THE WORLDS LARGEST LEUCOXENE PRODUCER

Investment Highlights

- In commencing production at its Keysbrook Mineral Sands Plant, MZI Resources (MZI) is emerging as the largest, single-project producer of leucoxene in the world, with significant upside potential as a result of both mine life extensions and production expansion opportunities. We initiate on MZI with a Buy recommendation and a A$0.59/share target price.

- **Keysbrook Project:** The newly built Keysbrook mineral sands project south of Perth, Western Australia is in the process of commencing production with first product sales expected before the end of 2015. MZI expects to produce around 38ktpa of Leucoxene L88 (88% TiO₂), 29ktpa of Leucoxene L70 (70% TiO₂) and 29ktpa of zircon concentrate. MZI has existing five year sales contracts for 85% of production with Chemours and Tricoastal/Wensheng. With a substantial Mineral Resource relative to its current Ore Reserve, we expect an extension to its current 5.5 year mine life with the potential for increased future production.

**Valuation:** We value MZI using a sum of the parts (SOTP) methodology. We apply an NPV at 10% on the Keysbrook Project based on the existing Ore Reserve and arrive at a value of (A$0.42/share). We use a risky mine life extension to the Keysbrook operation and include the value of the exploration assets to add a further A$0.2/share. The value of unpaid capital and net debt deducts A$0.34/share, to arrive at our SOTP valuation of A$0.59/share. We therefore initiate coverage on MZI with a Buy recommendation and a A$0.59/share target price, for a current expected return of 39.8%.

- **Catalysts:** We view the near term catalysts for the stock price as being the ramp-up to full production over the coming months and the achievement of first sales by the end of 2015. Added to this would be the announcement of an expected upgrade to the Ore Reserve to allow for mine life extension and the possible consideration of expansion plans. Medium term catalysts consist of the successful implementation of the various potential moderate capital expenditure expansion plans (primarily the increased throughput and enhanced recovery plans) and an expected firming in the market prices for rutile and zircon. Longer term catalysts involve the larger scale production expansion possibilities and further exploration potential across its tenement portfolio.

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**11 November 2015**

**12mth Rating**

<table>
<thead>
<tr>
<th>Buy</th>
<th>Price</th>
<th>Target Price</th>
<th>12m Total Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A$ 0.42</td>
<td>0.59</td>
<td>39.6</td>
</tr>
</tbody>
</table>

**RIC:** MZI.AX  
**BBG:** MZI AU

**Shares o/s:** m 195.8  
**Free Float:** % 88.0  
**Market Cap.:** A$m 82.2  
**Net Debt (Cash):** A$m 108.1  
**Net Debt/Equity:** % 585.0  
**3m Av. D. T’over:** A$m 0.03  
**52wk High/Low:** A$ 0.56/0.22  
**2yr adj. beta:** 0.82

**Valuation:**  
**Methodology:** DCF  
**Value per share:** A$ 0.59

**Analyst:** Jason Chesters, CFA  
**Phone:** ( +61) 8 9263 1144  
**Email:** jchesters@psl.com.au

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**Year End June 30**  
**2015A**  
**2016F**  
**2017F**  
**2018F**

<table>
<thead>
<tr>
<th>Reported NPAT ($m)</th>
<th>(18.1)</th>
<th>(0.1)</th>
<th>17.5</th>
<th>22.0</th>
</tr>
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<tbody>
<tr>
<td>Recurrent NPAT ($m)</td>
<td>(16.6)</td>
<td>(0.1)</td>
<td>17.5</td>
<td>22.0</td>
</tr>
<tr>
<td>Recurrent EPS (cents)</td>
<td>(22.0)</td>
<td>(0.1)</td>
<td>8.9</td>
<td>11.2</td>
</tr>
<tr>
<td>EPS Growth (%)</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>25.5</td>
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<tr>
<td>PER (x)</td>
<td>na</td>
<td>na</td>
<td>4.7</td>
<td>3.8</td>
</tr>
<tr>
<td>EBITDA ($m)</td>
<td>(3.0)</td>
<td>15.0</td>
<td>35.9</td>
<td>39.9</td>
</tr>
<tr>
<td>EV/EBITDA (x)</td>
<td>na</td>
<td>8.9</td>
<td>2.9</td>
<td>1.8</td>
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<tr>
<td>Capex ($m)</td>
<td>43.8</td>
<td>26.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Free Cashflow</td>
<td>(59.0)</td>
<td>(26.3)</td>
<td>23.1</td>
<td>27.7</td>
</tr>
<tr>
<td>FCFPS (cents)</td>
<td>(63.1)</td>
<td>(13.4)</td>
<td>11.8</td>
<td>14.1</td>
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<tr>
<td>PFCF (x)</td>
<td>na</td>
<td>na</td>
<td>3.6</td>
<td>3.0</td>
</tr>
<tr>
<td>DPS (cents)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Yield (%)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Franking (%)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**12 Month Share Price Performance**

**Performance %**  
**1mth** 11.8  
**3mth** 3.7  
**12mth** 51.8

**Rel. S&P/ASX 300**  
**1mth** 5.5  
**3mth** 10.8  
**12mth** 72.9

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**RESEARCH NOTE – PATERSONS SECURITIES LIMITED**

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EXECUTIVE SUMMARY

MZI is a mineral sands company with experience in mineral sands production at its previous operations on the Tiwi Islands, and is currently focussed on successfully ramping up its newly built Keysbrook mineral sands project south of Perth, Western Australia (Figure 1).

The Keysbrook deposit has a leucoxene dominated mineral assemblage including Leucoxene L70 (70% TiO₂), Leucoxene L88 (88% TiO₂) and Zircon. Leucoxene is an alteration of titanium minerals and is formed through the weathering of ilmenite which reduces the iron and enhances the titanium content. Once at full production, Keysbrook will be the largest, single-project leucoxene producer in the world.

In addition to the current production profile at Keysbrook, MZI has a number of expansion initiatives, including at its Keysbrook project, nearby exploration tenements and exploration tenements on the Tiwi Islands.

With the majority of expected production committed under long term contracts to key buyers, and with a number of future growth initiatives, we view MZI as an attractive investment. We initiate coverage of MZI with a Buy recommendation and a A$0.59/share valuation.

Figure 1: Location of projects

Source: MZI Resources
OPERATIONS AND EXPLORATION

Keysbrook Project

The Keysbrook project is located approximately 70km south of Perth, Western Australia. Keysbrook consists of mining operations and a wet concentration plant (WCP). Heavy Mineral Concentrate (HMC) produced at the WCP is then transported by truck, 130km south from Keysbrook to the Doral mineral separation plant (MSP) located at Picton, near the port of Bunbury. Product extracted from the MSP is transported to Bunbury for export to customers (Figure 2).

Figure 2: Keysbrook Project location

Source: MZI Resources
The Keysbrook deposit is approximately 1,406 hectares in area and is characterised by its mineral assemblage, with leucoxene the dominant constituent. The deposit is a degraded dunal system with minimal overburden and containing low levels of clay and oversize material. The mining depth is expected to average between 2m and 5m, resulting in a near zero strip ratio. The current land use is predominantly pastoral and sits within two shires (the Shire of Murray and the Shire of Serpentine-Jarrahdale). As land titles in the area were granted prior to 1899, the minerals are freehold to the owner, not the State.

The Keysbrook Ore Reserve (Figure 3), last updated on 17 October 2012, formed the basis for the Keysbrook Project, and results in a relatively short (5.5 years) mine life. The Mineral Resource (Figure 3) of 155Mt grading 2.0% THM (last updated 7 August 2015, represented a 68% increase in the Keysbrook Mineral Resource) holds the potential for a substantial mine life extension, as well as a potential increase in production capacity. MZI expects to announce an Ore Reserve update later in 2015.

**Figure 3: Keysbrook Ore Reserves and Mineral Resources**

<table>
<thead>
<tr>
<th>JORC Ore Reserves</th>
<th>Ore (Mt)</th>
<th>THM grade (%)</th>
<th>In situ THM (t)</th>
<th>L70 (%)</th>
<th>L88 (%)</th>
<th>Zircon (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proved</td>
<td>23.0</td>
<td>2.7</td>
<td>610,000</td>
<td>27.8</td>
<td>46.6</td>
<td>14.6</td>
</tr>
<tr>
<td>Probable</td>
<td>2.8</td>
<td>2.5</td>
<td>68,000</td>
<td>27.4</td>
<td>46.5</td>
<td>15.0</td>
</tr>
<tr>
<td>Total</td>
<td>26.0</td>
<td>2.6</td>
<td>670,000</td>
<td>27.8</td>
<td>46.6</td>
<td>14.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JORC Mineral Resources</th>
<th>Tonnes (Mt)</th>
<th>THM grade (%)</th>
<th>In situ THM (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured</td>
<td>63.9</td>
<td>2.2</td>
<td>1,400,000</td>
</tr>
<tr>
<td>Indicated</td>
<td>29.2</td>
<td>2.2</td>
<td>655,000</td>
</tr>
<tr>
<td>Inferred</td>
<td>61.9</td>
<td>1.6</td>
<td>1,050,000</td>
</tr>
<tr>
<td>Total</td>
<td>155.0</td>
<td>2.0</td>
<td>3,105,000</td>
</tr>
</tbody>
</table>

Source: MZI Resources

GR Engineering Services were appointed as the EPC contractor in November 2014, and mobilised to site in February 2015. Construction was completed three weeks ahead of schedule and under budget and first production was achieved at the WCP during October 2015. Secondary processing at the MSP is scheduled for November 2015, with first sales to customers targeted for late December 2015. Capital expenditure and pre-operating costs were expected to amount to A$75.8m.

The processing route at Keysbrook is depicted in Figure 4. Mining is planned to be conducted at a rate of 4.5Mt per annum, using a fleet of articulated dump trucks and excavators. The ore is processed though a nearby (semi-portable) Mining Feed Unit (MFU) which screens the material to 2.5mm and the ore is then slurred to the WCP (Figure 5). Once at the WCP, the ore is processed using a series of desliming cyclones and spirals to produce an anticipated 110kt of HMC per annum. The sand tailings slurry will be pumped back to the various mining areas to fill the shallow pits left by mining. MZI expects to recycle around 80% of the water used in the process (Figure 6 shows the process water dams and pumps). Land rehabilitation will be conducted on an ongoing basis.

The HMC produced is to be trucked to the Doral Mineral Separation Plant in Picton (Figure 7). MZI has reached a toll treatment agreement with Doral to process the Keysbrook HMC on a one month on, one month off basis. The agreement also involved certain capital expenditure to be conducted by MZI for plant upgrade. The HMC is intended to undergo magnetic separation to extract the L70 product, electrostatic separation to extract the L88 product and gravity separation to extract the zircon. The zircon is planned to be produced as a concentrate and is expected to contain 56% zircon and 11% L88. MZI expects to produce around 38ktpa of L88, 29ktpa of L70 and 29ktpa of zircon concentrate. MZI currently expects to transport the finished product from the MSP to the port at Bunbury for export to customers in the USA and China.

Recent testwork conducted by MZI has confirmed the potential to increase heavy mineral recoveries to >90%, and in particular, to increase the L88 product recoveries to 83-90% from 71%. The achievement of the improved recoveries is expected to involve minor flowsheet modifications which can be retro-fitted for a moderate capital cost.
Based on the current capacity and flowsheet, operating costs are expected to amount to A$355/t including rehabilitation.

**Figure 4: Keysbrook flow sheet**

![Keysbrook flow sheet](image1)

**Figure 5: Keysbrook Wet Concentrator Plant**

![Keysbrook Wet Concentrator Plant](image2)
Other expansion opportunities exist at Keysbrook in addition to the enhanced recovery program. The current design of the WCP includes a proportion of spare capacity which could be utilised through increasing the mining rate. The current toll treatment agreement with Doral for the MSP also has excess capacity. Dependent on the size of the Ore Reserve upgrade and the demand for and pricing of its products produced, MZI could also consider a doubling of production which would entail a more significant investment in both the WCP and the MSP.
Current arrangements with product buyers cover approximately 85% of all product produced (under the current production plan). Chemours (a recent spinout from Dupont), the largest titanium dioxide producer in the world, has contracted to take the full production of L70 under a five year contract at an estimated average fixed price of US$350/t. The product is destined for use in its North American plants. Chemours has also contracted to buy 25ktpa of the L88 product for five years at a price based on approximately 85% of the rutile price. The product is likely destined for its Taiwan plant. The full production of the zircon concentrate is sold under a five year contract to Tricoastal/Wensheng in China. We understand that pricing is based on the zircon and TiO₂ metal content less a fee for processing, recovery, etc.

**Exploration projects nearby the Keysbrook deposit**

In addition to the Keysbrook deposit, MZI has also discovered the adjacent Yangedi and Railway deposits. The Yangedi deposit (to the west of the Keysbrook WCP) has a current Indicated Mineral Resource of 51.1Mt grading 1.5% MH for 790kt of in-situ HM with a mineral assemblage of 61.2% L70, 20.0% L88 and 10.8% Zircon. The Railway deposit (to the south of the Keysbrook) WCP has a current Indicated Mineral Resource of 13.6Mt grading 2.2% HM for 305kt of in-situ HM. In addition, MZI is conducting further regional exploration.

**Tiwi Islands**

The Tiwi Islands are located approximately 50kms north of Darwin (Figure 8) and consist of the Bathurst and Melville Islands. MZI, under the previous owner Matilda Minerals, has been operating on the Tiwi Islands since 2006, having commenced with the Andranagoo mine. MZI moved on to the Lethbridge West deposit (completed in 2010) and the Lethbridge South deposit (completed in January 2013).

In 2011, MZI identified a large Resource (currently in the Inferred category) at Kilimiraka in the south west of the Bathurst Island. The current Inferred Resource (spread across four dunal systems) is 56.2Mt grading 1.6% HM for 893.7kt of in-situ HM. A Scoping and Feasibility Study is scheduled to commence during 2017.

![Figure 8: Location of the Kilimiraka project](https://example.com/kilimiraka_location.png)
CORPORATE AND CAPITAL STRUCTURE

MZI currently has 92.7m shares on issue (post the issue of Tranche 1 of the current Placement). The Company has approximately A$17m in cash and around A$125m in debt (based on the current A$ exchange rate). Debt facilities used to fund the development of the Keysbrook Project and other working capital include:

- Resource Capital Funds (RCF) convertible loan (US$21m) - fully drawn
- RCF Bridge Facility (US$33.5m) – US$25.5m drawn
- RMB Project Facility (US$37.5m) – fully drawn
- RMB Working Capital Facility (US$3.0m) – undrawn
- RMB Bank Guarantee Facility (A$11.5m) – Approximately A$6m drawn

The remaining two tranches of the current Placement at A$0.40/share and the Share Purchase Plan (SPP) if fully taken up is expected to result in the issue of an additional 103.1m shares and raise A$41.24m. The majority of the proceeds (by way of share issue) is expected to be used to pay back the RCF Bridge Facility. As a result, RCF would increase its equity stake in MZI from the current 30.2% to around 39%.

VALUATION

We value MZI using a sum of the parts (SOTP) methodology. We have assumed the full allotment of shares under the current Placement and SPP in calculating the number of shares on issue and apply the capital expected as part of unpaid capital.

We apply an NPV at 10% on the Keysbrook Project based on the existing Ore Reserve and arrive at a value of (A$0.51/share). We use a risked mine life extension to the Keysbrook operation and include the value of the exploration assets to add a further A$0.42/share. The value of unpaid capital and net debt deducts A$0.34/share, to arrive at our SOTP valuation of A$0.59/share.

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CATALYSTS

We view the near term catalysts for the stock price as being the ramp-up to full production over the coming months and the achievement of first sales by the end of 2015. Added to this would be the announcement of an expected upgrade to the Ore Reserve to allow for mine life extension and the possible consideration of expansion plans.

Medium term catalysts consist of the successful implementation of the various potential moderate capital expenditure expansion plans (primarily the increased throughput and enhanced recovery plans) and an expected firming in the market prices for rutile and zircon.

Longer term catalysts involve the larger scale production expansion possibilities and further exploration potential across its tenement portfolio.
BOARD OF DIRECTORS

Mal Randall – Non-Executive Chairman

An experienced company director and chairman with extensive experience in corporate management and marketing in the resources sector, including more than 20 years with the Rio Tinto group of companies. Mal’s experience extends over a broad range of commodities including iron ore, diamonds, base metals, coal, uranium and industrial minerals both in Australia and internationally.

Trevor Matthews – Managing Director

Trevor has worked in the resources industry for 30 years and held executive positions with North Limited, WMC Resources Limited, Murchison Metals Ltd and other listed entities in both operational and corporate roles including Managing Director and Executive Director. Trevor has experience in various commodities and operations including iron ore, silicon metal, copper, gold, nickel and cobalt and significant experience in greenfields project development, operational management, finance and corporate governance.

Maree Arnason – Non-Executive Director

Maree is an experienced director and senior executive whose career has spanned 30 years across industries including resources, energy, transport and manufacturing. Following development of her senior executive career with ASX-listed companies including BHP Billiton and Wesfarmers, Maree has broadened her work over the past 10 years to include directorships in listed and private companies. This has also included peak industry and not-for-profit organisations, as well as executive roles leading strategic development and commercial projects.

Maree is a life member and past national director of the Australia China Business Council and a serving member of the WA Executive Committee; a co-founder/director of Energy Access Services, who operate an independent energy trading platform for WA’s wholesale gas market; a non-executive director of Juniper, one of WA’s largest aged care services organisations and a Trustee, Committee for Economic Development of Australia (CEDA).

Rodney Baxter – Non-Executive Director

Rod has 25 years of operational and executive leadership experience in the resources and engineering services sector. He was most recently the Managing Director of engineering, asset management and construction services company, Calibre Group. Previous roles include Managing Director of Consolidated Minerals and Divisional Director with Anglo American Platinum.

Rod’s career has included a number of substantial business turnarounds as well as the delivery of growth and transformation strategies in various industry sectors. He has also held non-executive board positions on public company boards.

Stephen Ward – Non-Executive Director

Dr Stephen (Steve) Ward has over 30 years’ industry experience working globally in mineral sands and related products with producers including Iluka Resources, Consolidated Rutile and Bemax and with global titanium pigment producers Tioxide (now Huntsman pigments) and Cristal. He has an extensive mining and mineral processing background with a proven record of managing the critical transition from development to production.

Dr Ward has held Board and Senior Executive roles in Europe, the USA, Malaysia and Australia affording him extensive corporate, technical, operational and sales skills highly appropriate for MZI. He has also gained broader resources experience in rare earths, iron ore and other commodities.

Dr Ward is a graduate from Nottingham University, UK (BSc Hons Chemistry and PhD Physical Chemistry) and a graduate of the Australian institute of Company Directors (GAICD)

Nathan Wong – Non-Executive Director

Nathan has extensive experience in the mineral sands value chain in China, at both a technical and commercial level. He is a Director of Tricoastal Minerals (Holdings) Limited which is the largest mineral sands processor in China with a comprehensive sales and marketing network throughout China. He brings additional depth of processing and marketing expertise on the Board.
## RESEARCH NOTE – PATERSONS SECURITIES LIMITED

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Recommendation History

Stock recommendations: Investment ratings are a function of Patersons expectation of total return (forecast price appreciation plus dividend yield) within the next 12 months. The investment ratings are Buy (expected total return of 10% or more), Hold (-10% to +10% total return) and Sell (> 10% negative total return). In addition we have a Speculative Buy rating covering higher risk stocks that may not be of investment grade due to low market capitalisation, high debt levels, or significant risks in the business model. Investment ratings are determined at the time of initiation of coverage, or a change in target price. At other times the expected total return may fall outside of these ranges because of price movements and/or volatility. Such interim deviations from specified ranges will be permitted but will become subject to review by Research Management. This Document is not to be passed on to any third party without our prior written consent.