temporarily by creating a link in GSIs OCRIS portal.**
- He also proposed continuation of Shri P. Tarafdar, Dy. Director General, GSI, as member TCC NMET even after his superannuation on 30th November, 2018. If all the members agree, we will recommend his name for the approval of the

Executive committee. Shri.P. Tarafdar has vast experience in Mineral exploration with technical capability to evaluate the mineral exploration projects and provide suitable guidance. Hence, his presence in the TCC-NMET will be helpful in evaluating the projects.

- He invited the implementing agencies for their presentations.

18.1 EVALUATION OF NEW PROPOSALS FOR MINERAL EXPLORATION

18.1.1 Project proposals of (OMECL)

OMECL made five presentations- Four for G2 level exploration of bauxite in Keluamali, Majhingamali, Turhapani, Nunspaimali blocks and one G2 level proposal for iron ore in Khandadhar Sub block-A.

1. The TCC examined all the four proposals for bauxite and suggested to reframe the proposals to G3 level of exploration. On examination of available exploration data it is found that the data is insufficient for taking up the proposal for G2 stage of exploration.
2. Therefore, the committee has suggested to carry out exploration in G3 stage with geological mapping on 1: 4,000 scale with DGPS / Total station for bounding co-ordinates of the block.
3. The proposed area of exploration 40% is falling in the forest area, hence forest clearance is essential before taking up drilling programme.
4. Drilling with grid spacing of 400m x 400m may be carried out as par as possible based on the detailed mapping. The boreholes are to be drilled through the lithomarge horizon and up to the top of bedrock. However, the exact spacing between borehole may be decided based on the dimension/disposition of the bauxite.
5. The committee also suggested that the borehole planning may also be done taking into consideration of delineated configuration of the bauxite body. Drilling should be planned only after demarcation of individual bauxite pockets/lenses by detailed mapping. The boreholes should be drilled to check the depth continuity of the bauxite and the borcholes may be drilled in the central part of the individual bauxite pockets/lenses and based on the surface disposition delineated by mapping and intersection of bauxite along the borehole, the surface influence may be considered for resource estimation.
6. Drill holes points are to be restricted within the bauxite body.
7. The committee further suggested that provision of the analysis of Gallium, Vanadium, Titanium and REE may also be kept in addition to other proposed analyses.
8. Lithomarge clay may be analyzed for REE in the initial 5 boreholes with collection of 25 samples each 5 samples from individual borehole and the sample length may be kept as 1m.

9. If the value of the REE are encouraging, then all the borehole samples are analysed for the same, or else the REE analysis be skipped for the remaining boreholes.

Accordingly, OMECL revised the proposals of bauxite and resubmitted. The details of the finalized proposal with revised cost estimates are as follows-

(1) **PROJECT:** PRELIMINARY EXPLORATION (G3) FOR BAUXITE IN KELUAMALI BLOCK, DISTRICT- KALAHANDI, ODISHA.

Discussion:

- The block lies in East Coast Bauxite Belt in Kalahandi district, Odisha comprises Khondalite, Charnockites, Granite and Granite Gneiss. Bauxite occurs as capping in the area.
- Based on preliminary (G4) mineral exploration by Directorate of Geology, Odisha in 2006, a 49 million tonnes of Bauxite ore resource was estimated on the basis of geological mapping and channel sampling. The laterite formation is directly overlying Khondalite with average thickness of 10 m.
- The OMECL proposed to take up G3 level exploration in the block with an area of 11.292 sq km along with detailed geological mapping on 1:4,000 scale.
- The exploratory drill holes may be carried out on 400m x 400 m grid comprising 58 boreholes with a total of 2300 m of drilling. The committee accepted the proposal of OMECL for the drilling to be taken up on outsourced basis.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc., have to be undertaken as per the time schedule and work plan given in **Annexure-3A & 3B.**
- The committee also recommended that initially 25 samples from 5 bore holes (1 m sample length) are required to be analyzed for REE, if results are not encouraging then the drilling may be restricted to the top of lithomarge and if the results are encouraging the bore holes may be drilled up to the top of underlying bedrock.
- Committee emphasised core recovery should be more than 90%.
- 40% of area of exploration is falling in the forest area, hence forest clearance is essential before taking up drilling programme.

Recommendations:

The committee recommended the proposal of Keluamali Block for G3 level of exploration for Bauxite at an estimated cost of Rs. 339.05 Lakhs to be completed in 12 months as per Annexure-3A & 3B on outsourced basis, for the approval of Executive Committee.

(2) **PROJECT:** PRELIMINARY EXPLORATION (G3) FOR BAUXITE IN MAJHINGAMALI BLOCK, DISTRICT- RAYAGADA & KALAHANDI, ODISHA.

Discussion:

- The block lies in East Coast Bauxite Belt in Kalahandi and Rayagada districts, Odisha. The rock types exposed in the area are Khondalite, Charnockites, Granite and Granite Gneiss. Bauxite mineralization is directly link with ateriteformation over bedrocks.
- Based on G4 mineral exploration carried out by Directorate of Geology, Odisha in 2004, the resource was estimated to the tune of 19 million tonnes on the basis of geological mapping, channel sampling, chemical and mineralogical studies. The laterite formation is directly overlying Khondalite suite of rocks with average thickness of 6m.
- The OMECL proposed to take up G3 level exploration in the block with an area of 4.479 sq km along with detailed geological mapping on 1:4000 scale.
- The exploratory drilling may be carried out on 400m x 400 m grid comprising 32 boreholes with a total of 1230 m. The committee accepted the proposal of OMECL for drilling to be taken up on outsourced basis.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc. have to be undertaken as per the time schedule and work plan given in **Annexure-4A & 4B.**
- The committee also recommended that initially 25 samples from 5 bore holes (1 m sample length) are required to be analyzed, if results are not encouraging then the drilling depth may be restricted to the top of lithomarge and if the results are encouraging all the bore holes may be drilled up to the top of bedrock.
- Committee emphasised core recovery to be more than 90%.

Recommendations:

The committee recommended the project proposal of Majhingamali Block for G3 level of exploration for Bauxite at an estimated cost of Rs. 187.93 Lakhs & to be completed in 10 months as per Annexure-4A & 4B on outsourced basis, for the approval of Executive Committee.

(3) **PROJECT:** PRELIMINARY EXPLORATION (G3) FOR BAUXITE IN TARHAPANI (WEST) BLOCK, DISTRICT- KORAPUT, ODISHA.

Discussion:

- The block lies in East Cost Bauxite Belt in Korapur district, Odisha. The rock types exposed in the area are Charnockites, Granite and Granite Gneiss. Bauxite mineralization is directly link with laterite formation over Charnockites, Granite and Granite Gneiss.
- Based on G4 mineral exploration by Directorate of Geology, Odisha in 2005-07, the resource was estimated to the tune of 7.47 million tonnes on the basis of geological mapping, channel sampling, chemical and mineralogical studies.

The laterite formation directly overlies the bed rock with average thickness of 3m.

- The OMECL proposed to take up G3 level exploration in the block with an area of 4.322 sq km along with geological mapping on 1:4000 scale.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc., have to be undertaken as per the time schedule and work plan given in **Annexure-5A & 5B.**
- The exploratory drilling may be carried out on 400m x 400m grid comprising 36 boreholes with a total meterage of 1440 m. OMECL proposed drilling to be taken up on outsourced basis.
- The committee also suggested that initially 25 samples from 5 bore holes (1 m sample length) are required to be analyzed for REE from lithomarge, if results are not encouraging then the drilling may be restricted to the top of lithomarge and if the results are encouraging all the bore holes may be drilled up to the top of bedrock.
- Committee emphasised core recovery should be more than 90%.

Recommendations:

The committee recommended the project proposal of Tarhapani (West) for G3 level of exploration for Bauxite at an estimated cost of Rs. 211.61 Lakhs & to be completed in 10 months as per Annexure-5A & 5B on outsourced basis, for the approval of Executive Committee.

(4) PROJECT: PRELIMINARY EXPLORATION (G3) FOR BAUXITE IN NUNAPAIMALI BLOCK, DISTRICT- RAYAGADA, ODISHA.

Discussion:

- The block constitutes a part of East Cost Bauxite Belt in Rayagada district, Odisha. The rock type comprises Khondalite, Charnockites, Granite and Granite Gneiss. Bauxite mineralization is directly linked with laterite formation over Khondalite, Charnockites, Granite and Granite Gneiss.
- Based on G4 mineral exploration by Directorate of Geology, Odisha in 2002-03, the resource was estimated to the tune of 6.9 million tonnes on the basis of geological mapping, channel sampling, chemical and mineralogical studies. The laterite formation is directly overlying Charnockite with average thickness of 6m.
- The OMECL proposed to take up G3 level exploration in the block with an area of 4.282 sq km along with geological mapping on 1:4000 scale.
- The exploratory drilling may be carried out on 400m x 400m grid comprising 33 boreholes with a total meterage of 1320 m. OMECL proposed the drilling to be taken up on outsourced basis.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc. have to be undertaken as per the time schedule and work plan given in **Annexure-6A & 6B.**

- The committee also suggested that initially 25 samples from 5 bore holes (1m sample length) are required to be analyzed for REE from lithomarge, if results are not encouraging then the drilling may be stopped restricted to the top of lithomarge and if the results are encouraging all the bore holes may be drilled to the top of bedrock.
- Committee emphasised core recovery to be more than 90%.
- The work should be completed and final report should be submitted in 10 months' time.

Recommendations:

The committee recommended the project proposal of Nunapaimali Block for G3 level exploration for Bauxite at an estimated cost of Rs. 202.21 Lakhs & to be completed in 10 months as per Annexure-6A & 6B on outsourced basis, for the approval of Executive Committee.

(5) PROJECT: GENERAL EXPLORATION (G2) EXPLORATION FOR IRON ORE IN THE SUB-BLOCK-A IN KHANDADHAR IRON ORE DEPOSIT, DISTRICT- SUNDERGARH, ODISHA.

Discussion:

- The OMECL proposal of Khandadhar Sub-block-A for G2 level of exploration for iron ore was examined by the committee.
- OMECL informed that the notified area of Khandadhar block A, B, C, D, E, F & G for iron exploration comprises total area of 57.8798 sq km that includes 4.039 sq km of area of Khandadhar Sub-block-A (being proposed here for approval) and 2.93 sq km of Khandadhar Sub-block-C (approved in 10th EC) for G2 exploration. Thus, excluding total area of 6.969 sq km for G2 exploration, the remaining area for G4 exploration comes to 50.91sq km instead of 47 sq km.
- OMECL requested to committee that the modified area for G4 level of exploration would comprise an area of 50.91 sq km and may be taken into consideration for G4 level of exploration (approved 10th EC). OMECL also informed that this aerial change in approved G4 proposal of Khandadhar area is without any additional cost implication.
- OMECL presented the G2 exploration for iron ore in Khandadhar Sub-Block A. The committee examined the proposal and suggested to re-plan the drilling taking into consideration the structural attributes of the block. The committee also observed that the G4 exploration have not punctured the entire depth of the ore body. Therefore, the drill holes have to be planned up to the underlying shale/ BHJ accordingly fix the borehole depth for each borehole. Detailed Geological mapping may be carried out in 1:4000 scale, with borehole spacing may be kept at 200m x 200m.
- Since the area of exploration is falling in the structural closure, start drilling in the middle and go towards the periphery of the basin.

Recommendations:

The TCC approved the modified area (i.e. 50.91sq km) of Khandadhar Block for G4 level exploration for iron ore without involving any cost implication and without any change in approved time schedule.
The committee suggested to resubmit the modified proposal of Khandadhar Sub-block-A, after incorporating suggestions, for G2 stage of exploration for iron, in next TCC meeting.

18.1.2 Project proposals of (MECL)

The committee reviewed projects proposal submitted by MECL for Iron and Manganese ore in Jamda-Koira Valley Iron Ore Belt in Silpunji Block (Jharkhand), Gold in C K Halli Main Block (Karnataka) and Bauxite in Sendurkhar Block (Chhattisgarh). The details are as follow-

1. **PROJECT:** REGIONAL EXPLORATION (G3) OF IRON & MANGANESE ORE IN JAMDA-KOIRA VALLEY IRON ORE BELT IN SILPUNJI BLOCK, DISTRICT-WEST SINGBHUM, JHARKHAND.

Discussion:

The committee examined the proposal for Iron and Manganese in Silpunji Block of Jamda-Koira valley Iron Ore Belt with following modifications and suggested to re-submit the proposal in next TCC.

- The area is represented by the Iron Ore Series of Archean Age. The block area lies in the western limb of horse-shoe of Bonai Synclinorium.
- GSI and DMG, Jharkhand had carried out G4 level exploration in Silpunji-Kumoria area during FS 2010-12, and recommended for detailed mapping and drilling to establish the deposit and its lateral extent.
- The committee suggested that the western boundary may be extended up to 500 m in consultation with DGM Jharkhand to cover the ore body.
- The committee also suggested to carry out 150 cubic meter of pitting and trenching at suitable locations.
- Geophysical Survey (Magnetic and Gravity) may be carried out to delineate the structure, nature and disposition of the iron ore body. If required, the Resistivity Survey may be taken to supplement the available information.
- After geophysical surveys are completed, geological mapping may be taken on 1:4000 scale with pitting and trenching and sampling.
- The exploratory drilling program shall be planned based on the outcome of geophysical survey and mapping.
- The modified proposal has to be submitted for discussions in the next TCC.

Recommendations:
Committee asked MECL may submit the modified work plan and cost sheet along with modified block boundary in consultation with DMG, Jharkhand, in the next TCC.

2. **PROJECT:** GENERAL EXPLORATION (G2) FOR ESTIMATION OF GOLD ORE RESOURCES IN C.K HALLI MAIN BLOCK (0.37 SQ KM) IN CHITRADURGA DISTRICT, KARNATAKA.

Discussion:

- The block is located along the central shear zone of Chitradurga Schist Belt comprising a thick pile of volcano-sedimentary sequence metamorphosed to green schist facies belonging to Dharwar Super Group.
- The area has been studied by GSI over the years, 1932 onwards. During 1997-99 GSI explored the area by geological mapping and some trench sampling and 16 inclined boreholes. A total ore reserves of the order of 0.948 million tonne has been established in which 0.498 million tonne are of G2 and 0.450 million tonne are of G3 category. GSI also recommended a few deeper drill holes to establish the persistence of mineralized zone at greater depth.
- Based on the above data of GSI, MECL proposed the G2 level of exploration in C. K. Halli block.
- MECL deliberated the proposal with block area of 0.37 sq km along with 22 nos. of borehole with a total meterage of 4124 m.
- Initial in each section line, boreholes may be carried out to intersect the probable lode at shallower depth. The drill holes proposed to intersect the load at deeper depth may be drill only after getting encouraging results of the initial shallow drill holes.
- Along each section lines, correlation of the auriferous loads between the boreholes are also to be established.
- The work should be completed and final report should be submitted within 13 months' time.

Recommendations:

The committee recommended the project proposal for G2 level exploration for Gold at an estimated cost of Rs. 579.71 Lakhs & to be completed in 13 months as per Annexure-7A & 7B, for approval of Executive Committee.

PROJECT: REGIONAL EXPLORATION (G3) OF BAUXITE IN SENDURKHAR BLOCK, TEHSIL- PANDARIA, DISTRICT- KABIRDHAM, CHHATTISGARH.

Discussion:

- The proposed block lies in Sendurkhar plateau that constitutes a part of the table land of basaltic lava flows of the Archean-Cenozoic age. Bauxite is pisolitic to massive in nature and exhibits various colors like pale yellow, cream to brown.
- The block area encompasses an area of 2.9 sq km, to be covered by detailed geological mapping on 1:4000 scale.

- The exploratory drill holes may be carried out on 400m x 400 m grid comprising 23 boreholes with a total of 345 of drilling. The committee accepted the proposal.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc., have to be undertaken as per the time schedule and work plan given in **Annexure- 8A & 8B.**
- The committee also recommended the analysis of Ga, V and TiO_2 in addition to other elements.
- Committee emphasized core recovery should be more than 90%.
- The work should be completed and final report should be submitted in 7 months' time.

Recommendations:

The committee recommended the project proposal of Sindurkhar Block for G3 level exploration for Bauxite at an estimated cost of Rs. 94.43 Lakhs & to be completed in 7 months as per Annexure-8A & 8B, for the approval of Executive Committee.

18.1.3 Project proposals- (DGM, Chhattisgarh)

The exploration proposals of Chendradar, Gopaltola & Lurena blocks for Bauxite and Bagan Block for Iron ore could not be discussed in 17th TCC in the absence of any representative from DMG, Chhattisgarh. The representative of DMG, Chhattisgarh, presented these items before the 18th TCC Committee. The project wise details are as follow-

(1) **PROJECT TITLE:** PRELIMINARY EXPLORATION (G3) FOR BAUXITE IN CHENDRADADAR BLOCK, KABIRDHAM DISTRICT, CHHATTISGARH.

Discussion:

- The proposed area (2 sq km) contains predominantly laterite with bauxite occurring as lensoid/pocket in the Bodai-Daldali plateau in central part of Maikal Range hill.
- The bauxite exploration was carried out by DGM Chhattisgarh during 2013-14 and 2015-17 in 2.00 sq km with geological mapping on 1:4000 scale and 220 nos. of surface sampling.
- The committee suggested for exploratory drilling of 45 borcholes on 200m x 200m grid with total meterage of 450 m and averuge depth of 10m each.
- Drilling with grid spacing of 200m x 200m may be carried out as par as possible based on the detailed mapping. The borcholes are to be drilled through the lithomarge horizon and up to the top of bedrock. However, the exact spacing between borehole may be decided based on the disposition of the bauxite.
- The committee also suggested that the borehole planning may also be done taking into consideration the delineated configuration of the bauxite body. Drilling should be planned only after demarcation of individual bauxite pockets/lenses by detailed mapping. The boreholes should be drilled to check the depth continuity of the bauxite

and the boreholes may be drilled in the central part of the individual bauxite pockets/lenses and based on the surface disposition delineated by mapping and intersection of bauxite along the borehole, the surface influence may be considered for resource estimation.

- Drill holes points are to be restricted within the bauxite body.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc., have to be undertaken as per the time schedule and work plan given in **Annexure- 9A & 9B.**
- The committee further suggested that provision of the analysis of Gallium, Vanadium, Titanium and REE may also be kept in addition to other proposed analyses.
- Few samples of lithomarge may also be analyzed for REE.
- The work should be completed and final report should be submitted in 10 months time.

Recommendations:

The committee recommended the project proposal of Chendradadar Block for G3 level exploration for Bauxite at an estimated cost of Rs. 106.66 Lakhs & timeline of 10 months, as per Annexure-9A & 9B, for the approval of Executive Committee.

(2) **PROJECT:** RECONNAISSANCE SURVEY (G4) FOR IRON ORE IN GOPALTOLA (SALHEWARA) BLOCK (ID: I-9), RAJNANDGAON DISTRICT, CHHATTISGARH.

Discussion:

- The proposed Block covers 42.24 Sq. km area for iron ore exploration.
- Geological mapping has been carried out by DGM in 1980-81 in Karni-Dongiri, Jup-Dongi and Dongar-Bor area for iron ore. The iron ore deposits are associated with Banded Hematite Quartzite (BHQ) of the Iron Ore Series of the Archaean.
- An area of 50 sq.km taken up as large-scale geological mapping to be carried out on 1:12500 scale. Surface work should be carried out extensively to understand the natural and behavior of iron ore body.
- The committee suggested for scout drilling of 5 boreholes with total meterage of 500m and average depth of the each bore hole will be 100m.
- The core recovery in all the boreholes should be maintained at least 90% in other lithologies and in the mineralised zones ~95%, in order to have a correct resource estimation.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc., have to be undertaken as per the time schedule and work plan given in **Annexure- 10A & 10B.**
- The work should be completed and final report should be submitted in 10 months time.

Recommendations:

The committee recommended the project proposal of Gopaltola Block for G4 level exploration for Iron Ore at an estimated cost of Rs. 108.57 Lakhs & timeline of 10 months as per Annexure-10A & 10B, for the approval of Executive Committee.

(3) **PROJECT:** RECONNAISSANCE SURVEY (G4) FOR IRON ORE IN BOGAN AREA OF ANTAGARH BLOCK, KANKER DISTRICT, CHHATTISGARH.

Discussion:

- The DGM Chhattisgarh informed that block area has law and order problem and exploration can't be taken up in present situation, therefore, the proposal is being dropped presently.

Recommendations:

The committee took the note of the suggestion.

(4) **PROJECT:** PRELIMINARY EXPLORATION (G3) FOR BAUXITE IN LURENA BLOCK, SURGUJA DISTRICT, CHHATTISGARH.

Discussion:

- The proposed area of 1.65 sq km is predominantly laterite with bauxite occur as lensoid/ pocket form in the Mainpat plateau.
- The G2 explorations for bauxite were carried out by DGM Chhattisgarh in 2016-17 in adjacent areas in Sarbhanja and Pathrai blocks with estimation of 2.38 MT and 3 MT bauxite reserves respectively.
- Drilling with grid spacing of 200m x 200m may be carried out as par as possible based on the detailed mapping. The boreholes are to be drilled through the lithomarge horizon and up to the top of bedrock. However, the exact spacing between borehole may be decided based on the disposition of the bauxite.
- The committee also suggested that the borehole planning may also be done taking into consideration the delineated configuration of the bauxite body. Drilling should be planned only after demarcation of individual bauxite pockets/lenses by detailed mapping. The boreholes should be drilled to check the depth continuity of the bauxite and the boreholes may be drilled in the central part of the individual bauxite pockets/lenses and based on the surface disposition delineated by mapping and intersection of bauxite along the borehole, the surface influence may be considered for resource estimation.
- drill holes points are to be restricted within the bauxite body.
- The committee suggested for exploratory drilling of 50 boreholes on 200m x 200 m grid with total meterage of 500 m and average depth of 10m.
- Core recovery may be maintained at 90% for the entire drill hole length.
- Few samples of lithomarge may be analyzed for REE.
- The execution of exploration including survey, mapping, drilling, sampling and chemical analysis etc., have to be undertaken as per the time schedule and work plan given in **Annexure- 11A &11B.**
- The work should be completed and final report should be submitted in 10 months time.

Recommendations:

The committee recommended the project proposal of Lurena Block for G3 level exploration at an estimated cost of Rs. 112.18 Lakhs & timeline of 10 months as per Annexure-11A & 11B, for the approval of Executive Committee.

18.2 Up-gradation of Regional Exploration Blocks (MECL)

18.2.1 APPROVAL FOR DRILLING WORK SOUTH OF KESHARPUR, DISTRICT-MAYURBHANJ, ODISHA FOR COPPER. (FR ODS 09)

The project was approved in 3rd EC held on 25th October, 2016 at an estimated cost of ₹ 276.93 Lakhs. However, at the time of undertaking geophysical surveys in this block, it came to notice of MECL that GSI has undertaken G3 stage of exploration during FS 2018-19 in Madanshahi block which is part of the area allotted to MECL. Madanshahi block falls in the northern margin of the MECL South of Kesharpur block. The TCC in its 16th meeting held on 24-25 September, 2018, advised that after obtaining the coordinates of Madanshahi block from GSI, the G4 exploration in rest of the area may be taken up. GSI has provided co-ordinates of their block.

MECL presented the proposal for exploratory drilling for the modified block South of Kesharpur for base metal exploration. MECL has delineated two zones A & B based on magnetic surveys which fall in the modified block area. The Committee recommended two exploratory boreholes in Zone B in the contact zone of phyllites and Granite and one bore hole in Zone A. The proposal would require an additional 40m of drilling in addition to already approved 600m (3rd EC).

The original program approved for a drilling of 600 m. @ Rs. 11,215 per metre as per the prevailing rate for the year 2016-17. Hence the additional cost estimated for 40m = Rs. 11,215 x 40 = 4,48,600 as per the per meter rate prevailing for 2016-17.

Recommendations:

The Committee accepted the additional requirements 40m of drilling and suggested that 640m drill holes to be executed in three inclined boreholes- 2 boreholes in Zone-B in eastern part and one deep bore hole to intercept deeper zone (litho-contact). The Committee approved the additional cost of Rs 4,48,600 for additional 40m of drilling.

18.3 Miscellaneous items proposed by MECL

18.3.1 APPROVAL OF REVISED COST ESTIMATE FOR CHEMICAL ANALYSIS OF PALYAMKOTTAI LIGNITE BLOCK WITH RESPECT TO ESTABLISHED INDIAN STANDARD PROCEDURE (ISP).

The Palyamkottai Lignite Block, Cuddalore district, Tamil Nadu is under execution by MECL under NMET funding at an estimated cost of Rs 717.27 lakhs. There is a provision of Rs 8,61,950 for chemical analysis for primary and composite samples. MECL has informed that in order to make the block auctionable the analysis has to be carried out as per ISP norms for which additional analysis for band by band samples and composite samples is required to

be analysed at an additional cost of Rs **20,55,027**. The detailed cost estimated for the additional sampling has been given in **Annexure-12**.

Recommendation:

The committee examined the proposal for additional analysis and recommended for the approval of the EC for the additional cost of Rs 20,55,027 as per Annexure-12.

18.3.2 DATE OF START OF EXPLORATION PROJECTS APPROVED UNDER NMET FUND SHOULD BE CONSIDERED FROM THE DATE OF RECEIPT OF FOREST CLEARANCE/ HARVESTING SEASON ETC.

MECL requested that the commencement/start date of projects may be considered from the date of receipt of Forest clearance/harvesting season.

The committee suggested to put up the matter to Executive Committee.

18.3.3 PAYMENT OF NPV FOR FOREST AREAS & CHARGES FOR ENGAGEMENT OF ICFRE TO CONDUCT STUDY ON THE IMPACT OF NUMBERS OF BOREHOLES TO BE DRILLED FOR PROSPECTING IN FOREST AREA THROUGH NMET FUND.

The Committee suggested to take up the matter separately with EC, NMET.

18.4 Time Extension for G4 blocks proposed by NMDC

In 4th Executive Committee meeting held on 21st February 2017, five project proposals of iron and gold were approved at the cost of 7.45 crore to be executed by NMDC. As NMET accounting procedure was not finalized, NMDC was requested to execute the projects through its own fund subject to reimbursement after NMET accounts becomes operational. In the meeting held on 8th August, 2017 at Ministry of Mines, NMDC informed that the work has been initiated for these blocks and some preliminary surveys were carried out. However, NMDC agree to continue the exploration work subjected to confirmation of reimbursement of expenditure under NMET fund. The matter was deliberated in the 5th EC meeting held on 6th October, 2017 and decided it would be confirmed in accordance with NMET Rules. NMDC was informed vide letter no. -10/4/2015-NMET dated 16.11.2017 for reimbursement of expenditure on these projects. Subsequently, the work was taken up in these blocks.

NMDC requested vide letter dated 20th September, 2018 to extend the time schedule of these blocks. NMDC presented the work carried out so far in Matmari, Bukkapatna, Nandgaon-Gora-Maheva and Jampani Dulkiburu-Dangaposi Blocks. It was also informed that the Degve-Kalana-Asaniya Block, Maharashtra has been dropped in the 10th meeting of EC held on 30th October, 2018 on the recommendation of NMET TCC. The Committee reviewed the work progress and recommended approval of extension of timeline.

The details are as follows-

18.4.1 **PROJECT:** REGIONAL EXPLORATION (G4) FOR GOLD & ASSOCIATED ELEMENTS IN MATMARI BLOCK RAICHUR, KURNOOL, MANVI-TALUK DISTRICTS, KARNATAKA. (SR_KAR_65)

The block area mostly soil covered and under cultivation for almost 9 months in a year. There is hardly 3 months (April-June) for field work.

The committee directed NMDC to complete the left out geological mapping and sampling in suitable time during off season of cultivation (working window) and extended the timeline to complete the project along with submission of the final geological report by November 2019.

18.4.2 PROJECT: REGIONAL EXPLORATION (G4) FOR GOLD & ASSOCIATED ELEMENTS IN BUKKAPATNA BLOCK TUMKUR, CHITRADURGA DISTRICTS, KARNATAKA. (SR_KAR_09)

The block area is under disputed area which was earlier granted to M/s HZL for Reconnaissance Survey which was not executed by M/s HZL. The geological mapping in 70 sq km is going on in modified block and out of which 32 sq km area is under forest covered for which NMDE get forest clearance in March 2017.

Recommendation:

The committee directed NMDC to complete the left out geological mapping and sampling and extended the timeline to complete the project along with submission of the final geological report by September 2019.

18.4.3 PROJECT: REGIONAL EXPLORATION (G4) FOR GOLD & BASE METAL IN NANDGAON-GORA-MAHEVA AREA, CHHATARPUR DISTRICT, MADHYA PRADESH. (CR_MP_05)

NMDC *briefed the work and requested the committee for timeline extension.*

The committee directed NMDC to complete geological mapping and extended the timeline, to complete the project along with submission of the final geological report by September 2019.

18.4.4 PROJECT: REGIONAL EXPLORATION (G4) EXPLORATION IN JAMPANI DULKIBURU-DANGUAPOSI BLOCK, WEST SINGHBHUM DISTRICT JHARKHAND. (ER_JH_01)

NMDC *briefed the work and requested the committee for timeline extension.*

The committee directed NMDC to complete geological mapping and sampling and extended the timeline to complete the project along with submission of the final geological report by June 2019.

18.5 PROPOSAL FOR CONTINUATION OF SH P. TARAFDAR, DY DG, CHQ, GSI, AS TCC-MEMBER

With the permission of Chair, Shri. Manoj Kumar, Member Secretary, TCC-NMET, put up the proposal before the committee, for further continuation of Sh P. Tarafdar, DDG, as

TCC-Member, in view of his retirement from service in Nov., 2018 and being a vital member of TCC, till a suitable replacement is placed. The TCC committee univocally recommended the continuation of Sh P. Tarafdar, as TCC-Member even after his superannuation.

The Chairman, TCC-NMET in his concluding remarks accepted the proposal as all the committee members are also of the same opinion. He further recommended the name of Shri. P. Tarafdar, DDG to continue the TCC as member for his valuable guidance and suggestions during the project proposal discussions.

The Committee concluded the meeting with the following remarks/guidelines-

1. The committee requested all the State DMG to make it convenient to present in the TCC meeting whenever the exploration items are proposed from the respective state.
2. The committee requested all the State DMGs to extend co-operation to NEAs in facilitating the matters pertaining to forest clearance and resolve the administrative and local issues, if any.
3. The issues pertaining to payments towards forest clearance, crop compensation etc may be put up to the Executive Committee/ Competent Authority for approval.
4. In core drilling, the Core Recovery of more than 90% in other lithologies and in case of mineralised zones it should be more than 95% to be ensured to make a reliable attempt on the resource estimation. It is to be ensured that the core preservations may be done as per the approved guidelines.
5. The new proposals may be put up in approved format for new proposals.
6. The mid-term presentation for review or discussing any matter pertaining to ongoing projects under NMET funding, may be put up in the approved format for project monitoring.
7. The time over-run of the approved projects may be avoided to the best of effort by NEAs.
8. The issue of Date of Commencement as to be the date of Forest and other statutory clearance may be put up to the Executive Committee/ Competent Authority.
9. In case of bauxite exploration, the reactive silica may be analyzed only when total silica yield is more than 5%.
10. In case of bauxite exploration, the REE analyses proposed in lithomarge may be carried out only after getting encouraging results in proposed initial few samples.
11. In case of bauxite exploration, the Ga, V and TiO_2 may also be analyzed.

Sh Manoj Kumar, Director & Member Secretary summed up the various discussions. The Chairman, TCC-NMET delivered the concluding remarks and extended his gratitude to Sh Pradipta Tarafdar, Dy Director General (PSS), CHQ, GSI for his significant and effective contributions towards TCC of NMET.

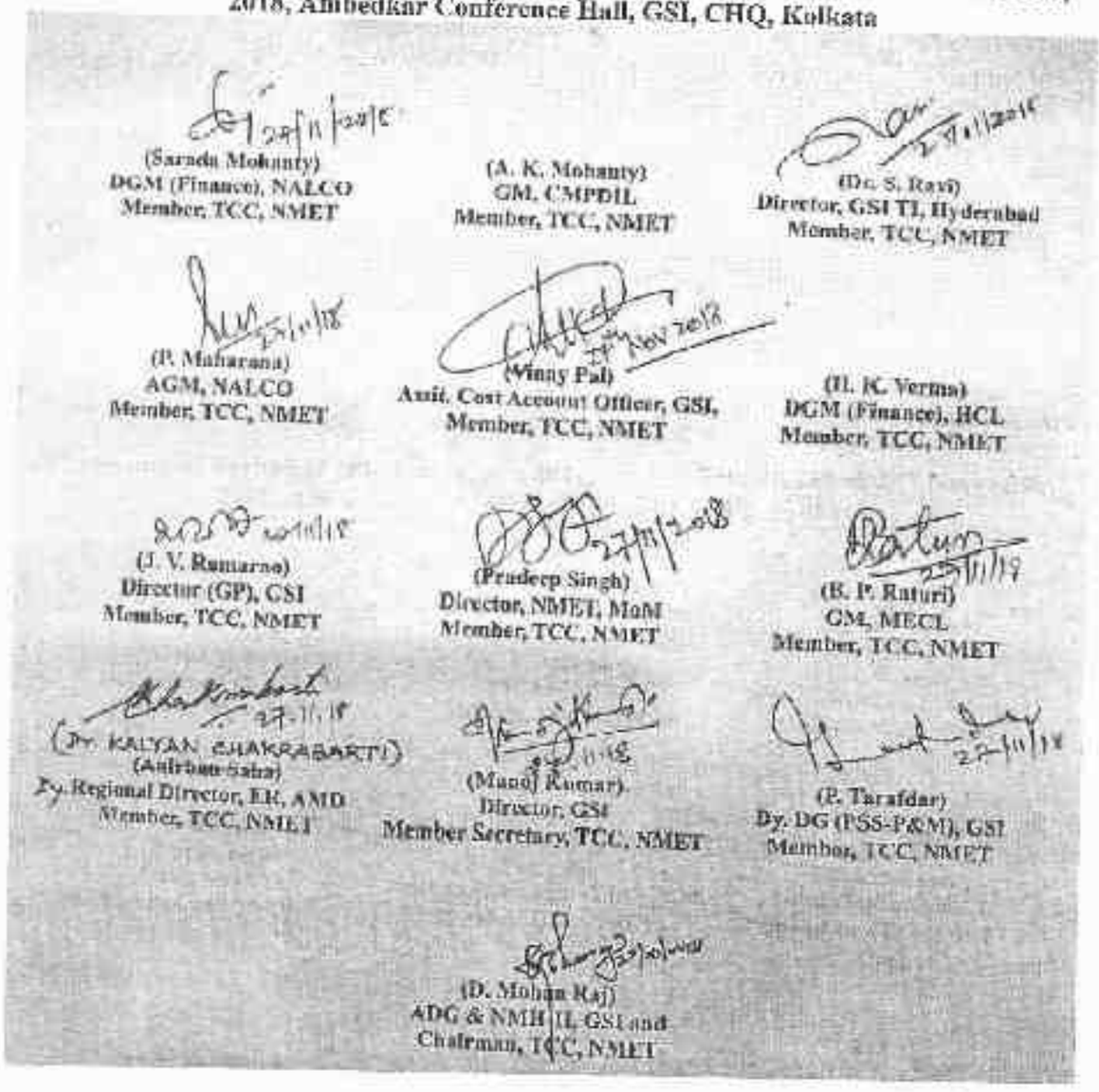
The meeting was over with due acknowledgement and thanks to participants by the Member Secretary.

(Manoj Kumar)
Director, GSI
Member secretary, TCC-NMET

(D. Mahan Raj)
ADG & Head NM2, GSI
Chairman, TCC-NMET

Annexure -1A

18th meeting of Technical-cum-Cost Committee, NMET, held on 26th & 27th November, 2018, Ambedkar Conference Hall, GSI, CHQ, Kolkata



(Sarada Mohanty)
DGM (Finance), NALCO
Member, TCC, NMET

(A. K. Mohanty)
GM, CMPDIL
Member, TCC, NMET

(Dr. S. Ravi)
Director, GSI TI, Hyderabad
Member, TCC, NMET

(P. Maharana)
AGM, NALCO
Member, TCC, NMET

(Vinay Pal)
Asst. Cost Account Officer, GSI,
Member, TCC, NMET

(H. K. Verma)
DGM (Finance), HCL
Member, TCC, NMET

(J. V. Ramarao)
Director (GP), GSI
Member, TCC, NMET

(Pradeep Singh)
Director, NMET, MoM
Member, TCC, NMET

(B. P. Raturi)
GM, MECL
Member, TCC, NMET

(Dr. KALYAN CHAKRABARTI)
(Arbitrator-Sahu)
Dy. Regional Director, ER, AMD
Member, TCC, NMET

(Manoj Kumar)
Director, GSI
Member Secretary, TCC, NMET

(P. Tarafdar)
Dy. DG (PSS-P&M), GSI
Member, TCC, NMET

(D. Mohan Raj)
ADG & NMH IL, GSI and
Chairman, TCC, NMET

Annexure-1B

List of participants

S. No.	Name & Designation	Organization	Contact No./Email
1	Shri D. Mohan Raj, ADG & NMH-II, GSI and Chairman, TCC, NMET	Geological Survey of India National Mission Head-II Nagpur	9765980957 hodm2@gsi.gov.in hodm2gsi@gmail.com
2	Shri P. Tarafdar, Dy. DG (PSS-P&M), GSI, Member, TCC, NMET	Geological Survey of India PSS P&M, CHQ, Kolkata	9503088847 taraidar.pradipta@gmail.com
3	Shri Pradeep Singh, Director, NMET, MoM, Member, TCC, NMET	NMET, Ministry of Mines New Delhi	9810253957 nmet-mines@gov.in
4	Shri B. P. Raturi, GM, MECL Member, TCC, NMET	MECL, Nagpur	9422806417 bpraturi100@yahoo.co.in
5	Shri Manoj Kumar, Director, GSI Member Secretary, TCC, NMET	NMET, Ministry of Mines New Delhi	9815882417 nmet-tcc@gov.in
6	Dr. Kalyan Chakrabarti Dy. Regional Director, ER, AMD, Member, TCC, NMET	AMD, Eastern Region, Jamshedpur, Jharkhand	9431302105
7	Shri J. V. Ramana, Director (GP), GSI Member, TCC, NMET	Geological Survey of India Southern Region, Hyderabad	9440691784 rarajamm1@rediffmail.com
8	Dr. S. Ravi, Director, GSI TI, Hyderabad, Member, TCC, NMET	Geological Survey of India GSITI, Hyderabad	9441138854 sraviiyers@gmail.com
9	Shri Sarada Mohanty, DGM (Finance), NALCO, Member, TCC, NMET	NALCO, Bhubaneswar	9937251501 odiyasarada@gmail.com
10	Shri P. Maharana, AGM, NALCO Member, TCC, NMET	NALCO, Bhubaneswar	8500669500 pkm0644@gmail.com
11	Shri Vinay Pal, Assit. Cost Account Officer, GSI, Member, TCC, NMET	Geological Survey of India IGC 2020, DGCO, New Delhi	8527368161 palvinay009@gmail.com
13	Shri Subhash Kumar, Senior Geologist	NMET, Ministry of Mines New Delhi	9868302624 subhash.kumar.gsi@gov.in
14	Shri R. Vijay Kumar, Director	Geological Survey of India NMH-II, Nagpur	9444222598 gsivijay75@gmail.com
15	Shri S. Dharendran, Supdg. Geologist	Geological Survey of India NMH-II, Nagpur	9944882204 dharunae@gmail.com
16	Dr. D. R. Patel, Joint Director	DGM, Chhattisgarh	9827153271 patelrdrdgm@gmail.com
17	Shri P. N. Verma	DGM, Chhattisgarh	9827171307
18	Shri Shatesh Verma, Dy. Director (Geology)	DGM, Chhattisgarh	
19	Shri Saurabh Vivek	MECL, Nagpur	9545425923
20	Dr. S. K. Biswas	MECL, Nagpur	9820812363
21	Md. N. Ansari, Sr. Manager (Geology)	NMDC Ltd, Hyderabad	9963117045 mdnansari@nmdc.co.in
22	Dr. Ch. Sarvan Kumar DGM (geology)	NMDC Ltd, Hyderabad	9490760005 chsarvankumar@nmdc.co.in
23	Shri Parchanan Das	NMDC Ltd, Hyderabad	8374986796
24	Shri Shailender Sinha	OMECL, Bhubaneswar	9937388703 shailender.omecl@gmail.com
25	Shri Kali Charan Rai	OMECL, Bhubaneswar	9437438280
26	Shri Kumar Amitabh	DGM, Jharkhand	9431196469 amitabhgeo@gmail.com

(Manoj Kumar)
Director, GSI (HQ)
Member secretary, TCC-NMET

Annexure-2

Mineral Exploration Projects/Blocks recommended for Executive Committee in 18th TCC meeting held on 26.11.2018 & 27.11.2018

Implementing Agency: OMECL					
S. No.	Block Name	Commodity	Stage	Duration	Approved Cost (Rs. in Lakhs)
1	Keluamali, Kalahandi district, Odisha	Bauxite	G3	12 months	Rs. 339.05
2	Majhingamali Block, Istrict-Rayagada & Kalahandi, Odisha.	Bauxite	G3	10 months	Rs. 187.93
3	Tarhapani (west) Block, District- Koraput, Odisha.	Bauxite	G3	10 months	Rs. 211.61
4	Nunapaimali Block, District-Rayagada, Odisha.	Bauxite	G3	10 months	Rs. 202.21
				Total	Rs. 940.80

Implementing Agency: MECL					
S. No.	Block Name	Commodity	Stage	Duration	Approved Cost (Rs. in Lakhs)
1	C K Halli Main Block in Chitradurga District, Karnataka.	Gold	G2	13 months	Rs 579.71
2	Sendurkhar Block, Tensil-Pandaria, District- Kabirdham, Chhattisgarh.	Bauxite	G3	7 months	Rs. 94.43
				Total	Rs. 674.14

Implementing Agency: DGM, Chhattisgarh					
S. No.	Block Name	Commodity	Stage	Duration	Approved Cost (Rs. in Lakhs)
1	Chendradadar Block, Kabirdham District, Chhattisgarh.	Bauxite	G3	10 months	Rs. 106.66
2	Gopaltola (Salhewara) Block, Rajnandgaon District, Chhattisgarh.	Iron	G4	10 months	Rs. 108.57
3	Lurena Block, Surguja Chhattisgarh.	Bauxite	G3	10 months	Rs. 112.18
				Total	Rs. 327.41

Total cost of new projects approved: Rs. 1942.35 Lakhs

(Manoj Kumar)
Director, GSI (HQ)
Member secretary TCC/SMET

Additional approved cost

1. Additional cost for chemical analysis for Palayamkotti Lignite Block, district- Cuddalore - Tamil Nadu is Rs. 20,55,027/-
2. Additional drilling cost of 40 m for drilling work South of Kesharpur, District- Mayurbhanj, Odisha for Copper. (TR ODS 09) is Rs 4,48,600/-

Annexure-3A

Detailed cost estimate for Bauxite in Kchuanali Block (G3)

S. No.	Item of Work	Unit	Estimated Cost (2018-19)		
			ESC Rate Rs	QTY	Amount Rs
A	**DRILLING (to be outsourced)**				
1	Surface Drilling (2 Diamond / 1 RC/VS)	m	7028	2320	16304960
2	Tender preparation, publishing and finalisation	one time		1	400000
	Sub Total- A				16704960
B	**GEOLOGICAL WORK**				
1	Survey Party days	day	6056	120	726720
2	Geological Mapping, Geological Party days	day	8083	120	969960
3	Bulk Sampling Party Days	day	13908	10	139080
4	Core Sampling Party days	day	2905	230	668150
	Sub Total- B				2503910
C	**PITTING**				
1	Pitting 5 nos.	Cu m	37530	5	187650
	Sub Total- C				187650
D	**LABORATORY STUDIES**				
1	Chemical Analysis				
	i) Primary and check samples				
	a) Primary samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	2000	6172000
	b) Check samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	200	617200
	ii) Composite samples				
	a) Composite samples for 14 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, V_2O_5, P_2O_5, LOI, MnO, MgO, CaO, Na_2O, K_2O, Cr_2O_3 & Organic Carbon)	Nos	5998	58	347884
	b) Composite Metalurgical Samples -Trihydrate Alumina (THA), Monohydrate Alumina (MHA), Reactive Silica (R-SiO_2)	Nos	1838	58	106604
	c) REE*	Nos	4620	58	267960
2	Physical Analysis				
i)	a) XRD Studies on composite	Nos	5813	10	174390
ii)	b) ICP-MS studies (14 trace elements including Gallium)	Nos	4620	30	138600
iii)	Preparation of thin section	Nos	556	5	2780
iv)	Petrographic studies	Nos	1478	5	7390
v)	Preparation of polished section	Nos	556	5	2780
vi)	Mineralographic studies	Nos	2090	5	10450
vii)	Specific gravity & porosity determination	Nos	389	10	3890
viii)	Bulk density	Nos	144	5	720
	Sub Total-D				7852648
E	**PRESERVATION OF CORE**				
	GI Core Boxes	Nos	2000	580	1160000
i)	Transportation of core boxes	km	33	1200	39600
	Sub Total- E				1199600
	Total A+B+C+D+E				28448768
F	EXPLORATION REPORT 1% of A+B+C+D+E				284488
	Total A+B+C+D+E+F				28733256
I	GST @18%				5171986
	Grand Total				33905242
					or Say Rs. 339.05 Lakhs

if total SiO_2 is more than 5%, Reactive Silica may be analysed

* initially 25 samples from 5 bore holes (1m sample length) are required to be analysed, if results are not encouraging then the drilling may be stopped restricted to the top of lithomarge. If the results are encouraging all the bore holes may be drilled to the top of bedrock.

(Manoj Kumar)
Sc.-'A', GSI (HQrs)
Member secretary, TCC (Min)

Annexure-3B

Time Schedule /Action Plan for Exploration proposal for Bauxite in Kelnamali block (G3)														
S. No.	Time/Item	Months	1	2	3	4	5	6	7	8	9	10	11	12
1	Work Order To the Out Sourced Partner													
2	Mobilisation	Lump sum												
3	Approach Road	5 km												
4	Drilling	2320 m												
5	Pitting (5 Pit)	5 Cu m												
6	Survey	11.292 sq km												
7	Mapping	11.292 sq km												
8	Sampling	2469 Nos.												
9	Laboratory Studies	2469 Nos.												
10	Report writing, Peer Review and Submission	5 Months												

(Manoj Kumar)
Director, GM(BGCD)
Mines Convenor, TEC 90827

Annexure-4A

Details cost estimate for Bauxite in Majhlagumali Block (G3)

S. No.	Item of Work	Unit	Estimated Cost (2018-19)		
			ESC Rate Rs	QTY	Amount Rs
A	**DRILLING (to be outsourced)**				
1	Surface Drilling (2 Diamond/RC/VS)	m	7028	1230	8644440
2	Tender preparation, publishing and finalisation	one time		1	400000
	Sub Total- A				**9044440**
B	**GEOLOGICAL WORK**				
1	Survey Party days	day	6056	90	545040
2	Geological Mapping, Geological Party days	day	8083	90	727470
3	Bulk Sampling Party Days	day	13908	10	139080
4	Core Sampling Party days	day	2905	120	348600
	Sub Total- B				**1760190**
C	**PITTING**				
1	Pitting 5 nos.	Cu m.	17530	5	187650
	Sub Total-C				**187650**
D	**LABORATORY STUDIES**				
1	Chemical Analysis				
	i) Primary and check samples				
	a) Primary samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	1050	3240300
	b) Check samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	105	324030
	ii) Composite samples				
	a) Composite samples for 14 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, V_2O_5, P_2O_5, LOI, MnO, MgO, CaO, Na_2O, K_2O, Cr_2O_3 & Organic Carbon)	Nos	5998	32	191936
	b) RBB*	Nos	4620	32	147840
	c) Composite Metallurgical Samples Trihydrate Alumina (THA), Monohydrate Alumina (MHA), Reactive Silica(R-SiO_2)	Nos	1838	32	58816
2	Physical Analysis				
i)	a) XRD Studies on composite (Bohemite & Gibbsite)	Nos	5813	10	58130
ii)	b) ICP-MS studies (14 trace elements including Gallium)	Nos	4620	10	46200
iii)	Preparation of thin section	Nos	556	10	5560
iv)	Petrographic studies	Nos	1478	10	14780
v)	Preparation of polished section	Nos	556	10	5560
vi)	Mineragraphic studies	Nos	2090	10	20900
vii)	Specific gravity & porosity determination	Nos	389	15	5835
viii)	Bulk density	Nos	144	5	720
	Sub Total- D				**4120607**
E	**PRESERVATION OF CORE**				
i	G.I Core Boxes	Nos	2000	308	616000
ii	Transportation of core boxes	km	33	1200	39600
	Sub Total- E				**655600**
	Total A+B+C+D+E				**15768487**
F	EXPLORATION REPORT 1% of A+B+C+D+E				**157685**
	Total A+B+C+D+E+F				**15926172**
	GST @18%				**2866711**
	Grand Total				**18792883**

or Say Rs. 187.93 Lakhs

if total SiO_2 is more than 5%, Reactive Silica may be analysed

* initially 75 samples from 5 bore holes (1m sample length) are required to be analysed, if results are not encouraging then the drilling may be stopped restricted to the top of lithomarge. If the results are encouraging all the bore holes may be drilled to the top of bedrock.

Manoj Kumar
Director, GSI Odisha
Mining Survey, ER&NE)

Annexure-4B

Time Schedule /Action Plan for Exploration proposal for Bauxite in Mahingumuli block (G3)												
S. No.	Time/Items	Months	1	2	3	4	5	6	7	8	9	10
1	Work Order To the Out Sourced Partner											
2	Mobilisation	lumpsum										
3	Approach Road	5 km										
4	Drilling	1230 m										
5	Pitting (5 Pit)	5 Cu m										
6	Survey	4.47 sq km										
7	Mappping	4.47 sq km										
8	Sampling	1330 Nos.										
9	Laboratory Studies	1330 Nos.										
10	Report writing with Peer Review	3 Months										

(Manoj Kumar)
Director, GSI (DGCD)
Member secretary, TCC-SMET

Annexure-5A

Detailed cost Estimate for Bauxite in Tarkapani (West) Block (G3)

S. No.	Item of Work	Unit	Estimated Cost (2018-19)		
			ESC Rate Rs	QTY	Amount Rs
A	**DRILLING (to be outsourced)**				
1	Surface Drilling (2 Diamond / 1 RC/VS)	m	7028	1440	10120320
2	Tender preparation, publishing and finalisation	one time		1	400000
	Sub Total- A				**10520320**
B	**GEOLOGICAL WORK**				
1	Survey Party days	day	6056	90	545040
2	Geological Mapping, Core Logging	day	8083	90	727470
3	Bulk Sampling Party Days	day	13908	10	139080
4	Core Sampling Party days	day	2905	120	348600
	Sub Total- B				**1760190**
C	**PITTING**				
1	Pitting 5 nos	Cum	37530	5	187650
	Sub Total- C				**187650**
D	**LABORATORY STUDIES**				
1	Chemical Analysis				
	i) Primary and check samples				
	a) Primary samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	1200	3703200
	b) Check samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	120	370320
	ii) Composite samples				
	a) Composite samples for 14 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, V_2O_5, P_2O_5, LOI, MnO, MgO, CaO, Na_2O, K_2O, Cr_2O_3 & Organic Carbon)	Nos	5998	36	215928
	b) Composite Metallurgical Samples -Trihydrate Alumina (THA), Monohydrate Alumina (MHA), Reactive Silica (R-SiO_2)	Nos	1838	36	66168
	c) RED*	Nos	4620	36	166320
2	Physical Analysis				
i)	a) XRD Studies on composite	Nos	5813	10	58130
ii)	b) ICP-MS studies (14 trace elements including Gallium)	Nos	4620	10	46200
iii)	Preparation of thin section	Nos	556	10	5560
iv)	Petrographic studies	Nos	1478	10	14780
v)	Preparation of polished section	Nos	556	10	5560
vi)	Mineragraphic studies	Nos	2090	10	20900
vii)	Specific gravity & porosity determination	Nos	389	10	3890
viii)	Bulk density	Nos	144	5	720
	Sub Total- D				**4677676**
E	**PRESERVATION OF CORE**				
	GI Core Boxes	Nos	2000	360	720000
i)	Transportation of core boxes	km	33	1200	39600
	Sub Total- E				759600
	Total A+B+C+D+E				**17905436**
F	EXPLORATION REPORT 1% of A+B+C+D+E				179054
	Total A+B+C+D+E+F				18084490
	GST @18%				3255208
	Grand Total				**21160644**

or Say Rs. 211.61 Lakhs

if total SiO_2 is more than 5%, Reactive Silica may be analysed

* initially 75 samples from 5 bore holes (1m sample length) are required to be analysed, if results are not encouraging then the drilling may be stopped restricted to the top of lithomarge. If the results are encouraging all the bore holes may be drilled to the top of bedrock

(Manoj Kumar)
Director, GSI (HQ)
Member convener, TCCMME

Annexure-5B

Time Schedule /Action Plan for Exploration proposal for Ruxite in Nunapaimali block (G3)													
S. No.	Time/Items	Months	1	2	3	4	5	6	7	8	9	10
1	Work order to the outsourced partner											
2	Mobilisation	lumpsum										
3	Approach Road	km										
4	Drilling	1440 m										
5	Pitting (5 Pit)	5 Cum										
6	Survey	4.322 sq km										
7	Mapping	4.322 sq km										
8	Sampling	1500 Nos.										
9	Laboratory Studies	1500 Nos.										
10	Report writing, Peer Review and submission	Months										

Annexure-6A

Detailed Cost Estimate for Bauxite in Nunapainali Block (G3)

S. No.	Item of Work	Unit	Estimated Cost (2018-19)		
			ESC Rate Rs	QTY	Amount Rs
A	**DRILLING (to be outsourced)**				
1	Surface Drilling (2 Diamond / 1 RC/VS)	m	7028	1320	9276960
2	Tender preparation, publishing and finalisation	one time		1	400000
	Sub Total-A				**9676960**
B	**GEOLOGICAL WORK**				
1	Survey Party days	day	6056	90	545040
2	Geological Mapping, Core Logging	day	8083	90	727470
3	**Bulk Sampling Party Days**	day	13908	10	139080
4	**Core Sampling Party days**	day	2905	120	348600
	Sub Total- B				**1760190**
C	**PITTING**				
1	Pitting 5 nos	Nos	37530	5	187650
	Sub Total- C				**187650**
D	**LABORATORY STUDIES**				
1	Chemical Analysis				
	i) Primary and check samples				
	a) Primary samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	1200	3703200
	b) Check samples for 7 radicals (Total Al_2O_3, Available Al_2O_3 (THA), Total SiO_2, Reactive SiO_2# Fe_2O_3, TiO_2, V_2O_5 and LOI)	Nos	3086	120	370320
	ii) Composite samples	Nos			
	a) Composite samples for 14 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, V_2O_5, P_2O_5, LOI, MnO, MgO, CaO, Na_2O, K_2O, Cr_2O_3 & Organic Carbon)	Nos	5998	33	197934
	b) Composite Mettalurgical Samples -Trihydrate Alumina (THA), Monohydrate Alumina (MHA), Reactive Silica (R-SiO_2)	Nos	1838	33	60654
	c) REE*	Nos	4620	33	152460
2	Physical Analysis				
i)	a) XRD Studies on composite	Nos	5813	10	58130
ii)	b) ICP-MS studies (14 trace elements including Gallium)	Nos	4620	10	46200
iii)	Preparation of thin section	Nos	556	10	5560
iv)	Petrographic studies	Nos	1478	10	14780
v)	Preparation of polished section	Nos	556	10	5560
vi)	Mineragraphic studies	Nos	2090	10	20900
vii)	Specific gravity & porosity determination	Nos	389	15	5835
viii)	Bulk density	Nos	144	5	720
	Sub Total- D				**4642253**
E	**PRESERVATION OF CORE**				
1)	**GI Core Boxes**	Nos	2000	330	660000
	Transportation of core boxes	km	33	1200	39600
	Sub Total- E				**699600**
F	**Total A+B+C+D+E**				**16966653**
	EXPLORATION REPORT 1% of A+B+C+D+E				169667
I	Total A+B+C+D+E				17136320
	GST @18%				3084538
	Grand Total				20220857
					or Say Rs. 202.21 Lakhs

if total SiO_2 is more than 5%, Reactive Silica may be analysed

* initially 25 samples from 5 bore holes (1m sample length) are required to be analysed, if results are not encouraging then the drilling may be stopped restricted to the top of lithomarge. If the results are encouraging all the bore holes may be drilled to the top of bedrock.

(Manoj Kumar)
Director, GM (G&C)
Member-secretary, TCC/NMET

Annexure-6B

Time Sebedule /Action Plan for Exploration proposal for Bauxite in Nunapsinuli block (G3)												
S. No.	Time/Items	Months	1	2	3	4	5	6	7	8	9	10
1	Work order to the outsourced partner											
2	Mobilisation	lumpsum										
3	Approach Road	km										
4	Drilling	1320 m										
5	Pitting (5 Pit)	5 Cu m										
6	Survey	4.282 sq km										
7	Mapping	4.282 sq km										
8	Sampling	1500 Nos.										
9	Laboratory Studies	1500 Nos.										
10	Report writing with Peer Review	Months										

(Manoj Kumar)
Director, GM (HoCO)
Mandate vacating, TCC-NMDC

Cost Estimate for General Exploration (G2) Proposal for Gold in C. K Halli Main Block (0.37 Sq km), Chitradurga District, Karnataka

S. No.	Item of Work	Unit	Base	Financial Year (2018-19)			Financial Year (2019-20)			Total	
			Rate 1.4.90	Esc. Rate (Rs)	Qty.	Amount (Rs)	Esc. Rate (Rs)	Qty.	Amount (Rs)	Qty	Amount (Rs)
A	DRILLING										
1	Surface Drilling (T Higs)	m	1714	8472	0	0	8472	4124	34938528	4124	34938528
2	Transportation	Km.	8.8	33	0	0	33	4600	151800	4600	151800
3	Accommodation	One time / Drill	18592 5	690693	0	0	690695	3	2072079	3	2072079
4	Camp Setting / Winding	Drill/ month	88006	254864	0	0	254864	6	1529184	6	1529184
5	Road Making (Flat Terrain)	Km	7800	19317	0	0	19317	10	193170	10	193170
	Sub Total A					0			38884761		38884761
B	GEOLOGICAL WORK										
1	Survey Party Days (1 party)	day	1180	6056	0	0	6056	45	272520	45	272520
2	Geologist Party days (1 party)	day	1541	8083	0	0	8083	180	1454940	180	1454940
3	Core Sampling Party days (1 Party)	day	525	2905	0	0	2905	180	522900	180	522900
4	Bulk Sampling Party days (1 parties)	day	2566	13908	0	0	13908	30	417240	30	417240
	Sub-Total B					0			2667600		2667600
C	Pitting and Trenching (10mx1mx1m) 10 Nos	Cu. m	393	1739	0	0	1739	100	173900	100	173900
	Sub-Total C					0			173900		173900
D	LABORATORY STUDIES										
a	Chemical Analysis										
1	Primary + Check Samples - Duplicate half										
	i) for Au (Fire assay)	Nos	205	1111	0	0	1111	1000	1111000	1000	1111000
	ii) Au (Fire assay), Internal Check 5%		205	1111	0	0	1111	50	55550	50	55550
	iii) Au (Fire assay), External Check, 10%		205	1111	0	0	1111	100	111100	100	111100
	iv) Duplicate Half, Au-Fire Assay, 5%		205	1111	0	0	1111	50	55550	50	55550
	v) for RFE	Nos		7381	0	0	7381	50	369050	50	369050
	vi) Trench/Pitting Samples for Au (fire assay)	Nos		1111	0	0	1111	100	111100	100	111100
2	Composite Samples										
	i) Fire Assay for Au+Ag	Nos	205	1439	0	0	1439	30	43170	30	43170
b	Physical Analysis										
	i) ICPMS (15 trace elements) ****	Nos	1173	4831.5	0	0	4832	50	241575	50	241575
	ii) XRD Analysis	Nos	1137	5813	0	0	5813	25	145325	25	145325
	iii) Preparation of thin section	Nos	100	556	0	0	556	20	11120	20	11120
	iv) Petrographic Studies	Nos	228	1478	0	0	1478	20	29560	20	29560
	v) Preparation of polished section	Nos	100	556	0	0	556	20	11120	20	11120
	vi) Mineragraphic studies	Nos	364	2090	0	0	2090	20	41800	20	41800
	vii) Specific Gravity determination	Nos	32	194.5	0	0	195	50	9725	50	9725
	viii) Transportation (Beneficiation sample to IBM Bangalore)	km.	8.8	33	0	0	33	400	13200	400	13200
	ix) Beneficiation sample *	Nos		280900	0	0	280900	1	280900	1	280900

(Manoj Kumar)
Director, GSI (DGSD)
Member secretary, TCC-NMET

	x) Transportation (Geotechnical sample)	km	8.8	33	0	0	33	4400	145200	4400	145200
	xi) Geotechnical sample	Nos		200000	0	0	200000	1	200000	1	200000
	Sub-Total D					0			2986045		2986045
E	Preservation of Core										
i)	(i) Core boxes	Nos.		2000	0	0	2000	1050	2100000	1050	2100000
iii)	Transportation of Core Boxes	km	8.8	33.0	0	0	33	400	13200	400	13200
	Sub-Total E					0			2113200		2113200
	Total A+B+C+D+E					0			46651606		46825506
F	EXPLORATION REPORT - 1% of (A+B+C+D)							1	466516	1	466516
G	PEER REVIEW OF DGR (Lump Sum)	Nos			0	0	10000	1	10000	1	10000
H	Environmental Studies										
1	Satellite Imagery studies	Scene	99697	476193	0	0	476193	1	476193	1	476193
2	Base line Data Collection	(10 km radius)	15127 3	722540	0	0	694857	1	694853	1	694857
3	Chemical Analysis	Nos	25740 0**	604478	0	0	604478	1	604478	1	604478
4	Report Writing	Nos	50000	50000	0	0	50000	1	50000	1	50000
	Sub Total H								1825528		1825528
	Total Cost (A+B+C+D+E+F+G+H)										49127550
	GST 18%										8842959
	Grand Total: with GST 18%										57970509
											Say Rs 579.71 Lakh

Note	
1	Revised rates of promotional work done by MECL on behalf of Govt. of India vide letter No.37(1)/2006-M.L dated-02/07/2014 and based on actual escalation as per RBI Indices as on 21-03-2017 and the same has been considered for subsequent year.
2	* IBM Rates has been followed by beneficiation studies
3	** Nilgund Committee Rates with actual escalation as per RBI index as on 31/03/2017 and the same for subsequent year
4	*** As approved in the 12th meeting on Technical Committee and the meeting of Executive Committee of NMET
5	**** Rate has taken from Schedule of Charges of different activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.
6	Expenses incurred towards crop compensation - subject to the approval of the EC.
7	Expenses incurred towards technical support to state governments prior & during auction process - subject to the approval of the EC

Annexure-7B

Time Schedule / Action Plan

S. No.	Activities	Unit	Months												
			1	2	3	4	5	6	7	8	9	10	11	12	13
1	Camp Setting	Month													
2	Surface Drilling (3 Drills)	Month													
3	Survey Party days. (1 Party)	Month													
4	Geologist Party days (1 Party)	Month													
5	Sampling Party days														
i.	Core Sampling (1 party)	Month													
ii.	Bulk Sampling (1 party)	Month													
iii.	Exploratory Mining (1 Party) for Pitting and Trenching	Month													
6	Laboratory Studies	Month													
7	Geotechnical Studies (Drill core 1 BH)	Month													
8	Beneficiation Studies	Month													
9	Camp Winding	Month													
10	Baseline Environmental Studies	Month													
11	Report Writing (Including Peer Review of Report)	Month													

(Vinay Kumar)
Director, GSI (HQ)
Member Secretary, TCC-MoEF

Annexure-8A

Cost estimate for exploration of bauxite in Sendurkhar Block (G3), district- Kabirdham, Chhattisgarh								
S. No.	Item of Work	Unit	Base Rate	Financial Year (2018-19)			Total	
			1.4.90	Esc. Rate (Rs)	Qty.	Amount (Rs)	Qty	Amount (Rs)
A	**DRILLING**							
1	Surface Drilling (2 Rigs)	m	1714	7028	345	2424660	345	2424660
2	Transportation	km	8.8	33	800	26400	800	26400
3	Accommodation	One time/ Drill	185925	690693	2	1381386	2	1381386
4	Camp Setting / Winding	Drill/month	68606	254864	4	1019456	4	1019456
5	Road Making (Hilly Terrain)*	km	7800	28976	10	289760	10	289760
Sub Total A						5141662		5141662
B	**GEOLOGICAL WORK**							
1	Survey Party Days (1 party)	day	1180	6056	60	363360	60	363360
2	Geologist Party days (1 party)	day	1541	8083	90	727470	90	727470
3	Core Sampling Party days(1 parties)	day	525	2905	60	174300	60	174300
Sub-Total B						1265130		1265130
C	**LABORATORY STUDIES**							
1	**Chemical Analysis**							
a	Primary + Check Samples							
	i) Primary Samples for 5 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, LOI)	Nos	414 (76x4+110)	2254	275	619850	275	619850
	ii) Check Samples for 5 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, LOI) 5%	Nos	414 (76x4+110)	2254	15	33810	15	33810
	iii) External Check for 5 radicals (Al_2O_3, SiO_2, Fe_2O_3, TiO_2, LOI) 10%	Nos	414 (76x4+110)	2254	30	67620	30	67620
b	Composite Samples							
	i) Composite Samples for14 radicals (CaO, MgO, Al2O3, SiO2 &, Fe2O3, TiO2, SO3 , P2O5, V2O5, Na2O, K2O, Mn2O3, Organic carbon & LOI)	Nos	1098 (76x13+110)	5998	23	137954	23	137954
	ii) TAA (Total Available Alumina) and Reactive Silica	Nos	262 (76x2+110)	1422	23	32706	23	32706
c	REE analysis of primary samples*	Nos		4620	23	106260	23	106260
2	**Physical Analysis**							
a	Trace Element studies of Composite Samples for 14 trace elements viz. Pb, Zn, Ni, Co, Mo, Sn, V, Ga, Zr, Cr, As, Sb, Bi, Ge, by ICP-MS method*	Nos		4620	23	106260	20	106260
b	XRD Studies	Nos	1137	5813	23	133699	20	133699
c	Preparation of thin section	Nos	100	556	10	5560	10	5560
d	Petrographic Studies	Nos	228	1478	10	14780	10	14780
e	Specific Gravity determination	Nos	32	194.5	20	3890	20	3890
Sub-Total C						1262389		1262389
D	**PRESERVATION OF CORE**							
1	GI Core boxes	Nos.		2000	85	170000	85	170000
2	Transportation of Core Boxes	km	8.8	33.0	1000	33000	1000	33000
Sub-Total D						203000		203000
Total A+B+C+D						7872181		7872181
E	**EXPLORATION REPORT - 1.5% of (A+B+C+D) or Rs. 120000 whichever is higher**	Nos			1	120000	1	120000

(Alok Kumar)
Director, GM Division
Mineral Wing, TCS/NMET

F	PEER REVIEW OF DGR (Lump sum)	Nos		10000	1	10000	1	10000
TOTAL (A+B+C+D+E+F+G)								8002181
GST 18%								1440393
GRAND TOTAL (with GST 18%)								9442574
								Says 94.43 Lakhs

Note:

1	Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(1)/2006-M.L. dated-02/07/2014 and based on actual escalation as per RBI indices as on 31-03-2018 and the same has been considered for subsequent year.
2	Phosphorite rates have been considered as there is no rates for Bauxite in Revised Rates of Promotional Work as per recommendations of J.R. Goel Committee's report as on 31.03.2018
*	Rate has taken from Schedule of Charges of differen activities of GSI as on 2014-15 and 40% escalation on the same has been considered for FY 2018-19.
**	Nityanad Committee Rates with actual escalation as per RBI index as on 31.3.2017 and the same for subsequent year.
	Mineral Exploration and evaluation 18%(SAC Code: 998343)
3	ii) Expenses incurred towards crop compensation - subject to the approval of the EC.
4	i) Expenses incurred towards technical support to state governments prior & during auction process - subject to the approval of the EC
	# if SiO2 is greater than 5% Reactive Silica may be analysed

Annexure-8B

Time schedule for exploration (G3) of bauxite in Sendurkhar Block

S. No.	Activities	Unit	MONTHS						
			1	2	3	4	5	6	7
1	Camp setting	month							
2	Surface Drilling (2 rig)	m							
3	Survey Party days (1 Party)	day							
4	Geologist Party days (1 Party)	day							
5	Sampling Party days (1 Party)	day							
6	Laboratory Studies	Nos.							
7	Camp winding	month							
8	Report Writing (Including Peer Review of Report)	day							

Manoj Kumar
Director, GSI (HQ), UK
Member Secretary, SCSCMMET

Annexure-9A

Cost estimate for preliminary exploration for bauxite in Chendradadar (G3)

S. No.	Item of work	Unit	Base Rate	Financial Year (2018-19)			Total	
				Esc. Rate as per MECL SoR	Qty.	Amount	Qty	Amount
A	**DRILLING**		14.90	(Rs)		(Rs)		(Rs)
1	Surface Drilling (2 Rigs)	m	1714	7028	450	3162600	450	3162600
2	Road making (Flat Terrain)	km	5200	19317	10	193170	10	193170
3	Transportation (2Rigs)	km	8.8	33	400	13200	400	13200
4	Accommodation (One Time /Drill)	Nos	185925	690693	2	1381386	2	1381386
5	Camp Setting / Winding	Drill/month	68606	254864	4	1019456	4	1019456
6	GI Core Boxes	Nos	Lumpsum	2000	150	300000	150	300000
7	Transportation charges of Core Boxes	KM	8.8	34	300	10200	300	10200
	Sub Total A					**6080012**		**6080012**
B	**GEOLOGICAL WORK**							
1	Survey Party Days (1 party)	day	1180	6146	60	368760	60	368760
2	Geologist Party Days (1 Party)	day	1541	7802	90	702180	90	702180
3	Core Sampling Party days (2 parties)	day	525	2809	90	252810	90	252810
	Sub Total B					**1323750**		**1323750**
C	**LABORATORY STUDIES**							
a	Chemical Analysis							
1	Primary + Check Samples							
	(i) Primary Samples for 7 radicals (TiO_2, Ga, V, SiO_2, Al_2O_3, Fe_2O_3 % & LOI)	Nos	414 (76×4+110)	2254	450	1014300	450	1014300
	(ii) Analysis of REE	Nos		4831	20	96620	20	96620
	iii) Composite Sample for 24 radicals (CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3, TiO_2, SO_3, P_2O_5, V_2O_5, Na_2O, K_2O, Mn_2O_3, Organic carbon & LOI)	Nos	1098 (76×13+110)	5998	45	269910	45	269910
	(iv) Check Samples for 5 radicals (TiO_2, Ga, V, SiO_2#, Al_2O_3, Fe_2O_3 % LOI)	Nos	414 (76×4+110)	2254	45	101430	45	101430
	v) TAA (Total Available Alumina) and Reactive Silica	Nos	262 (76x2+110)	1422	23	32706	23	32706
	Sub Total C					**1514966**		**1514966**
	Total A+B+C					**8918728**	**0**	**8918728**
D	Report Writing (1% of Total (A+B+C or Rs. 120000 whichever is higher) as per MECL SoR	Nos			1	120000	1	120000
	Total A to D					**9038728**		**9038728**
E	GST 18%							1626971
	Grand Total: with GST 18%							**10665699**
								Say 106.66 Lakhs

Note:

1. Revised rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(D)/2006M.L., dated 02/07/2014 and based on actual escalation as per RBI Indices as on 31-03-2017 and the same has been considered for subsequent year.
2. * As per actuals.
3. **Nityanand Committee Rates with actual escalation as per RBI Index as on 31.03.2017 and the same for subsequent year.
4. ***As approved in the 12th meeting of the Technical Committee & the meeting of Executive Committee of NMET.
5. ****Rate has taken from Schedule of Charges of different activities of GSI on 2014-15 and 40% escalation on the same has been considered for F.Y. 2018-19
6. #If SiO2 is greater than 5% Reactive Silica may be analysed

Dhiraj Kumar
Director, GM (EC-CO)
Member secretary, TCC-NMET

Annexure-9B

Time Schedule (in month) for exploration programme in Chendradadar block (G3)										
Item of work	1	2	3	4	5	6	7	8	9	10
Geological mapping										
Bed rock sampling										
Surveying (one party)										
Drilling										
Survey party for contouring and surface feature										
Sample preparation										
Geologist party days for drilling sampling and report work										
Analytical work Drill core sample										
Camp winding										
Report Writing (Including Peer Review of Report)										

(Mukul Kumar)
Director, GM (WCR)
Master training, TCC-NMET

Annexure-10A

Cost estimate for preliminary exploration for iron ore in Gopaltola (G4)

S. No.	Item of work	Unit	Base	Financial Year (2018-19)			Total	
			Rate	Esc. Rate as per MECL SoR	Qty.	Amount	Qty	Amount
			14.90	(Rs)		(Rs)		(Rs)
A	**DRILLING**							
1	Surface Drilling (2 Rigs)	m	1714	7028	500	3514000	500	3514000
2	Road making (Hilly Terrain) *	km	7800	28976	10	289760	10	289760
3	Transportation (2Rigs)	km	8.8	33	400	13200	400	13200
4	Accommodation (One Time /Drill)	Nos	185925	690695	2	1381386	2	1381386
5	Camp Setting & winding	Drill/ month	68606	254864	4	1019456	4	1019456
6	GI Core Boxes	Nos	Lumpsum	2000	125	250000	125	250000
7	Transportation Charges of Core Boxes	km	8.8	33	300	9900	300	9900
	Sub Total A					**6477702**		6477702
B	**GEOLOGICAL WORK**							
1	Survey Party Days (1 party)	day	1180	6056	10	60560	10	60560
2	Geologist Party Days (1 Party)	day	1541	8083	90	727470	90	727470
3	Core Sampling Party days (2 parties)	day	535	2905	90	261450	90	261450
	Sub Total B					**1049480**		1049480
C	**LABORATORY STUDIES**							
a	Chemical Analysis							
i	Primary – Check Samples							
	(i) Primary Samples for 6 radicals (Fe%, Mn%, SiO_2%, Al_2O_3%, P_2O_5%, S%)	Nos	490 (76×5+110)	2670	500	1335000	500	1335000
	(ii) Composit Samples for 6 radicals (Fe%, Mn%, SiO_2%, Al_2O_3%, P_2O_5%, S%)	Nos		2670	20	53400	50	53400
	(iii) Check Samples for 6 radicals (Fe%, Mn%, SiO_2%, Al_2O_3%, P_2O_5%, S%)	Nos	490 (76×5+110)	2670	50	133500	50	133500
b	Petrographic Studies							
	Thin Section Preparation	Nos	100	556	10	5560	10	5560
	Polished Section Preparation	Nos	100	556	10	5560	10	5560
	Mineragraphic Studies	Nos	364	2090	10	20900	10	20900
	Sub Total C					**1553920**		1553920
D	Report Writing (1% of Total (A+B+C or Rs. 120000 whichever is higher) as per MECL SoR	Nos			1	120000	1	120000
	Total A to D					**9201102**		9201102
E	GST 18%							1656198
	Grand Total: with GST 18%							10857300
								Say 108.57 Lakhs

Note:	
1	Revised rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006 M.L., dated-02/07/2014 and based on actual escalation as per RBI Indices as on 31-03-2017 and the same has been considered for subsequent year.
2	* As per actuals
3	**Nityanand Committee Rates with actual escalation as per RBI Index as on 31.03.2017 and the same for subsequent year.
4	***As approved in the 12th meeting of the Technical Committee & the meeting of Executive Committee of NMET.
5	****Rate has taken from Schedule of Charges of different activities of GSI on 2014-15 and 40% escalation on the same has been considered for F.Y. 2018-19

(Uday Kumar)
Director, GM (Mining)
Member secretary, TCC/NMET

Annexure-10B

Time schedule (in month) for preliminary survey (G4) mineral exploration in proposed iron ore block-Gopaltola										
Item of work	1	2	3	4	5	6	7	8	9	10
Geological mapping										
Drilling										
Sample preparation										
Geologist party days for drilling sampling and report work										
Analytical work Drill core sample										
Camp winding										
Report Writing (Including Peer Review of Report)										

Annexure-11A

Cost estimate for preliminary exploration for bauxite in Lurenn Block (G3)								
S. No.	Item of work	Unit	Base	Financial Year (2018-19)			Total	
			Rate	Esc. Rate as per MECL SoR	Qty.	Amount	Qty	Amount
			14.90	(Rs)		(Rs)		(Rs)
A	**DRILLING**							
1	Surface Drilling (2 Rigs)	m	1714	7028	500	3514000	500	3514000
2	Road making (Flat Terrain)*	km	5200	19317	10	193170	10	193170
3	Transportation (2Rigs)	km	8.8	33	400	13200	400	13200
4	Accommodation(One Time /Drill)	Nos	185925	690693	2	1381386	2	1381386
	Camp Setting & winding	Drill/ month	68606	254864	4	1019456	4	1019456
5	GI Core Boxes	Nos	Lumpsum	2000	125	250000	125	250000
6	Transportation Charges of Core Boxes	km	8.8	33	300	9900	300	9900
	Sub Total A					**6381112**		**6381112**
B	**GEOLOGICAL WORK**							
1	Survey Party Days (1 party)	day	1180	6036	50	302800	50	302800
2	Geologist Party Days (1 Party)	day	1541	8083	80	646640	80	646640
3	Core Sampling Party days (2 parties)	day	525	2905	120	348600	120	348600
	Sub Total B					**1298040**		**1298040**
C	**LABORATORY STUDIES**							
a	Chemical Analysis							
1	Primary + Check Samples							
	(i) Primary Samples 7 radicals (TiO_2, Ga, V, SiO_2, Al_2O_3, Fe_2O_3 % & LOI)	Nos.	414 (76×4+110)	2254	500	1127000	500	1127000
	(ii) Analysis of REE	Nos.		4831	20	96620	20	96620
	iii) Composite Sample for 14 radicals (CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3, TiO_2, SO_3, P_2O_5, V_2O_5, Na_2O-K_2O, Mn_2O_3, Organic carbon & LOI)	Nos.	1098 (76×13+110)	5998	50	299900	50	299900
	(iv) for Check Samples 5 radicals (TiO_2, Ga, V, SiO_2#, Al_2O_3, Fe_2O_3 % LOI)	Nos.	414 (76×4+110)	2254	50	112700	50	112700
	vi TAA (Total Available Alumina) and Reactive Silica	Nos.	262 (76x2+110)	1422	50	71100	50	71100
	Sub Total C					**1707320**		**1707320**
	Total A+B+C					**9386472**	**0**	**9386472**
D	Report Writing (1% of Total (A+B+C or Rs. 120000 whichever is higher) as per MECL SoR	Nos.			1	120000	1	120000
	Total A to D					**9506472**		**9506472**
E	GST 18%							1711165
	Grand Total: with GST 18%							11217637
								Say **112.18 Lakhs**

Note:	
1	Revised rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I)/2006/V.L., dated-02/07/2014 and based on actual escalation as per RBI Indices as on 31-03-2017 and the same has been considered for sub-sequent year.
2	* As per actuals
3	**Nityanand Committee Rates with actual escalation as per RBI Index as on 31.03.2017 and the same for subsequent year.
4	***As approved in the 12th meeting of the Technical Committee & the meeting of Executive Committee of NMET
5	****Rate has taken from Schedule of Charges of different activities of GSI on 2014-15 and 40% escalation on the same has been considered for F.Y. 2018-19
6	# If SiO_2 is greater than 5% Reactive Silica may be analysed

(Manoj Kumar)
Director, GM (HQ)
Mineral Exploration & Consultancy Limited

Annexure-11E

Time Shedule (in month) For exploration programme in Lurenu Block.										
	Months									
Item of work	1	2	3	4	5	6	7	8	9	10
Geological mapping										
Bed rock sampling										
Surveying (one party)										
Drilling										
Survey party for contouring and surface feature										
Sample preparation										
Geologist party days for drilling sampling and report work										
Analytical work Drill core sample										
Camp winding										
Report Writing (Including Peer Review of Report)										

(Manoj Kumar)
Director, WMP/PGCYD
Hindustan zinc limited, UDAIPUR

Annexure-12

Revised estimate for chemical analysis for Palayamkotti Lignite Block, district- Cuddalore- Tamil Nadu			
Old estimate	No. of samples	Rate	Value in Rs.
Chemical Analysis			
a) Primary Samples	900	698	628,200
b) Composite Samples	250	935	233,750
Total-A			861,950
REVISED ESTIMATE			
Chemical Analysis	No. of samples	Rate	Value in Rs.
BAND BY BAND SAMPLE			
a. Proximate (Moisler, Ash, VM, FC) (Band by band & Overall)	780	935	737,715
b. CV (Band by band & Overall)	789	1,503	1,185,867
COMPOSITE SAMPLE			
Proximate (Moisler, Ash, VM, FC)	94	935	87,890
Gross CV	94	1,503	141,282
Ultimate(C, H, N, S, M, M, Moisture)	10	9,944	99,440
Sulphur Distribution (Pyrite, Non pyrite, Organic, Total Sulphur) (5% of Primary)	10	3,694	36,940
Ash Analysis (10 Radicals) (10% of Primary)	10	13,644	136,440
Ash Fusion Test (APT) (10% of Primary)	10	2,743	27,430
HGI	5	3,802	19,010
Total			2,472,014
GST 18%			444,963
GRAND TOTAL-B			2,916,977
ADDITIONAL REQUIREMENTS (B-A)			2,055,027

(Dinesh Kumar)
Deputy GM (Geol)
Mining section, JCC-NMDT