



STRATEGIC ENERGY RESOURCES LIMITED  
ACN 051 212 429

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April 17, 2015

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## Quarterly Report to March 31, 2015

### HIGHLIGHTS FOR THE QUARTER:

- **Ionic Industries new board appointments in preparation for demerger**
- **Peer recognition of work by our Monash researchers with graphene based energy storage breakthrough**
- **Graphene membrane manufacturing machine commissioned**
- **Ionic Industries demerger preparation progressing well**

*Strategic Energy Resources Limited (ASX Code: SER) is a market leader in graphene research with via our collaboration with Monash University under our wholly owned subsidiary Ionic Industries Pty Ltd. SER holds numerous mineral exploration assets and holds equity interests in Valence Industries (which owns the Uley graphite mine near Port Lincoln, South Australia), Oil Basins Ltd and Magnum Gas & Power. Mineral exploration licences are held in South Australia, Western Australia and Victoria.*

# **GRAPHENE RESEARCH WITH MONASH UNIVERSITY**

## **Ionic Industries new board appointments**

With the planned demerger of our graphene technology company progressing well, three key appointments have been made to the team to help take Ionic Industries forward. Previously Mark Muzzin was the only director of Ionic Industries.

Dr Anne-Marie Grisogono – Director

Dr Anne-Marie Grisogono is a physicist with over 30 years experience in applied research and development and research management, including 15 years as a Research Leader in the Defence Science and Technology Organisation (DSTO). She has led scientific support for the Army's acquisition of the Tiger armed reconnaissance helicopter, worked with Army Headquarters to reframe the Army's approach to strategic planning and R&D prioritisation and management, and has held national and international leadership roles within DSTO in the fields of simulation, systems engineering and systems science, human sciences and complexity science. She is currently on the Australian Research Council's College of Experts, and now holds a visiting researcher position in the Melbourne Business School at Melbourne University and an adjunct professorial appointment in the Faculty of Computer Science, Engineering and Mathematics at Flinders University.

Dr Mainak Majumder - Director

Dr Mainak Majumder is a Senior Lecturer in the Department of Mechanical and Aerospace Engineering at Monash University and is the Group Leader of the Nanoscale Science and Engineering Laboratory (NSEL). He holds a Master's degree from the Institute of Technology-Banaras Hindu University and was a staff scientist at CSIR, India from 2001-03. He obtained his PhD in 2007 from the University of Kentucky, USA and obtained postdoctoral training at Rice University, Texas USA on carbon nanomaterials.

Robert Riebolge – Director (proposed Chairman)

Mr Riebolge read engineering at Adelaide University gaining a BE (Hons) and continued post graduate studies at the City University, London obtaining an MSc (Distinction). Mr Riebolge is a Fellow of the Institution of Engineers, Australia and a Chartered Engineer, has been a Member of the Academic Board of the Australian Institute of Management, SA Chapter and has been an Adjunct Lecturer in the MBA programmes of the University of Adelaide and the University of South Australia. Mr Riebolge has delivered tailored courses in Project Appraisal, Cost Benefit Analysis, Project Management and Contract Management in Australia, Fiji, Hong Kong, Malaysia, Samoa and Singapore.

Mr Riebolge is an international expert in the optimal economic configuration of electricity systems with a large proportion of renewables and storage in their energy mix having undertaken cost benefit studies of hydro electric schemes in Afghanistan, Burundi, Iceland, Indonesia, Rwanda, Surinam, Tanzania and Turkey. Recently, Mr Riebolge completed the documentation of nearly 10 years of trialling the transformation of legacy electricity grids to smart grids and beyond that employs evolving technology, demand side participation methodologies and techniques and distributed generation and storage. To put this work into context, Mr Riebolge undertook system simulation and scenario modelling of the electricity grid with an energy mix that included a significant proportion of renewables (photovoltaics and wind) and distributed storage (in home batteries, grid storage and electric vehicles).

The work gives an invaluable insight of the likely future of electricity grids and how graphene can play a pivotal role in their transformation.

### **Peer Recognition for our Researchers**

A new breakthrough by our researchers at Monash University has been accepted and published by the respected American Chemical Society (ACS) publications. The paper is titled “Electrochemical Capacitance of Ni-Doped Metal Organic Framework and Reduced Graphene Oxide Composites: More than the Sum of Its Parts” and has appeared in ACS Applied Materials and Interfaces. The breakthrough presents a unique way of converting an insulator into a high performance energy storage material. The project reinforces another application of the wonder material – graphene.

#### *The Importance of Publication of Academic Papers*

Publication is the only way to inform the scientific community and the broader community about our research team’s innovations. Just because an academic paper is submitted to a journal does not mean the paper will be accepted. It is peer reviewed by the journal and assessed rigorously for its scientific merits and assessed by peers across the world and only if it is adding to the known literature in a given research area will a paper be published. “This publication opens up a new area of research in the area of electrochemical energy storage and is an important step towards a greener world”. Dr. Parama Banerjee-Chakraborty said.

### **Graphene Membrane manufacturing Machine Commissioned**

Under our Australian Research Council Linkage grant (ARC Linkage) with Monash University, we have taken receipt of the membrane casting equipment for our graphene membrane technology. This membrane casting facility will be used for our research project titled: ‘Green Manufacturing of Graphene from Indigenous Natural Graphite and Graphene-based Nanofiltration Membranes’.

This is a very important step in our development of a roll-to-roll process for manufacturing high performance graphene membrane, which will potentially have multiple uses in the mining and food processing industries. Monash University has filed an invention disclosure to protect the intellectual property (IP) developed in this technology, while Ionic Industries will have exclusive rights to use the IP for commercialisation.

### **Ionic's Graphene for Water Purification and Energy Storage**

Ionic Industries is focused on two critically important issues for human sustainability and advancement, namely water and energy. SER partnered with Monash University 5 years ago on graphene research and development. The relationship has benefited from being the recipients of two Australian Research Council Linkage grants on graphene based technologies, namely on our super capacitors and our graphene membrane technologies.

#### **Water Purification**

Water purification is a huge market and graphene will potentially contribute greatly to the advancement in technologies for water processing. SuperSand and membrane technologies are expected to benefit the water purification industry.

## **Energy Storage**

Energy storage is the other key focus for Ionic Industries. We have been working on super capacitors with Dr Majumder's team from Monash University, who have been researching and developing our focussed ion beam super capacitor technology for some 5 years.

Super capacitors and nanocapacitors are the next step in the evolution of energy storage. Research and development of these energy storage devices are advancing quickly and have many advantages over current battery technology.

In almost every case, desired performance is limited by the capability envelope of the energy storage systems currently available. The size (both by volume and by weight), limits the range, endurance and payload of the application as well as being a significant cost factor.

A huge amount of R&D is currently in place, much of it targeting improvements in chemical batteries e.g. the many recently announced initiatives in lithium based systems. These will no doubt produce some improvements but the potential for improved performance is limited by the basic physics of the devices. Chemical batteries rely on moving ions between electrodes and so the theoretical limit for the energy density of all reversible chemical batteries is the energy density in ionic bonds,  $\sim 1\text{GJ/m}^3$ . Current chemical battery technology is already close to that limit so there is not a lot of scope for improvement.

In the bigger picture, one can say that chemical batteries are a fairly mature technology which has limited scope for further improvement, and which will eventually be overtaken by radically different novel energy storage systems based on different physics, which have the potential to greatly exceed the performance limits of chemical batteries.

Nanocapacitors also have several other advantages. Since it is electrons rather than ions that move, the speed at which they can be charged and discharged is limited by the speed of electrons moving, which can be 10% of the speed of light. For practical purposes, this is close enough to instantaneous, and so can deliver very high power and be recharged very fast. In principle they also maintain fixed output performance with no drop off or heating, and they can be configured to provide any desired voltage and power.

Such technologies are likely to eventually overtake the existing chemical battery energy storage systems in many applications but there is still a lot of R&D required before this happens. We are fortunate to be in on the ground floor of this potential technology revolution and to be able to be part of its development.

### **The Importance of Graphene in the Future of Energy Storage Solutions**

In the electricity sector, renewables, in particular wind and solar, provide a solution as an alternative source of energy. These sources are already a significant part of the energy mix in a number of countries and are expected to account for an increasing share of the world's electricity output in the future. But these renewables are intermittent in that solar photovoltaics (PV) do not generate electricity at night or when there is cloud cover; when the wind does not blow no windmill electricity is produced.

So for these renewable sources to supply us with reliable and continuous power, electricity that is generated when there is a surplus has to be stored and released

when renewables are not generating. With the transformation of electricity grids from centrally supplied legacy grids to smarter grids this storage in the form of in home battery banks and grid banks can now be deployed and activated in the networks.

Distributed storage overcomes the intermittency limitations of renewables, smoothing out the peaks and troughs of the load profiles, thus creating an efficient and reliable integrated energy system that displaces fossil fired base load plant.

Storage also improves the distribution grids' stability, where the potential for regional balancing can be limited when storage is unavailable. Given this fundamental role that distributed storage will play in the emerging smarter grids, global demand is expected to soar over the next two decades, as renewables become increasingly cost competitive, and a large component of the generating plant mix.

Much progress is being made in storage technologies but currently they are still developing. Greatest progress has however been made with solar PV paired with battery storage.

### **Graphene: an Amazing Vision of the Future**

The research and development work done on graphene by Ionic Industries is only a fraction of the scientific advancement made possible by projecting the developments of this allotrope of carbon. Our collective experience as previous owners of the Uley graphite mine keeps us in the box seat as further uses for graphene are explored.

SER shareholders are fortunate to be in at the start of a possible technical and manufacturing revolution which could be the solution to so many of the earth's huge problems.

## **MINERAL EXPLORATION**

### **SPENCER JOINT VENTURE (SER 75%) EL 5010 SOUTH AUSTRALIA**

The Spencer area comprises 321 km<sup>2</sup> and is located on the west coast of Spencer Gulf on the Olympic Dam trend. This same trend is the home to some exceptional discoveries including Olympic Dam, Carrapateena, Prominent Hill, Mount Gunson, Wallaroo, Moonta and Hillside.

SER as operator of EL 5010 is pleased to report that a new Deed of Access has been approved. Access is granted till 12 September 2016 and can be further extended in line with future permit extensions.

### **MYALL CREEK (SER 50%) EL 5011 SOUTH AUSTRALIA**

The Myall Creek Copper Project (EL5011) covers an area of 381 km<sup>2</sup> and is located on the southern Stuart Shelf between Whyalla and Port Augusta, a highly prospective part of the eastern margin of the Gawler Craton. The Myall Creek Project includes a 15 kilometre zone with anomalous copper shown in historic drilling.

Previous work indicates that mineralization is controlled by a lithological/chemical redox contrast which exists between the base of the Tapley Hill formation and an underlying unconformable contact between the two sedimentary/volcanic units. This unconformity continues to have a strong potential for high grade prospects.

The licence area is immediately west of the Torrens Hinge Zone.

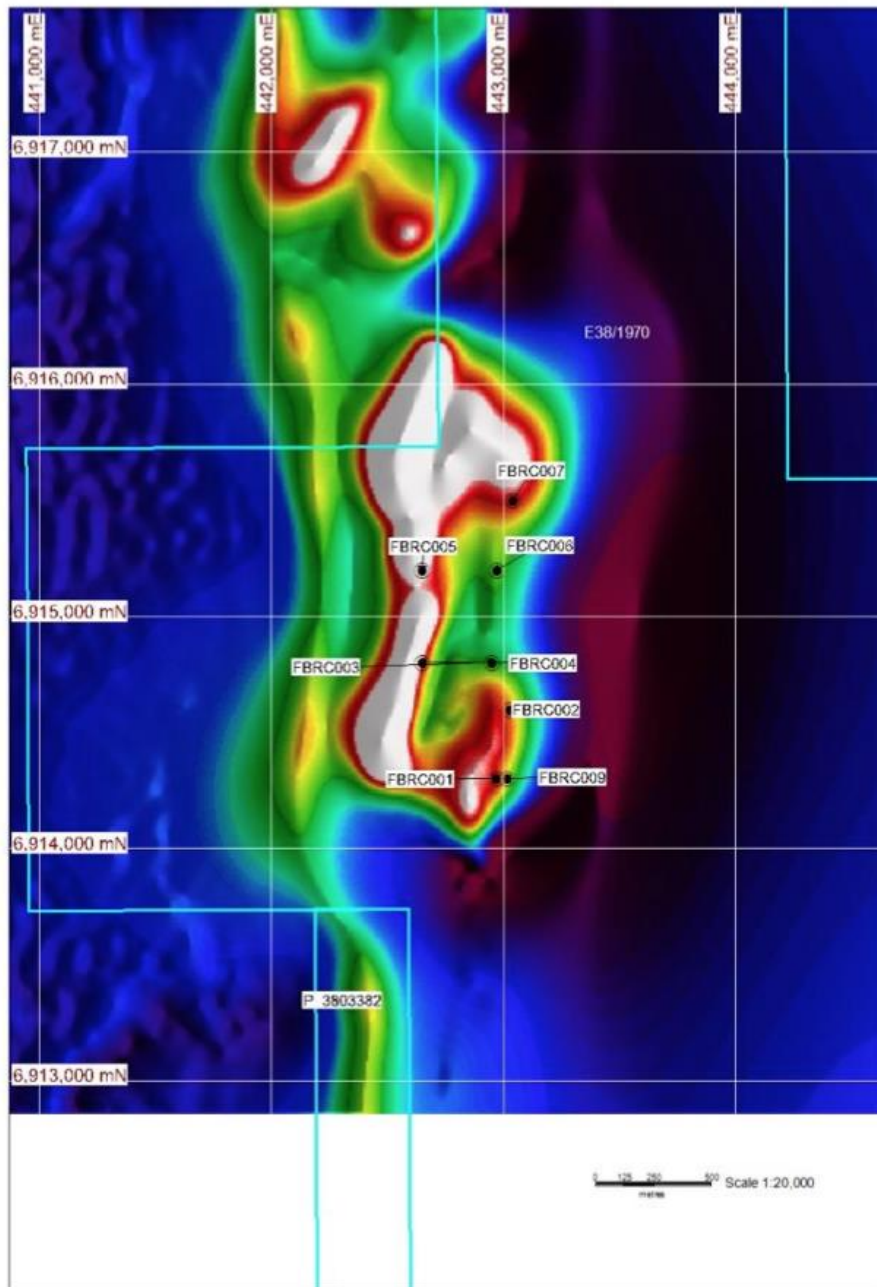
Technical assessment of the prospectively of the Myall Creek project for both Zambian style copper mineralization and the potential of Olympic Dam style IOCG mineralization at depth is ongoing.

With the recent \$2m target development to the north of Myall Creek by the Department of State Development for the Deep Targets Task Force, SER is awaiting the findings from this work and will be looking to gauge the impact the work has on regional exploration and targeting and specifically the Myall Creek project.

## **FALCON BRIDGE (SER 95%) E38/1970 WESTERN AUSTRALIA**

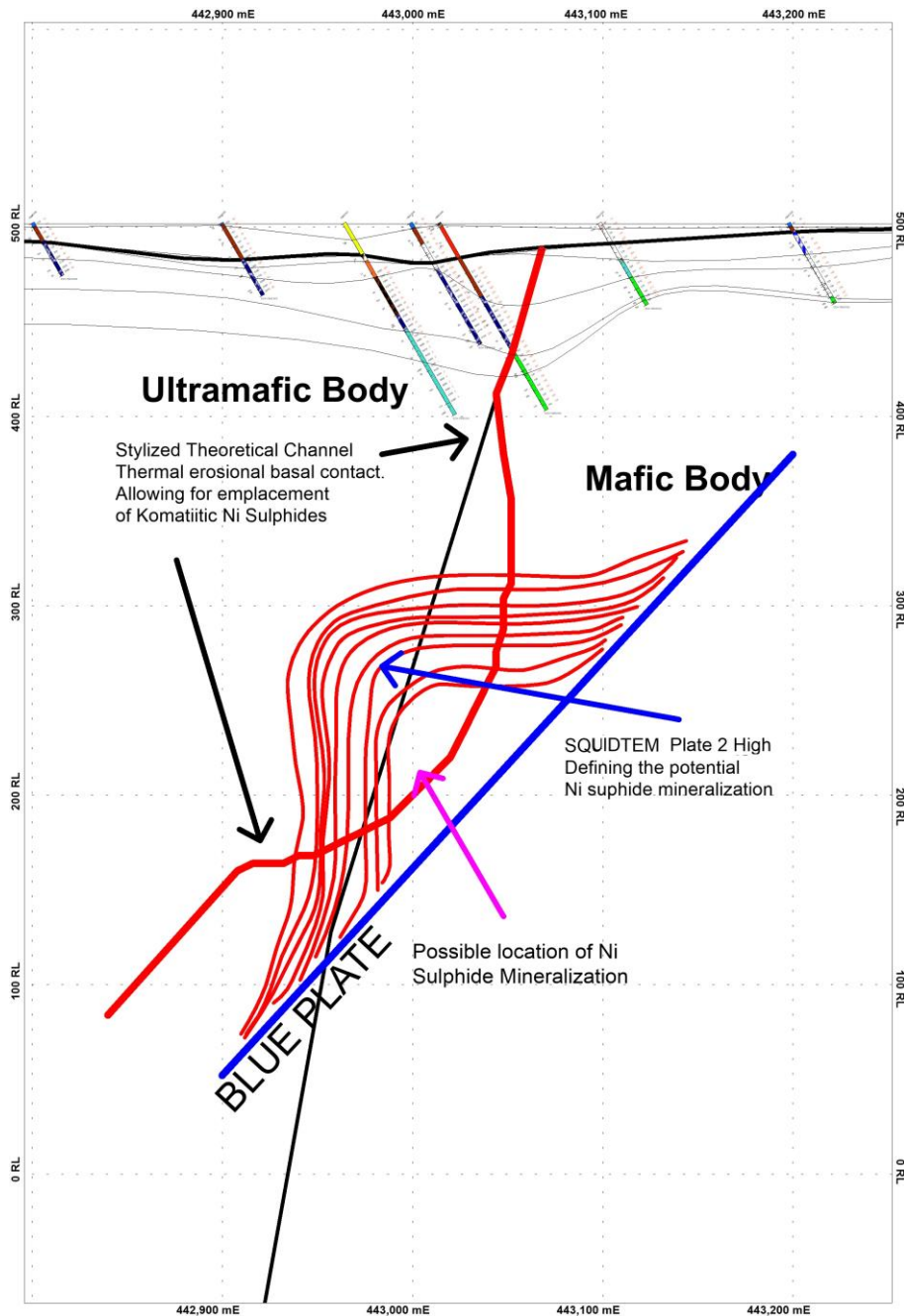
The Falcon Bridge tenement EL 38/1970 covers an area of 138.1 km<sup>2</sup> in the north eastern corner of Western Australia's Archaean Yilgarn Craton. The Falconbridge Ni sulphide project has undergone a significant review from geological, geochemical and geophysical perspective.

Located some 48km along/en echelon to an ultra-mafic bulge where recent drilling by others has encountered nickel sulphides. SER holds a 95% interest in E38-1970 on which is located a bulge in the ultramafic rock units (the TORO GRANDE anomaly) and shown on the below transient electromagnetic image (TEM).



**Magnetics with RC Collar Map**

As a result of data reviews by independent consulting geologists/geophysicists the following model of the Toro Grande mineralisation was published in SERs June 2014 quarterly (see map below) and shows, current drilling, the Squid TEM contours in red, the blue target plate defined by modelling the Squid contours and a stylized theoretical channel thermally eroded into underlying basalts by the overlying ultramafic sequence. This erosional channel allows for emplacement of Komatiitic nickel sulphides elsewhere in Western Australia, however the presence of massive nickel sulphides at Toro Grande is unproven and remains an exploration target. Previous drilling at Toro Grande included published results for 7 holes with intersected down hole widths of 12-39m with grades between .41 to .69% Ni which are clearly not massive sulphides.



## CASTERON (SER 5%) EL 5040 VICTORIA

As reported on 29 October 2009, SER entered into a sale and operating agreement with Encounter Minerals Pty Ltd. SER sold a 95% interest in the exploration licence for a 5% free carried interest for the first 5 years of the permit or the first \$600,000 of expenditure on the work program, whichever occurs first.

Encounter Minerals has completed a 5 hole drilling program. SER has been advised that the results have been encouraging, and further geophysics and geochemistry is planned. EL 5040 comprises 486 graticular sections and is located some 350 kilometres west of Melbourne, Victoria.



## CORPORATE UPDATE

SER's preparation for the demerger of our graphene subsidiary are well advanced and an announcement should be made shortly. In keeping with our strategy of spinning out single focus companies, we believe this strategy will give our shareholders substantial upside and will help underpin the value in SER. During the previous quarter a tax consultant was engaged to review the tax position and has confirmed over \$23 million of operating tax losses, which could be utilised on profits from the sale of any of our investments.

Our plan is to demerge 100% of our graphene entity, with SER retaining 20%. We are currently holding discussions with various funders and brokers and subject to further accounting and other advice 80% of the demerged Ionic Industries will be distributed pro-rata to SER shareholders at a record date, to be determined. Following this important first step our graphene technology company (Ionic Industries) will, subject to funding agreements, apply for listing in an IPO process.

The Company is well placed to receive substantial financial benefit from the demerger of the Uley Graphite project, with its successful capital raising and listing of Valence Industries. SER is the major shareholder with 21,788,907 shares, escrowed till January 2016.

SER will also benefit from a 1.5% royalty from any graphite sales of Uley graphite by Valence Industries.

## INTERESTS IN MINING TENEMENTS

Mining Tenement	Location	Beneficial Percentage held	Interest acquired/farm-in during the quarter	Interest disposed/farm-out during the quarter
EL 5010	South Australia	75%	-	-
EL 5011	South Australia	50%	-	-
E38/1970	Western Australia	95%	-	-
EL 5040	Victoria	5%	-	-



**Mark Muzzin**  
CEO

### **Risk Factors**

*Various statements in this release constitute statements relating to intentions, future acts and events. Such statements are generally classified as forward looking statements and involve known and unknown risks, expectations, uncertainties and other important factors that could cause those future acts, events and circumstances to differ from the way or manner in which they are expressly or impliedly portrayed herein.*

*Furthermore, exploration for oil, gas and minerals is speculative, expensive and subject to a wide range of risks. Individual investors should consider these matters in light of their personal circumstances (including financial and taxation affairs) and seek professional advice from their accountant, lawyer or other professional advisor as to the suitability for them of an investment in the Company.*

# Appendix 5B

## Mining exploration entity quarterly report

Introduced 1/7/96. Origin: Appendix 8. Amended 1/7/97, 1/7/98, 30/9/2001, 01/06/10.

Name of entity

STRATEGIC ENERGY RESOURCES LIMITED

ABN

14 051 212 429

Quarter ended ("current quarter")

31 MARCH 2015

### Consolidated statement of cash flows

	Current quarter \$A'000	Year to date (9 months) \$A'000
<b>Cash flows related to operating activities</b>		
1.1 Receipts from product sales and related debtors	-	-
1.2 Payments for		
(a) exploration and evaluation	(60)	(256)
(b) development	-	-
(c) production	-	-
(d) administration	(65)	(442)
(e) bank guarantee	-	-
1.3 Dividends received	-	-
1.4 Interest and other items of a similar nature received	9	54
1.5 Interest and other costs of finance paid	-	-
1.6 Income taxes paid	-	-
1.7 Demerger Implementation Fees	-	-
<b>Net Operating Cash Flows</b>	<b>(116)</b>	<b>(644)</b>
<b>Cash flows related to investing activities</b>		
1.8 Payment for purchases of:		
(a) prospects	-	-
(b) equity investments	-	(200)
(c) other fixed assets	-	7
1.9 Proceeds from sale of:		
(a) prospects (including deposits received)	-	-
(b) equity investments	-	-
(c) other fixed assets	-	-
1.10 Loans to other entities	-	-
1.11 Loans repaid by other entities	-	-
1.12 Research and Development – Monash University	(51)	(204)
<b>Net investing cash flows</b>	<b>(51)</b>	<b>(397)</b>
1.13 Total operating and investing cash flows (carried forward)	(167)	(1,041)

+ See chapter 19 for defined terms.

Appendix 5B  
Mining exploration entity quarterly report

1.13	Total operating and investing cash flows (brought forward)	(167)	(1,041)
	<b>Cash flows related to financing activities</b>		
1.14	Proceeds from issues of shares, options, etc.	-	-
1.15	Proceeds from sale of forfeited shares	-	-
1.16	Proceeds from borrowings	-	-
1.17	Repayment of borrowings	-	-
1.18	Dividends paid	-	-
1.19	Other (provide details if material)	-	-
	<b>Net financing cash flows</b>	-	-
	<b>Net increase (decrease) in cash held</b>	<b>(167)</b>	<b>(1,041)</b>
1.20	Cash at beginning of quarter/year to date	1,567	2,441
1.21	Exchange rate adjustments to item 1.20	-	-
1.22	<b>Cash at end of quarter</b>	<b>1,400</b>	<b>1,400</b>

**Payments to directors of the entity and associates of the directors**  
**Payments to related entities of the entity and associates of the related entities**

	Current quarter \$A'000	
1.24	Aggregate amount of payments to the parties included in item 1.2	103
1.25	Aggregate amount of loans to the parties included in item 1.10	-

1.26 Explanation necessary for an understanding of the transactions

Director's fees and consulting fees paid during the March 2015 quarter.

**Non-cash financing and investing activities**

2.1 Details of financing and investing transactions which have had a material effect on consolidated assets and liabilities but did not involve cash flows

Nil

2.2 Details of outlays made by other entities to establish or increase their share in projects in which the reporting entity has an interest

Nil

+ See chapter 19 for defined terms.

### Financing facilities available

Add notes as necessary for an understanding of the position.

	Amount available \$A'000	Amount used \$A'000
3.1 Loan facilities	-	-
3.2 Credit standby arrangements	-	-

### Estimated cash outflows for next quarter

	\$A'000
4.1 Exploration and evaluation	50
4.2 Development	-
4.3 Production	-
4.4 Administration	150
<b>Total</b>	<b>200</b>

### Reconciliation of cash

Reconciliation of cash at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts is as follows.

	Current quarter \$A'000	Previous quarter \$A'000
5.1 Cash on hand and at bank	300	217
5.2 Deposits at call	1,100	1,350
5.3 Bank overdraft	-	-
5.4 Other (provide details)	-	-
<b>Total: cash at end of quarter</b> (item 1.22)	<b>1,400</b>	<b>1,567</b>

### Changes in interests in mining tenements

	Tenement reference	Nature of interest (note (2))	Interest at beginning of quarter	Interest at end of quarter
6.1	Interests in mining tenements relinquished, reduced or lapsed	-	-	-
6.2	Interests in mining tenements acquired or increased	-	-	-

+ See chapter 19 for defined terms.

### Issued and quoted securities at end of current quarter

Description includes rate of interest and any redemption or conversion rights together with prices and dates.

	Number issued	Number quoted	Issue price per security (see note 3) (cents)	Amount paid up per security (see note 3) (cents)
7.1 <b>Preference securities</b> (description)				
7.2 Changes during quarter (a) Increases through issues (b) Decreases through returns of capital, buy-backs, redemptions				
7.3 <b>+Ordinary securities</b>	348,622,501	348,622,501		Fully paid
7.4 Changes during quarter (a) Increases through issues (b) Decreases through returns of capital, buy-backs, redemptions				
7.5 <b>+Convertible debt securities</b> (description)				
7.6 Changes during quarter (a) Increases through issues (b) Decreases through returns of capital, buy-backs, redemptions				
7.7 <b>Options</b> (description and conversion factor)	27,000,000	-	<i>Exercise price</i> \$0.0452	<i>Expiry Date</i> 25 December 2016
7.8 Issued during quarter				
7.9 Exercised during quarter				
7.10 Cancelled during quarter				
7.11 <b>Debentures</b> (totals only)				
7.12 <b>Unsecured notes</b> (totals only)				

+ See chapter 19 for defined terms.

## Compliance statement

- 1 This statement has been prepared under accounting policies which comply with accounting standards as defined in the Corporations Law or other standards acceptable to ASX (see note 4).
- 2 This statement does give a true and fair view of the matters disclosed.

Sign here:



Date: 17 APRIL 2015

Print name: MELANIE LEYDIN  
(Company Secretary)

## Notes

- 1 The quarterly report provides a basis for informing the market how the entity's activities have been financed for the past quarter and the effect on its cash position. An entity wanting to disclose additional information is encouraged to do so, in a note or notes attached to this report.
- 2 The "Nature of interest" (items 6.1 and 6.2) includes options in respect of interests in mining tenements acquired, exercised or lapsed during the reporting period. If the entity is involved in a joint venture agreement and there are conditions precedent which will change its percentage interest in a mining tenement, it should disclose the change of percentage interest and conditions precedent in the list required for items 6.1 and 6.2.
- 3 **Issued and quoted securities.** The issue price and amount paid up is not required in items 7.1 and 7.3 for fully paid securities.
- 4 The definitions in, and provisions of, *AASB 1022: Accounting for Extractive Industries* and *AASB 1026: Statement of Cash Flows* apply to this report.
- 5 **Accounting Standards** ASX will accept, for example, the use of International Accounting Standards for foreign entities. If the standards used do not address a topic, the Australian standard on that topic (if any) must be complied with.

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