



## Eastern Australia suddenly hot for porphyry copper-gold

Big drill hits in eastern Australia have finally convinced the doubters of the porphyry copper-gold story in our own backyard. **David Upton** explains.

For decades, Australian explorers have headed overseas with dreams of finding Tier1-sized porphyry copper-gold. South America, South East Asia and PNG are at the top of the list, but anywhere in the so-called Pacific Rim of Fire has been a preference for local explorers over their own backyard.

The exodus reflects a view that Australia is not a good place for porphyry copper, despite Newcrest's Cadia and Ridgeway discoveries in 1993 and 1996 respectively, with a combined resource of more than 10 million tonnes of copper and 50 million ounces of gold.

Certainly, the track record of porphyry discoveries since 1996 has been uninspiring. Data compiled by Richard Schodde of MinEx Consulting shows just 10 deposits with an average size of 240,000t of copper and 770,000oz of gold.

But Cadia proved that supergiant porphyry deposits do exist in Australia. And geoscience agencies over the past decade have amassed evidence of volcanic arcs right across eastern Australia, analogous to those in the Pacific Rim of Fire, just older and hidden under cover.

Whatever the reasons behind local explorers' lack of enthusiasm, the idea Australia is not prospective for porphyry copper-gold was smashed last month by big drill hits by Alkane Resources at Boda in central western NSW and Stavely Minerals at Thursday's Gossan in western Victoria.



*DevEx's Bogong prospect, west of Canberra.*

Alkane Resources announced on September 9 a stunning intercept at the Boda prospect within its 100%-owned Northern Molong Porphyry project, about 100km north of Cadia and 30km southeast of Dubbo.

Diamond drill hole KSDD003 intersected 502m averaging 0.48 g/t gold and 0.20%

copper from a depth of 211m. This included 313m @ 0.62 g/t gold and 0.17% copper from 228m.

Alkane's drill hit is all the more remarkable because it was Alkane's first and only deep hole at Boda, designed to test beneath a zone of gold mineralisation identified by RC drilling by Alkane in 2016.



Phase 4 porphyry intrusions of the Macquarie Arc produced deposits such as Newcrest's Cadia in New South Wales.

By comparison, Newcrest's discovery hole at Cadia Hill was 217m @ 1.36 g/t gold and 0.15% copper, which came from the sixth and final hole of a deep drilling program.

In some ways, Alkane's success is no surprise. The Northern Molong Porphyry project, covering an area of 110sq.km, dates back to at least 2010 and was driven by former managing director, Ian Chalmers, who stepped down in 2017 after 11 years at the helm.

Chalmers led the exploration team that discovered the 2Moz McPhillamys gold deposit, which Alkane joint ventured to Newmont and subsequently sold to Regis Resources in 2012. McPhillamys is still the biggest gold discovery in the Lachlan Fold Belt since Cadia. Chalmers was also a founding director of Northern Star, which is now a \$7 billion gold company.

Follow up drilling is hotly anticipated for a number of reasons. First, the mineralisation and geochemistry extracted from KSD003 suggests Alkane has yet to test an inner core of bornite, which is a higher-grade copper sulphide. Secondly, Alkane appears to have worked out the controls on the porphyry copper-gold mineralisation in its project area. The Boda drill hit and highly encouraging intercepts from just-completed drilling at the Kaiser prospect only 4km north of Boda are on the margins of a series of intrusions.

The Alkane results also contain a third reason to get excited that has implications across the region. The discovery was made in what are known as Phase 4 porphyry intrusions of the Macquarie Arc. Phase 4 was a (geologically) brief period between about 439 and 435 million years ago, occurring right at the end of the Macquarie Arc as subduction of a tectonic plate came to a shuddering halt. For reasons no-one understands, it appears the system spewed huge amounts of gold and copper in this very narrow window of time.

Phase 4 delivered Cadia and Northparkes, and now it looks like it might have produced

another giant copper-gold system for Alkane at Boda-Kaiser.

Phase 4 rocks were hot property before Alkane's discovery and have driven action in the exploration scene by North American majors over the past 12 to 18 months, but has gone unnoticed by most local explorers until now.

About 18 months ago, the Geological Survey of NSW announced that a mapping project known as East Riverina had identified Phase 4 rocks in southern end of the Junee-Narramine volcanic belt, which hosts Evolution Mining's 6Moz Cowal deposit at its northern end.

The breakthrough was the product of five years of field work to produce the first new maps of the region since 1960 and a large amount of very precise age-dating at Geoscience Australia's SHRIMP laboratory in Canberra.

The opportunity was not lost on Freeport, one of the world's largest porphyry copper miners. The company resumed to exploration in Australia in 2018 as a direct result of the work by GSNSW and GA and is currently drilling in the southern end of the Junee-Narramine belt. As reported in this column three months ago, Freeport is also looking more widely for porphyry copper now that it is back in Australia, including a greenfields region immediately east of Adelaide in a joint venture with Terramin Resources.

Newmont has also moved into the southern end of the belt, while Evolution Mining, Sandfire Resources and St Barbara are also increasing their activity.

The good news is the Phase 4 story and the wider potential for Tier 1 porphyry discoveries in the eastern states is not held exclusively by the North American heavyweights and big local players. There are juniors offering massive leverage and creating big excitement on the ASX.

For example, Alkane's share price doubled following the Boda discovery, boosting its market cap towards \$400 million. The response to Stavely's big drill hit at

its Thursday's Gossan prospect was even more spectacular, with investors lifting the company's market cap by almost 300% to about \$175 million.

Another big mover has been DevEx Resources, which acted quickly on the breakthrough news of additional Phase 4 rocks in central NSW. In 2018, the company pulled together two projects – Junee, at the southern end of the Junee-Narramine volcanic belt, and Bogong, about 80km west of Canberra.

Drilling at Bogong is expected to get underway within weeks, but DevEx's share price has already jumped by 50% since the Alkane discovery and has doubled since the start of the year.

Bogong was always a ridiculously good-looking prospect, largely forgotten since it was last drilled decades ago because local explorers preferred to drill for porphyry copper anywhere but in Australia.

DevEx, led by managing director Brendan Bradley, plans to drill test under the historic Bogong copper mine. The rocks have all the right signatures and rock chips from the surface have assayed up to 10% copper and 0.47g/t gold. Bogong was last drilled by AOG in 1974, with a best result of 54.9m @ 1.06% copper from just 6.1 metres. The hole ended in mineralisation and was never assayed for gold. AOG moved on because this was pre-Cadia and the company was searching for the much higher copper grades of VMS-style deposits.

At the Junee project, there has been no drilling for more than 20 years in an area mostly under cover. Limited outcrops of porphyry rocks have produced assays of up to 2% copper, and magnetic data is lighting up intrusions just below the surface.

DevEx's drill results could add to the fire already lit by Alkane and Stavely. Whatever the outcome, there is now so much happening in eastern states porphyry copper-gold it promises to become the next big theme in exploration investment. After decades in the doldrums, the rush is on.