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General Manager  
The Company Announcements Office  
Australian Securities Exchange

## **EXCEPTIONAL COARSE FLAKE GRAPHITE RECORDED AT ALL OF THE FIRST THREE AREAS TESTED AT WILDHORSE PLAINS**

### **Highlights**

- Coarse and ultra coarse crystalline graphite recorded in all of the first three areas tested on Wildhorse Plains.
  - Campoona Graphite Shaft samples recorded 30% crystalline graphite ranging to 250µm (US 60 mesh and classified as Large flake graphite) with an average length of 100µm (US 140 mesh).
  - Campoona South recorded 15 to 20% crystalline graphite ranging to 300µm (US 50 mesh and classified as Extra Large flake graphite) with an average length of 250µm (US60 mesh) within graphite clots up to 4mm in length.
  - Council pit recorded 15 to 20% crystalline graphite with an average length of 300µm (US50 mesh) and maximum flake size of 1,000µm (US 18 mesh classified as Super Large graphite flake graphite).
- The commercial price realised for graphite is based on size and purity. Large flake graphite (>180µm or US80 mesh) is in high and growing demand for use in fuel cells and Lithium-ion batteries and currently trades for >US\$2,500/t.
- A detailed close-spaced airborne Electro-magnetic geophysical survey will be flown over the Campoona South area in July 2011. The survey will follow-up a historic wide-spaced survey that indicated up to 8km of strike of highly graphitic schists which have recorded Large and Extra Large flake graphite.
- Drill testing of Campoona targets is planned to commence in early August 2011.
- Floatation test work on Sugarloaf commenced to determine graphite recovery.

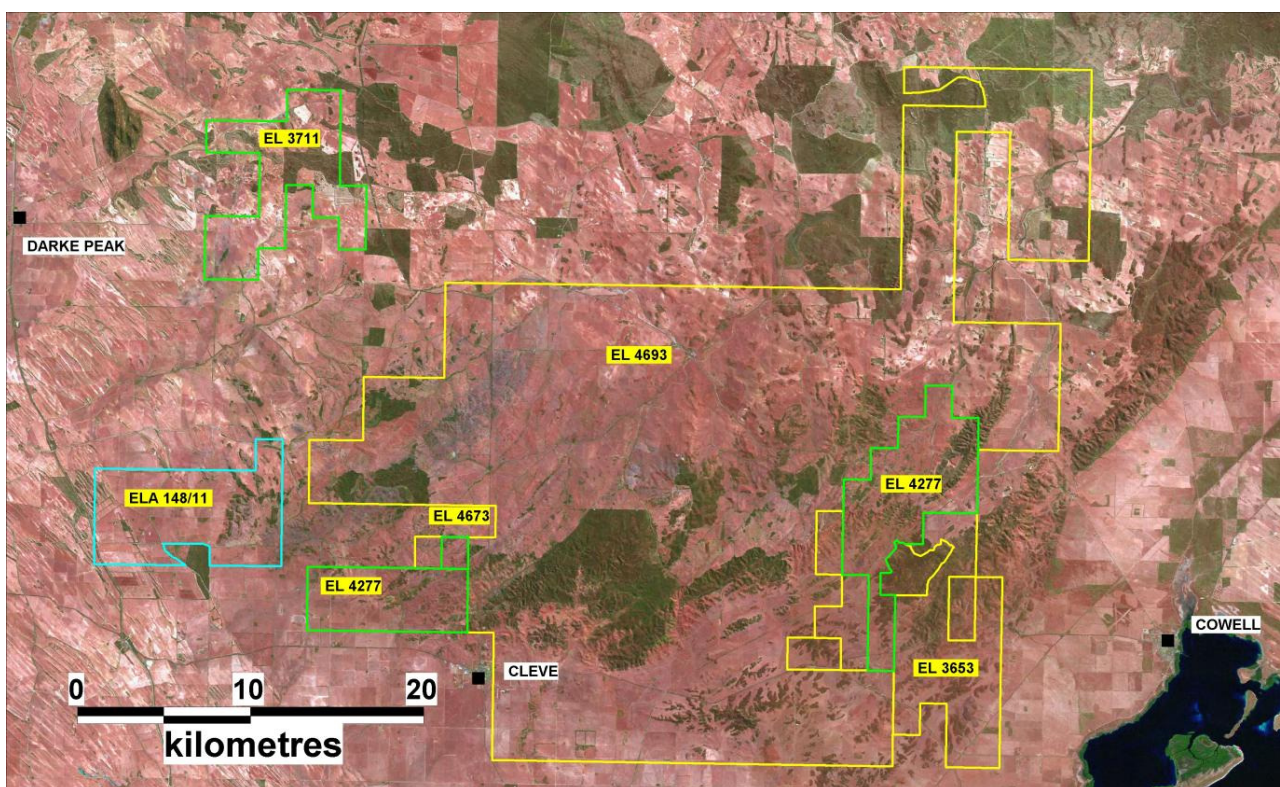
Archer Exploration Limited (“Archer”) (ASX:AXE) has a 100% interest in EL3711 Carapsee Hill located 10km east of Darke Peak in northern Eyre Peninsula, South Australia that hosts the Sugarloaf graphite deposit. Sugarloaf has an Exploration Target of 24-37Mt grading 10-12% total carbon which, in terms of tonnes and grade, make the deposit very large in world terms. The deposit is open along strike and down dip.

***\*The potential quantities and grades presented are conceptual in nature, there has been insufficient exploration to define an overall Mineral Resource and it is uncertain if further exploration will result in the determination of a Mineral Resource.***

In addition to the Sugarloaf graphite deposit, Archer has a 100% interest in all minerals other than uranium on nearby EL4693 Wildhorse Plains covering 816km<sup>2</sup> and EL3653 Elbow Hill covering a further 79km<sup>2</sup>.

Archer applied for an area of 54km<sup>2</sup> west of Wildhorse Plains in May 2011. The application has been accepted by the state and has been designated as Exploration Licence Application ELA148/11.

Once granted, Archer will have 924km<sup>2</sup> – a dominant landholding in what is shaping as a significant graphite province within the highly prospective Cleve Uplands.

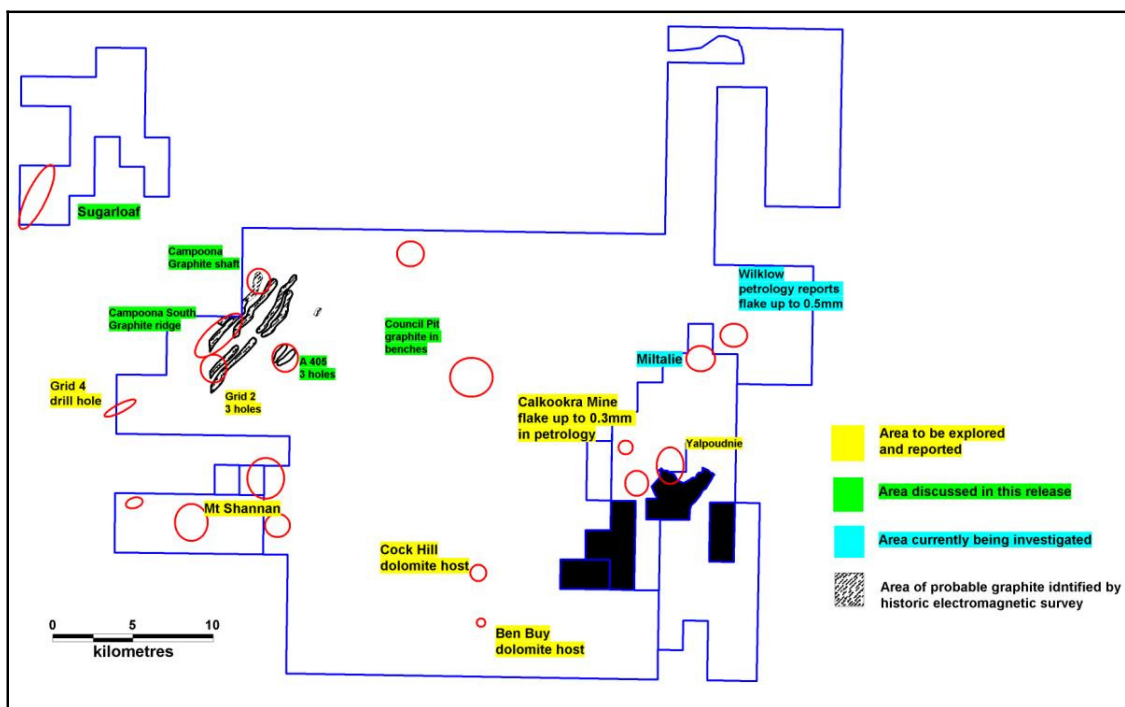


**Figure 1. Archer's Graphite Tenements and Interests in the Cleve Area of South Australia**

## Wildhorse Plains Graphite

Literature research identified that several occurrences of crystalline flake graphite occur on EL4693 Wildhorse Plains.

Three of these areas, Campoona Graphite Shaft, Campoona South and Council Pit, were selected for immediate follow-up. Figure 2 highlights the areas that are being discussed in this release as well as identifying the next areas to be sampled to determine if crystalline flake graphite is also present. Figure 2 also highlights areas where historic drill samples have been recently recovered for petrological evaluation.



**Figure 2. Historic recorded graphite occurrences on Wildhorse Plains (graphite occurrences relating to this release are highlighted in green)**

## Recent Petrology

Figure 3 below, shows the location of the samples discussed in this release and indicates the area of future exploration focus, namely an electro-magnetic survey that will be followed by drilling.

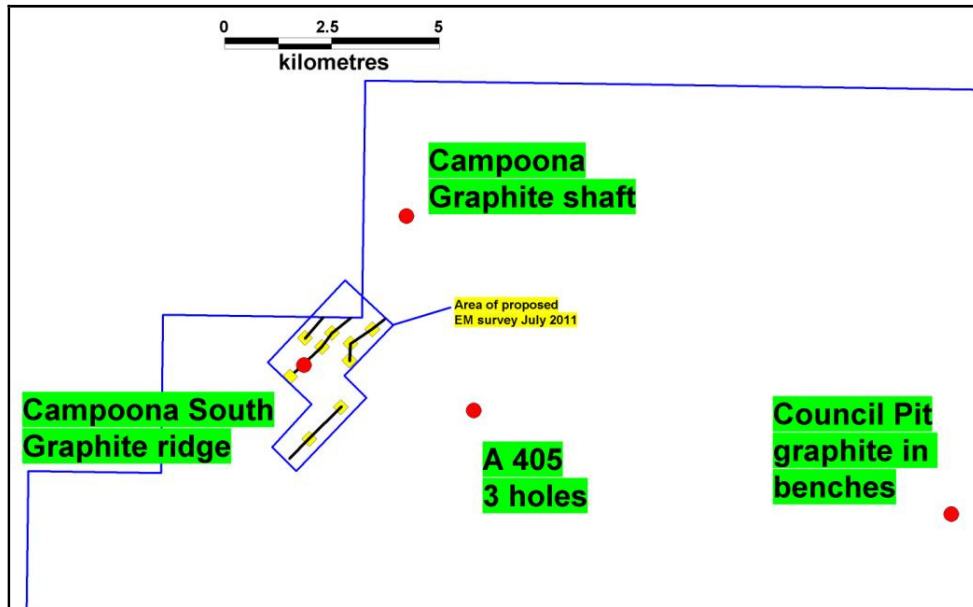


Figure 3. July 2011 petrology locations and future electro-magnetic survey area.

### Campoona Shaft

Two samples were submitted for petrological examination by Pontifex and Associates in Adelaide.

The graphite content was reported as 25-30%. Overall size ranged mostly 10  $\mu\text{m}$  to 50  $\mu\text{m}$  (width) x 250  $\mu\text{m}$  (length). The average length was estimated by Pontifex as 100 $\mu\text{m}$ . The graphite occurs within "fairly homogeneous, quartz-graphite schist, incorporating minor "porphyroblasts" of muscovite crystals and small lenses of extremely fine sillimanite."

Plates 1, 2 and 3 are photomicrographs of thin sections that show the graphite at different scales, the scale bar is located in the lower right hand corner of each image. In all images the graphite flakes can be compared to the scale bar.





Plate 1. Transmitted light, graphite is the black mineral, scale is 500μm (0.5mm)

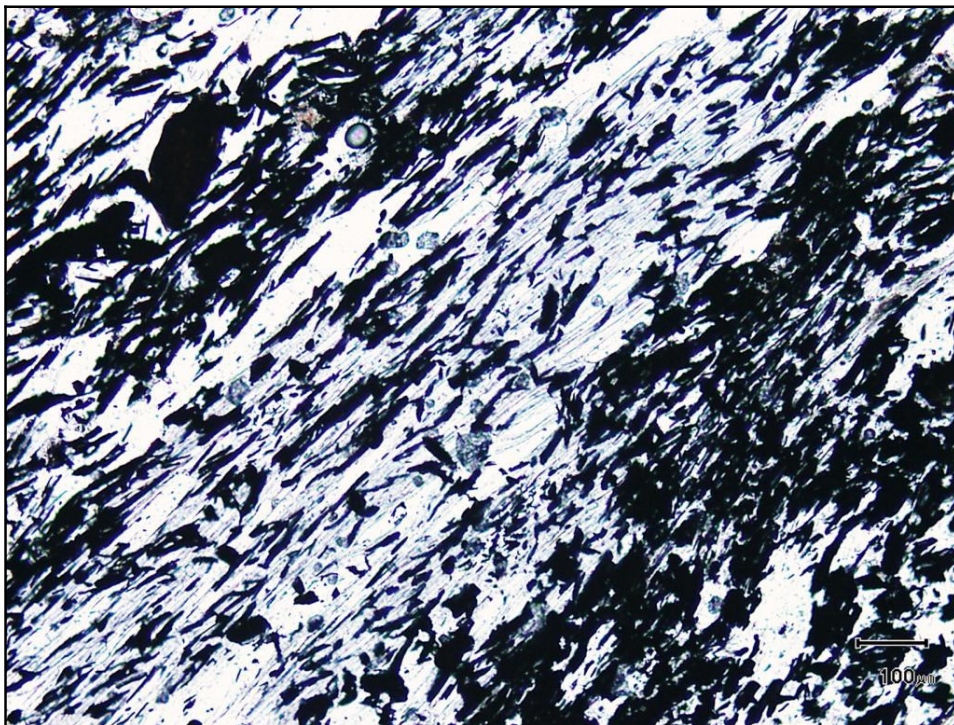
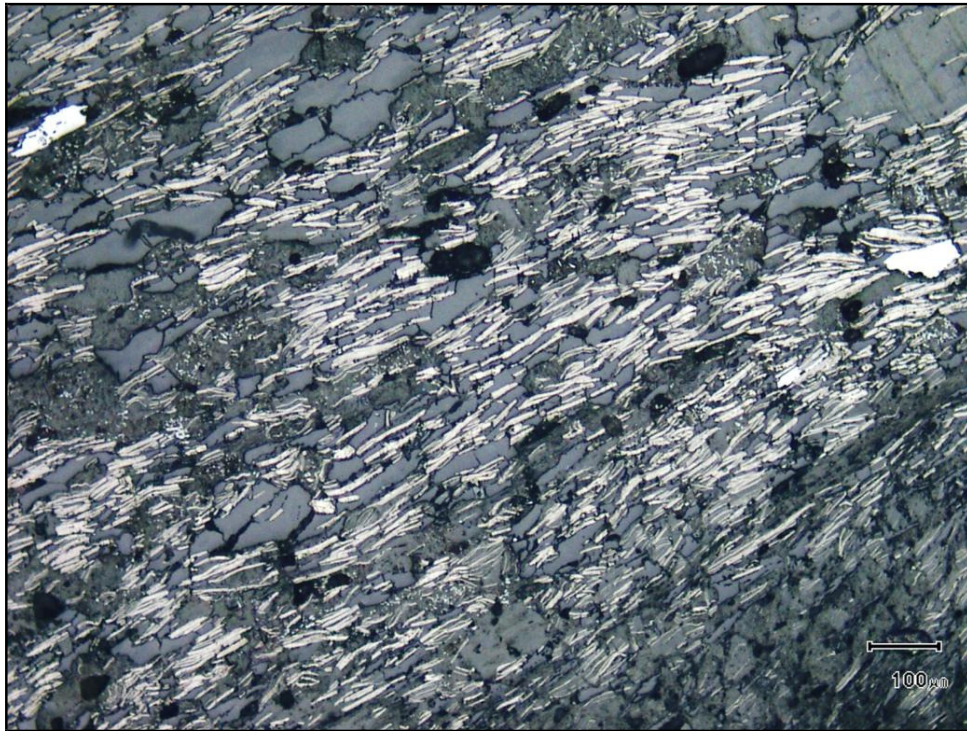


Plate 2. Transmitted light, graphite is the black mineral, scale is 100μm (0.1mm)





**Plate 3. Reflected light, graphite is the white mineral, scale is 100µm (0.1mm)**

### **Campoona South**

One sample of the outcrop was submitted for petrology.

The graphite content was reported as 15-20%. Overall graphite size ranged from 5µm to 80µm (width) x 300µm (length) with an average size estimated by Pontifex of 50µm x 250µm. Petrological examination reported the graphite as occurring within “heterogeneous, fine layered quartz-feldspar microgneiss, together with quartz-graphite schist”. This includes “minor quartz-clay-sericite-altered ex-sillimanite, and scattered small lenses of relatively concentrated graphite.”

Another component seen in this hand specimen and unique to it are small individual black lenses, varying in size from 2mm x 4mm of concentrated graphite (see Plates 4 and 5).

The presence of sillimanite is important as it reflects a high grade metamorphic overprint has occurred. The metamorphism of a rock refers to the temperature and pressure that the rock has experienced over time. As metamorphic grade increases, higher pressures and temperatures generally enable the development of larger crystals sizes and, in the case of the graphite occurrences tested on Wildhorse Plains, is conducive to the formation of large crystalline flake graphite.



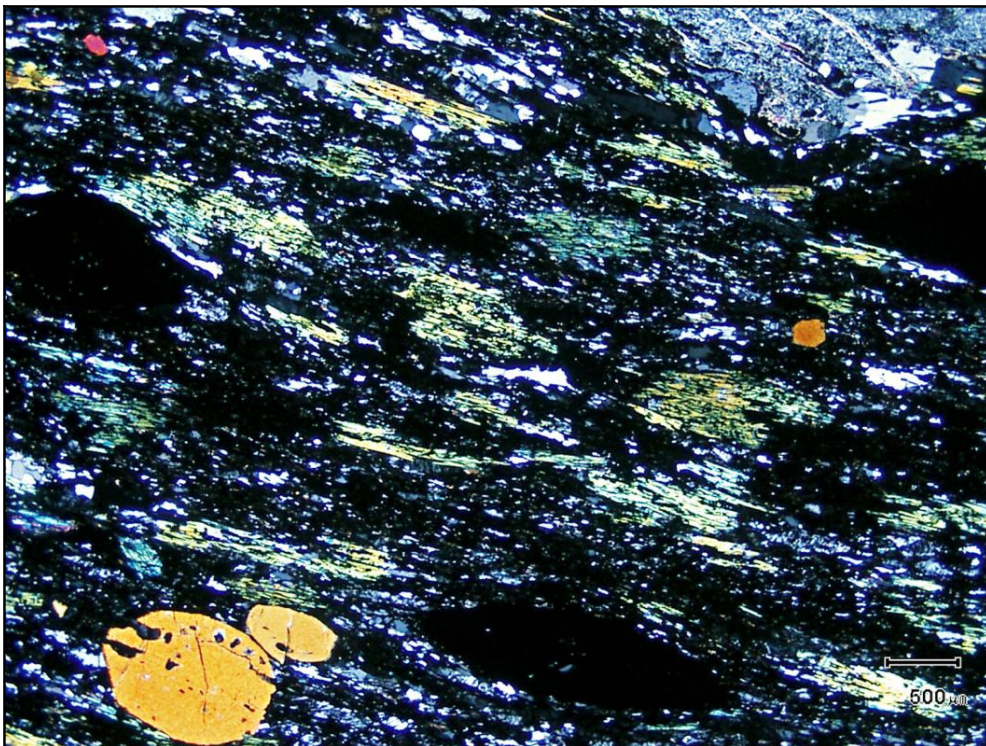


Plate 4. Transmitted light, graphite is the black mineral, scale is 500 $\mu$ m (0.5mm).



Plate 5. Reflected light, graphite clots are the white aggregates, scale is 200 $\mu$ m (0.2mm)

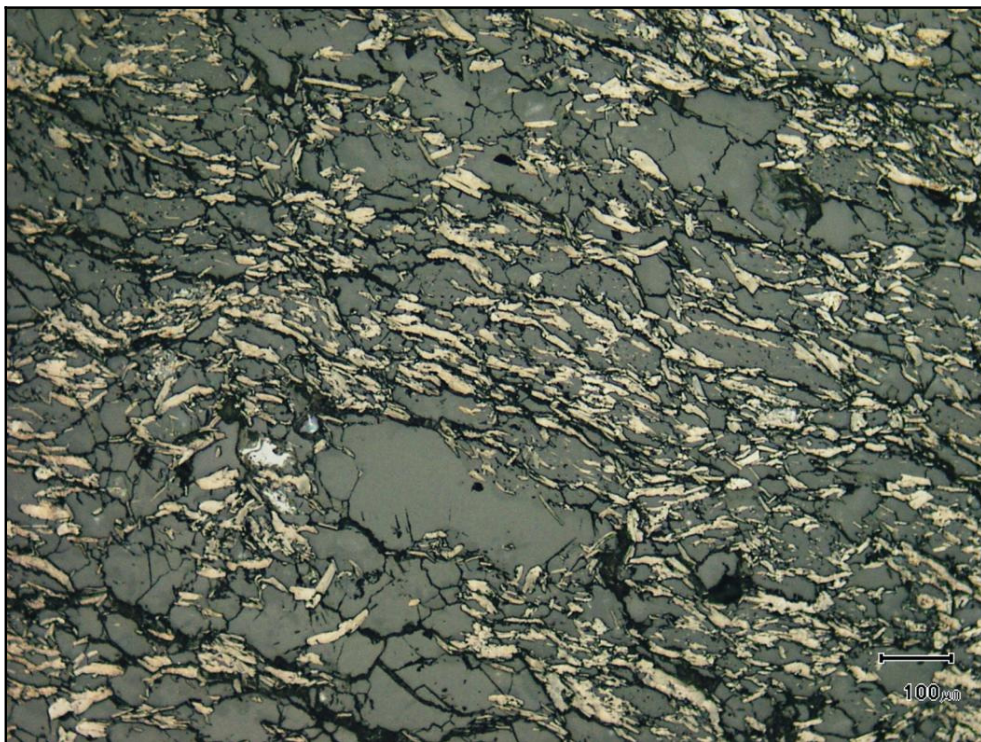


### **Council Pit**

The Council pit is a disused historic borrow pit.

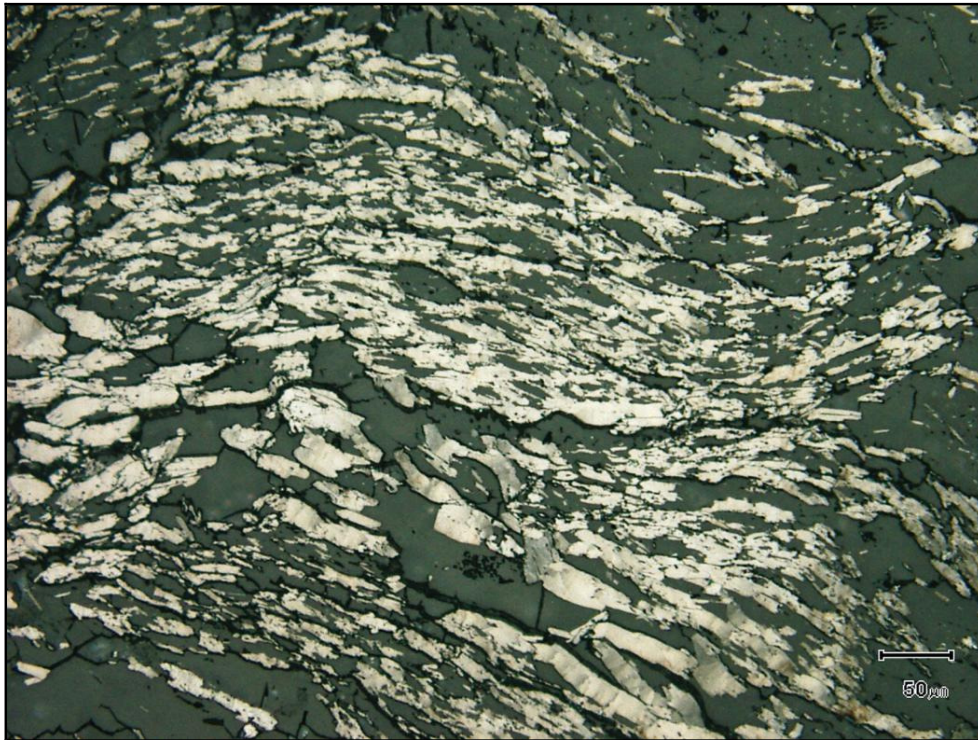
The graphite content was reported between 15-20%. The overall size of graphite ranges from 2  $\mu\text{m}$  to 50  $\mu\text{m}$  (width) x 1000  $\mu\text{m}$  (length) with the average estimated by Pontifex of 20  $\mu\text{m}$  x 300  $\mu\text{m}$ . The range in length to 1,000  $\mu\text{m}$  is classified in the graphite market as Super Large graphite. The graphite occurs within “schistose micro-gneiss, with thin intricately intercalated schistose layers of quartz-feldspar-graphite also scattered amphiboles”.

Plates 6 and 7 are photomicrographs of the graphite within the rocks.



**Plate 6. Reflected light photograph, graphite is light yellowish brown, scale is 100  $\mu\text{m}$ .**





**Plate 7. Reflected light photograph, graphite is white to light yellowish, scale is 50µm.**

#### **A405**

No petrology has yet been performed on the graphite in the holes as it was determined from the carbon chemistry that the percentage of graphite present was very low. The elevated carbon reported by the laboratory has been ascribed to the presence of dolomitic rocks which are carbonate ( $\text{CO}_3$ ) rich. Without performing a 'carbonate analysis' the amount of potential graphite present would be less than 5%. Archer has considered this to be a lower ranking graphite target within the emerging portfolio of graphite occurrences, however at potentially 5% C is higher in grade than many existing graphite mines.

Note: Graphite has a chemical formula of C. C is also present in carbonate-rich rocks where it complexes with oxygen to form  $\text{CO}_3$ . Due of the presence of carbonate rocks within the tenement, Archer has been careful to perform field tests for carbonate.

#### **Future Petrology**

Historic drill core has been sampled for the Wilflow and Miltalie areas. These samples are to be submitted for carbon analyses followed by petrology to understand the morphology and occurrence of the graphite present. Results should be available by mid-August 2011.

## **2012 Graphite Exploration**

The identification of several coarse flake graphite occurrences on Wildhorse Plains is extremely encouraging and highly significant for the potential future production of high value graphite.

As a result, drilling at Sugarloaf has been temporarily postponed in favour of assessing the resource potential of the Campoona Shaft, Campoona South and Council Pit graphite targets (collectively referred to as the Campoona graphite targets). However, metallurgical evaluation of Sugarloaf will continue and samples representing wide downhole intervals are presently being tested for graphite recovery.

### **Immediate Exploration**

Historic exploration on the Campoona graphite targets has recorded highly graphitic rocks over significant drill widths (>25m). The petrological examinations reported in this release highlight the potential of these targets to provide much prized high value coarse flake graphite. It is planned that exploration be immediately focussed on evaluating the targets through:

#### **1. Close-spaced Airborne Electro-magnetic Geophysical Survey**

Archer will fly a close-spaced aerial electro-magnetic (EM) survey in July to cover the Campoona South occurrence and Grid 2 occurrence.

#### **2. Drilling**

Landowner permission has been received and PIRSA approved a EWA for a drill program to test the Grid 2 and Campoona South graphite occurrences. The drilling will also test other areas identified along strike of these occurrences identified through the EM survey.

#### **3. Metallurgy**

Samples from the Sugarloaf drilling are undergoing metallurgical testwork to define the graphite recovery. This work will be followed by resource drilling of the Sugarloaf Graphite. Drilling is considered the 'easy' component to the resource definition as previous drilling has recorded a wide tabular steeply dipping ore body that shows no sign of thinning at depth. Future drilling of part of the >2km of strike to achieve a JORC Inferred Resource is anticipated to be completed in a short time frame.

## **Summary**

The presence of Large, Extra Large and Super Large crystalline flake graphite is considered to be highly significant to the possible future development of graphite operations based on Archer's Wildhorse Plains graphite occurrences. Importantly, these areas are widespread (as evidenced by historic wide-spaced EM surveys) and several additional graphite occurrences are yet to be assessed.



Once the new ELA is granted Archer will have graphite potential on a land parcel of 924km<sup>2</sup>, a dominant landholding in the highly prospective Cleve Uplands.

## **About Graphite**

Graphite and diamonds are the only two naturally formed polymers of carbon. Graphite is an excellent conductor of heat and electricity and has the highest natural strength and stiffness of any material. It maintains its strength and stability to temperatures in excess of 3,600°C and is very resistant to chemical attack. At the same time it is one of the lightest of all reinforcing agents and has high natural lubricity.

### **Traditional Uses for Graphite**

Traditional demand for graphite is largely tied to the steel industry where it is used as a liner for ladles and crucibles, as a component in bricks which line furnaces and as an agent to increase the carbon content of steel. In the automotive industry it is used in brake linings, gaskets and clutch materials. Graphite also has a myriad of other uses in batteries, lubricants, fire retardants, and reinforcements in plastics.

Industrial demand for graphite has been growing at about 5 per cent per annum for most of this decade due to the ongoing industrialization in China, India and other emerging economies.

### **Rapidly Growing Demand for Graphite from “Green Initiatives”**

Graphite demand is surging in response to a number of green initiatives including lithium-ion batteries, fuel cells, solar energy, semi-conductors, and nuclear energy. Many of these applications have the potential to consume more graphite than all current uses combined.

The market for graphite exceeds one million tonnes per year with some 600,000 tonnes produced as amorphous graphite powder and 400,000 tonnes of various sized crystalline flake graphite.

China produces around 80 per cent of the world's graphite supply. Approximately 70% of Chinese production is graphite powder termed amorphous graphite. Chinese graphite is declining in quality and costs are increasing due to the effects of high grading and to tightening labor and environmental standards. The majority of Chinese graphite mines are small and many are seasonal. Easily mined surface oxide deposits are being depleted and mining is moving into deeper and higher cost deposits. China now has a 20% export duty on graphite, as well as a 17% VAT, and has instituted an export licensing system to ensure supply to its domestic economy including its burgeoning steel industry which internally consumes a great deal of graphite. These measures are creating supply concerns for the rest of the world.

The demand for graphite is surging as the world seeks newer and better energy storage solutions to provide clean portable energy, alternative fuel for the automotive industry (the

emergence of hybrid electric vehicles) and energy storage solutions for green energy initiatives such as solar energy.

Graphite is in strong demand for use lithium-ion batteries. Lithium-ion batteries are smaller, lighter and more powerful than traditional batteries. They have no memory effect and a very low rate of discharge when not in use. As a result, most portable consumer devices such as laptops, mobile phones, MP3 players and digital cameras use lithium-ion batteries. These batteries are now also being used in power tools.

However, lithium-ion batteries are now being used in hybrid electric vehicles (“HEV”), plug in electric vehicles (“PEV”) and all electric vehicles (“EV”) where the batteries are large and the potential demand for graphite huge. There is twenty times more graphite than lithium in lithium-ion batteries.

While batteries store electrical energy for subsequent use, fuel cells also generate electricity through chemical reactions and therefore need to be periodically “refueled”. Fuel cells can be used in both stationary and mobile applications. Fuel cells use substantially more graphite than lithium ion batteries. Fuel cells have no moving parts, are long lasting, low maintenance, quiet and reliable and produce little or no waste products.

Graphite use is also expected to rise sharply due to its growing use in Pebble Bed Nuclear Reactors (“PBNR”). These reactors are small, modular nuclear reactors. The fuel is uranium imbedded in graphite balls the size of tennis balls. These reactors have a number of advantages over large traditional reactors namely:

- Lower capital and operating costs.
- They use inert gases rather than water as coolants. Therefore, they do not need the large, complex water cooling systems of conventional reactors and the inert gases do not dissolve and carry contaminants.
- These reactors cool naturally when shut down.
- The reactors operate at higher temperatures leading to more efficient use of the fuel and they can directly heat fluids for low pressure gas turbines.

The first prototype is operating in China and the country has firm plans to build 30 by 2020. China ultimately plans to build up to 300 Gigawatts of capacity and PBNRs are a major part of the strategy.

Small, modular reactors are also very attractive to small population centers or large and especially remote industrial applications. Companies such as Hitachi are currently working on turn-key solutions. Researchers at West Virginia University estimate that 500 new 100GW pebble reactors will be installed in the US by 2020 with an estimated graphite requirement of 400,000 tonnes. This alone is equal to the world’s current annual production of flake graphite without taking into account pebble reactor demand from the rest of the world, growing industrial demand and growing demand from other applications such as lithium-ion batteries. It is estimated that each pebble reactor will require 300 tonnes of graphite at start up and 60-100 tonnes per year to operate.



## Surging Demand Pushes Graphite Prices

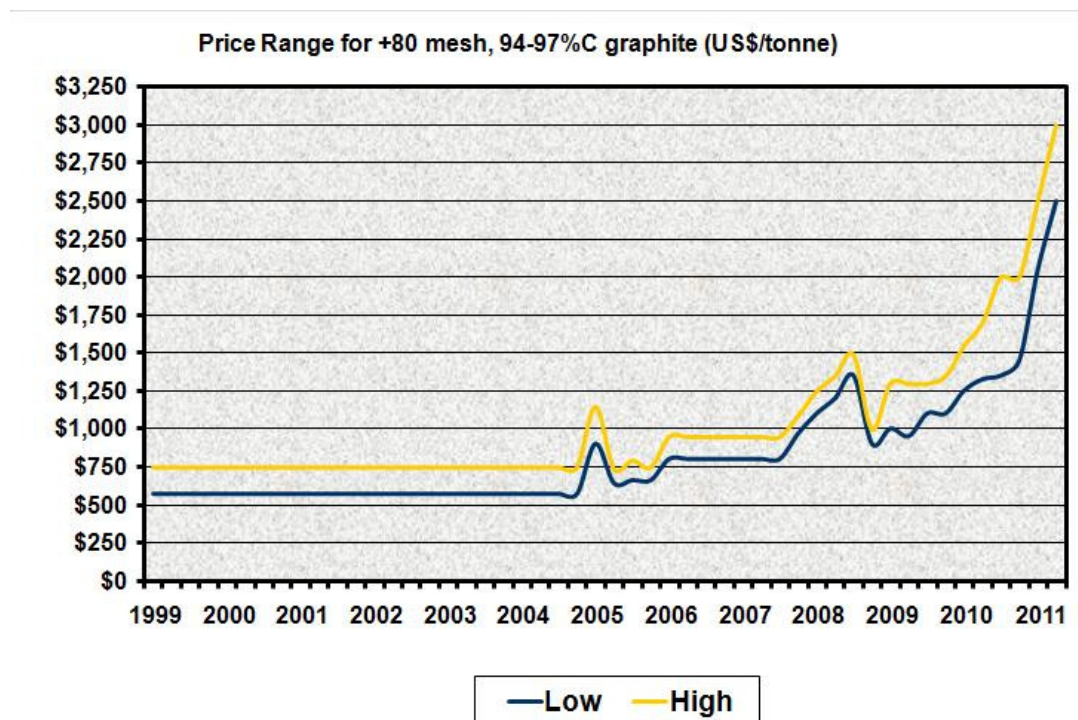
Surging demand has and continues to drive graphite prices higher.

### 2010 Year End Graphite Prices per Tonne

Amorphous high grade powder grading 99% to 99.9% C, +400 mesh <sup>#</sup>	\$35,000
Large flake graphite, 94% to 97% C, +80 mesh	\$2,500
Large flake graphite grading 90% C, +80 mesh	\$1,375
Fine flake 94% to 97% C, -80 +100 mesh	\$1,795
Fine flake 90% C, -80 +100 mesh	\$1,150
Fine flake 85% to 87% C, -80 +100 mesh	\$1,020
Amorphous graphite 94% to 97% C, +100 mesh	\$1,489
Amorphous graphite 90% C, -100 mesh	\$1,050
Amorphous graphite 80% to 85C	\$850

Source : [www.megagraphite.com](http://www.megagraphite.com)

<sup>#</sup> Denotes number of openings per (linear) inch of mesh. 400 mesh is equivalent to a size of 37 microns.



NB + 80 mesh is 0.177mm

## Demand Trends

Refractories remain the largest end use for the graphite market (35%), where flake and amorphous grades are used in various applications. Flake graphite provides good oxidation and corrosion resistance, while improving the structural strength of castable and shaped refractories. Amorphous graphite is applied where a flexible and deformable product is required. The short and medium-term outlook for the refractories industry is very promising - particularly in the steelmaking segment, where global crude output is continuing to rise.

Mobile energy markets, currently the second largest consumer of graphite (25%), are experiencing significant growth especially in batteries where it is intercalated with lithium ions - creating a very stable battery that provides a high energy density.

The production of spherical graphite for Lithium-ion batteries destroys around 60-70% of the feedstock flake graphite. It is estimated that up to 100,000 tonnes of flake graphite (or 25% of total current world production) is already dedicated to Lithium-ion batteries. Exponential growth is predicted for electric cars as the world's economies drive towards green power initiatives. The automotive industry projects that by 2025, 400,000 tonnes of flake graphite (100% of today's world production) would be required to manufacture spherical graphite for Lithium-ion batteries/fuel cells.

In the medium and long-term the Lithium-ion market is facing a huge graphite shortfall which is exacerbated by the lack of graphite exploration and development over the last 20 years.

Of significance is that China produces 70% of the world's graphite which has strategic implications for the long-term, stable sources of supply to the Western World.

Prices appear set for sustained growth on the back of surging demand.

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*The exploration results reported herein, insofar as they relate to mineralisation, are based on information compiled by Mr. Wade Bollenhagen, Exploration Manager of Archer Exploration Limited. Mr. Bollenhagen is a Member of the Australasian Institute of Mining and Metallurgy who has more than sixteen years experience in the field of activity being reported. Mr. Bollenhagen consents to the inclusion in the report of matters based on his information in the form and context in which it appears.*