

## Kambale Drilling, Geophysics and Metallurgical Test Work Update

### Summary

- RC drilling campaign extended to test recently identified new zones of interest.
- Independent Geologist on standby to update the maiden Mineral Resource Estimate.
- Loupe EM survey just completed after being expanded to extend and infill new zones of anomalism within the broader Project licence area.
- Metallurgical test work progressing well.
- Positive feedback from discussions with senior Ghana government officials and key community groups on Project development.

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Castle Managing Director, Stephen Stone commented “The infill and extensional RC drilling and Loupe EM geophysics campaigns have gone extremely well at the Kambale Graphite Project, Ghana.

We are looking forward to updating the present Mineral Resource Estimate of 15.6Mt at 9.0% TGC in addition to being able to identify additional zones of graphite on the broader 149km<sup>2</sup> Project licence.

Recent discussions with senior government officials confirmed a high level of support for the Project which was mirrored during meetings with key community leaders.

Kambale continues to evolve as a credible addition to the Critical Minerals strategic supply chain where graphite’s key and largely irreplaceable role in electric vehicle battery and stationary power storage units is becoming more apparent to a world focused on achieving clean energy targets. A widely forecast looming supply shortage is expected to manifest favourably on fine flake graphite concentrate and precursor Battery Anode Material prices.”

**Photo 1: Drying of graphite drill samples with geologists logging in the background.**



**Photo 2: Castle technicians about to start another day’s Loupe EM geophysical survey.**



### Next Steps at Kambale

1. Complete RC drilling programme and report results;
  2. Update MRE;
  3. Process recently completed Loupe EM geophysics survey data to identify any new zones of graphitic schist within the broader licence area;
  4. Complete Phase 2 metallurgical test work to produce a commercial-grade, bulk, fine flake graphite concentrate that will then be evaluated for its capability to produce higher-value precursor Battery Anode Material (“BAM”); and
  5. Commence a development Scoping Study.
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Castle Minerals Limited (ASX: CDT) (“Castle” or the “Company”) advises that in order to test recently identified new zones of interest it has extended to 44 holes and nearly completed an RC drilling campaign primarily designed to increase the current JORC Code (2012) Mineral Resource Estimate (“MRE”) of 15.6Mt at 9.0% TGC containing 1.41Mt of graphite at its flagship Kambale Graphite Project, Ghana (“Project”)(Photos 1 to 3).

A large component of the campaign (originally 35-holes for 4,100m) is aimed to infill drill a considerable volume of mineralisation and enable it to qualify to be included in the maiden MRE (refer ASX 12 April 2023) and to extend this along strike and to depth.

Independent geologist, Palaris Australia Pty Ltd, is on standby to undertake an updated MRE as soon as all assays become available.

The updated MRE will underpin a Scoping Study that will evaluate the merits of a long-life, open-cut mining operation producing at site a bulk fine-flake graphite concentrate and possibly higher-value precursor material for use in Battery Anode Material (“BAM”) manufacture.

**Photo 3: Castle MD, Stephen Stone, meets with the chief and senior leaders of the Jingu community upon whose lands drilling is presently being undertaken.**



### **Loupe EM geophysics survey completed**

A Loupe EM geophysical survey has just been completed after being increased in order to extend and infill new zones of interest identified as the survey progressed across the broader 149km<sup>2</sup> Kambale licence (refer ASX 22 May 2023).

This is the first time the new, state-of-the-art Loupe EM technology has been used in Ghana. It was specifically chosen after having successfully delineated EM conductor zones at Castle's Kendenup-Martagallup graphite project in Western Australia where there is similarly extensive soil cover obscuring the hard rock geology.

Data is now being processed and interpreted by Perth-based consultants, Terre Resources Pty Ltd.

### **Metallurgical test work**

Phase-2 test work on diamond core samples from representative areas of the deposit is progressing well having moved from the bench-scale batch testing phase to the production of a bulk fine-flake graphite concentrate. This work is now expected to be completed late July.

### **Government and Community**

Castle MD, Stephen Stone, recently met with several senior Ghana government officials to update them on progress at the Project and to discuss strategies to enable it to be fast-tracked towards development as warranted.

The MD also met with leaders from those communities upon which the Project is located and will be most affected by exploration and development. The communities were very welcoming and supportive of current and proposed exploration activities.

### **Comment**

The well-advanced RC drilling programme, the just completed and extended Loupe EM geophysical survey, the progressing metallurgical test work and recent governmental and community engagements are all components of Castle's quest to fast-track the Kambale Graphite Project. This is to take advantage of the widely forecast looming supply deficit and hopefully attendant price increases for fine flake concentrate and precursor BAM used in the manufacture of electric vehicle battery and stationary power storage units.

Once the MRE has been updated and the Perth-based phase of metallurgical test work completed Castle will be in a position to commence a high-level Scoping Study.

The Company is adequately funded to complete planned programmes.

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## **KAMBALE PROJECT BACKGROUND**

### **Geology**

The Kambale graphite deposit was identified in the 1960s by Russian geologists prospecting for manganese. They undertook a limited programme of trenching and shallow drilling.

The genesis of the flake graphite in Kambale is believed to be the result of high-grade metamorphism (amphibolite-granulite facies) which has converted trapped amorphous carbon into characteristic fine crystalline layers.

### **Castle 2012**

Encouraged by firm graphite prices in 2012, Castle undertook three consecutive phases of drilling comprising RAB (251 holes, 5,621m), aircore (89 holes, 2,808m) and reverse circulation (3 holes, 303m). This work confirmed several zones of moderately to steeply dipping, north-east trending graphitic schists hoisted mainly in granodiorites. A JORC Code 2006 MRE was also made.

A concurrent review of a wide-spaced, regional-scale electromagnetic survey dataset inherited by Castle from previous licence holder, Newmont Limited, outlined a roughly elongate, north-south orientated, ~10km-long region that could be considered prospective for graphitic schist horizons.

The Company also undertook a very limited programme of bench-scale test work on RC chips.

Thereafter, little work was undertaken until the more recent improvement in graphite prices prompted a re-evaluation of the Project in early-2021.

### Phase 1 test work

In September 2021 Castle reported that preliminary test work by Independent Metallurgical Operations Pty Ltd (IMO), Perth, on sub-optimal near-surface, weathered graphitic schists sourced from trenches yielded encouraging fine flake graphite concentrate grades of up to 96.4% and recoveries of up to 88%. A conventional multiple grind and flotation concentration flowsheet was used. The three composited samples provided for the test work graded 12.56%, 16.09% and 17.16% TGC.

### Ground geophysics and follow-up drilling

In March 2022, a ground electromagnetic (HLEM) survey demonstrated a strong correlation between already drill confirmed graphite mineralisation and zones of high conductivity. Several high conductivity zones also extended well outside of drilled areas.

In late 2022, a 52-hole 5,353m RC programme was undertaken to test the interpreted steep dipping, shallow conductive plates derived from the HLEM survey. The results confirmed that the majority of the plates were associated with graphite mineralisation and that the graphite continued to depths of at least 100m.

### Maiden MRE

In early-March 2023 Castle reported that robust lenses of graphitic mineralisation containing high-grade zones with excellent continuity had been delineated by a 30-hole, 2,622m RC infill and 4-hole, 365.2m diamond core drilling campaign.

In April 2023 a maiden JORC Code (2012) Mineral Resource Estimate (“MRE”) of 15.6Mt at 9.0% TGC containing 1.41Mt of graphite was provided by independent consultants.

The MRE is hosted by twelve, sub-parallel, steep to moderately dipping graphitic schist zones. These were delineated using data from several phases of trenching and drilling which comprised 386-holes for a combined 16,018m of RAB, aircore, RC and diamond core drilling. Of this database, 85 RC and 4 diamond core holes for a total of 8,644m were used in the actual estimation, in comparison to the previous JORC Code 2006 MRE undertaken in 2012 which incorporated 54 aircore and only 3 RC drill holes for a total of 2,233m.

**Table 1: Summary JORC Code (2012) Mineral Resource Estimate (5% TGC cut-Off):**

Classification	Tonnes (kt)	Contained TGC (kt)	TGC (%)
Indicated	5,979	542	9.1%
Inferred	9,632	863	9.0%
<b>Total</b>	<b>15,611</b>	<b>1,405</b>	<b>9.0%</b>

Mineralisation commences at or close to surface and extends to at least 120m below surface. The MRE excluded any mineralisation below the 200mRL, or approximately 100m below the topographic surface.

A material proportion of mineralisation intersected by drilling did not qualify for inclusion in the MRE. Infill drilling of these zones would be required for it to do so.

### Phase 2 test work

A 300kg sample of fresh, unweathered graphitic schist sourced from the four diamond drill core holes drilled into various representative areas of the deposit was delivered to IMO in late December 2022. It is presently undergoing testing to produce a commercial grade bulk concentrate. This will then be sent to a specialist facility in Europe that will assess its ability to be used in the manufacture of precursor and Battery Anode Material (BAM).

## **ADDITIONAL INFORMATION**

### **Ghana**

Ghana has a well-established mining industry including several Tier-1 mining operations. It is now Africa's largest gold producer and the World's sixth largest. Accordingly, it has a well-trained and very capable workforce supported by an excellent mining services and supply sector. It is a safe and politically stable jurisdiction based on the Westminster system of government and has a workable Mining Act and fiscal regime.

### **Logistics and infrastructure**

The Project is located 6km west of the Upper West region capital of Wa which is 400km north, via good sealed roads, of Kumasi. From Kumasi it is approximately 240km south east by rail or road to the international port of Tema, 30km west of the capital Accra, which provides direct access to global export markets.

The Wa region has an excellent infrastructure including a commercial airport only a few kilometres from the Project, numerous well maintained sealed and unsealed roads, plenty of potable water and reliable grid power largely fed with electricity generated by the 400MWh Bui hydroelectric dam.

### **Social licence**

Castle management has some 16 years of successfully operating in Ghana and in particular its Upper West region. The Company has established a good reputation for its pro-active commitment to community engagement, local employment and training and aims to apply best practise health, safety and environmental standards.

Prior to embarking on any specific exploration programme the Company's Ghanaian team conducts comprehensive discussions and information sessions in local dialects with all stakeholders to fully inform them as to the Company's activities and to identify sites of cultural, religious, social and economic sensitivity and to appropriately mitigate any matters of concern. Compensation for access and any disruptions caused is provided in close consultation with landowners. All site disturbances are rehabilitated immediately after use.

### **Graphite market**

The graphite market is diverse across industrial, metallurgical, chemical and specialised areas with each sector requiring reliable long term supplies of graphite concentrates with very specific qualities. Deposit type, size and geometry, flake size, flake shape, grade, impurities, capital and operating costs, ability to be refined, proximity to specific markets, supply logistics, jurisdiction, fiscal regime and many other factors all combine to determine the commercial viability of a particular deposit.

The current medium to long term outlook for the broader graphite concentrates market is one of escalating demand and a looming supply deficit driven in particular by its use in the fast-growing EV battery and stationary power storage sectors. At present, there is no viable high-volume substitute for graphite whether that be natural flake or its synthetically manufactured form which involves a considerably higher CO<sub>2</sub> generating process. Given the wide variety of uses and required specifications and volumes, the market and pricing for graphite is very opaque.

The reader is directed to numerous recent publications, conference proceedings, market research papers and corporate websites of companies engaged in graphite exploration, project development or production for informed commentary and analysis of the graphite market.

Authorised for release to ASX by the Board of Castle Minerals Limited:

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**PREVIOUSLY REPORTED INFORMATION RELATING TO THIS RELEASE**

Additional details, where applicable, can be found in the releases referenced in this Report and/or in the following releases lodged by the Company with the ASX:

Headline	Date
Castle Commences Geophysical Survey to Locate Additional Graphite	22 May 2023
Castle Commences Resource Upgrade Drilling at Kambale	16 May 2023
Castle's Kambale Project Exceeds 1.4Mt Contained Graphite	12 April 2023
Excellent High-Grade Continuity Confirmed at Kambale Graphite Project	13 March 2023
Kambale Graphite Project RC Drilling Completed	4 January 2023
Kambale Graphite Diamond Core Drilling Completed (Amended)	23 December 2022
Kambale Graphite Diamond Core Drilling Completed	20 December 2022
Independent Exploration Target Estimate Highlights Kambale as a Large-Scale Graphite Deposit	28 November 2022
Kambale Core Drilling Underway	10 November 2022
Kambale Graphite Deposit Extended	3 November 2022
Encouraging Kambale Graphite project Interim Drill Results	29 September 2022
Kambale Graphite RC Drilling Programme Completed	24 August 2022
More Graphite Zones at Kambale	11 July 2022
Drilling Campaign Launched at Kambale Graphite Project	14 June 2022
Kambale Graphite EM Survey Increases Size Expectations	31 March 2022
EM Survey Commences at Kambale Graphite Project Ghana	14 March 2022
Encouraging Graphite Test Work Results	21 September 2021
Kambale Graphite Test Work Update	5 August 2021
Graphite Test Work Underway	3 June 2021
Castle to Reappraise Kambale Graphite Project, Ghana	15 March 2021
Drilling Doubles Strike length of Kambale Graphite Deposit	17 September 2012
Metallurgy Test Work Confirms Commercial Potential of Kambale Graphite Deposit	3 September 2012
High Grade Graphite intercepts Extend Kambale Deposit	24 August 2012
Maiden Resource Confirms Kambale as One of World's Largest Graphite Deposits	24 July 2012
Large High Grade Deposit Confirmed at Kambale	6 July 2012
Extensive Zones of High Grade Graphite Intersected	9 May 2012

### About Castle Minerals Limited

Castle Minerals Limited is an Australian Securities Exchange (ASX: CDT) listed and Perth, Western Australia headquartered company with interests in several projects in Western Australia and Ghana that are prospective for Battery Metals (lithium and graphite), base metals (zinc, lead and copper) and gold.

The **Earaheedy Basin** project comprises the **Withnell**, **Terra Rossa** and **Tableland** sub-projects with the Withnell licence strategically located adjacent to the evolving World-Class Chinook-Magazine zinc-lead project of Rumble Resources Ltd (ASX: RTR) and north of the Strickland Metals Limited (ASX: STK) Iroquois prospect. The Terra Rossa licences have additional prospectivity for copper.

The **Beasley Creek** project is prospective for gold and lithium and lies on the northern flanks of the Rocklea Dome in the southern Pilbara.

The **Success Dome** project lies in the Ashburton structural corridor midway between the Paulsen's and Ashburton gold deposits and is prospective for gold and base metals.

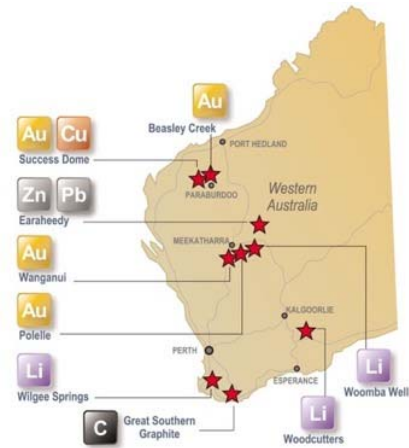
The **Polelle** project, 7km southeast of the operating Bluebird gold mine near Meekatharra, hosts a mainly obscured and minimally explored greenstone belt prospective for gold and possibly base metals whilst the **Wanganui** project is prospective for down-plunge high-grade gold shoots.

The **Wilgee Springs** project, along strike from and within the same metamorphic belt as the world-class Greenbushes lithium mine 25km to the south, is prospective for spodumene bearing pegmatites as is the **Woodcutters** project, 25km south east of the Bald Hill lithium mine and 25km north west of the Buldania lithium deposit. The **Woomba Well** project will also be evaluated for lithium bearing pegmatites.

The **Great Southern Graphite** project comprises granted licences encompassing the historical **Kendenup** graphite workings and the adjacent **Martagallup** graphite occurrences and one application covering a graphite occurrence at **Mt. Barrow**.

In **Ghana, West Africa**, Castle's substantial and contiguous tenure position in the country's Upper West region encompasses large tracts of highly prospective Birimian geological terrane, the host to many of West Africa's and Ghana's multi-million-ounce gold mines. The emerging flagship **Kambale Graphite Project** lies within the Ghana tenure.

Castle retains a **4% net smelter precious metal royalty** over the Julie West licence, a key component of Azumah Resources Limited's Wa Gold Project, Upper West region, Ghana.



## STATEMENTS

### Cautionary Statement

All of Castle's projects are considered to be of grass roots or of relatively early-stage exploration status. Other than for the Ghana projects, there has been insufficient exploration to define a Mineral Resource. No Competent Person has done sufficient work in accordance with JORC Code 2012 to conclusively determine or to estimate in what quantities gold or other minerals are present. It is possible that following further evaluation and/or exploration work that the confidence in the information used to identify areas of interest may be reduced when reported under JORC Code (2012).

### Forward Looking Statement

Statements regarding Castle's plans, forecasts and projections with respect to its mineral properties and programmes are forward-looking statements. There can be no assurance that Castle's plans for

development of its mineral properties will proceed. There can be no assurance that Castle will be able to confirm the presence of Mineral Resources or Ore Reserves, that any mineralisation will prove to be economic or that a mine will be successfully developed on any of Castle's mineral properties. The performance of Castle may be influenced by a number of factors which are outside the control of the Company, its Directors, staff or contractors.

### **Competent Persons Statements**

The scientific and technical information in this Report that relates to the geology of the deposits and exploration results is based on information compiled by Mr Stephen Stone, who is Managing Director of Castle Minerals Limited. Mr Stone is a Member of the Australian Institute of Mining and Metallurgy 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 as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Stone is the Qualified Person overseeing Castle's exploration projects and has reviewed and approved the disclosure of all scientific or technical information contained in this announcement that relates to the geology of the deposits and exploration.