

Initiation | Mining Companies

24 February 2016

Central Asia Metals plc

Dividend-paying, low-cost copper producer

Central Asia Metals (CAML) recorded a profit in its first year of operation (2012) and has remained profitable ever since. It has paid a dividend each year from cash earnings, something of a novelty for a junior mining company and has returned to shareholders all the funds it raised (US\$60 million) in its 2010 IPO (initial public offering).

CAML's main asset is its Kazakhstan-based Kounrad copper-recovery plant, which recovers copper from waste originating from the Kounrad open-pit copper mine, giving it some of the lowest costs in the industry.

In 2015, Kounrad completed an expansion of the plant, increasing copper production capacity by 50% from its original output in 2012 (10,000 tonnes per annum). The company funded the expansion from its existing cash resources. Recent approval to work copper dumps in the western part of the site will allow operations to continue through to 2034.

The company is currently debt-free and had cash of US\$42 million on its balance sheet at the end of 2015.

Year	Cu prod (kt)	Cash costs (US\$/lb)	Rev. (U\$m)	EBITDA (U\$m)	EBITDA margin (%)	EPS (USc)
2015f	12.1	0.68	63.6	32.6	51	19.5
2016f	13.7	0.68	65.3	32.1	49	14.6
2017f	14.0	0.74	73.9	38.0	51	16.2

Source: Marten & Co

The company has a 75% interest in Copper Bay Ltd (Copper Bay). Copper Bay is conducting a feasibility study on a project to re-treat copper mine waste material that has been deposited on a beach, in Chile. The project is described in detail on p15.

Ticker	CAML
Base currency	GBP
Price	140.0
Ave daily trading volume	133,000
1 year high	194.0
1 year low	124.0
1 month performance (%)	9.8
3 month performance (%)	-15.2
1 year performance (%)	-14.6
Yield (%)	8.6%

Performance vs index rebased
Time period: Jan 2013 to Feb 2016



Source: Bloomberg

Net cash (US\$m)	42.0
NAV ⁸ /share	225p
P/NAV	62%
Market cap (£M)	156.4
Shares outstanding (M)	111.7

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Introduction

Further information on CAML can be found at the company's website:
www.centralasiametals.com

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

The company also holds a 75% interest in Copper Bay, a private company that is evaluating a copper tailings treatment project, in Chile.

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 that surround the open-pit mine.

In 2010, the company completed an IPO on AIM, raising gross proceeds of US\$60 million (net proceeds of £35 million).

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

Investment case

Low-cost production

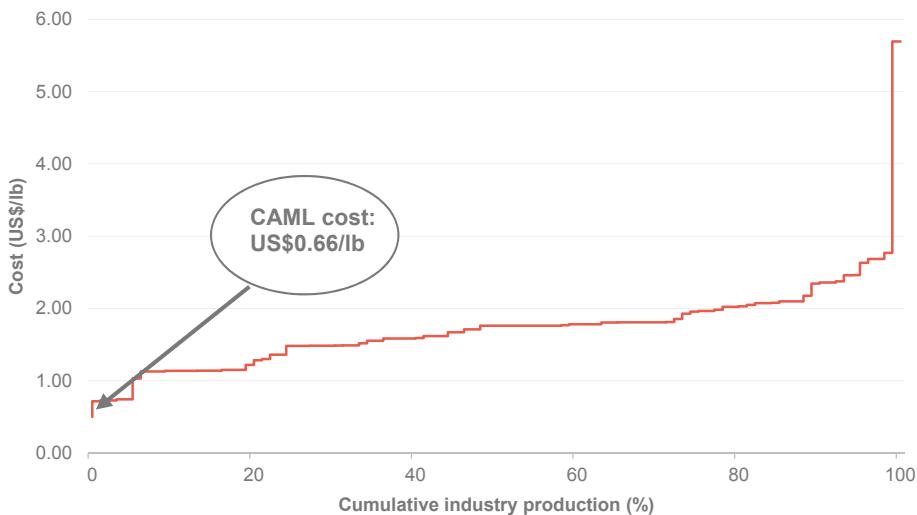
CAML recorded a profit in its first year of operation, 2012, and has remained profitable ever since.

At its Kounrad operation, the company treats copper-bearing material that has already been mined and dumped in heaps (using a solvent extraction-electrowinning process (SX-EW)). As there is no mining involved, unit costs of production are low (see Figure 1).

Cash costs are in the lowest 1% of the industry (see Figure 1).

With 2014 cash costs of US\$0.66/lb (using an industry convention for calculating costs that is different from the way that CAML accounts for costs - Appendix 1 for explanation), the company is one of the lowest-cost copper producers in the industry. Figure 1 shows, on a cumulative basis, how the cost of producing one pound of copper varies throughout the industry, with CAML firmly located at the lower end of the cost curve.

Figure 1: Copper industry cost curve 2014 (C1 US\$/lb*)



Source: Thomson Reuters GFMS/Marten & Co * C1 as per Brook Hunt standard

Cost-control measures have been helped by a significant depreciation of the Kazakh tenge over the past year, as 50% of operational costs are denominated in tenge (while revenues are in US dollars).

It is anticipated that because of the low cost of production, the company will remain profitable throughout the commodity downcycle, even if prices remain at the currently low level of approximately US\$4,500/t (US\$2.04/lb)

Historically a consistent dividend payer with high yield (8.6%)

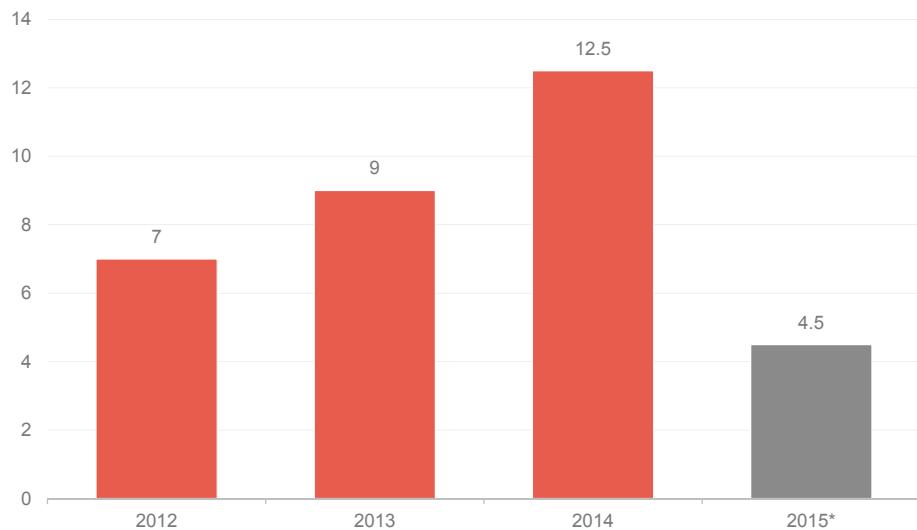
After paying a dividend each year, CAML has paid back all money raised at IPO (US\$60 million).

The company has a policy of paying 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 the minimum (as shown in Figure 2).

Furthermore, with the interim 2015 dividend, CAML has returned to shareholders all the funds it raised (US\$60 million) in the 2010 initial public offering (IPO).

However, with lower metal prices in 2015 and into 2016, it remains to be seen whether the company will be able to maintain dividend payments at the current level (at the current share price of 140 pence per share, CAML's twelve month trailing yield is 8.6%).

Figure 2: Dividends paid (pence per share)

Source: Central Asia Metals' reports. * Interim

■ Technical success

CAML treats the pre-mined copper-bearing material through a solvent extraction and electrowinning ([SX-EW](#)) process. In 2012, CAML brought its SX-EW project into production under budget. In each succeeding year, copper production has been increased, despite a number of operational complexities, including extreme winter temperatures.

In 2015, Kounrad completed an increase in SX-EW plant production capacity by 50%, from the original capacity of 10,000 tonnes per year (10 kt/y). There is a related project to construct infrastructure needed to access dumps to the west of the mine, since resources in the original, eastern dumps are diminishing. This infrastructure, including pipelines, will supply the feedstock for the additional SX-EW capacity, and is due to be commissioned mid-2017.

Despite a short disruption to operations in 2015 – which was due to one piece of equipment failing, and which led to a production shortfall of around 1kt – the company produced a record of 12.1kt of copper in 2015.

■ Profitability and financial discipline

The company has reported a profit since commencement of operations, although record earnings per share (EPS) in 2014 were enhanced by a one-off, extraordinary item. The acquisition of the remaining 40% of Kounrad led to a remeasurement to fair value of the existing interests on acquisition of control and a gain of US\$33 million in the income statement.

Although the company's costs have benefitted from a depreciation of the tenge against the US dollar, a lower copper price may have reduced revenue and so there is the potential for a fall in EPS. Furthermore, EPS growth could be constrained if the copper price remains low.

The 50% expansion in copper capacity has been funded from cash flow.

The Copper Bay investment adds value and provides a foothold in Chile...

...as well as cleaning up an environmental hazard.

The company is currently debt-free and had cash of US\$42 million on its balance sheet at the end of 2015.

Strategic investment in Copper Bay adds value

CAML's investment in Copper Bay gives it a foothold in Chile, the world's largest copper producer.

The company is also pursuing similar projects in other geographical areas, having developed its expertise at the Kounrad dump treatment plant.

The current NAV estimate is based on only one of the three mineralised zones that exist at Copper Bay and there may therefore be potential to extend the life of the operation, if the other zones are found to have economic value.

In addition, the Copper Bay project addresses key social and environmental issues. In the course of its operations, it will clean up a contaminated beach and remove a dust problem affecting the local town of Chañaral.

Valuation

The valuation model below is on a sum-of-the-parts basis, taking into account the net present value (NPV) of the Kounrad operation, based on company projections for production and costs, and that of the potential tailings retreatment project at Copper Bay, based on its recent preliminary feasibility study.

Figure 3: Valuation model for CAML

	US\$m	£m	Pence per share
Kounrad NPV ^{8%*}	329	215	193
Copper Bay (75%) NPV ^{10%*}	12	8	7
Investments	0	0	0
Cash	42	28	25
NAV	383	250	225

Source: Marten & Co * net present value discounted at 8% or 10%

The NPV for Kounrad assumes that the company successfully brings the western dumps into operation in 2018 as activities at the eastern dumps wind down.

To provide an estimated valuation, copper production has been modelled as increasing in 2016, 2017 and 2018 before settling back to a steady state rate of just under 13 kt/y until the licence expires in 2034.

For valuation purposes, a copper price of US\$5,000/t (US\$2.04/lb) in 2016 and US\$5,500/t (US\$2.50/lb) in 2017 have been used, as well as a long-term price of US\$6,600/t (US\$3.00/lb).

At Copper Bay, it is assumed that after commencing operations in 2019, the treatment ramps up to five million tonnes per year (Mt/y) and stays at that rate for seven years, before existing resources are exhausted. Average annual copper production is 8.2 kt. It is assumed that the initial capital investment for the retreatment operation at Copper Bay is US\$88 million, as estimated in a 2015 pre-feasibility study.

It is estimated that the NPV after tax of CAML's 75% interest in the project is US\$12 million (7 pence per share). The valuation assumes that the company raises 50% of

Copper Bay adds 7 pence per share to valuation.

its share of the capital needed through bank debt and funds the remainder from cash flow generated from its Kounrad operation.

As CAML is an operating company, there is an argument for using a measure for valuation that compares its market value with earnings. A common such measure is EV/EBITDA, which is enterprise value (market capitalisation adjusted for cash and debt) divided by earnings before interest, tax, depreciation and amortisation. Using this measure, in theory, allows like-for-like comparison of companies, to gain a relative valuation. However, in practice, it can be difficult to identify a suitable peer group for comparison. Most copper producers are much larger in market value terms (Antofagasta and First Quantum, for example, in London) and much copper production derives from multi-commodity, diversified mining companies such as Rio Tinto and Glencore.

There is one Toronto Stock Exchange (TSX)-listed copper producer with a similar profile that offers some comparables. Amerigo Resources (TSX:ARG) produces copper and molybdenum concentrates by treating fresh and historic tailings from the El Teniente mine, in Chile.

CAML outperforms a similar operation in Chile.

Figure 4: Comparison of CAML and Amerigo Resources

	CAML	ARG
2014 Cu production (Mlb)	24.6	41.0
Cash cost (US\$/lb)	0.66	2.08
Revenue (US\$M)	76.6	119.6
EBITDA (US\$ million)	47.1	7.2
EBITDA margin (%)	61.5	6.1
EPS (US\$)	0.56	(0.06)
EV (US\$ million)	180.7	67.4
EV/EBITDA	4.5	9.4
Shares outstanding (million)	111.7	173.6
Market cap (US\$ million)	215.5	14.2

Source: Company reports, Bloomberg

As the metrics in the Figure 4 illustrate, CAML compares favourably.

Sensitivity analysis

The sensitivity of the NAV estimate for CAML has been analysed in accordance with changes in the key variables; the price of copper and the discount rate.

Because of its low cost of production, the company could continue to generate free cash flow even at prices 30% below the base case price of US\$6,600/t (long term) as shown in the sensitivity analysis in Figure 5.

Were spot prices of around US\$4,500/t to remain indefinitely, it is estimated that CAML's NAV could fall to 119 pence per share.

Figure 5: NAV sensitivity analysis (pence per share)

Discount rate	Copper price (US\$/lb)						
	-30%	-20%	-10%	Base	+10%	+20%	+30%
5%	143	189	234	280	325	371	417
8%	117	155	192	229	266	304	341
10%	104	137	170	203	235	268	301
12%	93	122	151	181	210	239	268

Source: Marten & Co Assumptions: US\$1.53/£; shares outstanding 111.7 million

Note that because different discount rates for Kounrad and Copper Bay have been used, the base case NAV of 225 pence per share does not appear in the table.

Assets - Kounrad

Location

The Kounrad mine and the surrounding dumps, which represent the raw material for CAML's treatment works, are located in the Balkhash area of south-central Kazakhstan, 15 km north of the town of Balkhash and 600 km north-west of the largest city, Almaty. Balkhash is on the northern bank of Lake Balkhash, which stretches 600 km from east to west.

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

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 (which gives the company the right to exploit the copper dumps). 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 21.2 million ordinary CAML shares and £848,470 in lieu of dividends once the transfer was complete.

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 the material that had been oxidised from its original sulphide state and the underlying unaltered copper sulphide material, the operation only treated the sulphide ore, which was amenable to its processing technology, while discarding and stockpiling the oxide material (in the eastern dumps) and uneconomic sulphide material to the west of the open pit.

Ore, meanwhile, was transported by rail 18 km for further treatment at a flotation concentrator and smelter at Balkhash.

The mine struggled over 2006-2007 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.

In the 1960s, the Ural Research & Project Institute of Copper Industry (Unipromed Plc) identified the opportunity to process the low-grade sulphide and oxidised dumps using [SX-EW](#) technology. 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 but pulled financing of the project in 2005, triggering the cancellation of the SUC and allowing CAML to tender for the licence.

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, formed in the Carboniferous age, 327–312 million years ago.

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.

CAML completed several phases of exploration work between 2007 and 2012 to validate historic resource estimates.

Estimated 230 kt of recoverable copper (2013).

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 from some 230 kt of recoverable copper.

Figure 6 summarises the 2013 resource estimate.

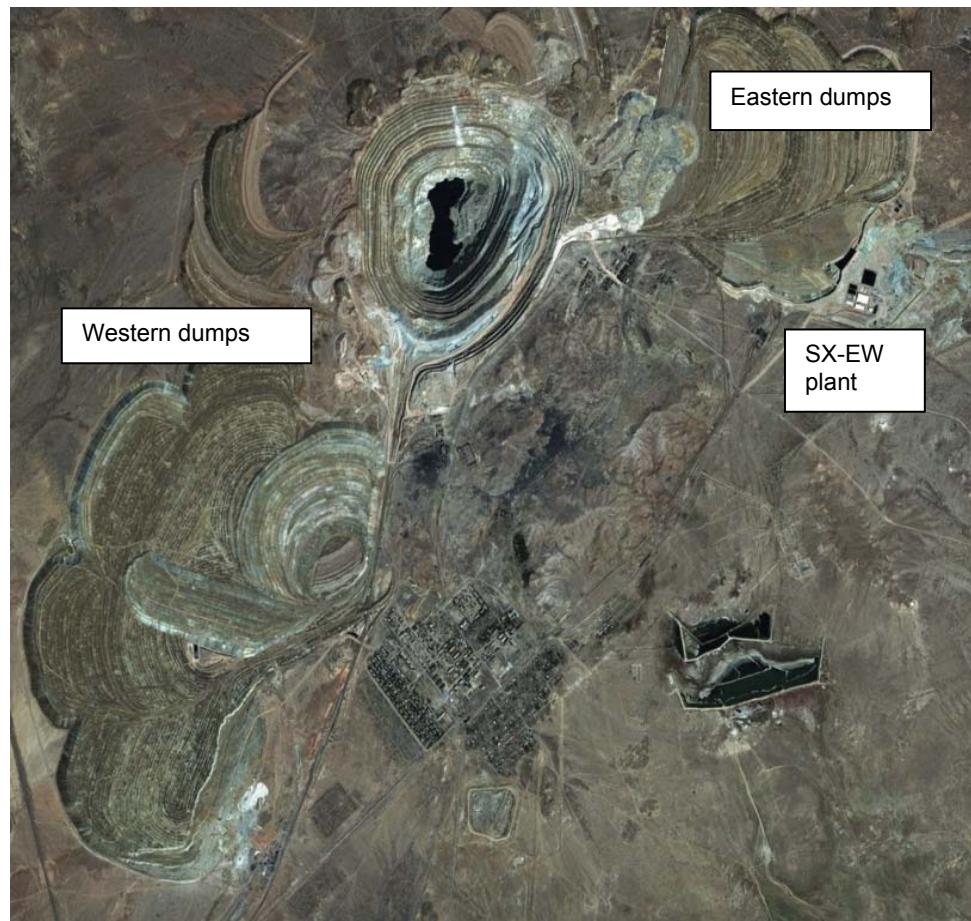
Figure 6: 2013 Resource estimate

	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. 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%.

Figure 7: Aerial view of the dumps



Source: Central Asia Metals

Feasibility study

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 (for more information on the leaching process see Appendix 2).

The company commissioned a pilot scale [SX-EW](#) plant near Dump 6 in August 2008, with an initial design output of 200 kilograms per day (kg/d) of copper. The pilot plant was subsequently expanded to 600 kg/d in May 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.

The study estimated that it would cost approximately US\$47 million to bring the plant into production and furthermore indicated acceptable returns for CAML. The company therefore stopped pilot plant production at the end of 2010 in preparation for its IPO and the ramp-up to commercial operations.

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 the [SX-EW](#) process.

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

CAML began constructing a 10 kt/y SX-EW plant, plus the infrastructure required to irrigate the dumps and transport pregnant leach solution (PLS) to the plant, in 2011, and completed it in April 2012, at a cost of US\$39 million, some US\$8 million under budget.

The SX-EW plant was constructed well below budget.

An off-take agreement with Traxys ensures sales.

Product sales

CAML sells the bulk (90%) of its copper cathodes to international commercial services group, Traxys, in terms of an agreement which is in force until the end of 2018. Pricing, on an ex-plant basis, is linked to the London Metal Exchange (LME) copper price, less set selling costs.

CAML also makes minor sales to local customers.

Expansion

The company is currently undertaking in a two-phase expansion programme to increase copper production capacity by 50%. The total capital cost for the expansion is estimated at US\$35 million, all of which is being funded internally from cashflow.

Stage one, which was completed and commissioned in May 2015, entailed the expansion of the [SX-EW](#) plant to a PLS throughput capacity of 1,200 m³/hr at a capital cost of US\$13.0 million (US\$2.5 million under budget).

Part of the expansion project involved the addition of two new coal-fired boiler units at a budgeted cost of US\$2.1 million (upgrading the heating system from 8.4 MW to 14 MW), which were commissioned at the end of September 2014. The additional

Stage one expansion completed taking PLS capacity to 1,200 m³/hr.

US\$20 million capital expenditure (capex) for western dumps will be funded from cash flow.

heating capability allowed a higher volume of solution to be processed during the 2014/15 winter, resulting in an increase in 2014 production to 11.1 kt.

The Stage two expansion, which is planned to be operational by mid-2017, involves constructing the infrastructure to exploit material from the western dumps, located some 12 km from the plant, to replace the diminishing resources in the eastern dumps.

The plan will require the installation of two 12 km pipelines to allow for the PLS and acid flows to be cross-transferred to the expanded SX-EW plant. In addition, the exploitation of the western dumps will require the construction of a three-unit, coal-fired boiler house for solution heating, a pond collection system and approximately 3 km of collector trenches.

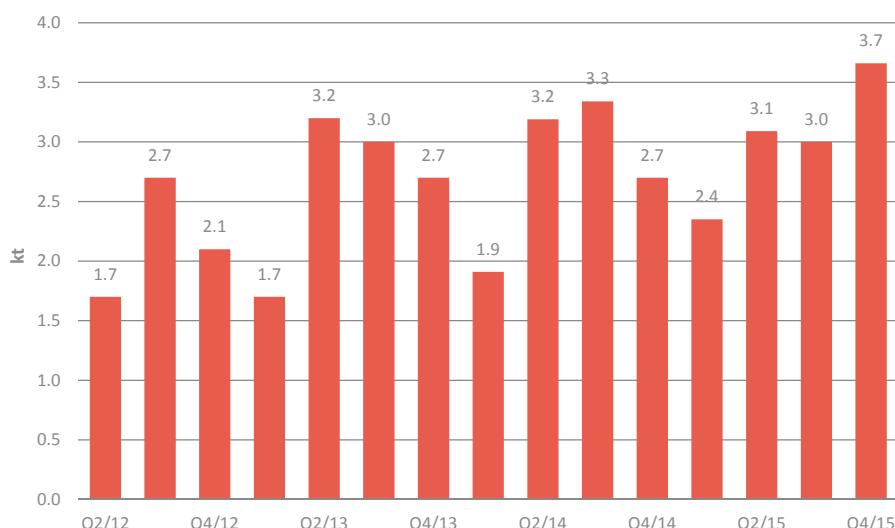
The capital cost of the Stage two expansion is currently estimated at US\$19.5 million. It will be largely committed during 2016 and sourced from cash generated from operations.

The company received a mining permit for the western dumps from the State authorities in late 2015 and will now procure materials and equipment and complete final detailed engineering plans with an expected commissioning date of Q2 17.

Production profile

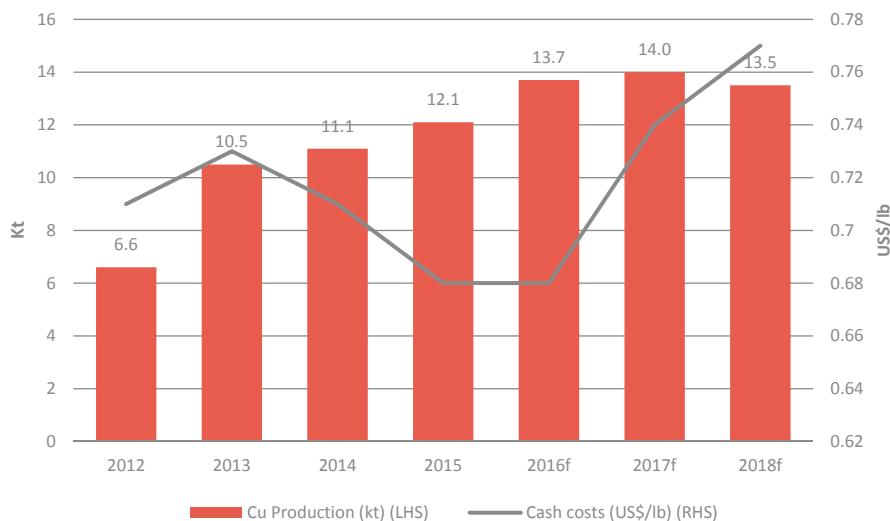
Figure 8 shows the quarterly production history demonstrating the seasonal nature of production.

Figure 8: Quarterly copper production at Kounrad



Source: Central Asia Metals

Figure 9 shows the annual production and cost profile (using CAML's cash cost convention) since start up and forecasts through to 2018.

Figure 9: Annual copper production and costs – actual and forecast

Source: Central Asia Metals and Marten & Co

In 2015, Kounrad produced a record 12.1 kt of copper despite a disruption to production after a mechanical failure in the plant at the end of June. As Figure 8 illustrates, production fell accordingly in Q3 15, but recovered strongly in Q4.

Cash costs in H1 2015, as reported by the company, were US\$0.74/lb, a slight increase on the corresponding period of 2014 when unit costs were US\$0.72/lb. Total costs rose 15%, to US\$1.87/lb, as the company incurred a charge of US\$0.06/lb on impairment of inventory after the incident in June.

Low cost production benefiting from weak currency.

The company has guided towards a decrease in cash costs to US\$0.65-0.70/lb for 2015 as a whole, mainly as a result of a depreciation in the value of the Kazakh tenge against the US dollar.

The plant is currently capable of processing 1,200 m³/hr of PLS, although in winter conditions the rate is lower than this. Because of the seasonal temperature variations, the company is forecasting an average annualised throughput of approximately 80% of design.

Based on this estimated throughput, and the fact that the long-run PLS grade is stabilising at levels lower than previous years, the company is targeting copper production of between 13 kt and 14 kt for 2016.

As operations transition from the eastern to the western dumps from 2017, production is expected to fall slightly to 12.7-12.9 kt/y by 2019 as a result of different mineralogy of the western dumps and longer leach times leading to lower PLS grades.

Recoveries in this area may be higher than anticipated, however, because after decades of weathering, some of the material classed as 'sulphides' may be more amenable to acid leaching than the categorisation suggests.

As well as lower annual production from the western dumps, costs are expected to rise by about 15% 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.

Assets - Copper Bay

CAML has a 75% interest in Copper Bay.

In June 2015, CAML exercised an option to increase its interest Copper Bay from 50% to 75% by committing US\$3 million to the company.

Copper Bay is evaluating the potential to process beach-deposited, previously-mined copper waste minerals (tailings) at Chañaral, in northern Chile.

Location

The project is located at Chañaral Bay, on the Pacific coast in the Atacama region of Chile, some 1,000 km north of the capital Santiago. The nearby town of Chañaral (population: 13,500) is well served by a paved road and there is an existing rail link to a port within the Bay. The nearest airport is 120 km away by road.

The project will benefit from grid power in Northern Chile.

Figure 10: Location of the Copper Bay project



Source: Copper Bay

■ Ownership

Minera Playa Verde Limitada, a 100%-owned subsidiary of Copper Bay, owns the eight licences covering an area of 1,515 hectares (ha) where the tailings lie.

A small portion of the resource area (and an area to the north of the beach) is owned by Empresa Nacional de Minería (ENAMI). ENAMI (The Chilean National Mining Corporation) processes ores and concentrates from over 2,000 small- and medium-scale copper producers to produce cathodes and refined copper for international markets.

■ History

The copper tailings originate from the Potrerillos and Salvador copper mines and were transported some 100 km via the Rio Salado river and deposited onto the beach and into the bay at Chañaral between 1938 – 1975.

The French Bureau of Geological and Mining Research (BRGM) first drilled the deposit in 1972 and since that time several companies have conducted exploration (drilling) campaigns.

The previous owners undertook an economic study of the possible exploitation of a defined resource in 2008 but decided not to proceed with the project.

■ Mineralisation

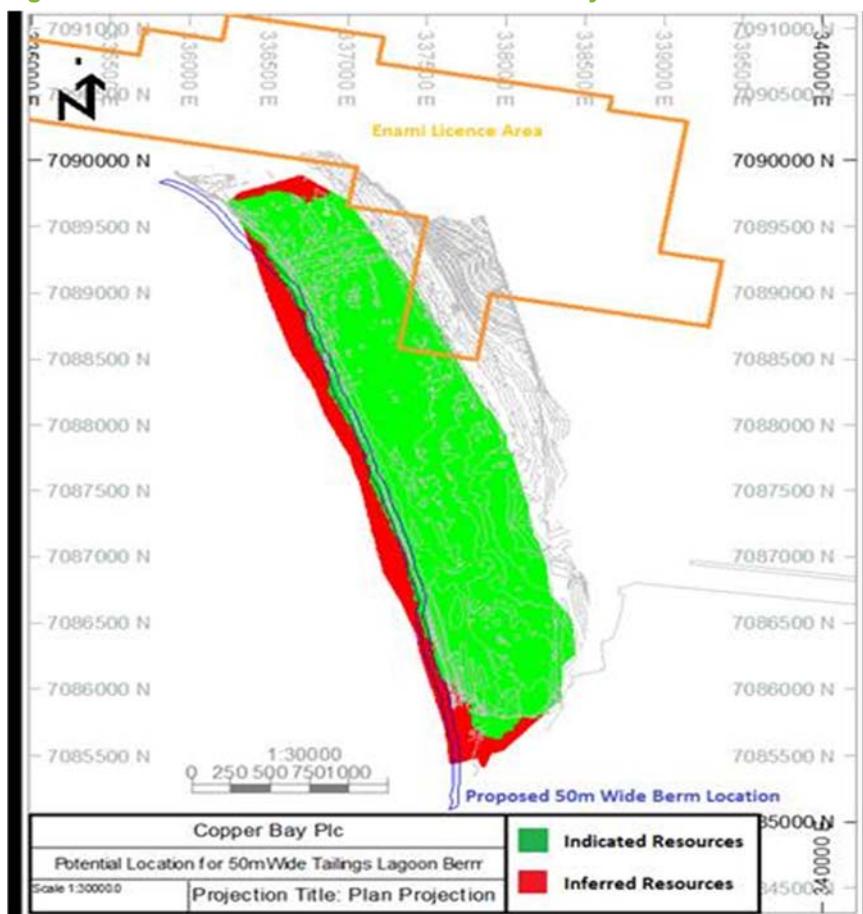
The deposit comprises a beach and near-shore fine granular deposit of copper tailings material and as such does not possess any recognised geological structure. However, there is some evidence in vertical section that the tailings display a layered structure in terms of fluctuating grade and grain size. The tailings material typically comprises light-grey fine beach sand with shell fragments and coarser rounded gravel and pebbles.

The tailings are the waste products of the concentration process at the Potrerillos and Salvador underground copper mines.

At the time of their deposition, the remnant copper in the tailings was predominantly chalcopyrite and almost entirely in sulphide form. In the intervening years, however, the copper sulphides have weathered to a point where approximately 50% of the copper has now been converted into oxides and chlorides.

■ Resources

The area of tailings deposition can be divided into three zones - Bay Zone (Bahía), Surf Zone (Rompiente) and the Beach Zone (Playa). The total area is approximately 1 km wide by almost 5 km long, and extends into Chañaral Bay a further 2 km.

Figure 11: Plan of resource areas at Chañaral Bay

Source: Copper Bay

In 2014, WAI oversaw a drilling programme of 136 vertical holes on a 100 m x 100-150 m grid over the Beach Zone and used the results, along with the results of previous drilling campaigns conducted in 1972 and 2008 (a total of 264 holes), in its determination of resources.

In December 2014, WAI estimated the following resources, based on a 0.10% copper cut-off:

Figure 12: Resources at Chañaral Bay (December 14)

	Tonnes (Mt)	Grade (% Cu)	Contained Copper (kt)
Indicated	42.7	0.244	104.3
Inferred	8.5	0.234	19.8

Source: Wardell Armstrong International

Much of the inferred resource will be used as a berm (barrier) to protect the resource area from sea ingress during proposed dredging operations, but the company expects to reclaim this resource on completion of the dredging.

WAI estimated the following resources in the berm (again at a 0.10% cut-off).

Figure 13: Berm resources

	Tonnes (Mt)	Grade (% Cu)	Contained Copper (kt)
Indicated	2.3	0.262	6.0
Inferred	6.4	0.249	16.0

Source: Wardell Armstrong International

Subsequent to the December 2014 resource estimation, rains in the Atacama Desert in March 2015 caused the Rio Salado channel to flood and burst its banks leading to a mudslide, or alluvion, which affected the part of the beach that is closest to the town of Chañaral. This has led to the formation of two channels in the beach, one of which has subsequently become a lagoon.

The overall effect of the flooding was to deposit a layer of mud up to approximately 30 cm thick over approximately 50% of the beach.

Mining resource

Copper Bay has assumed a resource, which can be practically reclaimed (the mining resource) and which forms the basis of operational planning. The mining resource includes adjusted, post-alluvion, indicated resources (including those in the berm) along with the adjusted inferred resources to the east of the berm; an allowance for the estimated resources in the Enami concession and an estimate provided by WAI of the quantity of mud that is now sitting on top of the beach following the alluvion (1.2 Mt at 0.060% copper) and then a deduction of 5% for mining losses.

Initial (Beach) resource contains 101 kt of copper and there is additional mineralisation in adjacent zones.

The net mining resource is 43 Mt at a grade of 0.236% copper for contained metal of 101.5 kt.

Additional resource potential

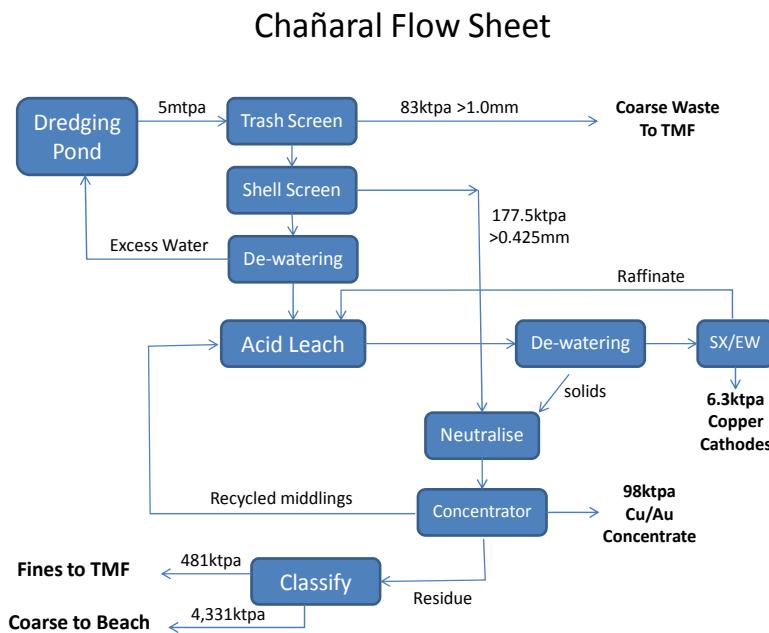
As mentioned earlier, there are two other zones of tailings deposition at Chañaral Bay which have not been included in any mine plans, but nevertheless represent potential for extending the life of the Copper Bay operation.

Reclamation and processing

According to a 2015 preliminary feasibility study (PFS) (see page 20), Copper Bay plans to reclaim material from the seaward part of the beach using floating dredges with pipe discharges to pump the material to the processing plant. Concurrently, material from the upper beach area will be shifted to the dredging area using high pressure water jets.

The overall metallurgical recovery, based on testwork conducted by WAI, is expected to be 72.8%.

Figure 14: Copper Bay flowsheet



Source: Copper Bay

The PFS envisages the disposal of fine tailings in a tailings management facility located 3 km from the processing plant, while returning the greater tonnage of coarse material to the beach.

A positive PFS in 2015 prompted CAML to increase its interest to 75% by investing a further US\$3 million.

Pre-feasibility study

In June 2015, Copper Bay completed an internal PFS on the project with input from various independent consultants.

Based on the mining resource of 43 Mt, the study examined the economics of a 5 Mt/y treatment operation producing 6.2 kt/y copper cathode and 2.4 kt/y of copper in concentrate for nine years with an estimated capital cost of US\$88 million.

Using a constant copper price of US\$3.00/lb, the study indicated an after-tax internal rate of return (IRR) of 21% and payback of 3.6 years.

Further work

The injection of US\$3 million from CAML will enable Copper Bay to undertake a full feasibility study, which it plans to complete in late 2016.

Copper Bay valuation

The production and financial forecasting model for the Copper Bay project is based on the following project parameters:

Figure 15: Project parameters

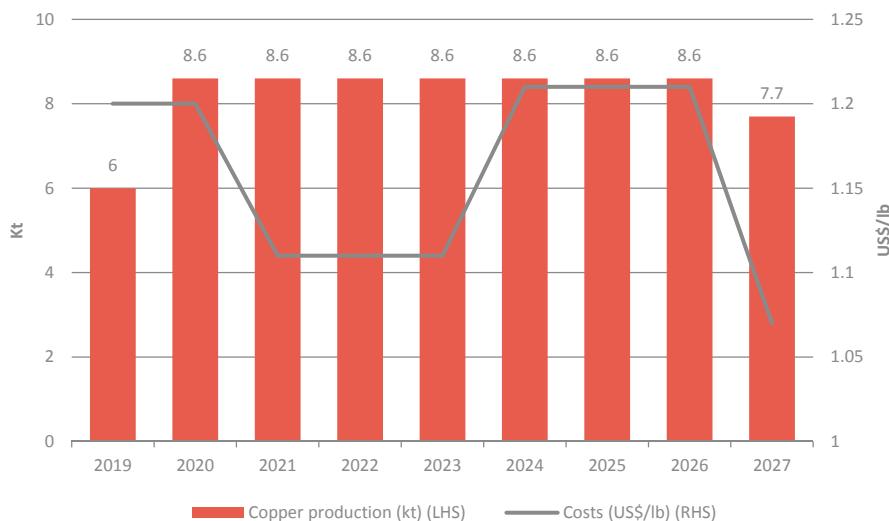
Parameter	Assumption	Source
Mining resource	43 Mt @ 0.236% Cu for 101.5 kt of Cu contained	Wardell Armstrong (as modified by Copper Bay)
Initial production	2019	CAML
Ave treatment rate	4.8 Mt/y	Copper Bay PFS
Max treatment rate	5.0 Mt/y	Copper Bay PFS
Life of mine (LOM) average grade	0.24% Cu	Copper Bay PFS
SX-EW plant recovery	52%	Copper Bay PFS
Flotation plant recovery	21%	Copper Bay PFS
LOM copper production	73.9 kt	Copper Bay PFS
Max copper production	8.6 kt/y	Copper Bay PFS
LOM average C1 cash cost*	US\$1.16/lb	Copper Bay PFS/ Marten & Co
LOM	9 years	Copper Bay PFS
Capital investment	US\$88 million	Copper Bay PFS
Long-term copper price	US\$6,600/t	Marten & Co

Source: Marten & Co

* C1 as per Brook Hunt standard (see Appendix 1)

The above model leads to the following production and cost profile for the Copper Bay project.

Figure 16: Forecast copper production and cost profile for Copper Bay



Source: Marten & Co

Analysis would suggest an NPV, at a discount rate of 10%, of US\$16 million after tax (CAML's share US\$12 million). For CAML shareholders this would equate to approximately 7 pence per share in its NAV.

The model assumes that CAML funds its 75% share of the initial investment required to construct the Copper Bay facility through a combination of project debt (50%, US\$33 million) and cashflow generated from its Kounrad operation (50%). The company may, of course, opt to raise a portion through issuing additional shares.

The model is based on the Joint Ore Reserves Committee (JORC)-compliant resources as delineated by WAI for the Beach Zone. However, as mentioned earlier, there are mineralised deposits lying in the Surf and Bay zones. At this stage there has not been enough work done to define a resource in these zones. There may be opportunities to reduce capex by eliminating the need for a tailings management facility.

It is assumed that the US\$88 million project capex can be funded through a combination of debt and cashflow generated from the Kounrad operation.

Risks

Copper prices

The copper price has come under pressure over the past two years as Chinese economic growth has slowed, causing a weakness in demand. Figure 17 shows the extent of the decline in the benchmark LME spot copper price over the past two years.

Figure 17: LME spot copper price (US\$/t)

Source: Bloomberg

The advent of new production has also had a negative impact on the supply-demand balance.

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, 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.

As far as copper sales are concerned, CAML has concluded a new offtake agreement with international commercial services group, Traxys, which extends to 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 is exposed to variations in the exchange rates between those currencies.

In 2014, the tenge devalued by 17% and then in August 2015 the government moved to a free floating exchange rate against the US dollar, causing the currency to depreciate (by as much as 55%).

The depreciation has affected the value of assets when expressed in US dollars. The current US-dollar exchange rate with the British pound is lower than the long-run assumption, which may have a positive impact on profitability in the short term.

Political

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

More recently, however, the Kazakh government has proposed 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 trends 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; socio-economic agreements; political stability; labour issues; geological database; and security.

In the latest survey, published in 2015, Kazakhstan is ranked 70th (out of the 122 jurisdictions surveyed). Chile, where the Copper Bay project is located, was ranked 13th. Since July 2013, Chile has been considered by the World Bank as a "high-income economy", and hence as a developed country. The country has a long history of mining: copper mining contributes 20% of Chilean GDP and accounts for 60% of exports.

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 and updated regarding any appropriate tax law changes. CAML also receives tax advice on local issues from its tax advisers.

Technical

The Kounrad operation is now in its fourth full year of production from the dumps on the eastern side of the open pit (eastern dumps) and has outperformed expectations each year, although the mechanical failure experienced in 2015 led to lower than originally planned production for the year.

CAML knows 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.

From 2017 onwards the Western dump material will have different characteristics, which may affect processing rates and operational performance. After decades of weathering, some of the material classed as 'sulphides' could potentially be more amenable to acid leaching than the categorisation suggests.

At Copper Bay, meanwhile, the company has undertaken metallurgical testing as part of the prefeasibility study and work to date suggests a recovery of 72.8%. However, further work needs to be done to increase the confidence in the suggested processing route and recoveries. A key challenge will be to remove the environmental hazard that the tailings material presents.

Permitting

CAML received the permit to exploit the western dumps in November 2015.

In November 2015, the Ministry for Investment and Development approved an amendment to the Kounrad Subsoil Use Contract allowing CAML to exploit the Western dumps.

The Copper Bay project is not yet at the permitting stage as the company is still assessing the viability of the project. However, Copper Bay already is working on social and environmental studies.

Capital structure

The company has 111.7 million shares issued, which were trading at 140 pence per share on 22 February 2016 giving the company a market capitalisation of £156.4 million. Collectively, the directors own 26.7 million shares, which include the 21.2 million shares owned by Mr Rakishev (see page 25).

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

The largest shareholder is prominent Kazakh businessman and CAML non-executive director, Kenges Rakishev, who holds just over 19% of the company

The remainder of the shareholder base is largely institutional (57%), with Hargreave Hale holding 10.1%, Fidelity Worldwide Investment (9.1%), D&A Income (6.8%) and Commonwealth American Partners (6.6%).

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.

Board

Nigel Hurst-Brown is non-executive chairman. He is a Fellow of the Institute of Chartered Accountants in England and 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.

Nick Clarke is chief executive officer and a director. He is a Chartered Engineer with forty years mining industry experience, sixteen 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.

Howard Nicholson is technical director of CAML. 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.

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.

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 Oxford University.

Mr Rakishev serves as board chairman for SAT & Company, which is a diversified industrial holding firm for industrial companies 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**; and chartered accountant and experienced resources executive, **David Swan** (Chairman of the Audit Committee). In December 2015, the company appointed mining engineer and company director, **Roger Davey**, as a non-executive director.

Management

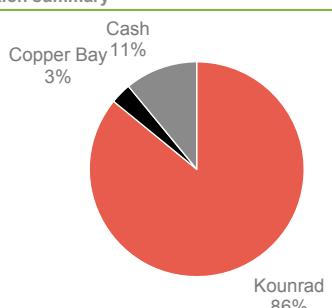
The Kazakhstan management team is led by **Pavel Semenchenko** who is general director for Sary Kazna, one of CAML's two Kazakh subsidiaries. He has more than 15 years of experience in managing businesses in Kazakhstan and a proven record in the resources industry.

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 corporate social responsibility (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 predominately in the international overseas mining industry in Central Asia, the former Soviet Union and West Africa. He has formerly worked for the Environment Agency in the United Kingdom, Avocet Mining, Newmont-BHP's joint venture in Guinea, and Orsu Metals as well as operating his own consultancy practice.

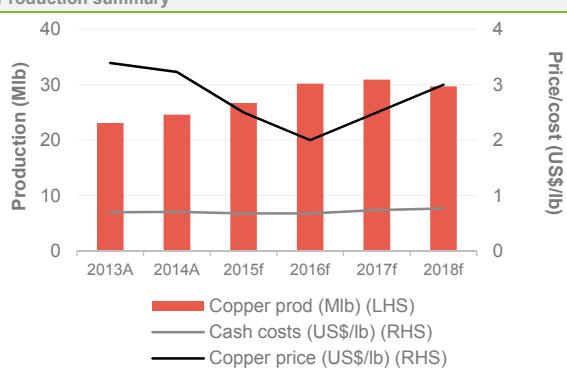
Figure 18: Central Asia Metals summary

Sum of the parts valuation – January 2016	US\$M	Pence per share
Kounrad NPV ^{8%}	329	193
Copper Bay (75%) NPV ^{10%}	12	7
Investments	0	0
Subtotal	341	200
Net cash/(debt)	42	25
NAV	383	225
Asset valuation summary		



The chart displays the CAML share price in GBP over a three-year period. The y-axis represents the price in GBP, ranging from 80 to 200. The x-axis shows dates from Jan/13 to Jan/16. The price starts at approximately 140 GBP in Jan/13, fluctuates between 105 and 140 GBP until mid-2013, then rises steadily to a peak of over 200 GBP in late 2014. It experiences a sharp drop in early 2015 but recovers to end the period at approximately 140 GBP.

NAV sensitivity analysis (pence per share)							
Disc. rate	-30%	-20%	-10%	Base	10%	20%	30%
5%	143	189	234	280	325	371	417
8%	117	155	192	229	266	304	341
10%	104	137	170	203	235	268	301
12%	93	122	151	181	210	239	268



Copper resources (2013)	Mt	Cu %	kt
Kounrad			
Indicated	386.0	0.10	368.2
Inferred	261.1	0.09	246.0
Copper Bay			
Indicated	42.6	0.24	101.2
Inferred	5.4	0.23	18.8

Source: Central Asia Metals and Marten & Co.

Y/E 31 Dec, all figures in US\$M unless otherwise stated					
Forecast assumptions	2014	2015	2016f	2017f	2018f
Copper price (US\$/t)	7,114	5,510	5,500	5,500	6,600
Copper price (US\$/lb)	3.23	2.50	2.50	2.50	3.00

Production summary	2014	2015f	2016f	2017f	2018f
Kounrad					
Ave flow rate (1,000l/hr)	771	912	960	1,000	1,000
PLS grade (Cu g/l)	2.24	2.05	2.20	2.20	2.10
Recovery (%)	73.5	74.0	74.0	74.0	74.0
Copper production (kt)	11.1	12.1	13.7	14.0	13.5
Cash costs (US\$/lb)	0.71	0.68	0.68	0.74	0.77
Fully absorbed costs (US\$/lb)	1.65	1.67	1.43	1.50	1.52
Copper Bay					
Tonnes treated (kt)	-	-	-	-	-
Grade (Cu%)	-	-	-	-	-
Cathode production (kt)	-	-	-	-	-
Copper in concentrate production (kt)	-	-	-	-	-
C1 cash costs (US\$/lb)	-	-	-	-	-
Fully absorbed costs (US\$/lb)	-	-	-	-	-
Company					
Total copper production (t)	11.1	12.1	13.7	14.0	13.5
Cash costs (US\$/lb)	0.71	0.68	0.68	0.74	0.77
Fully absorbed costs (US\$/lb)	1.65	1.67	1.43	1.50	1.52
Profit & loss summary					
Revenues	76.6	63.6	65.3	73.9	85.5
Cost of production	(9.4)	(10.4)	(12.1)	(13.9)	(12.9)
Mineral extraction tax	(4.4)	(3.8)	(3.9)	(5.1)	(5.1)
Selling costs	(3.9)	(3.2)	(3.1)	(3.5)	(3.5)
G&A	(11.9)	(13.6)	(14.0)	(13.5)	(13.9)
EBITDA	47.1	32.6	32.1	38.0	49.1
D&A	(11.3)	(12.0)	(8.0)	(8.0)	(8.0)
Interest	(0.3)	0.0	0.0	(2.6)	(2.3)
Taxation	(10.5)	(6.3)	(7.2)	(8.9)	(12.2)
Other	33.0	8.0	0.0	0.0	0.0
Net income	59.4	22.3	16.8	18.5	26.8
Ave shares outstanding (million)	106.1	111.7	111.7	111.7	111.7
EPS (US\$)	0.56	0.20	0.15	0.16	0.24
Dividend (pence per share)	10.0	7.0	6.0	5.0	5.0

Abridged balance sheet Y/E	2014	2015f	2016f	2017f	2018f
Cash & equivalents	46.1	42.0	33.8	29.5	24.6
Fixed assets	162.7	160.4	166.0	209.0	228.3
Total assets	216.2	213.8	211.3	250.0	264.4
Current liabilities	4.7	5.0	5.0	5.0	5.0
Long term debt	0	0	0	33.0	29.3
Other LT liabilities	23.7	20.0	20.0	20.0	20.0
Total liabilities	28.4	25.0	25.0	58.0	54.3
Shareholders' equity	187.8	188.8	186.3	192.0	210.1

Cash flow summary	2014	2015f	2016f	2017f	2018f
Cash from operations	30.5	31.8	22.3	21.4	30.0
Cash from investing activities	(10.8)	(8.4)	(20.5)	(46.0)	(22.3)
Cash from financing activities	(15.6)	(12.7)	(10.0)	20.3	(12.7)

Profitability	2014	2015f	2016f	2017f	2018f
Net Cash at end	40.2	42.0	53.6	29.5	24.0

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

Appendix 1 – C1 costs explanation

C1 cash 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 Brook Hunt (now part of Wood Mackenzie).

Under the Brook Hunt definition, C1 costs are direct costs, which include costs incurred in mining and processing (labour, power, reagents, materials), plus local general and administrative expenditure (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.

CAML reported 2014 cash costs for Kounrad as US\$0.71/lb, but these include mineral extraction tax and exclude local G&A. Kounrad's 2014 C1 costs according to the Brook Hunt definition are calculated as US\$0.66/lb by excluding the mineral extraction tax (US\$0.18/lb) and adding back in local G&A (US\$0.13/lb)

The mineral extraction tax (at 5.7% of revenue) is brought in under total costs, which include indirect costs and non-cash items, such as depreciation and amortisation.

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-pregnant leach solution (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. 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.

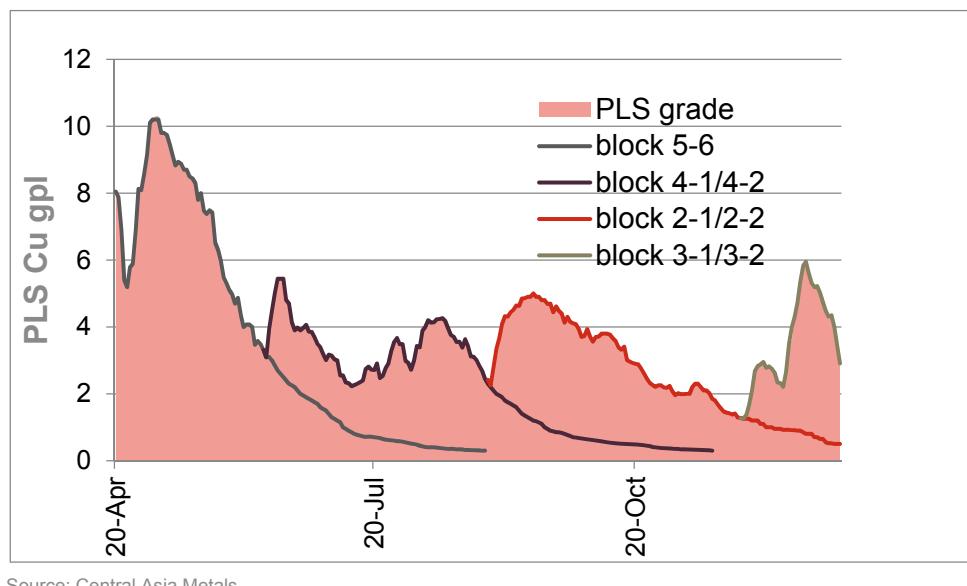
The dumps are divided into blocks. Leaching of any one block is essentially a three-phase process, with a 'bloom' (high-grade) phase, a steady phase and finally a tail recovery phase over approximately 6-months. The first 120 days recover about 40% of the copper with the remaining 10-11% over the final 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.

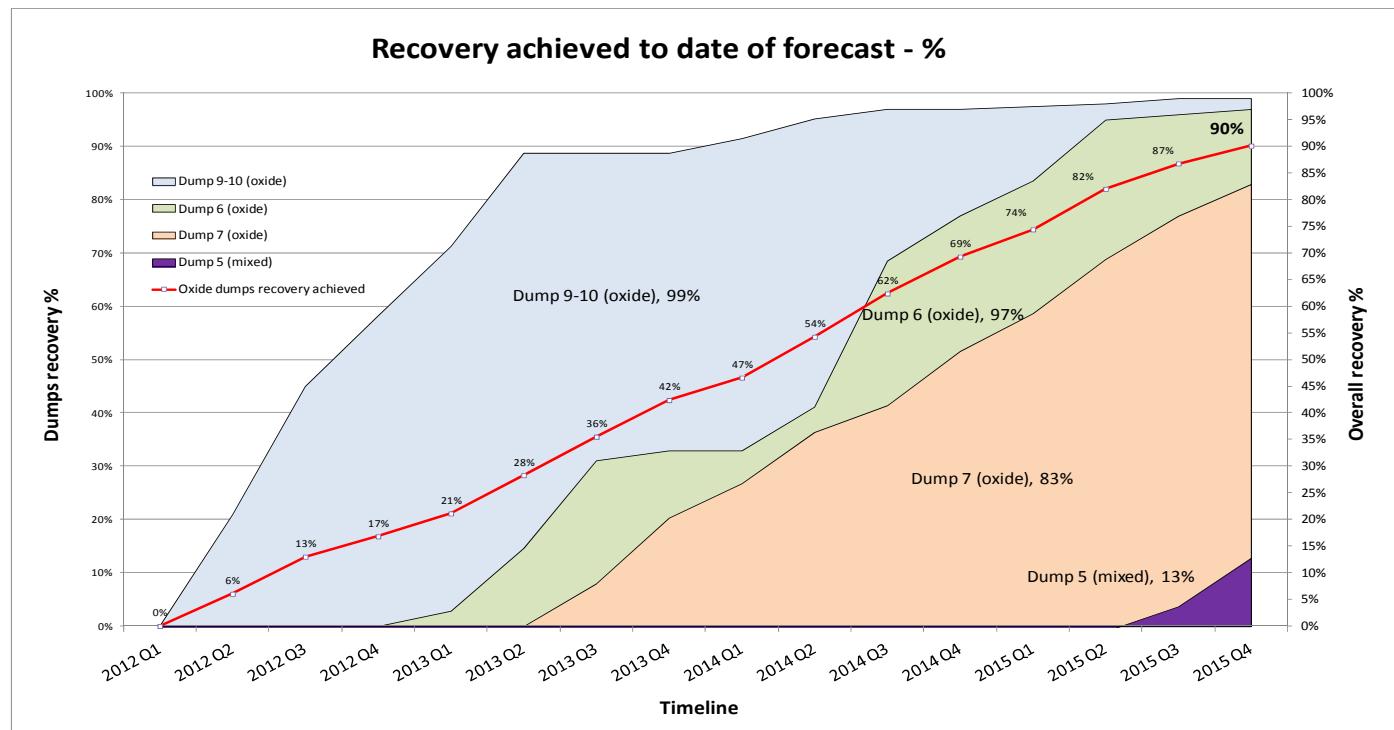
In Figure 19, below, which shows the leach curves for block in 2014, as the PLS grade of block 5-6 falls off, blocks 4-1 and 4-2 come into play and support the PLS average grade until blocks 2-1 and 2-2 commence. Thus, the PLS grade averaged 2.24 g/l in 2014 (which is close to the most efficient grade of 2.00 g/l) despite a wide range between 8 g/l and less than 1 g/l.

Figure 19: Leach curves for blocks



Source: Central Asia Metals

Figure 20: Dump leach profiles since start up



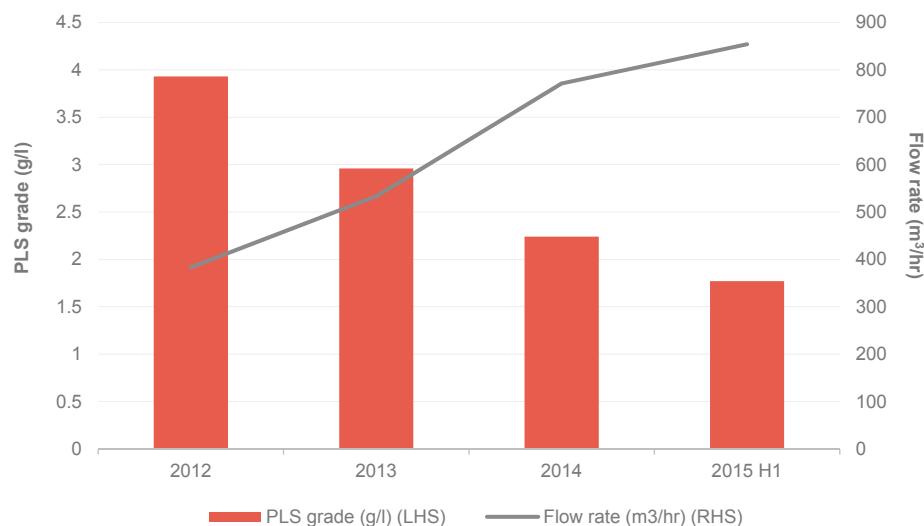
Source: Central Asia Metals

The second main variable that CAML can control is the flow rate of raffinate. 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 21 shows the average flow rates since operations began.

Figure 21: Average flow rates and PLS grade



Source: Central Asia Metals

With the plant expansion in 2015, copper cathode deposition rates have improved from 35 t/d to 50 t/d (summer) and from 18 t/d to 25 t/d (winter).

Appendix 3 – Resource definition work

Figure 22: 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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