

## SPEC BUY

Current Price **\$0.16**

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## Cradle Resources – Panda Hill

### Rock the Cradle

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#### Quick Read

Cradle Resources (CXX) is developing the high value Panda Hill Niobium (Nb) project in Southern Tanzania. Panda Hill benefits from low strip ratios (0.4:1), excellent infrastructure, close proximity to a major city and high, open pittable grades. Argonaut's site visit in August 2014 confirmed our view that Panda Hill will be a low cost, high margin, low technical risk mine. We foresee significant upside potential from shallow high grade zones that were defined in the recent drilling program and from higher plant recoveries.

#### Event & Impact | Positive

**What is Niobium?** Niobium is a high value, high growth metal alloy used for lightening and strengthening steel. It is generally sold as Ferroniobium (FeNb) which is blended directly into a steel furnace. Demand growth is increasing, particularly in the use of fuel efficient cars, oil and gas pipelines (rolled steel) and structural steel. About \$9 worth (or ~200g of Nb at US\$41/kg) lightens a standard 1 tonne car by ~100kg. The current market consumes 50-60kt FeNb with an estimated value of \$2.2bpa (over twice the value of the current graphite market).

**Positive Scoping Study:** Low operating costs, modest capex and a high value commodity results in excellent economics with an estimated EBITDA margin of 53% and the capacity to generate +US\$76mpa free cash flow (Base Case). The preferred Base Case assumes a 2.0Mtpa plant producing 4.8kt Nb (Nb in the form of FeNb) for US\$185m capex. Project payback is estimated at 2.8 years. CXX also scoped a staged development case producing 2.7ktpa with initial capital of US\$125m ramping up to 5.5ktpa Nb in Stage 2.

**Strategic partner secured:** In June 2014, Tremont an African focused mining platform backed by Denham Capital, agreed to fund the Panda Hill project up to decision to mine. Four optioned stages of US\$5m expenditure (total US\$20m) will earn Tremont incremental 12.5% project ownership allotments (total 50% ownership). The four stages include; 1) an upfront payment in June 2014, 2) funding for a PFS, 3) funding for a DFS and, 4) payment towards project development. Post earn-in, costs will be shared 50:50.

**Upside potential:** Drilling undertaken during Argonaut's site visit defined a near-surface, high grade (magnetite rich) zone. We believe this zone has the potential to supply initial high grade ore and expedite project payback. The mine is likely to run at an elevated Nb<sub>2</sub>O<sub>5</sub> of 0.7% for the initial 10 years of the mine life.

#### Recommendation

Argonaut assigns a SPEC BUY recommendation to CXX.

Ticker:	CXX
Sector:	Materials
Shares on Issue (m):	147.5
Market Cap (\$m):	23.6
Net Cash	3.9
Enterprise Value (\$m):	19.7
52 wk High/Low:	\$0.25 / \$0.15
12m Av Daily Vol (m):	0.08

Project Name	Commodity	Location
Panda Hill	Niobium	Tanzania

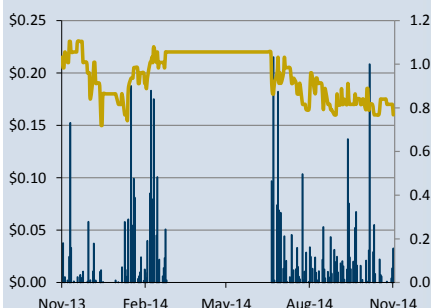
Production	Production (Mt)	C1 costs (US\$/kg)
Scoping Study	1.0 -2.3	16.17-19.86

Panda Hill Resources (pro-forma 50% CXX)			
	Mt	Nb <sub>2</sub> O <sub>5</sub> Grade	Cont. Nb <sub>2</sub> O <sub>5</sub> (kt)
Total	81.8	0.52%	423.0

Directors	
Craig Burton	Chairman
Grant Davey	Managing Director
Evan Cranston	Non-Executive Director
Didier Murcia	Non-Executive Director

Substantial Shareholders	
Craig Burton	16.0%
Edwards Family Holding	9.1%
Grant Davey	8.8%
Arredo Pty Ltd	5.9%
Brett Mitchell	5.9%

Share Price Graph



## Overview

**Panda Hill benefits from excellent infrastructure...**

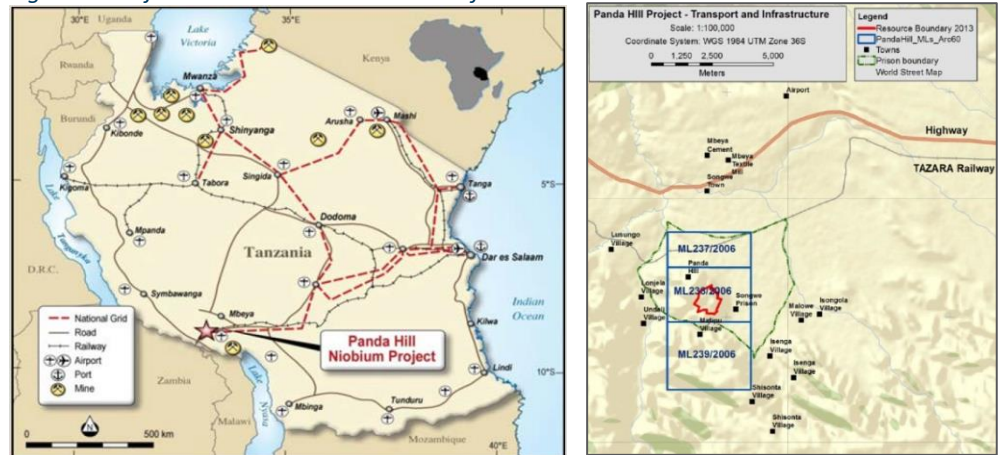
Panda Hill is located in Tanzania near the south-eastern regional centre of Mbaya. The project benefits from excellent infrastructure and key advantages including:

- Proximity to a major centre with an international airport
- Sealed roads from Mbaya to the major port of Dar es Salaam
- Rail within 3km of Panda Hill
- Likely water sources including local rivers, groundwater and catchment
- A granted mining lease
- Amendable to low strip (0.4:1) open pit mining

The project has an Inferred Resource of 82Mt @ 0.52% Nb<sub>2</sub>O<sub>5</sub>. As Nb is a relatively unknown commodity to resource investors, the best analogy for the value of the project is its 6.5Moz @ 2.5g/t gold equivalent.

**Located proximal to the major regional centre of Mbaya**

Figure 1: Project location and associated infrastructure



Source: CXX

## Timeline to development

**DFS completion anticipated in Q4 2015...**

Recent drilling and metallurgical work will be used for the PFS due in Q1 2015. This will be followed by a BFS, expected Q4 2015 followed by project development in 2016.

Cradle Resources



Table 1: Project metrics

Metric	Unit	Value
First Production (est.)	Yr	2017
Throughput Rate	Mtpa	2
Mine Life	Yrs	28
Feed Grade (LOM)	% N <sub>2</sub> O <sub>5</sub>	0.52%
Feed Grade (1st 10 yrs)	% N <sub>2</sub> O <sub>6</sub>	0.70%
Production Rate	ktpa	2.7-5.5
Capex	US\$m	185
Opex	US\$/kg	16.7
Realised Price	US\$/kg	44
EBITDA at 2.0Mtpa rate	US\$mpa	84
Free Cash Flow (steady state)	US\$mpa	76
EBITDA Margin (steady state)	%	53%
IRR (Company Reported)	%	61%

Source: Argonaut

**...with expected strong economics including steady state US\$110mpa EBITDA**

**A higher Resource grade than the highly profitable Niobec Nb mine...**

**...CXX adopting a known processing route currently used at Niobec**

**Market currently dominated by CBMM in Brazil...**

**...however with modest low production and high annual CAGR, Panda Hill will be undisruptive...**

**...and intensity of FeNb use by China likely to be a key driver going forward**

**Upside to PFS expected from higher grades in the initial years of production...**

## See through value from Niobec transaction

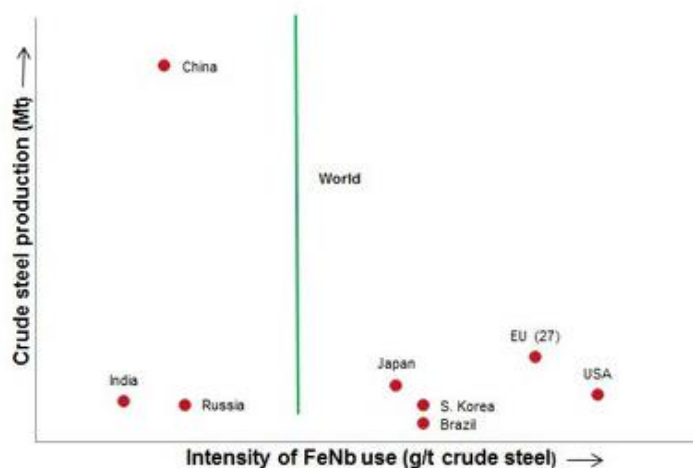
Niobec is an underground Nb<sub>2</sub>O<sub>5</sub> mine in Canada and the most analogous to Panda Hill based on the similar flow sheet, however the grade of Panda Hill is considerable higher (Niobec ~0.42%). This operation has delivered consistent EBITDA of US\$68-88m since 2008 (increasing in recent years). IAMGOLD recently divested Niobec for US\$500m (total Resource 2.9Mt @ contained Nb<sub>2</sub>O<sub>5</sub>) implying metrics of ~6.7x EBITDA or US\$173/t Nb<sub>2</sub>O<sub>5</sub>. The see through value for Panda Hill is \$740m on an EV/EBITDA basis or US\$74m on an EV/Resources basis (noting that Niobec is underground with an expected lower Reserve to Resource conversion than the open pit Panda Hill).

## Market and sales

Supply of Nb<sub>2</sub>O<sub>5</sub> is highly condensed and dominated by Brazilian consortium Companhia Brasileira de Metalurgia e Mineração (CBMM) who produces 84% of global supply. Anglo America and IAMGOLD (prior to sale of Niobec) both produce 7-8% each. These three parties have coexisted for some time and there has been no move by CBMM to lower prices and force the smaller players from the market. Prices have been relatively stable at US\$37-41/kg from 2009-2013. Demand CAGR averaged 10% from 2000-2010.

China accounts for 25% of global demand, however it has the lowest Nb alloy intensity of major global steel producers. Increased demand for lower fuel consumption vehicles and lighter/stronger steel alloys is likely to drive higher intensity of use from China (the world's largest steel producer). CXX's production of ~4.8t is strategically less than forecast FeNb demand growth (CAGR 3%pa) and unlikely to be disruptive to the market.

Figure 3: Intensity of FeNb in steel by region



Source: Rostkill

## Opportunities

Panda Hill is clearly market constrained, not Resource constrained. We regard the biggest opportunity for the project being market expansion driven by a growing demand for Nb in steel alloying across a range of industrial applications. Secondly, we see upside from high grade, near surface ore delineated by recent drilling. This has been supported by recent test work which confirmed scoping study recoveries. Recovered metal optimisation will be key for the project via a blend of lower recovery, high grade

oxide/transitional ore (incorporating high grade magnetite rich zones grading 1-3% Nb<sub>2</sub>O<sub>5</sub>) and lower grade, high recovery fresh rock.

#### Potential for grid power and/or rail transport

Access to the local power grid as an alternative to the heavy fuel oil on-site generation considered in the Scoping Study, may result in lower power costs (from US\$24¢/kWhr to ~11¢/kWhr). A further opportunity exists to use the nearby rail (~3km) to transport both product and reagents.

#### High grade magnetite zone near surface provides opportunity for early high grade ore source

Figure 4. a) High grade near surface Magnetite Rich Zone in core (left), b) high grade Nb zone reading on XRF Niton gun; 8.6% Nb<sub>2</sub>O<sub>5</sub> equivalent (right)



Source: Argonaut

## Risks and Mitigants

#### Risks include: A condensed market, dominated by one player...

Entering a condensed market dominated by a single producer is Panda Hill's primary risk. CBMM is a low cost producer with the potential to drive down prices. We believe CXX is protected from this risk by high margins (profitable even at considerably lower prices), initial low production rates will be undisruptive to the market and a desire for customers to encourage diversity of supply away from the current three major suppliers.

#### ...the current inferred only Resource...

The solely Inferred status of Resource and limited metallurgical test work provide additional risks. However, recent infill drilling will enable a Resource upgrade and highlights potential for both increased scale and grade. The Company has also dispatched 900-1000t of bulk rock for metallurgical testing. Argonaut did note on our site visit that Panda Hill Carbonatite is geologically complex and geological/metallurgical zonation will be critical for mine/blend optimisation.

#### ...and the need to relocate a low security prison

A final risk is the requirement to relocate a low security prison farm and associated village at the foot of Panda Hill. While the cost of this relocation is factored into development capex, final agreements are yet to be reached. However, Argonaut understands that an agreement-in-principle has been struck with the Ministry of Justice and our communication with Tanzanian Ministers highlighted very strong support for the development of the project.

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**Important Disclosures**

CXX: Argonaut acted as Manager and Broker to the Placement that raised \$3.6M in June 2014 and received fees commensurate with this service. Argonaut holds or controls 1,750,000 CXX shares.

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