

REPORT ON RESOURCE ASSESSMENT
K1 GRAPHITE MINE SITE
AT KARASNAGALA OFF ATTANAGALLA
GAMPAHA DISTRICT
SRI LANKA



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Terms and Definitions

“CYL” refers to **CEYLON GRAPHITE CORP.** from Vancouver, British Columbia, Canada;

“GSMB” refers to the **Geological Services and Mining Bureau** of Sri Lanka, Colombo Sri Lanka;

“K1” refers Karasnagala Graphite Occurrence, Sri Lanka

Units in the **C.D.G.C. Inc.’s** report are in metric units unless as otherwise specified.

Precious metal content is reported in grams of metal per metric tonne (g/T Au or Ag) except as otherwise stated. Tonnage figures are dry, metric tonnes unless otherwise stated. Reference to base metals reported in weight percent or in parts per million (ppm) metal. **Graphite or Organic Carbon (Cg) content is expressed in weight percent.**

The weight, the measurement as well as the currency convention which is used in the course of this study is in conformity with the nomenclature of the international system (IS).

The cartographic reference system used for local mapping and drawing is Universal Transverse Mercator

Datum: UTM WGS84 zone 44N, Geoid

Coordinates: Local Grid (Kandawala Sri Lanka _

Elevation: -31.960m, CGG2013a

Magnetic Declination: 02° 2.40’ W changing by 0° 3.2’ E per year. UTM Grid Declination: 1° 55.08’ W.

Magnetic Field: 40683 H(nT)

Ellipsoid Elevation: 111m. Orthometric Elevation: 142.960m

Introduction

CEYLON GRAPHITE CORP. (“CYL”), from Vancouver, British Columbia, Canada, has obtained the right to explore for graphite in the Gampaha area in Sri Lanka and after a successful exploration program the company has obtained the mining rights with Industrial Mining License (A category) in the area called Karasnagala off Attangalla of Gampaha District in Sri Lanka under its daughter Company Sarcon Development Pvt Ltd Sri Lanka. The site was named as the K1 site. While starting the mining activities the company is carrying out further exploration in the site in order to update the resources. The present report is to update the resource evaluation while continuing the exploration and mining activities in the area.

1.0 Project Background

Sarcon Development (Pvt) Ltd. has obtained Initial Exploration License (EL/222 – valid from 28.01.2013 to 27.01.2015) and Renewed Exploration Licenses (1st and 2nd time) (EL/222/R/1 – valid from 22.07.2015 to 21.07.2017 & EL/222/R/2 – valid from 26.09.2017 to 25.09.2019) and this has been extended for another two years from the Geological Survey and Mines Bureau (GSMB) covering 27 Grid Units around Aruggammana –Asiyadeniya areas in the Kegalle District and the Urapola – Pasyala areas in Gampaha District in order to conduct an exploration program to identify graphite mineralization and to assess the economic viability of identified graphite occurrences within the reserved grid units (Fig – 1). The Geological Survey & Mines Bureau (GSMB) has the authority to consider the issuance of mining license under the section 35(1) of the Mines & Minerals Act (No 33 of 1992).



Fig. 1: Location Map showing the Project Area

After obtaining the exploration license (initial and renewed), Sarcon Development (Pvt) Ltd. initiated an exploration program, covering the reserved grid units. This comprised a reconnaissance survey, detailed geological mapping, geophysical investigations, land surveying, rehabilitation of old workings, core drilling, sample analysis and data evaluation. Based on the results of the detailed exploration program, a promising area for graphite mineralization was discovered at the Karasnagala area (covering abandoned Gal Pathala Mine Complex) in Attanagalla. The company is conducting a series of exploration activities in the permitted zone with the objective of identifying the most suitable sites for establishment of mines. K1 site is one of the sites identified for starting a mine. Presently, the mine operation is continuing with the development of an underground mine. While continuing the mine development activities some deep level explorations are also in progress.

According to a former worker who lives in the vicinity of the abandoned Gal Pathala Mine Complex, mining activities in the main Gal Pathala mine at Karasnagala village were conducted in the 1830's. This currently abandoned mine was located within the Nikahetikanda ridge structure. Three vertical shafts (one major and two moderate) were identified in this mine and were located on the top of the approximately 100m high, Nikahetikanda ridge structure while two observed main adit structures were located on the downward NW hill slope. A number of shallow pits were also identified surrounding the main Gal Pathala mine site and were located within a 500m radius of the main mine.

Steam turbines were used to generate the compressed energy, needed for drilling inside the shafts and cross-cut tunnels. The main shaft was driven up to 28Fm (90.5m) depth to construct a room in which to install a winch and also for mucking purposes. According to the former worker, several adits and crosscuts were driven in different directions from the winch room. Below the winch room another vertical shaft up to a depth of about 10Fm (18m) was constructed. When the mine was in operation, a number of graphite veins were discovered at different levels within the main shafts.

According to the former worker, good quality needle type semi-crystalline graphite veins between 6 inches to 1.5 feet thick were observed within this mine at different levels. He further mentioned that a considerable amount of economically viable graphite could be mined from the remaining parts of the vein system in this mine, if the mining activities were recommenced in a manner. In addition, a substantial amount of graphite could also be mined by extending the mining activities further down into the abandoned surrounding shallow pits.

By considering the widespread nature of graphite mineralization covering the Gal Pathala mine complex at Karasnagala area based on historical records together with the results of the detailed exploration program conducted by the Sarcon Development (Pvt) Ltd., the management of Sarcon Development (Pvt) Ltd. has decided to develop a mine at Karasnagala area by utilizing the identified remaining graphite bearing vein systems.

The proposed mining site at Karasnagala is located within the Administrative District of Gampaha and the Divisional Secretariat of Attanagalla. It lies within the Attanagalla Pradeshiya Sabha limits and Grama Niladhari Division of Karasnagala.

2.0 Graphite Mining in the Country (Historical Background)

The existence of graphite in Sri Lanka has been known for a several centuries. The first record was in 1675 when the Dutch Governor Rykloft Van Geon's in writing to his successor, mentioned the existence of Graphite in Sri Lanka. There is also hearsay evidence that during the Kandyan era, iron ore had been melted in graphite crucibles.

Trade in graphite, mainly for the pencil industry, seems to have been in existence from the 16th century. But it is only during British times that this mineral was mined and exported, to be used in making crucibles for the casting of bomb shells and cannon balls. Graphite has been exported from Sri Lanka for the last 160 years, and in 1899 the mineral earned Rs. 2.2 million which was 22% of the total foreign exchange earnings at that time.

Before World War II 2,500 graphite pits and mines had been located in the South West and Central Highlands in Sri Lanka, but now only two underground mines and a few experimental mines are in operation.

In 1974 Mr. Rex A. Casinader carried out a study on the "Evaluation of the Graphite Industry in Sri Lanka" and categorized the 1850 to 1973 period into three phases.

- (i) The fledgling phase (1850s to 1870)
- (ii) The prosperity and maturity phase (1870 to 1917)
- (iii) The decline and selective phase (1917 to 1973)

(i) The fledgling state

From about the middle of the nineteenth century to the early 1870's there was a period during which graphite established itself as one of the minor export industries of the island. Among the factors contributing to the development of the graphite industry at this stage, was the growing demand for Sri Lankan graphite due to its high carbon content. This high-quality graphite was particularly required by the crucible industry which was rapidly emerging in Great Britain and USA perhaps activated by the American civil war.

(ii) The prosperity and maturity stage

The period from 1869 to 1918 may be characterized as a period of great activity for the graphite industry in Sri Lanka. This was the period that witnessed the exploitation of nearly 3,000 scattered graphite pit mines in the south-western quarter of the island, the crystallization of mining methods, viz the pit mines with mechanical aids ("mol pathal") and primitive pit mines operated manually (dabare pathal). It is a matter for conjecture whether some of the graphite mining methods were borrowed from traditional gemming methods and practices. Gemming has been carried out in Sri Lanka from ancient times and by the mid-19th century, when graphite mining was entering the fledgling stage, there was in active existence an established traditional system of gemming.

(iii) The decline and selective maturity

From 1917 to the present day, the graphite industry declined from being one of the major exports of Sri Lanka. In 1912 some graphite which matched the quality of that in Sri Lanka, was discovered in Madagascar. This resulted in stiff competition as the Madagascar graphite could be extracted at a lower cost. The Sri Lankan production declined slowly but inexorably, with some periods of revival during World War I and II.

The share of Sri Lanka, which had been half the world trade in graphite prior to 1912, fell to less than 2 per cent in 1980.

The State Graphite Corporation of Ceylon was established in 1971, after the nationalization of the graphite industry. On this occasion the three mines of Kahatagaha, Kolongaha and Walakatahena were grouped into a single entity, the Kahatagaha-Kolongaha Mine. The Bogala mine was already the result of the merger of several old small mines, producing from the same ore bodies.

At first these two mines were the sole producing units of the new corporation known as the State Mining and Mineral Development Corporation. The experimental graphite mine at Rangala was opened in 1973. The one at Ragedera was opened in 1976. After a few years of operation, the Rangala and Ragedara mines were abandoned.

Status of Graphite Mining in Sri Lanka from 1980 – to date

In the eighties, the only two graphite mines existing in Sri Lanka were the Kahatagaha – Kolongaha and Bogala mines and both mines were operated by the State Mining and Mineral Development Corporation.

In 1989, the Kahatagaha –Kolongaha mine was privatized and after a further few years of working, it was abandoned.

In 1996, the Kahatagaha –Kolongaha mine was taken over by the government and currently it is being run smoothly with a limited production (average of 600 – 1,000 metric tons per year).

In 1992, the Bogala mine was privatized and was taken over by a German company. At present, the mine is in operation with fair production (average of 3,000 – 5,000 metric tons per year).

Between 2000 – 2003 period, the Aluketiya mine was operated by a private firm and in 2003 it was abandoned.

Ragedara mine, which was abandoned in the early 1980s, was recommenced in 2011 as an experimental mine with limited production.

Abandoned Graphite Mines / Pits within the Proposed Exploration Area

The proposed exploration area can be described by a single zone as shown in Figures

– 1 & 2. Preliminary field investigations were conducted within the grid units covered by the selected area. A number of abandoned main mines were identified within these proposed grids. In the close vicinity of these main mines, a considerable number of abandoned shallow pits were also identified. All of these abandoned mines will be studied in detail during the proposed exploration program.

Some of the abandoned shafts and adit structures are shown in the following photographs (Plates: I - IV). During the preliminary field investigations it was observed that most of the abandoned mines (vertical shafts and horizontal adits) were filled with debris material.

Graphite-bearing rock garments could be seen within the dumped debris materials of the abandoned graphite mines in the proposed exploration area.

In 2019 the K1 mine site in the Gampaha district was commenced.

The following map (Map 2_ shows the current graphite mines in Sri Lanka

Current graphite mines in Sri Lanka

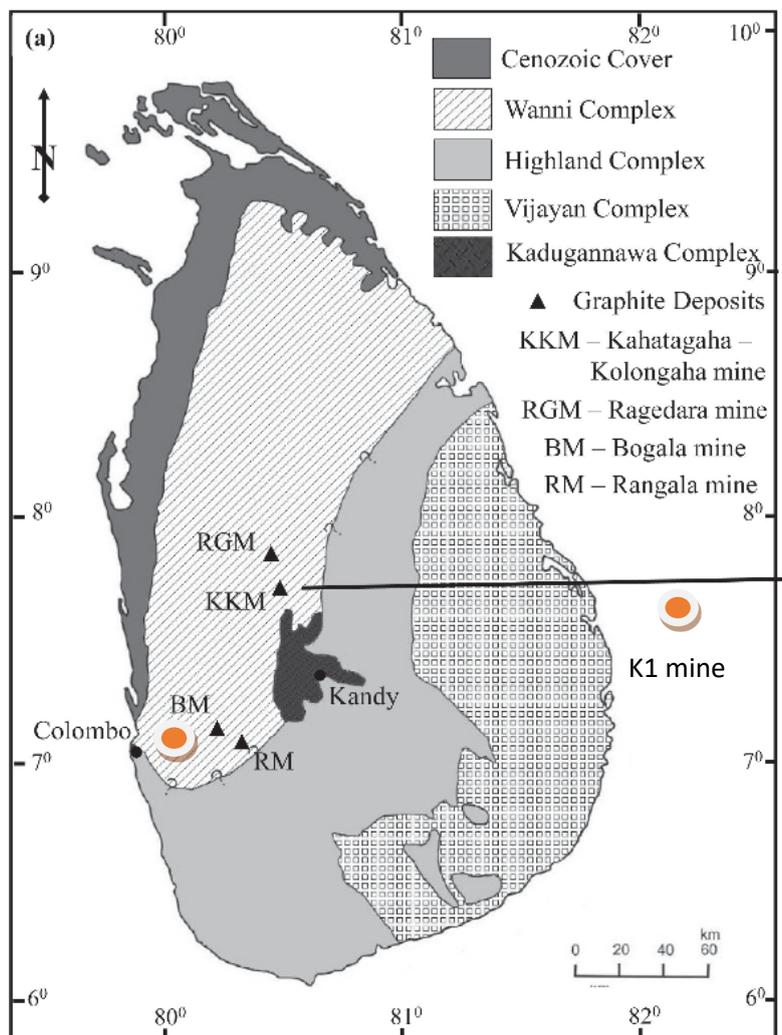


Fig 3: Map showing the major geological subdivisions of Sri Lanka (after Cooray, 1994) with the locations of presently mining graphite deposits and the updated K1 site.

3.0 Location and Physiographic condition

3.1 Location

The Ki1 site is located about 50 km east of Colombo, the capital city of Sri Lanka on the western side of the island. The area is not highly populated but a [pattern of mixed land use is

Administrative and Locational Details

Province: Western Province

District: Gampaha

Divisional Secretariate : Attanagalla

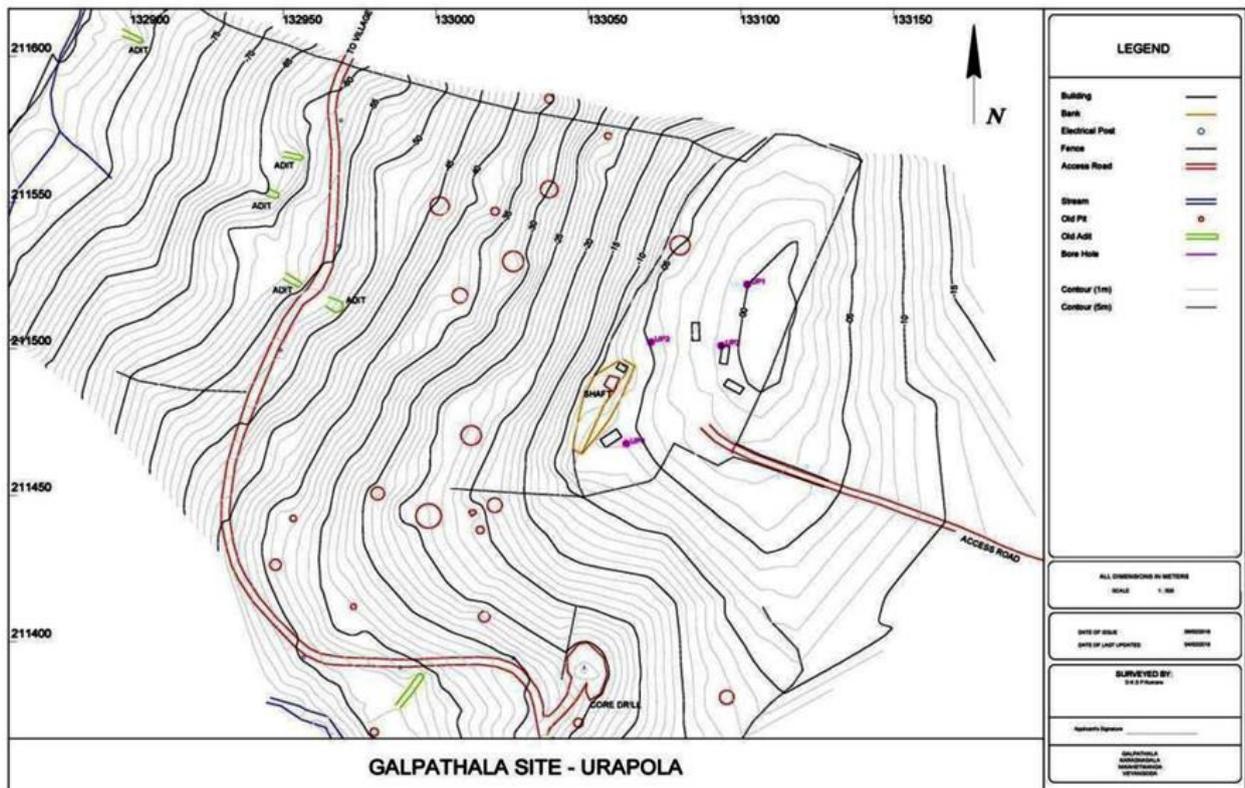
GN Division: Karasnagala

Name of the Mining site: “Gal Pathala” underground graphite mine Reference GPS point:

Latitude 7°6'15.086", Longitude 80°10'3.77

dominant.

Figure 4: Site plan with contour map



3.2 Accessibility

The exploration site is situated on the Veyangoda- Ruwanwella road, approximately 4 km from the Urapola junction towards Ruwanwella. The access from the Urapola junction to the exploration site is shown in Fig. 5.



Fig 5: Map showing access roads to the site K1

3.3 Topography

Topographically, the area covered by the proposed project and its surrounding belongs to the middle peneplain of Sri Lanka. The relief of the area varies from 65 – 125m MSL, (Figures – 4). The presence of ridge and valley topography is a characteristic feature encountered in and around the project area (Figures – 4 and Plate – 2.1). The proposed mine is situated on the SW- directed downward slope of the northwest-southeast trending ridge structure (Plate – 3.1A).



Plate – 3



Plate – 4

Plate –3: Showing the presence of ridge and valley topography in and around the project area

Plate – 4: The Proposed mine is situated on the SW-directed downward slope of the northwest-southeast trending ridge structure

The Karasnagala region can be considered as an undulating ridge and valley province. The relief varies substantially over short distances resulting in a great diversity of physiographic features within a comparatively small area.

It should be noted that several valleys are present at the study area mainly along two directions. Some of the valleys are developed parallel to the strike direction of the rock (northwest-southeast) and some valleys are developed along the northeast-southwest direction (these could be possible pre-existing fracture zones).

During this topographic survey, important structures such as old workings have also been identified and plotted on the topographic sheet. (Fig 7).

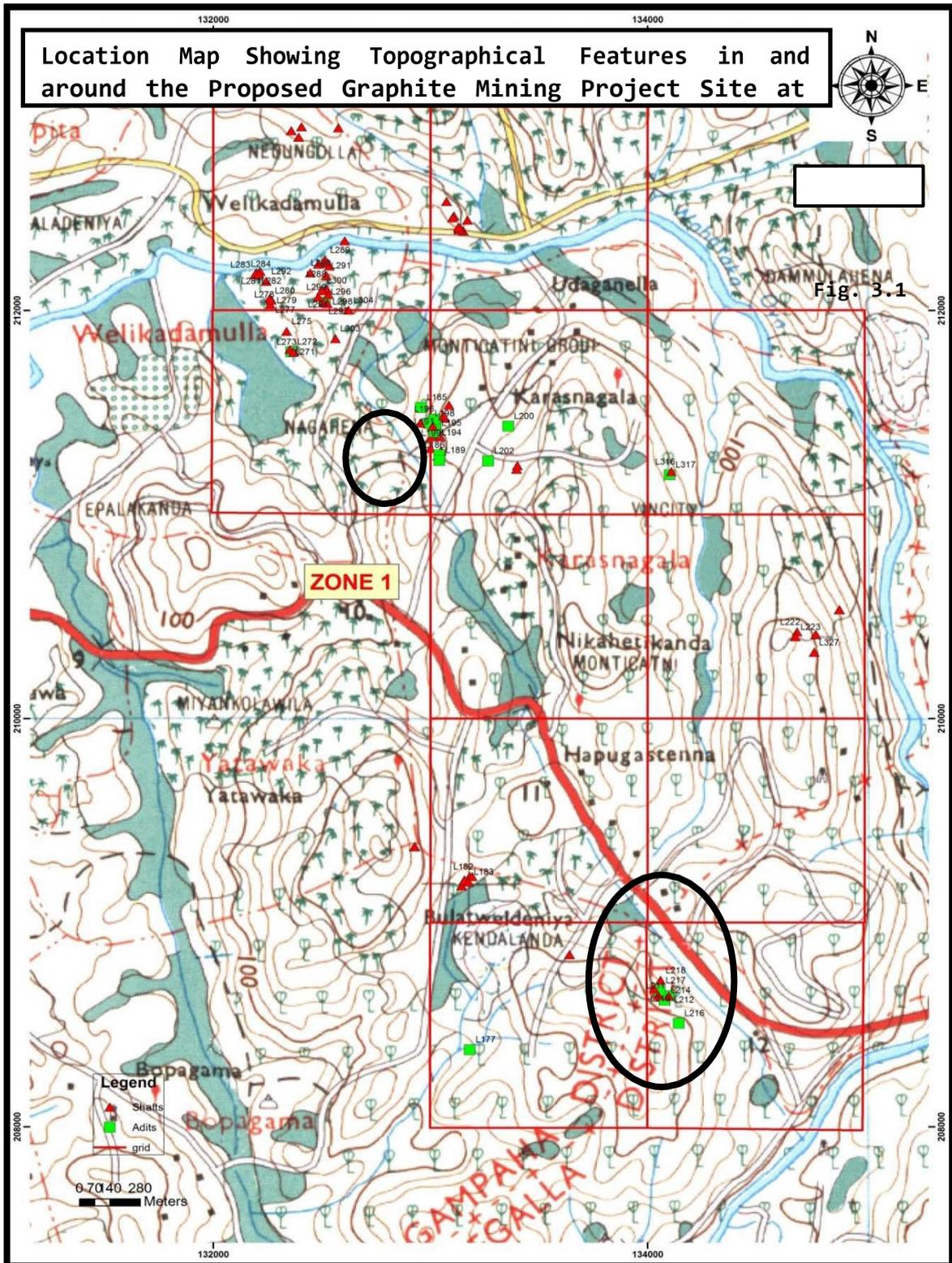


Fig 6: Topographic map (1:50000 scale) showing exploration grid units.

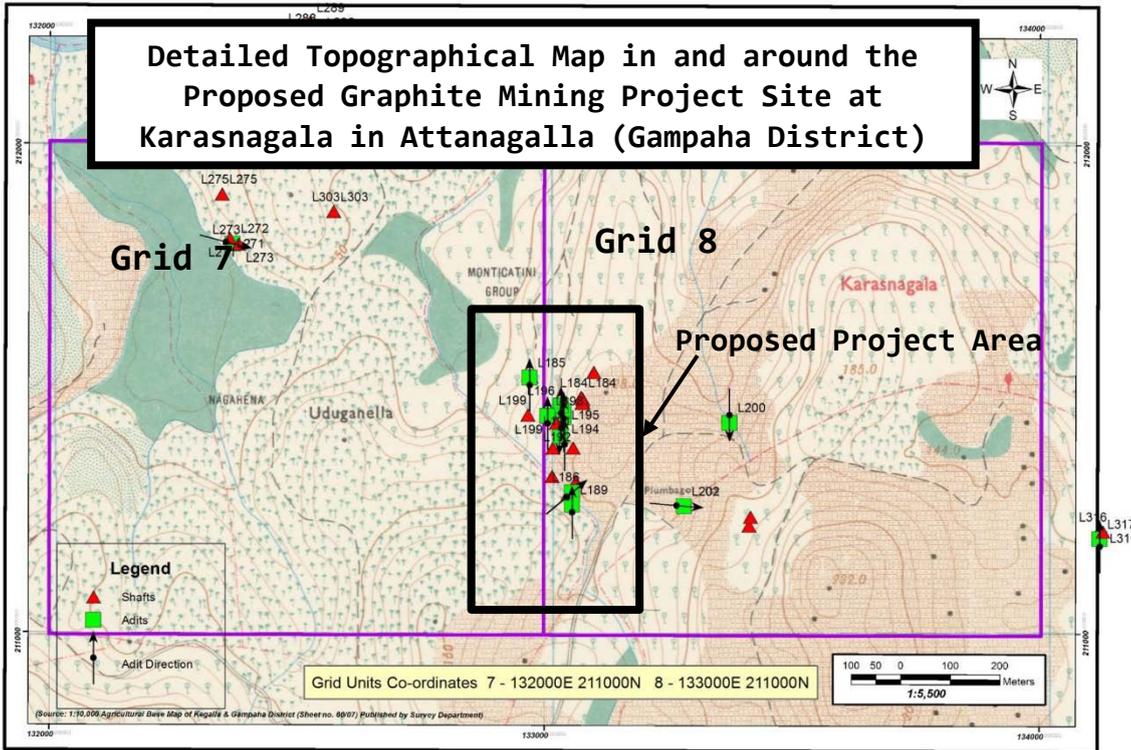


Fig 7: Map (1:10000 scale) showing old mine workings.

3.4 General Geology of the Area

Ninety percent of the island of Sri Lanka is underlain by Proterozoic high-grade metamorphic rocks with Miocene sediments (limestone) being restricted to a narrow strip fringing the NW, N and NE coastal regions. Geologically, the Precambrian metamorphic crust of Sri Lanka can be sub divided into three major lithotectonic units, namely the Highland Complex (HC), the Vijayan Complex (VC) and the Wannu Complex (WC). A simplified litho-tectonic map of Sri Lanka is shown in Figure – 3.2.1.

According to the above nomenclature, except for a few thin pegmatites, the entire study area is located within the Wannu Complex, in close proximity to the transitional zone of the Wannu and Highland Complexes (Fig. – 3.2.1).

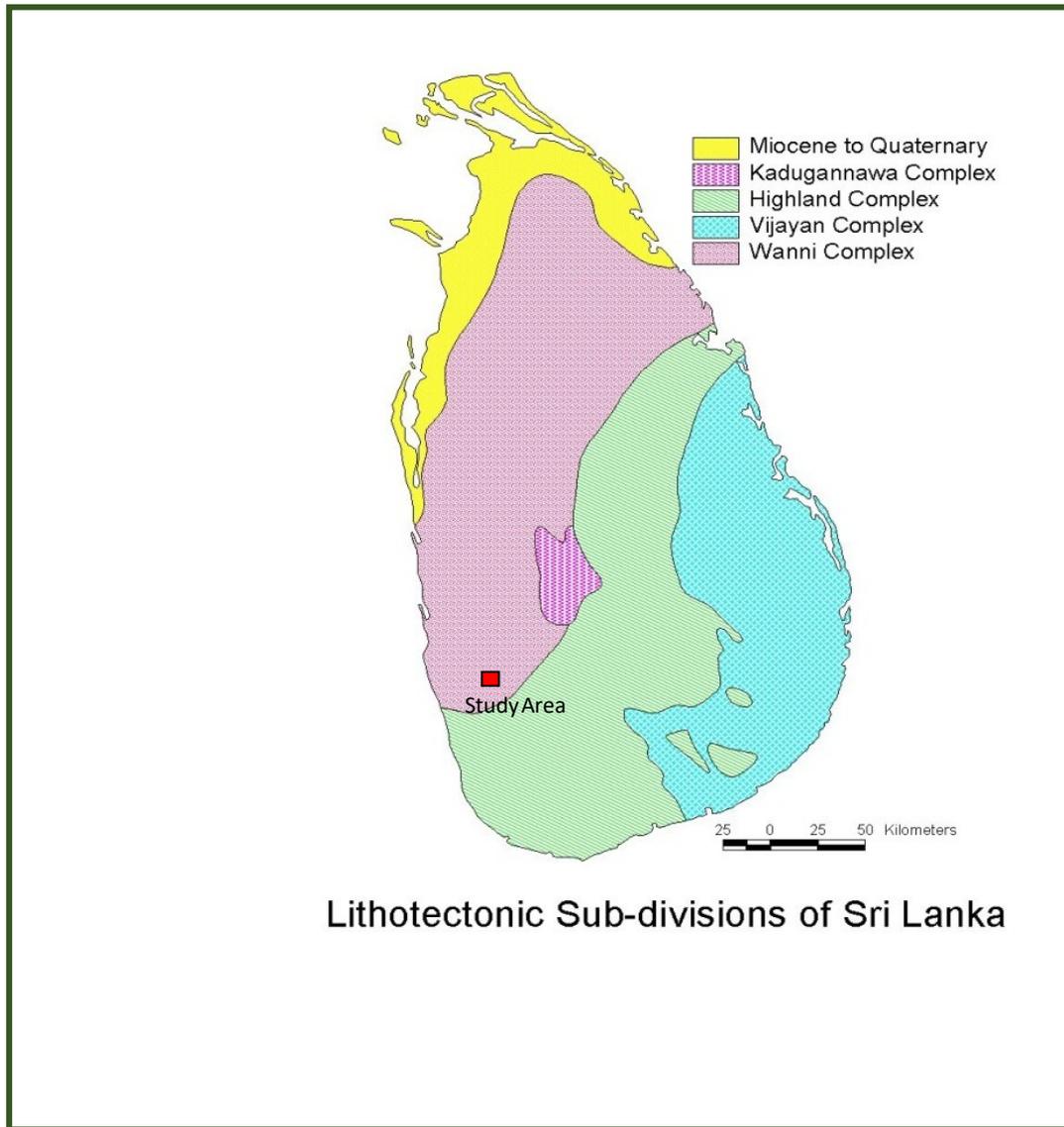


Fig 8: Simplified Geological Map of Sri Lanka, Note: The study area is highlighted within the red box

A substantial part of the Wannai Complex is made up of amphibolite facies rocks but the areas adjacent to the Highland Complex are of granulite grade and includes both charnockite and meta-pelites. There is no clear structural break between the rocks of the Highland and Wannai Complexes. Therefore, precisely defining the boundary between Highland and Wannai Complexes is not possible at the present moment. However, isotopic data indicates that the two Complexes are different. The WC is considerably younger than the rocks of the HC and also records lower metamorphic pressures. Zircon ages for foliated Wannai granitoids are between 1000 – 1100 Ma with a metamorphic overprint at 560 Ma (Kroner et. al. 1991) while the depositional age of HC rocks is 2000 Ma. The Wannai Complex is characterized by thick sequences of ortho-gneisses comprises of migmatitic, granitic and granodioritic gneisses. In the northeast section of the Wannai Complex, granulite-grade

variants such

as charnockitic rocks and minor granulite-grade metasediments are common. These rocks were introduced by a K-feldspar-rich melt in the later stages. Calc- gneiss bands can be identified but are not traceable for significant distances.

The metamorphic grade of the Wannu Complex is distinctly lower than that of the Highland Complex with a distinct gradient into the latter, although regions of the complex exhibit structurally-controlled granulite-amphibolite retrograde transitions and in-situ charnockites.

The area examined in detail falls in the 1: 100,000 scale sheet no.13 (Kochchikade- Attanagalle) published by Geological Survey and Mines Bureau in the year 1996.

Geologically, the area covered by the Karasnagala abandoned mine complex belongs to the Wannu Complex of Sri Lanka. The rocks encountered on a regional scale in and around the Karasnagala abandoned mine complex are charnockite, charnockitic biotite gneiss, garnet sillimanite graphite gneiss, cordierite gneiss, quartzite and granitic gneiss (Fig. 9). These rocks represent the western limb zone of the N-plunging antiformal structure (Fig. 9).

Field observations show that these major rock units vary locally changing from granitic composition to charnockitic gneissic features. Graphite is associated with all the above rock types and mainly occurs in thin quartzite bands within each rock. Graphite was also observed in the lateritic overburden, parallel to the foliation, along joint plains and within pegmatitic intrusions.

Rock bands, about few hundred meters thick extend for a few kilometres around the area and these rocks represent a series of small to medium scale synformal and antiformal structures and intense shear zones, oriented in a NNW-SSE direction in the survey areas. Lineaments are more concentrated in the survey area and they are mostly aligned in the NE-SW direction. The lithological layering mainly extend in an approximately N-S to NNW-SSE direction with an average dip of 40° (Fig. 10). During field investigations it was noted that quarrying activities were previously conducted in some of the small-scale rock exposures.

NNW-SSE trending major shear zones could be identified about 1km west and east of the abandoned graphite mines / pits in the Gal Pathala Mine Complex at Karasnagala.

Geological Map in and around the Project Area

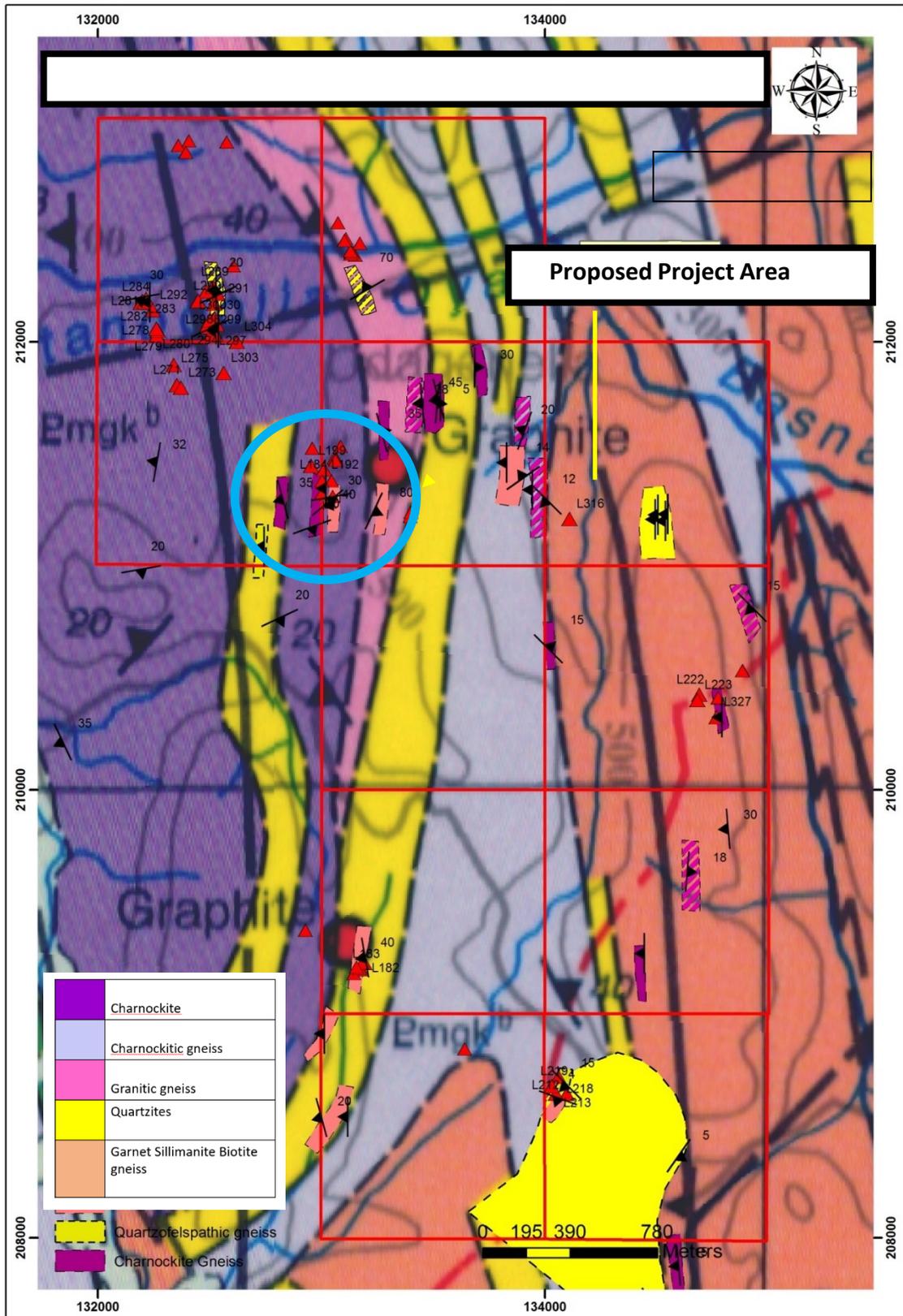


Fig 9 : Geological map of the area (1:100000 scale) published geological map of Kochchikade – Attanagalla (Sheet No. 13)

Detailed Geological Mapping in Grid Number 7 & 8 (Two Grids Covered in and around Karasnagala Area)

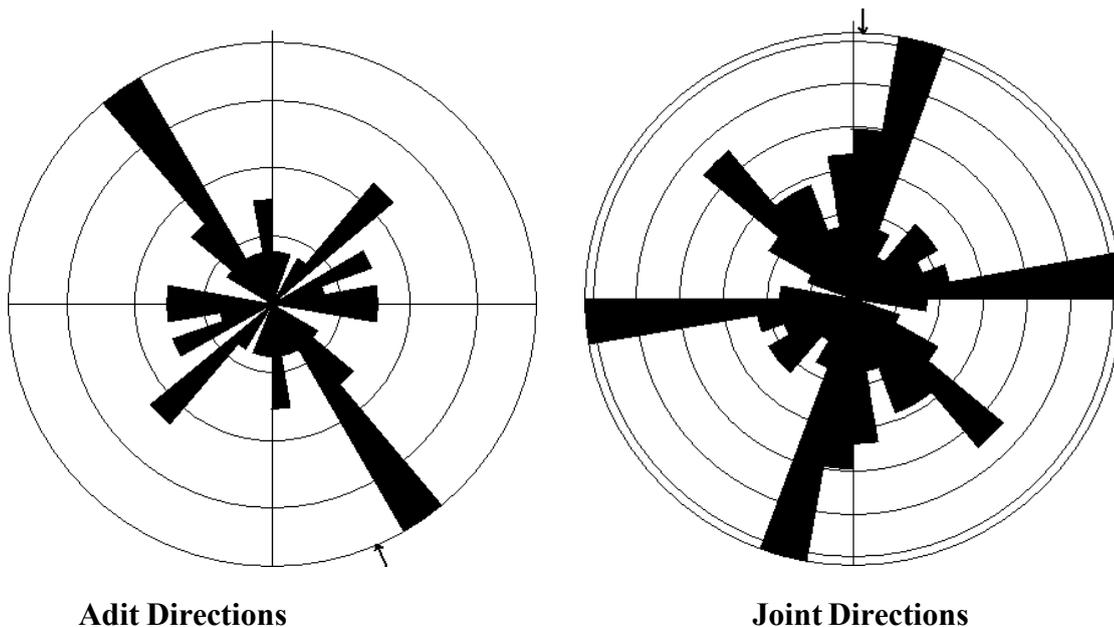
Detailed geological mapping was carried out at 1:10,000 scale. During mapping, special attention was given to record all the available geological and other information about the abandoned adits and shafts. In addition, other geological features, including rock types were identified and noted.

Based on the information gathered during these field investigations, a detailed geological map was prepared and is shown in Fig. 10.

Only a limited number of rock outcrops found in the surveyed area but their details such as strike, dip, and joint directions were meticulously recorded.

3.4.1 Structural Control of Graphite Occurrences

To investigate whether there is any correlation between the joint patterns and adit directions, orientation data were collected from all three areas and are plotted on the following rose diagrams.



The main adit directions show a North –West alignment and a third minor set of joints also extends in the same direction. As the data are scattered into three families, this may not be a conclusive conclusion but locally it was also observed that in most instances the adits follow joint directions.

Detailed Geological Map Showing the Locations of Abandoned Shafts, Adits and Adit Directions in Grids 7 & 8 (in and around the Karasnagala Area)

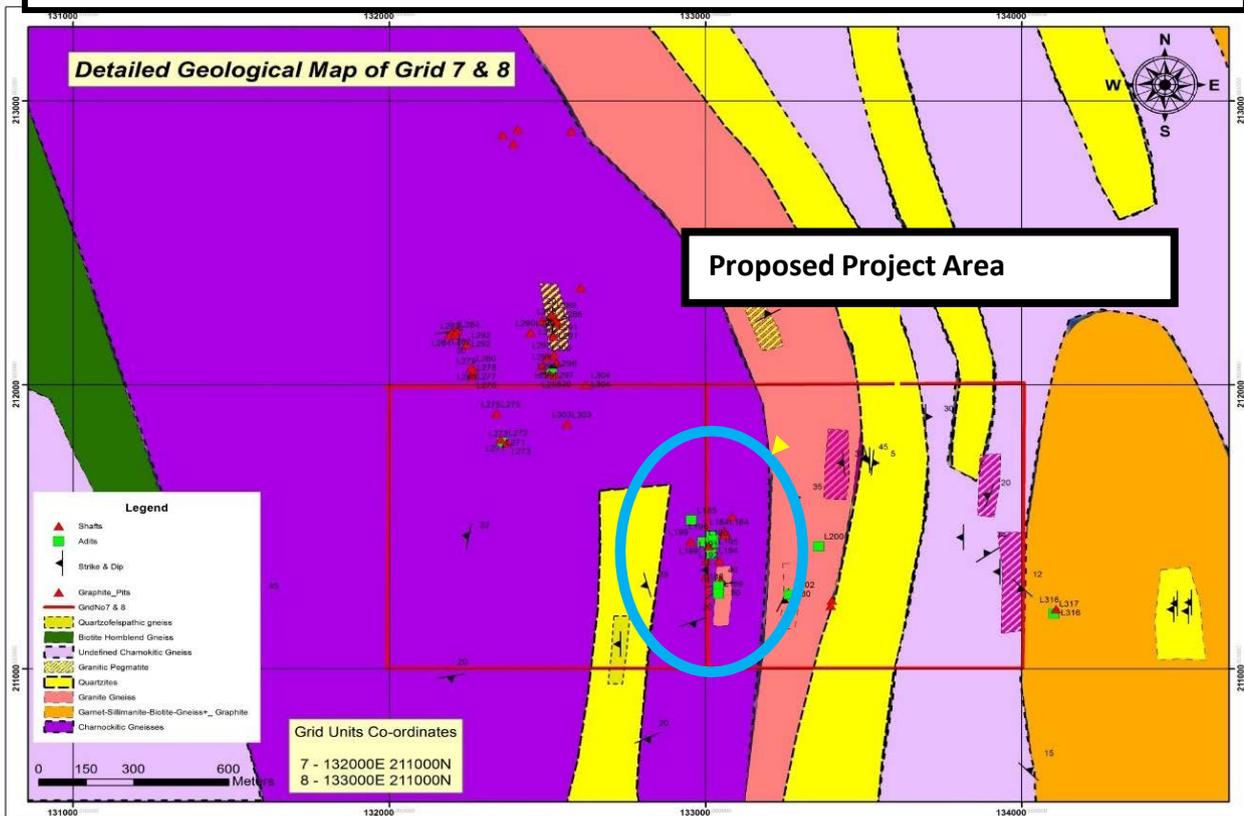


Fig 10: Detailed geological map of the project area

The lithological members and their resistance to various erosional processes strongly affect the topography of this region. The relatively lower ground in the survey area consists of more easily weathered hornblende and biotite rich lithologies, biotite hornblende gneiss and garnet sillimanite graphite gneiss. They form negative features and are usually exposed in the valley bottoms. In addition, different lithologies due to their differing resistance to tropical weathering, have given rise to a series of minor ridges and valleys which are prominent in the area. Ridge-forming rocks, which particularly define the regional structures generally consist of charnockite, quartzite and granitic composition rocks, which are more resistant to erosion.

Charnokitite, feldspathic quartzite rocks and granitic gneiss rocks were observed around the project site and are shown below.



Plate 5: Charnockite rock



Plate 6: Quartzo-feldspathic gneiss



Plate 7: Granitic gneiss

Graphite mineralization in the area is characterized by fairly elevated terrain with lateritic formations



Plate 8: Lateritic formation distributed in the graphite mineralization areas

Pure needle-type graphite is visible in dumped rock fragments in the abandoned mine areas.



Plate 9: Graphite mineralization in the host rock

3.5 Karasnagangala Graphite (K1) Exploration Core Drilling

Under the graphite exploration program of SARCON Development (Pvt) Ltd., Karasnagala's abandoned Gal Pathala Graphoite Mine area has been selected to commence the company's drilling program. This area was selected for the drilling program based on the results of the Geological Mapping exercise conducted by the GSMB during the initial exploration.

Since the results of the geological mapping program was very promising and some of the underground veins were visible in the abandoned mine structures, it was decided to put down drill holes in this area without conducting Geophysical Investigations initially. As the first step of this exploration drilling, it was decided to put down two bore holes through the GSMB to a depth of about 150m and 200m below the ground elevation. The drilling locations, their

directions and angles were decided by the GSMB officials, after studying the exploration and geological reports.

The following photographs show drilling activities conducted by the GSMB and the recovered core boxes.



Plate: 04- After Start drilling

Drilling Detail

Drill hole was drilled to the 35m depth to 75 degree angle.

Drill hole diameter is 48mm (NQ SIZE)

Overburden thickness 6m (depth)

Rock type

Three rock types were identified.

From 6M to 24.9M- Quartz rich Granitic Gneiss.

From 24.9M to 29.60M – Charnockitic Gneiss.

From 29.60M to 34M- Biotite Gneiss.

Four thin graphite veins (2cm thick) were detected in the Biotite Gneiss rock band at the depth of 25.80M, 26.16M, 26.70M, 27.30M, 28.35M, but there are no graphite with core sample because the vein have been washed by drilling water.

Fig 11: Drilling operations

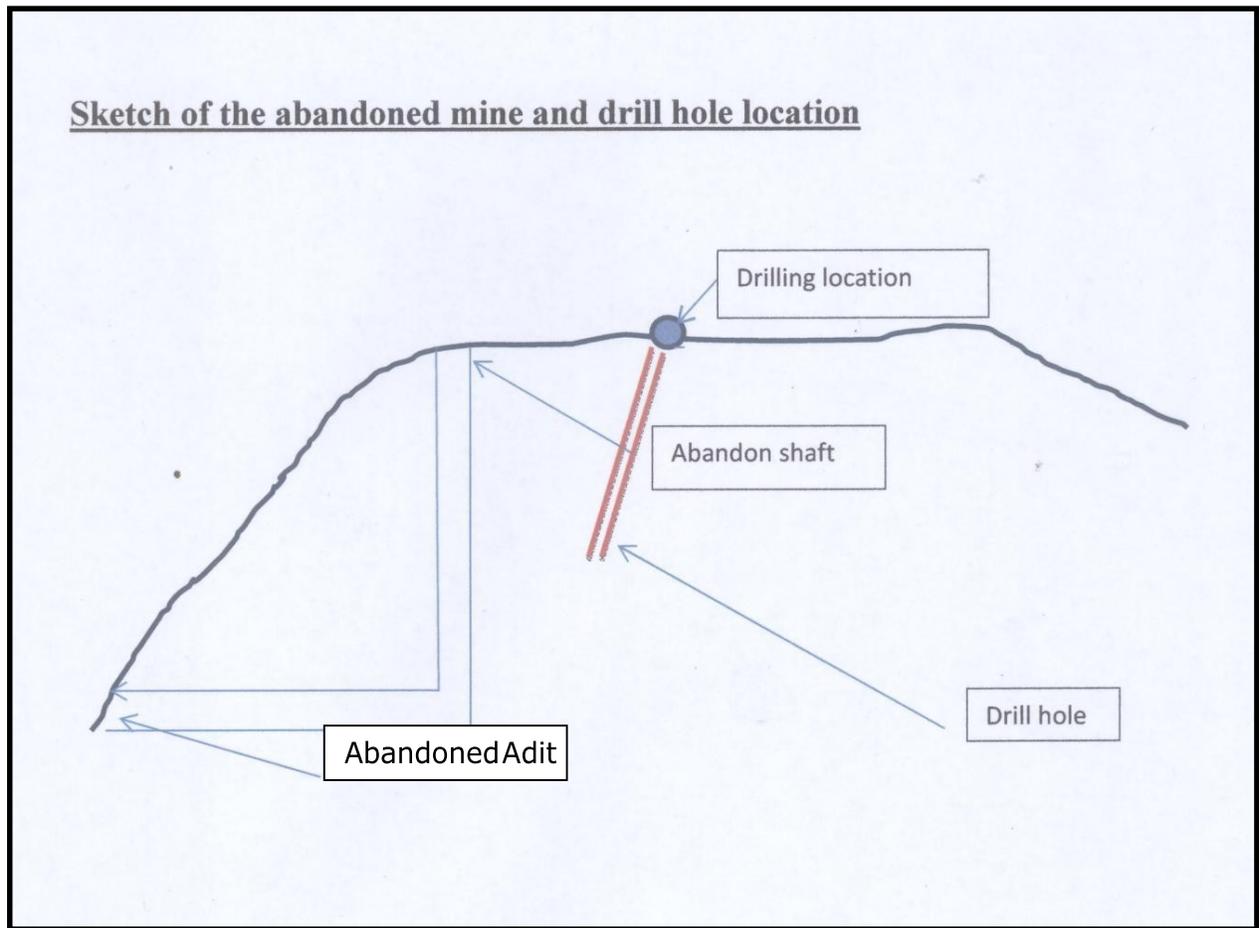


Fig 12: Schematic diagram of the K1 site during initial drill hole planning

In these drill holes, five thin graphite veins were detected in the Biotite Gneiss rock band at depths of 25.8m, 26.1m, 26.7m, 27.3m and 28.3m.

According to the site situation, these veins appear to be at one end of a vein striking from the graphite mineralized zone. Hence, it was decided to move the drilling program to the other side of the main shaft in the ridge structure.

According to the drilling results, field topography and other available evidences, economical veins of graphite should be identified inside the abandoned graphite mine. Therefore, in addition to moving the drilling program to the other side of the main shaft in the ridge structure, it was

also decided to clean the abandoned adit, shaft, tunnel structures and shallow pits within the abandoned Gal Pathala Graphite Mine complex in order to discover extension of vein patterns. After cleaning, a further drilling program is suggested commencing from the cleaned underground structures. In addition, continuing surface drilling program from the top of the ridge structure is suggested, based on the findings of the underground drilling program from the cleaned structures.

The company purchased a new drilling machine in May 2017. After purchasing the drilling machine, management of the SARCON has been able to put down three more drill holes on the other side of the main shaft in the Nikahetikanda Ridge Structure during the remaining period of the First time renewed exploration license.

Plates – 10, 11 & 14 show the new drilling machine and the carrying out of three drill holes (Holes 2, 3 & 4) on the other side of the main shaft in the Nikahetikanda Ridge Structure. Plates – 12, 13 & 15 shows the drill cores recovered from drill holes – 2, 3 and 4 respectively and the depths of the graphite veins observed in them.



Plate – 10: Photograph showing drilling of drill hole no. 2 in the other side of the main shaft

in the Nikahetikanda Ridge Structure



Plate – 11: Photograph showing drilling of drill hole no. 3 in the other side of the main shaft in the Nikahetikanda Ridge Structure



Plate – 12: Photograph showing some drill cores recovered from drill hole no. 2. In this hole, about 5 – 10cm thick graphite veins were observed at 10m, 25m and 50m depths



Plate – 13: Photograph showing some drill cores recovered from drill hole no. 3. Note the presence of an about 1.5m long graphite vein with few cm thick rock layers below 70m depth in this hole. In addition, about 5 – 8cm thick two graphite veins too were observed between 10 and 20m depths



Plate – 14: Photograph showing drilling of drill hole no. 4 on the other side of the main shaft in the Nikahetikanda Ridge Structure



Plate – 15: Photograph showing some drill cores recovered from drill hole no. 4. In this hole, about 5 – 15cm thick graphite veins were observed at 15m and 35m depths

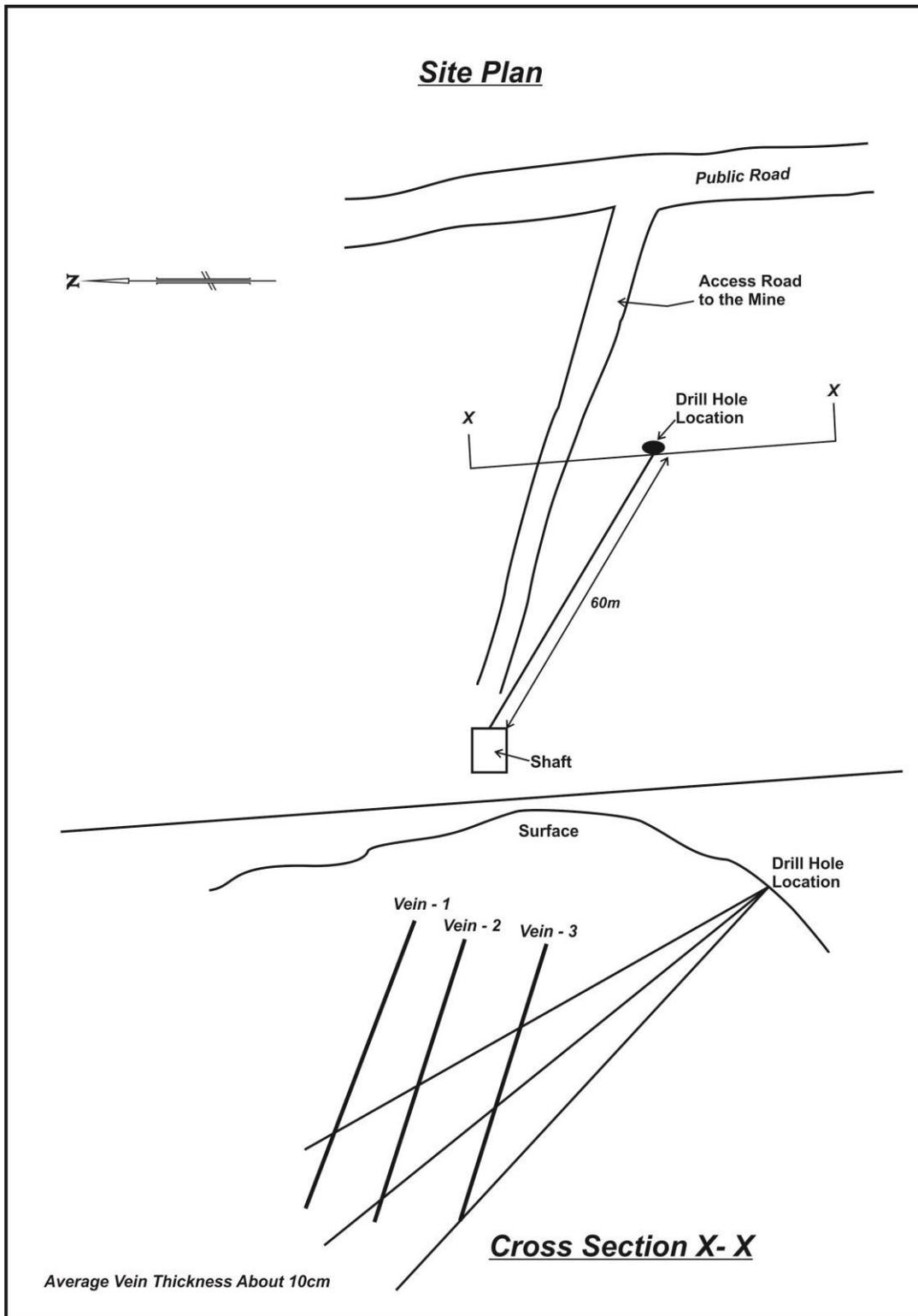


Fig: 12 Schematic diagram showing site map and cross section of graphite veins

Cross Section of the Mine

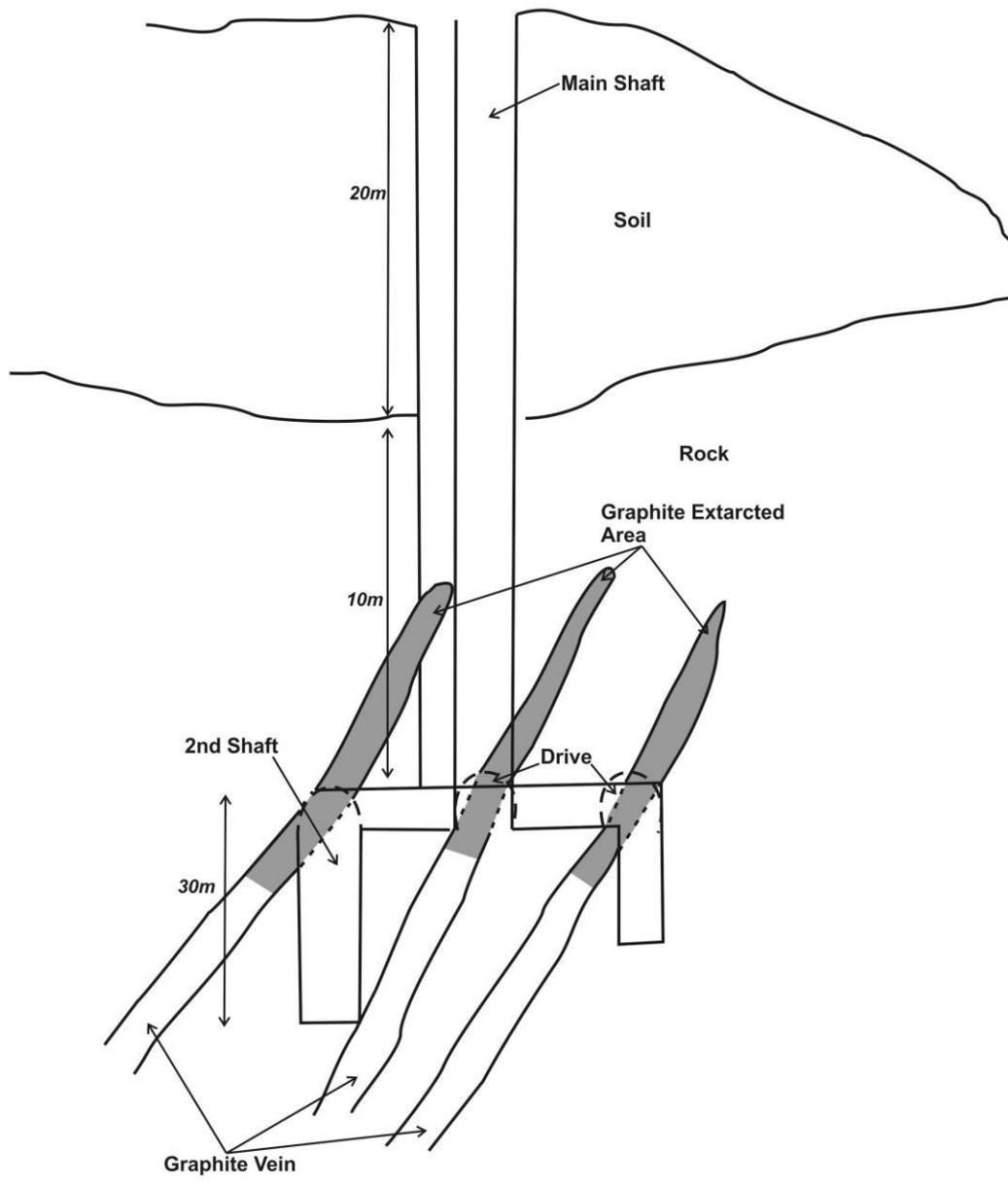


Fig 13 Schematic diagram of the mine.

4.0 Resource Estimates

Historically, graphite mining was prolific in the area. This can be verified with the available surface indications as well as by studying the abandoned mines in the area. Recent core drilling carried out on the property has proved mineralization of graphite in a series of 4 veins (final Graphite Exploration in Karasnagala area) and the area appears to be rich in graphite. Veins are steeply dipping and run NWW-SEE and are extending longitudinally. The total Indicated Ore Resources of graphite within the area covered by Galpathala Graphite Mine Complex has been estimated with the available drilling data and the cleaned main shaft, cross cuts and drives and is around 52,955 metric tons (Table-3).

4.1 Evaluation of Drill Holes

Out of the total of eight drill holes put down within the Galpathala abandoned graphite mine complex, economically viable graphite veins with vein thickness varying from 6 – 30cm were observed in the following six drill holes. Additionally, two holes with minor graphite veins / veinlets were identified.

Table 1: Details of Drill holes driven in the area.

Drill Hole	E	N	Azimuth	Dip	Hole Depth (m)
KRS01	133058	211387	360	(-50.5)	126.96
KRS02	133058	211387	316	(-50)	45.28
KRS04	133058	211387	360	(-55)	168.84
KRS05	133058	211387	316	(-60)	42.38
KRSN01	133102	211423	360	(-70)	219.47
KRSN02	133105	211371	020	(-55)	151.54

Survey Plan of Abandoned Galpathala Graphite Mine Complex

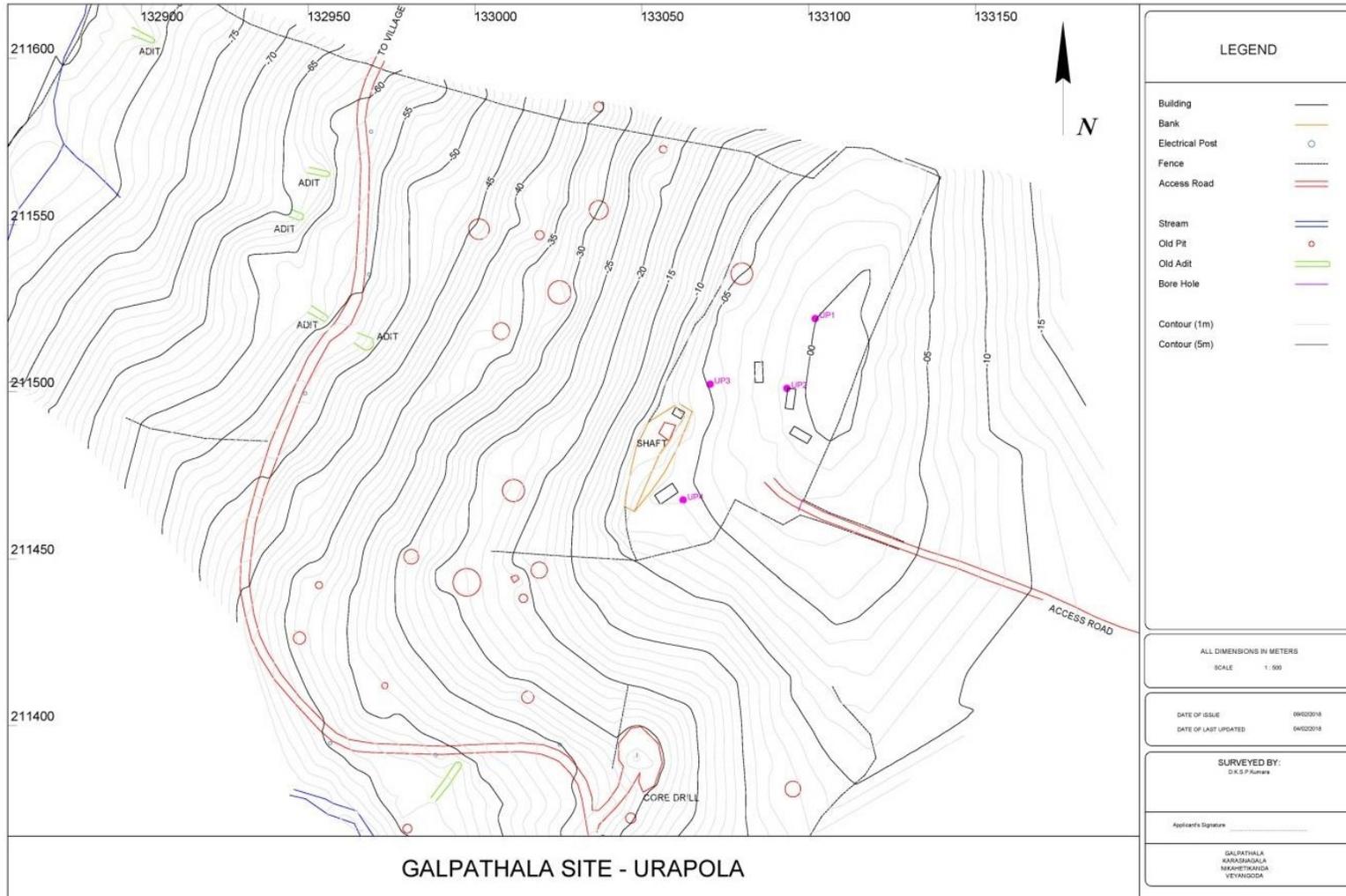


Fig 13 : Survey plan of the area

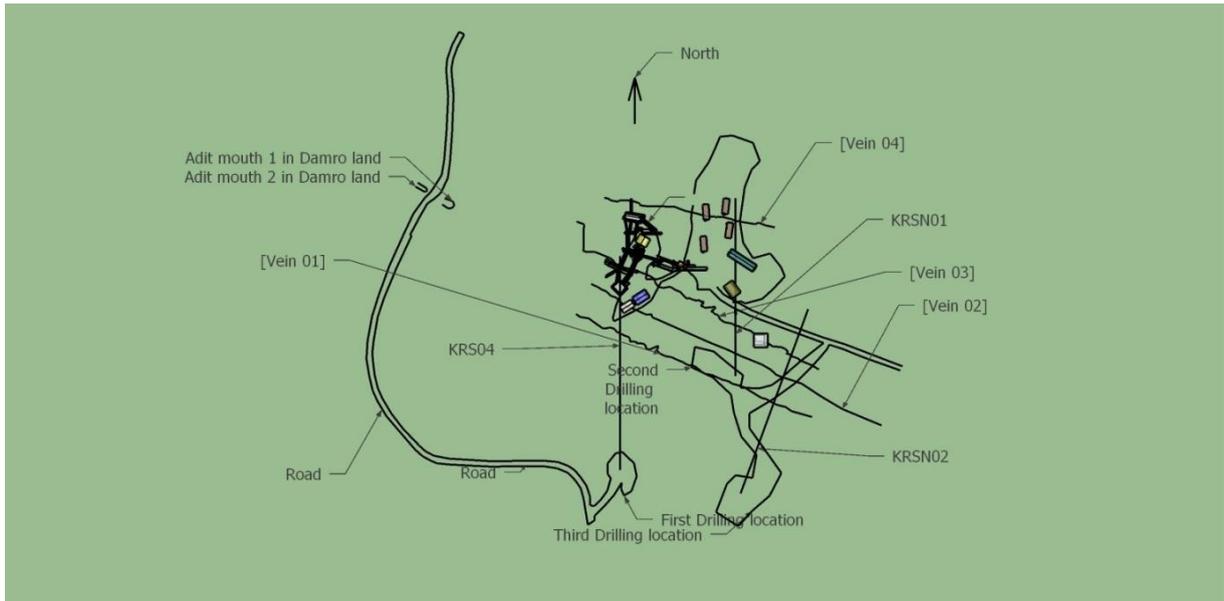


Fig 14: Confirmation of four veins in the Galpathala Mine Complex

4.1 Geological observation of graphite veins during the exploration activities of core logging, geological mapping and observation of old mine works.

Graphite veins were observed during the exploration program and recorded correctly with the exact location, and was used for subsurface modelling. It was observed that varying thicknesses of veins were observed during the project and shown in Plate 16 A to 16G.



Plate 16 A: 30 cm thick vein observed in core.



Plate 16 B: Observed Graphite vein in an old mine working



Plate 16 c and D: Observed Graphite vein in old mine workings



Plate 16E: Observed Graphite vein of 10 - 30cm thickness



Plate 16F: Observed Graphite vein (6 – 15cm varying thickness)



Plate 16G : Observed 10 cm thick graphite vein intersection in a core

4.2 Evaluation of Drilling Data

The graphite vein intersections are encouraging and their thickness varies from a few centimeters to 30cm. The orientations of the veins can be confirmed as corresponding to the existing veins in the cleared old mine. Most of the veins strike in a NWW-SEE direction and are almost vertically dipping. Our drilling details have confirmed the orientations of the veins. Finally, it can be concluded that four major vein systems have been proved by evaluation of drilling data and analyzing vein systems identified within the cleaned main shaft, cross cuts and drives.

Table 2: Number of intersections of graphite veins in drill holes

Drill Hole No	No of Intersections
KRS01	03
KRS02	02
KRS04	24
KRS05	01
KRSN01	08
KRSN02	13

4.3 Indicated Ore Resources

In this study based on the vein intersection results of drill holes and identified vein distribution pattern of the cleaned main shaft, cross cuts and drives, indicated ore resources have been estimated.

According to the drill hole data and vein distribution pattern of the cleaned main shaft, cross cuts and drives, lateral graphite veins distribution area could be considered as approximately 4.57 acres (18,497 square meters). Hence, it is proposed to extend the mine within this 4.57 acre area.

The area is shown in the following figure with boundary co-ordinates.

**Estimated Graphite Vein Distribution Area Covering Abandoned Galpathala Mine Complex and
Proposed Mine Extending Area**



Boundary co-ordinates		
Location	E	N
1	133144	211561
2	133105	211560
3	133094	211347
4	133044	211374
5	132974	211550
6	133071	211507
7	133103	211459
8	133135	211444

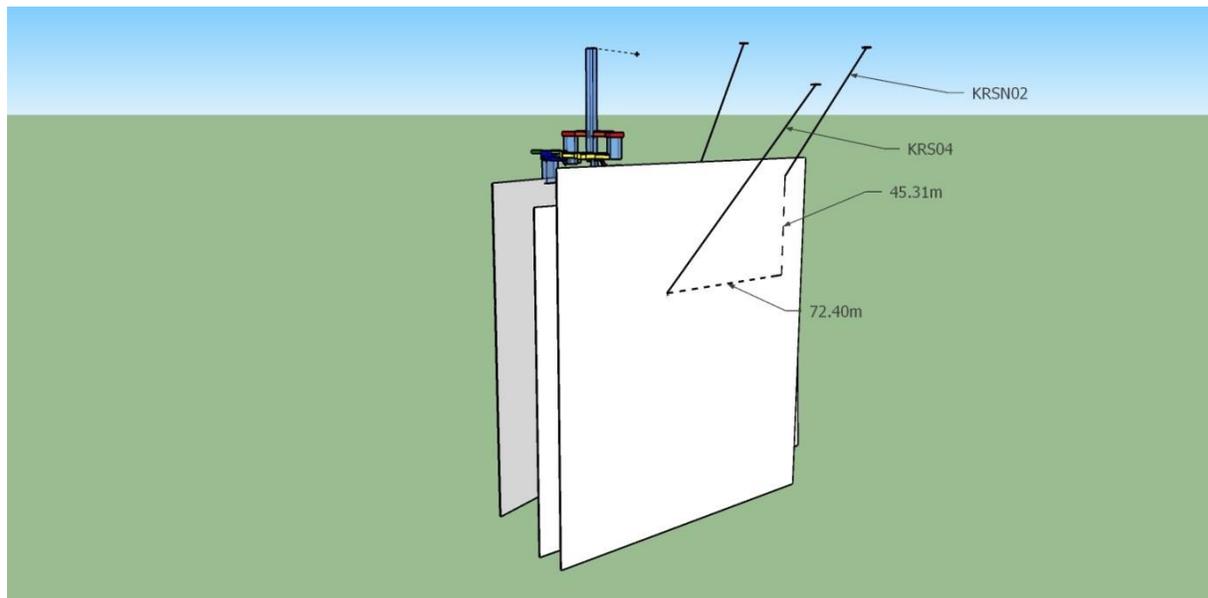
Fig 15: Land boundary of the mine area of K1 site

The Identified four graphite bearing veins intersections in drill hole data and their estimated thicknesses are given in the following Table.

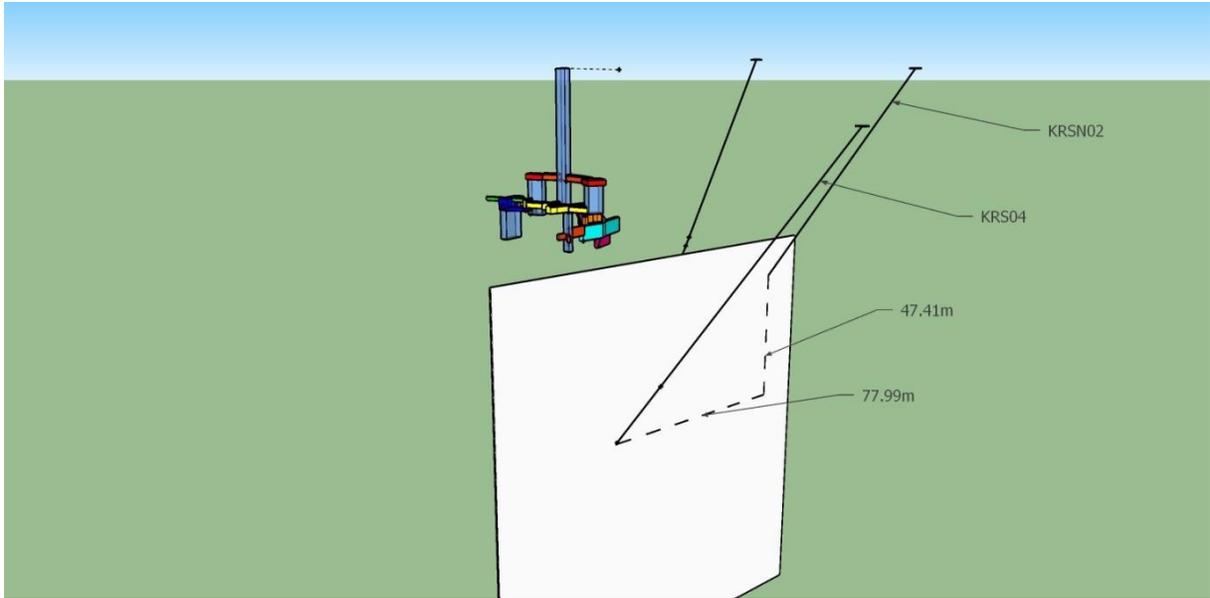
Table 3: Veins 01 - 04 intersection in Drill hole Data and their probable thicknesses

Hole No.	Depth (m)	Intersecting Vein Length (cm)	Actual Vein Width (cm)	Identified Vein System
KRS04	103.3	43	37.23	Vein 01
KRS04	103.35	32	27.71	Vein 02
KRS04	165.27	51	44.16	Vein 03
KRS01	66.78	18	15.58	Vein 03
KRS01	195.40	21	18.18	Vein 04
KRS02	67.05	18	18	Vein 01
KRS02	92.85	31	31	Vein 02
KRSN02	112.78	24	24	Vein 03
KRS05	51.82	20	20	Vein 04

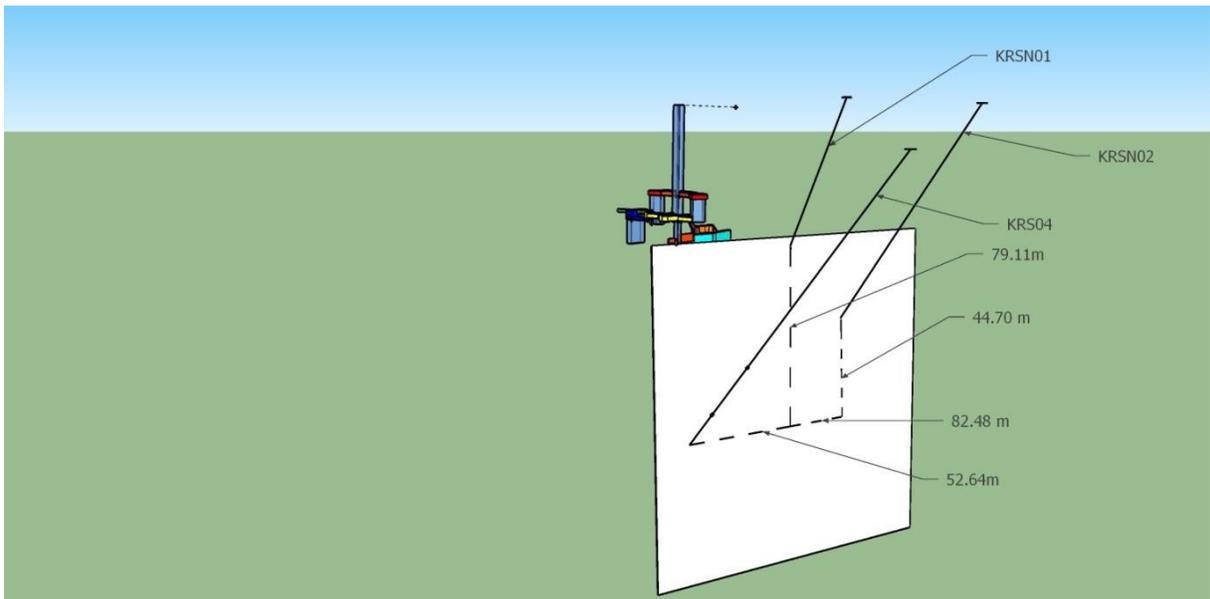
Resource Potential of Veins 01, 02, 03 and 04



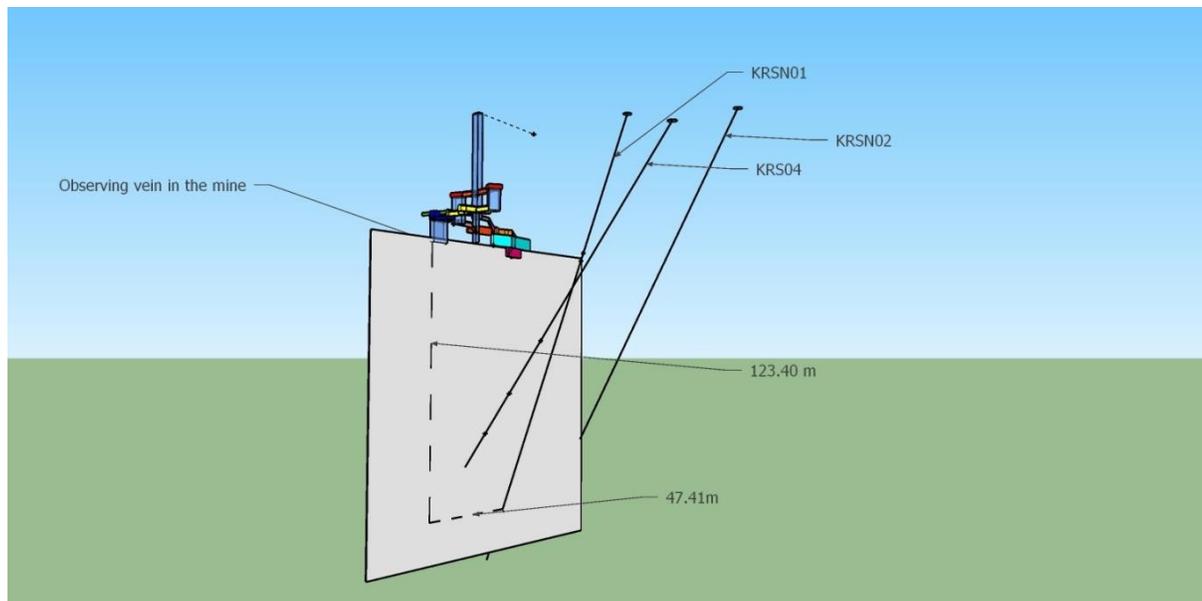
Schematic Diagram Showing Vein 01 Intersection by KRS04 and KRS02 Drill Holes



Schematic Diagram Showing Vein 02 Intersection by KRS04 and KRS02 Drill Holes



Schematic Diagram Showing Vein 03 Intersection by KRS01, KRS02 and KRS04 Drill Holes



Schematic Diagram Showing Vein 04 Intersection by KRS01 and observed vein in the Main Shaft

Historically, graphite mining had been prolific in the area. This can be verified with the available surface indications as well as by studying the abandoned mines in the area. Recent core drilling carried out within the property has proved graphite mineralization in a series of 4 veins (Pl.Refer Final Graphite Exploration Report in Karasnagala area) and the area appears to be rich in graphite. Veins run NWW-SEE are steeply dipping and are extend for significant distances longitudinally.

4.4 Future Growth of Resources

As will be explained further under the section of Mine Development, as the underground infrastructure expands laterally to depth with the excavation of drifts and winzes, additions to the reserve estimates will increase from the reserve position estimated from the currently- indicated status which is purely based on the opened- up areas available from past mine operations. This resource enhancement will bolster confidence in future mine planning. However, it is strongly recommended that continuous exploration drilling continues to be conducted as it will give directions for future development of the mine. According to the Sri Lankan geological setting and the mineralization pattern of vein graphite the K1 site has similar geological condition to the Bogala area where there has been a mine operating at 650 m level for over 200 years. Therefore, the graphite mineralization pattern in Bogala can be used as a preliminary guideline for estimation of the unconfirmed reserves. The drill-hole and geophysical investigations there have confirmed 52000 mt of resources to a depth of 145 metres.

5. Re-assessment of resources using present exploration results and historical records.

Based on the exploration results of geological mapping, geophysical evidence, studying abandoned mine works and exposures and drill hole data along with historical records and geological setting of the area the resources have been calculated as: i) Indicated resources and ii) inferred resources which need to be confirmed during exploration works while mining operations are in operation (Table 3).

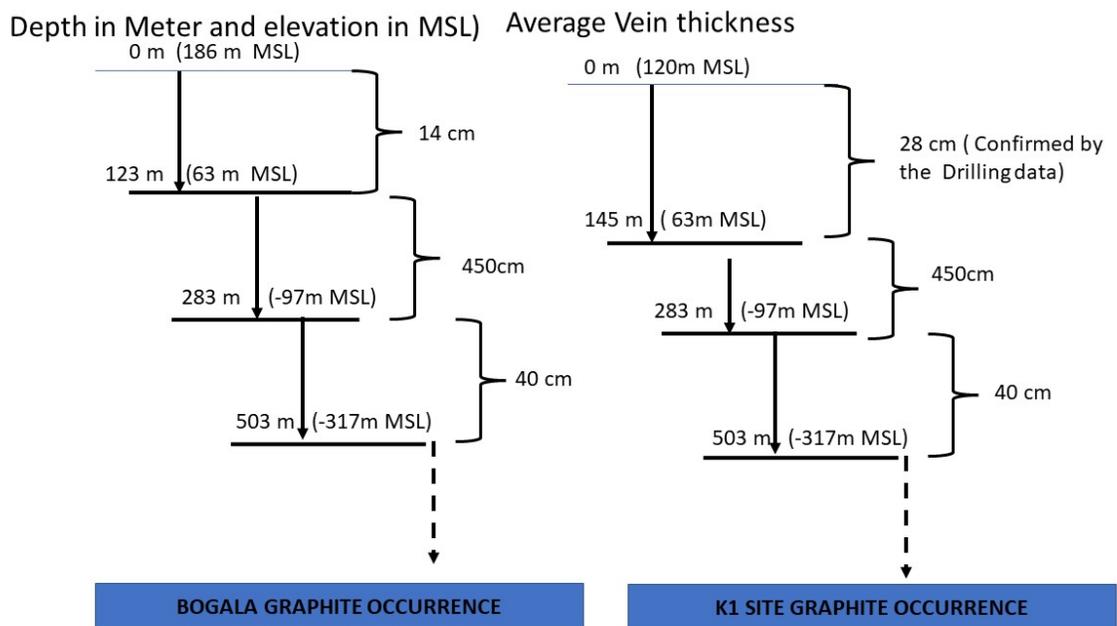


Fig 16: Average graphite vein thickness recorded within the Bogala graphite mine and predicted thickness at the K1 site as both have similar geological settings.

Re-assessment of resources based on exploration and geological evidence using similar geological setting (Fig 16)

Table 3 Re-assessment of resources in K1 mine site

Vein System	Average Vein Width (m)	Assumed Area of the Vein(m²)	Assuming Volume (m³)	Indicated Resources (MT)	Depth (M)
01	0.26405	142x145	6,000	13,380	145
02	0.27275	142x145	5,616	12,523	
03	0.26840	142x145	5,526	12,323	
04	0.32080	142x145	6,605	14,729	
Total Indicated Resources				52,955	
All 4 veins	4.50	142x138	352728	194,000	283
All 4 veins	0.40	142x220	49,984	27,491	503
Total Inferred resources (up to 503m level)				221,491	
Total Indicated and inferred resources				274,489	

5.2 Final Remarks

- Vein graphite found in Sri Lanka shows very high purity, at over 97 % C percentage.
 - Over 3000 abandoned mines exist, scattered mostly in a belt extending Southwest to Northeast located within the geologically high grade metamorphic terrain (Highland Complex) region of Sri Lanka.
 - Presently, only few mines are operated as underground mines, and some are over 500 m to 700 m).
 - Most veins are vertical or sub vertical and the thickness varies irregularly.
-

- The veins mostly follow geological structures such as fold axes, joints/ lineament patterns etc.
- Therefore, estimation of resources has been done using all the available prior information and data obtained for this present report. Confirmed resources are based on these detailed exploration results and inferred reserves are based on geological evidence and information from the analogous conditions observed in the present deep mine (Bogala Mine) which lies in a similar geological setting.

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