DETAILED PROJECT PROPOSAL ON

PRELIMINARY EXPLORATION (G3) FOR GRAPHITE AND ASSOCIATED MINERALS IN AND AROUND ANKLI BLOCK, DAHOD DISTRICT, GUJARAT

Area: 2.2 Sq. Km.

Submitted To

NATIONAL MINERAL EXPLORATION TRUST (NMET)

MINISTRY OF MINES, GOVERNMENT OF INDIA

खान मंत्रालय
MINISTRY OF
MINES
सत्यमेव जयते

Submitted by:

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SUMMARY OF BLOCK FOR PRELIMINARY EXPLORATION (G3)

1. General Information about the Block

Sl No	Features	Details
I	Block ID	GEO/NMET/GJ/09/2024-2025
II	Exploration Agency	GeoExpOre Private Limited
III	Previous Exploration Agency	G4 Stage by GSI
IV	G4 stage Geological Report (Previous stage Geological Report)	Report on Reconnaissance survey for graphite and associated mineralization in Devgadh Bariya-Nagwav Block, Dahod district, Gujarat (stage: G4) Item no.: M2ASMIF-MEP/NC/WR/SU-GUJ/2022/45262 -***Enclosed as Annexure-1***
V	Commodity	Graphite and Associated Minerals
VI	Mineral Belt	Champaner Group of Rajgadh formation (Aravalli Super Group)
VII	Completion Period with entire time schedule to complete the project	Ankli Block (2.20 sq.kms) 15 months.
VIII	Objectives	1. Carry out geological and structural mapping on a 1:4000 scale for demarcation of graphite associated minerals with the structural features to identify the surface manifestations and lateral disposition of the mineralised zones. 2. To collect surface (Bed rock samples) samples and subsurface (Boreholes) samples to analyse graphite and associated mineralisation and decide on the further course of the exploration program.

		3. Carry out a ground geophysical survey with Electric Resistivity (ER) and Induced Polarization (IP) methods to demarcate concealed graphite and associated mineralisation in a closed interval. 4. To carry out channel sampling for understanding the lateral variation of graphite and associate mineralisation. 5. To drill 14 boreholes with total meterage of 940m to prove the strike and depth persistence of graphite mapped in the area, which in turn will aid in deciding the future course of the exploration program. 6. To estimate graphite resources along with any accessory elements (if any) as per UNFC norms and minerals (evidence of mineral contents) rules – 2015 at the G-3 level
IX	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency	All the mapping, surface and subsurface mineral exploration (drilling) activities by the proposed agency GeoExpOre Pvt. Ltd. The chemical analysis will be done through empanelled agencies by NMET (NABL / QCI NABET accredited) Lab Tests: Shiva Analyticals (India) Private Limited,Hoskote, Bangalore. And or any other competent agency, Govt labs will be used whenever required (HGML, IBM, NGRI, IIMT (CSIR) & GSI)
X	Name/ Number of Geoscientists	Sr. Geologist : 1 (Field) + 1 (HQ) Jr. Geologists : 2 (Field) Geophysicist : 1
XI	Expected Field days (Geology, Geophysics, Surveyor)	Geologists: 60(HQ) + 150 days (Field) Geophysicist: 45 days Surveyor: 45 days

<table>
<tr><td>1</td><td>Location</td><td>Around Ankli Village, Dahod District of Rajasthan</td></tr>
<tr><td rowspan="5"></td><td>Latitude

&

Longitude
(Decimal Degree)</td><td>
<table>
<tr><th>Block Cardinal Points</th><th>Latitude</th><th>Longitude</th></tr>
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<tr><td>B</td><td>22.62714</td><td>73.90311</td></tr>
<tr><td>C</td><td>22.62439</td><td>73.91975</td></tr>
<tr><td>D</td><td>22.62069</td><td>73.92556</td></tr>
<tr><td>E</td><td>22.61503</td><td>73.91247</td></tr>
<tr><td>F</td><td>22.62064</td><td>73.89850</td></tr>
</table>
</td></tr>
<tr><td>Villages</td><td>Ankli Village</td></tr>
<tr><td>Tehsil/ Taluk</td><td>Devgad Bariya</td></tr>
<tr><td>District</td><td>Dahod</td></tr>
<tr><td>State</td><td>Rajasthan</td></tr>
<tr><td rowspan="4">2</td><td>Area (hectares/ square kilometres)</td><td>2.2 sq. km.</td></tr>
<tr><td>Block Area</td><td>2.2 sq. km.</td></tr>
<tr><td>Forest Area</td><td>0 %</td></tr>
<tr><td>Government Land Area</td><td>0%</td></tr>
<tr><td></td><td>Private Land Area</td><td>100% Private (Agriculture)Land</td></tr>
<tr><td rowspan="2">3</td><td>Accessibility</td><td>Ankli villages is situated 10km away from sub-district headquarter Devgadbaria (tehsildar office) and 65km away from district headquarter Dohad.</td></tr>
<tr><td>Nearest Rail Head</td><td>Godhra Railway Station, located 38 km from Ankli Village, is the</td></tr>
</table>

		nearest railway station.
	Road / Airport	Vadodara Airport, located 85 km from Ankli Village, is the nearest airport.
4	Hydrography	The area is devoid of major rivers
	Local Surface Drainage Pattern (Channels)	The drainage pattern of Dahod District, Gujarat, is primarily controlled by the regional topography, geology, and structural features of the area. The district is characterized by dendritic to sub-dendritic drainage patterns, typical of regions with homogenous rock formations and minimal structural control.
	Rivers/ Streams	The Mahi River is the primary river in Dahod, originating from Madhya Pradesh and flowing through central Gujarat before draining into the Arabian Sea. The Panam River, a major tributary of the Mahi, flows through the eastern parts of Dahod. The Anas River also originates in Madhya Pradesh and flows southward into Gujarat, where it joins the Mahi River. The Hadaf River is a significant seasonal river that drains parts of Dahod and Panchmahal districts. Together, these rivers form the district's key drainage network, supporting agriculture and groundwater recharge.
5	Climate	The climate of Dahod district, Gujarat, is classified as tropical monsoon (semi-arid to sub-humid), characterized by three distinct seasons: summer, monsoon, and winter.
	Mean Annual Rainfall	The average annual rainfall of the area is 742 mm (IMD record)
	Temperatures (December) (Minimum) Temperatures (June)	5 °C. 45 °C.

	(Maximum)	
6	Topography	The area forms gentle undulating topography isolated ridges. The highest elevation in the area is 228 m above the mean sea level.
	Topo-sheet Number	46 F/14
	Morphology of the Area	The area forms gentle undulating topography.
7	Availability of baseline geoscience data	Available details were described in GSI report entitled "Report on Reconnaissance survey for graphite and associated mineralization in Devgadh Bariya-Nagwav Block, Dahod district, Gujarat (stage: G4) Item no.: M2ASMIF-MEP/NC/WR/SU-GUJ/2022/45262 Annexure 1.
	Geological Map (1:50K/ 25K)	1:12,500 Scale Map
	Geochemical Map, Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	12,500 Scale Map Geophysical method SP method was deployed for delineation of ore bodies

8	Justification for taking Preliminary Exploration under G3	During FS: 2022-23, Geological survey of India, state unit of Gujarat, Daman and Diu & Dadra and Nagar Haveli has carried out G-4 stage investigation entitled “Reconnaissance Survey for Graphite and associated mineralization in Devgadh Bariya-Nagwav Block, Dahod District, Gujarat (Stage G-4)”. During this study, a total area of 100 sq. km was investigated through large scale mapping on 1:12,500 scales along Bed Rock sampling, trenching and geochemical analysis. A total of 50 bedrock samples, 50 nos. of pitting/trench samples and 10 Petrochemical samples were collected and analyzed for geo-chemistry (fixed carbon, major oxides, trace elements and XRD). Self Potential (SP) geophysical survey was also carried out for 20LKm to delineate potential area around Ankli village. The objective of the assignment was to identify graphite potential in this study area. During LSM mapping and geological investigations it was found that graphite occurs as scattered outcrops throughout the study area. The graphite is typically associated with graphite schist, which appears as detached outcrops within the meta-sedimentary assemblages of the Champaner Group. This assemblage is found as enclaves within the surrounding Godhra granitoids. Within the Champaner Group, the graphite schist is inter-bedded with other rock types, including quartzite, mica schist, and dolomite. Further, the SP survey revealed that anomalies ranging from -145 mV to +165 mV in the area which indicating two distinct low SP zones such as one in the central part and the other in the south-central part of the area which have strike lengths of approximately 700 meters and 300 meters, respectively. The presence of these low SP anomalies suggests the occurrence of subsurface graphite mineralization in the region.

		GSI, during the field investigations, graphite bands (flaky) were identified with strike length of 100 m to 500 m with varying thickness between 30 cm and 2 m in the Ankli and Jhab-Natatod regions. In the Ankli region (proposed block) FC values in the BRS varied between 1% and 8.20%, Pitting / Trenching samples varied between 8% and 15.80%. In the Nadatod-Jhab region, FC values in the BRS varied between 6% and 20.18%, in the Channel sampling varied between 6% and 19.85% and in the Pitting / Trenching samples varied between 1% and 15.80%. Based on the positive analytical results for fixed carbon and other trace elements, the Geological Survey of India (GSI) has recommended that detailed mineral exploration may be carried out in Ankli as well as Jhab-Nadatod regions. However, GeoExpOre carved out Ankli Block for further G3 stage of exploration as Jhab-Nadatod is falling under Forest cover. Further, out of 22 samples, 13 samples were falling in the proposed Ankli block. The Geochemical analysis of these BR samples is showing promising value (above cut-off grade) of Fixed carbon% varying between 4.61 % and 8.20 % (avg. 6.59 %). Similarly, the trench samples indicated average concentration of 3.41% and pit samples indicated between 1.95% and 15.80% (avg.9.23 %) of FC. The main objectives of this study are to delineate the Graphite mineralization zone through various methods such as surface and subsurface investigation (Boreholes) methods. The reserve estimation will be calculated along with accessory elements (if any) as per UNFC norms and minerals (evidence of mineral contents) rules – 2015.

2 Block summary

2.1 Physiography:

The proposed block is part of the Survey of India toposheet No. 46 F/14 (Scale 1:50,000), covering an area of 2.2 sq. km near Ankli Village, Devgad Bariya Tehsil, Dahod District, Gujarat. The land use/land cover analysis indicates that the entire area consists of private land. The terrain is characterized by undulating topography with a sub-dendritic to dendritic drainage pattern, flowing towards the northeast. The region experiences a dry climate, with temperatures ranging from 5°C in winter to 45°C in summer. The average annual rainfall is approximately 742 mm.

2.2 Background Geology (Regional Geology, Geology of the Block)

2.2.1 Aerial Reconnaissance

ASTER 1T data has been utilized for regional-scale alteration zone mapping. ASTER 1T provides high spatial, spectral, and radiometric resolution across 14 bands, covering visible to thermal infrared wavelengths. The spatial resolution varies: 15 m (VNIR), 30 m (SWIR), and 90 m (TIR). VNIR helps detect vegetation and iron oxides, SWIR identifies OH-bearing minerals like clays and phyllosilicates, and TIR distinguishes silicates and carbonates. Enhanced SWIR bands improve lithological mapping. Standard ASTER products include land surface temperature, emissivity, reflectance, and elevation maps. Data was sourced from USGS Earth Explorer, utilizing band ratios and combinations in VNIR and SWIR regions. The downloaded ASTER 1T data was processed in two phases. Phase 1 involved geometric correction, reprojection, resampling, and the creation of a 14-band composite dataset. Phase 2 focused on enhancement techniques and band ratio analysis to generate alteration maps and thematic layers. Band ratioing, using mathematical expressions and standard spectral reflectance curves, aided in identifying alteration zones and discriminating potential mineralized areas. The lithological discrimination potential of VNIR and SWIR ASTER data was assessed by comparing ASTER reflectance spectra with laboratory spectra. Various thematic layers were derived from the composite 14-band data.

Ratio techniques effectively minimize brightness variations caused by topographic slopes and albedo changes by dividing bands with high reflectance by those with high absorption. For instance, the band 5/band 7ratio highlights altered zones rich in hydroxyl-bearing minerals, commonly used in mineral exploration. Similarly, band 3/band 1 detects iron oxide minerals, while band 9/1 is indicative of propylitic alteration minerals like epidote and chlorite.

Literature suggests that graphite in the area is mainly associated with dolomite. To identify carbonate occurrences, a composite image was created using band ratios 4/3, 5/2, and 3/1, assigned to red, green, and blue channels, respectively. The resulting image revealed that potential mineralization zones are concentrated in the southern and southwestern parts of Devgadh Bariya - Nagwav. Field validation confirmed that the western and southern regions of the block are favorable for graphite mineralization.

SRTM data for the area was downloaded from the USGS Earth Explorer and processed at different slope aspect angles—50°, 100°, and 200°—to optimize lineament detection. Cross-validation was performed using geomorphological features from toposheet No. 46F/14. After validation, the lineaments were digitized by visually interpreting all linear features present in the area.

2.2.2 Regional Geology

The Aravalli Mountain Belt, a major Proterozoic geological feature in India, extends approximately 700 km from southern Delhi to northeastern Gujarat (Fig. 1.1). The oldest rocks in this region belong to the Banded Gneissic Complex (BGC), also referred to as the Bhilwara Supergroup or Mewar Gneissic Complex, comprising Archean-age gneiss, granite, and amphibolite (Gopalan et al., 1990; Roy and Kroner, 1996). These rocks form the basement for the overlying Aravalli (2500–2000 Ma) and Delhi (2000–800 Ma) Supergroups (Gupta et al., 1995).

The Aravalli and Delhi Supergroups together constitute the Aravalli Fold Belt (AFB) and Delhi Fold Belt (DFB), both of which have undergone multiple deformation phases (e.g., Naha and Halyburton, 1974; Roy, 1995). Several granitic intrusions, including the Godhra Granitoid, are associated with these events. The Godhra granite has been dated at 955 ± 20 Ma using Rb-Sr whole-rock dating (Gopalan et al., 1979).

The region consists of metasedimentary rocks of the Lunavada and Champaner Groups of the Aravalli Supergroup. The Lunavada Group predominantly includes alternating quartzite and schist, where quartzite forms ridges and schist occupy low-lying areas (Iqbaluddin, 1989). The Champaner Group mainly comprises phyllite, impure limestone, and micaceous quartzite.

The present study focuses on the Godhra Granitoid and metasedimentary rocks near Devgadh Baria. The exploration area consists of Archean gneisses unconformably overlain by Paleoproterozoic Champaner Group metasediments, including dolomite, calc-silicate rock, quartzite, phyllite, biotite schist, graphite schist, and amphibolite. Manganese (Mn) and graphite mineralization are localized within manganiferous phyllite and dolomite of varying thickness.

The Godhra granite is represented by foliated to crudely foliated pink granite, possibly of syn-tectonic origin, often muscovite-rich and ferruginized. It is further intruded by biotite-rich grey granite and porphyritic pink granite. These granitoids are later cut by microgranite (grey and pink varieties), magnetite-rich rocks, amazonite-bearing albitic pegmatites, and alkali feldspar-rich pegmatites. The youngest acidic intrusions in the area are quartz veins, followed by an intermediate granodiorite intrusion.

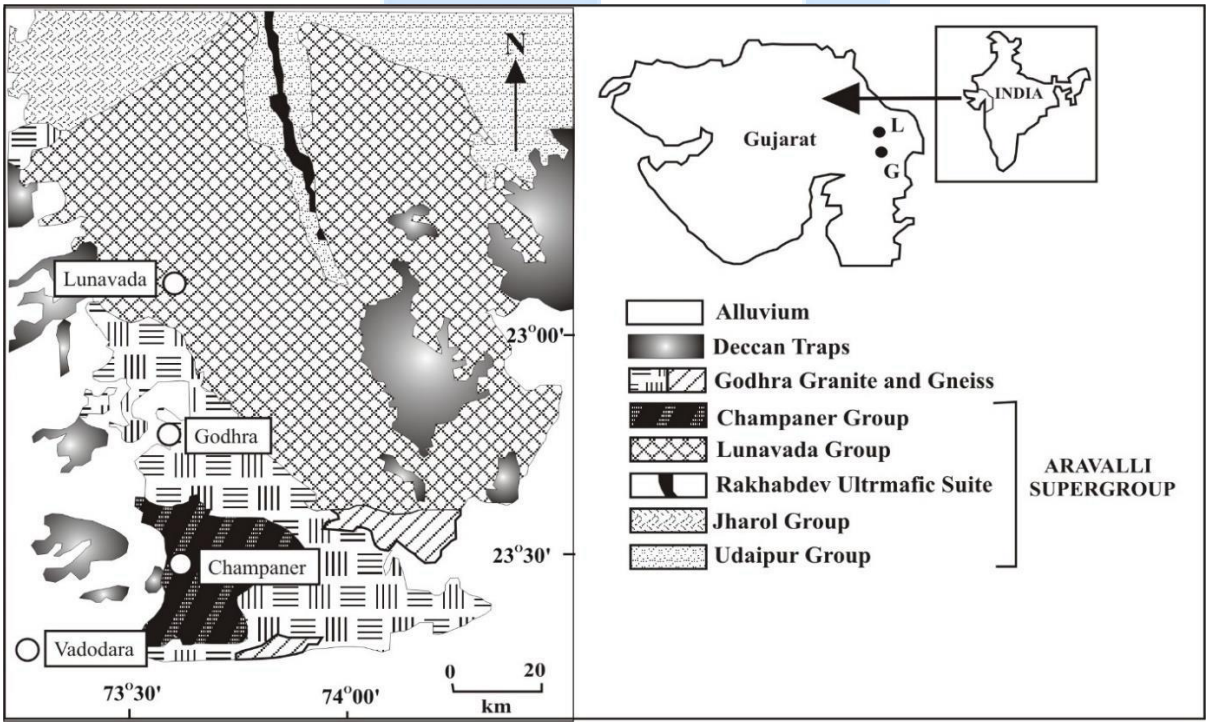

Figure 2.1 -Regional geological map depicting the Aravalli Supergroup along with the disposition of Godhra Granitoids in the regional scale (after Gupta et al., 1995). (L-Lunavada, G-Godhra)

2.2.3 Regional Stratigraphy:

Srikarni & Bhagat (2006) conducted 1:25,000 scale geological mapping in parts of toposheets 46F/14, 46F/15, 46J/2, and 46J/3**,** covering Vadodara, Panchmahals, and Dahod districts in Gujarat.

In 46F/14 and 46J/2**,** the Lunavada Group is represented by a sequence of dominantly schist/phyllite with quartzite bands, along with rare thin bands of calc-silicate, impure dolomite, and amphibolite at the base. The Champaner Group, particularly the Rajgad Formation in 46F/14, consists of phyllite and quartzitewith basal calc-silicate and amphibolite bands. Intrusive granite bosses and tors are observed within the metasediments of 46F/14, with sparse andalusite-bearing hornfels in the contact aureoles of these granitic bodies.

Their study suggests that the gneisses in the region originated from the metasediments of the Lunavada and Champaner Groups, with their formation occurring before or coeval with the emplacement of Godhra Granite**.** The Gneissic Complex in 46F/14, 46J/2, and 46J/3 resulted from intense migmatisation and high-grade metamorphism of metapelites from the Lunavada Group and marls and metapelites from the Champaner Group.

They found no structural discordance between the Lunavada Group and the Gneissic Complex, nor any conglomerate at their contact. Srikarni (2002) further mapped bands of dolomite, quartzite, calc-silicate, and amphibolite**,** extending along strike from the Gneissic Complex into the Rajgad Formation of the Champaner Group (46F/14). Some bands were traced across the contact between the Gneissic Complex and Lunavada Group, as mapped by earlier workers.

These findings suggest that the Gneissic Complex does not form the basement for the Lunavada Group. Instead, it represents metasediments of the basal Lunavada Group (Devgadh Baria-Dhanpur area) and the Rajgad Formation (46F/14), which were transformed into gneissic rocks through migmatisation**.**

The proposed work will be carried out in parts of the Champaner group of the Aravalli super group. The modified regional stratigraphic succession after Srikarni et al (2004), is as shown in Table 1.1

Table 2.1 - The compiled stratigraphy of the area (modified after C. Srikarni et al., 2004)

Time Period	Super Group	Group		Lithology
Recent				Alluvium
Late Cretaceous to Palaeocene	Deccan Traps	Malwa		Basalt and associated dolerite, associated dykes and sills
Upper Cretaceous			Bagh / Lameta Formation	Fossiliferous limestone, shale, sandstone, conglomerate, chert
Neo – Proterozoic			Intrusives	Pegmatite
			Godhra Granitoid	Granite Granodiortite
Meso - Proterozoic	Aravalli	Champaner Group	Rajgadh Formation	Schist and phyllite with rare bands of quartzite, dolomite, calcsilicate and Amphibolite bands
		Lunavada Group	Kadana Formation	Proto-quartzite/ortho-quartzite bands, Meta-subgrey wacke (quartz-biotite schists and muscovite, biotite-quartz schist

2.2.4 Regional Metamorphism and Structure:

The Aravalli and Delhi Supergroups together form the Aravalli Fold Belt (AFB) and Delhi Fold Belt (DFB), both of which have undergone polyphase deformation (e.g., Naha & Halyburton, 1974; Roy, 1978, 1995; Sinha-Roy et al., 1998). Granitic intrusions associated with these deformation events have played a crucial role in determining the deformation ages (e.g., Sychanthavong, 1990).

The Lunavada Group, a key component of the southern Aravalli Mobile Belt (AMB), has experienced three deformation phases: D1, D2, and D3. Petrographic studies of schist and quartzite in the region provide insights into the relationship between metamorphic and deformational events. The Godhra Granitoids exhibit an intrusive relationship with the Lunavada Group metasediments, shedding light on the metamorphic history and deformation mechanisms of the Proterozoic rocks around Lunavada.

According to Mamtani et al. (2001), the Lunavada region underwent metamorphism up to the lower amphibolite facies, with anorth-to-south metamorphic gradient from chlorite grade in the north to garnet grade in the south. The progressive regional metamorphism (M1 and M2-1) corresponded to D1 and the early stages of D2, while M2-2 was **a** retrogressive event occurring during the waning stages of D2 or early D3 deformation. Athermal event linked to late-D3/post-D3 Godhra Granitoid intrusion followed the regional metamorphism.

2.2.5 Regional mineralisation:

In certain areas, mineralized zones are exposed at the surface, primarily confined to graphite schist, interbanded with quartz-mica schist and dolomite. Key indicators of mineralization include the presence of old mine pits, the alignment of dug wells with these pits, and the occurrence of graphite ore dumps nearby. Additionally, the presence of greyish-black, slippery sludge or water in dug wells, borewells, and small nalas serves as a crude indicator of graphite mineralization.

The graphite mineralization is predominantly associated with graphite schist interlayered with dolomite bands, with thicknesses varying from 30 cm to 2.0 m and strike lengths ranging from 100 m to 500 m. The mineralized zones follow the first foliation (S1), oriented east-west with a 50–60° dip towards the north, and are intercalated with quartz and quartzo-feldspathic veins. These siliceous and felsic veins range in thickness from 10 mm to 1.5 m

within the graphite mineralized zone. Fixed carbon analysis of bedrock, channel, and pit samples from the graphite bands reveals a carbon content ranging from 6% to 20.18%.

2.3 Geology of the Block

Geologically, the Ankli areacomprises the Chhota Udaipur gneissic complex, consisting of granitegneiss, the Lunavada Formation, characterized by micaceous quartzite, the Champaner Formation, represented by quartz-biotite schist, graphite schist, and dolomite, and the Godhra Granitoid suite, primarily composed of syeno-granite. These lithological units collectively document the region's complex deformational and metamorphic history. Table 1.2 shows the litho-stratigraphy of the proposed block based on the field relationship as proposed by the GSI (FSP: 2022-23).

Table 2.2 – Lithostratigraphy of Proposed Block (After GSI, 2022-23)

Super Group	Group		Lithology
		Godhra Granitoid	Syenite-Granite
Aravalli	Champaner Group	Rajgadh Formation	Quartz mica schist Graphite Schist Dolomite / calc Silicate
	Lunavada Group	Kadana Formation	Quartzite bands
			Granite Gneiss

2.4 Description of Litho-units

2.4.1 Micaceous Quartzite

The quartzite in the area exhibits two distinct varieties: one is uniform in composition, hard, and buff-colored, belonging to the Lunavada Group, while the other is micaceous with crudely developed foliations, associated with the Champaner Group. Quartzite occurrences have been observed in both then orthern and southern parts of the area. It is hard, compact, jointed, and fractured, displaying gray coloration with compositional banding. Quartzite occurrences reported in the Ankli and Jhab areas are depicted in Figure 1.1. The general trend

of schistosity /foliation in the quartzite varies from N80°W–S80°E to an east-west orientation**,** with a dip ranging from 55° to 75° towards the north.

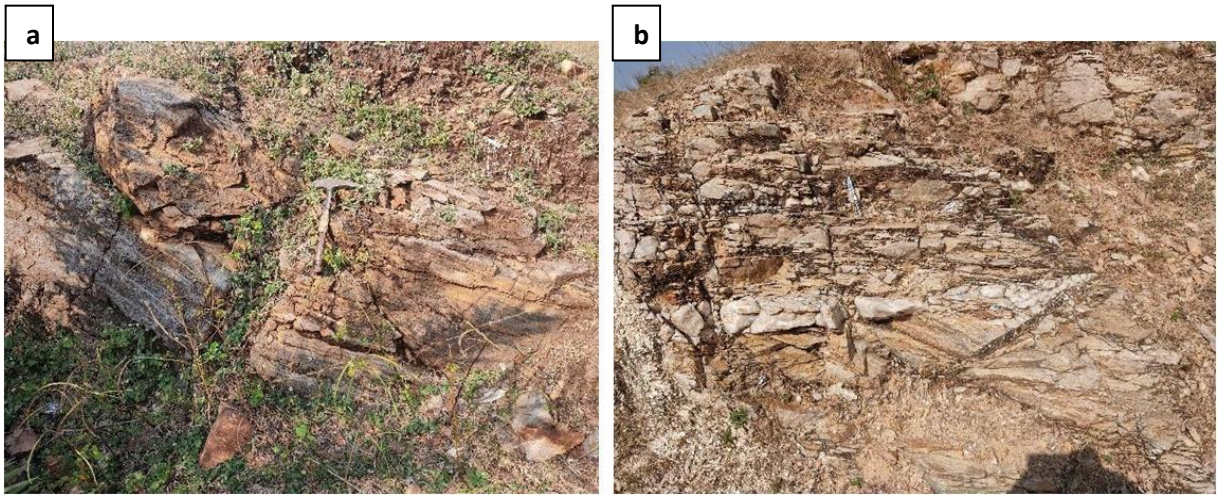

Figure 2.2 –Micaceous Quartzite of Champaner Group exposed in the (a) Ankli area and (b) Jhab Natatod areas (Source: GSI Report)

2.4.2 Quartz Mica Schist

Quartz-mica schist primarily occupies the low-lying areas of the study region, with outcrops observed along Nala sections, local pits, and road cuttings. The schists are well-foliated, with parallel biotite and muscovite flakes, displaying colors from dark greenish-gray to reddish-brown due to ferrous staining. Quartzite interbeds are common, later intruded by granites. Quartz-mica schist occurrences are noted in the Ankli area (Figure 1.2)

Figure 2.3 –Quartz mica schist exposed in the Ankli area (Source: GSI Report)

2.4.3 Graphite Schist

Graphite schist occurs as a parting within quartz mica schist, with higher graphite content distinguishing it as graphite schist. It is a fine-grained, soft, and greasy rock that soils the hand, grading into quartz mica schist. Graphite appears as flaky-type, formed by metamorphism of carbonaceous sediments and carbonates. The rock consists of steel-grey graphite flakes mixed with muscovite and powdery ash-grey material. Flaky graphite is softer with visible flakes, while the amorphous variety is extremely fine-grained and associated with quartz and mica. Minute calcite and silica veins are present in some areas. Graphite bands are closely associated with thick, brecciated, and ferruginized quartz veins containing oxidized sulphides. Concordant quartzo-feldspathic veinlets and siliceous partings are well recorded (Figure 1.3).

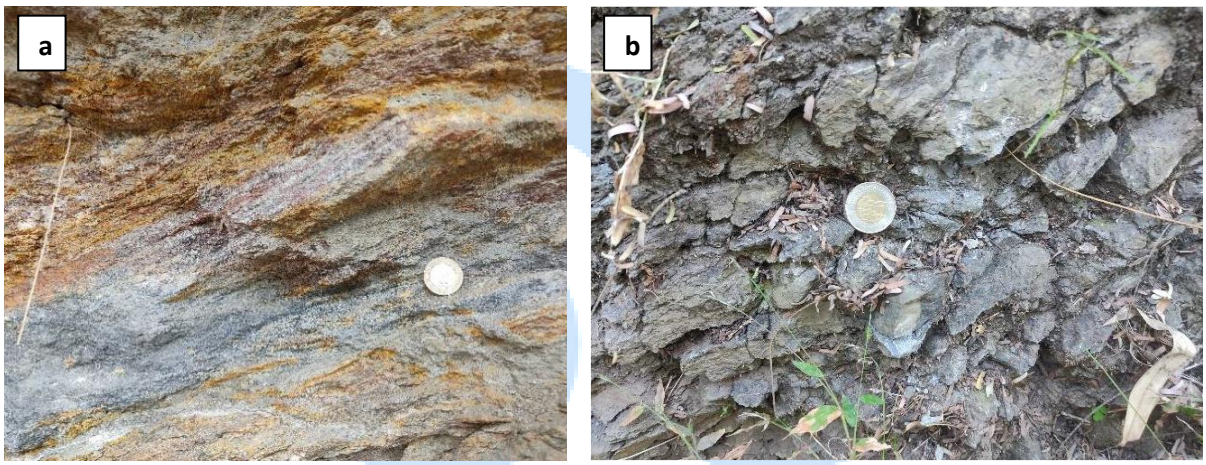

Figure 2.4 –Graphite Schist exposed in the (a) Ankli area and (b) Jhab Natatod areas (Source: GSI Report)

2.4.4 Dolomite

Dolomite occurs as isolated patches within the granitoids and schists near Anklii, Jhab, and Nadatod. It is characterized by its dark grey color, distinctive elephant-skin weathering pattern, and ribbed or furrowed surface structures. In some locations, the presence of actinolite and diopside has been observed within the dolomite, indicating a transition to calc-silicate rock. Measurable outcrops of dolomite are predominantly found in the southern part of the study area, particularly around Anklii, Jhab, Redhana, and Nadatod (Figure 1.4).

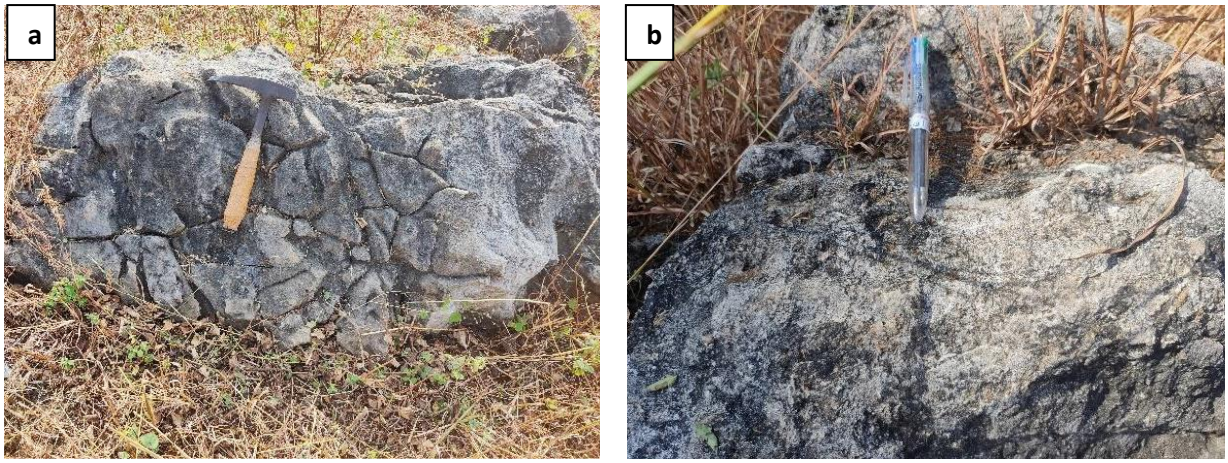

Figure 2.5 –Dolomite exposed in the (a) Ankli area and
(b) Jhab Natatod areas (Source: GSI Report)

2.4.5 Syeno-granite

Syeno-granite has been identified in the study area near Anklii village. It is a fine- to medium-grained, leucocratic rock primarily composed of K-feldspar, plagioclase, quartz, and tite (Figure 1.5).

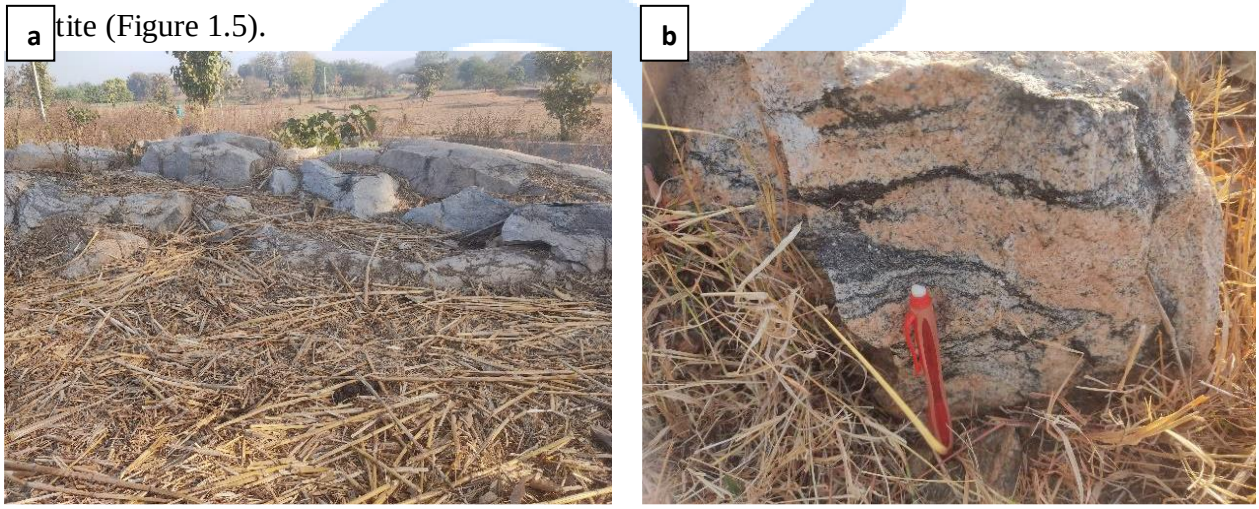

Figure 2.6 – Syeno-granite exposed in the (a) & (b) Ankli area (Source: GSI Report)

2.5 Structural Framework of the Block

The Aravalli and Delhi Supergroups have undergone multiple phases of deformation, with granitic intrusions emplaced during these tectonic events. In the proposed block, the Aravalli Mobile Belt (AMB) records three distinct deformation episodes—D_1, D_2, and D_3—interpreted from petrographic studies of litho-units such as quartzite and schist.

The Godhra Granitoids intrude the Lunavada Group of metasedimentary rocks, which have undergone metamorphism up to the lower amphibolite facies. A metamorphic gradient is evident, ranging from chlorite-grade assemblages in the northern part to garnet-grade assemblages in the south. Progressive regional metamorphism, designated as M_1 and M_{2-1}, corresponds to the D_1 phase and the majority of D_2. The M_{2-2} phase represents a retrogressive event associated with the waning stages of D_2 or the early phase of D_3 deformation. A thermal event linked to the late-D_3 or post-D_3 intrusion of the Godhra Granitoids followed the regional metamorphism.

2.6 Mineral Potentiality Based On Geology, Geophysics, Ground Geochemistry

The mineralized zones in the area are exposed at several locations, primarily confined to graphite schist interbanded with quartz-mica schist and dolomite. These exposures align with dug wells and old mine pits, where the presence of graphite ore dumps near these features serves as a strong indicator of mineralization. Additionally, greyish-black, slippery sludge or water observed in dug wells, borewells, and small nalas further suggests the presence of graphite mineralization.

Graphite mineralization in the area is predominantly associated with graphite schist interlayered with dolomite bands, exhibiting variable thicknesses ranging from 30 cm to 2.0 meters and strike lengths extending between 100 to 500 meters. The mineralized zones follow the first foliation (S1), oriented east-west with a 50–60° dip towards the north. Quartz and quartzo-feldspathic veins are commonly intercalated within these formations, with vein thicknesses varying between 10 mm and 1.5 meters.

Out of 50 BRS collected samples, 13 were from the Ankli block. Chemical analysis revealed that fixed carbon content in bedrock samples (BRS) ranged from 1.0% to 8.20%, while pitting samples exhibited values between 1.95% and 15.80%. Considering the cutoff grade, 7 out of 13 BRS samples showed values ranging from 4.61% to 8.26%, while 9 out of 15 pitting samples fell within the range of 3.4% to 15.80%. These results indicate that the Ankli block holds significant potential for further G3-level exploration, which will provide a more accurate assessment of the depth continuity and resource persistence of graphite mineralization.

2.7 Scope for Proposed Exploration

This project proposes a preliminary survey at the G-3 stage consisting of Surface investigation - detailed geological and structural mapping of a 2.2 sq. km. area on a 1:4000 scale; Subsurface investigation – Geophysical investigation – Resistivity and IP; Sample collection: surface – Bed rock sampling and Channel sample collection; Drilling of 14 Boreholes (60 m of 5 Boreholes; 70 m of 4 Borehole and 75 m of 4 Boreholes) with total depth of 940 m depth; Geochemical Analysis of Graphite schist and other litho-units; Petrological analysis and Resource estimation under G3 category and report preparation.

2.8 Objectives of Exploration

1. Carry out surface investigation (geological and structural mapping on a 1:4000 scale) to demarcate Graphite and Associated mineral-bearing formations with the structural features (surface manifestations and lateral disposition of the mineralized zones)
2. Subsurface geophysical investigation of Resistivity and IP method to understand the depth persistence of mineralisation zones
3. To understand the surface manifestation and lateral disposition of the mineralized zones through collection of Bed Rock Samples and Channel samples collection and geochemical analysis
4. To drill of 14 number of Boreholes (60 m of 5 Boreholes; 70 m of 4 Borehole and 75 m of 4 Boreholes) with a total depth of 940 m, used to understand the strike and depth persistence of mineralized zones in the area, which in turn will aid in deciding the future course of the exploration program at the G3 category of UNFC
5. To estimate preliminary Graphite mineral resources along with any accessory elements (if any) as per UNFC norms and minerals (evidence of mineral contents) rules – 2015 at the G-3 level.

2.9 Observation and recommendation from previous work

Of the 22 collected samples, 13 were from the proposed Ankli Block. Geochemical analysis of these bedrock (BR) samples revealed promising fixed carbon (FC) values, ranging from 1.00% to 8.20%, with an average of 6.26%. Similarly, trench samples showed an average FC concentration of 3.41%, while pit samples exhibited FC values ranging from 1.95% to 15.80%, with an average of 9.23%.

Furthermore, the SP survey identified anomalies ranging from -145 mV to +165 mV, indicating two distinct low SP zones. One is located in the central part of the area, while the other lies in the south-central region, with strike lengths of approximately 700 meters and 300 meters, respectively. The presence of these low SP anomalies suggests potential subsurface graphite mineralization in the region.

Based on positive analytical results for fixed carbon and other trace elements, the Geological Survey of India (GSI) has recommended detailed mineral exploration in both the Ankli and Jhab-Nadatod regions. However, GeoExpOre has prioritized the Ankli Block for further G3-stage exploration, as the Jhab-Nadatod area falls under forest cover.

2.10 Previous work

2.10.1 Previous Exploration details in the proposed block area

2.10.1.1 Baseline Geological and Geochemical Data

G.G. Agrawal (1965-66) mapped 480 sq. km in Chhota Udepur and Devgadh Baria Taluks (Baroda and Panchmahals districts) at a 1:63,360 scale. He identified Aravalli metasediments comprising phyllites intercalated with dolomitic limestone and grit, intruded syn-tectonically by Erinpura-age granites. Four granite varieties—biotite, grey, pink, and porphyritic—were mapped based on structural and mineralogical characteristics. In the northern part, phyllites metamorphosed into mica-schists, and grit became fine-grained due to granite intrusion. Post-Delhi tectonic movements led to further deformation of the metasediments. Prasad Rao (1969) mapped 300 sq. km in Devgadh Baria Taluk (Panchmahals) at a 1:31,680 scale, identifying quartzites and biotite-sericite schists as the main Aravalli metasediments intruded by porphyritic granite. The region consists of an older migmatite complex with amphibolite, biotite schist, and carbonate xenoliths, along with younger intrusive granites, aplites, and pegmatites. He also reported graphite associated with carbonate and mica-bearing xenoliths within the migmatite complex.

Narayana et al. (1975) reported graphite deposits with an average grade of 9–13% in Panchmahal district, Gujarat, mainly associated with graphite gneisses near marble and calc-silicate rocks. Key occurrences were recorded in Narksat-Jambughoda, Jhab-Redhana, Devgarh Bariya, Nadatad, Bamroli Ankli, Phakura, Varada, Jambugan, Khos, Lunaga, Muthhai, and Sewaniya within the metasediments of the Aravalli Supergroup. Gopinath et al.

(1977) classified the metasediments of the Champaner Fold Belt into the Champaner Series, pre-Champaner, and Aravalli sequences. Des Raj et al. (1995) recorded graphite occurrences in Ghata, Jhab-Ankli-Bamroli-Redhana, and Nadatod-Jamran areas. Graphite was found as veins and lenses, striking N20°E-S20°W with lengths of 100–900m and thicknesses of <1.0–4.0m. The Jhab-Ankli-Bamroli-Redhana samples contained 18–20% fixed carbon, with mineralization occurring in schist.

B.K. Sahu & Sanjay Wahi (1992-93) mapped the Lunawada Group, identifying complexly folded low-grade metasediments intruded by syn- and post-tectonic granites. Srikarni and Sanjay Das (1990-95) described the Champaner Fold Belt as a southern extension of the Aravalli Fold Belt, marking two distinct litho-assemblages separated by a NW-SE fault. Jain et al. (1992) observed that the gneissic complex experienced two deformation phases, whereas the Lunawada metasediments underwent three. Srikarni & Bhagat (2006) mapped 375 sq. km at 1:25,000 scale in Vadodara, Panchmahal, and Dahod districts, documenting lithologies of the Gneissic Complex, Lunawada Group, and Champaner Group. Their studies indicated that gneisses were derived from metamorphism and migmatization of the basal Lunawada and Champaner metasediments before the Godhra Granite intrusion. Srikarni (2002) further identified dolomite, quartzite, calc-silicate, and amphibolite bands in the Rajgad Formation, suggesting the gneissic complex represents metamorphosed Lunawada and Champaner sediments rather than a basement unit.

Mamtani et al. (2001) studied the Lunawada Group, revealing three deformation episodes (D1, D2, and D3) and regional metamorphism reaching lower amphibolite facies. Progressive metamorphism (M1 and M2-1) accompanied D1 and D2, while a retrogressive event (M2-2) occurred during late D2 or early D3. Post-D3 thermal activity was linked to the Godhra Granitoid intrusion. Nilesh & Shamsheer (2020) conducted a reconnaissance survey for rare earth elements (REE) and rare metals (RM) in the Kikawada-Ghelvant area (Chhota Udepur district). They recorded three old graphite mine pits in Jaloda village, where mineralization occurred within graphite schist in contact with calc-silicate rocks, trending NE-SW. Roy & Jauhari (2019) delineated three graphite-bearing zones in the Juwari Bari-Chhoti-Rampura-Jobat area (Alirajpur district, Madhya Pradesh). Graphite-bearing units had strike lengths of 900m, 2.7km, and 3.7km, with widths ranging from 5m to 30m. The northern zone was within Aravalli metasediments, while the southern zone was associated with a NW-SE

trending shear zone at the phyllite-granite contact. Trench and grab samples showed fixed carbon values of 1–16.88%, with an average grade of 2%.

Gandhi & Gupta (2016) carried out a National Geochemical Mapping (NGCM) survey, reporting high tungsten, lithium, and cesium concentrations in the southwestern part, suggesting pegmatite veins in phyllite. REE values in stream sediments ranged from 92.24 ppm to 8624.45 ppm in the southeastern part of the study area.

2.10.1.2 Baseline Geophysical Data

Agrawal and Srivastava (1973) conducted a self-potential (SP) geophysical survey to investigate graphite-bearing zones in Bamroli-Ankli-Jhab-Redhana-Phulpura-Devgadh Baria areas (Panchmahals district). Graphite bands were found within metasediments and gneissic bands of the Aravalli Supergroup, appearing disconnected within a granitic terrain of post-Aravalli age. These graphitic horizons, primarily associated with calcareous rocks, follow regional trends ranging from WNW-SSE to E-W. Two prominent negative SP anomaly centers were identified, with values of -304 mV and -365 mV over a one-kilometer strike length. The survey concluded that graphite mineralization is of higher quality in the northern part compared to the southern part. Systematic trenching and pitting along the anomaly axes were recommended for further exploration.

3.0 Block Description

The coordinates of the corner points of the GSI (G4) area covering 100 sq. km are given in Table 3.1.

Table 3.1: GSI (G4) Block coordinates

GSI G4 AREA (100 sq.km)		
CARDINAL POINTS	**LATITUDE**	**LONGITUDE**
A	N22° 42' 30.17"	E73° 53' 27.02"
B	N22° 42' 29.67"	E73° 59' 57.91"
C	N22° 36' 31.40"	E73° 59' 58.99"
D	N22° 36' 30.90"	E73° 53' 31.04"

3.1 Proposed G3 investigation area

The area falls in Survey of India Toposheet no. 46F/14 and covers about 2.2 sq. km. Localities in the area include Ankli Village, Dahod district, Gujarat. The coordinates of the block's corner points are given in Table 3.2 below as shown in the Figure No.3.1.

Table 3.2: GeoExpOre Proposed (G3) Block coordinates (2.2 Sq.km)

CARDINAL POINTS	LATITUDE	LONGITUDE
A1	N22° 37' 33.9"	E73° 54' 00.0"
B1	N22° 37' 37.7"	E73° 54' 11.2"
C1	N22° 37' 27.8"	E73° 55' 11.1"
D1	N22° 37' 14.5"	E73° 55' 32.0"
E1	N22° 36' 54.1"	E73° 54' 44.9"
F1	N22° 37' 14.3"	E73° 53' 54.6"

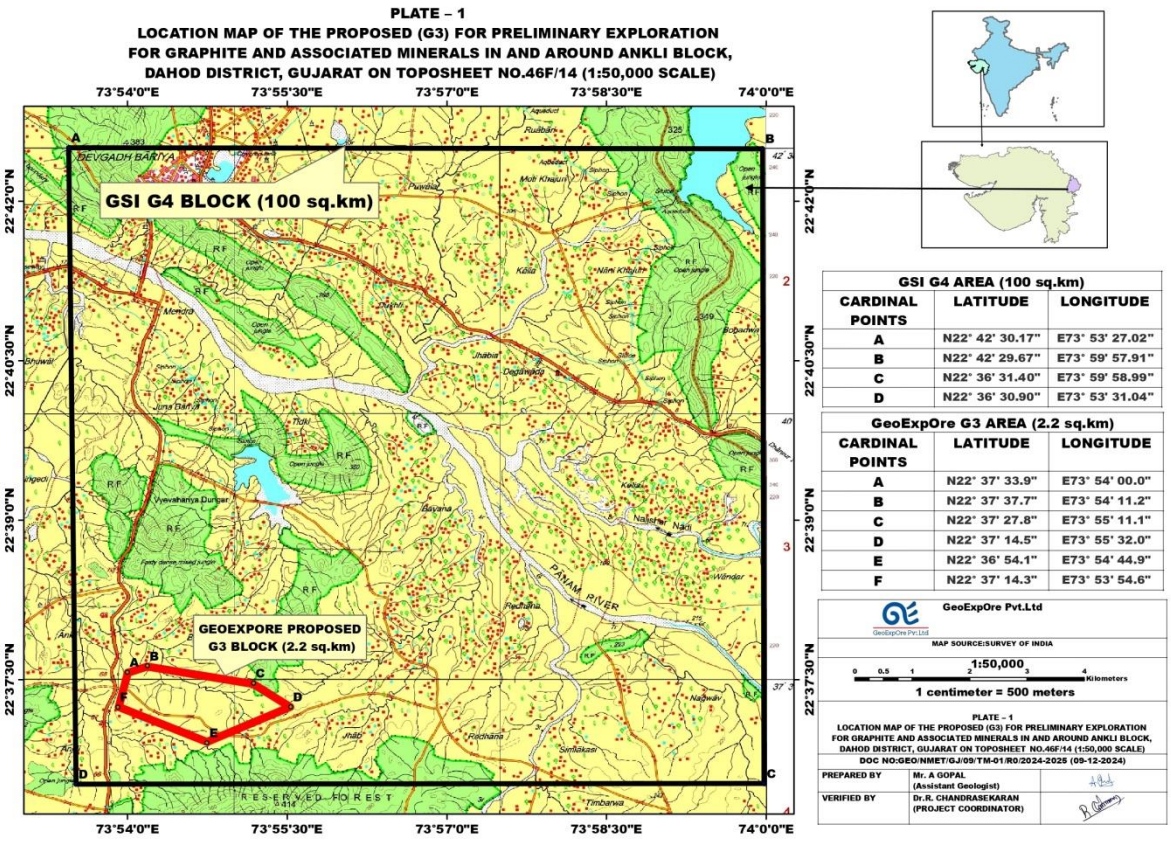

Figure 3.1–Location Map of the Proposed Block

4.0 Planned Methodology

The exploration program has been proposed in accordance with the objectives set for the preliminary survey (G-3) of the block. The Exploration shall be carried out as per Minerals (Evidence of Mineral Contents) Rule-2015 and Minerals (Evidence of Mineral Contents) Amendment Rules-2021. Accordingly, the following scheme of exploration is formulated to achieve the objectives. The details of the different activities to be carried out are presented in the following paragraphs.

4.1 Geological Mapping (1: 4,000 Scale)

Geological mapping will be conducted across the entire 2.2 sq. km area at a 1:4,000 scale. The study aims to delineate rock types and their contacts, identify graphite-mineralized zones, and map associated mineralization-bearing formations (host rocks). Additionally, structural features will be examined to assess surface manifestations and the lateral extent of the mineralized zones.

4.2 Geochemical Sampling (Bedrock & Channel sampling)

During the course of Geochemical Sampling, the bedrock samples shall be collected from the outcrops. A total of 300 nos. of primary samples from bedrock samples and 512 channel samples will be collected and analysed for proximate (Volatile matter, Fixed carbon, Moisture and Ash) and associated mineralization in the area. Around 120 nos. of check samples (15%) will also be analysed for proximate analysis and associated mineralization.

4.3 Survey

The block boundary will be surveyed using DGPS, with total station measurements referenced to the WGS-84 datum for precise demarcation of the proposed area boundary points. The survey team will also map surface features and conduct contouring within the project area, supporting geological activities such as locating outcrops, and channel sample collection. These sample locations will be accurately plotted on the map to facilitate proper interpretation of the data. Additionally, during the drilling program, the survey team will be responsible for borehole positioning, determining reduced levels, and recording borehole coordinates. 15 Nos. of Boundary coordinates required for DGPS survey to carry out drilling activity.

4.4 Geophysical Survey

A ground geophysical survey, including Resistivity and Induced Polarization (IP), will be conducted in the proposed block to delineate target mineralization. The survey will follow 100-meter traverse intervals across the mineralization trend. A total of approximately

7.91line-kilometers is planned for the Resistivity and IP survey to identify subsurface graphite-mineralized zones as shown in the Figure 3.1.

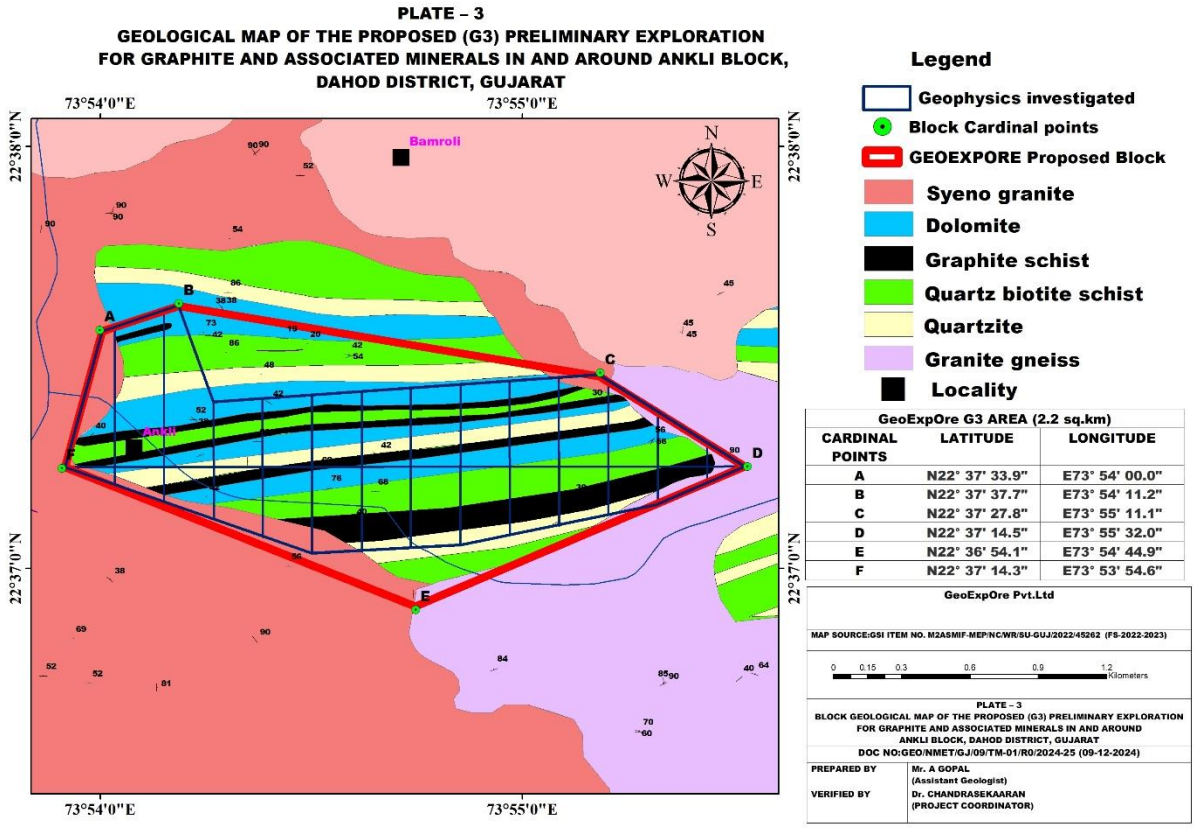

Figure 4.1–Geophysical Investigation area

4.5 Core Drilling

Based on the results of surface exploration, including geological mapping, geophysical, and geochemical surveys over a 2.2 sq. km area, exploratory boreholes will be drilled in targeted mineralized zones as shown in the Figure 3.2. The objective is to determine the continuity of mineralized zones along strike and dip and to assess the subsurface disposition and orientation of graphite mineralization represented in the Figure 3.3. A total of approximately 940 meters of drilling across 14 boreholes is planned to intersect the mineralized zones within the block. Of these, six boreholes will be drilled to a depth of 60 meters, four to 70 meters, and four to 75 meters, focusing on areas where graphite mineralization was established during the G-4 stage of exploration as shown in the Figure 3.4.

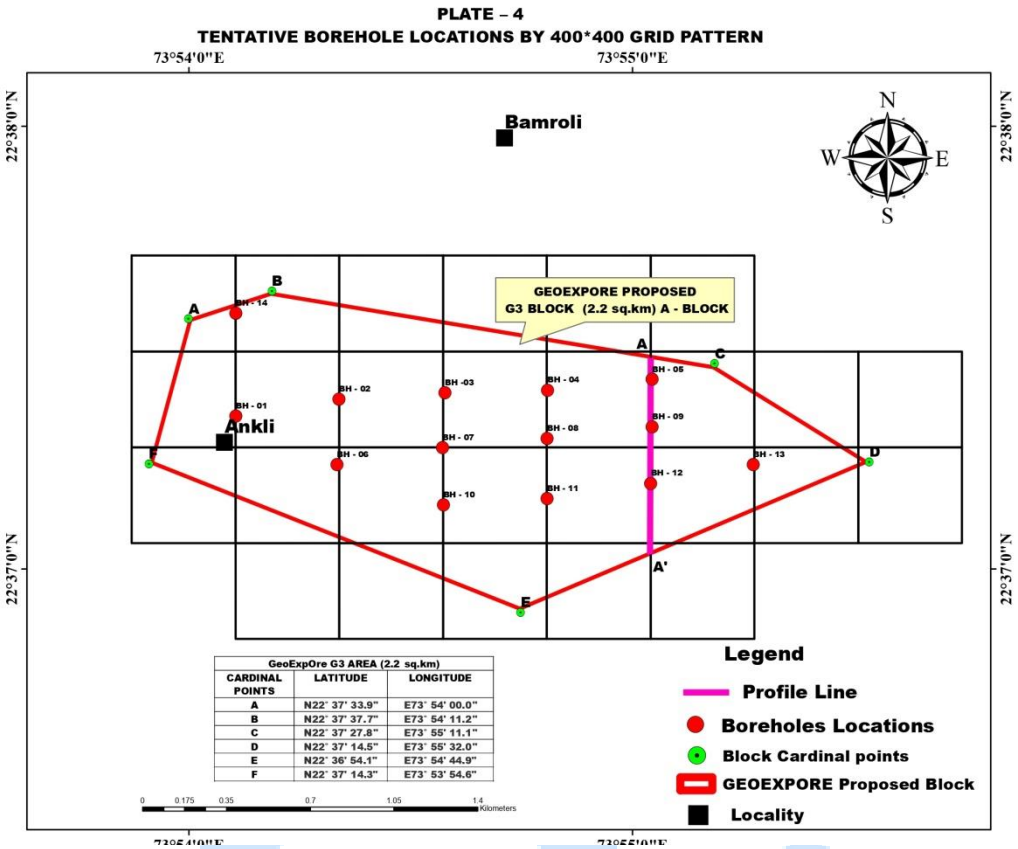

Figure 4.2–Tentative Borehole location

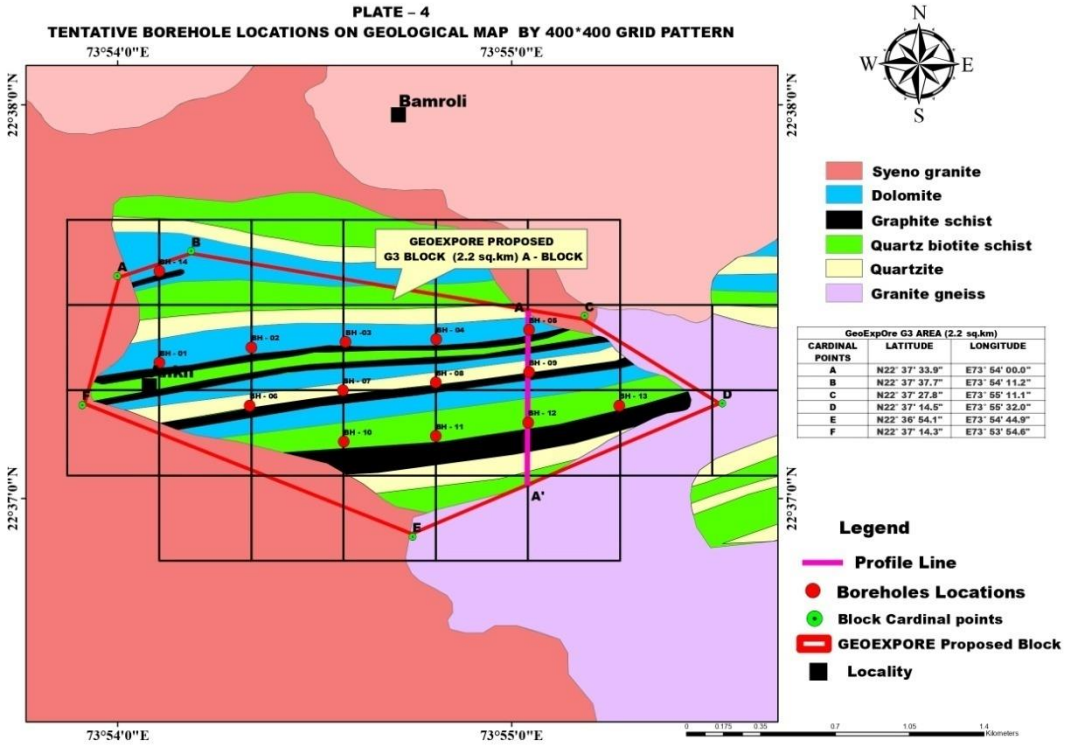

Figure 4.3– Tentative Borehole location on the Geological Map

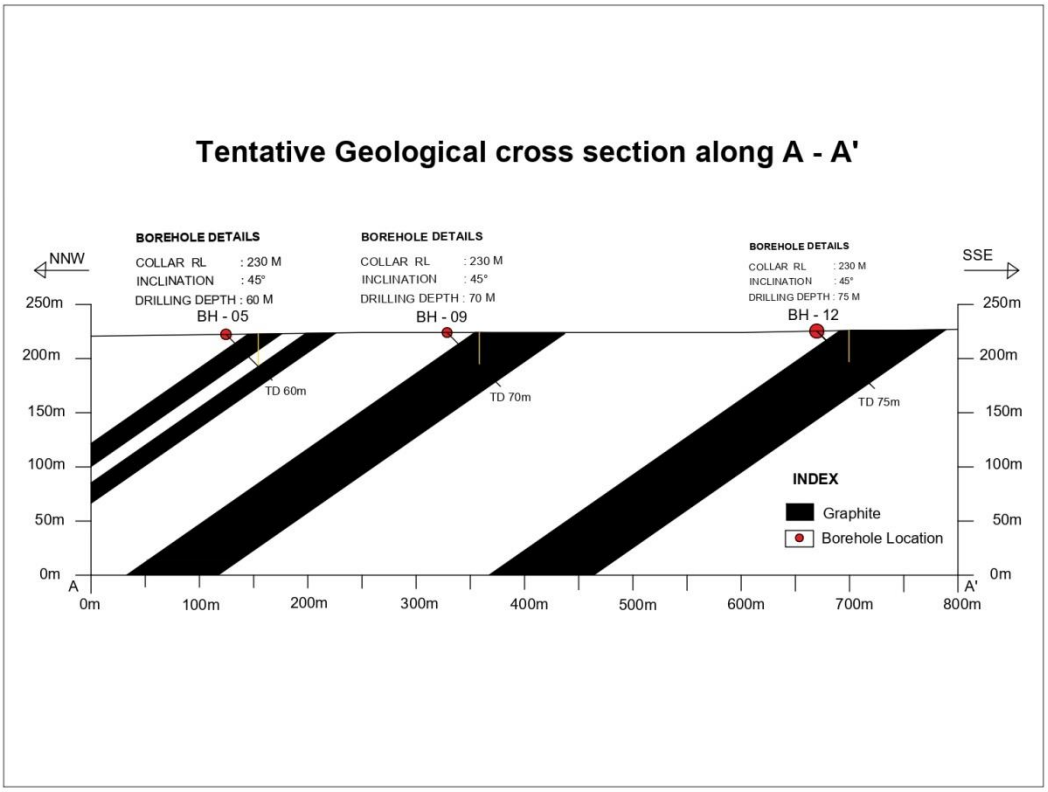

Figure 4.4– Hypothetical Cross Section of Profile line of A-A'

4.6 Core Logging

The borehole cores will be systematically logged, documenting details of lithological units, color, structural features, texture, and mineralization. Additionally, core recovery and rock quality designation (RQD) for graphite will be recorded to ensure a comprehensive assessment of the subsurface characteristics.

4.7 Core Sampling

The graphite-mineralized sections of the drill core will be sampled as primary samples. The sample length within the mineralized zone will be maintained at 1.00 meter, depending on the thickness of graphite and its physical characteristics. Primary core samples will be analyzed for Fixed Carbon (FC: Non-carbonate), Ash, Moisture, and Volatile Matter (VM) as part of the proximate analysis.

Sampling at 1.0-meter intervals will be conducted where feasible, considering factors such as mineralization intensity, lithological changes, and core recovery.

a) A total of 300 primary core samples will be analyzed for graphite mineralization, including FC (Non-carbonate), Ash, Moisture, and VM.

b) Approximately 15% of the primary samples (45 graphite samples) will undergo additional analysis for quality assurance.

4.8 Whole Rock Analysis

Whole rock analysis will be calculated from the sample analysis results of major oxides which is used to determine the chemical composition and variation of rock types. The analysis will include major oxides and radicals such as SiO_2, Al_2O_3, Fe_2O_3, TiO_2, MnO, CaO, Na_2O, K_2O, MgO, P_2O_5, CO_2, and S. This assessment will provide valuable insights into the lithological characteristics and geochemical variations within the study area.

4.9 Petrological & Mineralogical Studies

During geochemical sampling and core logging, 10 samples from various lithological units will be examined through petrographic studies in thin sections to determine their mineralogical and textural characteristics. Additionally, 10 samples from the mineralized zones will be analyzed through minerographic studies in polished sections to assess ore mineral assemblages, their distribution, alteration patterns, and enrichment processes. These studies will provide critical insights into the geological and metallogenic evolution of the deposit.

4.10 Bulk Density Determination

Bulk density measurements will be conducted on five samples from the mineralized zones intersected in the boreholes. This analysis will provide essential data for resource estimation and help assess the tonnage potential of the graphite mineralization.

4.11 Estimation of resources

The resource estimation will be carried out in accordance with the United Nations Framework Classification (UNFC) norms and the Minerals (Evidence of Mineral Contents) Rules, 2015 (MEMC Rules, 2015) at the G-3 (Prospecting) level. The estimation process will incorporate geological, geophysical, geochemical, and drilling data to delineate the mineralized zones and evaluate their continuity, grade, and tonnage.

5.0 Nature, Quantum and Target

The nature and quantum of the proposed work are given in the Table 5.1

Timeline - Title on "Preliminary Exploration (G3 Stage) for Graphite and Associated Minerals In and Around Ankli Block, Dahod District, Gujarat" Area of 2.2 sq. km, No.of BH:14, Borehole depth range- 940 m; Schedule timeline- 15 months Review: After 9 Months]																		
S. No.			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**		**10**	**11**	**12**	**13**	**14**	**15**
1	Camp Setting	**Months/Days**																
2	Geological Mapping & Sampling	**days**																
3	Geophysical survey	**L.km**																
4	Geological Party Days (HQ)	**Days**																
5	Laboratory Studies	**Months**																
6	Channel Sampling	**Months**																
7	Exploratory Drilling	**months**																
8	Camp Winding	**days**																
9	Report Writing with Peer Review	**months**																

REVIEW

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5.1 Nature Quantum of Proposed Block:

The Details of the particulars, quantum and targets are tabulated given in the Table 5.2

Cost Estimate - Title on "Preliminary Exploration (G3 Stage) for Graphite and Associated Minerals In and Around Ankli Block, Dahod District, Gujarat" Area of 2.2 sq. km, No.of BH:14, Borehole depth range- 940 m; Schedule timeline- 15 months Review: After 9 Months]							
S. No.	**Item of Work ***	**Unit ***	**Rates as per NMET SoC 2020-21**		**Estimated Cost of the Proposal**		**Remarks**
			SoC-Item No. *	**Rates as per SoC * (a)**	**Qty. (b)**	**Total Amount (Rs) (a*b)**	
A	**Geological Mapping Other Geological Work & Surveying**						
	Geological mapping, (1:12,500 scale) & Trenching , drilling work						
i	a. Charges for Geologist per day (Field) for geological mapping & trenching work, drilling work	day	1.3	11,000	150	16,50,000	
ii	b. Labours Charges; Base rate	day	5.7	522	300	1,56,600	Amount will be reimbursed as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher.
iii	c. Charges for Geologist per day (HQ)	day	1.3	9,000	60	5,40,000	

iv	d. Charges for one Sampler per day (1 Party)	one sampler per day	1.5.2	5,100	60	3,06,000	
v	e. Labours (4 Nos)	day	5.7	522	240	1,25,280	
	Sub Total- A					**27,77,880**	
B	**Ground Geophysical Survey**						
a	IP. Induced Polarization (I.P) cum Resistivity S.P and Magnetic (30 Lkm)	8-10 Line Km	3.4 b	14,48,693	1	14,48,693	
b	Geophysicist party days (Field)	per day	3.18	11,000	45	4,95,000	
c	c. Labours Charges	day	3.18	522	90	46,980	
d	Geophysicist party days (HQ)	per day	1.3	9,000	10	90,000	
	Sub Total- B					**20,80,673**	
C	**Survey work**						
a	DGPS Survey for BH fixation & RL determination	Per Point of observation	1.6.2	19,200	15	288000	14 Boreholes and 1 Base station = 15 (Total)
b	Charges of Surveyor (1 party) for Geophysical survey layout work & Block boundary demarcation	one surveyor per day	1.6.1.a	8,300	15	124500	
c	Labours Charges for survey work;	day	5.7	522	30	15660	

	Sub-Total C					**4,28,160**	
D	**Trenching/Pitting**						
a	Excavation of Trenches	per cu.m	2.1.1			0	
E	**DRILLING (after review)**						
1 (a)	Drilling up to 300m (Medium Hard Rock)	m	2.2.1.3 a	10,100	300	30,30,000	4 Boreholes are falling under the Quartz Biotite Schist
1 (b)	Drilling up to 300m (Hard Rock)	m	2.2.1.4.a	11,500	300	34,50,000	4 Boreholes are falling under Micaceous Quartzite and 6 Boreholes are falling under Dolomite
1 (c)	Drilling up to 300m (Hard Rock) (300m-600m)	m	2.2.1.4.b	12,420	300	37,26,000	
1 (d)	Drilling up to 300m (Hard Rock) (600m-900m)	m	2.2.1.4.c	13,225	40	5,29,000	
2	Borehole deviation Survey by Multishot Camera	m	2.2.6	340	940	3,19,600	
3	Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6	20,000	14	2,80,000	
4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7 a	2,000	14	28,000	
5	Transportation of Drill Rig & Truck associated per drill (2 rigs)	Km	2.2.8	6,000	60	3,60,000	
6	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	3	1,50,000	

7	Drilling Camp Setting Cost	Nos	2.2.9 a	2,50,000	1	2,50,000	
8	Drilling Camp Winding up Cost	Nos	2.2.9 b	2,50,000	1	2,50,000	
9	Road Making (Flat Terrain)	Km	2.2.10 a	22,020	15	3,30,300	
10	Drill Core Preservation	per m	5.3	1,590	300	4,77,000	
	Sub Total E					**1,31,79,900**	
F	**Borehole Geophysical Logging**	5 Bhs of 350m each	3.11	-	-	-	
G	**LABORATORY STUDIES**						
1	**Chemical Analysis**						
i)	**Geochemical Sampling-Surface samples (Bedrock/Soil/Stream sediment)**						
a)	a. Proximate analyses of BRS for Graphite, VM, FC, Moisture & Ash	Nos	4.1.16	3,000	300	9,00,000	Systematic grid pattern (100 m X 100 m) will be adopted
b)	b. Analysis of 14 radicals viz Al2O3, SiO2, Fe2O3, TiO2, P2O5, V2O5, LOI, MnO, CaO, MgO, K2O, Na2O, SO3, Cr2O3 & LOI	Nos	4.1.15 a	4,200	300	12,60,000	
ii)	**Surface Check samples (15% External)**						

a)	a. Proximate analyses of BRS for Graphite, VM, FC, Moisture & Ash	Nos	4.1.16	3,000	45	1,35,000	15 % of the Primary samples
b)	b. Analysis of 14 radicals viz Al2O3, SiO2, Fe2O3, TiO2, P2O5, V2O5, LOI, MnO, CaO, MgO, K2O, Na2O, SO3, Cr2O3 & LOI	Nos	4.1.15 a	4,200	45	1,89,000	
iii)	**Trench & Check Samples from Trench**						
	Channel Samples						
a)	a. Proximate analyses of Channel Samples for Graphite, VM, FC, Moisture & Ash	Nos	4.1.16	3,000	512	15,36,000	Systematic channel sampling will be done across the ore body
b)	b. Analysis of 14 radicals viz Al2O3, SiO2, Fe2O3, TiO2, P2O5, V2O5, LOI, MnO, CaO, MgO, K2O, Na2O, SO3, Cr2O3 & LOI	Nos	4.1.15 a	4,200	512	21,50,400	
iv)	**Trench Check samples (15% External)**						
a)	a. Proximate analyses of Channel Samples for Graphite, VM, FC, Moisture & Ash	Nos	4.1.16	3,000	77	2,31,000	

b)	b. Analysis of 14 radicals viz Al2O3, SiO2, Fe2O3, TiO2, P2O5, V2O5, LOI, MnO, CaO, MgO, K2O, Na2O, SO3, Cr2O3 & LOI	Nos	4.1.15 a	4,200	77	3,23,400	15 % of the Primary samples
v)	**BH Core samples**						
a)	a. Proximate analyses of Drill core Samples for Graphite, VM, FC, Moisture & Ash	Nos	4.1.16	3,000	300	9,00,000	A care will be taken for Systematic core preservation
b)	b. Analysis of 14 radicals viz Al2O3, SiO2, Fe2O3, TiO2, P2O5, V2O5, LOI, MnO, CaO, MgO, K2O, Na2O, SO3, Cr2O3 & LOI	Nos	4.1.15 a	4,200	300	12,60,000	
vi)	**BH Core samples (15%External)**						
a)	a. Proximate analyses of Drill core Samples for Graphite, VM, FC, Moisture & Ash	Nos	4.1.16	3,000	45	1,35,000	15 % of the Primary samples
b)	b. Analysis of 14 radicals viz Al2O3, SiO2, Fe2O3, TiO2, P2O5, V2O5, LOI, MnO, CaO, MgO, K2O, Na2O, SO3, Cr2O3 & LOI	Nos	4.1.15 a	4,200	45	1,89,000	

2	**Physical & Petrological Studies**						
i	Preparation of thin section	Nos	4.3.1	2,353	10	23,530	Petrography studies of all litho-units
ii	Study of thin section	Nos	4.3.4	4,232	10	42,320	
iii	Preparation of polish section	Nos	4.3.2	1,549	10	15,490	
iv	study of polished section	Nos	4.3.4	4,232	10	42,320	
v	Digital Photographs	Nos				-	
vii	Bulk Density	Nos	4.1	3,540	10	35,400	
	SEM Studies	per hour				-	
viii	EPMA studies	per hour				-	
						93,67,860	
H	**Total A to G**					**2,78,34,473**	
I	**Geological Report Preparation**	**5 Hard copies with a soft copy**	**5.2**	**5.2 (i/ii/iii/iv)**		**8,35,034**	Reimbursement will be made after submission of the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.
J	**Peer review Charges**		**As per EC decision**			**30,000**	

K	**Preparation of Exploration Proposal (5 Hard copies with a soft copy)**	**5 Hard copies with a soft copy**	**5.1**	2% of the Cost or Rs. 5.0 Lakhs whichever is less		**3,80,000**	EA will be reimbursed after submission of the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC-NMET in its meeting while clearing the proposal.
L	**Total Estimated Cost without GST**					**2,90,79,507**	
M	**Provision for GST (18% of J)**					**52,34,311**	GST will be reimburse as per actual and as per notified prescribed rate
N	**Total Estimated Cost with GST**					**3,43,13,818**	
				or Say Rs. In Lakhs		**343.14**	
Note:							
1	**Strict adherence to the Ministry of Finance's and GFR guidelines is mandatory. Every transaction must adhere to GFR rule 21.**						
2	**In case of delay/non- performance, the appropriate action will be taken by competent authority against delinquent agency as per prevailing govt. of India rules/guidelines on procurement.**						
3	**If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execusion of the project by NEA on its own, a Certifiate regarding non outsourcing of any component/project is required.**						
4	**Necessary efforts should be made to minimize any adverse impact on the environment during exploration activities.**						
5	**Any item of work not mentioned above shall be added as per SoC.**						
*****	**SoC Item No, Unit and Rate for each item of work must be as mentioned in the SoC.**						