

**DEEPSEATED MINERAL PROGNOSIS BY GEOPHYSICAL TECHNIQUES:  
LITHOSPHERIC STRUCTURE AND RELATIONSHIP WITH KIMBERLITE  
CLUSTERS OF KALYANDURG- TIMMASAMUDRAM-CHIGICHERLA,  
ANANTAPUR DISTRICT, ANDHRA PRADESH.**

**(Basemetal/Precious metals  
etc.)**

**By  
Geological Survey of India,  
Southern Region,  
Hyderabad, Telangana.**

**Summary of the Block for Reconnaissance Survey (G4 Stage)GENERAL  
INFORMATION ABOUT THE BLOCK**

| <b>Features</b>                                                                                                                                                         | <b>Details</b>                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Block ID                                                                                                                                                                | KTC Block                                                                                                                                                                                                                                                                                      |
| Exploration Agency                                                                                                                                                      | CSIR-NGRI, Hyderabad and GSI, SR, Hyderabad                                                                                                                                                                                                                                                    |
| Commodity                                                                                                                                                               | Diamond and Base Metals                                                                                                                                                                                                                                                                        |
| Mineral Belt                                                                                                                                                            | Ramagiri Penakacherla Schist Belt and PGC                                                                                                                                                                                                                                                      |
| Completion Period with entire Time schedule to complete the project                                                                                                     | Three years from the date of approval/budget                                                                                                                                                                                                                                                   |
| Objectives                                                                                                                                                              | To derive subsurface structure beneath the Kalyandurg-Timmasamudram-Chigicherla (KTC) Kimberlite cluster and Ramagiri-Penakacherla Schist Belt by deploying different geophysical methods for understanding the occurrence of Kimberlite pipes and gold mineralization and geological studies. |
| Whether the work will be carried out by the proposed agency or through outsourcing and details thereof.<br>Components to be outsourced and name of the outsource agency | The work components will be carried out by CSIR-NGRI and GSI, Hyderabad.<br>Dr. Prasanta K Patro, CSIR-NGRI, PI<br>Dr. S. Srinivas, GSI, Co-PI<br>Dr. S. Ravi, GSI, Co-PI<br>Dr. EVSSK Babu, CSIR-NGRI-Co-PI                                                                                   |
| Name/ Number of Geoscientists                                                                                                                                           | CSIR-NGRI- 2 Scientists, GSI- 2 Geoscientists<br>Other Geoscientists, Technical Officers and Research Students would be coopted as found necessary.                                                                                                                                            |
| Expected Field days (Geology/Geophysics)                                                                                                                                | Detailed field days for Geophysics and Geology enclosed.                                                                                                                                                                                                                                       |
| <b>Location</b>                                                                                                                                                         |                                                                                                                                                                                                                                                                                                |
| Latitude                                                                                                                                                                | 14.25 to 14.65                                                                                                                                                                                                                                                                                 |
| Longitude                                                                                                                                                               | 76.80 to 77.90                                                                                                                                                                                                                                                                                 |
| Villages                                                                                                                                                                | Kalyandurg, Timmasamudram, Chigicherla, Ramagiri                                                                                                                                                                                                                                               |
| Tehsil/ Taluk                                                                                                                                                           | Kalyandurg                                                                                                                                                                                                                                                                                     |
| District                                                                                                                                                                | Anantapur                                                                                                                                                                                                                                                                                      |
| State                                                                                                                                                                   | Andhra Pradesh                                                                                                                                                                                                                                                                                 |
| <b>Area (hectares/ square kilometers)</b>                                                                                                                               |                                                                                                                                                                                                                                                                                                |
| Block Area                                                                                                                                                              | Kalyandurg-Timmasamudram-Chigicherla block, Anantapur district, Andhra Pradesh.                                                                                                                                                                                                                |
| Forest Area                                                                                                                                                             |                                                                                                                                                                                                                                                                                                |
| Government Land Area                                                                                                                                                    | -NA-                                                                                                                                                                                                                                                                                           |
| Private Land Area                                                                                                                                                       | -NA-                                                                                                                                                                                                                                                                                           |
| <b>Accessibility</b>                                                                                                                                                    |                                                                                                                                                                                                                                                                                                |
| Nearest Rail Head                                                                                                                                                       | Anantapur                                                                                                                                                                                                                                                                                      |
| Road                                                                                                                                                                    | Anantapur-Kalyandurg Road                                                                                                                                                                                                                                                                      |
| Airport                                                                                                                                                                 | Bengaluru                                                                                                                                                                                                                                                                                      |
| <b>Hydrography</b>                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |
| Local Surface Drainage Pattern                                                                                                                                          |                                                                                                                                                                                                                                                                                                |

|                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rivers/ Streams                                                                                | Penna River                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Climate</b>                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Mean Annual Rainfall                                                                           | Mainly dry area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Temperatures(December)<br>(Minimum)<br>Temperatures                                            | 12 <sup>0</sup> c<br>45 <sup>0</sup> c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Topography</b>                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Toposheet Number                                                                               | 57 B/14, 57 F/2, F/6 , F/7 and F/10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Morphology of the Area                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Availability of baseline geoscience</b>                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Geological Map (1:50K/ 25K)                                                                    | <b>Available</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Geochemical Map                                                                                | <b>Available / Not Available</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Geophysical Map<br>(Aeromagnetic, ground geophysical, Regional as well as local scale GP maps) | <b>Available</b><br>Aeromagnetic, Regional and local scale Geophysical maps                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Justification for taking up Reconnaissance Survey / Regional Exploration</b>                | <p>The identified KTC block comprises three kimberlite clusters some of them are diamondiferous as well as Ramagiri-Penakacherla Schist belt, which is associated with gold mineralization.</p> <ul style="list-style-type: none"> <li>• To understand the deep crustal nature and structural features with integrated geophysical surveys which might have facilitated as conduits for mineralization and associated weak zones for emplacement of Kimberlite pipes.</li> <li>• To decipher the mantle heterogeneities to understand the physicochemical architecture of the subcontinental lithospheric mantle and its bearing on diamond genesis and stability based on kimberlites and their entrained xenoliths, xenocrysts including diamonds.</li> <li>• To generate comprehensive genetic model for the gold and associated base metal mineralization in and around Ramagiri schist belt by deploying detailed geophysical, geological, petrological, geochemical and isotopic studies.</li> </ul> <p>(Separate sheet enclosed)</p> |

## **Detailed description on the following titles to be made in the proposal.**

### **1. Block Summary**

#### **Physiography:**

The topography is gently undulating, varying from 500 m to 520 m in the area and sparsely vegetated with thorny bushes and shrubs. The cultivation is mainly restricted to plains and nala bunds. The main crops grown are groundnut, pulses and paddy. The temperature varies from 20<sup>0</sup> C to 45<sup>0</sup> C and average annual rainfall is about 50 cm.

#### **Background Geology (Regional Geology, Geology of the Block):**

The Peninsular Gneissic Complex (PGC) comprising of three main litho components forms and the Ramagiri-Penakacherla Schist belt and Closepet granite forms the geology of the KTC block (Hanumantha Rao, 1996; Gopal Reddy and Suresh, 1994). The major component of PGC is Tonalite- Trondhjemite Gneiss (TTG) and is commonly associated with enclaves of amphibolites and migmatites. Tonalite Granodiorite-Adamellite (TGA) is the next abundant component, which is associated with a variety of mafic-felsic rocks of igneous origin such as coarse-grained hornblendite-gabbro-diorite and the mafic rich microgranitoid enclaves, all confined to discrete linear zones within the TGA suite. The third component is the younger granites equivalent to the Closepet granite. The granites have intruded the TTG and TGA components of PGC. All these rock types are emplaced by a number of younger intrusive represented mostly by dolerite dykes, quartz reefs and occasionally by pyroxenite and Kimberlite bodies.

#### **Mineral potentiality based on geology, geophysics, ground geochemistry:**

TK4 Kimberlite pipe (14m x 6m in size) which is situated in Timmasamudram cluster was proven to be the occurrence of higher percentage gem quality diamonds. Processing of nearly 208 tonnes of Kimberlite rock yielded about 133.13 carat gem quality diamond. This means about 64 carats per hundred tonnes (Srinivas Choudhary, 2005).

#### **Scope for proposed exploration:**

NGPM data available with GSI will be interpreted. Different geophysical surveys viz., Gravity, Magnetic, MT/CSAMT will be carried out in the KTC block. The data will be interpreted and shallow / deeper information with relation to known Kimberlites and gold mineralization will be studied. Detailed gravity magnetics, Radiometric and IP/Resistivity will be deployed over anomalous zones and few areas of interest from mineralization point of view will be demarcated.

#### **Geology:**

The regional geology of the area is predominantly occupied by the granites and gneiss mapped as Peninsular Gneissic Complex of Archaean age and gold bearing

Ramagiri-Penakacherla Schist Belt comprising of meta sediments, meta basics, meta basalt, amphibolite, biotite schist, meta basic dykes, migmatite aligned in NNW-SSE to N-S direction with steep dips (GSI,2011).

### **Significance of Kimberlite Clusters:**

Understanding of the physico-chemical conditions and evolution of lower crust and the sub- continental lithospheric mantle (SCLM) is fundamental to any study of Earth's endogenic processes. The crust-mantle systems of Precambrian cratons assume importance as a bulk of the earth's crust was accreted during this period. Chemically distinct colder cratonic-mantle with its intrinsic buoyancy and higher viscosity compared to hotter and convecting mantle below the oceanic crust forms an important factor in cratonic stabilisation. The colder cratonic roots are also store houses for precious diamonds which are formed under specific physico-chemical conditions following several chemical recipes.

Mantle-derived magmatic eruptions such as kimberlites and lamproites intruding the stable cratonic regions or their marginal zones at specific time windows of the Earth's history offer unparalleled opportunities for direct observation of the SCLM and the overlying crust. Their ascent to the surface from mantle depths (upto 670 km) is considered to be extremely rapid (a few hours). These eruptions also bring exotic rock fragments (xenoliths), minerals (xenocrysts) including diamonds. Xenoliths representing different regions of the lower crust and the mantle provide direct information on the frozen physico-chemical conditions of the crustal and mantle segments at the time of incorporation in the kimberlite magma. Therefore, a study of the petrological and isotopic signatures of the crustal- and mantle-derived xenoliths integrated with geophysical observations such as gravity, magnetic, radiometric and magnetotellurics would help in understanding the structure, composition, and tectonic evolution of the mantle and the overlying crust. The studies on the xenoliths also can yield extremely valuable information on the ambient physico-chemical conditions and processes of the lower-crust and mantle (frozen at the time of emplacement). The xenocrysts including diamonds provide direct evidence of the fluid mobility and physico chemical conditions for their genesis and preservation.

In the Indian scenario, the studies on mantle xenoliths from the kimberlites are confined to less than five pipes and all are largely aimed at the pressure-temperature estimates (geothermobarometry) using phase equilibria in order to construct palaeogeotherms for the craton. Yet another major deficiency of the previous studies is the paucity of bulk compositions (major, trace, REE and PGE) and isotopic information (Sm-Nd/Rb-Sr/Re-Os) on the samples where geothermobarometry results have been documented. As the bulk geochemistry and isotopic compositions could provide direct information on the melt extraction processes in the mantle, crustal growth and evolution, existing data sets therefore, find a limited utility, and there is an urgent need for an integrated study program on the xenoliths as well as diamonds from the Indian kimberlites.

Hence, it is proposed to study the petrology, geochemistry, phase-equilibria (P-T-f<sub>O2</sub>), isotopic study of a large number of xenoliths and xenocrystic material, apart from solid mineral inclusions preserved with in the diamonds - representing different kimberlite fields in in the prosposed area. The study is expected to yield the first direct constraints on the chronology of the major thermal events affecting the sub-

continental lithosphere of the craton. These data when correlated with the known geologic record would offer much useful constraints on the relationships between crust and mantle in space and time. The data when integrated with the available sub-crustal geophysical information on the region is expected to further constrain the finer structure of the lithosphere as well as the diamond potential of the individual kimberlite clusters.

### **The Ramagiri-Penakacherla Schist Belt:**

The Ramagiri Gold Field is about 16 km long and divided into four blocks viz. Chennabhavi, Kottapalle, OmPratima-Gantlappa and Jibutil. Auriferous zones associated with sheared grey to smoky quartz carbonate veins were emplaced in the quartz-chlorite schist/quartz-sericite schist. The exploration carried out by the GSI and IBM has indicated a reserve of 0.7 Mt with an average grade of 7 g/t in the Om Pratima-Gantalappa block

The BGML is producing gold from Yeppamana mine in this block since 1984. In Kottapalle Block, north of this mine, a probable reserve of 0.11 Mt with an average grade of 2.65 g/t over an average width of 1.41 m was estimated up to 165 m depth. Surface manifestations of mineralization in the form of wall rock alterations and sulphide minerals were recorded at several places. Pounding marks are noticed NNE of Konapuram indicating ancient gold mining activity in the area. An auriferous quartz vein extending over a strike length of 150 m with gold content of 2.48 g/t and profuse base metal mineralization with concentration of Cu up to 17.20% and Zn up to 0.10% is recorded 1 km northeast of Cherlapalle.

Empirical mineral targeting models, which are based on the observation of characters and patterns of known deposits eg., specific host rock or specific lithosequence, are commonly used in mineral exploration. Such models, without understanding the processes that were involved in the formation of a mineral deposit, are found to be of limited use, particularly while targeting concealed or deep-seated precious mineral deposits. Targeting for such concealed deposits require a comprehensive understanding of the geological and chemical processes that produce ore grade accumulation of gold.

Archaean and Proterozoic terrains of Australia and Canada have been extensively explored and mined for gold. Detailed studies on the large gold deposits from the Archaean cratons have brought out several common features:

- i. *Distinct temporal evolution in mafic volcanic geochemistry*: basalts in the upper sequence are enriched in LILE (K, Ba, Cs) and HFSE (Zr, Th, La, Ce, Nb) indicating significant crustal contamination. Source region of these basalts is enriched in metals, sulphur and volatiles and sulphur saturated prior to eruption.
- ii. *Proximal to enriched diorite and high – Mg granitoids (eg., sanukitoids)*: These diorites and Mg-rich granitoids were generated through melting of enriched mantle wedge or underplated enriched basalt sources. They are Au- and S-rich and contain high Th, La, Ce, Ba and Sr. There are >20 dioritic intrusions around Eastern Gold Fields, Australia which contain

0.2 to 0.5 ppm gold. These intrusions are low-grade porphyry systems and generate alteration cells similar to modern day Cu-porphyry systems. These intrusions are major Au contributors to the large gold deposits. They were emplaced during the onset of compressional tectonic regime and they are internal to the greenstone belt. These intrusions often have hydrothermal magnetite haloes.

iii. *Large alteration haloes:* Large foot print (10 x 10 km) of pathfinder elements usually associated with low temperature hydrothermal systems are found. They are contributed both by magmatic and metamorphic fluids. The magmatic fluids are oxidised to neutral, associated with Py- Hm – Mg – Albite – Phengite – Actinolite – Epidote – Mg-rich chlorite and contain W – Bi – Mo. The metamorphic fluids are reduced - acidic, associated with Py – Po – Muscovite – Fe Chlorite – Chloritoid and contain As – Sb – S. The magmatic fluids originate from the granitoid sources and metamorphic fluids are from the volcano- sedimentary pile. Metal zoning from Mo – Bi – As- Sb is commonly noticed. Large gold deposits are found within these hydrothermal cells.

iv. *Proximity to epiclastic basin / unconformity contacts:* In well mineralised Archaean terranes, there is a remarkable spatial coincidence between giant gold deposits and syntectonic polymict conglomerate basins. 90% of the Archaean gold ounces are within 1 km from conglomerate contacts. These conglomerate contacts are potential indicators for syn- volcanic / syn-tectonic faults, which can channel and mix the magmatic and metamorphic fluids, leading to the formation of a giant gold deposit. These unconformity contacts are often marked by thrust faults, resulted due to basin inversion. The thrust fault may be a regional As-Sb corridor.

Based on the above observations an ore genetic model has been developed which has been used for generating targets in both greenfield and brownfield project areas. A schematic model is shown in figures 1 and 2 below.

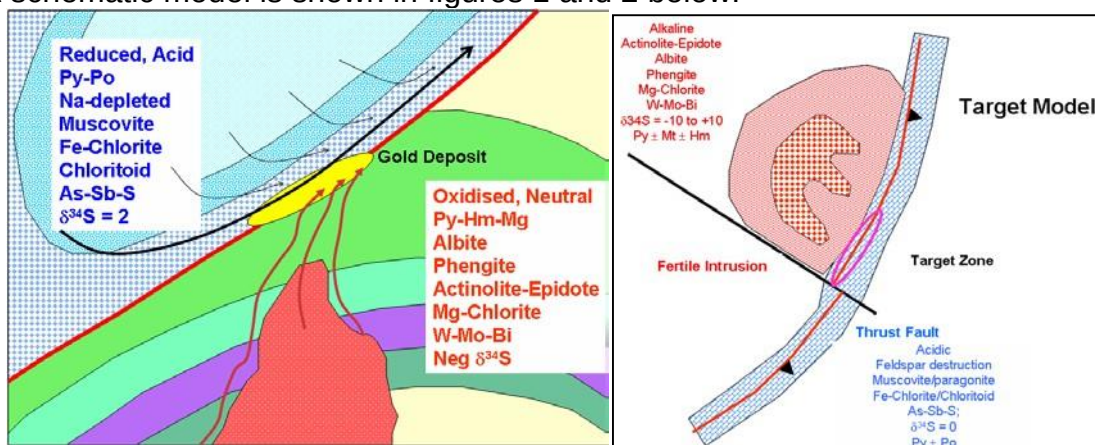


Fig. 1. Schematic model for Archaean Gold Deposit 2. A. target model for an Archaean Gold deposit

From the Fig. 1 it is evident that large Archaean gold deposits are formed when fluids with contrasting chemical characters, eg., magmatic and metamorphic fluids, channelled through a large thrust fault. These fluids have distinct chemical and mineralogical characters which leave their imprints as large alteration haloes. On a broad scale, the footwall regions of the gold system will display the early high

temperature assemblages and the overprinting ore stage mineral assemblages. The early assemblages will include actinolite-albite-epidote-calcite-magnetite-pyrite. Closer to the gold stage assemblages will include albite-(or K feldspar)-biotite +/- phengite -Mg chlorite-pyrite-magnetite-hematite. With this assemblage, there will be a combination of elevated W-Mo-Bi, high Na-Cs and depleted As-Sb. On the other hand, the hanging wall regions of the gold system display mineral assemblages indicative of more reduced and acidic conditions. They include Fe-chlorite-muscovite-paragonite-chloritoid-pyrite- pyrrhotite +/- magnetite. With this assemblage, there will be a combination of elevated As-Sb-S, high K- Li and depleted Na.

Based on the above model the target is going to be an ore body in the plane of the thrust, or a linking structure that channels fluid flow from the intrusion into the thrust, or a fracture array in a brittle host rock adjacent to the thrust. In plan view, the objective is to look for a dilational jog on the thrust fault that focuses fluid flow from the system. The dilational zone may be an anomalous local stress field where the thrust bends around the intrusion or a restraining bend on the thrust where it is offset by an oblique cross fault. Gold is most likely to precipitate in the chemical gradient, where the chemistry of the system is changing from oxidised and neutral to acid and reduced. The objective should be to map the chemical gradient, and drill the structure that sits within the gradient.

Dharwar Craton of Southern India contain number of NW-SE trending Archaean Greenstone Belts which are surrounded by gneisses and intrusive granitoids. The Dharwar Craton is subdivided into Western Dharwar Craton (WDC) and Eastern Dharwar Craton (EDC), which are sutured along a curvilinear crustal scale shear zone along the eastern margin of Chitradurga schist belt. The WDC with wide, sediment – dominated belts and basement gneisses is considered to have been evolved in a back-arc type environment. On the other hand, the EDC with linear volcanic-dominated belts and juvenile granitoid intrusions is more akin to intra-arc tectonic setting. All the greenstone belts are bounded and traversed by number of shear zones. Studies carried out during last few decades have brought out number of gold occurrences in all these belts. However, only Kolar and Hutti greenstone belts of EDC have hosted world class gold deposits.

The work includes (i) Synthesising all the existing data on Ramagiri Greenstone Belt, including geological, structural, geochemical and geophysical data (ii) Litho-geochemical sampling along 25 traverses across the belt. Will be used for multi-element analysis by ICP (iii) Geochemical and isotopic study of granitic and volcanic rocks to understand temporal variation (iv) Structural mapping of key segments, particularly along the northern and southern cross faults to understand the nature of controlling structure (v) mineralisation age dating and ore-fluid characterisation of the greenstone belt etc.

The present study aims at testing the above model and evolving a genetic model for gold mineralization in Archaean Ramagiri-Penakacherla Greenstone Belt of Dharwar Craton, which hosted a potential gold deposit mined by BGML in the past. Once established, the same model will also be tested in other Schist belts to generate new targets.

## **Observation and Recommendations of previous work:**

Systematic ground magnetic (total field) investigation in the Timmasamudram-Mauktikapuram block has led to the discovery of a Kimberlite Pipe (TK6) in the Timmasamudram Cluster, Anantapur district, Andhra Pradesh (Srinivas, S., 2008, GSI). The Timmasamudram cluster hosts five kimberlite pipes viz., TK1, TK2, TK3, TK4 and TK5. Kimberlite pipe TK1 is signified by prominent bipolar anomaly while TK5 is associated with a low magnetic anomaly. The response over pipe TK2 is in the form of a magnetic gradient while TK3 is associated with strong east-west linear trend. A feeble magnetic anomaly corresponds with the TK4 pipe. The magnetic image map of the block reflects a number of magnetic linear zones that correspond to concealed / exposed dolerite dykes trending in NW-SE, ENE-WSW and NE-SW directions emplaced along fractures / shear zones. The intersections of these magnetic linear trends have been examined by closely spaced magnetic survey, as these zones are promising loci for kimberlite emplacement. The pipe TK6 is identified in one of the intersection of ENE-WSW and NW-SE magnetic linear trends. The pipe TK6 is capped by one metre thick soil cover and pitting over the area indicates boulders of kimberlite in a sole-shaped form over 14 m x 6 m dimension and needs to be further tested for the occurrence of diamond. The Kalyandurg and Chigicherla clusters also studied geophysically by detailed investigation. As these three clusters are aligned in east-west direction over a length of 120 km and emplaced along weak planes and the adjoining Ramagiri-Penakacherla schist belt with good assay values of gold is of geologically and geophysically significant. The integrated geophysical techniques will decipher the deepseated structures and their relationship with Kimberlite and the schist belt.

## **2. Previous Work**

Previous Exploration in adjoining area (Regional area); All the sample (bed rock/trench/ groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly: Project proposed at G4 stage

Previous Exploration in the proposed block area: All the sample (bed rock/trench/ groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly: Project proposed at G4 stage.

Ground geophysical investigations employing regional Gravity and Magnetics and detailed magnetic, Induced Polarisation, Resistivity and Self Potential surveys for identification of kimberlite pipes and gold exploration in Ramagiri-Penakacherla Greenstone Belt were carried out. The Ramagiri-Penakacherla Schist Belt is mapped by gravity and magnetic (total field) surveys on regional scale under GPM program by Geophysics Division, SR. Multi-sensor airborne geophysical data of low altitude (150 m above ground level with flight line spacing of 500 to 1000 m) was also flown by RSAS over the area.

### 3. Block description

| Block Corner points Cardinal | Latitude    | Longitude  |
|------------------------------|-------------|------------|
| ABCDEFGH                     | 14.65 North | 76.80 East |
|                              | 14.65       | 77.90      |
|                              | 14.40       | 77.90      |
|                              | 14.40       | 77.70      |
|                              | 14.25       | 77.70      |
|                              | 14.25       | 77.40      |
|                              | 14.40       | 77.40      |
|                              | 14.40       | 76.80      |

### 4. Planned Methodology Geophysical Studies:

It is proposed to deploy integrated geophysical methods such as, audio magnetotellurics, Controlled Source magnetotellurics, long period magnetotellurics, Gravity, Magnetics, over the identified KTC block cutting across Kalyandurg, Timmasamudram and Chigicherla Kimberlite clusters. The available NGPM data and detailed geophysical data over Timmasamudram cluster will be interpreted. Based on magnetotellurics data interpreted results few areas will be covered by detailed gravity and magnetic surveys and ground follow-ups will be carried out. Two blocks identified on the basis of interpretation of NGPM data viz (i) Palacherla-Chigicherla and (ii) Perur-Ramagiri block will be covered by semi detailed magnetic and radiometric surveys.

### Geological Studies:

It is proposed to collect fresh litho-samples from key areas of the block targeting kimberlites and their xenolith and xenocryst population as well as diamonds in the custody of the GSI. This would be supplemented by the existing bore hole samples followed by detailed petrological, mineral, geochemical and isotopic studies. The study also involves field mapping, collecting structural data and fresh sample collection for litho-geochemical and ore petrological studies to understand fluid mobility and mineralization and its timing.

Both geophysical and geological studies will be modelled to understand (a) formation and stability of diamonds and (b) genetic models for the gold mineralization in the TKC block.

### 5. Nature Quantum and Target

G4 stage GR should be submitted for G3 stage proposal and G3 stage GR for G2 proposal Succinct details of the previous stage exploration

## Nature and Quantum of work proposed

| <b>Components</b>                      | <b>G4 Stage</b>                                                                                                                                                                                                                                                               |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aerial reconnaissance                  | Remote sensing, airborne geophysical survey etc.                                                                                                                                                                                                                              |
| Geological Survey                      | i) 1.25K/ 12.5K<br>ii) Assessment of lithology, structure, surface mineralisation and analysis of old history of mining, if any.                                                                                                                                              |
| Geochemical Survey                     | i) Regional Grab / chip / Stream Sediment / Soil Sampling<br>ii) Recording of broad geomorphology, drainage, etc.                                                                                                                                                             |
| Geophysical Survey                     | Aero-geophysical / Regional ground geophysical survey (Refer another table below)                                                                                                                                                                                             |
| Pitting/ Trenching                     | Five to ten to expose mineralised zone. The location of Pitting and trenching should be judiciously planned to cover the entire mineralised body, to delineate the strike extension and also for planning scout boreholes. Sample length to be specified                      |
| Scout drilling / Systematic drilling   | Few boreholes if required along the positive profiles delineated by surface sampling/pitting trenching                                                                                                                                                                        |
| Grab and Chip sampling                 | A few samples from bed rock (few representative samples from all the exposed rocks in the area for first-hand information and more Samples from rocks, which host the mineralisation). Few representatives samples to be subjected to Davis tube recovery test in case of BMQ |
| Core samples                           | Samples from mineralized zones as well as hanging wall/footwall side to be collected. Sample length to be specified                                                                                                                                                           |
| Petrographic and mineragraphic studies | Principal rock types, mineral assemblage, identification of minerals of interest                                                                                                                                                                                              |
| Synthesis of all available data        | We shall integrate with all the available geophysical data from GSI with the new data generated from the present project. Synthesis of all available data and Report writing                                                                                                  |

### Borehole spacing (As per MEMC, 2015)

| <b>Type of deposit</b> | <b>Bedded Stratiform and Tabular deposit of regular habit minerals to be identified</b>   | <b>Bedded stratiform and tabular deposits of irregular habit (Minerals to be identified)</b>             | <b>Lenticular bodies occurring enechelon Lenses, pockets. (Different minerals)</b>                       |
|------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| G4 Stage               | Scout drilling, if necessary (In line with grid specified by the Central Government / IBM | Scout drilling, if necessary (In line with grid specified by the Central Government / IBM time to time). | Scout drilling, if necessary (In line with grid specified by the Central Government / IBM time to time). |

|                                                                                                                                                                                             |                                                                                                                                                                                                                          |                                                                                                                                                                                                                         |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
|                                                                                                                                                                                             | time to time).                                                                                                                                                                                                           |                                                                                                                                                                                                                         |       |
| Remarks                                                                                                                                                                                     | For shallow surficial deposits continuing to a depth of up to 6 m from surface pitting in grid spacing for various levels of prospecting may suffice. For deposits continuing further in depth, drilling is recommended. | For shallow surficial deposits continuing to a depth of up to 6m from surface pitting in grid spacing for various levels of prospecting may suffice. For deposits continuing further in depth, drilling is recommended. | ----- |
| (Vertical depth of intersection of mineralized zone should be specified (first level), number of boreholes, approximate borehole spacing, approximate length of boreholes may be specified) |                                                                                                                                                                                                                          |                                                                                                                                                                                                                         |       |

### Geophysical Studies

The NGRI team is having significant contribution in MT surveys, data acquisition, processing and interpretation / modelling 1-D and 2-D. The GSI team is well acquainted with geophysical techniques for mineral exploration and kimberlite exploration. The proposed KTC block is aimed to understand the crustal level / moho and the deep seated structures and its role in Kimberlite / Gold exploration. Both the NGRI and GSI team will participate in the field programs of each other depending on interest.

#### Work component by CSIR-NGRI:

- Magnetotelluric (BBMT, CSAMT and LMT) studies over the KTC block from Kalyandurg to Chingicherla passing through Timmasamudram.
- BBMT studies along a profile across Ramagiri schist belt.
- A grid with closely spaced AMT/CSAMT sites in and around Timmasamudram.
- An integration of various geophysical data sets like MT, CSAMT, Gravity and Magnetic will be done. An integrated model for the subsurface structure of shallow and deeper will be inferred. Few areas favorable for mineralization will be identified.

#### Work component of GSI:

- ☐ Analysis of legacy geophysical data (GSI-NGPM) reports pertaining to Kalyandurg-Timmasamudram-Chingicherla areas and Ramagiri-Penakacherla Greenstone belt.
- ☐ Semi detailed (400 m station interval) Magnetic and Radiometric data acquisition in the following two identified blocks based on NGPM data interpretation.

- (1) around Perur-Ramagiri block (20 km X 20 km) and
  - (2) around Palacherla- Chigicherla cluster (15 km X 15 km) on 1:12500 scale
- ☐ Semi detailed gravity surveys over Timmasamudram Kimberlite Cluster (TK1 to TK6 pipes) and integration with the existing magnetic (total field) and electromagnetic data.
  - ☐ Processing of Semi detailed magnetic and Radiometric data and preparation of different derived maps in GEOSOFT-Oasis Montaj Platform.
  - ☐ Collection of about 100 rock samples for Physical Properties (density and magnetic susceptibility) measurement in the laboratory.
  - ☐ Integration of gravity and magnetic models with MT/CSAMT and to derive subsurface shallow and deeper sections. Crustal and lithospheric structure and implications of the KTC Kimberlite cluster and Ramagiri-Penakacherla greenstone belt.

### **Geological Studies**

The CSIR-NGRI and GSI have state of the art Cameca SX100 EPMA, LA-ICPMS and LA-MC-ICPMS systems for bulk and in-situ elemental and isotopic determinations. GSI team is well acquainted with field geological and structural mapping capabilities as well satellite-based observational systems. The CSIR-NGRI has proven abilities and track record in geochemical and isotopic modelling techniques such as 4-D lithospheric mapping, chemical tomogram construction and Terrance ChronTM techniques.

- ☐ Structural and field mapping including ground based and satellite based studies (GSI)
- ☐ Litho-sampling (GSI and CSIR-NGRI)
- ☐ Sample preparation for petrographic and petrological studies (GSI)
- ☐ SE-BSE-CL imaging of xenoliths, xenocrysts and diamonds (CSIR-NGRI)
- ☐ Sample preparation for LA-ICPMS and isotopic studies including mineral separation (CSIR-NGRI)
- ☐ Mineral chemistry using EPMA (GSI and CSIR-NGRI)
- ☐ Mineral chemistry using LA-ICPMS (CSIR-NGRI)
- ☐ Isotopic studies (CSIR-NGRI)
- ☐ Diamond characterization and inclusion studies (GSI and CSIR-NGRI)
- ☐ Bulk Geochemistry – XRF (GSI) and ICPMS (CSIR-NGRI)



[illegible]

## **6. Manpower deployment**

CSIR-NGRI- 2 Scientists, GSI- 2 Geoscientists

Other Geoscientists, Technical Officers and Research Students would be co-opted as found necessary

## **7 COLLABORATIVE WORK OF GSI WITH CSIR-NGRI TO BE FUNDED BY NMET, NEW DELHI:**

PERIOD: THREE YEARS

The following geophysical and geological work will be carried out over a period of three years (FS:2022-25) by CSIR-NGRI in collaboration with GSI, SR, Hyderabad. The budget for the following work will be funded by NMET, New Delhi on the basis of SOC, NMET to Geological Survey of India, Southern region, Hyderabad and will be paid to CSIR-NGRI, Hyderabad by Geological Survey of India, Southern Region, Hyderabad. An MOU between GSI, Hyderabad and CSIR-NGRI, Hyderabad executed on 11<sup>th</sup> April, 2022 at CSIR-NGRI, Hyderabad for the collaborative project for the following work.

### **Geophysical Studies**

The NGRI team is having significant contribution in MT surveys, data acquisition, processing and interpretation / modelling 1-D and 2-D. The GSI team is well acquainted with geophysical techniques for mineral exploration and kimberlite exploration. The proposed KTC block is aimed to understand the crustal level / moho and the deep seated structures and its role in Kimberlite / Gold exploration. Both the NGRI and GSI team will participate in the field programs of each other depending on interest.

Work component by CSIR-NGRI:

- Magnetotelluric (BBMT, CSAMT and LMT) studies over the KTC block from Kalyandurg to Chigicherala passing through Timmasamudram.
- BBMT studies along a profile across Ramagiri schist belt.
- A grid with closely spaced AMT/CSAMT sites in and around Timmasamudram.
- An integration of various geophysical data sets like MT, CSAMT, Gravity and Magnetic will be done. An integrated model for the subsurface structure of shallow and deeper will be inferred. Few areas favourable for mineralization will be identified.

### **Geological Studies**

The CSIR-NGRI have state of the art Cameca SX100 EPMA, LA-ICPMS and LA-MC-ICPMS systems for bulk and in-situ elemental and isotopic determinations. The CSIRNGRI has proven abilities and track record in geochemical and isotopic modelling techniques such as 4-D lithospheric mapping, chemical tomogram construction and Terrance ChronTM techniques.

- Litho-sampling (GSI and CSIR-NGRI)
- SE-BSE-CL imaging of xenoliths, xenocrysts and diamonds (CSIR-NGRI)
- Sample preparation for LA-ICPMS and isotopic studies including mineral separation

(CSIR-NGRI)

- Mineral chemistry using EPMA (GSI and CSIR-NGRI)
- Mineral chemistry using LA-ICPMS (CSIR-NGRI)
- Isotopic studies (CSIR-NGRI)
- Diamond characterization and inclusion studies (GSI and CSIR-NGRI)
- Bulk Geochemistry – XRF (GSI) and ICPMS (CSIR-NGRI)

## ANNEXURE-I

**PROJECT:** Deep-seated mineral prognosis by geophysical techniques: Lithospheric structure and relationship with Gold and Kimberlite clusters of Kalyandurg-Timmasamudram-Chigicherla, Anantapur district, Andhra Pradesh.

**Objective:** To derive subsurface structure beneath the Kalyandurg- Timmasamudram-Chigicherla (KTC) Kimberlite cluster and Ramagiri-Penakacherla Schist Belt by deploying different geophysical and geological studies for understanding the occurrence of Kimberlite pipes and gold mineralization.

The work component of CSIR-NGRI will be funded by NMET, New Delhi as approved by EC, NMET, dated 25-2-2020 (Ref.3 & 4) as stated "EC agreed about the funding for the project in collaboration with GSI and NGRI working based on specific themes for mineral exploration after signing MOU and it was further decided that the cost of the work components which are not in SoC NMET will be reimbursed on actual basis and cost of such work components have to be certified from the Head of the Institution with whom MoU signed". An MOU between GSI, Hyderabad and CSIR-NGRI, Hyderabad executed on 11<sup>th</sup> April, 2022 at CSIR-NGRI, Hyderabad for the following collaborative project work.

In this regard, it is requested to kindly obtain financial sanction and budget allocation of Rs.2,59,97,760/- (Rs.2,20,32,000+Rs.39,65,760, GST18%) (Rupees Two Crores Fiftynine Lakhs Ninetyseven Thousand and seven hundred sixty only) from NMET, New Delhi for the three-year project.

### **BUDGET: Geophysics - CSIR – NGRI**

| Sl.No. | Item of Work                     | No. of Sites                                                            | Rate per sounding (Lakhs) | Total Amount (Lakhs) |
|--------|----------------------------------|-------------------------------------------------------------------------|---------------------------|----------------------|
| 1      | Magnetotelluric (BBMT) Profile-1 | 30<br>(3-5 days of recording from 1000 Hz - 1000 s, 2.5 - 3 km spacing) | 2                         | 60                   |
| 2      | Long period MT Profile-1 & 2     | 10<br>(20-25 days of recording from 30s - 10000s, 9-10 km spacing)      | 3                         | 30                   |
| 3      | CSAMT Profile-1                  | 40<br>(1day recording from 10000 Hz-100 Hz, 0.51 km grid)               | 1.75                      | 70                   |
| 4      | Magnetotelluric (BBMT) Profile-2 | 8<br>(3-5 days of recording from 1000 Hz - 1000 s, 2.5 - 3 km spacing)  | 2                         | 16                   |

**Total Amount: Rs. 176 Lakhs**

### **Geology – CSIR-NGRI**

| S.No. | Nature of Work | Total work Load FS:2022- | NMET Rate | Cost (in Rupees) |
|-------|----------------|--------------------------|-----------|------------------|
|-------|----------------|--------------------------|-----------|------------------|

|   |                                                                   |            |                                                                     |                  |
|---|-------------------------------------------------------------------|------------|---------------------------------------------------------------------|------------------|
|   |                                                                   | 25         |                                                                     |                  |
| 1 | Field geological Studies and Sample Collection                    | 30 days    | 30 days Rs.11000/-per day                                           | 3,30,000         |
| 2 | a. Petrography studies (Nos)                                      | 60 days    | Rs. 1553: Petrographic studies +<br>Rs. 589 for sample preparation. | 1,28,520         |
|   | b. PCS<br>i) XRF (major oxides) (Nos.)<br>ii) ICPMS (Trace & REE) | 50 days    | Rs.4200/- for 50 samples<br>Rs.5380/- for 50 samples                | 4,79,000         |
|   | c. EPMA studies                                                   | 150 hrs    | Rs.8540/- per hour                                                  | 12,81,000        |
| 3 | i) LAM-ICP-MS                                                     | 15 days    | Rs.96,200/- per day NGRI rate                                       | 14,43,000        |
|   | ii) LAM-MC-ICPMS                                                  | 5 days     | Rs.86,200/- per day NGRI rate                                       | 4,31,000         |
| 4 | Raman Spectroscopy                                                | 10 days    | Rs.2100 per hour-6 hours per day machine running time: SOC GSI-2015 | 1,26,000         |
| 5 | Isotope analysis                                                  | 25 samples | Rs.8540/- per sample NMET rate                                      | 2,13,500         |
|   | <b>Total</b>                                                      |            |                                                                     | <b>44,32,020</b> |

Total budget: Geophysics Work + Geology Work= 1,76,00,000+ 44,32,000= Rs. 2,20,32,000+Rs.39,65,760 (18% GST)

**Total project cost= Rs.2,59,97,760/- (Rupees Two Cores Fifty nine Lakhs Ninety seven Thousand seven hundred sixty only)**

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### **List of Plates**

**Plate 1: Geological map on with location index.**

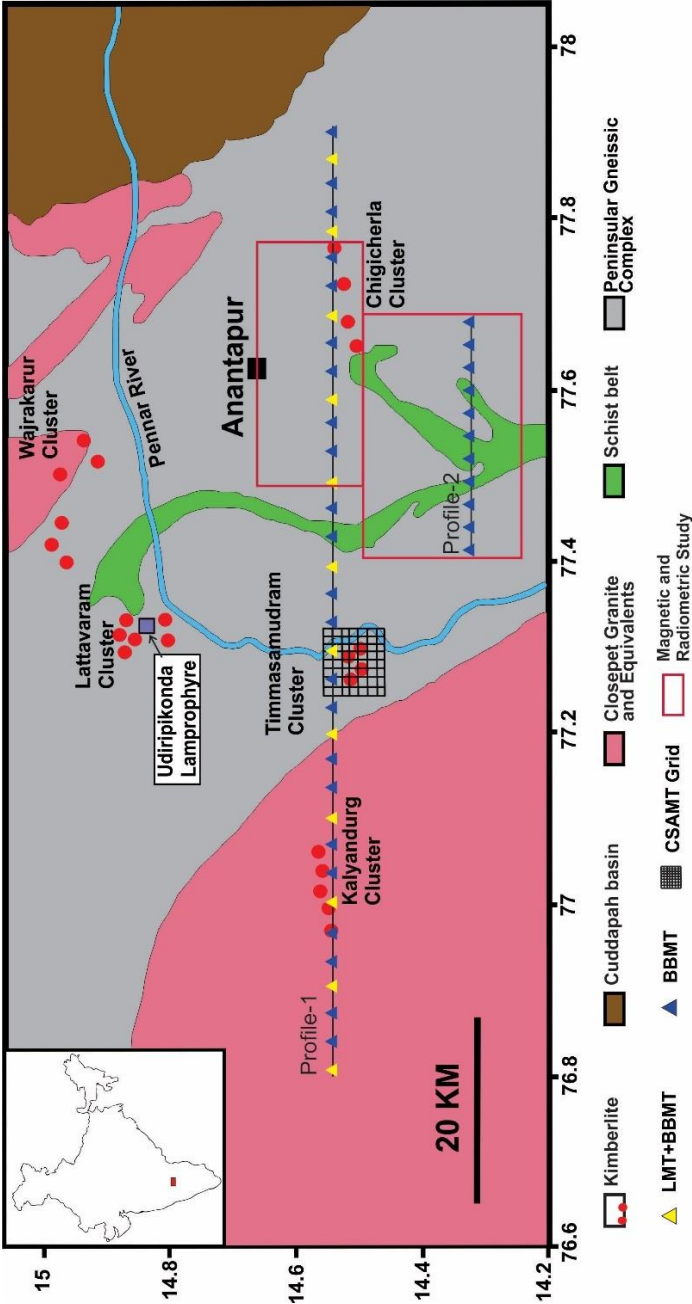
**Plate 2: Ground Bouguer Gravity image of the block.**

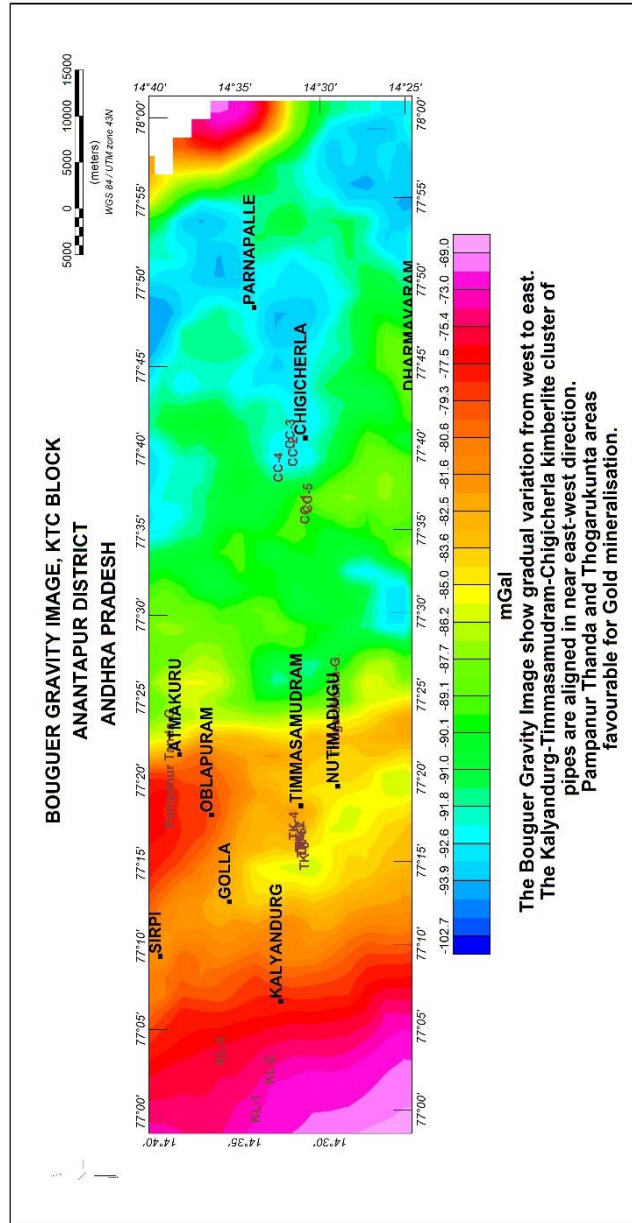
**Plate 3: Ground Magnetic (TF) image of the block.**

**Plate 4: Magnetic (TF) images of Timmasamudram Kimberlite cluster,  
Anantapur (Dist.), A P**

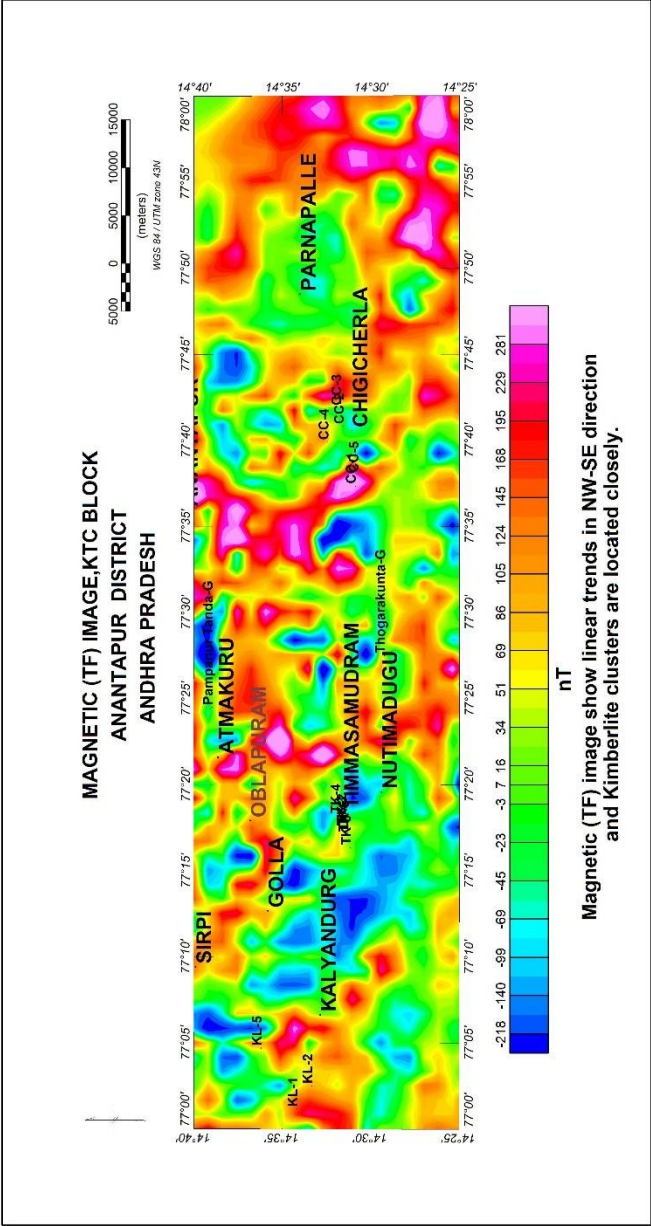
**Plate 5: Proposed block boundary over Geological map.**

PLATE 1



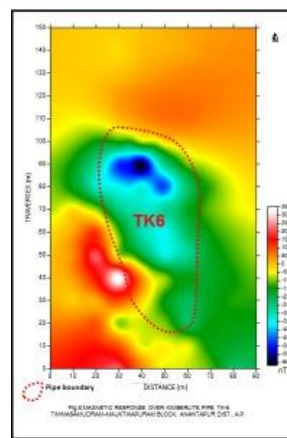
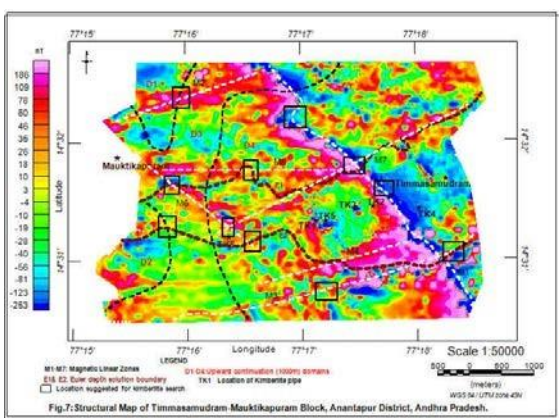
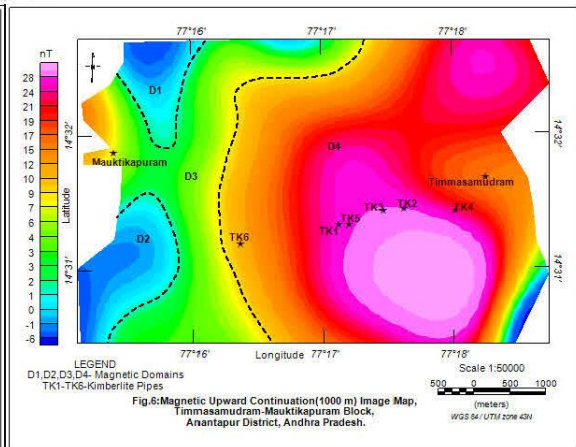
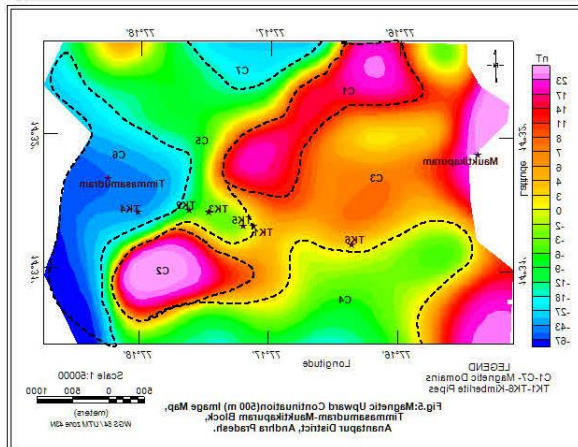
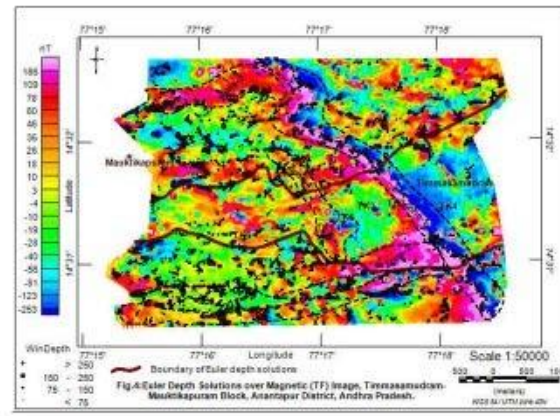
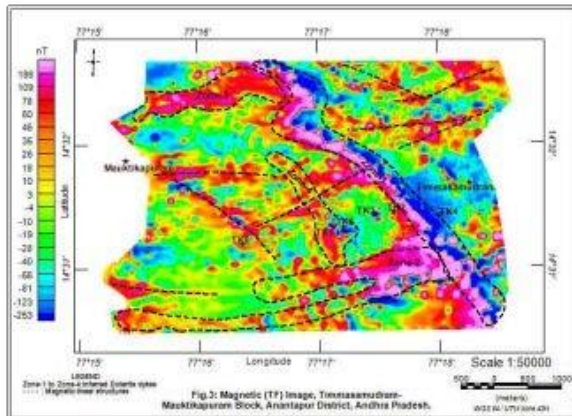
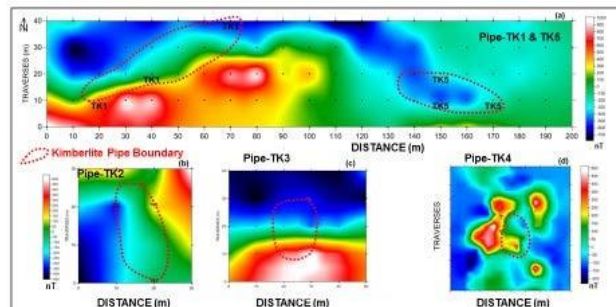
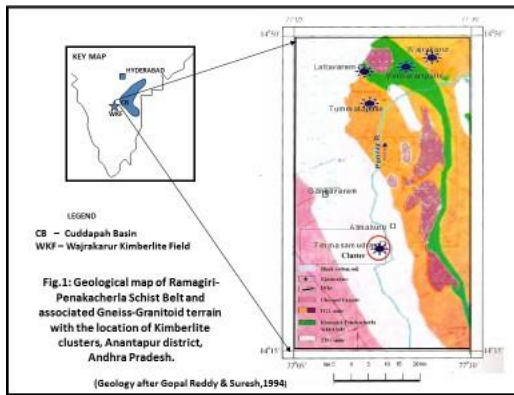


**PLATE -2**



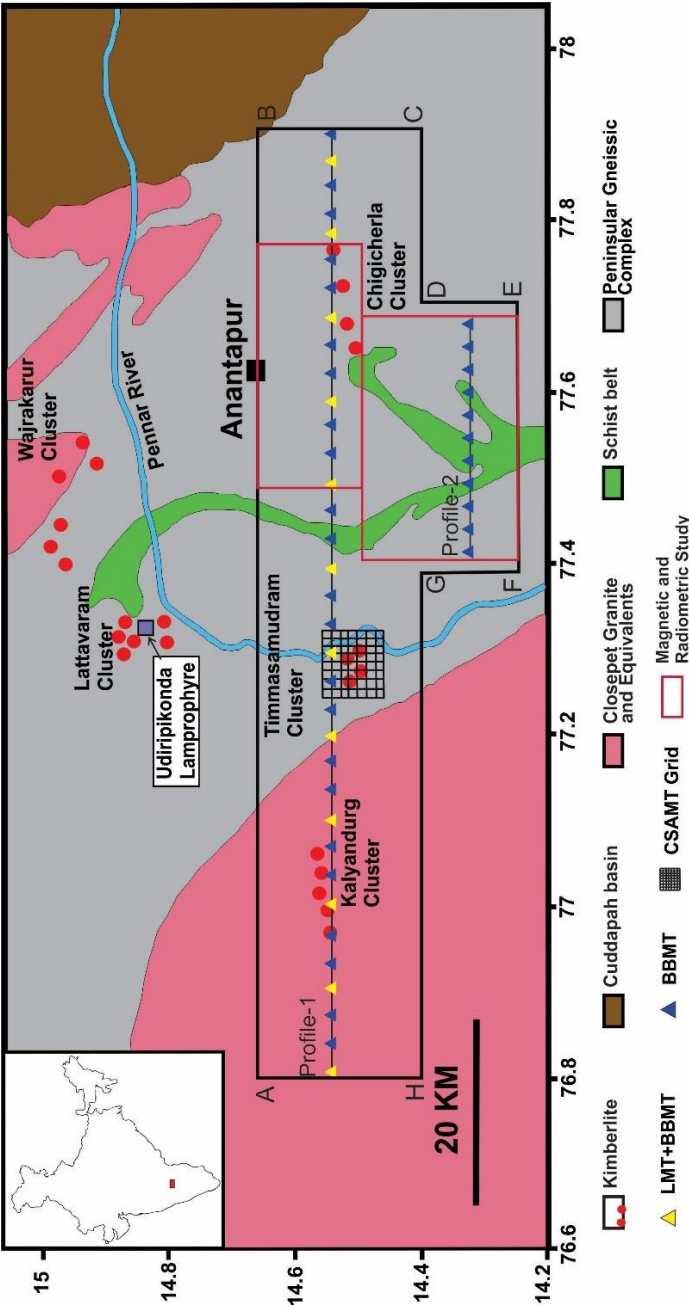
**PLATE 3**

## PLATE 4



Magnetic (TF) images of Timmasamudram Kimberlite cluster, Anantapur (Dist.), A P

Plate 5



**Ministry of Mines**  
**National Mineral Exploration Trust**

**Minutes of the 23<sup>rd</sup> Technical-cum-Cost Committee (TCC) NMET meeting held on 12<sup>th</sup> and 13<sup>th</sup> February, 2020 at ICAR Conference Hall, Office Block, National Agriculture Science Centre (NASC) Complex, New Delhi**

The 23<sup>rd</sup> meeting of Technical-Cum-Cost Committee (TCC) of National Mineral Exploration Trust (NMET) was held under the chairmanship of Shri D. Mohan Raj, Addl. Director General & Head, National Mission-II, GSI, Nagpur on 12<sup>th</sup> and 13<sup>th</sup> February, 2020 at ICAR Conference Hall, Office Block, National Agriculture Science Centre (NASC) Complex, New Delhi. The list of participants is in **annexure-1**.

Shri Manoj Kumar, Director & Member Secretary, TCC-NMET, welcomed Shri D. Mohan Raj, Additional Director General, National Mission-II, GSI & Chairman, TCC and all the Members of the TCC and participants representing various Notified Exploration Agencies (NEAs). He informed that due to official engagement, Shri Vinay Pal, Assistant Cost Accounts Officer could not attend the meeting and Shri Shashi Kant, Assistant Cost Accounts Officer, NMET would be attending the meeting in his place. The Chairman TCC granted leave of absence to Shri Vinay Pal.

Dr. L. P. Singh, Director & HoD, NMET welcomed all the participants and he emphasised in his opening remarks the need to prioritize the exploration activities of the critical and strategic minerals. He requested NEAs to submit more projects for mineral commodities in which the country is totally dependent on import. He also stressed that the NEAs should make their budgetary projections for NMET funded projects in a more realistic way as NMET's budgetary projection depends on that of NEAs.

Shri D. Mohan Raj, Addl. Director General & Head, National Mission-II, GSI and Chairman of TCC welcomed all the participants and expressed the need to give more emphasis on exploration of concealed and deep-seated minerals. He added that India has sufficient resources cum reserve base of bulk minerals (iron ore, bauxite and limestone) and hence more emphasis is needed for taking up exploration of other deficient minerals to make the country self-sufficient for those commodities also.

The chairman asked all the Notified Exploration Agencies to submit the project proposals only when the exploration block area is free of forest, no Local Law and Order problem, having all statutory clearance so that the project may be technically evaluated for recommendation for approval of EC.

**The Chairman TCC, NMET informed that for all the G2 level projects, a certificate should be submitted by State Directorate of Mining and Geology, stating that the block will be put to e-auction after successful completion of exploration work.**

**The agenda-wise discussion followed.**

**23.1: Discussion on the Action Taken Report (ATR) of the minutes of 22<sup>nd</sup> TCC Meeting held on 13<sup>th</sup> and 14<sup>th</sup> November, 2019**

The Member Secretary, TCC, NMET presented the ATR of the 22<sup>nd</sup> TCC meeting held on 13<sup>th</sup> and 14<sup>th</sup> November, 2019 at NALCO (HRD Centre for Excellence), NALCO Nagar, Bhubaneswar, Odisha. ATR of various agenda points are annexed in **annexure-2**.

*Shri Manoj Kumar*  
13/02/2020

*Shri D. Mohan Raj*  
13/02/2020

**23.2.5: Reconnaissance Survey for Deepseated mineral prognosis by Geophysical Techniques: Lithospheric structure and relationship with Kimberlite clusters of Kalyandurg-Timmasamudram-Chigicherla, Anantapur district, Andhra Pradesh. (G4)**

- i. Dr. Prasanta K Patro, CSIR-NGRI and Dr. S. Srinivas, Suptdg. Geologist, GSI, SR proposed project for Deepseated mineral prognosis by geophysical techniques: Lithospheric structure and relationship with Kimberlite clusters of KTC Block, Anantapur, AP with an objective to derive subsurface structure beneath the Kalyandurg-Timmasamudram-Chigicherla (KTC) Kimberlite cluster and Ramagiri-Penakacherla Schist Belt by deploying different geophysical methods integrated with geological studies for understanding the occurrence of Kimberlite pipes and gold mineralization.
- ii. The proposal was earlier discussed in 22<sup>nd</sup> TCC meeting when Committee had suggested that NGRI and GSI should have an MoU for carrying out the proposed project, defining the roles, responsibility and quantum of work to be carried out by each organization along with names of the geologists/geophysicists to be associated with the project.
- iii. The Committee suggested to include the studies related to mineralization of gold and basemetal in the objective.
- iv. The profile line for geophysical survey to be extended up to boundary of Cuddapah Basin in the east.

***The Committee recommended that the project proposal is technically viable for prognostication of Deepseated mineralisation e.g. Kimberlite pipes and gold-basemetal mineralisation. It was also noted that the proposal is for a collaborative research between a NEA (GSI) and a National Institute (NGRI) involving activities for which SoC rates are not available. Therefore, the committee decided that the funding mechanism to be decided by the Executive committee in its next meeting.***

**23.2.6: Preliminary (G3) and General Exploration (G2) of Iron Ore in Karauli amalgamated Iron Ore Blocks, District- Karauli, Rajasthan.**

- i. KIOCL proposed Preliminary (G3) and General Exploration (G2) of Iron Ore in Karauli amalgamated Iron Ore Blocks, District- Karauli, Rajasthan.
- ii. DGM, Rajasthan informed that all the blocks are under forest cover.
- iii. The committee suggested that State DGM, Rajasthan to obtain the forest clearance first and then only the project proposal will be discussed for mineral exploration under NMET fund.

***The Committee asked State DGM, Rajasthan to resolve the issue of forest clearance with Forest department and then only NMET funding can be considered for mineral exploration.***

***The Committee also instructed to all the Exploration Agencies to accelerate the pending issues of forest clearance in approved projects and to complete the exploration work in time.***

**23.2.7: General Exploration of Limestone in Reddipalayam amalgamated Limestone Block-2, District- Ariyalur, Tamil Nadu. (G2)**

- i. KIOCL proposed General Exploration (G2) for Limestone in Reddipalayam amalgamated Limestone Block-2, District- Ariyalur, Tamil Nadu.
- ii. The committee suggested for vertical boreholes with a grid interval of 400m x 400m for 620m drilling up to average depth of 60m or up to 2-3m in bedrock below limestone, covering an area of





**Government of India  
Ministry of Mines  
National Mineral Exploration Trust (NMET)**

**Minutes of the 16<sup>th</sup> meeting of the Executive Committee of National Mineral Exploration Trust (NMET) held on 25<sup>th</sup> February, 2020.**

The 16<sup>th</sup> meeting of the Executive Committee of National Mineral Exploration Trust (NMET) was held under the Chairmanship of Shri Sushil Kumar, Secretary (Mines) on 25<sup>th</sup> February, 2020 in Khanij Kaksh, Ministry of Mines, Shastri Bhawan, New Delhi. The list of participants is given in **annexure-I**.

Economic Advisor (EA), Mines & Member Secretary, EC welcomed the participants and invited the members to discuss the various agenda points. Following are the agenda points discussed and decisions taken.

**AGENDA 16.1**

**Approval of minutes of the 15<sup>th</sup> meeting of EC.**

The minutes had been circulated to all members of EC. No comments were received on the minutes and therefore, it was taken as approved.

**AGENDA 16.2**

**Discussion on ATR of the 15<sup>th</sup> meeting of Executive Committee**

**16.2.1 Approval of Report of Committee on Schedule of Charges (SoC) for NMET funded projects.**

EC in its 15<sup>th</sup> meeting discussed the revised Schedule of Charges (SoC) for NMET funded projects and recommended for approval of GB in its next meeting. While discussing ATR on SoC, the members felt that the SoC report has been discussed thoroughly with stakeholders, experts and other members of EC several times and accordingly the revised SoC was recommended for approval of GB.

The Secretary, Mines and Chairman, EC opined that as the SoC report has been discussed thoroughly at various levels and therefore, EC may approve it and report it to GB in its next meeting.

**Decision of EC**

EC approved the SoC of NMET which will come into effect from 1<sup>st</sup> April, 2020 and will be reported to GB in its next meeting.

**(Action: NMET)**



1. Additional cost of samples in Rengali (G2) Block, District- Bolangir, Odisha- ₹10,56,410/- including GST. (Manganese)
2. Additional cost for Geological Report writing of approved project- General Exploration (G2) for Magnesite in Selu Block District- Udaipur, Rajasthan- ₹2,72,858/- including GST.
3. Additional cost in approved project of Limestone in Cluster-1 (G4) Mellacheruvu, Mallareddy Gudem and Yepal Madhavaram Blocks, District- Suryapet, Telangana- ₹1,24,272/- including GST.

#### **Decision of EC**

- EC suggested that TCC may continue to approve as needed, the additional cost upto 10% of the original approved cost with proper justification and technical requirement for mineral exploration work.

**(Action: NMET)**

#### **AGENDA 16.11**

**Funding mechanism for the Projects which have work components for which there is no Schedule of Charges (SoC).**

1. **National Geoscience Data Repository (NGDR)**
2. **Heliborne Survey for the interpreted airborne legacy data.**
3. **Projects in collaboration with Notified Exploration Agencies like GSI and National Research Institute working on specific themes for mineral exploration.**

EC was informed that in 23<sup>rd</sup> TCC meeting, CSIR-NGRI and GSI proposed a project on Deep-seated mineral prognosis by geophysical techniques. The TCC recommended that the project proposal is technically viable for prognostication of Deep-seated mineralization, e.g. Kimberlite pipes and gold-basemetal mineralisation.

However, it was noted by TCC that the proposal is for a collaborative research between a NEA (GSI) and a National Institute (NGRI) involving activities for which SoC rates are not available. Therefore, TCC recommended that the funding mechanism for all such projects for which SoC is not available should be discussed and decided by the Executive committee.

#### **Decision of EC**

- EC suggested that the model adopted by Directorate of Hydrocarbon (DGH) should be followed for handling the National Data Repository (NDR).
- For NGDR and Heliborne Survey, GSI should take approval from Financial Standing Committee (FSC) and Ministry of Mines for project execution under NMET fund. After completion of tendering process and other statutory clearances, the project proposal will be put up in TCC for recommendation for approval by EC.
- EC agreed about the funding for projects in collaboration with GSI and National Research Institute working based on specific themes for mineral exploration after signing MoU and it was further decided that the cost of the work components which are not in SoC,



NMET will be reimbursed on actual basis and cost of such work components have to be certified from the Head of the Institute with whom MoU will be signed.

**(Action: NMET/GSI/NGRI)**

#### **AGENDA 16.12**

#### **Modernisation of Mineral Processing Laboratories of Indian Bureau of Mines.**

Indian Bureau of Mines, Nagpur proposed for the modernisation of Mineral Processing Laboratories through NMET funding.

#### **Decision of EC**

- EC advised to submit the proposal to the Ministry for making provision in the budget with phasing on annual basis.

**(Action: IBM)**

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