

28 October 2016



## *Quarterly Activities Report to 30 September 2016*

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### *Tomingley Gold Operations (TGO)*

- Persistent heavy rain during the quarter (394mm) dramatically impacted production by delaying ore releases, particularly at the base of the Wyoming One starter pit.
- Importantly mine schedules have been adjusted accordingly with full year guidance for FY2017 production remaining unchanged at 65,000 – 72,000 ounces. The cost impact is under review and will be reported at the end of the December quarter.
- **Quarter Results**
  - Gold production 10,435 ounces
  - Site operating cash costs were A\$1841/ounce and total operating costs (AISC) of A\$2,139/ounce
  - Gold sales 10,000 ounces for revenue of A\$16.3 million at an average price of A\$1,627/ounce
  - Gold forward contracts at 30 September 2016 of 54,900 ounces at average forward price of A\$1,704/ounce.
- Site net operating cash flow after development costs for the quarter was negative \$4.9 million, the second time since production ramped up in May 2014 that a negative result was recorded.
- Revised Resource and Reserve Statements were issued on 22 September 2016.
- Resource/Reserve development drilling on site has commenced and regional target expansion drilling is planned for the December quarter.

### *Dubbo Zirconia Project (DZP)*

- AZL signed an exclusive worldwide marketing, sales and distribution agreement with UK based Minchem Ltd for all zirconium materials produced by the DZP. Minchem is a technical ceramics marketing and manufacturing business that has been involved in zirconium chemicals and zirconium dioxide (ZrO<sub>2</sub> or zirconia) products for over 40 years.
- A major demonstration pilot plant run was completed providing zirconium, hafnium and rare earth product samples for further customer evaluation.
- The Due Diligence review of Vietnam Rare Earth JSC (VTRE) has commenced.
- MOU for product offtake and supply of process equipment with Siemens Ltd advised in a separate ASX release on 25 October 2016.

### *Corporate*

- The Group's cash position totalled A\$28.3M with A\$22.5M cash and bullion on hand valued at A\$5.8M, a decrease of A\$1.5M from the previous quarter

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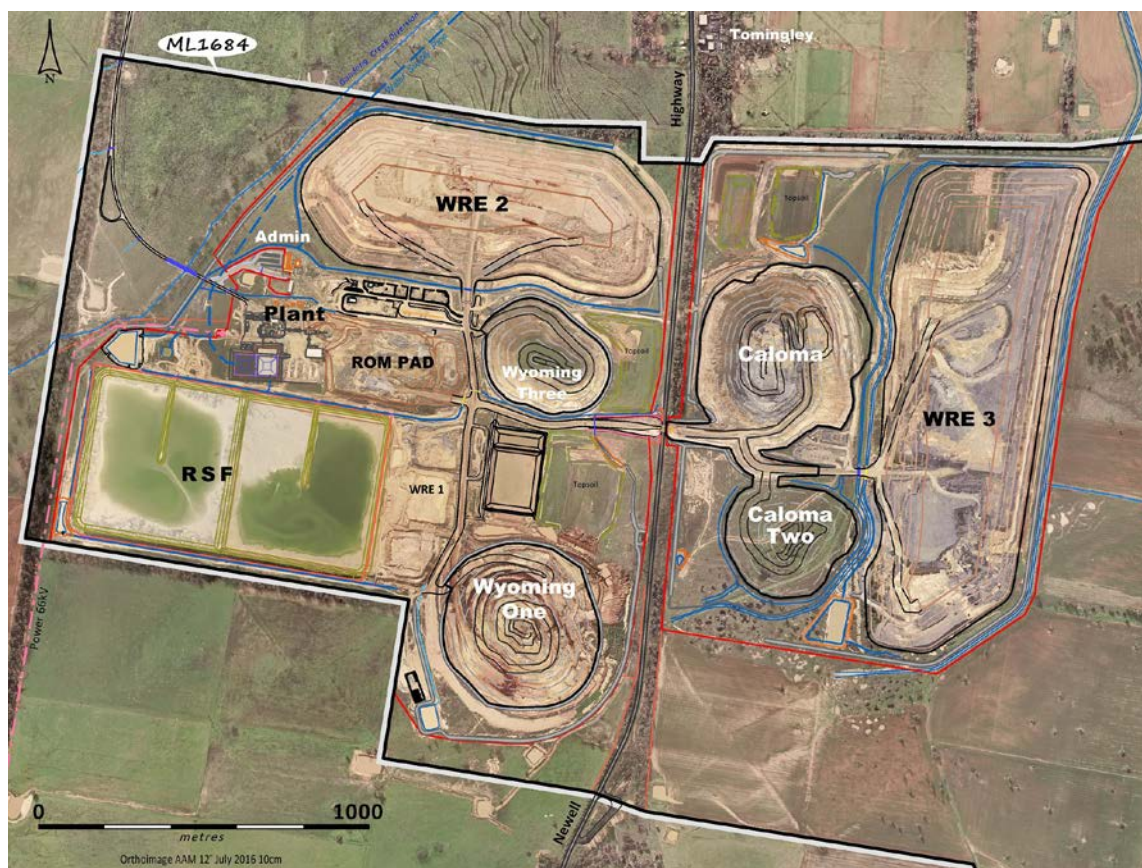


## TOMINGLEY GOLD OPERATIONS (TGO)

Tomingley Gold Operations Pty Ltd 100%

The TGO is based on four gold deposits (Wyoming One, Wyoming Three, Caloma and Caloma Two) located about 14 kilometres north of the Company's inactive Peak Hill Gold Mine, and approximately 50 kilometres southwest of Dubbo. Underground operations below the Wyoming One and Caloma orebodies are now incorporated into the life-of-mine schedule.

### TGO Site layout September 2016



### Operations

The severe wet weather seen in the previous quarter continued into this quarter with a total of 394 mm of rain falling, well over the long term average of 116 mm for the equivalent period. Whilst localised flooding occurred on several occasions the bypass water drains and pit protection measures in place prevented all but pit boundary catchment rainfall from entering the pits themselves.

This continued wet weather had the impact of delaying ore releases, particularly the ore at the bottom of the starter pit in Wyoming One, and as a result only 10,435 ounces gold were poured for the quarter. It is important to note that the mine schedules have been adjusted accordingly and full year guidance of FY2017 production remains unchanged at 65,000 – 72,000 ounces. The cost impact is under review, but any increase is expected to be no more than A\$100 per ounce averaged over the full year.

Mining continued to occur in two pits, Caloma and Wyoming One. With access limited to the base of the Wyoming One starter pit containing large ore blocks, effort was directed primarily at the cutback to final design of the full Wyoming One pit. Wyoming Three continues to be used for water storage. Geological block model reconciliations in both pits remain satisfactory.



Development of the Caloma Two open cut progressed during the quarter, in particular the perimeter drain and access work. Mining of Caloma Two will commence in the coming quarter. Construction of the next lift of the residue storage facility was also largely completed with some weather related delays.

During the periods that the mining fleet was able to operate, productivity remained sufficient such that overall total costs met forecast. As stated above gold poured for the quarter was 10,435 ounces, with sales of 10,000 ounces at an average sales price of A\$1,627/oz generating revenue of A\$16.3 million and, with the deferred production described above, a site operating cash outflow of A\$6.6 million. The hedge book at quarter end was 54,900 ounces gold at an average forward price of A\$1,704/oz.

#### TGO FY 2017 Quarterly Production Figures

TGO Production		FY 2016	Sept Quarter 2016	FY 2017
Waste mined	BCM	6,199,820	1,533,279	1,533,279
Ore mined	Tonnes	1,285,454	221,139	221,139
Strip Ratio	Ratio	12.2	18.4	18.4
Grade	g/t	1.84	1.51	1.51
Ore milled	Tonnes	1,096,105	231,797	231,797
Head grade	g/t	2.08	1.50	1.50
Recovery	%	90.9	90.1	90.1
Gold poured	Ounces	67,812	10,435	10,435
<b>Revenue Summary</b>				
Gold sold	Ounces	67,983	10,000	10,000
Average price realised	A\$/oz	1,605	1,627	1,627
Gold revenue	A\$M	109.1	16.3	16.3
<b>Cost Summary</b>				
Mining	A\$/oz	736	1,188	1,188
Processing	A\$/oz	292	505	505
Site Support	A\$/oz	96	148	148
C1 Site Cash Cost	A\$/oz	1,124	1,841	1,841
Royalties	A\$/oz	46	35	35
Sustaining capital	A\$/oz	31	130	130
Rehabilitation	A\$/oz	18	68	68
Corporate	A\$/oz	37	65	65
AISC <sup>1</sup>	A\$/oz	1,256	2,139	2,139
Bullion on hand	Ounces	2,971	1,936	1,936
<b>Stockpiles</b>				
Ore for immediate milling	Tonnes	701,047	661,645	661,645
Grade	g/t	0.82	0.8	0.8
Contained gold	Ounces	18,480	17,201	17,201

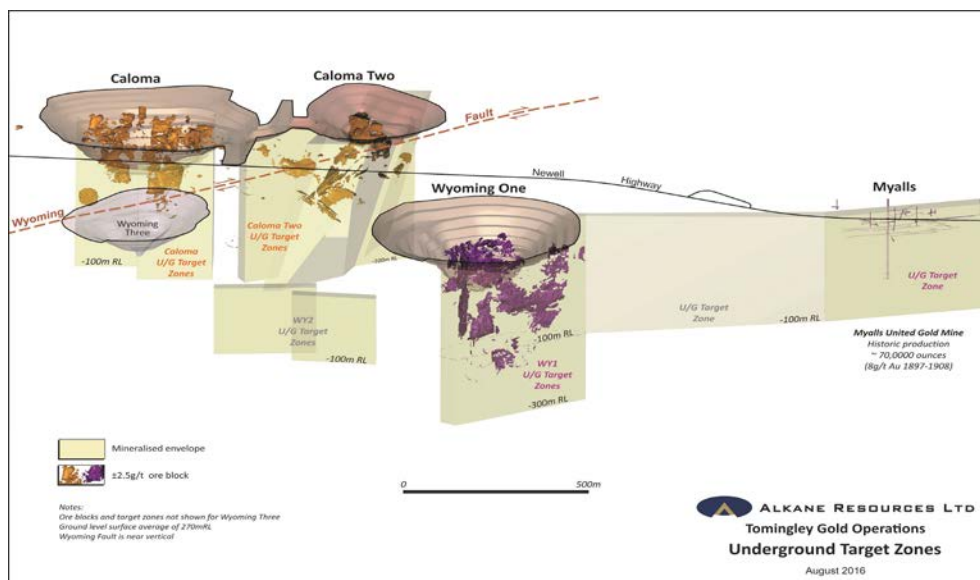
<sup>1</sup>AISC = All in Sustaining Cost comprises all site operating costs, royalties, mine exploration, sustaining capex, mine development and an allocation of corporate costs, on the basis of ounces produced. AISC does not include share based payments or net realisable value provision for ore inventory.





### Resource Development and Exploration

As advised in the ASX Announcement of 22 September, the Company is stepping up the exploration effort for additional resources/reserves in the Tomingley Project area, and a review of targets in the 30km long prospective belt, including the Peak Hill Gold Mine (the site of an earlier mining operation by Alkane) is in progress. Limited sub pit drilling is underway at Caloma and Wyoming One and exploration drilling will be scheduled on regional targets later this year. The persistent heavy rain affecting the operations has also impacted on access for drilling both on site and at regional targets.





## Mineral Resource and Ore Reserve Estimates as at 30 June 2016

The Company reported Ore Reserves and Mineral Resources for the Tomingley Gold Operations as at 30 June 2016 in accordance with the 2012 edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC 2012). The details of these statements are reported in the ASX announcement 22 September 2016. The Company confirms that it is not aware of any new information or data that materially affects the information included in that announcement and that all the material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed.

These estimates take into account ore depleted by mining during the 2016 financial year and are set out in the tables below.

### Mineral Resources

TOMINGLEY GOLD PROJECT MINERAL RESOURCES (as at 30 June 2016)									
DEPOSIT	MEASURED		INDICATED		INFERRED		TOTAL		Total Gold  (Koz)
	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	
Open Pittable Resources (cut off 0.50g/t Au)									
Wyoming One	1,980	1.7	416	1.6	671	1.1	3,067	1.6	153
Wyoming Three	86	2.0	16	1.3	33	1.4	135	1.7	8
Caloma	604	1.3	1,892	1.4	1,204	1.4	3,700	1.4	163
Caloma Two			1,085	2.4	704	1.3	1,789	2.0	112
Stockpiles							701	0.8	18
Sub Total	2,670	1.6	3,409	1.7	2,612	1.3	9,392	1.5	454
Underground Resources (cut off 2.50g/t Au)									
Wyoming One	169	4.8	206	4.4	363	4.2	738	4.4	104
Wyoming Three	10	3.6	6	3.1	4	3.1	20	3.4	2
Caloma			1	2.9	18	2.9	19	2.9	2
Caloma Two			92	3.5	63	3.2	155	3.3	17
Sub Total	179	4.7	305	4.1	448	4.0	932	4.2	125
TOTAL	2,849	1.8	3,714	1.9	3,060	1.7	10,324	1.8	579

Apparent arithmetic inconsistencies are due to rounding

These Mineral Resources are wholly inclusive of Ore Reserves.

### Ore Reserves

TOMINGLEY GOLD PROJECT ORE RESERVES(as at 30 June 2016)							
DEPOSIT	PROVED		PROBABLE		TOTAL		Total Gold  (Koz)
	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	Tonnage (Kt)	Grade (g/t Au)	
Open Pittable Reserves (cut off 0.50g/t Au)							
Wyoming One	1,297	1.7	150	1.5	1,447	1.6	78
Wyoming Three	0	0	0	0	0	0	0
Caloma	116	1.7	722	1.6	838	1.6	43
Caloma Cut Back	233	1.4	251	1.1	484	1.2	19
Caloma Two	-	-	318	3.2	318	3.2	33
Stockpiles	701	0.8	-	-	701	0.8	18
Sub Total	2,347	1.4	1,441	1.9	3,788	1.5	191
Underground Reserves (cut off 2.50g/t Au)							
Wyoming One*	224	4.0	301	3.4	524	3.7	62
Sub Total	224	4.0	301	3.4	524	3.7	62
TOTAL	2,571	1.6	1,742	2.2	4,312	1.8	253

Apparent arithmetic inconsistencies are due to rounding



\*The Underground Reserves were advised in the ASX release of 9 December 2015 and the Company confirms that all material assumptions and technical parameters underpinning this Reserve continue to apply and have not materially changed.

## **DUBBO ZIRCONIA PROJECT (DZP) – zirconium, hafnium, niobium, yttrium, rare earth elements**

*Australian Zirconia Ltd (AZL) 100%*

The DZP stands ready for construction, with the mineral deposit and surrounding land wholly owned, all State and Federal approvals in place, an established flowsheet and a solid business case.

The key to progressing into construction, the first step of which is detailed design, is to secure the financing for the project. Integral to financing is establishing the security of the revenue stream for the project, in the last quarter several activities have occurred and are described in *Marketing* below.

The DZP Demonstration Pilot Plant (DPP) was run again during the quarter. This was primarily to produce samples that allow AZL to demonstrate the quality of its products to customers. Running the pilot plant also allows AZL to continue to collect data that will improve the engineering and operation of the project, giving further surety to production volumes and quality. This is described further in *Product Development* below.

The broad financing environment and product market have started to show signs of improvement, and are further discussed, together with an overview of the DZP at the end of the section.

### ***Marketing Activities to Secure Offtake***

AZL's worldwide Zirconium Marketing agreement was finalised with Minchem, a leading European manufacturing and trading company. During the quarter AZL and Minchem representatives met with over 24 companies in Europe, US and Asia, many of whom see the DZP output as meeting their needs. Minchem are working with AZL to gain (in order of preference) product offtake agreements, supplier pre-qualification, memoranda of understanding (MOUs) or letters of intent (LOI). This is progressing positively and is a necessary step as the DZP begins to allocate its future production to end customers.

During the quarter, AZL attended both the Baotou Rare Earth Conference in Baotou, China and the Rare Earth Permanent Magnets workshop in Darmstadt, Germany. The Baotou Conference is the premier rare earths conference in China, which is run by the government and is only open to foreign participants every four years by invitation. Attendance allowed AZL to progress discussions with a number of companies with whom relationships have previously been established, as well as to meet new potential customers. These discussions continue to move forward and AZL is now narrowing its target customers as interest has risen to a level that suggests the DZP rare earth output is at risk of being oversold.

Progress with Vietnam Rare Earth JSC (VTRE) to convert the letter of intent (ASX announcement 7 April 2016) to a formal agreement continued during the quarter, with follow up meetings planned during the December quarter in Vietnam and in Australia. A number of opportunities have been identified to grow the existing VTRE business at an early stage to complement Alkane's offtake discussions for the DZP. Growth of rare earth sales utilising VTRE's existing capacity will also assist DZP commissioning and rapid production ramp up, while lowering overall production costs at VTRE.



## ***Product Development to Produce Samples and Confirm Performance***

The DPP trials occurred during the quarter as planned. Products have been generated for customers and will be sent to them in the coming quarter. The DPP produced zirconium products at different grades, including standard 99.1%  $\text{ZrO}_2 + \text{HfO}_2$  and premium nuclear grade 99.6%  $\text{ZrO}_2$  (<50ppm Hf), a hafnium concentrate and a rare earth concentrate. The hafnium concentrate is intended to be further processed to a 95.0%  $\text{HfO}_2$  product. The opportunity was taken to show some potential customers through the DPP whilst it was operating.

## ***Product markets***

While prices remained stable for all DZP products during the quarter, unchanged from the June quarter, a number of expanding and new developments have potential to consolidate and eventually improve prices for all products.

The rare earths used in permanent magnets (REPMs) account for >75% of all rare earths demand by value, and are the key driver of the rare earths market. The estimated production of sintered NdFeB magnet alloys in China in 2015 was 140,000t; representing an annual domestic growth rate of 16% per annum, compared with 2014. ROW growth was 12% per annum, while global growth was 14% per annum. China produced 88% of total supply, highlighting how its dominant position is being maintained. The bonded magnet market was 6,000t NdFeB in 2015, of which China produced 4,000t. IMCOA's estimates, allowing for recycling, are approximately 10-15% less than these figures; indicating that illegal production of these rare earths is >40% of total production. Against this background, the outlook for REPMs remains excellent, with high growth rates forecast to continue as existing and new applications increase demand. With high growth rates being experienced in all major applications for REPMs, the automotive sector stands out, with increasing demand from hybrid and electric vehicles corresponding to an increase in demand for electric motors containing NdFeB magnets. The announcement by Honda of a new hybrid vehicle for the Honda Freed range will be expanded to other models and is an example of emerging new demand that is being followed by other manufacturers.

Recent research at the University of Michigan on ceramic thin films for solid electrolytes as an alternative to the current liquid electrolytes in lithium batteries offers to be a promising new application for lanthanum and zirconium. Apart from making lithium batteries safer and allowing them to operate at higher temperatures, they also provide higher energy density, thus allowing batteries to be smaller for the same output. This film LLZO, Lithium Lanthanum Zirconate, contains approximately 20% lithium hydroxide ( $\text{LiOH}$ ), 53% lanthanum oxide ( $\text{La}_2\text{O}_3$ ) and 26% zirconia ( $\text{ZrO}_2$ ). Further process development is required before being commercialised but this is emerging as a promising solution to the shortcomings of current Li ion batteries.

## ***Financing***

AZL's funding strategy has not changed with strategic investment, Export Credit Agency finance and commercial debt remaining as the key components of the envisaged project funding suite.

The ability of the DZP to provide long term sustainable security of supply of a diverse range of over 10 critical metals and oxides is one of the strong themes which is being increasingly recognised both in Australia and overseas. The diversity of products and markets also provides stability of revenue streams over a broad base as different markets cycle through ups and downs over time.









## **ELSIENORA (gold)**

*Alkane Resources Ltd 100%*

Alkane met its expenditure obligations with respect to the Farm-In agreement with Isabella Minerals Pty Ltd (a wholly owned subsidiary of Balamara Resources Ltd) to earn an 80% interest in exploration licences 6082 and 6767 at Elsenora. Agreement was also finalised to purchase the residual 20% interest in the tenements for the payment of \$75,000. A new exploration licence application has been lodged covering the area of EL6082 and 6767.

The tenements are located 75km south of Blayney and are considered prospective for orogenic style gold mineralisation and volcanic hosted gold and base metal mineralisation. RC drilling at the Cuddyong Prospect has delineated a zone of strong sericite-pyrite alteration and quartz veining hosted predominantly in intermediate to mafic volcaniclastic sediments along a strike length of approximately 700 metres (using a >0.5g/t gold cut-off)

## **ORANGE EAST PROJECT (gold-copper)**

*Alkane Resources Ltd earning 80%*

The Orange East Project is located approximately 15 kilometres east-south-east of Orange and consists of one exploration licence covering approximately 45 square kilometres. The project area hosts the historic Carangara copper workings at Byng (1850 to 1875); however, the most compelling exploration target is at the Gunnarbee prospect, where a multi-element soil geochemical anomaly, with a similar elemental suite to the surface anomaly at McPhillamys, has been outlined over an area of 1000m by 500m.

The exploration licence (EL8442) was approved on 11 May and land access negotiations will commence as soon as practicable. Alkane's initial approach will be to complete soil geochemistry and ground geophysics in areas currently not covered. Drilling of highest priority targets will be undertaken once these surveys have been completed and land access has been granted.

**BODANGORA (including KAISER) (copper-gold); Wellington (copper-gold), CUDAL (gold-zinc), ROCKLEY (gold) and FINNS CROSSING (gold-copper)** were inactive during the quarter

## **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 (Western Areas Ltd) advised that work on the joint venture ground focused on extending the surface MLEM data coverage to the remainder of the tenement and to cover the area of known ultramafic lithology. Multiple broad, strong and anomalous responses were identified, some of which have been drill tested previously and are interpreted to be associated with sulphidic black shale. A number of moderate to weak, short strike length anomalies were also detected, and some of these lie adjacent to the interpreted Camelot ultramafic stratigraphy and in areas of other known ultramafics. These anomalies have not been explained by previous drilling and will be drill tested in the coming quarter.

## **CORPORATE**

The Group's cash position totalled A\$28.3M with A\$22.5M cash and bullion on hand valued at A\$5.8M, a decrease of A\$1.5M from the previous quarter.



The placement of the shortfall from the rights issue launched in April was completed in early July resulting in an inflow of \$4.1M.

The \$7.0M project loan facility, part of the working capital facilities executed with Macquarie Bank, was fully drawn during the quarter. A scheduled repayment of \$2.0M was made at quarter end leaving the drawn balance at \$5.0M. The performance bond facility remains undrawn.

### Competent Person

*Unless otherwise advised above, 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*

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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 focused in the Central West region of NSW, Australia. Currently Alkane has two advanced projects - the Tomingley Gold Operations (TGO) and the nearby Dubbo Zirconia Project (DZP). Tomingley commenced production early 2014. Cash flow from the TGO has provided the funding to maintain the project development pipeline and will assist with the pre-construction development of the DZP.

The NSW Planning Assessment Commission granted development approval for the DZP on 28 May 2015 and on 24 August 2015 the Company received notification that the federal Department of the Environment gave its approval for the development. Mining Lease 1724 was granted on 18 December 2015 and the Environment Protection Licence was approved on 14 March 2016. Financing is in progress and this project will make Alkane a strategic and significant world producer of zirconium, hafnium and rare earth products when it commences production in 2018.

Alkane's most advanced gold copper exploration projects are at the 100% Alkane owned Wellington and Bodangora prospects, and Elsenora farm-in. 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. Encouraging gold mineralisation was recently drilled at Elsenora.

