

Central Asia Metals

A consistent dividend payer with a high yield

Central Asia Metals (CAML) has increased its annual dividend by 24% year-on-year, to 15.5p per share, providing shareholders with a 6.6% yield. The company recorded its fifth consecutive year of profits and has paid out dividends in excess of the funds it raised in its 2010 initial public offering (IPO).

CAML's main asset is its Kounrad copper dump treatment operation, in Kazakhstan, which produces copper through a solvent extraction - electrowinning (SX-EW) plant.

CAML appears to have a long and stable future production profile and, if this continues, as one of the lowest-cost copper producers in the industry, it should continue to deliver a high dividend yield for many years. It currently outperforms its peer group of copper producers on most value metrics and has a better EBITDA margin and dividend yield than some of the more prominent London-listed copper producers.

Although ex-production growth, CAML says that it is looking prudently at opportunities to grow its output. The company had cash of US\$40 million at the end of 2016 and is debt-free.

Year	Cu Prod (kt)	Cash costs (USc/lb)	Rev. (U\$m)	EBITDA (U\$m)	EBITDA margin (%)	EPS (USc)
2017f	13.5	50	78.3	46.6	60	0.27
2018f	13.2	52	81.6	49.4	60	0.29
2019f	13.2	53	87.0	54.3	62	0.32

Source: Marten & Co

If copper prices rise towards the levels assumed, the model for CAML suggests that the company could offer reliable returns for investors.

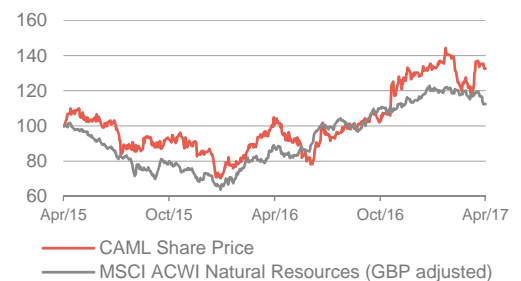
Valuation summary

The sum-of-the-parts NAV valuation for CAML from the model is 268.5 pence per share, implying that the company is currently trading at a 13% discount to net asset value (NAV).

Listed	LSE
Ticker	CAML LN
Base currency	GBP
Price	234.00p
Daily volume (1-year avg.)	119k shares
1-year high	245.75p
1-year low	138.00p
1-month performance	3.9%
3-month performance	0.4%
1-year performance	27.5%
Calendar YTD perf.	2.9%
Yield	6.6%

Perf. vs MSCI ACWI Nat Res. rebased

Time period 23 April 2015 to 23 April 2017



Source: Bloomberg

Net cash	US\$40.4m
NAV ^{8%} /share	268.5p
P/NAV	87%
Market cap	£262.3m
Shares outstanding	112.1m
EV/EBITDA	4.5

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Further information about CAML can be found on the company's website:

www.centralasiametals.com

Introduction

CAML's primary focus is a low-cost, copper dump treatment operation associated with the Kounrad copper mine, in Kazakhstan.

Elsewhere in Kazakhstan, the company is exploring a copper prospect and, in Chile, it holds a 75% interest in Copper Bay Ltd, a private company that has completed a feasibility study on a copper tailings treatment project.

CAML was incorporated in the UK in 2005 and in 2007 successfully tendered for a 60% interest in the Subsoil Use Contract (SUC) at Kounrad, which allowed it to explore and process the mineralised dumps.

In 2010, the company completed an IPO on AIM, raising gross proceeds of US\$60m (net proceeds of £35m), the equivalent of which has been returned to shareholders through dividends.

CAML's corporate headquarters are in London, with operational management in Balkhash, Kazakhstan.

Key investment points

- 2016 EPS of US23.7c, up 17% (see page 5).
- Net profit increased substantially from US\$22.4m in 2015 to US\$26.2m in 2016.
- EBITDA was US\$39.1m, up 12% and representing a margin of 56%.
- Final dividend increased by 25% to 10.0p (see page 7).
- Record copper production of 14,020t (14.0kt) in 2016, up 16% from 2015 (see page 5).
- Copper sales up 16% year-on-year to 13.9kt.
- Substantial reduction in C1 unit costs (see the glossary on the QuotedData website for an explanation of this and other industry jargon) in 2016, to US43c/lb (2015: US60c/lb) (see page 5 and 6).
- Internally-funded Western dumps exploitation project close to completion and under budget (see page 19).
- CAML has provided guidance that it expects its copper production to be in the range of 13.0-14.0kt in 2017 from the Kounrad operation (see page 6).
- The Copper Bay definitive feasibility study (DFS), completed in Q4 2016, is an option on higher copper prices (see page 20).
- Significant uplift in NAV^{8%} to 268.5p per share (see page 9).
- The company has outperformed its peer group of copper producers, but appears to be undervalued relative to its peers (see page 12).
- Shares currently trading at 13% discount to NAV.
- 52-week stock market performance – 28% rise.
- Company has cash of US\$40.4m and no debt (31 December 2016).

Investment case

Impressive financial results for 2016

Annual dividend increased by 24% on the back of increased earnings

The company reported increased earnings and earnings per share (EPS) in 2016 and on the back of this has increased the total annual dividend by 24%.

Earnings in 2016 were US\$26.2m (2015: US\$22.4m) and EPS increased by 17%, to US23.7c (2015: US20.1c). Earnings in 2015 benefitted from an extraordinary foreign exchange gain of US\$9.0m.

Figure 1: 2016 financial highlights

	US\$m	y-o-y
Revenue	69.3	3%
EBITDA	39.1	12%
Earnings	26.2	17%
EPS (USc)	23.7	17%
Cash at end	40.4	-3%
Total dividend (paid and proposed) (pence)	15.5	24%

Source: CAML

Profitability as measured by EBITDA, was US\$39.1m, an increase of 12% on 2015, representing an EBITDA margin of 56% (2015: 52%).

Revenue was up marginally to US\$69.3m owing to higher copper cathode production and volume of sales, and despite a fall in the average copper price received from US\$5,336/t to US\$4,994/t.

Record copper production of 14kt

In 2016, copper production at Kounrad was a record 14.0kt, representing a 16% increase on 2015, which the company was able to achieve because of the successful completion of the SX-EW plant expansion in 2015.

Copper cathode sales for the year were 13.9t, which was a 16% increase on 2015.

Cost of sales in the income statement were US\$18.4m, a dramatic improvement on the previous year when costs were US\$25.5m. The decrease was principally due to a substantial reduction in depreciation and amortisation charges (-US\$5.3m). The company has been able to change its accounting approach and is now depreciating and amortising certain assets over a longer productive life since the approval for development of the Western dumps at the end of 2015, which will extend the operation through to 2034.

The remaining improvement in costs was due to a reduction in minesite operating costs as a result of a devaluation of the Kazakh tenge against the US dollar, which resulted in a 30% reduction in minesite costs year-on-year.

C1 costs reduced to US43c/lb

Unit costs of copper production in 2016 showed a dramatic improvement to US43c/lb on a C1 cost basis and US\$1.06/lb on a fully inclusive basis.

The decrease was in part because of the higher production base, but primarily as a result of the depreciation of the tenge, as mentioned above. Seventy percent of C1 costs are incurred in the local currency. In 2016, the tenge stabilised and remains stable in 2017 thus far.

Figure 2 shows the breakdown of unit costs with variances from the previous year.

Figure 2: Comparison of 2016 and 2015 operating costs

Costs (USc/lb)	2016	2015	y-o-y
Labour	9	13	-31%
Reagents	5	8	-38%
Power	5	9	-44%
Materials	5	6	-17%
Other	4	4	0%
Cost of production	28	40	-30%
Distribution & selling	9	12	-25%
Local general and administrative costs (G&A)	6	8	-25%
C1 costs	43	60	-28%
Mineral extraction tax (MET) & local taxes	14	19	-26%
Depreciation	16	39	-59%
Inventory impairment	0	2	-100%
Corporate G&A	33	38	-13%
Full inclusive cost	106	158	-33%

Source: CAML

Kounrad generated operating cashflow of US\$44.7m, up from US\$33.6m in 2015. CAML paid out US\$20.4m in dividends and spent US\$12.3m on the expansion project and sustaining capital. As at 31 December 2016, the company held cash and equivalents of US\$40.4m and had no debt.

CAML's guidance is production of 13-14kt of copper for 2017

CAML has said that, for 2017, it expects its production to be between 13.0-14.0kt of copper cathode from Kounrad. The Eastern dumps will provide the majority of the copper production with the Western dumps providing an increasing amount of overall copper production from Q2 2017 onwards.

In Q1 2017, Kounrad produced 3.4kt of copper, up almost 5% on the corresponding period of 2015. Given that production in the winter period is generally lower than in the warmer summer months, the company appears to be well on track to meet its target production of 13-14kt for the year.

Q1 production benefitted from the introduction of an intermediate leaching circuit (ILC), which enabled a higher overall recovery of copper from the covered winter blocks.

Industry-leading cost of production

CAML recorded a profit in its first year of operation, 2012, and has remained profitable ever since.

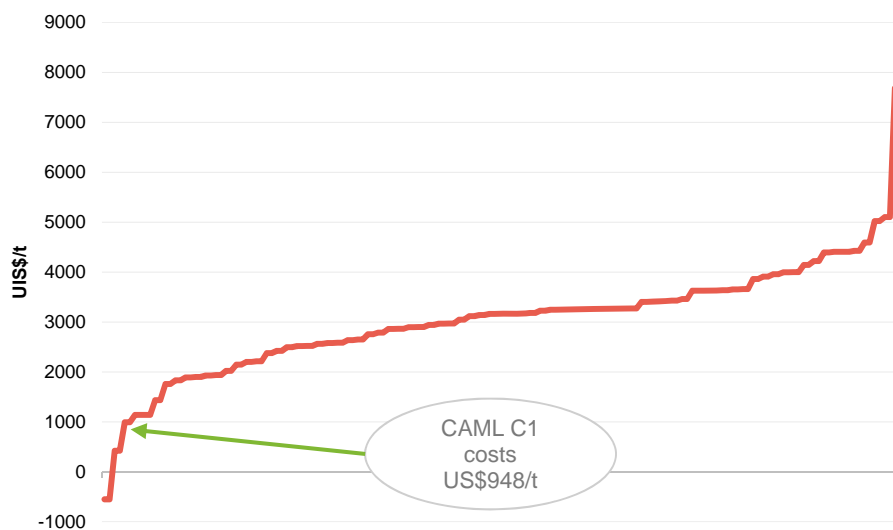
The key to this profitability is the great advantage that CAML has at its Kounrad operation, in that it treats, through a SX-EW process, copper-bearing material that has already been mined and dumped in heaps by a third party. As there is no mining involved, CAML's unit costs of production are very low compared to its peers.

Cash costs in the lowest 4% of the industry

In 2016 cash costs were just US43c/lb (US\$948/t), making the company one of the lowest-cost copper producers in the industry, well inside the top 4%.

Figure 3 shows, on a cumulative basis, how the cost of producing one tonne of copper varies throughout the industry, with CAML firmly located at the lower end of the cost curve.

Figure 3: Copper mining industry cost curve 2016 (C1 US\$/t)



Source: Thomson Reuters GFMS, Marten & Co

Costs at the Kounrad operation have benefitted from a significant depreciation of the Kazakh tenge two years' ago, as 70% of operational costs are denominated in tenge (while revenues are in US dollars).

The model suggests that, because of its low cost of production, CAML could continue to generate profits even if prices were to decline back to the lows of the recent downcycle.

A consistent dividend payer with high yield

Final dividend raise to 10.0p per share, taking total to 15.5p. Yield of 6.6%

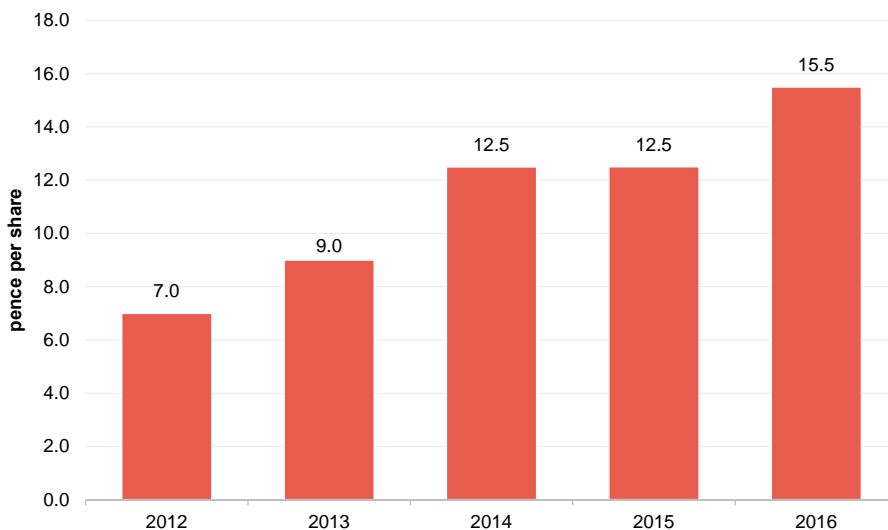
The company has increased the proposed final dividend for 2016 to 10.0p, taking the total for the year to 15.5p. Earlier in 2016, the company raised its interim dividend by 22%, to 5.5p per share

Based on this annual dividend and the company's current share price, the indicative dividend yield is 6.6%.

The company's dividend policy is to pay an annual dividend of a minimum of 20% of revenue from Kounrad (subject to the company's cash reserves providing a dividend cover of three times or greater). Since commencing operations at Kounrad, the company has paid dividends each year at a rate substantially higher than that minimum, and dividends declared for 2016 equate to 31% of gross revenue.

The company boasts an impressive stream of dividends (as shown in Figure 4); something of a novelty for a junior mining company.

Figure 4: Dividends paid (pence per share)



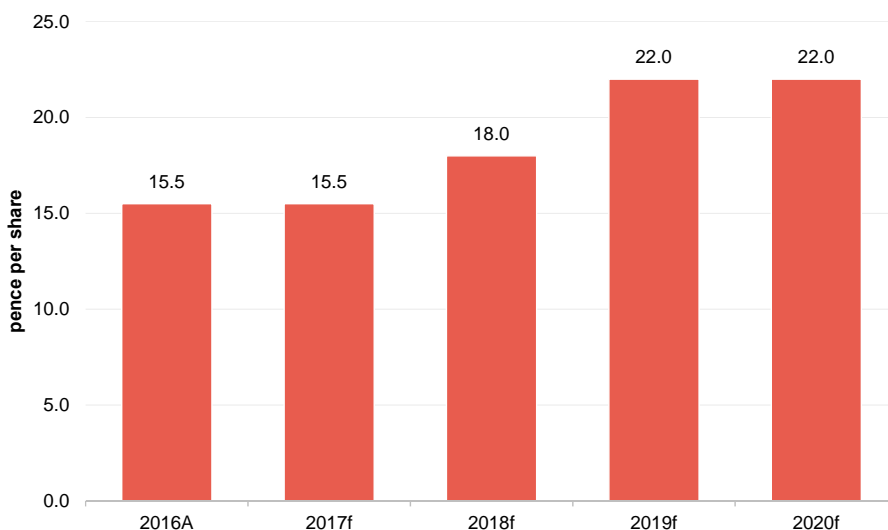
Source: CAML

After paying a dividend each year, CAML has paid back all money raised at IPO (US\$60m)

Since commencing operations, CAML has declared dividends of 56.5p per share, for a total of US\$96m, far in excess of all the funds it raised (US\$60m) in the 2010 IPO.

The model assumes that the company will be able to continue paying approximately 30% of gross revenue out as annual dividends.

Figure 5: Forecast dividends



Source: Marten & Co

Proven operational success

CAML has operated the Kounrad leach and SX-EW plant successfully for five years.

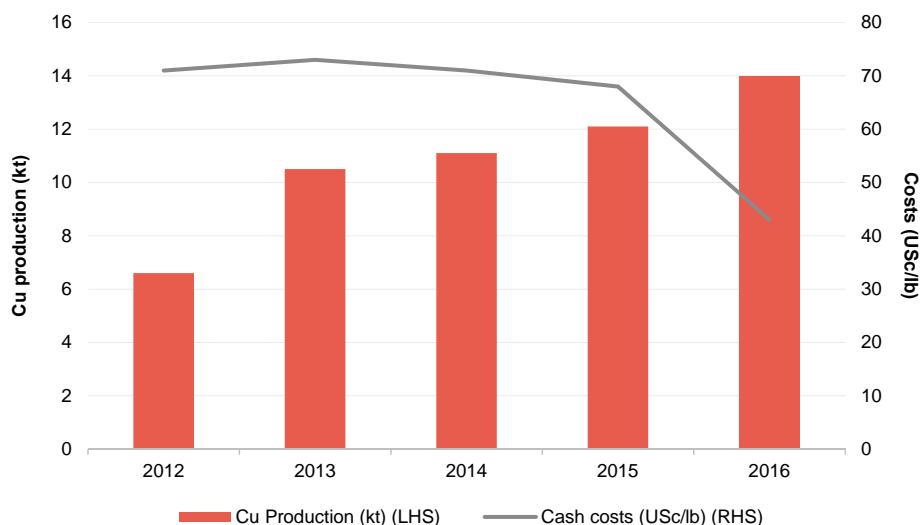
Although the process flowsheet at Kounrad seems simple on paper, there are many technical challenges.

The operations involve spraying acid onto existing copper containing dumps, collecting the pregnant solution and feeding it to a SX-EW plant, which is a tried and trusted

recovery technology in the copper industry. However, the chemical composition of the dumps is seldom uniform and ongoing chemical activity can alter the effectiveness and speed of the leaching process, affecting the strength of the copper in solution feed to the plant. Moreover, management has to manage flow rates and solution grades in severe winter climatic conditions, with temperatures down to -40°C at times.

This is an achievement in itself, but on top of that the company has successfully completed a 50% increase in the capacity of the plant so that it now can produce up to 13-14kt/y of copper. It funded this expansion from cash resources.

Figure 6: Annual copper production and C1 costs



Source: CAML

Western dumps – the key to longevity

Following the installation of infrastructure to allow the exploitation of copper resources in the Western dumps, it is assumed that CAML can maintain production of over 13kt/y for at least another 14 years until 2032.

The adoption of an innovative re-leaching system – the intermediate leaching circuit — in Q1, would appear to have already enhanced leach recovery from the Eastern dumps. If this circuit proves to be successful and is retained, it could potentially add to production volumes from both dumps.

Valuation

CAML has been valued on a sum-of-the-parts basis taking into account the net present value (NPV) of the Kounrad operation using a discount rate of 8%.

Given that the company has decided not to proceed with the Copper Bay project at this stage, it has been treated as an investment in the model and has been valued at CAML's cost of acquisition of its 75% interest. No value has been attached to the Shuak exploration property at this stage.

NAV @ 8% of 268.5 per share

The model suggests an NAV for CAML of 268.5p per share.

Figure 7 summarises the NAV model.

Figure 7: Valuation model for CAML

	US\$M	£M	Pence per share
Kounrad NPV ^{8%*}	338.7	264.6	236.0
Investments (Copper Bay)	6.2	4.8	4.3
Investments (Shuak)	0.0	0.0	0.0
Cash	40.4	31.6	28.2
NAV	385.3	301.0	268.5

Source: Marten & Co * net present value discounted at 8%

The NPV for Kounrad assumes that the company successfully brings the Western dumps into operation in Q2 2017 as activities at the Eastern dumps wind down over the next few years.

The model assumes that production falls slightly as operations transition from the Eastern to the Western dumps as a result of different mineralogy of the Western dumps and longer leach times leading to lower pregnant leach solution (PLS) grades. The model assumes an average PLS grade of 2.0 g/l, which is lower than that achieved thus far from the Eastern dumps.

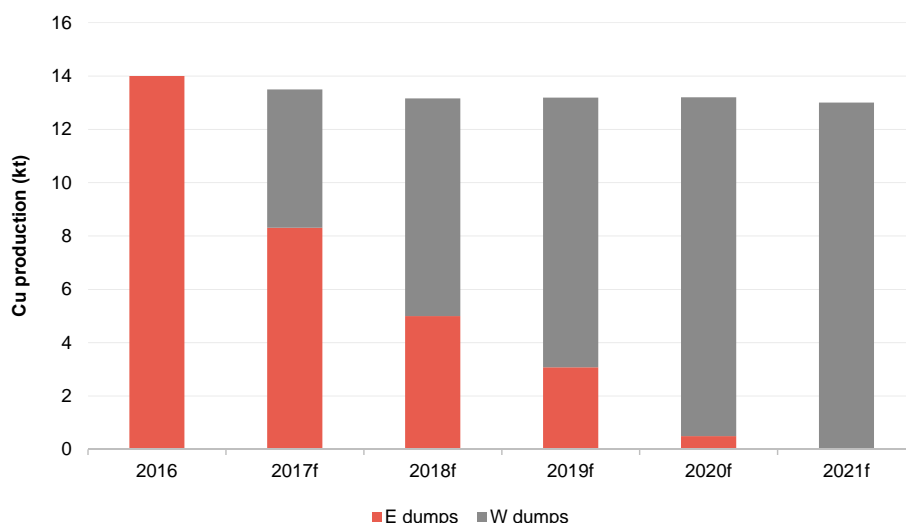
However, the company may be able to achieve higher production than the model assumes because recoveries in this area could be higher than allowed for in the model. This is because, after decades of weathering, some of the material classed as 'sulphides' may in fact be more amenable to acid leaching than the categorisation suggests.

The model assumes copper production dips to 13.5kt, in 2017 and then settles back to a steady state rate of just over 13 kt/y until 2032.

CAML has guided production of between 13kt and 14kt for 2017.

Figure 8 shows the model's production forecasts from the Eastern and Western dumps.

Figure 8: Annual copper production forecast



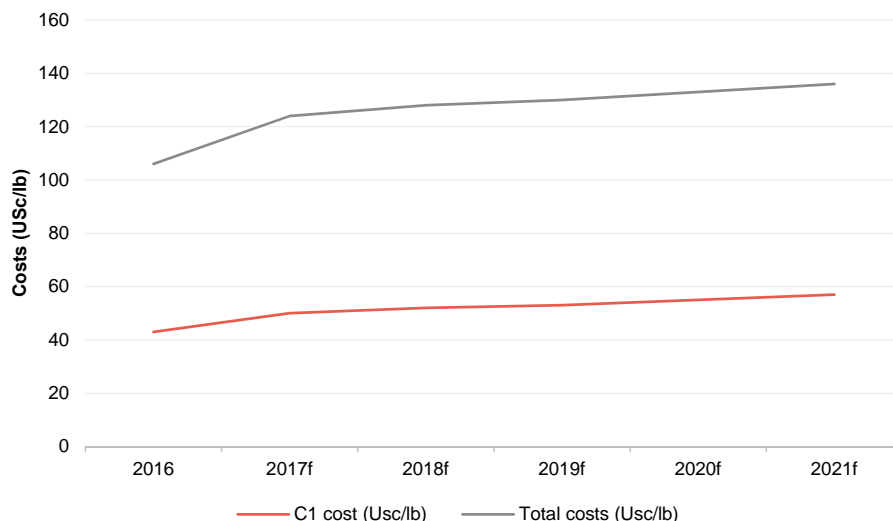
Source: CAML, Marten & Co

The model assumes that C1 costs rise by about 10% in 2017, because of increased reagent consumption, owing to the different mineralogy, and greater power consumption, as the Western dumps are further from the processing plant than the Eastern dumps. A further increase in costs, due to Kazakh inflation, has also been assumed. Kazakh inflation has been approximately 8% over the past year and the model assumes modest cost inflation each year after 2017.

Fully-allocated costs are also assumed to rise reflecting higher depreciation and administration costs spread over a lower volume of sales.

Figure 9 illustrates the model's projected C1 and fully-allocated costs.

Figure 9: Projected C1 and fully-allocated costs at Kounrad



Source: CAML, Marten & Co

The short-term copper price forecasts used in the model have been adjusted to reflect the improved market conditions from the end of last year and into this year, and a slightly more conservative slope upward to the long-term forecast assumption (see discussion on copper prices, page 21).

The model assumes a copper price of US\$5,800/t (US\$2.63/lb) in 2017, US\$6,200/t (US\$2.81/lb) in 2018 and thereafter a long-term price of US\$6,600/t (US\$3.00/lb).

The forecasts are summarised in Figure 10.

Figure 10: Comparison of original and revised copper price forecasts

	2017	2018	2019	2020
Original forecast (Feb 2016)	5,500	6,600	6,600	6,600
New forecast (April 2017)	5,800	6,200	6,600	6,600

Source: Marten & Co

NAV valuation has been raised from 197.5p in February 2016 to 268.5p

The NAV valuation has increased from 197.5p per share to 268.5p per share since QuotedData's initiation note of February 2016 because of:

- A reduction in operating costs, principally as a result of the depreciation of the tenge
- A 30% reduction in capital costs for completion of the Western dumps infrastructure
- The completion of the major capital spending programme this year, and
- The use of a lower exchange rate of £1.28/US\$ (against £1.45/US\$) when calculating the NAV to reflect the weakness of the pound following the Brexit vote

CAML has decided not to proceed with the Copper Bay project for the moment. As such, this has not been included, at this point in time, in the NAV valuation for CAML as a net present value (NPV) based on discounted cash flow (DCF) analysis. Instead, the Copper Bay project has been valued at the cost of CAML's investment, that is US\$6.2m.

With a recent definitive feasibility study (DFS), the Copper Bay project remains a near-term option in the event of higher copper prices. Meanwhile, there are opportunities to

enhance the project economics. CAML may investigate the potential to expand the current seven-year mine life by including resources from two other areas that lie adjacent to the main Bay Zone, which hosts the mineable resource that underpins the DFS.

The current estimated capital cost of the project is US\$88.5m and it is likely that to fund the capex CAML would have to look at debt financing, at least in part.

CAML will not contemplate any investment opportunity that may jeopardise its ability to pay dividends in line with its policy

Management has previously said that it will not consider Copper Bay, or any other potential investment, if it jeopardises its ability to pay dividends in line with its policy; management believe that this has been one of the pillars of its success and a major key to its attractiveness as an investment.

The company says that it is in the great position of not having to do any deals – it has resources at Kounrad to keep operations generating cashflow beyond 2030.

At the end of 2016, the company had US\$40m in cash and after paying US\$13.8m for the final dividend and with the expansion project now paid for, it is assumed that it still has around US\$26m with which it can pursue suitable investment opportunities.

Comparative valuation

In addition to the absolute valuation of CAML as described above, it is useful to compare the company to other members of its peer group, although the universe of junior copper producing companies is not large.

Most copper producers are significantly larger in production scale or market value terms (Antofagasta and Kaz Minerals, for example, in London) and a large proportion of the world's copper production derives from multi-commodity, diversified miners such as BHP Billiton, Rio Tinto and Glencore.

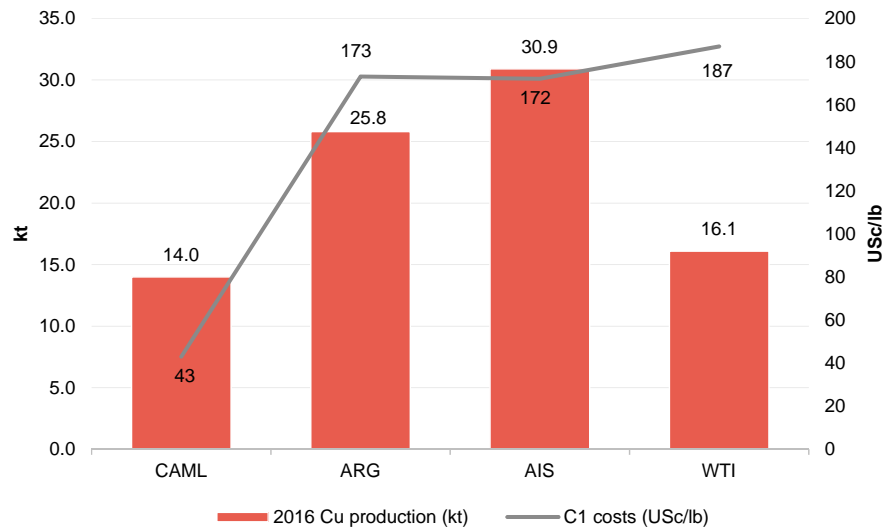
For the purpose of comparing CAML's operating and market performance, three copper producers of similar size have been identified. Although comparisons with larger copper producers are arguably not as insightful, some comparable metrics for Antofagasta and Kaz Minerals have also been included (see Figure 15 page 15).

The three copper producers that have been used to make comparisons are:

- Amerigo Resources (TSX:ARG). Amerigo is a TSX-listed copper producer that produces copper and molybdenum concentrates by treating fresh and historic tailings from the El Teniente mine, in Chile.
- Aeris Resources (ASX:AIS). Aeris (formerly Straits Resources) is Australia's fifth largest independent copper producer and operates underground mines at Tritton, in New South Wales, to produce copper concentrates.
- Weatherly International (WTI:AIM). Weatherly is a London-listed copper miner which operates an open-pit, heap leach and SX-EW mine at Tschudi, in Namibia.

As Figure 11 shows, CAML is the smallest in terms of copper output, but the lowest cost producer in the group.

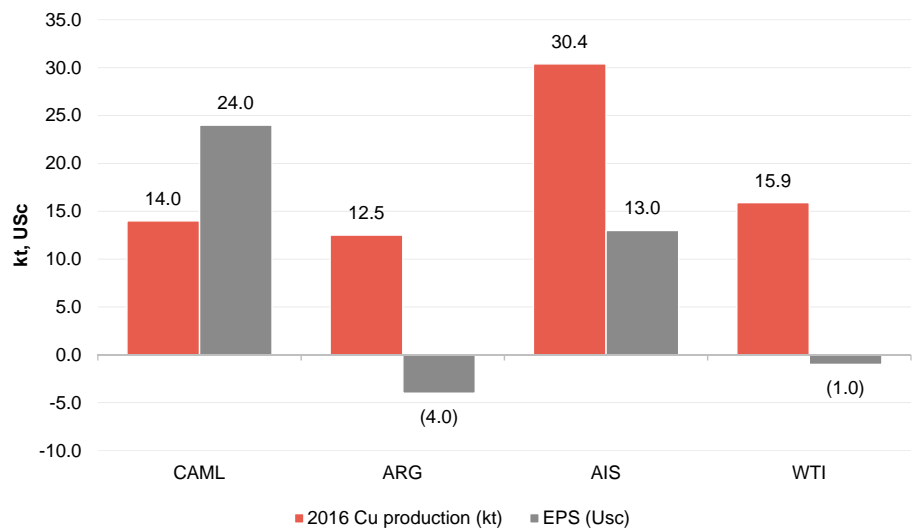
Figure 11: Comparative copper production and costs



Source: Marten & Co, published company information, end-March 2017

Despite being the lowest volume producer in the group, the company’s cost advantage translates through to best-in-group earnings per share, as Figure 12 demonstrates.

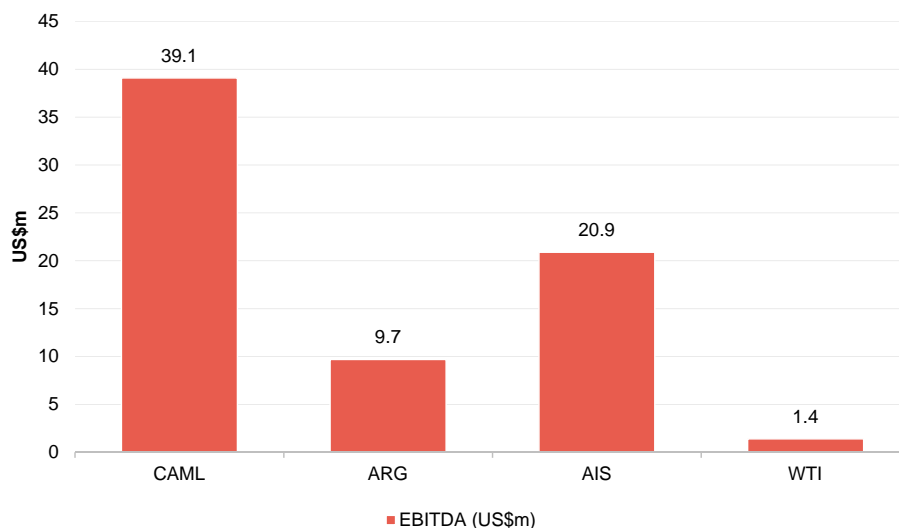
Figure 12: Comparative copper production and EPS



Source: Marten & Co, published company information, end-March 2017

Looking at EBITDA, in 2016 reported US\$39.1m, far exceeding the performance of the comparable companies.

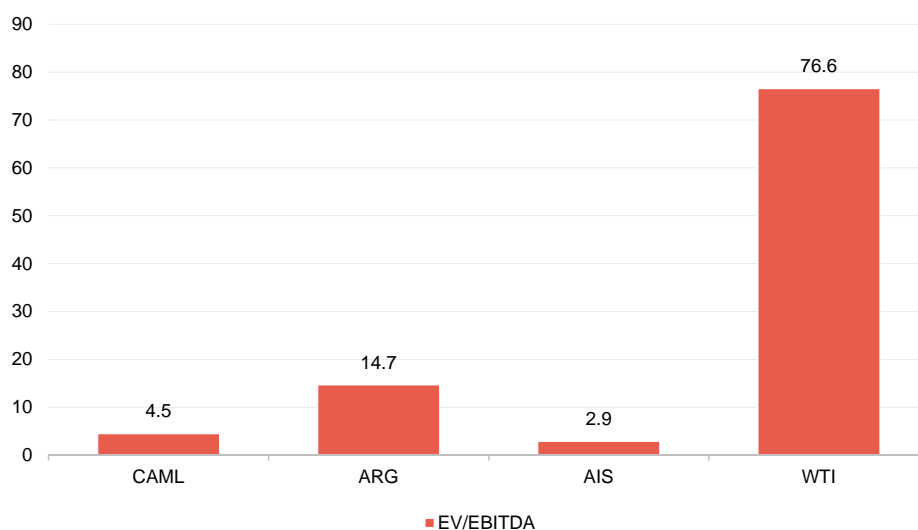
Figure 13: Comparative EBITDA



Source: Marten & Co, published company information, end-March 2017

Finally, despite its superior performance in all metrics, CAML appears to be relatively undervalued in terms of enterprise value/earnings before interest, tax, depreciation and amortisation (EV/EBITDA), as Figure 14 shows.

Figure 14: Comparative EV/EBITDA ratios



Source: Marten & Co, published company information, end-March 2017

CAML has just increased its annual dividend and now has a yield of 6.4%. None of the other three copper producers pays a dividend.

CAML is the standout small- to mid-cap copper producer in its peer group and yet seems to be undervalued

From the above discussion, CAML would appear to be the standout small-to mid-cap copper producer in its peer group and yet it seems to be undervalued relative to its peers. This suggests that there could be the potential for a re-rating upwards.

Looking at two other much larger, copper producers listed in London, KAZ Minerals operates three underground and two open-pit copper mines, in Kazakhstan, and a copper-gold mine, in Kyrgyzstan.

Antofagasta, operates four copper mines in Chile. Both companies produce significant quantities of other metal by-products.

Figure 15: Comparison of production and profitability metrics for CAML and larger London-listed copper producers

Metric	Unit	CAML	ANTO	KAZ
2016 copper production	kt	14.0	709.4	140.3
C1 cash cost	USc/lb	43	120	59
Revenue	US\$M	69	3,622	766
EBITDA	US\$M	39.1	1,626	351
EBITDA margin	%	56	45	46
Market cap	US\$M	298	10,349	2,561
EV	US\$M	257	11,420	5,230
EV/EBITDA		4.5	7.0	14.9
EPS	USc	23.7	12.1	40.0
Dividend	USc	15.5	18.4	0
Dividend yield	%	6.6	2.7	na

Source: Marten & Co, published company information

As Figure 15 illustrates, despite being the smallest by some way in terms of production and market value, CAML delivers the best EBITDA margin and dividend yield through its low cash costs.

Sensitivity analysis

The sensitivity of the model's NAV estimate for CAML to changes in the key variables; copper price and discount rate, is shown in Figure 16.

Figure 16: NAV sensitivity analysis

NAV (p/sh): discount rate	Copper price (US\$/lb)						
	-30%	-20%	-10%	Base	+10%	+20%	+30%
NAV @ 5%	173	219	266	312	358	405	451
NAV @ 8%	152	191	230	268	307	346	385
NAV @ 10%	141	176	211	246	281	315	350
NAV @ 12%	131	163	195	226	258	290	321

Source: Marten & Co Assumptions: US\$1.28/£; shares outstanding 112.1 million

Because of its low cost of production, the company is somewhat insulated against downturns in the copper price. The model suggests that CAML would be able to continue to generate free cashflow even at prices lower than were seen in the recent seven-year low.

Page 23 provides more details on the base case copper price assumptions used in the model. These are US\$5,800/t (US\$2.63/lb) in 2017, US\$6,200/t (US\$2.81/lb) in 2018 and thereafter a long-term price of US\$6,600/t (US\$3.00/lb). If the copper price remains at the current level of US\$5,826/t, the NAV^{8%} would be 230p.

Assets - Kounrad

Location

The Kounrad mine and surrounding dumps are located in the Balkhash area of south-central Kazakhstan, 15 km north of the town of Balkhash and 600 km northwest of the largest city, Almaty. Balkhash is on the northern bank of the Lake Balkhash, which stretches 600 km in an east-west direction. The town has a flotation concentrator and smelter, which has treated Kounrad ore in the past.

The region is characterised by a semi-arid climate and typically flat topography, or steppe.

History

The Kounrad open pit copper mine was state-operated from 1936 to 1992, and managed by copper mining company, Kazakhmys, until 2006. Despite mining both oxide and sulphide material, the operation only treated the sulphide ore, which was amenable to its flotation technology, while discarding and stockpiling the oxide material (in the Eastern dumps) and the below cut-off grade sulphide material to the west of the open pit. It is this stockpiled material that CAML treats to extract copper.

The mine struggled over 2006-2007 with depleting grades and was consequently closed in late 2008, although Kazakhmys attempted limited mining again in 2011.

In October 2014, Kazakhmys was restructured with key and growth assets retained in the listed entity and rebranded KAZ Minerals plc. At this time Kounrad was transferred into private firm Cuprum Holdings along with several other mature assets, which were collectively rebranded as Kazakhmys Corporation.

The potential to treat the dumps using SX-EW technology to recover copper was first recognised in the 1960s by the Ural Research & Project Institute of Copper Industry (Unipromed Plc). Unipromed completed pilot plant scale tests over 1969-1970, which led to limited copper production between 1975 and 1992.

A joint venture in 1993 was established to build a commercial SX-EW plant but, having started building in 1995, work was terminated a year later and ownership of the dumps passed back into state hands. Jalyn Mining then tendered successfully for the rights over the Eastern dumps and designed an SX-EW plant. However, it pulled financing of the project in 2005, triggering the cancellation of the SUC and allowing CAML to tender for the licence.

CAML completed a technical evaluation of a dump leach project in 2006 before winning the SUC in 2007 as a private company and then forming a joint venture to operate the project.

The company commissioned a pilot scale SX-EW plant near Dump 6 in 2008, which operated through 2009.

In November 2009, CAML commissioned the Beijing General Research Institute of Mining and Metallurgy (BGRIMM) to complete a feasibility study on a 10 kt/y commercial copper SX-EW plant.

After its 2010 IPO, CAML began constructing a SX-EW plant, plus the infrastructure required to irrigate the dumps and transport pregnant solution to the plant. It completed the plant in April 2012, at a cost of US\$39m, some US\$8m under budget.

Geology and mineralisation

The Kounrad copper deposit is located within the North Balkhash metallogenic belt, part of the much larger Central Asian Orogenic Belt that extends 7,000 km from west to east and from the Siberian Craton in the north to the Tarim Craton in the south. It is a prolific host of major porphyry copper deposits.

The primary Kounrad deposit is a typical copper porphyry associated with calc-alkaline magmas, formed in a Carboniferous age (327–312 Ma) subduction-related setting.

Kounrad is made up of unconsolidated sediments and granitic bedrock units. Weathering and supergene enrichment have produced a general zonation of mineralisation:

- Oxidised cap: characterised by hematite, limonite, manganese oxyhydroxide, malachite, azurite, cuprite, native copper and chrysocolla mineralisation
- Leached zone: characterised by moderate oxidation in the upper part and destabilisation of sulphide minerals under acidic conditions in the lower parts
- Supergene blanket: characterised by chalcocite and covellite mineralisation
- Primary sulphide zone: characterised by disseminated and stockwork ore with pyrite, chalcopyrite, enargite and chalcocite mineralisation.

Resources

The dump resources are contained within Eastern and Western waste dumps that have accumulated over some 70 years of open-pit mining and processing from the primary Kounrad porphyry.

In 2013, consultant Wardell Armstrong International (WAI) estimated total resources (indicated and inferred) containing 614 kt of copper, suggesting a potential mine life of well over 20 years during which it would extract some 230 kt of recoverable copper.

The following table summarises the 2013 resource estimate.

Figure 17: 2013 Resource estimate

	Tonnes (Mt)	Grade (% Cu)	Contained copper (kt)
Eastern Dumps (oxide)			
Indicated	89.7	0.10	85.8
Inferred	79.6	0.10	81.7
Western Dumps (sulphide)			
Indicated	275.4	0.10	276.2
Inferred	169.4	0.09	160.3
Western Dumps (mixed)			
Indicated	20.9	0.03	6.2
Inferred	12.1	0.03	4.0

Source: Wardell Armstrong International

Note: Although the material in the West was originally classified as low-grade sulphide material, exposure to the atmosphere as well as natural chemical and bacterial activity has broken down some of these minerals converting them to acid leaching amenable species. Thus, the material in the Western dumps is now more accurately identified as 'mineralised waste' as it is characterised by acid soluble contents in the range 30% to 40%. Appendix 4 shows the resource definition work completed on the Western dumps.

CAML has been exploiting the Eastern dumps for five years and the resources there have only a limited life remaining. At the end of 2016, CAML's reconciliation between the 2013 resources and the material extracted through to the end of 2016 indicates that 25.2kt remain to be recovered.

Figure 18: Remaining copper in Eastern dumps

	Copper contained (kt)
Total resources	167.5
Recovered 2012-16	54.3
Remaining	25.2

Source CAML

The company started to leach the Western dumps in April 2017.

Figure 19 shows the location of the dumps relative to the open pit and the SX-EW plant.

Figure 19: Aerial view of the dumps

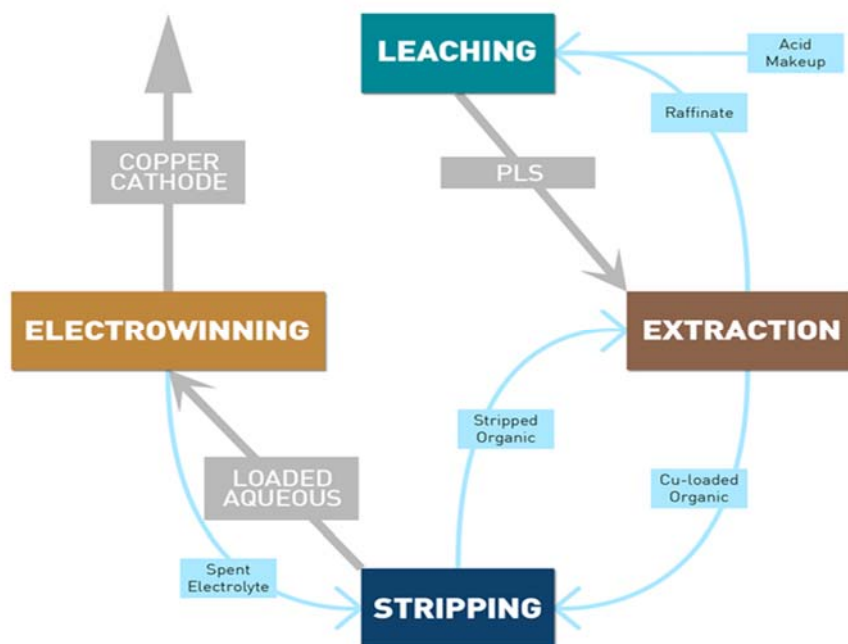


Source: CAML

Processing

The Kounrad operation is essentially a processing operation with no mining necessary. The existing dumps are leached *in-situ* and the resultant copper-containing solution is treated through an SX-EW process, which is an established route for dump leach projects around the world.

Figure 20: Schematic Kounrad SX-EW process flowsheet



Source: CAML

Details of the processes and of how CAML manages to control flow rates and pregnant leach solution (PLS) grade to achieve its target copper output, can be found in Appendix 2.

Product sales

Off-take agreement with Traxys until end-2018 ensures sales

CAML has an off-take agreement (an agreement between a producer and a buyer of a resource to purchase or sell portions of the producer's future production) with international commercial services group, Traxys, which is in force until the end of 2018, for the bulk (90%) of the copper cathodes produced. Pricing, on an ex-plant basis, is linked to the LME copper price, less set selling costs. CAML also makes minor sales to local customers.

Expansion complete; transition to Western dumps underway

In May 2015, the company completed and commissioned a 50% expansion of the SX-EW plant to a PLS throughput capacity of 1,200 m³/hr and can now produce up to 14kt/y of copper cathode. Consequently, the company was able to increase production to 12.1kt in 2015 and 14.0kt in 2016. CAML funded the project internally.

However, with reserves in the Eastern dumps rapidly becoming depleted, a critical element in maintaining feed to the expanded plant is the transition of leaching operations to the larger Western dumps. This project, which CAML terms Expansion Stage 2, is nearing completion with first production expected in May 2017.

The company has installed two 12 km pipelines to allow for the PLS and raffinate solution flows to be cross-transferred to the expanded SX-EW plant and added other infrastructure, including a 15km water pipe to Lake Balkhash.

The budgeted capital cost of the project was originally estimated at US\$19.5m but with the project now virtually complete, the company expects costs to come in some 30% lower. Once again, the full cost was covered by cash generated from operations.

Assets - Copper Bay

Seventy-five percent owned Copper Bay Limited (Copper Bay) has evaluated a project to process beach-deposited copper tailings at Chañaral, in northern Chile. CAML released the results of an independent definitive feasibility study (DFS) in January 2017.

The study was based on a mineable resource of 34.8Mt at a grade of 0.24% copper (84.6kt copper contained) with a production profile of 8.6kt/y of copper for seven years at an average C1 cash cost of US\$1.37/lb.

With an initial capital investment of US\$88.5 million and using a forecast copper price of US\$3.00/lb, the project would deliver an after-tax IRR of 19.1%.

Despite a positive feasibility result, CAML has deferred a production decision

However, despite the positive result, the company has decided not to go ahead with the project at this time, citing the current uncertainty with regard to the near and medium term expectations for copper.

The company maintains its interest in Copper Bay.

Assets - Shuak

Shuak is an exploration prospect in Kazakhstan in which CAML has an 80% interest. It represents the company's first venture beyond its Kounrad copper dump retreatment operation in the country.

In September 2016, CAML incorporated Shuak BV to hold the Shuak SUC and in February 2017 transferred 20% of the company to local partners.

The 197km² licence area hosts a copper and gold exploration project in the Akmola Oblast region of north Kazakhstan, approximately 300km north of the capital city, Astana.

There are two identified mineralisation styles on the property - near-surface saprolite-hosted oxide copper and a deeper copper porphyry.

In the short term, CAML is particularly interested in three targets, with the priority area being Mongol V that hosts a non-JORC resource of approximately 327kt of contained copper at a grade of 0.66% copper.

The company has already achieved recoveries in excess of 90% in column leach tests on the material at the Kounrad plant.

To retain its 80% interest, CAML must spend US\$2m on exploration within five years and plans to spend US\$1.3m in 2017 on trenching (1,800m) and drilling (22,000m).

Risks

Copper prices

Copper prices fell to a near seven-year low of US\$4,138/t in mid-January 2016. After trading in a sideways pattern for most of 2016, the price moved sharply higher in Q4 2016 and touched US\$6,000/t in Q1 2017 before settling back comfortably over US\$5,800/t.

Figure 21 shows the extent of the decline in the benchmark LME spot copper price over the past four years and the recent recovery.

Figure 21: LME spot copper price (US\$/t)



Source: Bloomberg

The decline to the beginning of 2016 appears to have been caused by a combination of supply increases, with the advent of new production, and concern on the demand side because of a slowing down of Chinese economic growth.

The significant turnaround in prices in late 2016, as a result of optimism in US infrastructure spending following President Trump's election victory, gained further support in early 2017 as a result of disruption to production at two of the world's largest copper mines.

At the world's largest copper producer, Escondida, in Chile, which accounts for 5% of global copper supply, workers went on strike in early February over benefits and working conditions and only returned after 43 days. Their issues are not fully resolved, however, and contract talks will be held again in 18 months.

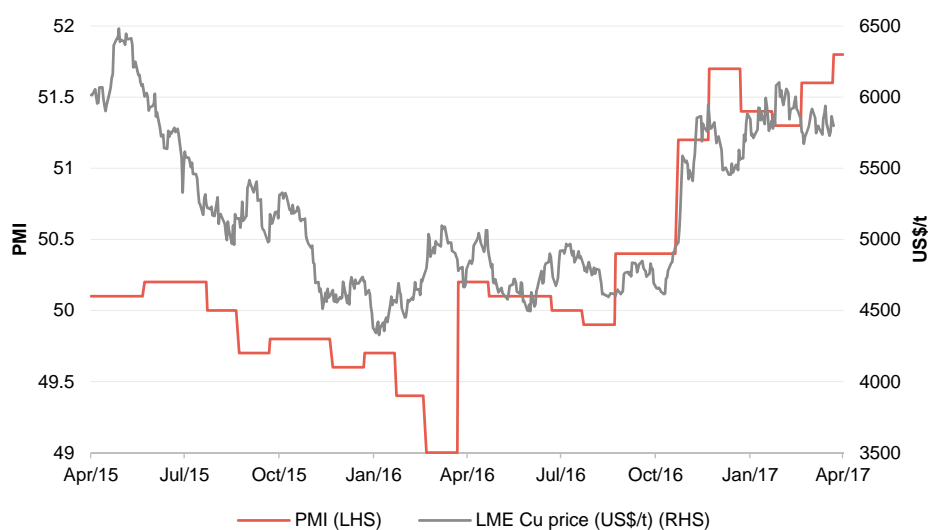
At Grasberg, in Indonesia, meanwhile, copper production was halted for five weeks as a result of a long-running dispute between the operating company and the government

over the terms of the mining company's operating licence. Again, the situation is far from resolved.

With the market thought to be more or less in balance in 2016, and with analysts expecting a small surplus this year, there appear to be no short-term catalysts for a further price rise.

However, there could well be further disruption to production at Escondida and Grasberg and there is some positive news from the demand side as Chinese PMI is climbing. PMI, the purchasing managers' index, is a forward-looking index that is a measure of future construction activity and it has climbed to the highest level for five years. As copper is a key commodity in construction its price shows a good correlation to the PMI.

Figure 22: LME copper price plotted against Chinese PMI

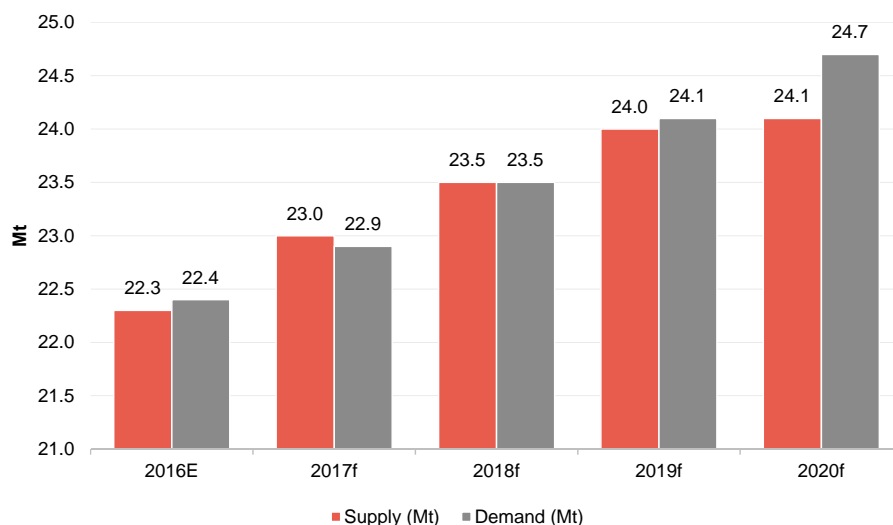


Source: Bloomberg, Marten & Co

In the longer term, production from existing mines is expected to decline by 17% over the next 10 years, meaning that any shortfall will have to be met by new projects

Although there are a number of projects scheduled to come on stream over the next five years, many analysts believe that projects will be deferred, or at least delayed, because of difficulties in arranging finance (head grades are falling and capital intensity increasing); problems securing adequate water supplies; and increasingly stringent permitting conditions, resulting in a shortfall in production targets.

On the demand side, economic growth, which drives copper consumption, is expected to be strong in Asia (particularly China), with the market forecast to grow by over 30% over the next 10 years.

Figure 23: Forecast copper supply and demand

Source: Wood Mackenzie, ICSG, RBC Capital Markets, Marten & Co

The short-term copper price assumptions, used in the model, have been modified to reflect the improved conditions this year and a slightly more conservative upward move to the long-term forecast used.

This reflects an assumption that the price will move up modestly until 2019 when it is assumed that the supply/demand balance again becomes more favourable and copper prices recover to the long-run price forecast.

The model uses a copper price of US\$5,800/t (US\$2.63/lb) in 2017, US\$6,200/t (US\$2.81/lb) in 2018 and thereafter a long-term price of US\$6,600/t (US\$3.00/lb).

As far as copper sales are concerned, CAML has an off-take agreement with international commercial services group, Traxys, which extends through until the end of 2018.

Management has the ability to offset downside price risk by hedging up to 30% of annual copper production.

Exchange-rate exposure

CAML reports financial results in US dollars, but most costs are denominated in Kazakhstan tenge or British pounds, so it is exposed to variations in the exchange rates between those currencies.

The tenge experienced a massive depreciation against the dollar in August 2015 of 85%. The average rate for the year was KZT222/US\$. For 2016, the average rate was KZT342/US\$.

CAML's operating costs benefitted from this movement as approximately 60% of the total cost base in Kazakhstan is denominated in tenge (70% of C1 cash costs) and inflationary pressures on costs incurred at Kounrad have been small by comparison.

The net effect was the tenge being worth an average 35% less in US dollar terms in 2016 in CAML's income statement compared to 2015.

Any strengthening of the floating tenge will have a reverse and negative impact on Kounrad's operating costs but will have minimal effect on the company's cash position as it holds only a small proportion of cash in tenge.

From 1 January 2016, the CAML board increased salaries by 25% for staff at Kounrad to compensate employees for the negative effects of the devaluation.

Political

The Kazakh government has maintained a strong state-influence since the collapse of the Iron Curtain and its hold over its mineral resources has been enforced through state-owned miners, as well as government-private joint ventures enforced as part of mining right issuances.

More recently, however, the Kazakh government has shown a more liberal attitude to foreign investment and an integral part of this more relaxed policy is a proposal for a completely new mining code based on the Western Australian mining framework. One of the key themes is believed to be a removal of extensive governmental approvals for exploration and mining. If the government accepts the proposals, the new mining code could come into force in 2017.

One of the most authoritative reports on mining investment attitudes each year is conducted by Canada's Fraser Institute. The Fraser Institute surveys mining companies worldwide and compiles a Policy Potential Index (PPI), which, as the Institute explains, serves as a report card to governments on how attractive their policies are from the point of view of an exploration manager.

The PPI is a composite index that measures the effects on exploration of government policies including uncertainty concerning the administration, interpretation and enforcement of existing regulations; environmental regulations; regulatory duplication and inconsistencies; taxation; uncertainty concerning native land claims and protected areas; infrastructure; socioeconomic agreements; political stability; labour issues; geological databases; and security.

In the latest survey, published in 2017, Kazakhstan is ranked 90 (out of the 104 jurisdictions surveyed), although the findings should be taken in the light of the fact that the sample size was very small.

Fiscal

Kazakh tax legislation is subject to different and changing interpretations, as well as inconsistent enforcement.

The company manages this risk by complying locally with all corporate tax regulations (paying monthly) and ensuring that its local accounting staff are adequately trained. CAML also receives tax advice on local issues from its tax advisers. The two key tax regulations that apply to CAML - the levels of corporate taxation and mineral extraction tax (MET) – have remained constant for a number of years.

The company maintains a strong local presence at every level throughout the group including the board.

In 2016, the company recovered US\$3.5m in outstanding VAT from the Kazakhstan authorities. As at 31 December 2016, a further US\$2.8m of VAT receivable was still owed to the company (US\$0.2m was refunded in February 2017).

CAML is working closely with its advisors to recover the remaining portion. The planned means of recovery will be through a combination of the local sales of copper cathode to effectively offset VAT liabilities and by a continued dialogue with the authorities.

Technical

The Kounrad operation is now in its fifth full year of production from the dumps on the eastern side of the open pit (Eastern dumps) and has outperformed expectations each year.

CAML has a very good understanding of how the Kounrad ore in the dumps behaves in the SX-EW process and has operating expertise in scheduling leaching cycles and managing flow rates to achieve production targets, despite having to operate in extremely low temperatures (down to -40°C) in winter.

The Western dumps have different characteristics, which may affect processing rates

There is some risk associated with treating the Western dump material from April 2017 onwards as it has different characteristics, which may affect processing rates and operational performance. However, there is also the potential that recoveries in this area may be higher than have been assumed because after decades of weathering, some of the material classed as 'sulphides' may in fact more amenable to acid leaching than the categorisation suggests.

Capital structure

The company has 112.1 million shares issued, which were trading at 234.0 pence per share giving the company a market capitalisation of £262.3 million.

Collectively, the directors own 26.7 million shares, which include the 21.2 million shares owned by non-executive director and Kazakh businessman, Kenges Rakishev (see page 26).

There are 2.3 million options outstanding with expiry dates out to May 2025.

The remainder of the shareholder base is largely institutional, as shown in Figure 24.

Figure 24: Major shareholders

	%
Kenges Rakishev	19.1
Hargreave Hale	10.2
FIL Investment International	8.9
Majedie Asset Management	7.3
Commonwealth American Partners	6.4
Blackrock Investment	5.8
D&A Income	5.1
CAML Share Trust	4.2
Miton Asset Management	4.0

Source: CAML (as at 28 February 2017)

Directors and management

The CAML board includes directors with the requisite engineering, metallurgical and financial experience who have a successful track record of financing, constructing and operating the Kounrad plant.

Nick Clarke is executive chairman and a director. He is a chartered engineer with 40 years' mining industry experience, 16 of which were spent in senior posts managing production and technical services in Africa and Saudi Arabia.

Nick was formerly managing director of AIM-listed Oriel Resources Plc until it was sold to Mechel OAO of Russia in 2008 for US\$1.5 billion. From 1992-2004, he was the managing director of mineral consultancy Wardell Armstrong International Ltd, where he managed numerous multidisciplinary mining projects in Kazakhstan, Kyrgyzstan, Uzbekistan, Romania, Macedonia and Tajikistan. Nick is a non-executive director of Wolf Minerals Limited.

Nigel Hurst-Brown is deputy chairman and a director. He is a Fellow of the Institute of Chartered Accountants in England & Wales and was formerly chairman of Lloyds Investment Managers (1986-1990), a director of Mercury Asset Management and more recently, managing director of Merrill Lynch Investment Managers.

He is currently chief executive of Hotchkis and Wiley (UK) Ltd and a non-executive director of Borders & Southern Petroleum Plc.

Nigel Robinson is chief financial officer and a director. He is a member of the Institute of Chartered Accountants in England and Wales and a former Royal Navy officer in the Fleet Air Arm.

He qualified with KPMG on exiting the military and spent three years with the firm before leaving to work in commerce. Mr Robinson spent six years in various management roles with British Airways before pursuing smaller enterprise roles in 2002. He joined CAML in 2007 and became CFO in 2009. Mr Robinson is also a director of Copper Bay Ltd.

Gavin Ferrar is an executive director responsible for business development. He holds post-graduate degrees in geology and finance and has been involved in the mining sector for 21 years. His career in industry began at Anglo American in the New Mining Business Division. He spent 10 years in the investment banking sector focusing on equity and debt financing for junior and major mining clients of Barclays Capital and Investec. Since 2011, he has worked with junior mining companies arranging finance and providing corporate advisory services before joining CAML in June 2014.

Kenges Rakishev is the company's largest shareholder (he holds a 19% interest following the ownership consolidation at the Kounrad operation in 2014) and is a non-executive director of the company. He holds a BA from the Kazakh State Law Academy, a BA (International Economics) from the Kazakh Economic University and an AMP Diploma from the University of Oxford.

Mr Rakishev serves as board chairman for SAT & Company, which is a diversified industrial holding firm for industrial entities including Jinsheng SAT (Tianjin) Commercial and Trading Co Ltd, Baicheng Jinsheng Nickel Industry Co Ltd, Taonan City Jinsheng Metallurgical Products Co Ltd and Ulanhot Jinyuanda Heavy Chemical Industry Co Ltd. Mr Rakishev also serves as chairman of NASDAQ-listed Net Element International Inc. He is a founder of Genesis Angels, a private investment fund dedicated to early-stage advanced technology companies.

Other non-executive directors are former managing director and head of oil and gas at Canaccord Europe, **Robert Cathery** (chairman of the remuneration committee); Kazakh national and executive director of Investment Banking at UBS (Kazakhstan), **Nurlan Zhakupov**; chartered accountant and experienced resources executive, **David Swan** (chairman of the audit committee); and **Roger Davey**, a mining engineer and company director.

Howard Nicholson is technical director of CAML, although he does not sit on the board. He is a metallurgist with 33 years of experience in project development and mine operations management.

Of specific relevance is his role as European Minerals Corporation chief operating officer during the development of the Varvarinskoye copper-gold mine, in Kazakhstan. Mr Nicholson has held senior management positions with Ashanti Goldfields, Lonrho, and Anglo American. He is a director of Copper Bay Ltd, CAML's partner at the Chañaral Bay project.

The Kazakhstan management team is led by **Pavel Semenchenko** who is general director for Sary Kazna, one of CAML's two Kazakh subsidiaries. He has more than 15 years of experience in managing businesses in Kazakhstan and a proven record in the resources industry.

Oleg Telnoi is general director for KCC. Oleg joined CAML in 2007 with over 10 years' of experience in finance management within the mining industry in Central Asia. He is a qualified engineer and received an MBA in 1997.

Nick Shirley is the CSR Director and the only ex-pat in Kazakhstan. Nick has over 20 years' of experience in the fields of environmental sciences, social responsibility and hydrogeology gained predominantly in the international overseas mining industry in Central Asia, the Former Soviet Union and West Africa. He has previously worked for the Environment Agency in the United Kingdom, Avocet Mining, Newmont-BHP's joint venture in Guinea and Orsu Metals as well as running his own consultancy practice.

Previous research publications

Readers interested in further information about CAML may wish to read QuotedData's previous research publications, as detailed in Figure 25. You can read the notes by clicking on them in Figure 25 or by visiting, www.quoteddata.com.

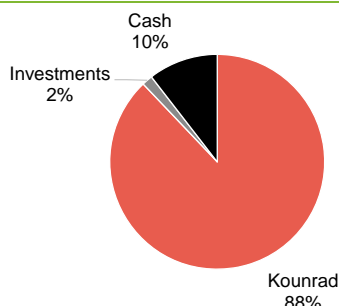
Figure 25: Marten & Co. previously published research on CAML

Title	Note type	Date
Dividend-paying, low cost copper producer	Initiation	24 February 2016
Defending the dividend	Update	21 April 2016
Profits soar as costs slashed	Update	13 September 2016

Source: Marten & Co.

Figure 26: Central Asia Metals summary

Sum of the parts valuation – April 2017	US\$M	Pence per share
Kounrad NPV ^{95%}	338.7	236.0
Investments - Copper Bay	6.2	4.3
Investments - Shuak	0.0	0.0
Subtotal	334.9	240.3
Net cash/(debt)	40.4	28.2
NAV	385.3	268.5



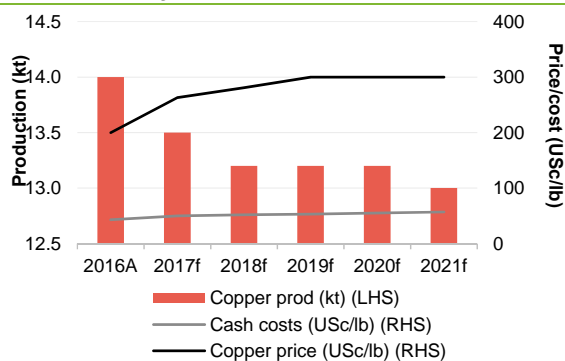
CAML share price



NAV sensitivity analysis (pence per share)

Cu price	-30%	-20%	-10%	Base	10%	20%	30%
5%	173	219	266	312	358	405	451
8%	152	191	230	268	307	346	385
10%	141	176	211	246	281	315	350
12%	131	163	195	226	258	290	321

Production summary



Copper resources (2013)	Mt	Cu %	kt
Kounrad			
Indicated	386.0	0.10	368.2
Inferred	261.1	0.09	246.0
Copper Bay*			
Measured & Indicated	53.4	0.24	92.2
Inferred	14.4	0.23	33.7

Y/E 31 Dec, all figures in 2016 US\$M unless otherwise stated

Forecast assumptions	2016a	2017f	2018f	2019f	2020f
Copper price (US\$/t)	4,994	5,800	6,200	6,600	6,600
Copper price (US\$/lb)	2.27	2.63	2.81	3.00	3.00

Production summary	2016a	2017f	2018f	2019f	2020f
Kounrad – Eastern dumps					
Avg flow rate (1,000l/hr)	888	550	380	260	50
PLS grade (Cu g/l)	2.40	2.30	2.00	1.80	1.50
Recovery (%)		75.0%	75.0%	75.0%	75.0%
Copper production (kt)	14,020	8,311	4,993	3,075	493
Kounrad – Western dumps					
Average flow rate (1,000l/hr)	-	400	600	780	980
PLS grade (Cu g/l)	-	2.00	2.10	2.00	2.00
Recovery (%)	-	75.0%	75.0%	75.0%	75.0%
Copper production (kt)	-	5,186	8,168	10,113	12,706
Copper Bay					
Copper production (t)	-	-	-	-	-

Company	2016a	2017f	2018f	2019f	2020f
Total copper production (kt)	14.0	13.5	13.2	13.2	13.2
C1 cash costs (US\$/lb)	0.43	0.50	0.52	0.53	0.55
Fully absorbed costs (US\$/lb)	1.06	1.24	1.28	1.30	1.33

Profit & loss summary	2016a	2017f	2018f	2019f	2020f
Gross revenue	69.3	78.3	81.6	87.0	87.1
Cost of production	(9.5)	(10.1)	(10.5)	(10.6)	(11.0)
Mineral extraction tax	(3.9)	(4.5)	(4.7)	(5.0)	(5.0)
Selling costs	(2.6)	(2.5)	(2.4)	(2.4)	(2.4)
G&A	(14.1)	(14.6)	(14.6)	(14.7)	(14.9)
EBITDA	39.2	46.6	49.4	54.3	53.8
Depreciation & amortisation (D&A)	(5.0)	(5.1)	(5.0)	(5.0)	(5.2)
Interest	0.0	0.0	0.0	0.0	0.0
Taxation	(6.7)	(11.2)	(11.9)	(13.2)	(13.1)

Net income	34.2	30.4	32.5	36.1	35.6
Average shares outstanding (million)	112.1	112.1	112.1	112.1	112.1
EPS (US\$)	0.24	0.27	0.29	0.32	0.31
Dividend (pence per share)	15.5	15.5	18.0	22.0	22.0

Abridged balance sheet Y/E	2016a	2017f	2018f	2019f	2020f
Cash & equivalents	40.4	48.2	59.1	69.4	75.3
Fixed assets	93.8	87.7	85.2	82.8	80.1
Total assets	138.5	140.2	148.6	156.5	159.7
Current liabilities	6.0	6.4	6.4	6.4	6.4
Long-term debt	0.0	0.0	0.0	0.0	.00
Other long-term liabilities	10.6	10.6	10.6	10.6	10.6
Total liabilities	17.0	17.0	17.0	17.0	17.0
Shareholders' equity	121.5	123.2	131.6	139.5	142.7

Cash flow summary	2016a	2017f	2018f	2019f	2020f
Cash from operations	35.5	33.0	35.0	38.5	38.2
Capital expenditure	(12.3)	(2.50)	(2.00)	(2.00)	(2.00)
Cash from investing activities	(13.3)	(2.50)	(2.00)	(2.00)	(2.00)
Dividends	(20.4)	(22.7)	(22.1)	(26.2)	(30.3)
Cash from financing activities	(22.8)	(22.7)	(22.1)	(26.2)	(30.3)
Cash at end	40.4	48.2	59.1	69.4	75.3

Profitability	2016a	2017f	2018f	2019f	2020f
EBITDA margin (%)	56%	60%	60%	62%	62%

Note that financial tables above are summaries and totals may not always agree

Source: CAML, Marten & Co. * 2017

Appendix 1 – CAML's cost advantage explained

In running a resource business, management must focus on controlling costs to grow its bottom line as the price of its product is a variable usually outside its control.

Probably CAML's most attractive investment feature is the fact that it is a low-cost copper producer; one of the lowest, if not the lowest, in the industry. This gives it a significant advantage over other copper producers, especially in the low-price environment that the industry has having to contend with over the past four years. It can make money when others may be struggling.

CAML's competitive advantage derives principally from the nature of its business model. Its copper extraction business is low cost because the operation simply involves processing pre-mined material. This means that mining costs, which are usually the largest component of total operating costs for a traditional copper mining company, are zero.

In 2016, the company strengthened its competitive position further by reducing its already low unit operating (C1) costs by 28%, by virtue of increased production, exchange rate movements that worked in its favour. Total costs were reduced on lower depreciation and amortisation charges for some of assets, with the Western dumps extending production through to 2034.

C1 costs are a standard metric used in copper mining as a reference point to denote the basic cash costs of running a mining operation to allow a comparison across the industry. Although producers are not bound to adhere strictly to any convention, the most widely accepted definition is that from consultants, Wood Mackenzie.

Under this definition, C1 costs are direct costs, which include costs incurred in mining and processing (labour, power, reagents, materials) plus local G&A, freight and realisation and selling costs. Any by-product revenue is credited against costs at this stage. Costs are reported in US dollars per pound of copper produced.

Increasing production invariably leads to a reduction in unit operating costs. Although there are certain variable costs that will increase as the treatment rate increases, for instance the costs of chemical reagents, a large proportion of costs, such as overheads, are fixed. Increased copper production means that fixed costs are spread over a wider volume resulting in a lower cost figure per pound of copper sales.

Furthermore, most of CAML's operating costs (70% of C1 costs) are in the local currency whereas the company reports its results in US dollars. With a massive depreciation of the tenge in 2015, the company is fortunate to report US dollar-denominated costs that have automatically declined.

Of course, however, any reversal of the depreciating trend of the tenge against the US dollar will impact negatively on costs and lead to a rise in those costs.

With C1 costs of just US43c/lb, CAML appears to be one of the lowest cost producers in the world, based on the 2016 industry C1 cost data from GFMS Thomson Reuters.

Appendix 2 - How CAML achieves targeted copper production rate

The leach process at Kounrad involves the irrigation of the dumps with sulphuric acid at a controlled rate through a network of dripper pipes. The acid leaches (dissolves) the copper ions as it percolates through the material and the resultant copper-PLS is collected in a trench surrounding the dump and then allowed to settle in ponds to release remaining solids before being pumped to the solvent extraction and electrowinning (SX-EW) plant.

In the SX section, the PLS is contacted with an organic solvent which extracts the copper leaving an acidic aqueous solution (raffinate), which is pumped back to the dumps. The copper-bearing aqueous phase is stripped of the copper by strong acid before being sent to the EW stage where the copper is reduced from copper sulphate in solution to a metallic copper cathode.

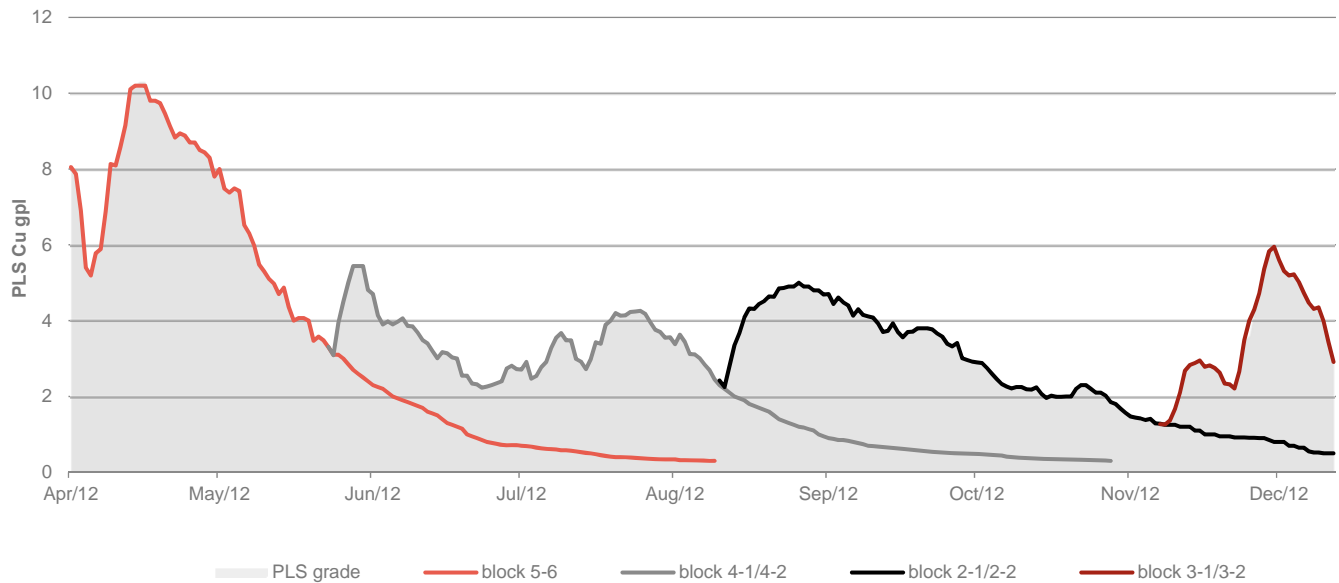
The key to achieving target copper cathode production is to control the grade of the PLS to the plant, which can be tricky given the variability of grade within each weathered dump. The company has the flexibility to manage the process two ways. Firstly, by working a number of individual dumps within the Eastern dumps at any one time and, secondly, by varying the flow rate of the raffinate.

The dumps are divided into blocks. Leaching of any one block is essentially a three-phase process, with a 'bloom' (high grade) phase, a steady phase and finally a tail recovery phase over a roughly six-month time period. The first 120 days recover about 40% of the copper with the remaining 10-11% over the final 60 days during which time the blocks are allocated rest periods.

New ore blocks are sequentially started developing a 'nest' of contiguous leach curves and thus by having a number of blocks undergoing leaching at any one time and phasing the commencement of leach, CAML is able to avoid major peaks and troughs in the grade of the PLS and deliver a fairly constant grade to the SX-EW plant.

In Figure 27, below, which shows the leach curves for block in 2012, as the PLS grade of block 5-6 falls off, blocks 4-1 and 4-2 come into play and support the PLS average grade until blocks 2-1 and 2-2 commence. Thus, the PLS grade averaged 2.24 g/l in 2014 (which is close to the most efficient grade of 2.00 g/t) despite a wide range between 8 g/l and less than 1 g/l.

Figure 27: Leach curves for blocks

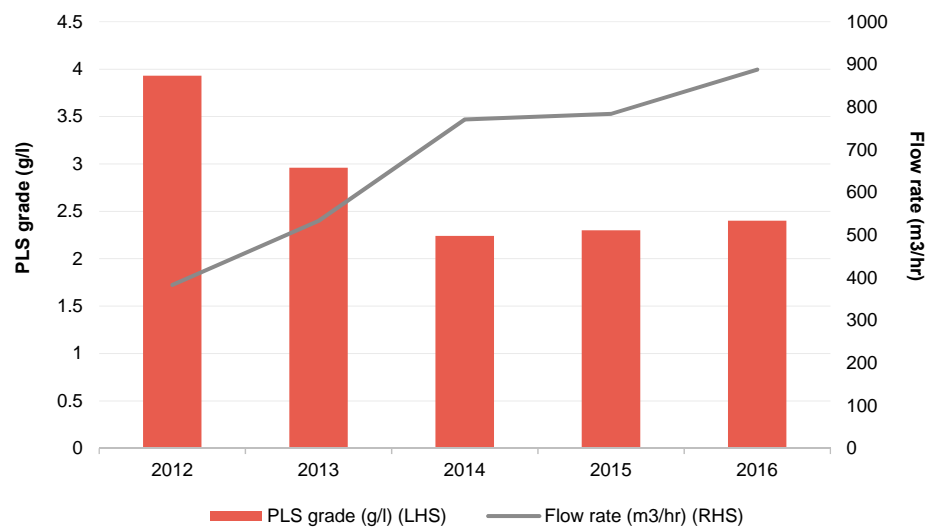


Source CAML

The second main variable that CAML can control is the flow rate. Although the average grade of the PLS since the start up has declined year-by-year as planned, and is reaching its long-term average of 2.00-2.30 g/l as predicted in the feasibility study, CAML has increased flow rates and with the expansion of the plant now complete can achieve up to 1,200 m³/hr (in summer).

Figure 28 shows the average flow rates since operations began.

Figure 28: Average flow rates and PLS grade



Source: CAML

With the plant expansion in 2015, copper cathode deposition rates have improved from 35 t/d up to 50 t/d (summer) and from 18 t/d up to 35 t/d (winter).

Appendix 3 – Ownership

After consolidating ownership in 2014, CAML owns 100% of the project through two wholly-owned subsidiaries - Kounrad Copper Company LLP (KCC), which is the holding company for CAML's 100% interest in the project's SX-EW facility and Sary Kazna LLP (SK), which is the holding company for CAML's 100% interest in the SUC. The SUC covers 22.5 km² and expires in 2034.

The SUC was operated as a 60:40 joint venture between SK and government organisation, SEC Saryarka (SA) from 2007. The SX-EW plant was built and operated by KCC, a 60:40 joint venture between CAML Kazakhstan BV (CAML BV) and SA, from 2008. Subsequently, SA sold its 40% stake to Kazakh businessman, Kenges Rakishev, via his company SAT & Co (SAT). CAML obtained 100% ownership in 2014.

CAML completed the consolidation of Kounrad in two parts: the transfer of the 40% interest in KCC from SAT to Mr Rakishev and subsequently to CAML BV, which was completed in October 2013; followed by the transfer of the 40% interest in the SUC to Mr Rakishev and subsequently to SK in May 2014.

CAML appointed Mr Rakishev as a non-executive director in November 2013 following the KCC consolidation. Consideration for the remaining 40% of the Kounrad operation was paid to Mr Rakishev in the form of 21.2m ordinary CAML shares and £848,470 in lieu of dividends once the transfer was complete

Appendix 4 - Resource definition work

Figure 29: Resource definition work at Kounrad

Year	Work	Location	Remarks
2007	10 drillholes	Dumps 6, 7 and 9-10	Samples throughout the programme were assayed for total copper (Cu _{total}), acid soluble copper (Cu _{acid}) and cyanide soluble copper (Cu _{cyan})
2008-09	85 drillholes plus 10 channel trenches	Dumps 1, 1a, 5, 6, 7, 9-10, 15, 16, 21 and 22	
2010	137 pits, nine surface trenches within dump 21a plus a further 13 pits.		10 kg composite sub-samples used for metallurgical testing
2011	98 RC drill holes to 3 m below the base of the dumps	Western dumps 1, 15 and 16 and Eastern dumps 5, 6, 7, and 9-10	
2012	131 RC drill holes to 3 m below the base of the dumps	Eastern dump 2 plus Western dumps 13, 15, 16, 20, 21 and 22	

Source: Wardell Armstrong International

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