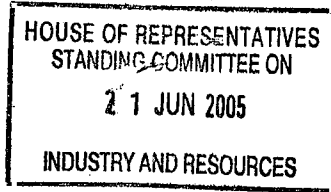




SOUTHERNGOLD

Submission No. 54



THE STRATEGIC IMPORTANCE OF AUSTRALIA'S  
URANIUM RESOURCES

Submission by Southern Gold Limited (ABN: 091 118 044) to the House of Representatives Standing Committee on Industry and Resources inquiry into the development of non-fossil fuel energy industry in Australia.

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**ENQUIRY INTO DEVELOPING AUSTRALIA'S NON FOSIL FUEL ENERGY  
INDUSTRY**

The House of Representatives Standing Committee on Industry and Resources  
Canberra ACT 2600

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## SUMMARY

There is a growing world wide momentum for the reinstatement of a responsible and safe power generation source from nuclear energy due to the scientifically demonstrated concerns that fossil fuels have aggravated atmospheric pollution and contributed significantly to global warming. Southern Gold Limited strongly supports the development of Australia's uranium resources and a world-wide nuclear power generation industry. Southern Gold Limited believes that Australia should be world leaders in the mining, enrichment, power generation research, safe disposal of radio active waste and the development of policies and legislation for the use of the world's uranium resources.

The rationalisation of the mining industry and the retreat of large companies from exploration have created a pool of seasoned explorers and a shortfall in the exploration capacity that Australia requires to maintain resource inventories and international competitiveness. Groups like Southern Gold have repositioned themselves in the junior exploration sector to fill the exploration gap.

With the effective moratorium on uranium exploration over the past 30 years, Australia has lost an economic and strategic opportunity to use its dominant resource position to become the leading supplier, researcher and manager of uranium resources. There are significant changes in recognition of the economic benefits and supply forecasts for uranium. There is an expectation that restrictive uranium exploration and mining policies will be withdrawn.

Smaller explorers like Southern Gold are therefore carrying a greater burden for defining and developing Australia's uranium resources but with limited funding. The junior exploration sector warrants expanded financial and regulatory support from State and Federal governments in facilitating exploration for the country's future development, competitiveness and prosperity.

Southern Gold therefore supports the development of Australia's uranium resources, encourages government incentives for uranium exploration by junior companies and endorses the past and current arguments of the AusIMM, MCA, State Chambers, AMEC and AIG for improvement in exploration ease and investment in this country.

## **INTRODUCTION**

Southern Gold Limited strongly supports the development of Australia's uranium resources and a nuclear power generation industry in view of growing environmental concerns with respect to global warming and atmospheric pollution. Uranium fuelled-power is green, efficient and has a demonstrated less harmful impact on its work force. Uranium mines and nuclear reactors can be placed at remote locations without the need for a large supporting work force and in locations that pose little or no threat to the wider community.

South Australia has to date demonstrated a greater preparedness to develop a uranium industry than other States in Australia. The State hosts two of the three producing uranium mines in Australia. The Olympic Dam mine contains 30% of the world's known uranium resources.

The extent of known uranium mineralisation in South Australia and the technology now available to identify and develop commercial deposits of uranium has prompted Southern Gold Limited to develop a number of opportunities within the under-explored Gawler Craton.

The opportunities are developed within the attractive environment of:-

- ❑ Improving sentiment towards uranium as a green fuel.
- ❑ Shortage of supply and attendant price rises for uranium for the long term.
- ❑ Mixed commodity advantages of Olympic Dam style deposits.
- ❑ Pedigree and new exploration technology developing for the under-explored Gawler Craton.
- ❑ Supportive exploration and development environment provided by the South Australian government in contrast with the anti-nuclear attitudes of other Australian jurisdictions.

## **SOUTHERN GOLD LIMITED - THE COMPANY**

Southern Gold Limited was incorporated on the 22 January 2004 and listed on the Australian Stock Exchange on 21 April 2005 to explore and develop gold, copper, nickel and uranium resources in Southern Australia.

Southern Gold has secured substantial exploration tenements with the rights for uranium and other minerals in the uranium-rich and -supportive jurisdiction of South Australia. The company will be using raised capital to undertake vigorous exploration for new uranium resources.

## **WORLD ENERGY CRISIS**

Over the last 100 years most of the world's energy has been obtained from fossil fuels (coal, oil and gas).

Nuclear energy is the world largest source of emission free energy and there will be an increasing dependence on nuclear fuelled power plants in the future in order to significantly reduce greenhouse gas emissions. The same amount of electricity is produced from 1000 tonnes of uranium as is produced from 16 million tonnes of coal which generates 33 million tonnes of carbon dioxide while nuclear power creates no greenhouse gas (source: Nuclear Energy Institute).

## **GREENHOUSE GAS AND GLOBAL WARMING**

In recent years scientists have paid increasing attention to the "greenhouse effect" and the need to reduce the sources of greenhouse gases released into the atmosphere. While there is some disagreement amongst the international scientific fraternity on the size and impact of global warming due to greenhouse gas emissions, there is agreement that the earth's lower atmosphere is in fact warming due to increasing levels of methane and carbon dioxide. Figure 1. shows the general world wide average temperature increase between 1880 and 2005 and a corresponding carbon dioxide increase.

Clearly the concentration of CO<sub>2</sub> in the Earth's atmosphere is increasing and the amount of energy returned to the earth due to the increasing CO<sub>2</sub> levels is believed to be significantly affecting global climatic conditions. The increasing world population is considered to be the main reason for the increase in CO<sub>2</sub> emissions, due primarily to the rapidly increasing energy needs of each individual.

Fossil fuels currently provide most of the world's energy and have been important in the economic development of many countries over the past 100 years and will continue to be utilised in developing countries and regions e.g. China, India, Africa and South America. As these industrial economies rapidly develop, the potential for greenhouse gas emissions to the atmosphere are forecast to significantly increase resulting in a number of global effects expected from temperature rises. Among these effects is an increase in desertification, a rise in sea level and pressures on agricultural growth in temperate zones. Halmann and Steinberg (2000) have predicted a rise in sea level in 2100 of between 15 and 90 centimetres with a best estimate of 48 centimetres resulting in some low lying countries being inundated.

## **USE OF URANIUM**

Nuclear power stations currently generate around 17% of the world's electricity. Southern Gold Limited understands that 31 countries currently rely on nuclear energy to generate substantial amounts of their electricity requirements. With a rapidly increasing demand for electricity worldwide and an expected doubling of electricity demand by 2050, Southern Gold Limited believes that nuclear energy is the preferred option for electricity generation without producing significant greenhouse gas emissions.

## **SOURCES OF URANIUM**

Uranium is a common element within the earth's surface and most rocks are weakly radio-active. Japan has demonstrated that it is possible to extract uranium from sea water. Apart from Australia more than 25 countries throughout the world have major sources of uranium.

The principle source of uranium is the uranium oxide, pitchblende. Deposits of industrial importance are wide spread occurring in the Democratic Republic of the Congo, Canada, the United States, Czechoslovakia, Portugal, Russia and elsewhere.

Secondary sources of uranium are chiefly the phosphates, arsenates and vanadates which may contain other metals in addition to uranium. Among these ores are brannerite found in the United States, Canada and Australia; davidite found in Australia autunite and carnotite both found in the United States. Currently only the richer uranium deposits are mined. Estimated reserve of uranium is well into the tens of millions of tonnes which represents a substantial energy resource.

Radiation occurs naturally and inevitably in our environment and radiation levels can vary considerably. All living things have evolved in an environment where there are significant levels of background radiation.

There are millions of sources of radiation in any urban environment. TV sets, X Ray machines, tobacco products, smoke detectors, building materials, and watches with luminous minutely radio-active tritium dials are just a few of the sources of radio-activity. Radiation may be used to diagnose ailments and some people are treated with radiation to cure disease.

## **WORLD RESOURCE**

Countries with major uranium deposits are Canada, South Africa, Namibia, USA, Brazil, Russia, Kazakhstan and Australia. Currently 30% of the world's annual demand is produced by Canada and 23% by Australia.

## **AUSTRALIAN RESOURCE**

Australia has approximately 30% of the world's economic uranium resources and current production amounts to about 10,500 tonnes of  $U_3O_8$ . This production could be significantly increased providing more employment, more export earnings and a significant reduction in carbon dioxide emissions. Southern Gold Limited strongly supports the development of a uranium mining industry in Australia and urges the Federal Government to provide exploration incentives to the junior exploration companies.

## **SOUTH AUSTRALIAN RESOURCE**

Uranium deposits in South Australia occur in two major geological domains, the Curnamona Craton which hosts the operating Beverley mine and the Gawler Craton which hosts the operating Olympic Dam mine. South Australian uranium deposits occur as both hard rock and palaeochannel (sedimentary) deposits.

### **Curnamona Craton.**

The Curnamona Craton in the Eastern area of the State (Fig 2) hosts the Beverley and Honeymoon sedimentary uranium deposits. There are a number of smaller sedimentary occurrences such as Goulds Dam, Emu Well, Lake Frome, Mulyungarie, Siccus and Yarramba.

Between 1951 and 1978 exploration conducted by the SA Mines Department and private company exploration outlined a hard-rock resource of 10Mt grading 0.5kg/t of uranium oxide at the Crockers Well deposit.

Uranium deposits occur at Mount Painter (Mt Gee) where uranium ore was mined from 1910 – 1935 to provide radium for medical use. A uranium resource of 5.3 Mt at 0.13kg/t uranium oxide has been outlined at Mt Gee and exploration continues.

### **Gawler Craton**

The Gawler Craton which occupies a total area of approximately 222,000 km<sup>2</sup> in the Central West of the State hosts the major Olympic Dam and Prominent Hill multi-element deposits (Fig 3) and known uranium occurrences in the Garford, Anthony, Mulgathing and Narlaby palaeochannels.

Olympic Dam contains 1/3 of the worlds known uranium resources but accounts for only 8% of the annual production of about 40,000 tonnes, even the proposed \$5billion expansion of the Olympic Dam project will only achieve 25-35% of the 30,000tpa production shortfall forecast for the next 16 years.

The Gawler Craton offers excellent opportunity to discover new shallow resources that will have significant advantages and value in filling the supply gap. The Gawler Craton is a much larger, less exposed and more poorly explored geological terrain than the Curnamona/Frome Craton region near Broken Hill and has an established uranium inventory 60 times greater than the Curnamona/Frome Craton.

The Prominent Hill mineral discovery in 2000 revealed new geological and exploration parameters that have opened up the potential of the Gawler Craton for more significant discoveries. The Central Gawler Province (CGP) is particularly and immediately prospective having the right sub-volcanic geology with hot-source granites and structural intersections. Persistent, but shallow, cover is now an opportunity for the application of new and more sophisticated exploration techniques.

### **Exploration Activities**

A number of junior explorers are actively exploring for uranium deposits within the Curnamona and Gawler Cratons. At Arkaroola, Alliance Resources and its partner Quasar Resources have encountered significant uranium mineralisation. Newly listed Pepinini Minerals are also actively exploring the Curnamona Craton where they have an estimated resource of 10 million tonnes at an average grade of 500g/t U<sub>3</sub>O<sub>8</sub> at Crockers Well.

Perth based junior explorer, Scimitar Resources, have a portfolio of uranium projects in the Curnamona Craton with the potential to host Beverley style mineralisation. Marathon Minerals recently uncovered 636m of continuous mineralisation at Mount Gee in the Northern Flinders Ranges. Havilah Resources have recently announced plans for an Initial Public Offer of Curnamona Energy which plans to raise \$4.4million for the exploration of tertiary palaeochannels on the Curnamona Craton.

### **ECONOMIC BENEFIT FOR AUSTRALIA AND SA**

Southern Gold Limited believes that the establishment of a uranium mining and processing industry in Australia will have a significant economic impact on both Australia and the individual States. As an example, the draft Environmental Impact Statement prepared in 1996 by Kinhill for the Jabiluka uranium project in the Northern Territory identified an increase to Australia's economic welfare by \$3.8 billion over its 28 year life. Access Economics also estimated the operation would increase economic activity in Australia by \$6.2 billion in real gross domestic product (Kinhill Engineers Pty Ltd 1996).

Despite current restrictions on the mining and export of uranium from Australia, there is already a significant production from the Olympic Dam mine (4,404 tonnes U<sub>3</sub>O<sub>8</sub> in 2004) and Beverley in situ leach mine (740 tonnes of U<sub>3</sub>O<sub>8</sub> in 2003-04) in South Australia and the Ranger mine in the Northern Territory. Further development of the



industry would involve large-scale construction projects, investment in plant and equipment, community infrastructure, employment creation, increased Government revenues and greater export earnings. Australia's third largest uranium mine, the Beverley project, commenced operations in late 2000, and had a capital investment of \$100m.

Market opportunities for uranium exports are currently very buoyant. The spot market is not currently indicative of the prospects for long term contract sales. Australia has the potential to secure long term contracts exporting high quality products at highly competitive prices.

Clearly the real beneficiaries of the current world supply shortage could be Australian producers due to a lower cost production. Australia and Canada control nearly 50% of the world's uranium resources and as the lowest cost producers stand to benefit from increased production.

In addition to increased economic benefits for Australia there are significant social and environmental benefits for regional Australia and particularly South Australia with the development of mining operations. The massive Olympic Dam copper/gold/uranium project in South Australia which was discovered in 1975, and commenced production in 1988, has provided significant economic benefits through employment, Government royalties and revenue to the State. Between 1997 and 2004 the Olympic Dam Mine has

contributed \$146 million in royalties to the State from copper, uranium, gold and silver production. The existing town of Roxby Downs is a fully integrated new township supporting a population of around 12,000 people. With the mooted expansion of the mine the population is likely to double and the projected life of the mine is estimated between 50 and 100 years.

## **EMPLOYMENT CREATION**

While direct employment at the mine is about 100 jobs, there is a 3.1 multiplier. The current wages bill is \$6million pa and royalties paid to the State and Aboriginal community are \$2.5million pa.

## **EXPORT EARNINGS**

Australia's third largest uranium mine, the Beverley project, currently produces an export income of around \$40 million pa and this income is rising. In 2004 the revenue from Australian uranium exports was \$411 million.

Currently China is proposing a 6 fold increase in its nuclear power generation over the next 20 years. Australia's current exports could be absorbed by the proposed increase in China's nuclear power generation by the year 2010. China alone presents Australia with a significant opportunity to expand uranium exports and Southern Gold Limited strongly supports increasing our exports to countries such as China where there are major greenhouse gas emissions from coal-fired power stations.

The Federal Government should also investigate the return of high-level uranium waste from power generation in countries we export uranium to. Southern Gold Limited believes that significant earnings could be received from the safe storage of such nuclear wastes and also ensures the responsible management and safeguards against nuclear weapons proliferation.

### **GOVERNMENT REVENUES**

In 2005, revenue from Australian uranium exports was \$411 million, with supplies from the Ranger, Olympic Dam and Beverley mines totaling 10,591 tonnes. Australia is currently the world's second largest exporter and supplies around 40% of the world demand. Based on a current spot price of \$US30/lb, the Olympic Dam resource of 3 billion tonnes grading 0.4kg/t is estimated to have a value of around \$US 72 billion.

The establishment of new uranium mining projects will provide additional Government revenues in the form of income taxes, corporate taxes, payroll taxes and mining royalties. Aboriginal groups in particular would benefit from these developments.

### **ENVIRONMENTAL ASPECTS AND SAFEGUARDS**

The international system of safeguards, administered by the International Atomic Energy Agency, provides practical safeguards for the use of nuclear energy. Australia has some of the strictest conditions relating to safeguards and controls on the production and use of nuclear materials. Australia should continue its pro-active role in strengthening the international controls and safeguards over the use of nuclear materials and technology and to withdraw from the nuclear industry and debate would significantly reduce Australia's influence and effectiveness in the further strengthening of safeguards and the management of high-level radio-active waste.

Nuclear power generation emits no carbon dioxide. Every 26 tonnes of U<sub>3</sub>O<sub>8</sub> used for generating electricity saves approximately 1 million tonnes of carbon dioxide relative to coal. Nuclear power has a high safety record. A 1000 MWe nuclear reactor uses approximately 30 tonnes of uranium per year as compared with 3.1 million tonnes of black coal per year for a conventional 1000 MWe coal fired power station. A nuclear power station produces no greenhouse gases while the coal fires power station produces about 7 million tonnes of carbon dioxide each year and up to 200,000 tonnes of sulphur dioxide per annum.

A 1000 MWe reactor generates up to 27 tonnes of high-level radio active waste which is potentially hazardous to the environment. On the other hand, the burning of coal in a 1000 MWe coal-fired power station can produce up to 200,000 tones pa of fly ash which may contain toxic metals and organic carcinogens as well as uranium. While much of the spent fuel from a nuclear reactor may be reprocessed and recycled, small quantities of high-level radio active waste are produced and must be isolated and safely stored. Southern Gold Limited firmly believes that suitable repository sites exist within stable geological environments within Australia and that Australia must take advantage of the economic benefits of storing small quantities of high-level nuclear waste.

## **GOVERNMENT POLICIES**

Commonwealth legislation which require permits or approvals prior to mining and export of uranium are the Customs (Prohibited Exports) Regulations (Pursuant to the Customs Act 1901) and the Environmental Protection (Impact of Proposals) Act 1974. (EPIP Act)

Exports of uranium are prohibited under the CPER without approved sales contracts and export permits from the Department of Industry, Science and Resources. Such export permits and contract approvals ensure that uranium exports comply with conditions of the commonwealth Governments Nuclear Safeguard Regulations.

The purpose of the EPIP Act is to ensure that matters affecting the environment to any significant extent are fully examined and taken into account in the formulation of development proposals such as the mining of uranium or other minerals.

Both pieces of Legislation provide adequate control and regulations on the development of the uranium industry and in fact the controls currently under these Legislative requirements are considered by Southern Gold Limited to be too over restrictive and limiting on the uranium industry and there needs to be an urgent revue of Government Policies to promote exploration for and development of uranium mining, nuclear power generation and the safe disposal of nuclear waste products within Australia.

Restrictive uranium exploration and mining policies need to be urgently changed or withdrawn to encourage the expansion of exploration for uranium by junior explorers. The Federal and State Governments must provide urgent incentives for uranium exploration by junior companies with the aim of ensuring the future prosperity of Australia.

The Nuclear Non-Proliferation (Safeguards) Act 1987 (NNPS Act) is designed to make provision in relation to the non-proliferation of nuclear weapons and to establish in accordance with certain international treaties and agreements, to which Australia is a party, a system for the imposition and maintenance of nuclear safeguards in Australia.

With the increased attention on the sources of greenhouse gases and the need to reduce their release to the atmosphere, Australia, in line with many other countries, has adopted a National Greenhouse Response Strategy aimed primarily at energy sources and energy use. If Australia is to be serious about the reduction of greenhouse gases, Southern Gold Limited believes that policies need to be urgently developed to restrict the use of fossil fuels for power generation and instead promote the use of green energy sources such as uranium and sustainable resources such as wind and solar. This could mean adopting the unpopular choice of imposing a "carbon tax" on the use of fossil fuels for power generation which would make nuclear power generation highly competitive economically and emission free.

Recently, New Zealand introduced a \$NZ15/t carbon tax aimed at encouraging the reduction of emissions of greenhouse gases and developing clean energy projects in order to meet the countries obligations under the Kyoto Protocol. While Australia needs to ensure that domestic and foreign investment is not discouraged by excessive taxes, the introduction of a carbon tax must be investigated as a possible inducement to reducing carbon dioxide gas emissions and encouraging green energy projects.

## **SOUTHERN GOLD URANIUM EXPLORATION ACTIVITIES**

Southern Gold Limited has established its core uranium exploration projects in the Gawler Craton in South Australia (Fig 4). The Gawler Craton offers excellent opportunity to discover new shallow resources that will have significant advantages and value in filling the uranium supply gap. Exploration targets developed by Southern Gold Limited include Olympic Dam-style copper/gold uranium and Tertiary palaeochannel uranium.

Southern Gold Limited has acquired mineral exploration tenements located in key structural positions in the Central Gawler Province with untested calcrete anomalies and established gravity anomalies. Two of these projects, the Southern Gawler Arc and the Yarlbrinda project offer new developing Olympic Dam style targets. Southern Gold Limited is a significant holder of quality exploration acreage with uranium potential and is exploring on land under Aboriginal ownership which will provide significant benefits to the traditional owners in the form of employment, education and royalties.

After the discovery of the Honeymoon deposit in the Curnamona Craton, the Gawler Craton was recognised as being equally prospective for palaeochannel roll-front uranium deposits. In particular hot uranium-rich granites provided the uranium to be dissolved and reprecipitated into the palaeochannels filled by young sediments of the same age as the Curnamona deposits. Southern Gold Limited has acquired ground around the Challenger gold mine covering approximately 80 kms of palaeochannel length along the Garford and Anthony channels. Past exploration focused on the Western part of the area produced up to 0.64kg/t U<sub>3</sub>O<sub>8</sub>. These channels are highly

prospective and provide excellent untested targets for uranium mineralisation which could be mined by in-situ leach technology similar to that currently being employed at the Beverley deposit on the Curnamona Craton.

Directors of Southern Gold Limited believe that nuclear power is a clean and safe means of meeting world-wide spiraling demands for electricity. Southern Gold Limited recognises that uranium mining and nuclear power generation are contentious issues but that there is gathering momentum in many countries for the generation of electricity without the accompanying greenhouse emissions of coal fired power stations and therefore strongly supports the development of new uranium mining operations in Australia and the expansion of the world-wide nuclear power generation industry.

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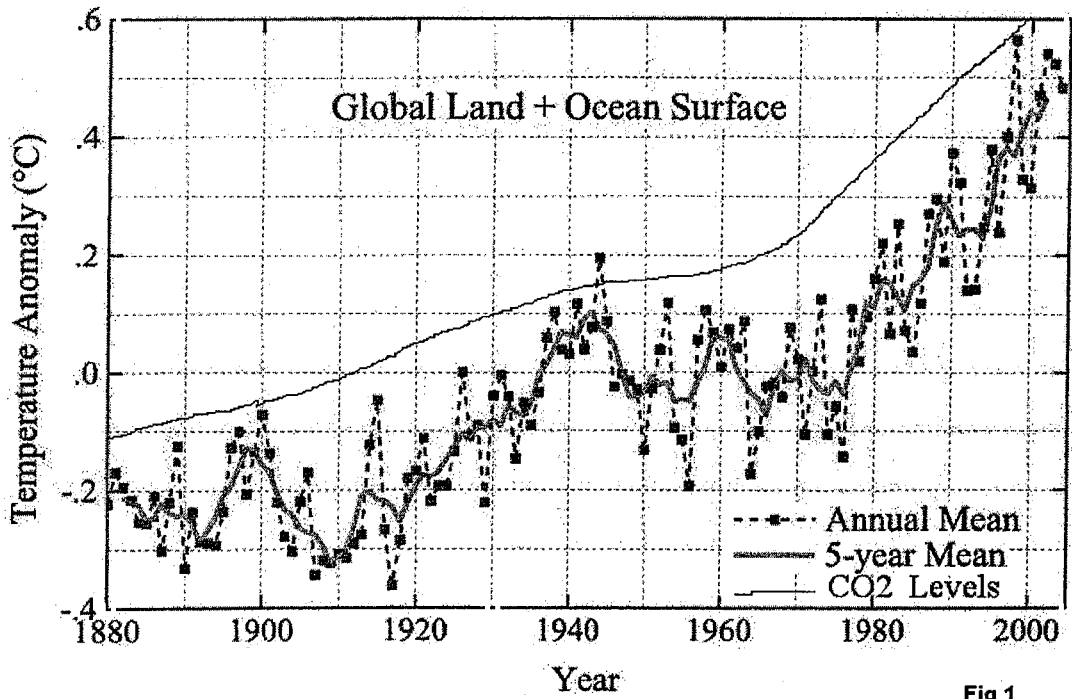


Fig 1

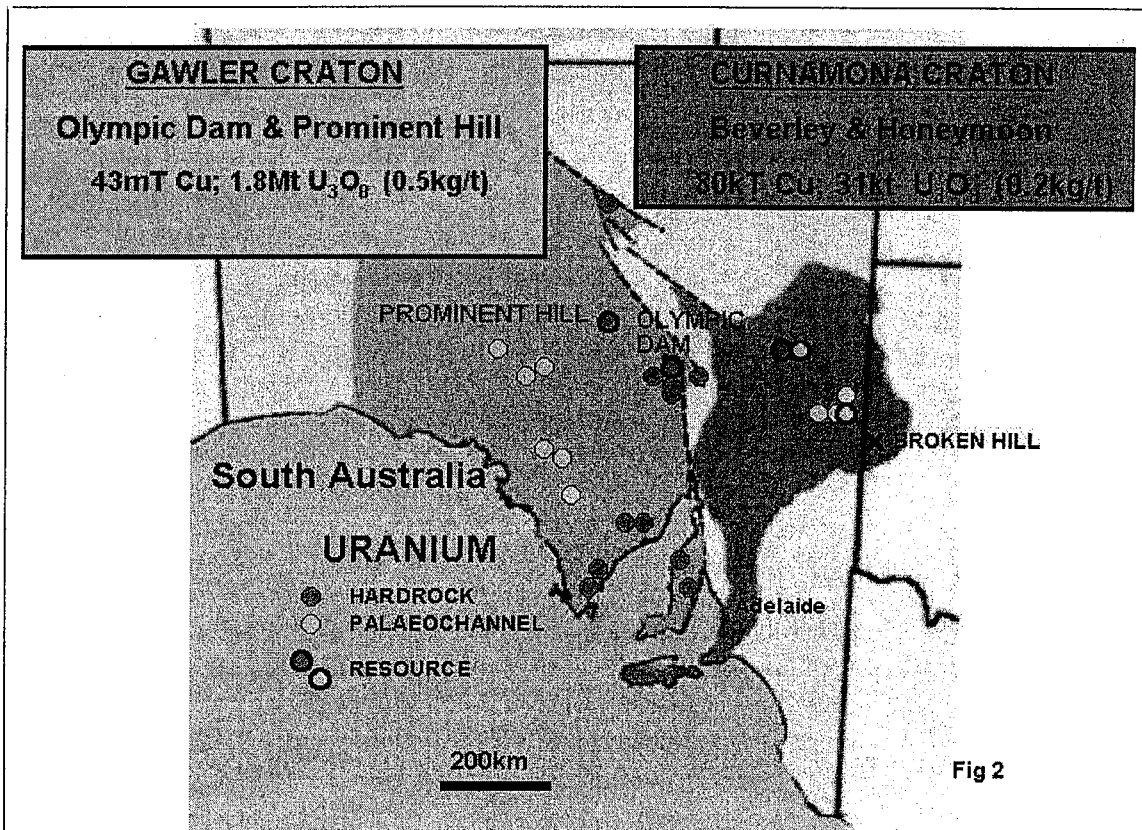


Fig 2

