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Lanka Graphite maps new vein graphite targets with EM survey in Sri Lanka

Key Points

- **Reconnaissance geological mapping has confirmed further locations of historical workings and identified structural targets for vein graphite deposits in two of Lanka Graphite's licences in south-western Sri Lanka**
- **Very Low Frequency (VLF) Electromagnetic (EM) surveys have identified zones of elevated conductance below and between old shafts and adits historically mined for vein graphite**
- **VLF anomalies extend away from known occurrences of vein graphite, suggesting strike extensions**
- **Results of this latest VLF survey will underpin a proposed second phase of detailed geophysical surveying.**

Lanka Graphite Limited (ASX: LGR) is pleased to announce the results from an ongoing VLF geophysical survey and geological mapping exercise being undertaken over its Exploration Licences in southwestern Sri Lanka.

Geological mapping has identified old pits, shafts and adits on Exploration Licences (EL) EL236 and 237. The mapping also highlighted structural and lithological trends that may be related to vein graphite mineralisation.

The VLF survey targeted three grids in EL236 and two grids in EL237 (**Error! Reference source not found.**) where there are historical graphite workings. The VLF survey results suggest the presence of graphite mineralisation between and beyond the extent of the mine workings, indicating that the mineralisation may extend beyond historical mining areas. Several of the conductors detected in the VLF surveys have no historical mine workings, and may be related to untested graphite mineralisation under cover.

Geological model

Sri Lanka has a long history of graphite mining dating back to the early 1800s with peak production in the first two decades of the twentieth century, reaching 33,410 long tons in 1916.

Sri Lankan graphite occurs predominantly as veins ranging in thickness from veinlets less than 1 mm thick to veins over 1 m thick. The veins are often zoned and contain more than one type of graphite e.g. flaky, needle or massive, related to the depositional conditions. The veins pinch and swell and also can end abruptly and are sometimes of limited extent and can be better described as lenses. In some case the veins can occur in clusters.

Vein graphite mineralisation is commonly associated with pegmatites and vein quartz, both related to tensional zones of open space in fold hinges and cross cutting structures. The graphite veins follow linear, sub-vertical, zones aligned with the axes of antiforms and is considered to have been derived from CO_2 in late hydrothermal fluids, produced during metamorphism.
Graphite veins may also be located in secondary fractures at steep angles to the strike of the antiformal hinge zones, although not all such fractures are so infilled. These types of secondary fracture veins can form the bulk of the graphite resource in a deposit in Sri Lanka.
Given that Sri Lanka was previously a major world supplier of high-quality vein graphite, extensive mining and prospecting for graphite occurred in the country over the past two centuries. Old shafts, adits and prospecting pits are therefore a common starting point for present day exploration.

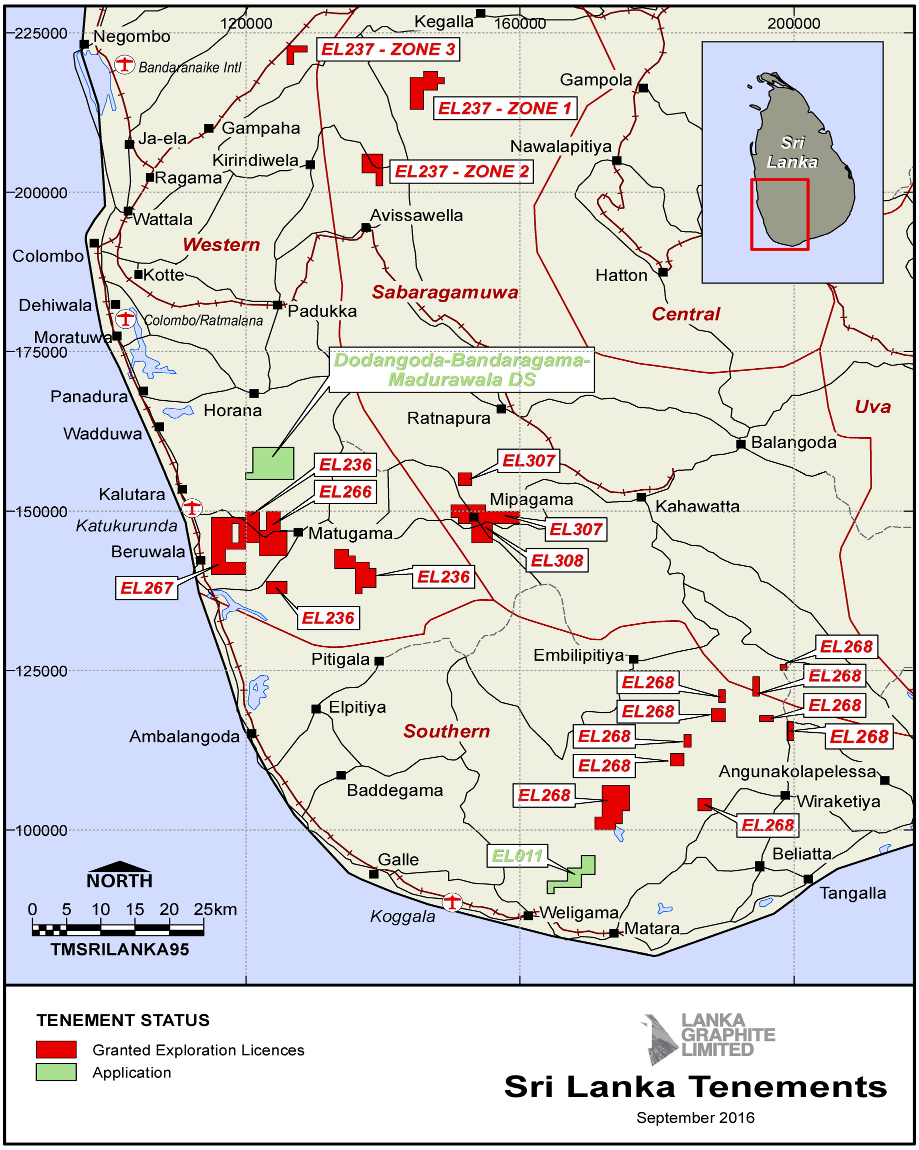

Figure 1. Location of Lanka's tenements in south-western Sri Lanka.

Geological mapping

Reconnaissance geological mapping has been completed by GSMB over portions of EL236 and EL 237. Several historical graphite pits, shafts and adits were identified and mapped; an example of the historical workings is shown in Figure 3. The distribution of the graphite occurrences together with geological information will assist in prioritising targets for follow-up.

EL236 Zone 3 Dodangoda area, Wallawita

Geological mapping in the three grids 03, 31 and 35 of EL236 identified charnockitic gneiss, garnet sillimanite schist and garnet hornblende biotite gneiss. Structural mapping in grid 03 showed that the predominant joint direction is NNE-SSW and NE-SW, while structural mapping in grids 31 and 35 indicated that the main joint direction is E-W and N-S.

An abandoned graphite mine field was observed in the Ridiwita area, where several vertical pits were identified. Most of them have been filled with sediments and covered with vegetation, however it was possible to find needle-type graphite particles in the area (Figure 1).

EL237 Zone 2 Gonagala-Ruwanella area

Geologically, the study area is interpreted to be in the Wanni Complex, close to the marginal zone of the Highland Complex. The mapped grids are mainly composed of paragneisses including garnet sillimanite biotite gneiss, charnockitic gneiss, granitoid gneiss, and garnetiferous quartzofeldspathic gneiss. According to government geological mapping, the grid straddles the Gonagala Antiform, which is flanked by north-south trending shear zones (Figure 2). Old pits and shafts were mapped near the eastern part of the grids, near the antiformal axis.

The grids mapped in EL237 are located in the Ruwanwella division of the Kegalle District in Sabaragamuwa province, where several abandoned graphite pits, adits and shaft were identified (Table 1).

Table 1. Location of old workings, Ruwanella area

Location	Latitude (E)	Latitude (N)	Remarks
X-1	137011	204266	Adit filled with debris
X-2	137054	204117	Adit filled with debris
X-3	137073	204411	Shaft filled with debris
X-4	137021	204040	Adit filled with debris
X-5	137018	203917	Adit filled with debris
X-6	137156	203912	Pit filled with debris

Figure 1. Old working and vein needle graphite fragments in the Ridiwita area, EL236

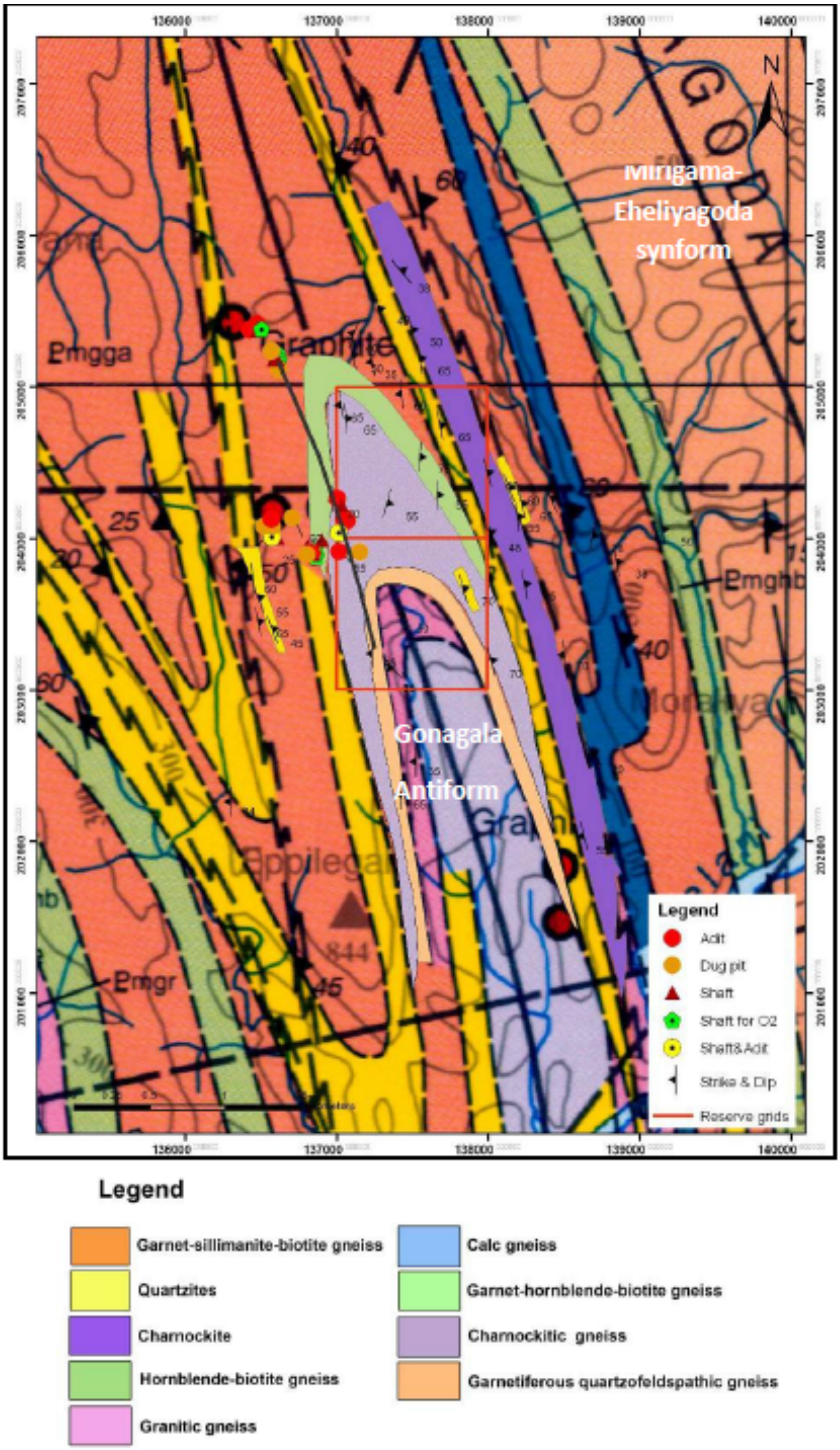

Figure 2. Government geology map of the Ruwanella area, EL237, showing antiformal and synformal structures

Figure 3. Abandoned pits and adits in EL237

Geophysical Surveying

VLF surveying was carried out over Lanka Graphite Limited's graphite prospects Walallawita (EL236) and Ruwanwella (EL237). The surveys were completed by Water Supply Consultants (PVT) Ltd using a Geonics EM-16 VLF receiver. PVT supplied a survey report which included the VLF EM data.

All VLF survey lines were oriented N-S, spaced 200m apart and used 100m station spacing. The Walallawita Prospect survey consisted of 11 x 1km long survey lines, and the Ruwanwella Prospect was comprised of 6 x 2km long survey lines.

The VLF survey results were of mixed quality. The quadrature responses for both survey blocks were negligible due to the low response signals, and were not used in this review. The tilt angle data were also of mixed quality. The tilt angle VLF data acquired at the Walallawita Prospect are useful in identifying conductive trends, but the Ruwanwella Prospect tilt angle VLF data are noisy and difficult to interpret.

The VLF tilt angle data were gridded, imaged and contoured for both of the surveyed graphite prospects (Figure 4 and Figure 6). Because the location of conductors detected in VLF tilt angle data are located under the positive to negative crossovers, or inflections, a Fraser filter was applied to the tilt angle data to transform the observed crossover inflection into positive peak anomalies. The resulting Fraser filter tilt angle VLF data were imaged, highlighting the crossover trends in red on the images, and are presented below in Figure 5 and Figure 7.

The locations of the known historic mine infrastructure were plotted and compared to the tilt angle and Fraser filtered tilt angle data images and the historic graphite mine locations occur along some of the identified conductive trends in the VLF data, but some of the historic mine locations are located away from any anomalous response. This could be related to the low resolution of the VLF data (200m x 100m spaced survey stations) not resolving narrow graphite veins, or may also be related to the orientation of the graphite veins being electrically null coupled with the uni-directional EM field generated from the NWC transmitter in Australia.

Geophysical interpretation

The VLF data in both of the survey blocks detected areas with negative VLF tilt angle responses, suggesting the presence of local conductors. The conductor trends identified in the Fraser filtered tilt angle data located adjacent to negative tilt angle responses highlight the interpreted locations of these conductors. Some of these conductors correspond to the known historic graphite mine infrastructure locations, suggesting these conductors are related to graphite mineralisation. However, some of the anomalous responses in the VLF data occur as single points, and therefore no trends can be inferred from the data. These single anomalous VLF responses may be related to small graphite veins with limited strike extents, system noise, conductive regolith cover, or graphite veins that are oriented NE-SW, and are therefore electrically null-coupled with the primary EM signal transmitted from the NWC transmitter in Australia.

At the Walallawita Prospect, three parallel conductive trends with NW-SE strike directions were interpreted from the VLF survey data (Figure 4 and Figure 5). The historic mine locations are offset from the strongest interpreted conductor location by approximately 100m and it is recommended to check the coordinates of the historic mine site locations at the Walallawita Prospect to ensure that they are correct.

At the Ruwanwella Prospect, numerous anomalous VLF responses were identified in the VLF tilt angle data. Some of the anomalous responses were identified from just one or two survey stations, and others extends for several hundred metres with varying amplitudes. There appears to be a dominant NW-SE trend from these anomalous VLF responses, but these trends may not represent the true graphite vein orientations because conductors oriented NW-SE are electrically well coupled with the primary EM field generated by the NWC transmitter in Australia, whereas NE-SW oriented conductors are electrically null coupled.

The conductor trends and locations identified in the VLF data at the Ruwanwalla Prospect were therefore interpreted using three different conductor orientations (Figure 6 and Figure 7). The first version (left image) used NW-SE to WNW-ESE oriented conductors, version two (centre image) used folded conductors, and version three (right image) interpreted the conductor orientations to be NE-SW. Any of these three, or alternative interpretations, may be correct. More detailed information at this prospect is required to better identify and interpret the conductor locations and orientations.

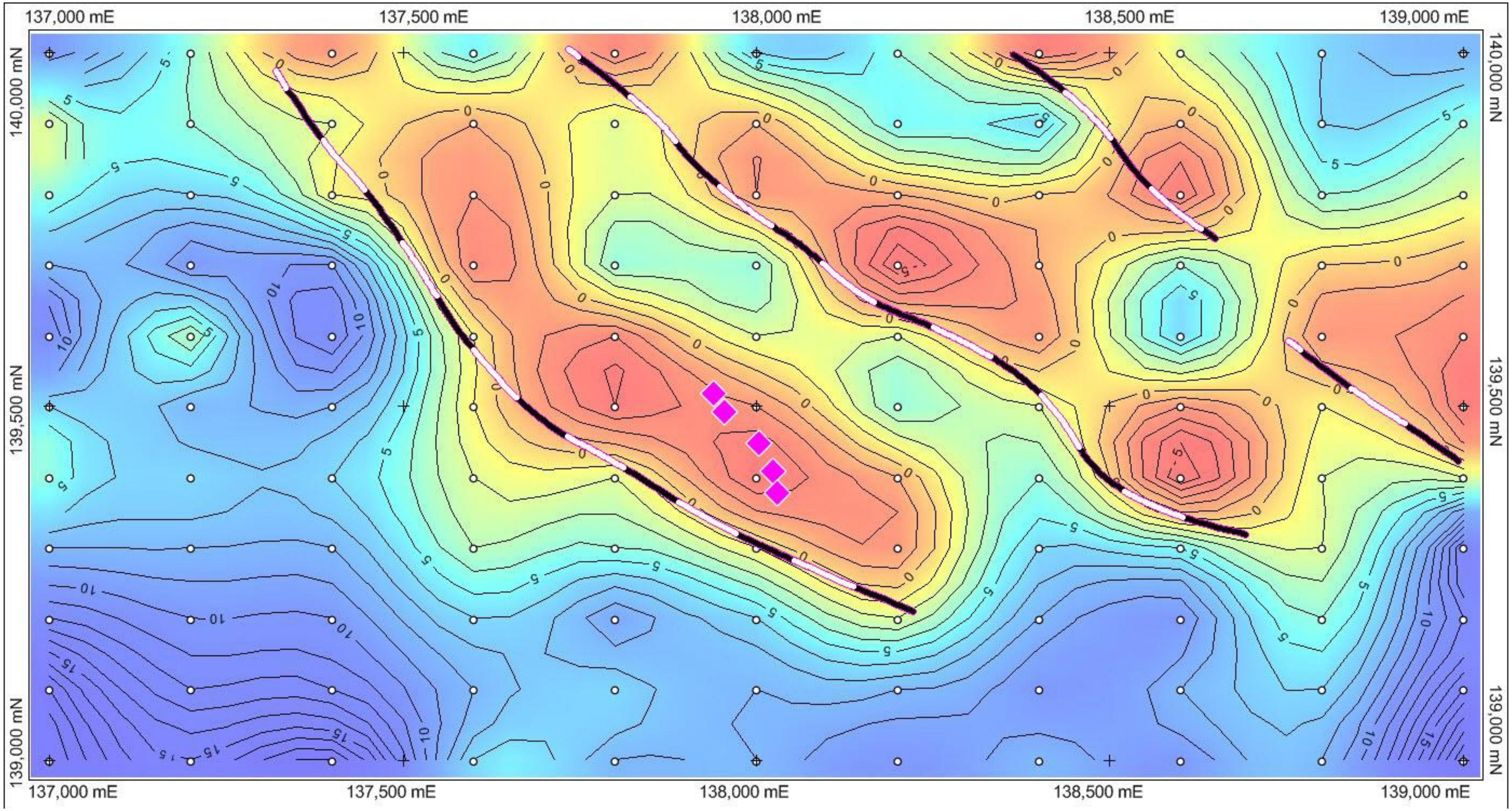

Figure 4. EL236 Walallawita graphite prospect map with the VLF survey stations (black and white dots), interpreted conductor location traces (black and white lines) and known historic graphite mine workings (pink diamonds) overlain on a VLF tilt angle survey data image and contours. Note the colour stretch of the VLF tilt angle image is reversed, highlighting anomalous negative responses in red. Map grid 500 m x 500 m

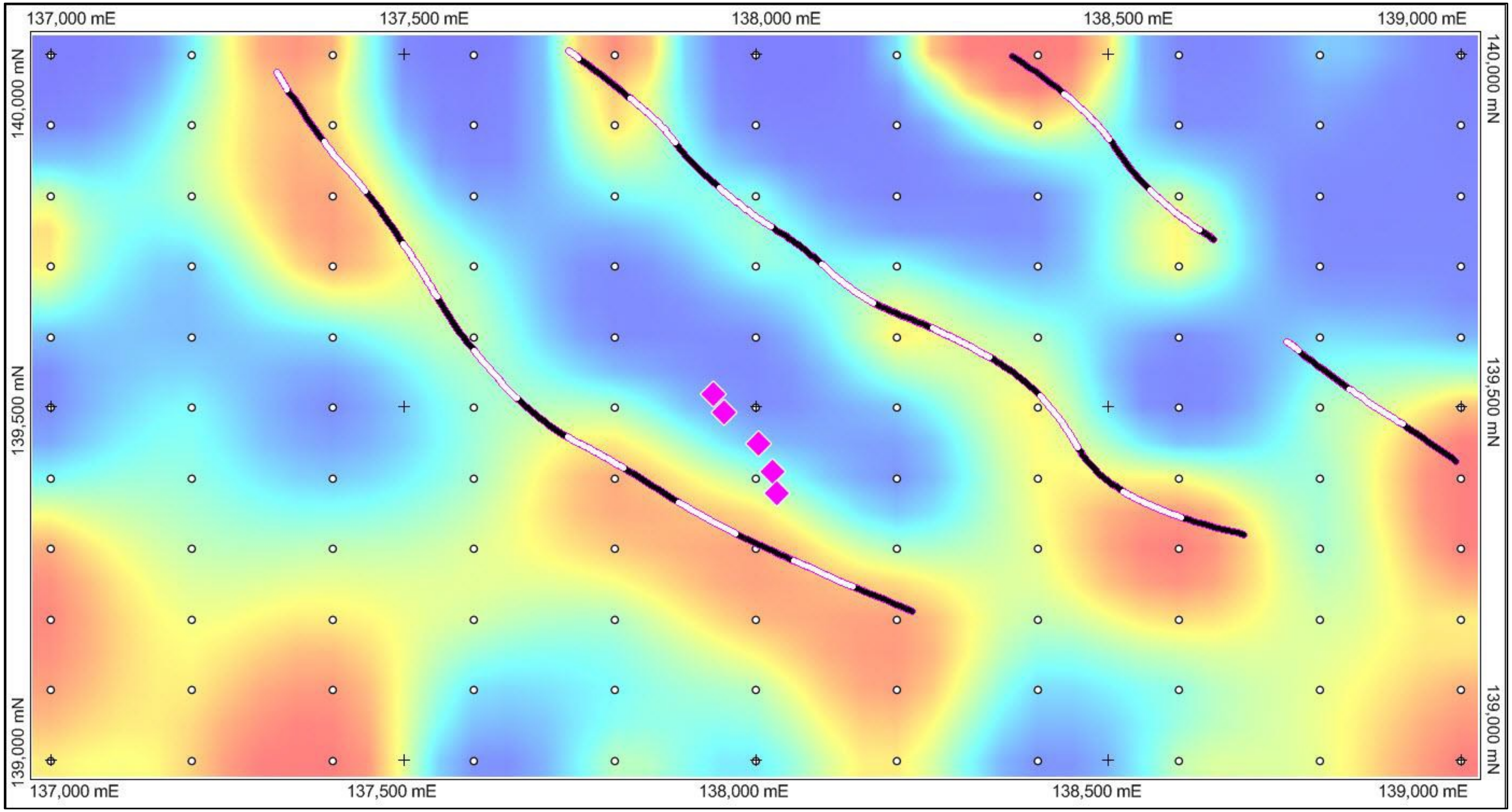

Figure 5. EL236 Walallawita graphite prospect map with the VLF survey stations (black and white dots), interpreted conductor location traces (pink and white lines) and known historic graphite mine workings (pink diamonds) overlain on a Fraser filtered VLF tilt angle survey data image

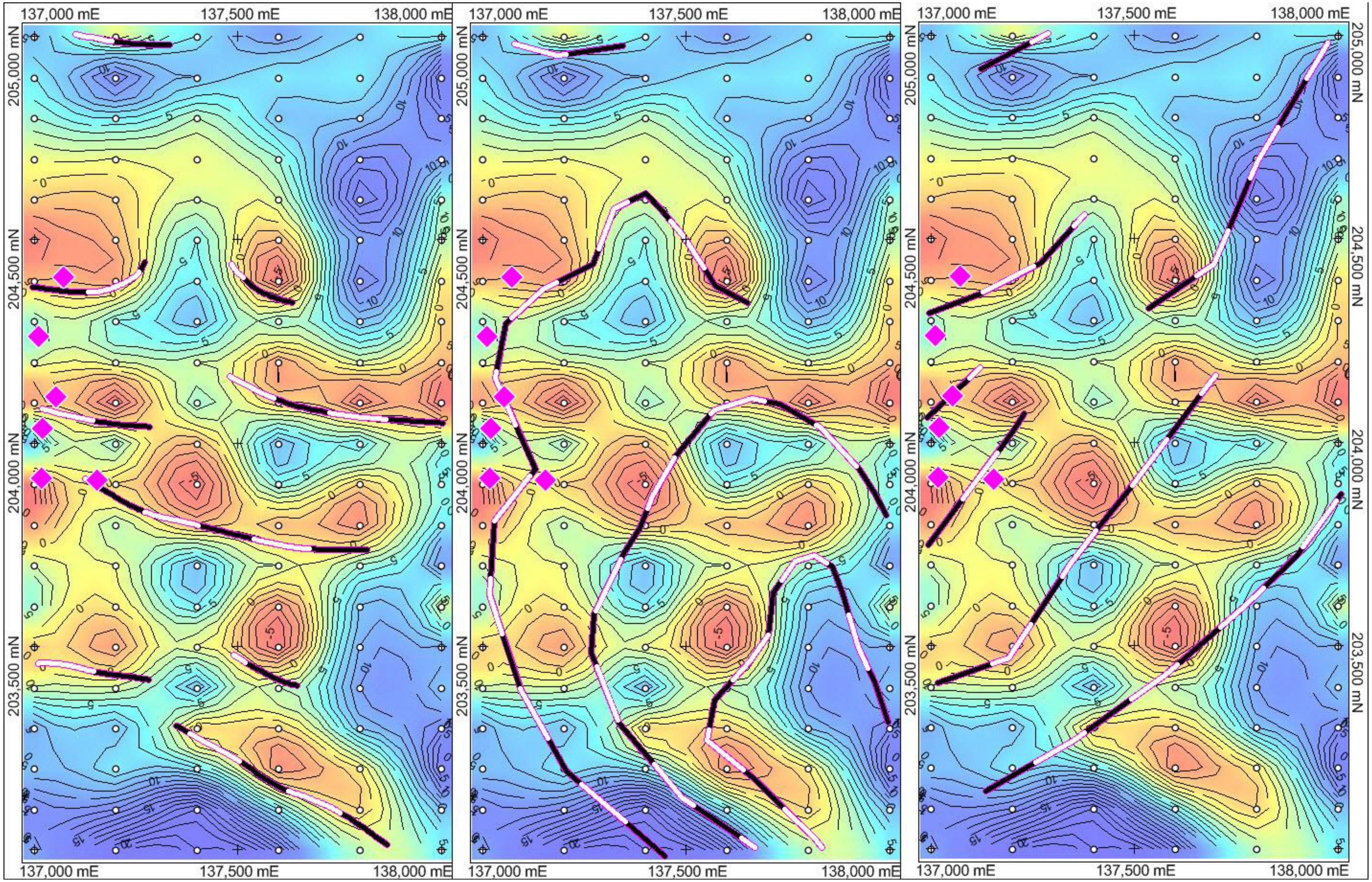

Figure 6. EL237 Ruwanwella graphite prospect map with the VLF survey stations (black and white dots) and known historic graphite mine workings (pink diamonds) overlain on a VLF tilt angle survey data image and contours. Three different interpretations of the conductor locations (black and white lines) identified from the VLF data are shown, using a) NW-SE oriented conductors (left panel), b) folded conductors (centre panel), or c) NE-SW oriented conductors (right panel). Note the colour stretch of the VLF tilt angle image is reversed, highlighting anomalous negative responses in red. Map grids 500 m x 500m

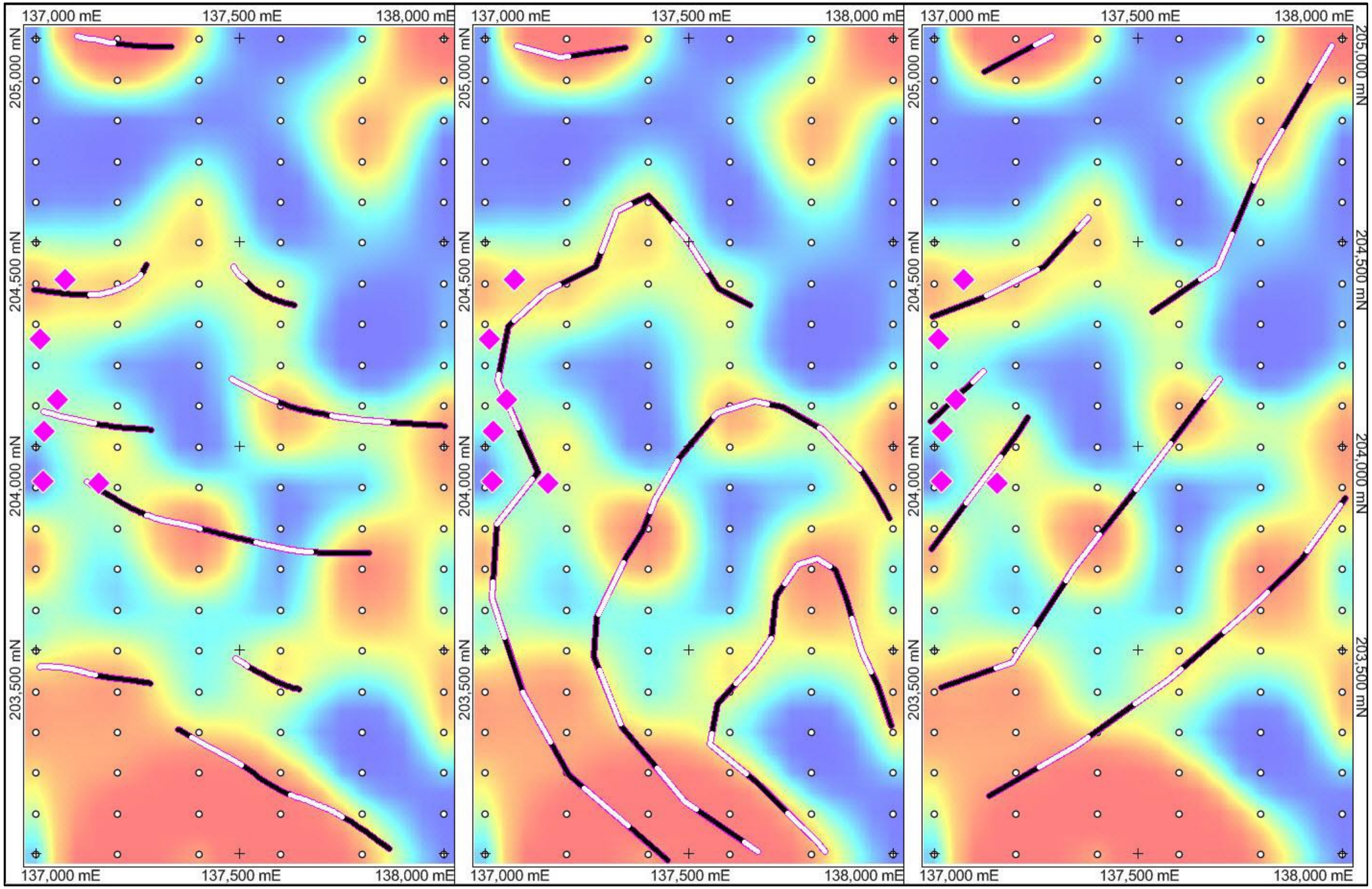

Figure 7. EL237 Ruwanwella graphite prospect map with the VLF survey stations (black and white dots) and known historic graphite mine workings (pink diamonds) overlain on a Fraser filtered VLF tilt angle survey data image. Three different interpretations of the conductor locations (black and white lines) identified from the VLF data are shown, using a) NW-SE oriented conductors (left panel), b) folded conductors (centre panel), or c) NE-SW oriented conductors (right panel)

Future geophysical surveys

The VLF surveys are essentially a semi-quantitative approach. To define testable targets and also explore for blind graphite veins away from historical workings, Lanka proposes to complete modern high-powered fixed loop, time-domain, electromagnetic surveys (FLEM).

FLEM data provides high resolution data that can be modelled in 3D, to produce geophysical models of the conductive targets. These conductor models can then be used to assist in drill planning.

Following completion of the reconnaissance VLF programme, Lanka will review all the new data and integrate it with existing geological information to rank targets for FLEM follow-up.

Justyn Stedwell
Company Secretary

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About Lanka Graphite Limited

Lanka Graphite Limited (ASX:LGR) is an ASX listed graphite exploration company that is focused on exploration of a number of historic and new exploration and mining tenements in Central and South Western Sri Lanka. Historical mining at a number of the granted tenements produced very high grade 'lump' or vein style graphite with grades >95 % C. High purity vein graphite was historically produced from Lanka's tenements at a grade that is believed to be suited for graphene derivation. Lanka Graphite will continue exploration of its granted tenements with the intention to develop high grade graphite production that can supply nearby Asian end user companies particularly focussed on new technology graphene applications.

Competent Persons' Statements

The information in this release that relates to Geophysical Results is based on information compiled by Dr Jayson Meyers who is a Fellow of the Australian Institute of Geoscientists. Dr Meyers is an employee of Resource Potentials Pty Ltd and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking, to qualify as a Competent Person in terms of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012 Edition).[1] Dr Meyers consents to the inclusion in this report of the matters based on information provided by him and in the form and context in which it appears.

The information in this report that relates to Exploration Targets, Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by GSMB (Pvt) Ltd and reviewed by Dr. Andrew Scogings, a Competent Person who is a Member of both the Australian Institute of Geoscientists and Australasian Institute of Mining and Metallurgy. Dr. Scogings is a full-time employee of CSA Global Pty Ltd and has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012 Edition)[1]. Dr. Scogings consents to the inclusion of such information in this announcement in the form and context in which it appears.

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[1] Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The JORC Code, 2012 Edition. Prepared by: The Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC 2012).

JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data – Lanka Graphite Reconnaissance Mapping

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	• Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down-hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling. • Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. • Aspects of the determination of mineralisation that are Material to the Public Report. • In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information.	• No samples were collected for analytical purposes, as representative veins were not fully accessible in the mostly filled old shafts and adits.
Drilling techniques	• Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).	• Not applicable, as this was a reconnaissance geological mapping exercise.
Drill sample recovery	• Method of recording and assessing core and chip sample recoveries and results assessed. • Measures taken to maximise sample recovery and ensure representative nature of the samples.	• Not applicable, as this was a reconnaissance geological mapping exercise.

Criteria	JORC Code explanation	Commentary
	• Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.	
Logging	• Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. • Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography. • The total length and percentage of the relevant intersections logged.	• Not applicable, as this was a reconnaissance geological mapping exercise.
Sub-sampling techniques and sample preparation	• If core, whether cut or sawn and whether quarter, half or all core taken. • If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry. • For all sample types, the nature, quality and appropriateness of the sample preparation technique. • Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. • Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. • Whether sample sizes are appropriate to the grain size of the material being sampled.	• Not applicable, as this was a reconnaissance geological mapping exercise.
Quality of assay data and laboratory tests	• The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total. • For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc. • Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether	• Not applicable, as this was a reconnaissance geological mapping exercise.

Criteria	JORC Code explanation	Commentary
	acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	
Verification of sampling and assaying	• The verification of significant intersections by either independent or alternative company personnel. • The use of twinned holes. • Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. • Discuss any adjustment to assay data.	• Not applicable, as this was a reconnaissance geological mapping exercise.
Location of data points	• Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation. • Specification of the grid system used. • Quality and adequacy of topographic control.	• The co-ordinate survey system in Sri Lanka is based on the Transverse Mercator Projection with the origin of the projection being 200,000m south and 200,000m west of Pidurutalagala or 7° 00' 01.729" N and 80° 46' 18.160" E. • The EL descriptions are: EL 236 and EL 237.
Data spacing and distribution	• Data spacing for reporting of Exploration Results. • Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. • Whether sample compositing has been applied.	• Not applicable, as this was a reconnaissance geological mapping exercise.
Orientation of data in relation to geological structure	• Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. • If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	• Not applicable, as this was a reconnaissance geological mapping exercise.
Sample security	• The measures taken to ensure sample security.	• Not applicable, as this was a reconnaissance geological mapping exercise
Audits or reviews	• The results of any audits or reviews of sampling techniques and data.	• Not applicable, as this was a reconnaissance geological mapping exercise.

Section 2 Reporting of Exploration Results – Lanka Graphite Reconnaissance Mapping

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. • The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.	• The targets surveyed are within granted tenements EL236 and EL237. • The prospects are located in southwestern Sri Lanka. • The tenements are in good standing and no known impediments exist.
Exploration done by other parties	• Acknowledgment and appraisal of exploration by other parties.	• There is evidence of old workings assumed to be for graphite, however no recorded assay results or vein widths. The spoil heaps are often small which suggests limited excavation. • The Sri Lankan geological Survey has mapped the target areas at 1:100,000 scale (Sheet 16, Colombo-Ratnapura, 1996; Sheet 19, Aluthgama-Galle, 2000). • The area in EL237 examined in detail falls in the 1: 100,000 scale sheet no.13 named as a Kochchikade- Attanagalle published by Geological Survey & Mines Bureau in year 1996.
Geology	• Deposit type, geological setting and style of mineralisation.	• Exploration is targeting vein graphite. • Sri Lankan graphite generally occurs in the form of veins, ranging in thickness from veinlets less than 1mm thick to massive veins over 1m thick. The veins are usually located in the hinge zones of antiforms within granulite facies zones of the Precambrian Basement terrain that underlies much of Sri Lanka. Secondary fractures associated with structural hinge zones can also act as tensional areas suitable for graphite deposition. • Vein graphite deposition is commonly associated with syngenetic formation of pegmatites and vein quartz. When associated with vein graphite formation the pegmatites and quartz veins can contain graphite within the rocks.

Criteria	JORC Code explanation	Commentary
		• Target zones for vein graphite in Sri Lanka are focussed on tightly folded anticlines and synclines with the former being the prime target zones. • Old shafts, adits and prospect pits are used to identify target areas for present day prospecting.

Drill hole Information	• A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:
	  o easting and northing of the drill hole collar
	  o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar
	  o dip and azimuth of the hole
	  o down hole length and interception depth
	  o hole length.
	• If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.
		• Not applicable, as this was a reconnaissance geological mapping exercise.

Data aggregation methods	• In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated. • Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. • The assumptions used for any reporting of metal equivalent values should be clearly stated.	Not applicable, as this was a reconnaissance geological mapping exercise.
Relationship between mineralisation widths and intercept lengths	• These relationships are particularly important in the reporting of Exploration Results. • If the geometry of the mineralisation with respect to the drill-hole angle is known, its nature should be reported.	• Not applicable, as this was a reconnaissance geological mapping exercise. Based on other locations in Sri Lanka, it is likely that graphite veins are narrow (up to approximately 1m in width) and steep dipping.

Criteria	JORC Code explanation	Commentary
	• If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').	
Diagrams	• Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	• These are included in the body of the text
Balanced reporting	• Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.	• Apart from the geology mapping data, there are no assay values of graphite grades.
Other substantive exploration data	• Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	• Lanka has completed reconnaissance geological mapping and identified old workings on the tenements.
Further work	• The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). • Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	• Additional site visits to verify old workings on ELs. • FLEM surveys are recommended for the area to better define existing conductors, model the conductors to assist in drill planning, and to identify new conductors for follow-up work.