



**ASX RELEASE  
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## **MAIDEN DRILL HOLE HITS 120 METRE GRAPHITE INTERSECTION AT ESMERALDA**

### **Highlights**

- Maiden graphite core drill hole completed at Esmeralda Project, Nth Qld
- First hole intersects 120 metres of visible graphite mineralisation
- Mineralisation is open at depth
- Second hole in two-hole Esmeralda program has commenced
- Initial assay results expected late in November

Metallica Minerals Limited ("Metallica") ([ASX:MLM](#)) is pleased to advise that the first graphite-focused core drill hole on the Company's unique 750 km<sup>2</sup> Esmeralda Graphite Project, 70 kilometres south of Croydon in north Queensland, has been completed.

Based on visual observations, drill hole WD001 intersected more than 120 metres of graphite mineralisation from a depth of 68 metres. The hole ended in mineralisation at a depth of 189 metres.

Visual inspection of the core suggests that the majority of the core potentially contains >10% graphite, with significant portions exhibiting grades indicative of >20% graphite.

The second hole (WD002) in the two-hole program, located about one kilometre from WD001, commenced drilling on 3 November 2015 and is targeting similar graphite mineralisation.

Initial assays for the two holes are expected towards the end of November.

### **Metallica's CEO, Mr Simon Slesarewich:**

*"We are extremely encouraged by these initial results from Esmeralda. The results provide the first hard evidence that Esmeralda hosts an extensive and high-grade graphite deposit. It is gratifying to see our research and theoretical modelling validated so clearly and so early in our first field program."*

*While we have to wait for the assays to tell the full story, the substantial width and consistency of mineralisation indicates a potentially world-class discovery. The intersection in WD001 is well above the mineralised length of some of the emerging graphite results from east Africa and more than comparable with graphite zone widths from the globally renowned Albany project in Ontario, Canada."*

*“Aside from the tremendous width of the intersection, we are also mindful that granite-hosted, hydrothermal-style graphite deposits, like Esmeralda, are often characterised by high-purity graphite in either flake or crystalline form. Again, we will just have to wait for the assay results to come back, but our initial inspection of the core is very encouraging.*

*After we get the assays later this month, the graphite cores from both holes will be assessed to determine initial metallurgical characteristics and likely market appeal.”*

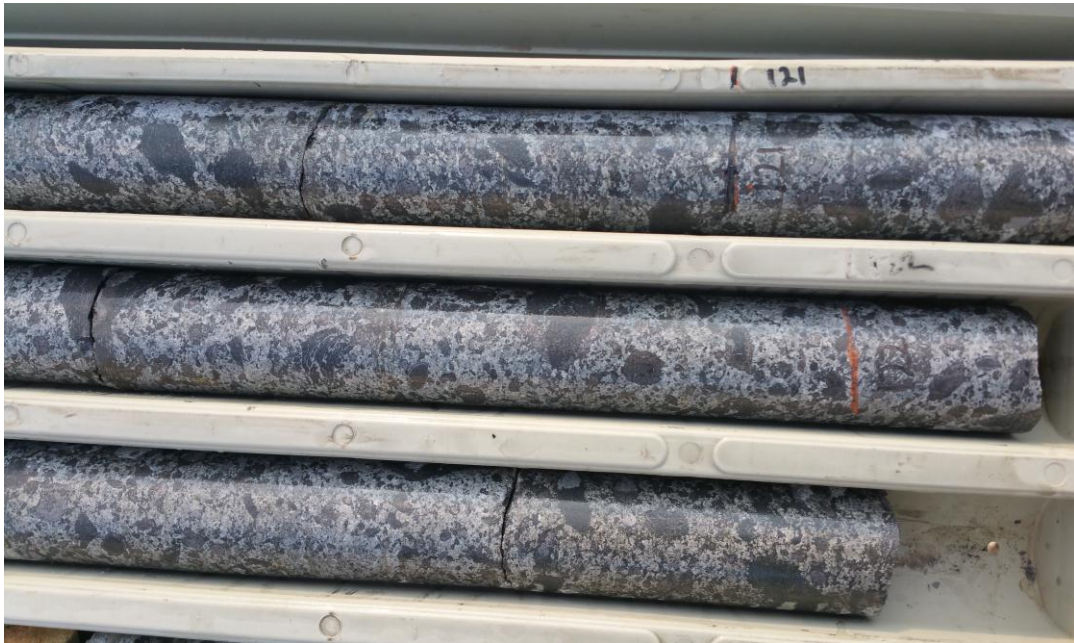


Figure 1: The darker areas above illustrate the frequency, density and consistent distribution of the graphite mineralisation through the core of WD001.

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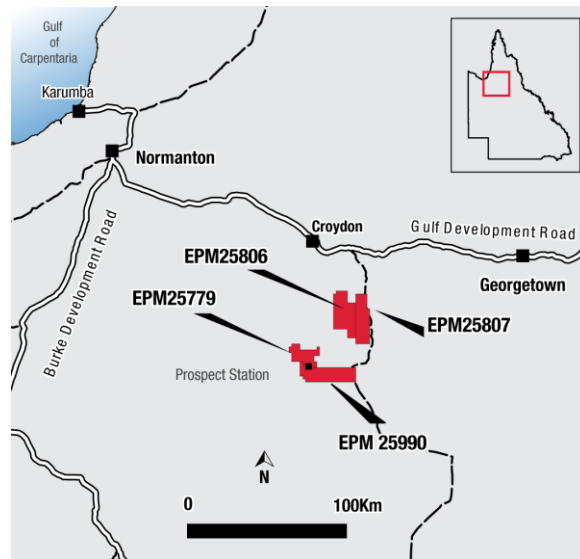
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## Background on the Esmeralda Graphite Project

In July 2015, Metallica Minerals Ltd (“Metallica”) was granted Exploration Permits for Minerals (EPMs) 25779, 25806 and 25807, which make up the Esmeralda Graphite Project. The project, located near Croydon in north Queensland, covers a combined area of over 750 km<sup>2</sup> and is held 100% by Metallica’s wholly owned subsidiary Touchstone Resources Pty Ltd.



Metallica has identified significant graphite occurrences within the Esmeralda Granites in the project area. These occurrences were first identified in 2006 by Metallica during a drilling program that targeted well-defined airborne and ground-defined intense electromagnetic (EM) anomalies. At the time, the drilling focused on base metal and gold-bearing massive sulphide mineralisation. Instead of sulphides, Metallica discovered significant graphite mineralisation. The discovery was unexpected because graphite is rarely associated with igneous rocks, such as granite.

Subsequently, a literature review of graphite occurrences in the Esmeralda Granites and Croydon Volcanics indicated large suites of potentially graphite-bearing igneous rocks. Metallica has identified targets where it is interpreted that hydrothermal processes and/or magmatic differentiation or structural controls could concentrate graphite into significantly higher percentages. Previous percussion drilling, including the 2006 Metallica program, has recorded significant zones of observable graphite mineralisation (>10% graphite visually) while exploring for metals and other types of mineralisation.

Igneous or hydrothermal-style graphite deposits, such as Esmeralda, are rare. The more common metamorphic-style graphite deposits make up about 95% of the world’s known graphite deposits. Hydrothermal-style graphite deposits are typically of high purity graphite in either flake or crystalline form. Examples of this style of mineralisation include the high-grade, narrow-vein Sri Lankan deposits and the Albany graphite deposit in Canada. The carbon source is non-organic and the carbon is thought to be from deep carbon dioxide (CO<sub>2</sub>) or methane (CH<sub>4</sub>) gaseous injection into the magma chamber, which later crystallises out as pure or near-pure carbon (graphite) crystals.

Metallica has developed a hydrothermal mineralisation model for the Esmeralda granite based on work completed by the Bureau of Mineral Resources (BMR) in 1988 and the recent (2013) discovery of the Albany graphite deposit.

# JORC CODE, 2012 EDITION – TABLE 1

## Section 1 Sampling Techniques and Data

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

Criteria	JORC Code explanation	Commentary
<i>Sampling techniques</i>	<ul style="list-style-type: none"> <li><i>Nature and quality of sampling (eg 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.</i></li> <li><i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></li> <li><i>Aspects of the determination of mineralisation that are Material to the Public Report.</i></li> <li><i>In cases where 'industry standard' work has been done this would be relatively simple (eg '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 (eg submarine nodules) may warrant disclosure of detailed information.</i></li> </ul>	<ul style="list-style-type: none"> <li>Sampling is yet to be completed on the current drilling program.</li> <li>Visual inspection of drill core has been completed and a preliminary estimate of graphite percentage has been completed by a competent geologist.</li> </ul>
<i>Drilling techniques</i>	<ul style="list-style-type: none"> <li><i>Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).</i></li> </ul>	<ul style="list-style-type: none"> <li>Drilling has been completed using a core drilling rig producing core at HQ3 size. Drill holes have been collared at surface and the un-mineralised Mesozoic cover sequence has been cased with HWT casing to maintain hole integrity and prevent hole contamination.</li> </ul>
<i>Drill sample recovery</i>	<ul style="list-style-type: none"> <li><i>Method of recording and assessing core and chip sample recoveries and results assessed.</i></li> <li><i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i></li> <li><i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>Drilling was completed with HQ3 and all core samples were recovered from the core barrel by pumping out the splits.</li> <li>The mineralized zone appeared to be quite competent and core recoveries was excellent.</li> <li>All core was carefully placed in HQ sized core trays and transported a short distance to a core processing area where core recovery, depth markup and photography could be completed.</li> </ul>

Criteria	JORC Code explanation	Commentary
<i>Logging</i>	<ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i></li> <li><i>The total length and percentage of the relevant intersections logged.</i></li> </ul>	<ul style="list-style-type: none"> <li>The core has been logged and sampling intervals have yet to be determined. The level of detail required for this assessment was considered more than adequate for this reconnaissance exploration drilling program.</li> <li>Logging included visual estimates of graphite mineralisation.</li> <li>Areas representative of mineralisation will have preliminary petrological and geochemical analysis completed to help define the assay schedule.</li> </ul>
<i>Sub-sampling techniques and sample preparation</i>	<ul style="list-style-type: none"> <li><i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></li> <li><i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></li> <li><i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></li> <li><i>Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples.</i></li> <li><i>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.</i></li> <li><i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></li> </ul>	<ul style="list-style-type: none"> <li>Sampling has yet to be completed.</li> <li>The sampling will be carried out by a geologist and Competent Person.</li> </ul>
<i>Quality of assay data and laboratory tests</i>	<ul style="list-style-type: none"> <li><i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></li> <li><i>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.</i></li> <li><i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i></li> </ul>	<ul style="list-style-type: none"> <li>No sampling or analysis is yet completed.</li> </ul>



Criteria	JORC Code explanation	Commentary
<i>Verification of sampling and assaying</i>	<ul style="list-style-type: none"> <li><i>The verification of significant intersections by either independent or alternative company personnel.</i></li> <li><i>The use of twinned holes.</i></li> <li><i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></li> <li><i>Discuss any adjustment to assay data.</i></li> </ul>	<ul style="list-style-type: none"> <li>No sampling or analysis is yet completed</li> </ul>
<i>Location of data points</i>	<ul style="list-style-type: none"> <li><i>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.</i></li> <li><i>Specification of the grid system used.</i></li> <li><i>Quality and adequacy of topographic control.</i></li> </ul>	<ul style="list-style-type: none"> <li>The drill collars were located by hand held GPS considered to have an accuracy of <math>\pm 4</math> m.</li> <li>The system used was GDA94 Zone 53L.</li> <li>The base topographic control is the local 1:100,000 topographic map (Prospect) which is adequate to identify overall and specific locations.</li> </ul>
<i>Data spacing and distribution</i>	<ul style="list-style-type: none"> <li><i>Data spacing for reporting of Exploration Results.</i></li> <li><i>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.</i></li> <li><i>Whether sample compositing has been applied.</i></li> </ul>	<ul style="list-style-type: none"> <li>The drill holes were designed to twin historic percussion holes so there is no nominal spacing at this preliminary stage.</li> <li>The aim of the program was to determine the presence or not of what appears to be significant graphitic mineralisation. The spacing was adequate for this purpose.</li> <li>Samples representing 1 m intervals for each drill hole were selected and composited using reasonable cut-off criteria by the Competent Person.</li> </ul>
<i>Orientation of data in relation to geological structure</i>	<ul style="list-style-type: none"> <li><i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i></li> <li><i>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.</i></li> </ul>	<ul style="list-style-type: none"> <li>Considering the deposit type the sampling has shown the presence of broad zones of continuity of mineralisation in an unbiased manner.</li> <li>It is considered that the only type of concentrated structure that could affect the results is narrow buried channels that may have high grades suggesting that the program as designed, would give conservative results, should such an occurrence be encountered.</li> </ul>
<i>Sample security</i>	<ul style="list-style-type: none"> <li><i>The measures taken to ensure sample security.</i></li> </ul>	<ul style="list-style-type: none"> <li>Drill core recovery was regularly observed by a competent geologist who supervised core being placed in core trays.</li> <li>Core processing and core recovery confirmed excellent recovery and nearly all drill core could be pieced together into one continuous piece.</li> </ul>

Criteria	JORC Code explanation	Commentary
		<ul style="list-style-type: none"> <li>• Samples were stored on site in remote location and then transported to Terrasearch in Townsville for additional core processing and storage.</li> <li>• Terrasearch have Procedures and controls in place to ensure security of sample.</li> </ul>
<i>Audits or reviews</i>	<ul style="list-style-type: none"> <li>• <i>The results of any audits or reviews of sampling techniques and data.</i></li> </ul>	<ul style="list-style-type: none"> <li>• A detailed review of the sample protocols has not been carried out as this is a reconnaissance exploration program not leading to resource estimation.</li> </ul>