



# KOOKABURRA GULLY GRAPHITE

**In South Australia's Eyre Peninsula  
a world class high grade flake  
graphite province**

***Dr A. John Parker  
November 2013***

**LINCOLN MINERALS LIMITED  
ASX : LML  
[www.lincolnminerals.com.au](http://www.lincolnminerals.com.au)**



Kookaburra Gully Trench 4  
12m @ 20.5% graphitic carbon



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***It is emphasised that Exploration Target tonnage and grade estimates are entirely conceptual in nature and it is uncertain if further exploration will result in the estimation of a Mineral Resource.***

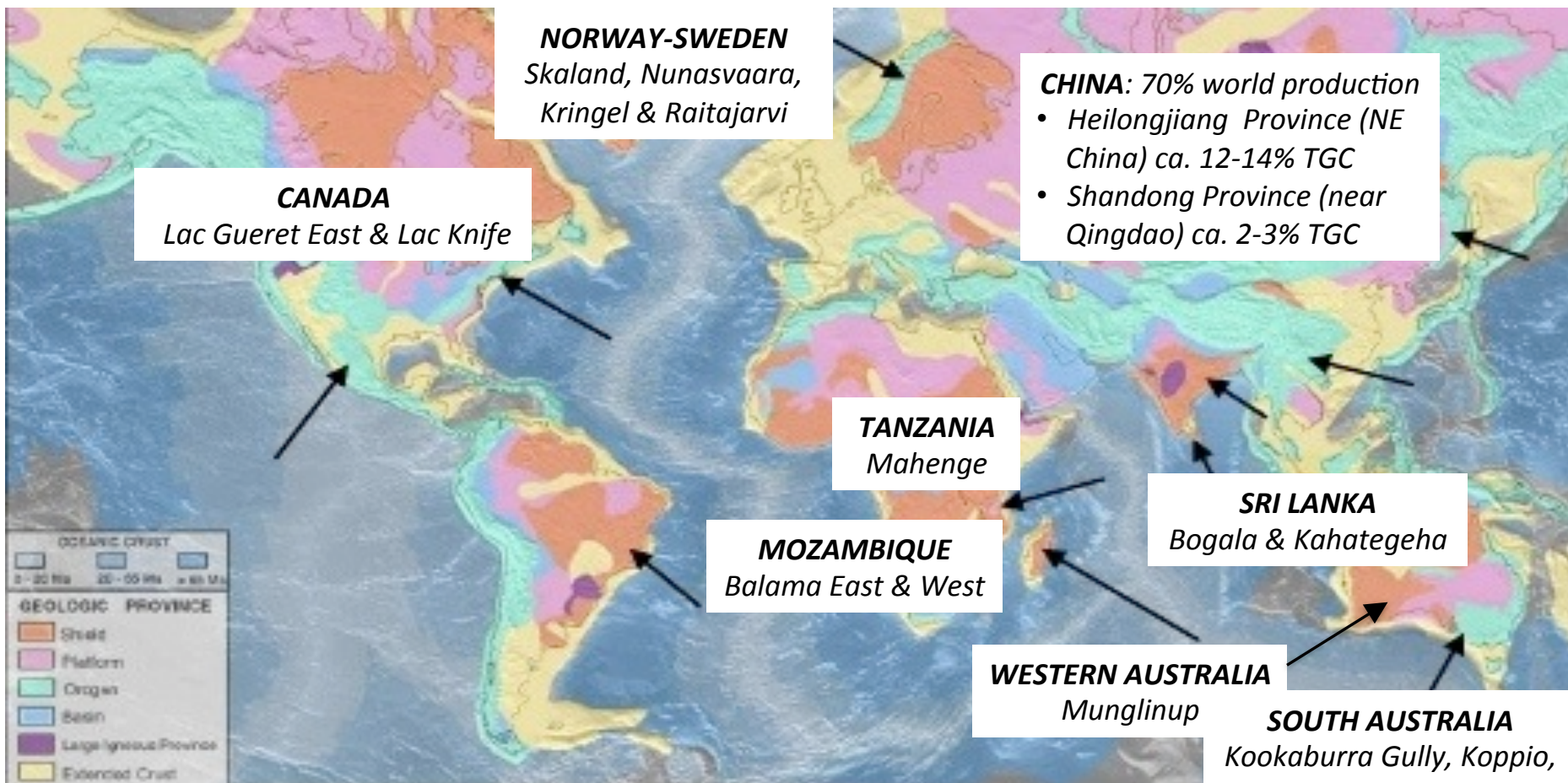
# Presentation outline

1. South Australia's Eyre Peninsula – host to 5 Global Top 20 graphite resources
2. Lincoln Minerals Graphite projects
3. Kookaburra Gully High Grade Flake Graphite Resource
4. Project timelines
5. References



# Global Graphite Resources

*(Graphite Resource Grades > 10% TGC)*



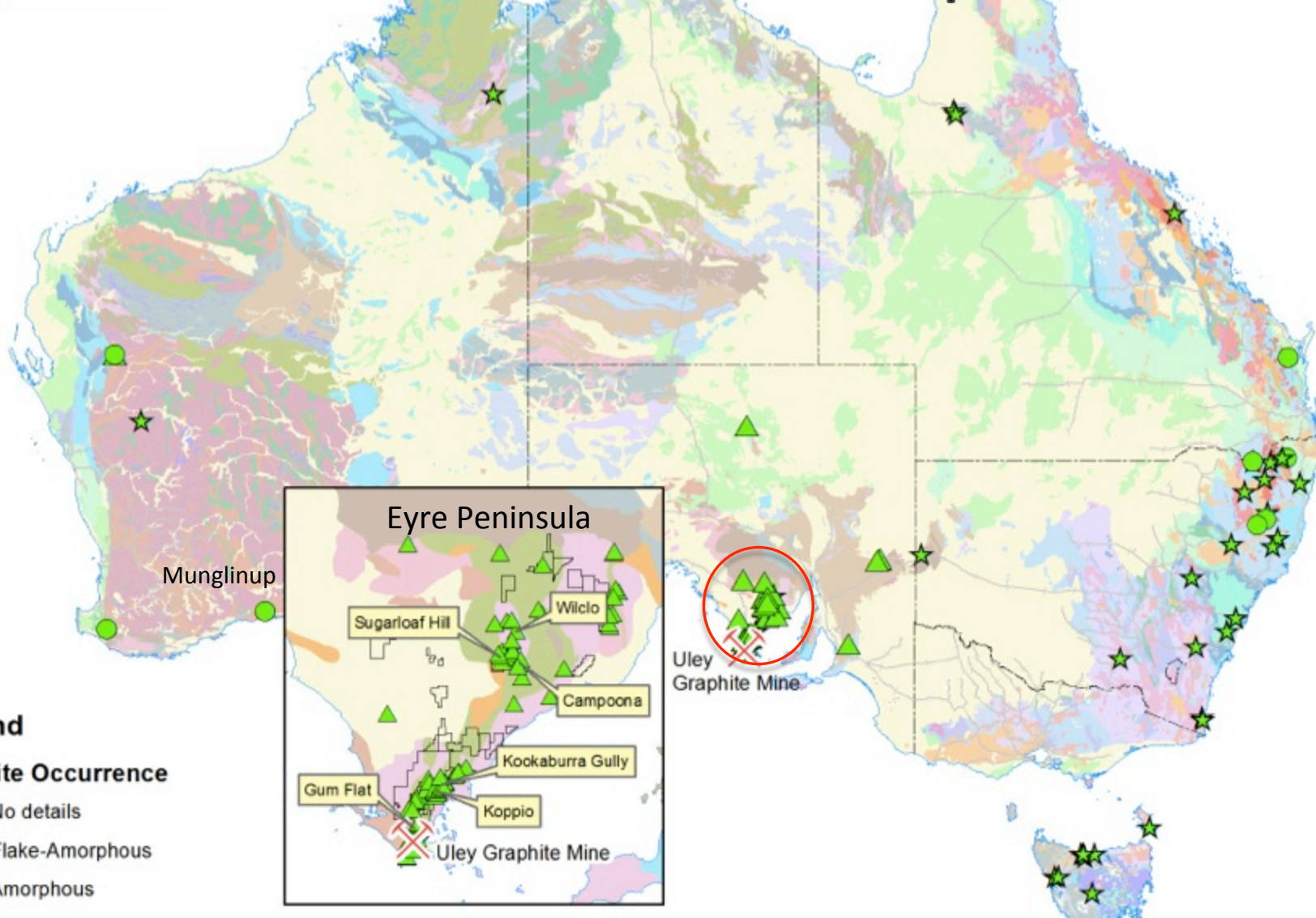
Arrows are pointing to major graphite occurrences around the world

Source: USGS, IAS

Map Source: Graphite Sector Overview, May 2012, Industrial Alliance Securities Inc



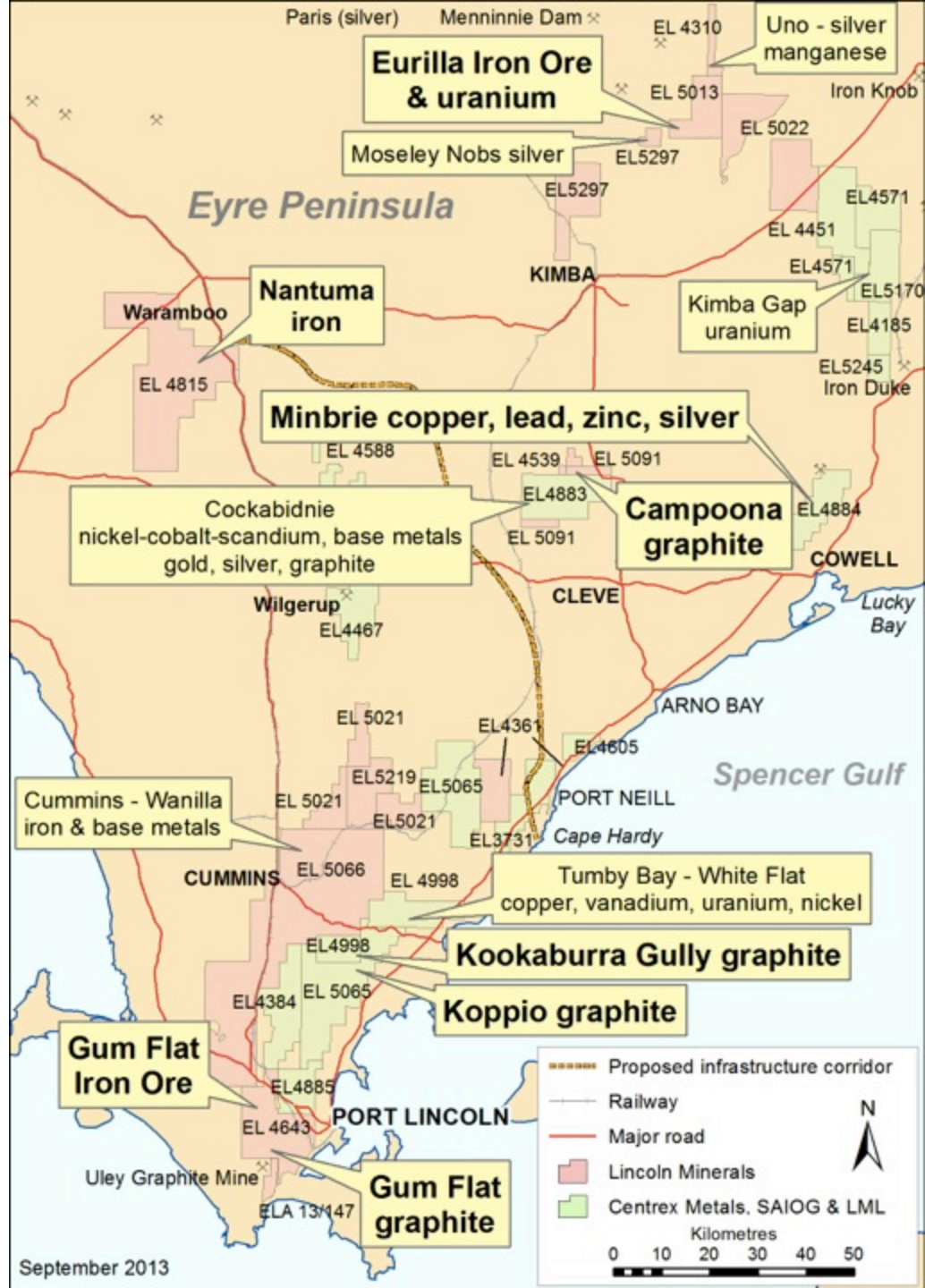
# South Australia's Eyre Peninsula Australia's Premier Graphite Province





# Projects

- Dominant position on Eyre Peninsula
  - tenements totalling 4,364 km<sup>2</sup>
  - proven world class iron ore & flake graphite province
  - close to infrastructure
- High grade JORC Mineral Resources with significant exploration upside in a region with a long history of iron ore & graphite production
- Lincoln Minerals has 5 graphite projects on Eyre Peninsula



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*Historic Koppio Graphite Mine*





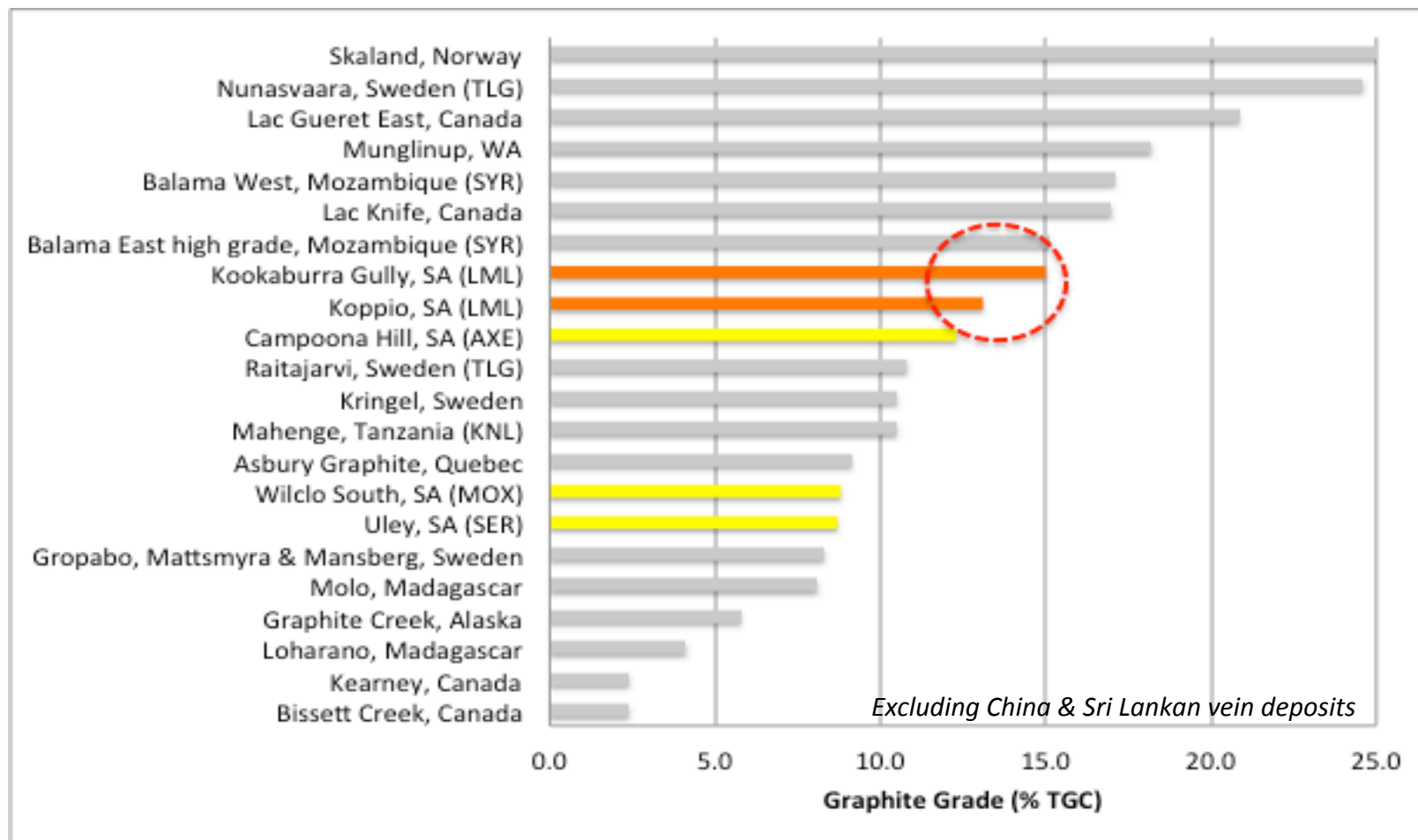
# Lincoln has 5 Graphite Projects

Project	Current Status	2013 - 2014
<b>KOOKABURRA GULLY</b>	<ul style="list-style-type: none"> <li>Indicated &amp; Inferred JORC Mineral Resource</li> <li>2.25 Mt @ 15.0% TGC</li> <li>Scoping studies completed</li> </ul>	<ul style="list-style-type: none"> <li>Detailed metallurgical studies</li> <li>Customer and market development</li> <li>Approval to mine</li> <li>Trial mining &amp; pilot plant</li> <li>D &amp; C full process plant</li> </ul>
<b>KOOKABURRA GULLY EXTENDED</b> (Immediate target)	<ul style="list-style-type: none"> <li>EM Survey completed</li> <li>Approval to drill received</li> </ul>	<ul style="list-style-type: none"> <li>Drilling &amp; JORC Resource 2014</li> <li>Exploration Target 7-20Mt @ 10-15% TGC</li> </ul>
<b>KOPPIO GRAPHITE MINE</b> (Target)	<ul style="list-style-type: none"> <li>EM Survey completed</li> <li>Existing Inferred Mineral Resource 57Kt @ 13.1% TGC</li> </ul>	<ul style="list-style-type: none"> <li>Drilling &amp; JORC Resource 2014</li> </ul>
<b>GUM FLAT (ULEY)</b> (Long-term target)	<ul style="list-style-type: none"> <li>Adjacent Uley Graphite Mine</li> </ul>	<ul style="list-style-type: none"> <li>Exploration targeted 2014</li> </ul>
<b>CAMPOONA SYNCLINE</b> (Long-term target)	<ul style="list-style-type: none"> <li>EM Survey completed</li> <li>Adjacent Archer Exploration's Campoona Hill</li> </ul>	<ul style="list-style-type: none"> <li>Exploration targeted 2014</li> </ul>

**Targeting resource expansion & early production across all 5 graphite projects**



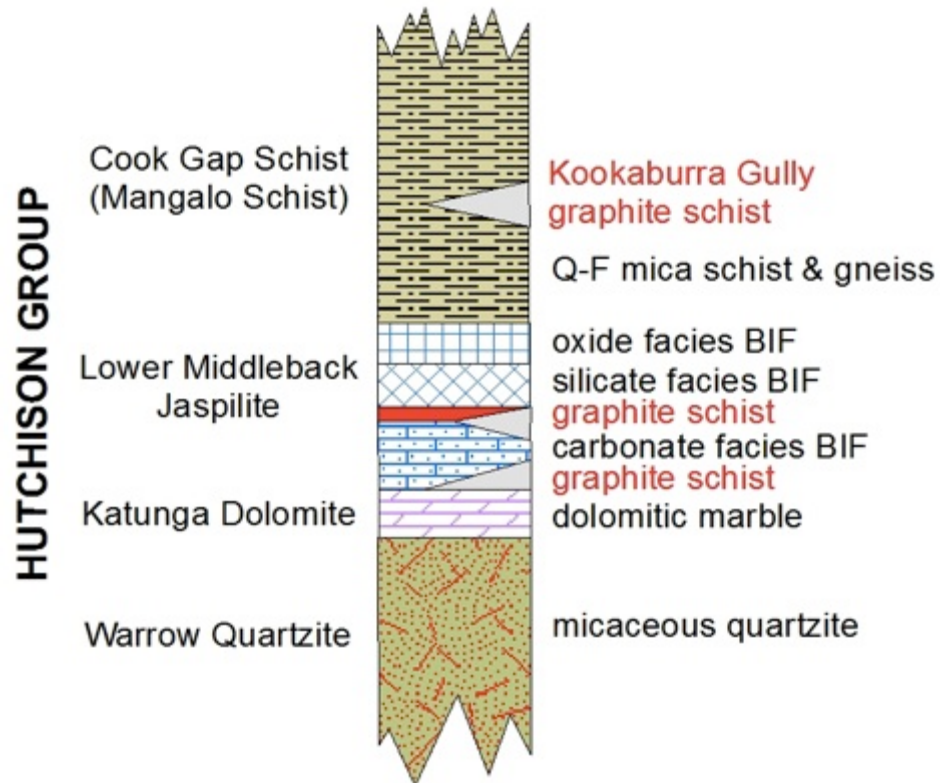
# Kookaburra Gully is a Top 10 Global Graphite Resource



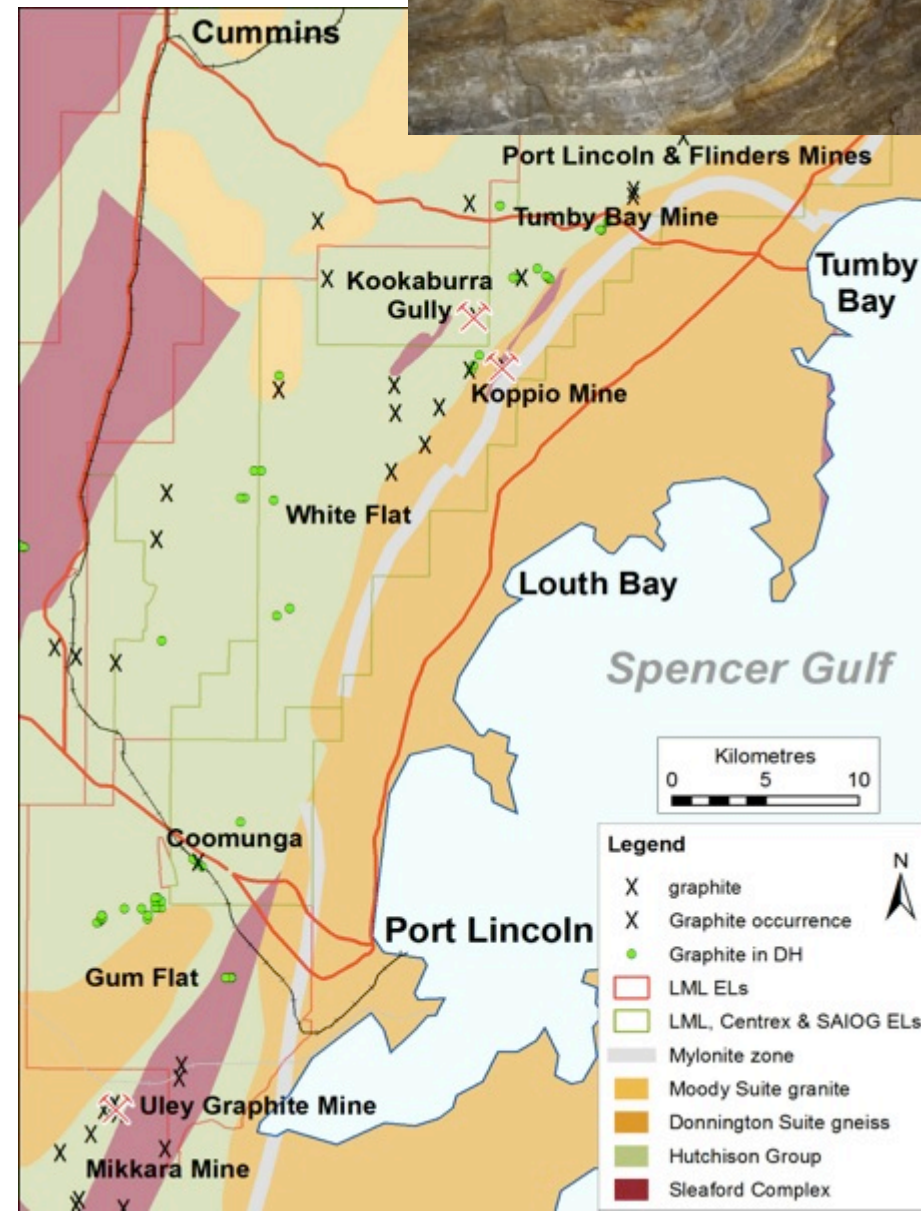
*“Kookaburra Gully is a world class deposit capable of delivering near term production at low cost; and there is significant potential as we explore major consistent EM anomalies immediately to the south of this resource.”*

# Eyre Peninsula Geology

- Graphite occurs within Early Proterozoic metamorphic sequence of quartzite, banded iron formation, marble, schist & gneiss
- Upper amphibolite ( to granulite) facies
- Multiply deformed folded schist sequence



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# Kookaburra Gully

Trench 4 (looking west)  
20m @ 16.3% C  
including  
12m @ 20.5% C

Identified by Pancontinental Mining in  
early-mid 1980's  
Several trenches excavated north and  
south of outcropping graphite unit





# Kookaburra Gully Project Summary

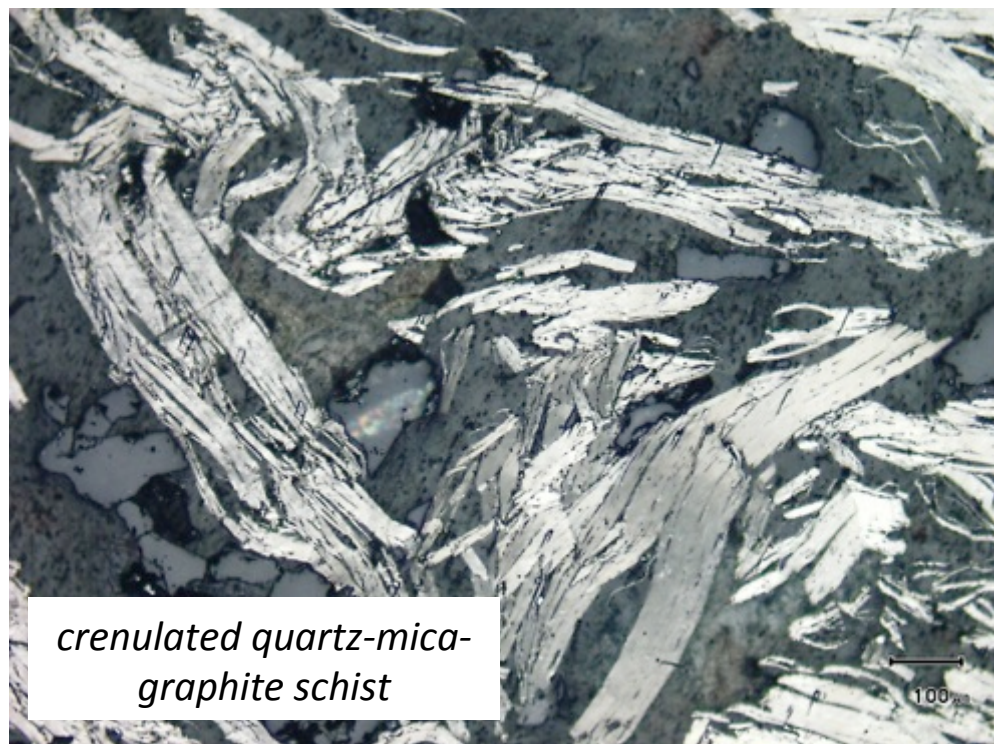
- **World class metamorphic flake graphite resource**
- Drilling undertaken by Lincoln Minerals in January 2013
- JORC Mineral Resource:
  - **2.25 Mt Indicated and Inferred at 15% TGC** (5% TGC cutoff)
  - or 3.16 Mt Indicated and Inferred at 11.5% TGC (2% TGC cutoff)
- Highly sought after **premium flake graphite product** produced at grades >93% TGC without chemical leaching
- Petrology - average size graphite flakes 350-500 micron
- Metallurgy – up to 98% TGC after **4 stage flotation** with 75-98% recovery
- Competitive on quality, grade, cost and economics
- **Proximity to infrastructure** and competitive transport options
- **Concept mine plan and Mining Lease Application** in preparation (AMC Consultants and Parsons Brinckerhoff)

*JORC = JORC Code, 2004    Mt = million tonnes    TGC = Total Graphitic Carbon*

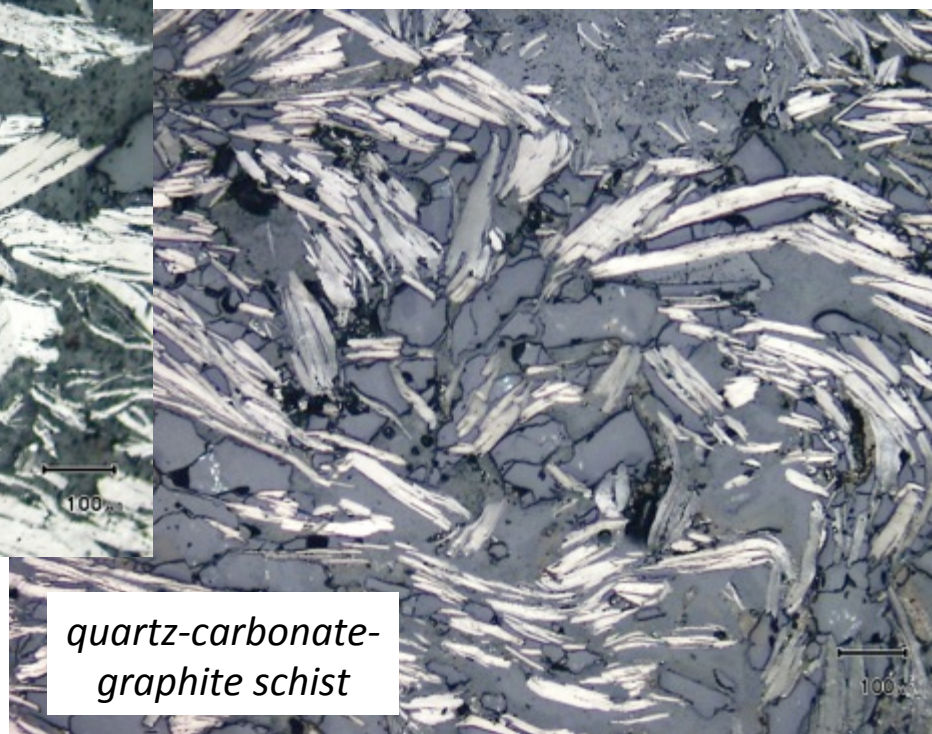


# Kookaburra Gully Geology

- Graphite flakes disseminated in quartzo-feldspathic mica  $\pm$  sillimanite  $\pm$  garnet  $\pm$  carbonate schist with clay near surface replacing muscovite mica
- Graphite flake length range 50-1500 $\mu$ m (average 350-500 $\mu$ m)



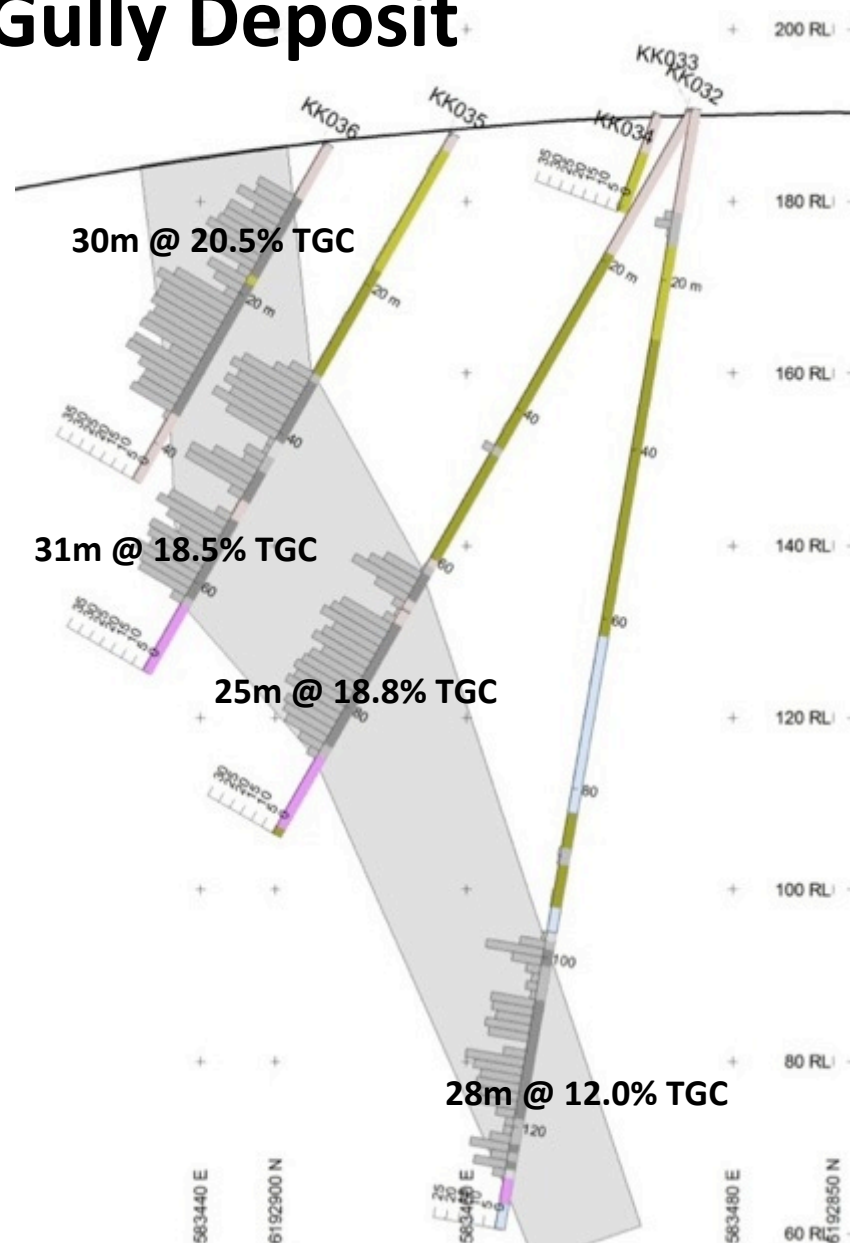
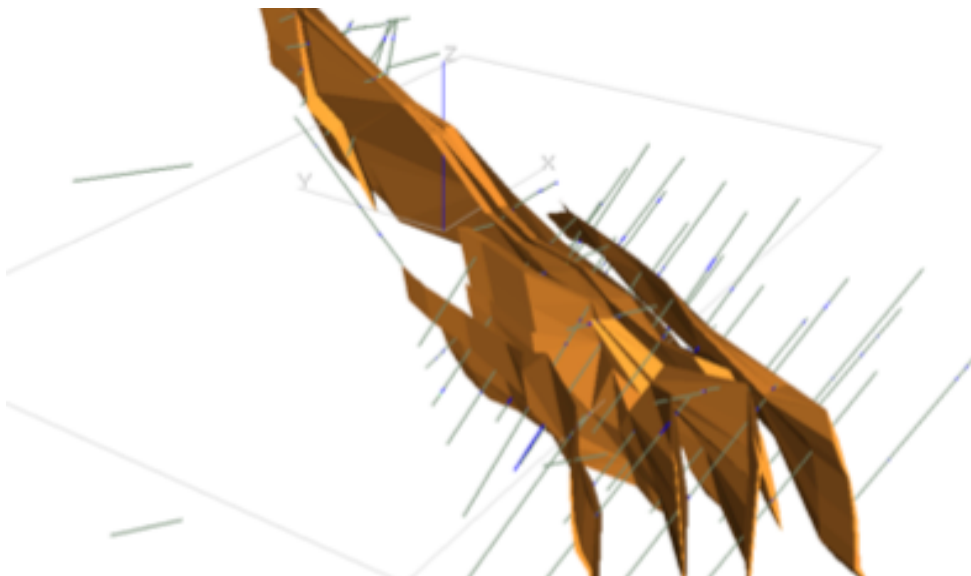
100  $\mu$ m





# Kookaburra Gully Deposit

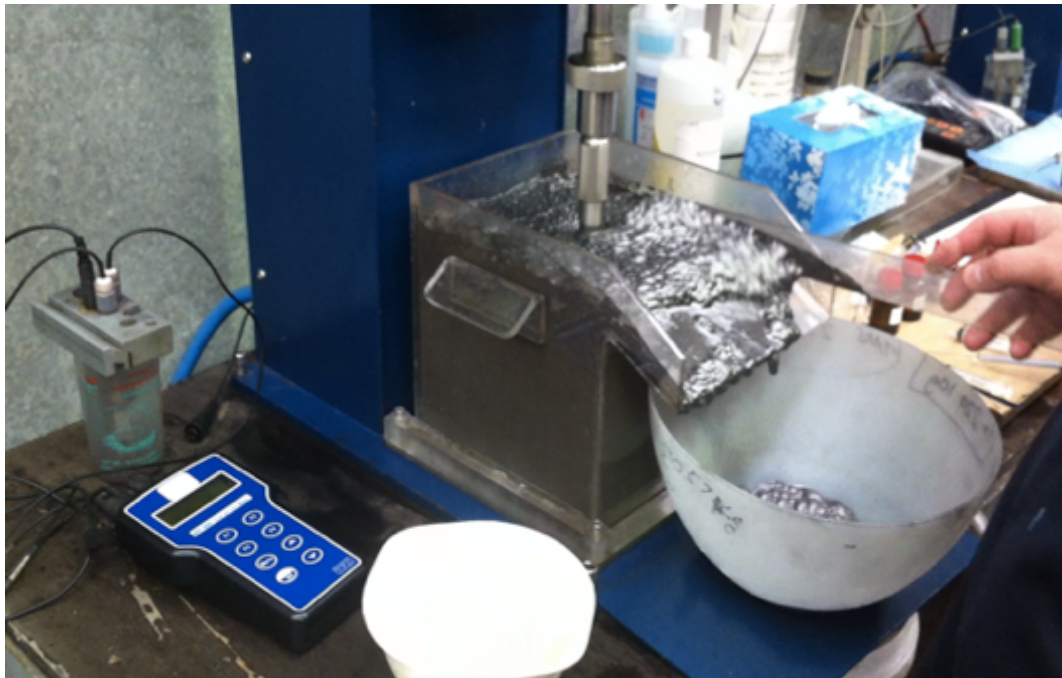
- Up to 40% total graphitic carbon (TGC)
- Mineralisation extends from surface to at least 125m below ground level & strike length of at least 500m
- Simple open-cut mining operation
- Easy to mine



# Metallurgical Studies in Progress

## ALS-Metallurgy – July-Nov 2013 (ongoing – in progress)

- Rougher flotation plus regrind and 4 stages of cleaning to optimise flowsheet
- Aircore drill samples produced 93-96% C concentrates with 91-98% recovery but only 10% flake at +106 micron due to samples being ground down during drilling
- Surface clay-rich trench samples => 10-25% flake and 98% C at +150 micron but only 75% recovery



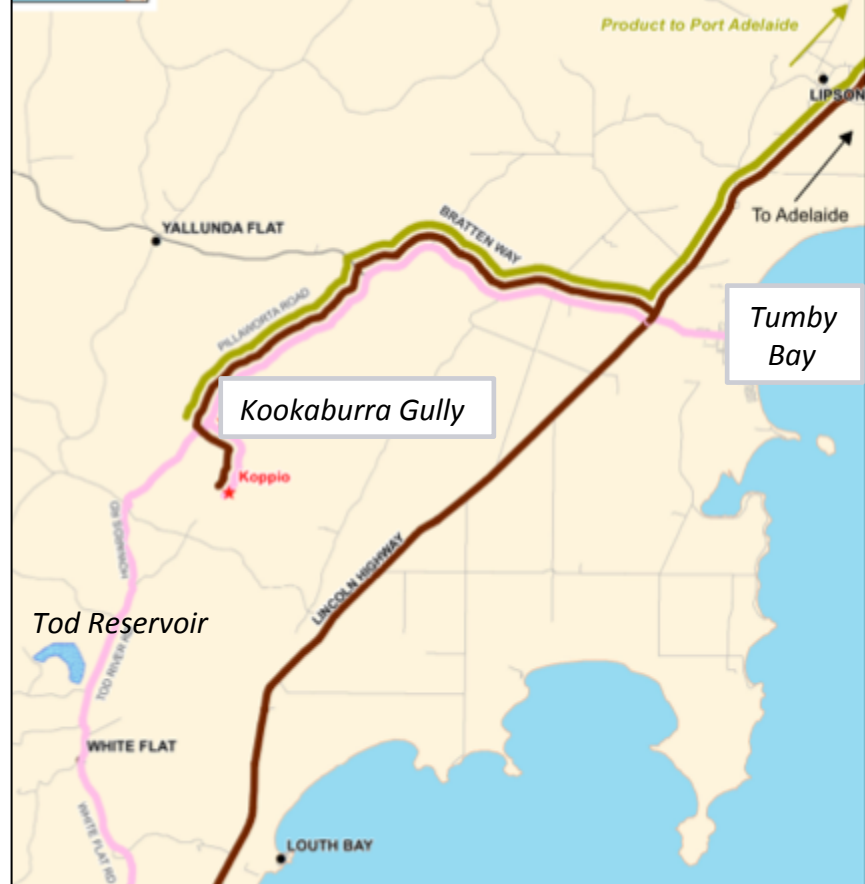


# Kookaburra Gully

## Conceptual Mining Operation

- Small open pit & process plant (cf Uley Graphite Mine) = small environ footprint
- Process 200,000-400,000 tpa ore
- Produce 24,000-55,000 tpa of high grade (93-98% TGC) graphite concentrate
- No major groundwater issues
- Water – pipeline from Tod Reservoir (10 km) with small desalination plant for final product cleaning
- Adjacent to main powerline but no substation so will initially generate power onsite (2-4 MW)
- Transport in containers to Port Adelaide for shipping (ca. \$100 per tonne)
- Mining Lease Application in prep by Parsons Brinckerhoff

*Internationally cost competitive*



Capex & Opex (excluding mining & transport)

	200,000 tonnes ore per annum	400,000 tonnes ore per annum
<b>Capex</b>	\$37.9m	\$48.5m
<b>Recovery</b>	<b>Processing Cost</b>	
80%	\$378	\$307
90%	\$338	\$276

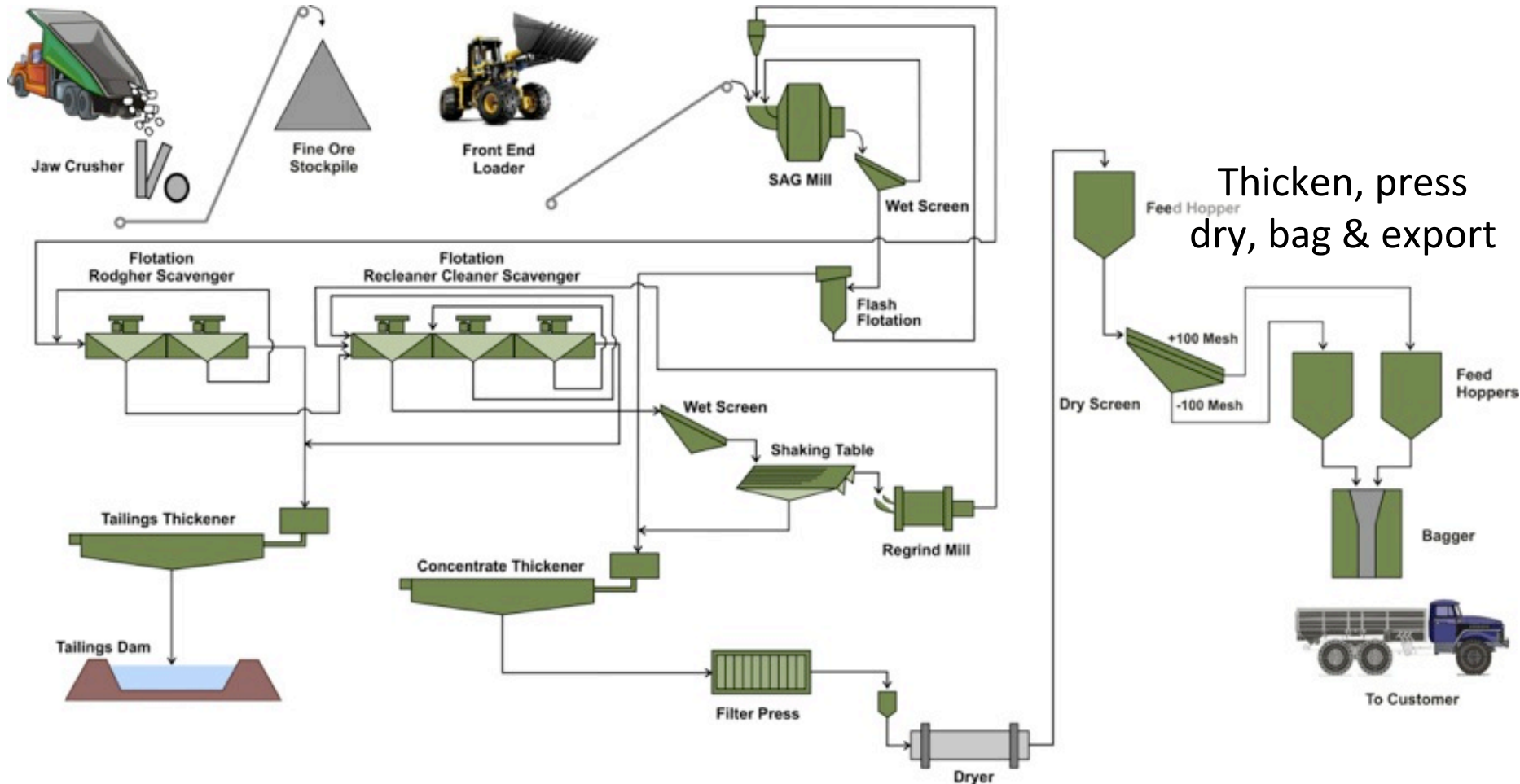


# Simple Low Cost Processing

## 4 stage flotation

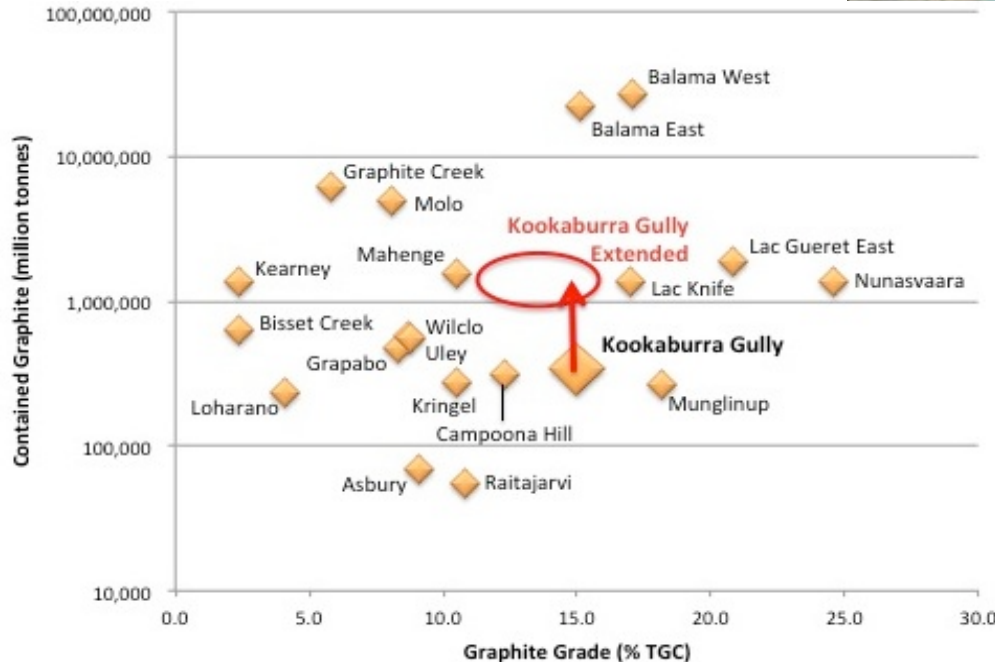
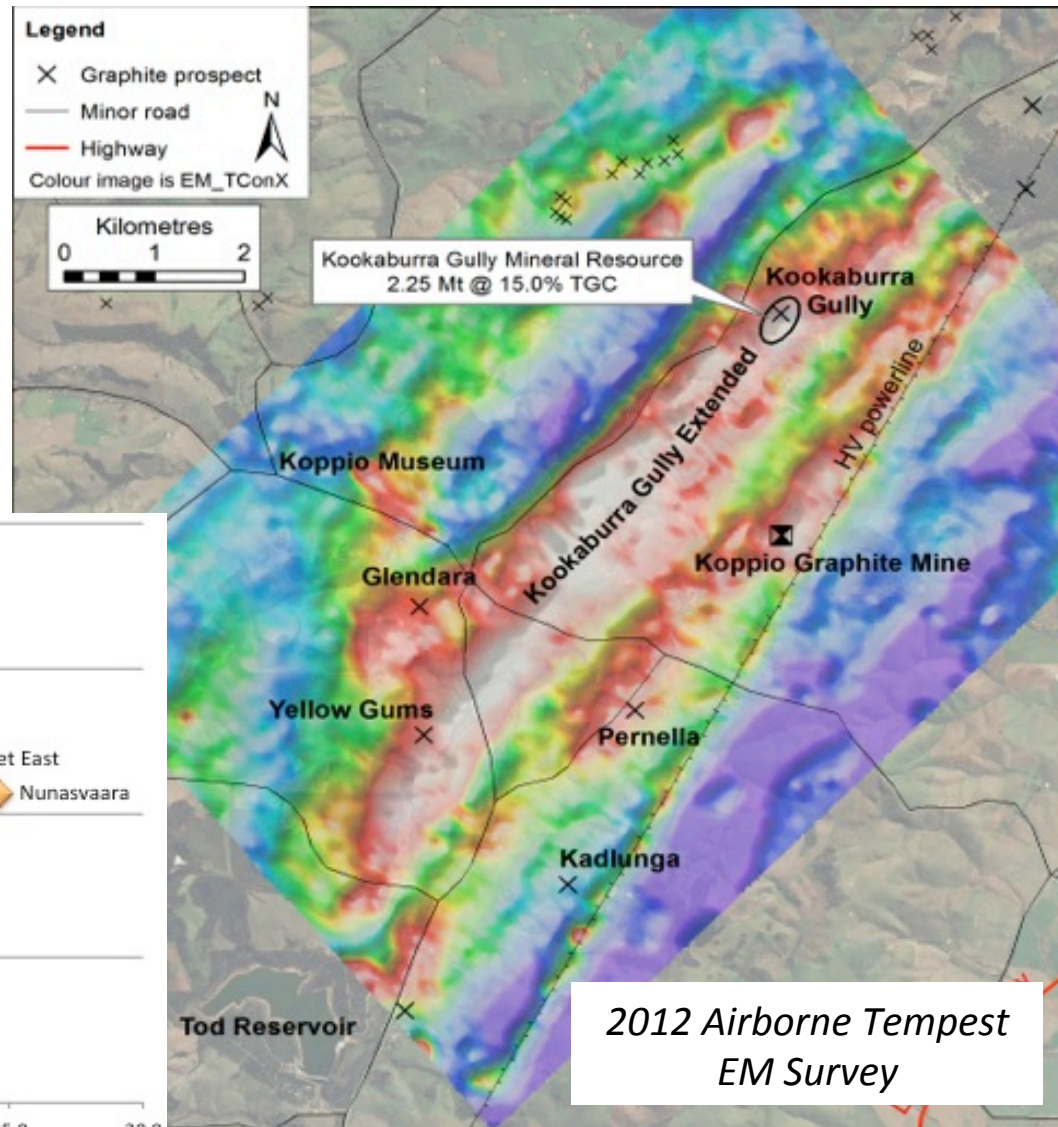
incl. flash flotation, regrind as needed  
then rougher, scavenger & cleaner flotation cells

Mine, crush  
screen & mill



# Significant Exploration Upside

- >4.5km EM anomaly extending SW from Kookaburra Gully
- Exploration Target\*\* of 7 – 20 Mt at Kookaburra Gully Extended
- Other significant EM anomalies:
  - Koppio Mine, Glendara & Pernella
- Drilling program approved



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# Summary Timeline – *Mine within 2 Years\**

	2013 H2	2014 H1	2014 H2	2015 H1	2015 H2
<b>Kookaburra Gully Graphite</b>	Metallurgy & Marketing	(Kookaburra Extended Drilling)	Secure Sales Contracts		Mine & Export Graphite
		Trial Mining Pilot Plant			
	Mining Lease Application & PEPR		Build Full Scale Process Plant		

Aim is to take the Kookaburra Gully graphite project to critical development and commercialisation milestones over next 9-15 months:

- Metallurgy and marketing for commitment from end-user customers
- Undertake drilling at Kookaburra Gully Extended
- Obtain Mining Lease and other Government/Community approvals 2014
- Build a Pilot Processing Plant (ca. \$1.97m) and undertake trial mining late 2014
- **Full scale plant targeted for 2015**

*\* Subject to Government approvals, finance and economic market conditions  
PEPR = Program for Environmental Protection & Rehabilitation*





**THANKYOU**

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# References

This presentation has been prepared by Lincoln Minerals Limited ("LML") as an aid to a spoken explanation. The information contained in this presentation is based on a number of public statements, Quarterly Reports and ASX releases made by LML:

## References

Lincoln Minerals, 2012. The next big graphite player on South Australia's Eyre Peninsula. *Lincoln Minerals Limited, ASX Announcement* 19 March 2012.

Lincoln Minerals, 2012. Scoping study completed for Eyre Peninsula graphite. *Lincoln Minerals limited, ASX Announcement* 19 September 2012.

Lincoln Minerals, 2013. Significant high grade graphite intercepts identified at world-class Eyre Peninsula project in SA. *Lincoln Minerals Limited, ASX Announcement* 19 February 2013.

Lincoln Minerals, 2013. Maiden high-grade flake graphite Indicated Resource for Lincoln's world-class Kookaburra Gully project in South Australia's Eyre Peninsula. *Lincoln Minerals Limited, ASX Announcement* 26 March 2013.

Lincoln Minerals, 2013. \$2m Eyre Peninsula pilot graphite plant by year's end for first global product testing: scoping study backing. *Lincoln Minerals Limited, ASX Announcement* 8 April 2013.



# Kookaburra Gully Resources

## *Kookaburra Gully Mineral Resource at 5% TGC lower cut-off grade*

Mineral Resource Classification	Tonnage (Mt)	Average Grade (% TGC)	Contained Graphite (tonnes)	Density (g/cc)
Indicated	1.56	14.3	223,000	2.56
Inferred	0.70	16.5	115,000	2.48
<b>TOTAL (&gt;5% TGC)</b>	<b>2.25</b>	<b>15.0</b>	<b>338,000</b>	<b>2.53</b>

## *Kookaburra Gully Mineral Resource at 2% TGC lower cut-off grade*

<b>Combined Indicated and Inferred JORC Resource of 3.15Mt @ 11.49% TGC</b>				
JORC Resource Category	Resource Tonnes	Average Grade (% TGC)	Contained Graphite (tonnes)	Density (g/cc)
Indicated	2,180,154	11.04	240,741	2.56
Inferred	976,264	12.49	121,897	2.55
<b>TOTAL (&gt;2% TGC)</b>	<b>3,156,418</b>	<b>11.49</b>	<b>362,638</b>	<b>2.56</b>

*Mt = million tonnes TGC = Total Graphitic Carbon*

*NB tonnages may not add up exactly as shown due to rounding of significant figures*