Alkane’s Multi Commodity Program in the Central West

SMEDG MEETING
Sydney 28 June 2012
Location and Business Strategy

- Multi commodity explorer and miner – focussed in the Central West of New South Wales, Australia Region with substantial existing infrastructure.
- Dubbo Zirconia Project – world class resource of zirconium, hafnium, niobium, tantalum, yttrium and rare earths.
- Tomingley Gold project – new gold development planned to commence 2013 based upon 812,000 oz resource.
- McPhillamys Gold project – major gold discovery (~3 million oz). Joint Venture with Newmont.
- Develop multiple operations over next five years – within tight geographic area. New discoveries at Cudal (Au-Zn), Bodangora (Au-Cu) and Galwadgere (Cu-Au).
Tomingley Gold Project

Location / Infrastructure / Resources

- TGP located 50km south west of Dubbo on the Newell Highway
- 15km north of Alkane’s Peak Hill Gold Mine (467,000oz)
- Resource – 12.6 Mt @ 2.0g/t (812,000oz)
- Three deposits – Wyoming One; Wyoming Three; Caloma, with Caloma Two a potential resource
- Exploration – significant upside
- Infrastructure
  - water - 45km pipeline
  - power - State Grid with 20km 66Kv power line
  - roads - primary & secondary access
- Skilled local workforce
  - 150,000 population within 120km diameter area
  - no accommodation required (no fly-in / fly-out)
Regional Geological Interpretation

- **Late Devonian sediments**
- **Early Devonian granites**
- **Late Silurian to Mid Devonian volcanics and sediments**
- **Ordovician to Silurian sediments**
- **Ordovician volcanic complexes**
- Mined 1996 to 2002, recovered 152,000 ounces of gold through to 2005 from heap leach operation
- Oxidised cap of a high sulphidation epithermal system
- Substantial but only partly tested large sulphide mineralisation that is moderately refractory (467,000oz)
- Where is the porphyry source?
- Could become part of “Plan Z” to provide sulphur for DZP acid plant and feed oxidised product into TGP CIL plant
Tomingley Gold Project

Geological Summary
Wyoming - Caloma

- Graphitic mudstone
- Volcaniclastic sediments
- Feldspar porphyry
- Pelitic Sediments
- Volcaniclastic sediments
- Graphitic mudstone
- Volcaniclastic conglomerate
- Epidote altered volcanics
- Chlorite-talc schist
- Andesitic volcanics
- Mineralisation

Typical Orogenic style gold deposits
Tomingley Gold Project

Wyoming One
North – South Section
614075mE

- Graphitic mudstone
- Volcaniclastic sediments
- Feldspar porphyry
- Cotton Formation
- Volcaniclastic conglomerate
- Epidote altered volcanics
- Chlorite-talc schist
- Andesitic volcanics
- Alluvium

Results:
- 9m @ 21.5g/t Au
- 6m @ 9.53g/t Au
- 12m @ 6.22g/t Au
- 18.4m @ 5.74g/t Au
- 7.2m @ 11.06g/t Au
- 66m @ 19.5g/t Au
- 11m @ 89.0g/t Au
- 14m @ 15.8g/t Au
- 9m @ 12.5g/t Au
- 12.5m @ 7.88g/t Au
Tomingley Gold Project

Caloma
East – West Section
6394100

- Alluvium
- Cotton Formation
- Feldspar porphyry
- Volcaniclastic sediments
- Dolerite
- Volcaniclastic conglomerate
- Epidote altered volcanics
- Chlorite-talc schist
- Andesitic volcanics
Tomingley Gold Project

**Wyoming One**
Conceptual underground development

**Ore Inventory:**
- 679,000 tonnes @ 3.98g/t Au (87,000 oz)

**Prefeasibility study:**
- Decline development near base of pit
- Sub level long hole open stoping
- Only three ore bodies ‘376’, ‘831’ and ‘Hangingwall’ targeted
- > 80,000 oz recovered
Caloma Deposit 3D Ore Model

Tomingley Gold Project

Project Upside

Caloma Underground

- Seven core holes 3,500m
- Numerous mineralised intercepts
  - PE 641D 7.1m @ 12.9g/t Au
  - PE 645D 4.4m @ 4.76g/t Au
  - PE 647D 3.0m @ 5.53g/t Au
- Geological modelling for resource potential
- Shallow south plunging system, not tested at depth

Caloma Two

Open pit potential
Current Project Activities

- Project waiting for approval from NSW Department of Planning and Infrastructure
- Review of capital and operating costs in progress
- Long lead construction items ordered (ball mill, water supply, tenders for earth works and other infrastructure)
- CAPEX – A$107M ($54M plant; $30M infrastructure; $23M owners costs)
- Throughput – 1.0Mtpa
- Head Grade – 2.00g/t
- Recoveries – 93%
- Gold Production – 50 - 60,000ozpa
- Operating Costs – being reviewed
- Life – 7.5years (targeting +10 years)
- Mine method – open cut & underground
- Caloma Two resource estimate
- Production anticipated mid 2013
McPhillamys Gold Project (49%)

Core drilling at McPhillamys
ORANGE DISTRICT EXPLORATION JOINT VENTURE (ODEJV)
Gold, Copper – Orange, NSW | Alkane Resources: 49%, Newmont Australia: 51%

TWO FOCUS AREAS:

- **Molong**
  - targeting copper-gold porphyry-style gold mineralisation (Ridgeway-type) and Carlin style

- **Moorilda**
  - drilling confirms a major gold system @ McPhillamy’s

- Newmont have earned 51%, to go to 75% by carrying all expenditures through to completion of final BFS

...significant upside + 4moz system
Project Highlights

- Joint venture – Newmont has 51% but may go to 75% by completing a bankable feasibility study
- Resource (0.3g/t cut) – 92Mt @ 1.0g/t gold (3.0Moz)
- Resource (0.5g/t cut) – 61Mt @ 1.3g/t gold (2.6Moz)
- Copper credits (<0.1%)
- Mining method – open cut or block cave
- Recoveries – +90% from CIL (preliminary metallurgy)
- Strip ratio – low
- Exploration – upside (open at depth)
- McPhillamys dimensions:
  - Outer ore envelope 1,000m x 260m 0.1g/t Au
  - Inner ore zone 600m x 200m to 450m depth
- Comparison with Barrick’s “Cowal Gold Mine”:
  - 64Mt @ 1.2g/t gold at start up
  - 8Mtpa for ~ 250,000ozpa currently
Strongly foliated dacitic schist
Med-coarse grained dacitic volcaniclastic
Coarse grained volcaniclastic conglomerate (Epiclastic)
Intensely sericite-altered schist
Gold histogram
Zinc histogram

ODEJV - McPhillamys

VMS - orogenically modified deposit??
Rare Metals – Rare Earths

- China produces 90% of world downstream zirconium chemicals
- China currently produces 95% of world REE output
- China is limiting the export of raw rare earths materials
- Brazil produces 90% of world niobium

- Green technology is dependent on rare metals and rare earths
- Increased demand also driven by changes in legislation
- China has dominant position

...not so rare, but increasingly valuable
Applications for Zirconium Materials

**Catalysts**
- Automotive
- Gasoline & diesel
- Industrial pollution
- Petroleum refining control
- Fuel cells

**Electronics**
- Dielectrics
- Piezoelectrics
- Multi layer capacitors
- Oxygen sensors
- Sonar

**Ceramics**
- Ceramic colours
- Enamels
- Opacifiers

**Wear**
- Engineering ceramics
- Thermal Barrier coatings
- Milling media
- Bioceramic hips/teeth
- Automotive brake pads
- Fibre optic ferrules

**Glass**
- Polishing Compounds
- Optical glass
- Cubic zirconia

**Chemicals**
- Paper coatings/binders
- Metal treatments
- Antiperspirants
- Pigment coatings
- Printing inks
- Sorbents-carbon capture
- Water treatment
- Paint drying agents
- Waterproofing agents
- Flame retardants

**Metal**
- Nuclear fuel rods
- Industrial components
- Zircalloys- nuclear cladding

**Refractories**
- Glass tank refractories
- Steel making refractories
- Flow control nozzles

Sources: General Electric, MEL Chemicals, Ferro Corporation, Areva, Zircor, PPG, Murata, Molycorp
Applications for Niobium Materials

**Special Steels - HSLA**
- Weight reduction for fuel efficiency
- Pipelines
- Bridges

**Alloys**
- Turbine blades

**Capacitors**
- Electric motors
- Mobile electronics

**Glass**
- Camera lens and TV glass
- Optical glass

**Jewellery**

**Superconducting Magnets**
- Particle accelerators
- Maglev transport
- Magnetic Resonance Imaging

**Coinage**

Sources: Ford MC, CBMM, Google images
* (High Strength Low Alloy)
Small content of niobium in chassis steel can lighten vehicle by 10% - fuel efficiencies; emissions minimisation

Potential for solid oxide fuel cells power plant which use zirconia ceramic (+ yttrium and cerium)
**Infrastructure**

- Population – 80,000 Dubbo regional
- Rail – railway hub
- Road – major highways intersection/hub
- Water – numerous sources
- Electricity – NSW State power grid
- Gas – NSW State gas grid
- Industrial – substantial light industry
- Agriculture – major agricultural hub
- Process chemicals available from multiple sources in eastern Australia
- Limestone available at Geurie
Jurassic aged trachyte intrusive or lava flow
East-west cross section through centre of deposit

- Rare earth grade identical distribution as the zirconium and niobium
- Basalt Dykes
- TRACHYTE
- SEDIMENTS
- Zirconium Niobium
- Recent Grits
- Siliceous Contact Zone
- 340m RL
### Resources & Reserves

- **Resources & Reserves** – open at depth
- Life – +20 years but can support longer life and higher production rates
- Major world resource - zirconium, hafnium, niobium, tantalum, yttrium & rare earth elements
- Important heavy rare earth distribution of 25% of total rare earth content

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<th>Tonnes (Mt)</th>
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<td>0-55</td>
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<td>1.94% ZrO$_2$, 0.04%HfO$_2$, 0.46% Nb$_2$O$_5$, 0.03% Ta$_2$O$_5$, 0.14% Y$_2$O$_3$, 0.74% REO (0.9% TREO)</td>
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<td>Inferred</td>
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<td>As above</td>
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<td>Total</td>
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<td>1.93% ZrO$_2$, 0.04%HfO$_2$, 0.46% Nb$_2$O$_5$, 0.03% Ta$_2$O$_5$, 0.14% Y$_2$O$_3$, 0.75% REO (0.9% TREO)</td>
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<td>Probable</td>
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<td>Total</td>
<td>0-45</td>
<td>35.9</td>
<td>As above</td>
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</table>
Processing

- Demonstration Pilot Plant – established 2008
- Process – unique & advanced
- Optimization – ongoing
- Sulphuric acid leach whole of ore
- Solvent extraction, separation & refining
- Chemical precipitation
- Zirconium products
- Niobium products
- Heavy RE product
- Light RE product
Memorandums of Understandings (MOU's)

<table>
<thead>
<tr>
<th>MOU</th>
<th>Date Announced</th>
<th>Product</th>
<th>Details</th>
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<tr>
<td>1</td>
<td>16 May 2011</td>
<td>Zirconium</td>
<td>Leading chemical company &amp; trading company to produce zirconium oxychloride</td>
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<tr>
<td>2</td>
<td>26 July 2011</td>
<td>Zirconium</td>
<td>JV with Australia's Mintech Chemical Industries to produce zirconium oxychloride</td>
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<tr>
<td>3</td>
<td>15 August 2011</td>
<td>Zirconium</td>
<td>JV with leading European manufacturing / trading company to market DZP products</td>
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<tr>
<td>4</td>
<td>26 October 2011</td>
<td>Niobium</td>
<td>European company to produce and market ferro-niobium</td>
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</table>

- Zirconium (39% of revenue) – 100% under MOU
- Niobium (22% of revenue) – 100% under MOU
- LREE (21% of revenue) – advanced negotiations
- YHREE (18% of revenue) – advanced negotiations
- Throughput – there are four MOU’s which virtually guarantee production at 1Mtpa
- Revenue update in progress, which will see shift in % distribution

- Primary filter cake contains ~ 200ppm Ta₂O₅. At 1Mtpa this equates to about 200tpa (>400,000lbs pa). A program has commenced to review recovery of this valuable Ta₂O₅ product
Core drilling at Bodangora
Bodangora – *Glen Hollow*

**Comobella Intrusive Complex**
4km x 3km monzonite intrusives / skarn / hydrothermal breccias

Comparable to Cadia – Ridgeway (Newcrest) system near Orange

Intensely hematite altered monzonite intrusives with disseminated chalcopyrite, bornite and native copper

Other targets outside of the CIC
**Glen Hollow recent intercepts**

- 46m @ 0.9g/t gold & 0.25% copper
- 18m @ 1.7g/t gold & 0.45% copper
- 7m @ 0.23g/t gold & 1.04% copper
Cudal – Bowen Park

New (?) style of mineralisation – structural / replacement

Many exploration targets to be tested
Wellington – Galwadgere

Silurian Felsic Volcanic
VMS style Cu-Pb-Zn mineralisation with structural Au overprint

Indicated Resource defined 2004

2.09Mt @ 0.99% Cu and 0.3g/t Au

Potential to open pit mine bulk of existing resource to produce 27% Cu and 3g/t Au clean concentrate
Long Section  GAL032 intersection 14m @ 1.13 g/t Au, 0.94% Cu + 0.89% Zn
Incl 4m 0.94g/t Au, 1.69% Cu + 2.98% Zn,  200m down plunge and has potential to double existing defined resource
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 Geosciences.

Competent Person

The information in this presentation that relates to mineral exploration, mineral resources and ore reserves is based on information compiled by Mr D I Chalmers, FAusIMM, FAIG, (director of the Company) 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 Competent Person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Ian Chalmers consents to the inclusion in the presentation of the matters based on his information in the form and context in which it appears.
Resource & Reserves: Tomingley + Peak Hill

Tomingley (TGP) – Mineral Resources

<table>
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<th>DEPOSIT</th>
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<td>Top Cut 2.5x2.5x5.0m model</td>
<td>Tonnage (t)</td>
<td>Grade (g/t)</td>
<td>Tonnage (t)</td>
<td>Grade (g/t)</td>
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<td>Wyoming One</td>
<td>2,316,550</td>
<td>2.2</td>
<td>890,340</td>
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<td>Wyoming Three</td>
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<td>1,521,420</td>
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These Mineral Resources are based upon information compiled by Mr Richard Lewis MAusIMM (Lewis Mineral Resource Consulting Pty Ltd) who is a competent person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Richard Lewis consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. The full details of methodology are given in the ASX Reports dated 25 March 2009, 2 October 2010 and 29 March 2012.

Tomingley (TGP) – Ore Reserves

<table>
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<th>DEPOSIT</th>
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<td>Tonnage (t)</td>
<td>Grade (g/t)</td>
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<td>1,700,000</td>
<td>1.6</td>
<td>200,000</td>
<td>1.3</td>
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<tr>
<td>Wyoming Three</td>
<td>500,000</td>
<td>1.6</td>
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<td>0.0</td>
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<td>Caloma</td>
<td>1,100,000</td>
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<td>1.8</td>
<td>300,000</td>
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These Ore Reserves are based upon information compiled under the guidance of Mr Dean Basile MAusIMM (Mining One Pty Ltd) who is a competent person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The Reserves and Resources are estimated at an effective A$1,540 per ounce gold price. Dean Basile consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

Peak Hill – Mineral Resources

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Resource & Reserves: Dubbo + Galwadgere

Dubbo Zirconia Project – Mineral Resources

<table>
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<tr>
<th>Deposit</th>
<th>Tonnage (Mt)</th>
<th>ZrO₂ (%)</th>
<th>HfO₂ (%)</th>
<th>Nb₂O₅ (%)</th>
<th>Ta₂O₅ (%)</th>
<th>Y₂O₃ (%)</th>
<th>REO (%)</th>
<th>U₃O₈ (%)</th>
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<tr>
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<td>0.46</td>
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<td>0.14</td>
<td>0.75</td>
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<td>Inferred</td>
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<td>0.14</td>
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<tr>
<td>Probable</td>
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<td>35.93</td>
<td>1.93</td>
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<td>0.14</td>
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Wellington – Galwadgere – Mineral Resources

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These Ore Reserves are based upon information compiled by Mr Terry Ransted MAusIMM (Alkane Chief Geologist) who is a competent person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. The reserves were calculated at a 1.5% combined ZrO₂+Nb₂O₅+Y₂O₃+REO cut off using costs and revenues defined in the notes in ASX Announcement of 16 November 2011. Terry Ransted consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. The full details of methodology were given in the 2005 Annual Report.
### Moorilda – McPhillamys – Mineral Resources

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*These Mineral Resources are based upon information compiled by Mr Richard Lewis MAusIMM (Lewis Mineral Resource Consulting Pty Ltd) who is a competent person as defined in the 2004 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Richard Lewis consents to the inclusion in the report of the matters based on his information in the form and context in which it appears. The full details of methodology were given in the ASX Announcement 5 July 2010. Totals may not tally due to rounding.*