



30 October 2018

## *Quarterly Activities Report to 30 September 2018*

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### *Tomingley Gold Operations*

- Development of the underground operation has been approved and execution has commenced.
- **Quarter Results**
  - Gold production was in line with forecast at 15,634 ounces.
  - Site operating cash costs were A\$763/ounce with AISC of A\$972/ounce.
  - Gold sales were 6,656 ounces for revenue of A\$11.4M at an average price of A\$1,720/ounce.
- Guidance for FY19 is unchanged at production of 30,000 to 35,000 ounces of gold at an AISC of A\$1,300 to A\$1,400 per ounce. Included in this is budgeted expenditure of \$5M on rehabilitation for which provision in Alkane's accounts has already been made.

### *Corporate*

- The Group's cash and bullion position totalled A\$82.4M, with A\$59.6M in cash and bullion on hand at fair value of A\$22.8M, an increase of A\$2.4M from the previous quarter.
- In accordance with its strategy of investing part of its cash balance in junior gold companies and projects that meet its investment criteria the company has:
  - Made an investment into gold exploration company Calidus Resources Limited (ASX:CAI).
  - Approved an investment into gold exploration company Explaurum Limited (ASX:EXU) subject to Explaurum shareholder approval.

### *Dubbo Project*

- Financing effort continues as global supply uncertainty remains:
  - The United States has imposed tariffs on Chinese zirconium chemicals and powders.
  - Ferro-niobium demand is increasing as steel companies are looking to substitute ferro-vanadium, which is facing short supply and rapidly escalating prices.
  - China's rare earth permanent magnet industry continues to forecast increasing demand.

### *Exploration*

- Continued grade and mineralised intercepts in the extensive regional exploration program that is underway around TGO. This program has the objective of defining additional resources that have the potential to be mined either via open pit or underground operations and fed to TGO.



## **TOMINGLEY GOLD OPERATIONS**

*Tomingley Gold Operations Pty Ltd 100%*

Tomingley Gold Operations (TGO) is a wholly owned subsidiary of Alkane, located near the village of Tomingley, approximately 50km southwest of Dubbo in Central Western New South Wales. The gold processing plant was commissioned in January 2014 and has been operating at the design capacity of 1Mtpa since late May 2014. Mining is based on four gold deposits (Wyoming One, Wyoming Three, Caloma One and Caloma Two).

### **Operations**

TGO continues to perform well, with one fleet operating between the Caloma Two and Wyoming One pits. Open pit mining has been extended with a single fleet on day shift until January to take advantage of final ore exposed in the pits.

A total of 15,634 ounces of gold were poured for the quarter. The site cash costs for the quarter were A\$763/oz with an all in sustaining cost (AISC) of A\$972/oz.

Guidance for FY19 production of 30,000 to 35,000 ounces of gold at an AISC of A\$1,300 to A\$1,400 per ounce is unchanged. The operation is expected to be processing stockpiles from January. The guidance for AISC is due to the higher proportion of fixed costs to reduced ounces during this period, particularly in processing, as well as the realisation of previously amortised rehabilitation (this includes budgeted expenditure of \$5M on rehabilitation for which provision in Alkane's accounts has already been made).

Gold sold for the quarter was 6,656 ounces at an average sales price of A\$1,720/oz, generating revenue of A\$11.4M. Bullion increased to 13,811 ounces (fair value of A\$22.8M at quarter end). Run of mine ore stockpiles stayed reasonably constant through the period.

Site operating cash flow<sup>1</sup> was –A\$5.7M due to the significant increase in unsold bullion on hand. There were no hedges in place at quarter end.

### **Underground Mining Development**

The board approved the development of underground operations, details were given in the **ASX Announcement of 24 September 2018**.

Development is on schedule with portal stabilisation works commencing in the coming quarter and mining development at the start of 2019. The first mining equipment has been delivered to site and recruitment is underway.

<sup>1</sup>**Operating cashflow** = As prescribed by AASB 107 Statement of Cashflows where exploration outflows and development outflows are grouped under investing cashflows. Note that the Quarterly Cashflow (Appendix 5B) includes those outflows under operating cashflows.

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## TGO FY 2019 Quarterly and Annual Production Figures

TGO Production		FY 2018	Sep Quarter 2018	FY 2019
Waste mined	BCM	3,165,414	234,281	234,281
Ore mined	Tonnes	1,589,811	258,108	258,108
Strip Ratio	Ratio	5.4	2.5	2.5
Grade	g/t	1.99	1.79	1.79
Ore milled	Tonnes	1,092,602	240,797	240,797
Head grade	g/t	2.42	2.29	2.29
Recovery	%	91.9	92.4	92.4
Gold poured	Ounces	78,533	15,634	15,634
<b>Revenue Summary</b>				
Gold sold	Ounces	75,507	6,656	6,656
Average price realised	A\$/oz	1,706	1,720	1,720
Gold revenue	A\$M	128.8	11.4	11.4
<b>Cost Summary</b>				
Mining	A\$/oz	475	384	384
Processing	A\$/oz	236	309	309
Site Support	A\$/oz	56	70	70
C1 Site Cash Cost	A\$/oz	767	763	763
Royalties	A\$/oz	52	50	50
Sustaining capital	A\$/oz	32	23	23
Rehabilitation	A\$/oz	117	101	101
Corporate	A\$/oz	34	36	36
AISC <sup>2</sup>	A\$/oz	1,002	972	972
Bullion on hand	Ounces	4,836	13,811	13,811
<b>Stockpiles</b>				
Ore for immediate milling	Tonnes	1,256,823	1,266,911	1,266,911
Grade	g/t	0.97	0.89	0.89
Contained gold	Ounces	39,338	36,355	36,355

<sup>2</sup>AISC = All in Sustaining Cost comprises all site operating costs, royalties, mine exploration, sustaining capex, mine development and an allocation of corporate costs, calculated on the basis of ounces produced. AISC does not include share based payments or net realisable value provision for ore inventory.

### Regional Exploration

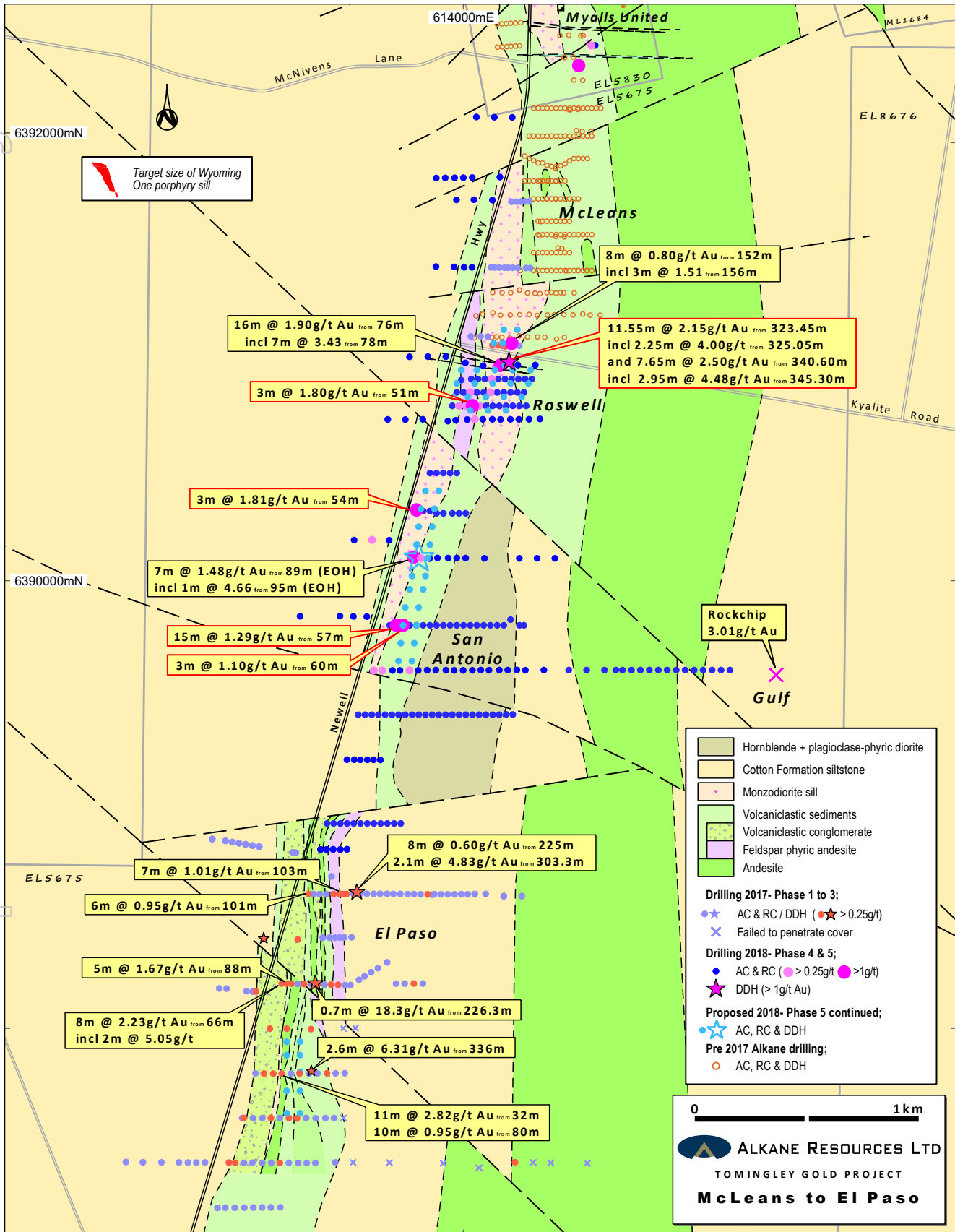
An extensive regional exploration program focused on the immediate mine area to the south of Tomingley has continued as part of the plan to provide additional ore feed, either at surface or underground, in the future to TGO.

Results from the drilling in the quarter are summarised in the **ASX Announcement of 19 October 2018**. The figure below from that announcement gives a summary of the extensive work and results to date.

RC drilling begins shortly to further understand the potential for gold resources at Roswell, San Antonio and El Paso prospects. These prospects appear to have a cumulative strike length of 2,500 metres.



# Tomingley Gold Project 2017-2018 Drilling Summary Plan





### *Peak Hill Gold Mine (PHGM)*

Re-evaluation of the potential for Peak Hill to be developed underground also forms part of the extensive regional exploration program in progress to provide additional ore feed for TGO. At the Proprietary ore body an Inferred Mineral Resource using a 2.00g/t gold cut-off was defined in the sulphide zone of:

- 1.02 million tonnes grading 3.29g/t gold and 0.15% copper (108,000oz).

The company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The company confirms that the form and context in which any Competent Person's findings are presented have not been materially modified from the original market announcement.

Core drilling is scheduled to commence in October to provide confirmation of the geology and structures, and fresh material for advanced metallurgical testing. Full details are in the **ASX Announcement of 18 October 2018**.

### **CORPORATE**

The Group's cash and bullion position totalled A\$82.4M, with A\$59.6M in cash and bullion on hand at fair value of A\$22.8M, an increase of A\$2.4M from the previous quarter. The Group is debt free.

In accordance with its strategy of investing part of its cash balance in junior gold mining companies and projects that meet its investment criteria, namely potential investments that have high exploration potential and/or require near term development funding, the company has made an investment into gold exploration company Calidus Resources Limited (ASX:CAI). Details are given in the **ASX Announcement of 17 October 2018**.

The company has also approved an investment into gold exploration company Explaurum Limited (ASX:EXU) subject to Explaurum shareholder approval. Details are given in the **ASX Announcement of 29 October 2018**. The company continues to evaluate other opportunities.

### **DUBBO PROJECT – zirconium, hafnium, niobium, yttrium, rare earth elements**

*Australian Strategic Materials Ltd (ASM) 100%*

The Dubbo Project (DP) remains construction ready, with the mineral deposit and surrounding land wholly owned, all material State and Federal approvals in place, an established flowsheet and a solid business case.

#### **Financing**

Australian Strategic Materials (ASM) continues to work towards securing finance for the Dubbo Project. ASM's key focus is on securing offtake contracts for its products and a resultant strategic investor in the project. The pressure on both prices and supply, as discussed in *Product Marketing* below is being increased by the tariff decisions of both the United States and China.

#### **Engineering**

ASM continues to work with engineers to detail the staged execution model for the Project so that packages can be rapidly let on securing funding. This will be largely completed this calendar year.



## **Product Development**

### *Zirconium*

Further samples of zirconium products produced at the demonstration pilot plant at ANSTO were provided to companies during the quarter for testing and evaluation. Feedback on samples tested so far has been positive and confirms the suitability of Dubbo Project zirconium products for a wide range of applications.

Additional testing on yttria stabilised zirconia milling media (microspheres) produced at laboratory scale confirms that high quality material has been produced. Options to produce further samples for product and market development are being considered.

Meetings and discussions continued with technology companies on the conversion of zirconium dioxide to zirconium metal continued during the quarter. Production of hafnium free zirconia and zirconium metal are two of the value added zirconium products under development for the Dubbo Project which can achieve price premiums over standard zirconium products.

### *Hafnium*

Efforts around hafnium oxide conversion to hafnium metal continued in parallel with those of zirconium metal.

## **Product Marketing**

The United States has imposed 10% tariffs on a wide range of Chinese products, including zirconium and hafnium chemicals and powders, which will increase to 25% from 1 January 2019, although the future of tariffs between the United States and China is very uncertain. The United States is a major market for Chinese zirconium products, with few alternative sources of supply as China dominates these markets with 95% of zirconium chemicals supply. Zirconium oxychloride (ZOC) is exempt from the tariffs but all downstream zirconium chemicals, high purity zirconium dioxide and fused zirconia materials will have the tariff applied so the impact on prices should be significant. This has increased interest in non-Chinese supply, with the Dubbo Project standing out as one of the most important alternatives to China and zircon.

Alkane and Minchem (ASM's Zr marketing agent) attended the Zircon Industry Association (ZIA) meeting in early September in Bangkok. A record attendance of 115 this year, compared to just 35 last year, highlighting the importance of zircon as a critical raw material for the zirconium industry. Alkane delivered a presentation on 'Zirconium chemicals supply chain risks and opportunities', which highlighted global dependence on zircon and Chinese supply, and opportunities for the Dubbo Project. Minchem also attended Cersai Bologna and met with all of the leading ceramic companies consuming zirconium products for producing inorganic ceramic pigments.

Alkane will attend the Metal Events Rare Earths conference in Hong Kong, as well as TZMI Congress on zirconium materials in Singapore in November, where it is also presenting.

### *Zirconium*

Zirconium prices were mostly flat during the third quarter, including zirconium chemicals, chemical zirconia and fused zirconia. ZOC prices drifted lower to US\$2,400-2,500/t, but are expected to remain firm due to zircon price increases which occurred during the quarter. Uncertainties created by trade tensions between the United States and China is evident for the Chinese ceramics industry, where ceramic tiles and sanitaryware will have tariffs imposed and reduced export activity is likely. This has weakened demand for zircon, and tempered expectations by major zircon producers for further



increases, where zircon prices have essentially doubled in the past two years. Premium zircon prices stabilised at US\$1,500-1,600/t.

#### *Hafnium*

Hafnium metal prices were mostly flat during the quarter with prices typically US\$700-800/kg (min 99% Hf max1%Zr), in warehouse Rotterdam, but have increased to US\$780-850/kg since the 10% tariff has been applied for US imports. The US is a major market for hafnium used for the aerospace industry. Increasing enquiries for hafnium chemicals and oxides for new development projects points to an increase in demand for new applications, which cannot be met by existing producers.

#### *Rare Earths*

Rare earth permanent magnet (REPM) prices drifted lower during the quarter, with Chinese export prices for Praseodymium/Neodymium mischmetal currently around US\$60/kg, FOB China. China's REPM industry continues to prepare for a surge in demand with almost weekly announcements about planned investment to increase REPM production capabilities and downstream electric motors capacities.

#### *Niobium*

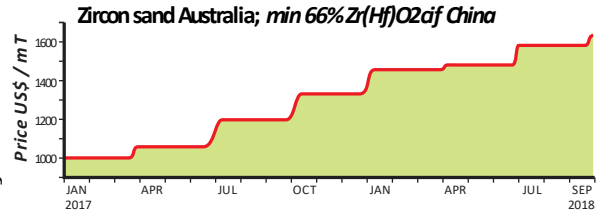
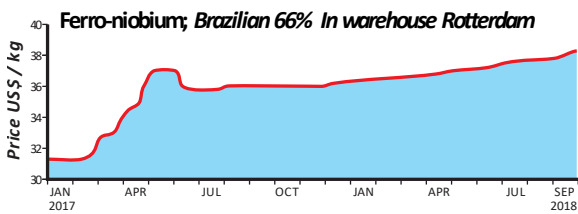
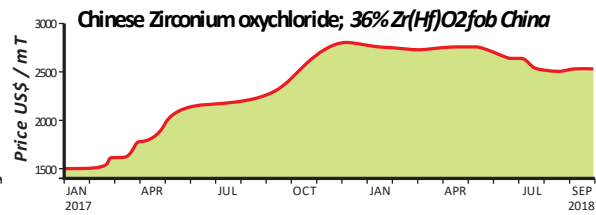
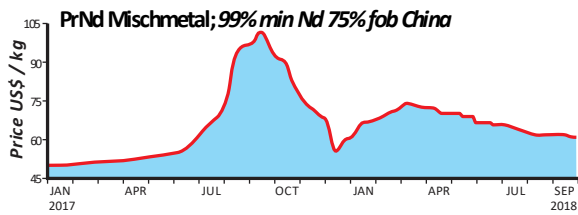
Spot ferro-niobium prices broke through US\$42/kg in October, an increase of ~15% since early 2018, with most of this increase occurring during the latest quarter. Ferro-niobium demand is increasing as steel companies are looking to substitute ferro-vanadium, which is facing short supply and rapidly escalating prices.

Niobium and vanadium are used as micro alloying elements to increase the strength of steel and other properties, which allows less steel to be used. Substitution of niobium for vanadium may occur, depending on relative prices. Ferro-vanadium prices are now almost three times ferro-niobium prices (~US\$120/kg), compared to one to one in early 2017. Sustained higher vanadium prices, combined with limited supplies, will encourage greater use of ferro-niobium and should benefit prices and revenue for ferro-niobium from the Dubbo Project.

The global vanadium market was approximately 80,000 tpa in 2017 according to the USGS, with China (43,000 t) and Russia (16,000 t) responsible for 74% of total supply. Around 90% of vanadium is used for micro-alloying steel to improve strength and other properties.

New Chinese high strength standards for rebar used to reinforce concrete are being introduced from 1 November 2018 to improve building and construction standards, and increase earthquake resistance. Low strength Grade 2 (335 Mpa) rebar will be eliminated and replaced with Grade 3 (400 Mpa), Grade 4 (500 Mpa), and Grade 5 (600Mpa). This should increase demand for vanadium at a time when Chinese supply is being challenged by strictly enforced environmental regulations. Total Chinese ferro-vanadium demand could increase by up to 10,000 t per year as a result of the new regulations, which is likely to reduce exports unless new supply is increased.

Australian Strategic Materials, Alkane's 100% wholly owned subsidiary for the Dubbo Project, has joined the Tantalum-Niobium international Study Centre.



Source: Asian Metal

**ELSIENORA (gold); ORANGE EAST PROJECT (gold-copper); WELLINGTON (copper-gold); CUDAL (gold-zinc); NORTHERN MOLONG PORPHYRY PROJECT (NMPP); ROCKLEY PROJECT (gold); TRANGIE (nickel-copper +); ARMSTRONGS (gold); Alkane Resources Ltd 100%.**

At Trangie 45 aircore holes totalling 3,242 metres were drilled in a 'cross' pattern over the magnetic anomaly. Confirmation of the bedrock is still to be determined but a carbonatite type body is probable. Analytical results are anticipated in the coming quarter.

On the other prospects activities were limited to data compilation and review, or preparation for field activities.

#### **LEINSTER REGION JOINT VENTURE (nickel-gold)**

*Alkane Resources Ltd 19.4% diluting, Australian Nickel Investments Pty Ltd (ANI) 79.6%. Two prospects - **Miranda** and **McDonough Lookout**.*

ANI have not advised of any changes at time of release.





### Competent Person

Unless otherwise advised above or in the Announcements referenced, the information in this report that relates to exploration results, mineral resources and ore reserves is based on information compiled by Mr D I Chalmers, FAusIMM, FAIG, (director of the Company) who has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Chalmers consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

### Disclaimer

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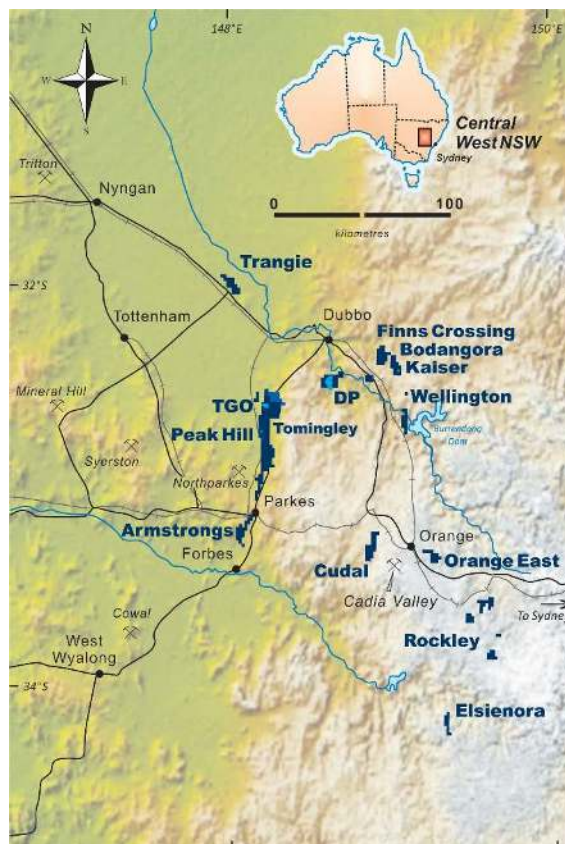
This document has been prepared in accordance with the requirements of Australian securities laws, which may differ from the requirements of United States and other country securities laws. Unless otherwise indicated, all ore reserve and mineral resource estimates included or incorporated by reference in this document have been, and will be, prepared in accordance with the JORC classification system of the Australasian Institute of Mining, and Metallurgy and Australian Institute of Geoscientists.

**ABOUT ALKANE - [www.alkane.com.au](http://www.alkane.com.au) - ASX: ALK and OTCQX: ANLKY**

Alkane is a multi-commodity company mainly focused in the Central West region of NSW, Australia. Currently Alkane has two advanced projects - the Tomingley Gold Operations (TGO) and the nearby Dubbo Project (DP). Tomingley commenced production early 2014. Cash flow from TGO has provided the funding to maintain the project development pipeline and has assisted with the pre-construction development of the DP.

The DP is a large in-ground resource of zirconium, hafnium, niobium, yttrium and rare earth elements. As it is an advanced poly-metallic project outside China, it is a potential strategic and independent supply of critical minerals for a range of sustainable technologies and future industries. It has a potential mine life of 75+ years. The DP is development ready, subject to financing, with the mineral deposit and surrounding land acquired and all major State and Federal approvals in place.

Alkane's most advanced gold copper exploration projects are at the 100% Alkane owned Bodangora, Wellington, Rockley and Elsenora prospects. Wellington has a small copper-gold deposit which can be expanded, while at Bodangora a large monzonite intrusive complex has been identified with porphyry style gold copper mineralisation. Gold and base metal mineralisation has been identified at Rockley and Elsenora.



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