

3 August 2015

## Cleveland Tailings Pre-feasibility Study successfully demonstrates viability

*This announcement should be read in conjunction with the attached Executive Summary, which is an extract from the Cleveland Tailings Pre-feasibility Study report, and the Ore Reserve Statement released separately today.*

**Elementos Limited (ASX: ELT) ("Elementos" or the "Company")** is pleased to announce the results of the Cleveland Tailings Pre-feasibility Study (PFS) as part of its development of the Cleveland tin, copper and tungsten mine, in north-west Tasmania, Australia.

### Cleveland Tailings Project – Key parameters and indicators

Mineral Resource (at 0.0% Sn cut-off)	Tonnes	Tin	Copper
Indicated	3.8 million	0.30 % Sn	0.13% Cu
Ore Reserve	Tonnes	Tin	Copper
Probable	3.7 million	0.29 % Sn	0.13% Cu
Contained metal		11 kt	4.8 kt
Production			
Plant maximum feed rate	650 kt tailings per annum		
Project life	7 years		
Products	Tin concentrate	Copper concentrate	
Grade	51% Sn	18% Cu	
Metal recovery to concentrate	47%	31%	
Metal in concentrate	5.2 kt Sn	1.5 kt Cu	
Financial analysis			
Life-of-mine average metal price	US\$21,171 per tonne Sn / US\$6,900 per tonne Cu		
Pre-production capital	A\$21 million		
Fully allocated (C3) cost per recovered tonne Sn	US\$13,137		
Total revenue	A\$143 million		
Net cash flow	A\$39 million		
Net present value (NPV)	A\$34 million (pre-tax) at a real discount rate of 8%		
Internal rate of return (IRR)	68% (pre-tax)		
Payback	3 years		

Sn = tin, Cu = copper, kt = thousand tonnes (kilotonne)

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## Key Findings

The PFS has demonstrated that the Cleveland Tailings Project is both technically and financially viable, with a risk and opportunity profile that is competitive with or better than other global tin assets at a similar stage of development.

- Production is scheduled to commence in FY 2016–17.
- The fully allocated cost (C3) is estimated at US\$13,137 per recovered tonne of tin, placing the project in the bottom half of the ITRI C3 cost curve.
- At current prices, the project is profitable and cash flow positive, indicating a robust project that trades through the cycles.
- The project area has excellent infrastructure when compared with other tin projects, with power, water, and communications on site and roads transecting the site, providing excellent access to ports and a skilled labour market.
- The project is in a low-risk jurisdiction relative to other tin provinces throughout the world, with a stable and well-understood regulatory environment and encouraging state government.
- Local community and other stakeholders are supportive.
- Environmental and mining applications have been lodged and Elementos has every reason to believe at this point in time that approval is likely given the significant government and stakeholder support to rehabilitate historical legacies as proposed in the mine plan.
- The Cleveland Tailings Project leverages the potential development of open-pit and underground hard-rock Mineral Resources, creating potential for significant production expansion.
- The study report has been independently reviewed by leading consultancy AMC Consultants Pty Ltd (AMC). AMC confirms that the study meets the JORC Code definitions of a pre-feasibility study and is of a standard normally accepted by the mining industry for studies of this type.

Elementos CEO Tim McManus said, "We are highly encouraged by the results of this Pre-feasibility Study, which shows that the reprocessing of tailings is viable when based on conservative assumptions. We have also reviewed the project in the context of integrating its development with the hard-rock resources at Cleveland and believe there are very few tin projects globally that can offer a leveraged, low-capital, low-cost development such as Cleveland. With exploration upside and proximity to all necessary infrastructure and being located in one of the lowest risk jurisdictions in the world, we believe Cleveland will be highly attractive to potential partners wishing to join with Elementos in advancing the development of the Cleveland Mine."

With the completion of the study the Company is also pleased to have been able to estimate an initial Ore Reserve for the Cleveland tailings. This Ore Reserve estimate is the subject of a separate announcement today.

The Pre-feasibility Study recommends that the project advance to the next stage of development, which would involve development of a Feasibility Study and continuation of the approvals process. With the completion of the Pre-feasibility Study, there is a sound basis to progress discussions with potential partners to continue the development of Cleveland and advance this exciting project with the additional information available from the release today.

For more information, please contact:

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Elementos is an Australian, ASX-listed metals company, focused on the development of Cleveland, an advanced stage tin-copper and tungsten project in Tasmania.

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## PREFACE

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The Executive Summary is an extract from the Cleveland Tailings Project Feasibility Study report dated July 2015. The full report is available under confidentiality agreement in the Cleveland Project data room.

### Forward-looking statements

This document may contain certain forward-looking statements. Such statements are only predictions, based on certain assumptions and involve known and unknown risks, uncertainties and other factors, many of which are beyond the company's control. Actual events or results may differ materially from the events or results expected or implied in any forward-looking statement.

The inclusion of such statements should not be regarded as a representation, warranty or prediction with respect to the accuracy of the underlying assumptions or that any forward-looking statements will be or are likely to be fulfilled.

Elementos undertakes no obligation to update any forward-looking statement to reflect events or circumstances after the date of this document (subject to securities exchange disclosure requirements).

The information in this document does not take into account the objectives, financial situation or particular needs of any person or organisation. Nothing contained in this document constitutes investment, legal, tax or other advice.

### Mineral Resource and Ore Reserve statements

Elementos confirms that any Mineral Resource and Ore Reserve estimates used in this document were estimated, reported and reviewed in accordance with the guidelines of the Australian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) 2012 edition.

Elementos confirms that it is not aware of any new information or data that materially affects the information included in the Cleveland Tailings Mineral Resource released on 17 June 2014 and that all material assumptions and technical parameters underpinning the estimates in the Cleveland Tailings Mineral Resource continue to apply and have not materially changed. Elementos also confirms the form and context in which the Competent Person's findings are presented have not been materially modified from the 17 June 2014 announcement.

This document includes the results from an economic analysis based on reasonable assumptions and evaluation of relevant Modifying Factors that are sufficient for a Competent Person, acting reasonably, to determine part of the Mineral Resources may be converted to an Ore Reserve.

# EXECUTIVE SUMMARY

In 2014–15, Elementos Ltd (Elementos) conducted a Pre-feasibility Study (PFS) of the technical and economic viability of the Cleveland Tailings Project, a tin and copper tailings Mineral Resource<sup>1</sup> in north-west Tasmania. The PFS has determined a preferred mining method and an effective method of mineral processing. The study contains a statement of Ore Reserves based on the published Mineral Resource estimate and the proposed method of extraction. It also provides an economic analysis of the project based on reasonable assumptions and at a confidence level consistent with the stage of development of the project.

## Key project parameters and indicators

Cleveland Tailings Project			
<b>Mineral Resource<sup>1</sup> (at 0.0% Sn cut-off)</b>	Tonnes	Tin	Copper
Indicated	3.8 million	0.30 % Sn	0.13% Cu
<b>Ore Reserve</b>	Tonnes	Tin	Copper
Probable	3.7 million	0.29 % Sn	0.13% Cu
Contained metal		11 kt	4.8 kt
<b>Production</b>			
Plant maximum feed rate	650 kt tailings per annum		
Project life	7 years		
<b>Products</b>	Tin concentrate	Copper concentrate	
Grade	51% Sn	18% Cu	
Metal recovery to concentrate	47%	31%	
Metal in concentrate	5.2 kt Sn	1.5 kt Cu	
<b>Costs<sup>2</sup></b>	C1	C2	C3
Operating cost per recovered tonne Sn	US\$7,879	US\$12,055	US\$13,137
Pre-production capital	A\$21 million		
<b>Revenue</b>	Tin	Copper	
Life-of-mine average metal price	US\$21,171 per tonne	US\$6,900 per tonne	
Total revenue	A\$143 million		
<b>Financial analysis</b>			
Net cash flow	A\$39 million		
Net present value (NPV)	A\$34 million (pre-tax) at a real discount rate of 8%		
Internal rate of return (IRR)	68% (pre-tax)		
Payback	3 years		

Sn = tin, Cu = copper, kt = thousand tonnes (kilotonne)

<sup>1</sup> Announced to the ASX on 17 June 2014 "Cleveland Tailings Resource Upgrade", available <[www.asx.com.au](http://www.asx.com.au)>.

<sup>2</sup> Net direct cash cost (C1); production cost (C2); fully allocated cost (C3)

## Key findings

The PFS has demonstrated that the Cleveland Tailings Project is both technically and financially viable, with a risk and opportunity profile that is competitive with or better than other global tin assets at a similar stage of development.

- Production is scheduled to commence in FY 2016–17.
- The fully allocated cost (C3) is estimated at US\$13,137 per recovered tonne of tin, placing the project in the bottom half of the ITRI C3 cost curve.
- At current prices, the project is profitable and cash flow positive, indicating a robust project that trades through the cycles.
- The project area has excellent infrastructure when compared with other tin projects, with power, water, and communications on site and roads transecting the site, providing excellent access to ports and a skilled labour market.
- Project is in a low-risk jurisdiction relative to other tin provinces throughout the world, with a stable and well-understood regulatory environment and encouraging state government.
- Local community and other stakeholders are supportive.
- Environmental and mining applications have been lodged and Elementos has every reason to believe at this point in time that approval is likely given the significant government and stakeholder support to rehabilitate historical legacies as proposed in the mine plan.
- The Cleveland Tailings Project leverages the potential development of open-pit and underground hard-rock Mineral Resources, creating potential for significant production expansion.
- The study report has been independently reviewed by leading consultancy AMC Consultants Pty Ltd (AMC). AMC confirms that the study meets the JORC Code definitions of a pre-feasibility study and is of a standard normally accepted by the mining industry for studies of this type.

## Background

The Cleveland Mine is situated at Luina, about 60 km from the port of Burnie (population approximately 20,000). North-west Tasmania has well-developed infrastructure and a strong mining culture. The site is linked to the port of Burnie and other major population centres on the north-west coast by sealed all-weather roads. Accessible power runs through the Cleveland mine site, and there is abundant water available for use. The Burnie region has a large pool of available and experienced workforce. The Tasmanian Government, Environmental Protection Authority (EPA), and Department of State Growth (Mineral Resources Tasmania) have all indicated support for the project.

Cleveland was an underground tin and copper mine operated by Aberfoyle Limited (Aberfoyle) between 1968 and 1986. During the life of the Cleveland operations, Aberfoyle mined and treated 5.7 million tonnes of ore, producing approximately 24,000 tonnes of tin and 10,000 tonnes of copper in concentrate.

Historical mining at Cleveland produced a tailings legacy that Elementos proposes to reprocess as the first stage of its development strategy for the Cleveland Mine. Subsequent stages, which are the subject of separate studies (not in the scope of this study), will target the development of the open-pit and underground Mineral Resources that have been identified by Elementos. The staged development strategy minimises up-front capital, with cash flow funding future stages.

The topography around the mine is relatively steep and rugged with elevations ranging from 300 metres to over 500 metres above sea level. The tailings are stored above ground on-site in two tailings dams. The tailings contain a substantial quantity of recoverable tin and copper due, in part, to operational inefficiencies and technical limitations of tin processing while the mine was in operation.

### Location of Cleveland mine and tenements



### Ownership and tenure

The project's assets are 100% owned by Rockwell Minerals (Tasmania) Pty Ltd (Rockwell), which is a wholly owned subsidiary of Elementos Limited. The assets are held under exploration licences EL 7/2005 and EL 15/2011. The Cleveland Tailings Project is located within EL 7/2005, which has an area of 18 square kilometres and includes the historical Cleveland Mine, tailings dams, and supporting surface infrastructure areas.

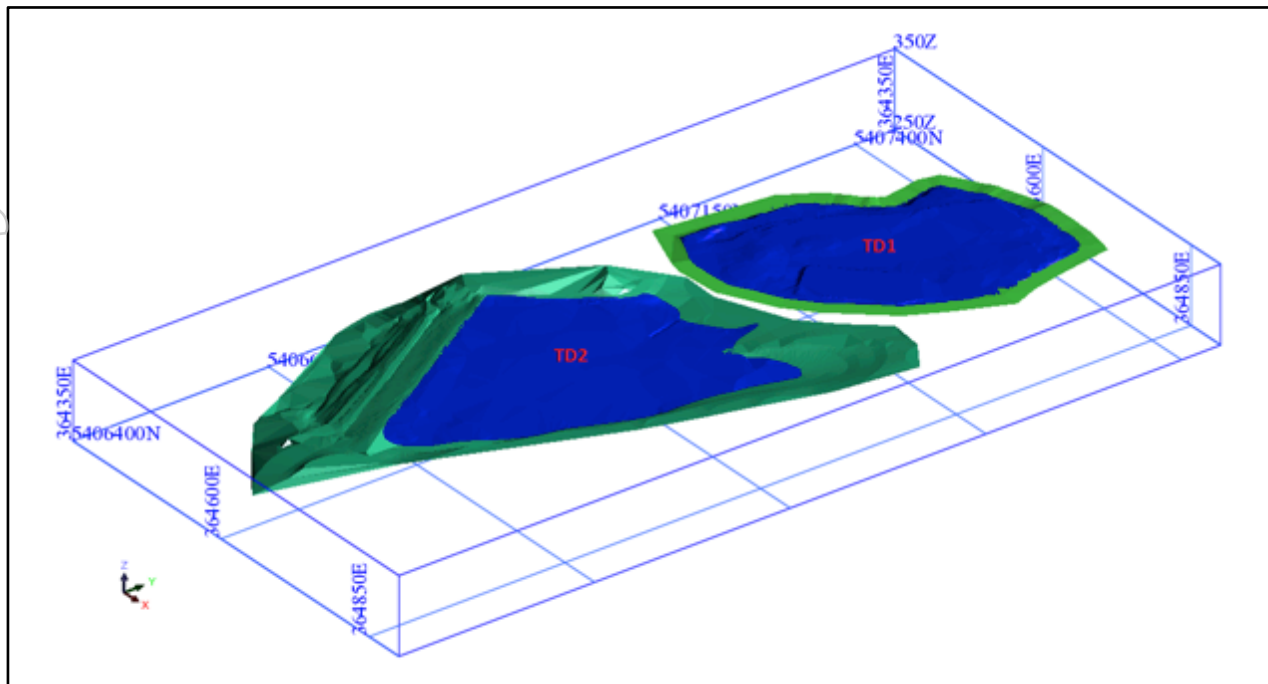
Elementos submitted a Mining Lease Application (MLA) with Mineral Resources Tasmania (MRT) on 31 March 2015. The MLA covers the reclamation of the Tailings Mineral Resource and Ore Reserve proposed in the study.

### Deposit

The in situ, hard-rock Cleveland deposit is a series of tin and copper bearing semi-massive sulfide lenses (pyrrhotite-cassiterite-stannite-chalcopyrite) within a series of sedimentary rocks belonging to Hall's Formation of Cambrian age. The deposit is geologically similar to the tin-bearing semi-massive and massive sulfide stratiform mineralisation at Renison.

Within the Cleveland mineralization, the cassiterite is fine grained with grain sizes generally in the range of 0.02 mm to 0.07 mm. The grain size dictates the extent to which the ore must be ground to release the cassiterite from the other minerals present. During the Aberfoyle operations at Cleveland, tin and copper recovery both averaged 60%. The cassiterite and chalcopyrite not recovered during historical processing was deposited in two tailings dams (TD1 and TD2) that now form the basis of the Cleveland Tailings Mineral Resource and the subject of this study.

### Tailings dam deposits TD1 and TD2



Tailings Dam 1 (TD1) was the first to be constructed and, importantly, was in operation prior to the installation of a flotation circuit. The pre-flotation tailings in TD1 can be expected to be of a higher grade when reprocessed. TD1 was constructed by upstream spiggotting with a downstream float toe. The embankment height is approximately 22 metres. The surface of TD1 was rehabilitated and revegetated in 1987.

Tailings Dam 2 (TD2) was constructed by upstream spiggotting with a float toe and a wide berm at the mid-point of the dam. During operations, additional fill material was added to the toe of the embankment to strengthen the dam wall. The embankment height is approximately 40 metres. The dam was taken out of service in 1985.

## Mineral Resource estimate

The mine design is based on the Mineral Resource estimate announced by Elementos on the 17 June 2014<sup>3,4</sup>, which is reproduced below.

Cleveland Tailings Mineral Resources (at 0% Sn cut-off)			
Category	Tonnage	Tin grade	Copper grade
Indicated	3.8 million	0.30 % Sn	0.13% Cu

Sn = tin, Cu = copper; values are subject to rounding errors

To upgrade the Mineral Resource to a higher (Measured) classification would require closely spaced drilling, which would be expensive and would not reduce grade uncertainty any further than the existing global estimate. The global estimate is based on approximately 6,000 reliable, historical plant production records. Elementos has a high confidence in this estimate and does not intend to further develop the Tailings Mineral Resource estimate prior to mining.

<sup>3</sup> Reported in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) 2012 Edition

<sup>4</sup> Announced to the ASX on 17 June 2014 "Cleveland Tailings Resource Upgrade", available <[www.asx.com.au](http://www.asx.com.au)>.

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## Mining

Several mining methods were reviewed for their suitability. On the balance of all the criteria considered (capital cost, surface water management, production flexibility, physical variability of the tailings, availability and operating cost), a loader-to-truck method was selected.

A total of 3.7 million tonnes of the tailings with an average head grade of 0.29 %Sn and 0.13% Cu will be mined at the rate of 650 thousand tonnes per annum (ktpa). The loader and truck capacity is factored at 75% to allow for moist material. The fleet has an availability of 75% and is assumed to operate on a two 12-hour daily shift roster.

Mining will be executed in four phases:

### Phase 1 – Preliminary site works

The preliminary site works involves re-establishing the site ready for construction of mining and reprocessing infrastructure and establishing water management.

### Phase 2 – Construction

Construction will then commence with the following activities:

- Construction of a starter embankment of the new Tailings Storage Facility (TSF)
- Refurbishment of the process water dam and construction of a polishing pond
- Construction and commissioning of the Process Plant and administration/ablution buildings
- Clear and grub TD1 (TD2 is prepared at the end of mining TD1)

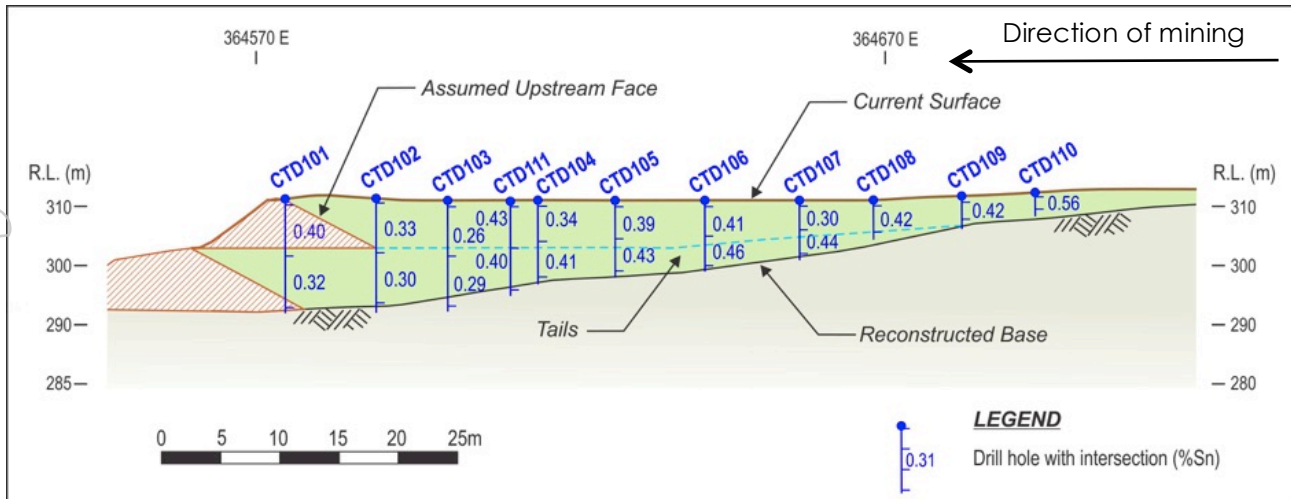
### Phase 3 – Mining

An active mine face will be established at the beachhead of TD1, the closest point to the proposed plant location. The clay cap and float is removed by truck and stockpiled for reuse. Any removed vegetation will be stockpiled for use in rehabilitation. An active mining area is exposed, containing feed for a minimum of three shifts. Limiting the removal of the clay cap reduces the amount of surface water that can enter the dams and will also reduce dust.

All material removed from the tailings dams will be periodically sampled for acid mine drainage (AMD) characterisation. The float material is predominantly chert, a benign, high-silicate rock. Subject to AMD testing, the float will be reused on-site for road sheeting. The stockpiled clay and any remaining float will be used in the construction of later lifts of the TSF.

The tailings (ore) material will be mined in a single bench. Sumps will be dug into the work area floor to dewater the floor and the remnant water trapped in the tailings dams. All water collected will be pumped to the process water dam and recycled to the Process Plant. The tailings dam wall will be exposed in such a manner that surface water runoff is controlled and scouring of the underlying sediments is prevented.

### TD1 schematic cross-section showing mining direction from the beachhead to the dam wall



### Phase 4 – Rehabilitation

The processing and office areas, historical tailings dams, roads and some water management structures will be rehabilitated in accordance with the following principles:

- Land disturbed by operations will be rehabilitated in accordance with appropriate post-mining land uses.
- In consultation with relevant stakeholders, a closure plan will be developed that clearly defines the post-closure land use.
- Where appropriate, rehabilitation will be progressive over the life of the operation.
- Success criteria agreed with relevant stakeholders will be monitored.
- Appropriate technologies and methods will be used to reduce environmental impacts and improve site rehabilitation.
- Designs for appropriate landforms for the mine site will behave and evolve in a predictable manner, according to the established design principles.
- Appropriate sustainable ecosystems will be established.
- Historical disturbances will be managed and, where appropriate, rehabilitated to an appropriate standard.
- Water and erosion management will be maintained on any structures that are required post closure.
- Long-term management of in situ tailings will be maintained to minimise risk of AMD.

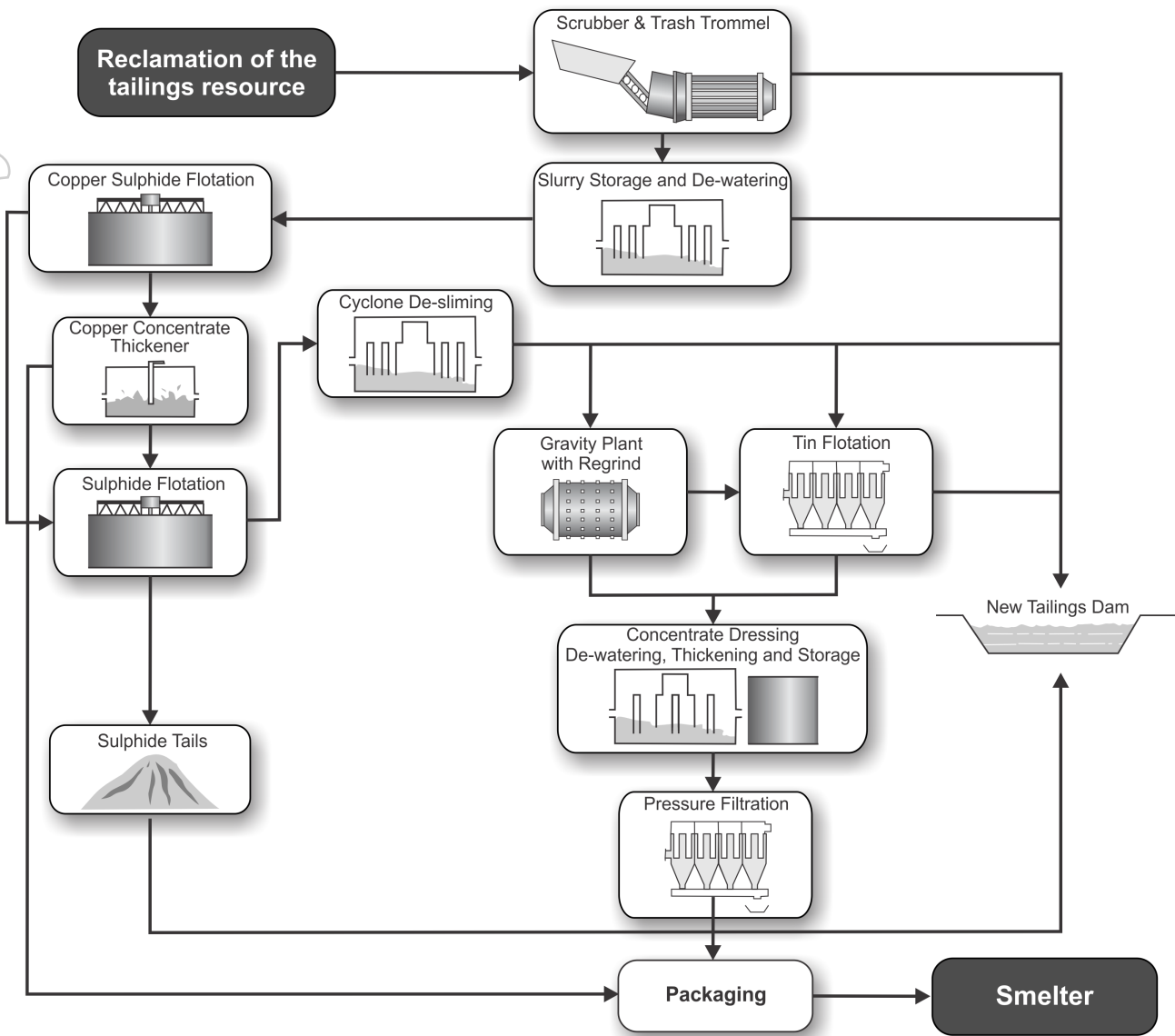
### Mineral processing

Locked-cycle gravity and flotation test work was conducted in early 2015 to confirm product grades and recoveries. The process design, shown below, employs conventional gravity and flotation technologies. Due to the deposit type, no primary comminution (crushing or grinding) is required prior to beneficiation. Concentrate dressing includes an acid leach process.

An engineering study by Howcam-Mincore, based on the results of the metallurgical testing, provided a Process Plant design and costing estimate to an accuracy of  $\pm 25\%$ . The engineering and estimating process included budget quotations from suppliers. The study produced conceptual designs of the plant, which are provided in this report.

The Process Plant will produce two saleable concentrate products: a tin concentrate grading 51 Sn% and a copper concentrate grading 18 Cu%, with recoveries of 47% and 31% respectively. Over the life of the project, approximately 5,250 tonnes of tin in concentrate and 1,500 tonnes of copper in concentrate will be produced and sold. The production schedule and product specifications are summarised below.

**650 ktpa process flow diagram (HowCam-Mincore)**



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Production schedule									
	Unit	Total	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Plant feed	Mt	3.7	0.25	0.65	0.65	0.65	0.65	0.65	0.20
Recovered Sn	t	5,247	355	922	922	922	922	922	257
Recovered Cu	t	1,490	101	262	262	262	262	262	80
Sn concentrate	t	10,288	696	1,809	1,809	1,809	1,809	1,809	550
Cu concentrate	t	8,278	560	1,455	1,455	1,455	1,455	1,455	442
<b>Total Concentrate</b>	<b>t</b>	<b>18,566</b>	<b>1,256</b>	<b>3,264</b>	<b>3,264</b>	<b>3,264</b>	<b>3,264</b>	<b>3,264</b>	<b>992</b>

t = tonne, Mt = million tonnes, Sn = tin, Cu = copper, FY17 = financial year 2016–17 (ending 30 June 2017)

### Tin concentrate specification

Tin	Sn	51%	Bismuth	Bi	0.004%
Sulfur	S	2.8%	Antimony	Sb	0.001%
Arsenic	As	0.01%	Silicate	SiO <sub>2</sub>	11.95%
Copper	Cu	0.04%	Zinc	Zn	0.01%
Iron-manganese	Fe-Mn	3.52%	Tungsten oxide	WO <sub>3</sub>	0.18%
Lead	Pb	0.01%			

### Copper concentrate specification (projected)

Copper	Cu	18%	Nickel	Ni	200 ppm
Arsenic	As	300 ppm	Lead	Pb	800 ppm
Bismuth	Bi	700 ppm	Sulfur	S	35%
Cadmium	Cd	400 ppm	Antimony	Sb	40 ppm
Cobalt	Co	200 ppm	Selenium	Se	30 ppm
Iron	Fe	30%	Silicate	SiO <sub>2</sub>	1.50%
Indium	In	700 ppm	Tin	Sn	2000 ppm
Magnesium	Mg	0.06%	Tungsten	W	60 ppm
Manganese	Mn	400 ppm	Zinc	Zn	2%
Molybdenum	Mo	12 ppm	Chloride		not available

ppm = parts per million, 1% = 10,000 ppm

## Infrastructure

Office buildings and associated amenities (with the exception of the Process Plant) will all be relocatable buildings, brought to site for the duration of the mine operations and removed at mine closure.

Voice and data communications will be serviced by the Mt Cleveland mobile phone tower, which provides full 4G-network coverage across site.

The power supply will be from an existing on-site mains power supply that also supplies Savage River. Discussions with TasNetworks indicate that the transmission line that cuts across site is a combined 110 kV/22 kV line. Supply will be taken from an existing 22 kV overhead line adjacent to the proposed Process Plant. TasNetworks has confirmed that adequate capacity exists in the 22 kV system to cater for the estimated maximum demand of approximately 2.7 MVA. The estimated annual consumption is approximately 18 GWh based on operating 365 days per annum.

Process water will be sourced from historical disturbed areas, such as the historical run-of-mine (ROM) pad and tailings dams, and recycled water from the TSF. Based on an estimated plant utilisation of 92% with an estimated water demand of 85 m<sup>3</sup>/h, the monthly average demand from processing is 55,000 m<sup>3</sup> per month (assuming recycling in drier months).

Water will be treated in the process water dam with final treatment provided by a polishing pond prior to release from site, or as required by the Environmental Management Plan.

## Logistics

The concentrate products will be stored in 1 tonne bulker-bags and transported in 24-tonne closed containers. The closed containers will prevent rain ingress and dust emissions prior to transport offsite. Approximately two to three containers of concentrate (24–72 tonnes of concentrate) will be shipped per week. Containers will be transported by road to the port of Burnie. Access to the site from Burnie will be via the following major sealed roads: Bass Highway, Massey Green Development Road, Ridgley Highway and Waratah Road.

A container ship currently runs between Melbourne, Burnie and King Island and returns once a month. At the Port of Melbourne, the containers will be transferred to a larger vessel for shipment to Asian countries with a smelting and refining capability.

## Environmental management

An environmental approvals submission has been prepared in accordance with the Environment Protection Authority (EPA) guidelines<sup>5</sup> for the preparation of a Development Permit and Environmental Management Plan (DPEMP) and the EPA's 2012 guidelines for the Cleveland Mine Project DPEMP<sup>6</sup>. The DPEMP was submitted on 12 March 2015.

The Cleveland Mine DPEMP guidelines were developed by the EPA based on the information supplied by Elementos<sup>7</sup> in a Notice of Intent (NOI) submitted December 2011. THE NOI was in accordance with the EPA NOI guidelines<sup>8</sup> and the requirements of section 27B of the *Environmental Management and Pollution Control Act 1994* (Tas.).

The project area is heavily disturbed by past mining activities and surveys of the project area have not identified any rare or threatened species. Consequently, the project is not expected to adversely impact on fauna or flora communities. Any impact by the project on Matters of National Environmental Significance are expected to be minor and can be readily mitigated by appropriate operational and management measures.

Specific commitments contained in the DPEMP demonstrate that appropriate operational and management measures will be in place to minimise any potential impacts and to minimise any risks to the environment and human health. The DPEMP demonstrates that the proposal will achieve best practise and be compliant with applicable Commonwealth and Tasmanian policies, legislation and regulations.

The key environmental issues identified in the DPEMP include:

- Acid and metalliferous drainage (AMD): evaluating the status of AMD as a baseline condition, development of cost effective mitigation strategies for existing (legacy) AMD, and prevention of AMD from sulfide exposure in tailings and to a lesser extent in waste rock.
- Tailings management: storing tailings in a geochemically and geotechnically stable environment.
- Water quality and water management: a Water Management Plan that describes the baseline conditions, provides detail on the management and treatment of waste waters and stormwater, and the management of AMD produced once the underground void is dewatered.
- Groundwater: descriptions of current groundwater conditions and the impact of the operation on groundwater.

The approvals process is continuing and Elementos has every reason to believe at this point in time that approval is likely given the significant government and stakeholder support to rehabilitate

<sup>5</sup> Environment Protection Authority (Tas.) 2014, *General guidelines for the preparation of a development permit and environmental management plan for level 2 activities and 'called in' activities*, January 2014, available <<http://epa.tas.gov.au/documents/dpemp%20general%20guidelines.pdf>>.

<sup>6</sup> EPA's Cleveland Mine Project DPEMP guidelines, 15 March 2012 .

<sup>7</sup> *Notice of Intent Cleveland Mine – Tailings reprocessing and mine exploration project 2011*, submitted December 2011

<sup>8</sup> EPA *Guide for preparing a notice of intent*, November 2014

historical legacies as proposed in the mine plan. The company therefore sees the risk of not obtaining approval as low.

## Manpower requirements

The reclamation and reprocessing of the tailings will be continuous, 24 hours-per-day, 7 days-a-week, in two 12-hour shifts. This will apply to both contract-mining personnel and the company's own operational employees. General and administration personnel will work normal office hours (Monday to Friday).

The project workforce will be accommodated in Waratah and sourced, where possible, from the surrounding local communities.

It is anticipated that approximately 31 employees will be required when in operation, spread across all roles and shifts. An additional 6 contract-mining personnel will be required during normal operations, subject to contract negotiations, spread across all shifts.

## Costs

Cost estimates were prepared in real 2015 Australian dollars (A\$) and are based on market conditions during December 2014 to April 2015 with no provision for escalation. All assumptions are detailed in the capital costs and operating costs sections of the report. Approximately 90% of the capital and operating cost estimates were sourced from independent studies and budget quotes and only 10% from industry benchmarking.

The estimated pre-development capital, pre-production capital, and post-production capital costs are summarised below. A detailed build-up of the major capital items and sources are provided in the report.

Capital requirement	
	A\$ million
Pre-development studies and approvals	1.25
Process Plant	13.44
Tailings Storage Facility (first lift)	3.11
Equipment (incl. 2 vehicles & forklift)	0.11
Initial site works	0.20
Site amenities and offices	0.13
Workshops and fuel storage	0.06
Environmental bond	1.04
First fills	0.09
Power connection	0.14
Process water dam and polishing pond	0.21
Working capital	1.12
<b>Total pre-production capital (incl. contingency)</b>	<b>20.9</b>
Sustaining capital	1.75
Post-production Tailings Storage Facility lifts	7.99
<b>Total capital requirement (incl. contingency)</b>	<b>30.6</b>

Contingency allowances for capital are based on the sources used: 15% for engineering studies, 15% for budget quotes, and 25% for industry benchmarking. It should be noted that the mining industry is experiencing a deflationary environment with declining input costs (for steel and fuel, in particular) and aggressive pricing from contractors with underutilised infrastructure and equipment. This situation is not expected to change materially within the next two years when the project is scheduled to commence. In this context, the contingencies are considered reasonable.

The average life-of-mine operating expenditures (OPEX) on an A\$ per recovered tonne of tin basis and A\$ per feed tonne basis are summarised below.

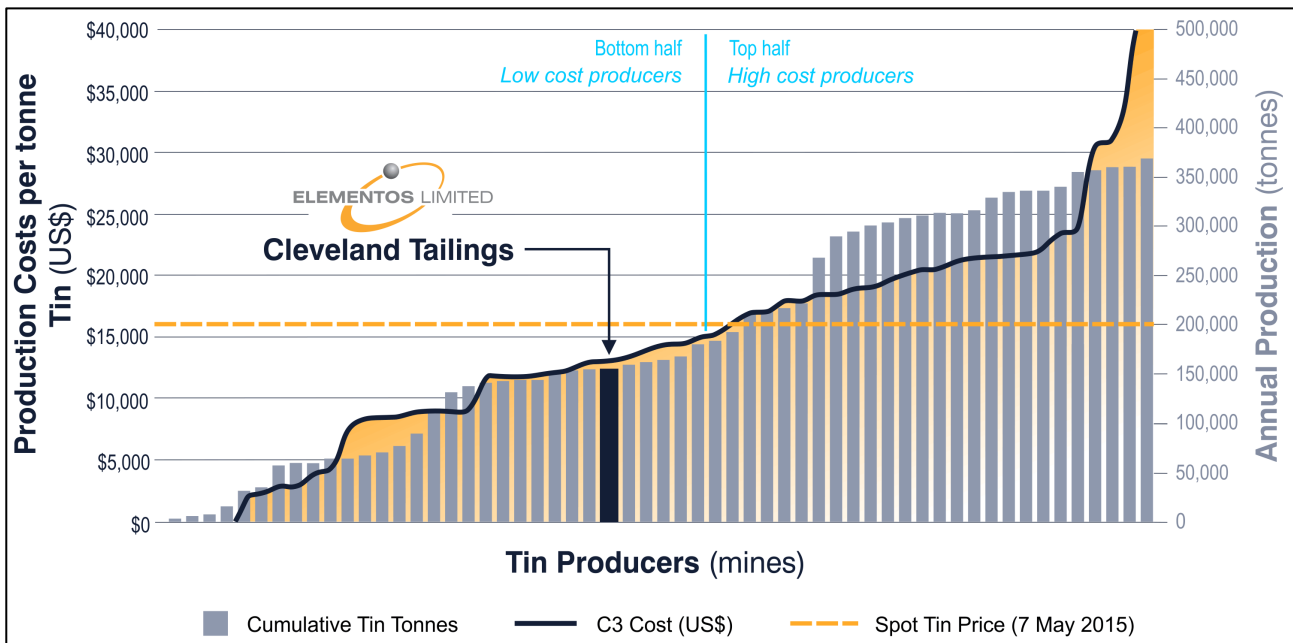
Life-of-mine average OPEX per recovered tonne of tin		
	A\$/t	US\$/t
Mining	1,446	1,073
Processing	7,018	5,208
Inland transport	181	134
Ocean transport, treatment and sale costs	3,116	2,312
General and administration	939	696
Copper credit	-2,082	-1,545
Net direct cash cost (C1)	10,618	7,879
Depreciation	5,627	4,176
Production cost (C2)	16,245	12,055
Tasmanian Government Royalty	1,458	1,082
Fully allocated cost (C3)	17,703	13,137

Life-of-mine average OPEX per tonne of feed		
	A\$/t	US\$/t
Mining	2.1	1.5
Processing	10.0	7.4
Inland transport	0.3	0.2
Ocean transport, treatment and sale costs	4.4	3.3
General and administration	1.3	1.0
Copper credit	-3.0	-2.2
Net direct cash cost (C1)	15.1	11.2
Depreciation	8.0	5.9
Production cost (C2)	23.1	17.1
Tasmanian Government Royalty	2.1	1.5
Fully allocated cost (C3)	25.1	18.6

The life-of-mine fully allocated cost (C3) per tonne of recovered tin, estimated at US\$13,137, places the project in the bottom half of ITRI<sup>9</sup> cost curve<sup>10,11</sup>. This is due to:

- A low mining cost because the deposit is at the surface and is located close to the proposed location of the Process Plant, and because of access to competitively priced skilled labour resources.
- A low processing cost because no comminution (crushing or grinding) is required.
- A low inland transport cost because the project is located close to an established export port with existing all-weather, sealed road access.

ITRI Tin C3 cost curve



## Sales

Both tin and copper metals are traded on the London Metal Exchange (LME) and have total price transparency. Potential buyers were contacted for both products and confirmed their saleability. Given the stage of the project, no sale contracts have been agreed.

Prices for the concentrates used in this study are based on The AusIMM *Cost Estimation Handbook*<sup>12</sup> and have been confirmed with market sources. The AusIMM method derives the concentrate price from the relevant LME metal price with adjustments for grade, unit deductions, impurity penalties, treatment charges and refining charges (TCRC), and ocean freight costs.

The tin price and A\$:US\$ foreign exchange rate (FX) forecasts are derived from Roskill<sup>13</sup>. And the copper price forecast is derived from Citi Research<sup>14</sup>.

Roskill expects tin prices to gradually recover to 2019 but, from 2020, expects prices to show considerable upside potential because an increasing supply deficit will require much higher prices to encourage new development. The average Roskill price forecast over the life of the project is US\$21,171 per tonne Sn, which is 4.8% below the average price for the past 5 years.

<sup>9</sup> ITRI is a not for profit membership based organisation representing the tin industry, [www.itri.co.uk](http://www.itri.co.uk)

<sup>10</sup> Includes existing operating mines and development projects

<sup>11</sup> ITRI, "Next Generation Tin Production: Is it Enough?", 23 October 2014, available [www.itri.co.uk](http://www.itri.co.uk).

<sup>12</sup> Australian Institute of Mining and Metallurgy, *Cost Estimation Handbook*, monograph 27, 2nd edition, 2013.

<sup>13</sup> Roskill, *Roskill Market Outlook Report; Tin*, ninth edition, 2015 premium version, April 2015

<sup>14</sup> Citi Research, *Commodities 2Q'15 Outlook*, April 2015

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Citi Research expects copper prices to increase over the life of the project due to slowing growth in copper production and a supply deficit in 2016. The average Citi Research price forecast over the life of the project is US\$6,900 per tonne Cu.

## Financial analysis

A financial analysis was conducted using a detailed financial model. The project inputs and outputs are summarised below.

Project financial analysis inputs and outputs		
Inputs	Unit	Base case
Ore Reserve	Mt	3.7
Ore Reserve tin grade	% Sn	0.29
Ore Reserve copper grade	% Cu	0.13
Plant feed (post trommel)	Mt	3.7
Plant feed tin grade	% Sn	0.30
Plant feed copper grade	% Cu	0.13
Average mill throughput	Mtpa	0.65
Average recovered tin (in tin concentrate)	tpa	922
Average recovered copper (in copper concentrate)	tpa	262
Average tin concentrate grade	%	51
Average copper concentrate grade	%	18
Average tin concentrate produced (dry)	tpa	1,809
Average copper concentrate produced (dry)	tpa	1,455
Life-of-mine average tin price	US\$	21,171
Average US\$ exchange rate	A\$ per US\$	0.74
Outputs	Unit	Base case
Life-of-mine project revenue	A\$ million	143
Life-of-mine operating costs (incl. depreciation)	A\$ million	87
Life-of-mine post-tax cash flow	A\$ million	39
Pre-production capital (with contingency)	A\$ million	21
Post-production capital (with contingency)	A\$ million	9.7
Net direct cash cost (C1)	US\$/t recovered Sn	7,879
Production cost (C2)	US\$/t recovered Sn	12,055
Fully allocated cost (C3)	US\$/t recovered Sn	13,137
NPV (8) pre tax	A\$ million	34
IRR (ungeared) pre tax	%	68
NPV (8) post tax	A\$ million	22
IRR (ungeared) post tax	%	46
Payback period	years	3

## Risk

Significant risks are associated with the development and commissioning of any mine. The main risk areas include work health and safety, mining operations, processing operations, environmental, transport, market, financial and regulatory.

Elementos completed a risk assessment in 2015 and from this compiled a risk register for the project. The risk assessment identified 27 risks, which were rated by likelihood and consequence. Controls and mitigation measures were then developed for all 27 risks and reassessed for their expected effectiveness. The number of risks in each risk category pre and post mitigation are shown below.

Project risk assessment					
Likelihood	Pre mitigation	Post mitigation	Consequence	Pre mitigation	Post mitigation
Almost certain	0	0	Catastrophic	1	0
Likely	1	0	Major	9	0
Possible	16	4	Moderate	12	9
Unlikely	9	15	Minor	4	13
Rare	1	8	Insignificant	1	5

Post mitigation, the highest likelihood was “Possible” (four risks) and the highest consequence was “Moderate” (nine risks). Only two risks (exchange rate and product price fluctuations) were rated as both “Possible” and “Moderate” post mitigation.

The financial value obtained from production is significantly exposed to fluctuations in the tin price. Elementos will mitigate the uncertainty associated with tin concentrate demand by selling its concentrate under long-term off-take sale agreements. Elementos is also exposed to fluctuations in currency exchange rates and, as a result, the company’s future financial results could be negatively impacted. Active commodity and currency hedging is uncommon in small markets, such as tin, and Elementos generally considers that hedging does not provide value to its shareholders.

Elementos will continue to identify, review, mitigate and monitor project risks over the life of the project.

## Forward work plan

As shown in the schedule below, the Cleveland Tailings Project Feasibility Study is due for completion in Q3 2016 and, subject to obtaining all the necessary approvals, production is scheduled to commence in late 2016.

Pathway to production	2014				2015				2016				2017				2018			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Cleveland Mine Redevelopment</b>																				
Acquisition		✓																		
<b>Stage 1: Cleveland Tailings Project</b>																				
Tailings Mineral Resource		✓	✓	✓																
Tailings Pre-feasibility			✓	✓	✓	✓														
Mining Lease Application					✓	✓														
Environmental Application					✓	✓														
Tailings Project Feasibility																				
Construction																				
Production																				
<b>Stage 2: Cleveland Open Pit Project</b>																				
Project Development <sup>a</sup>		✓	✓	✓	✓	✓														
Production <sup>b</sup>																				
<b>Stage 3: Cleveland Underground Project</b>																				
Project Development <sup>a</sup>		✓	✓	✓	✓	✓														
Production <sup>b</sup>																				

<sup>a</sup> Not in scope of this report

<sup>b</sup> Pending finalisation of technical studies

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