Archer Exploration Limited - Graphene Readily Extracted From Campoona Graphite

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Adelaide, Australia (ABN Newswire) - Archer Exploration Ltd. (ASX:AXE) is pleased to announce that a wide range of graphene and graphene-related products have been readily produced from raw Campoona graphite samples as well as from medium-grade (92% C) graphite concentrates. The product development research is part of ongoing collaboration between Archer and the University of Adelaide, School of Chemical Engineering (Prof Dusan Losic Nano Research Group).

The key graphene products produced from the Campoona graphite were:

Graphene oxide sheets Graphene sheets

Graphene nanosheets with controllable size (20 nm to 1,000 nm)
- Functionalised graphene nanosheets
- Graphene powders
- Graphene films
- Graphene membranes
- Graphene electrodes
- Graphene nanocarriers

Graphene based composites
- Graphene aerogel composites
- Graphene conductive hydrogels
- Graphene/carbon nanotube aerogels
- Graphene magnetic aerogels

Intercalated graphite

Graphene has been known since the 1940s. However, it was not until 1994 that two researchers, Geim and Novoselov from the University of Manchester, were able to isolate graphene. Geim and Novoselov were awarded the Nobel Prize for Physics in 2010 in recognition of their work.

Graphene has many attributes that gives rise to multiple applications that can be applied across a range of commercial areas.

Table 1. Graphene Applications by Commercial Area.

Commercial Area	Applications
Conductive formulations and Inks	Printable electronics E-textiles Coatings
Composite Materials	Mechanical reinforcement
Energy Storage	Lithium-ion batteries Supercapacitors
Transparent Conductive Films	Organic photovoltaic cells Organic light emitting diodes Display/touchscreens
Carbon Semi Conductors	Field effect transistor Spintronics Integrated circuits
Bio-Related	Targeted drug carrier Si-RNA carrier Sensors for single molecule detection
Water treatment	Capacitance de-ionization Filtration

Archer's Managing Director Mr Gerard Anderson said "Archer's business plan is to produce the highest quality natural graphite concentrates in the world that can rival synthetic graphite in terms of grade but potentially have superior performance characteristics due to the highly crystalline nature of Campoona graphite."

Mr Anderson added "the traditional natural graphite industry will be with us for a long time however, there are enormous changes taking place brought about by the rapid emergence of research into graphene. That research has already identified numerous applications and that number will only increase over time. Many predict that graphene will revolutionize the 21st century."

"It is an imperative, given the projected very long life of the Campoona project, that Archer invests in research into developing new products and potentially new commercial applications. Archer's plan is to be a manufacturer of high value graphite and graphene products. The ongoing research tells us we are going in the right direction and quickly."

These few selected examples of new materials and processing technologies developed by the Losic Nano Research Group show the enormous potential of the Campoona graphite in the development of new highly valuable materials and devices across a broad range of applications.

The following short summary of current worldwide research highlights the myriad of potential uses for graphene. Such uses include:

- Display screens in mobile devices - graphene can replace indium-based electrodes in organic light emitting diodes (OLED).

- Faster charging Lithium-ion batteries - graphene is placed on the surface of the anode surface resulting in faster recharging than conventional lithium-ion batteries.

- High performance Ultracapacitors - the large surface of graphene enables increased electrical power that can be stored and also reducing the recharge time to minutes.

- High strength composite materials - graphene appears to bond better to polymers and could result in the manufacture of components with high strength to weight ratio for such uses as windmill blades or aircraft components.

- Storing hydrogen for fuel cell powered cars - graphene layers have been found to increase the binding

energy of hydrogen to the graphene surface in a fuel tank, resulting in a higher amount of hydrogen storage. This could help in the development of practical hydrogen fueled cars.

- Lower cost fuel cells - researchers has shown that halogenated nanoplatelets could be used as a replacement for expensive platinum catalytic material in fuel cells.

- Water desalination - nanometer sized holes in graphene can be used to remove ions from water and result in lower costs of desalination.

- Lightweight containers - researchers have produced composite material using plastic and graphene nanoribbons that blocks the passage of gas molecules opening up applications ranging from drink bottles to lightweight natural gas tanks.

- More efficient solar cells - researchers have developed a honeycomb like structure of graphene in which the graphene sheets are held apart by lithium carbonate. This graphene replaces platinum in a dye sensitized solar cell to achieve improved conversion of sunlight to electricity.

- Electrodes with very high surface area and very low electrical resistance - Researchers at Rice University have developed electrodes made from carbon nanotubes grown on graphene.

- Lower cost solar cells - researchers have built a solar cell composed only of carbon which could potentially eliminate the need for higher cost materials.

- High frequency transistors - graphene can be used to make high speed transistors because electrons move faster in graphene compared with usually used silicon.

- Integrated circuits - Researchers are developing lithography techniques that can be used to fabricate integrated circuits based on graphene.

- Sensors to diagnose diseases.

- Graphene membranes - these membranes are made from sheets of graphene in which nanoscale pores have been created to greatly aid gas separation.

Archer is looking to have a mining lease application lodged by Q3 calendar 2014 and first production during 2015. Informal capital cost estimates point to around $15 million for a small size mine and about $25 million for a medium size mining enterprise.

To view pictures and tables, please visit:
http://media.abnnewswire.net/media/en/docs/ASX-AXE-768496.pdf

About Archer Exploration Limited:

Archer Exploration Ltd. (ASX:AXE) is a graphite, magnesite, copper, gold and manganese explorer focused on the discovery of world-class ore deposits.

The company has carefully acquired a portfolio of projects, covering an area in excess of 5300 km2, in the highly prospective Gawler Craton and Adelaide Fold Belt regions of South Australia. All projects are 100% owned by the Company.

Archer also has earned the right to 100% of minerals other than uranium on EL4693 Wildhorse Plain located near Cleve on Eyre Peninsula.

The Company's flagship Campoona and Sugarloaf graphite deposits occur in the Cleve district where the Company has tenure of 933km2 in the emerging graphite province.

Archer Exploration Ltd. has an experienced board and management team and has the ability to maximise the potential of the company's world-class projects.

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