

WALKABOUT RESOURCES PTY LTD

ANNUAL REPORT

JUNE 2010 to JUNE 2011



EL 2/2010 NEAR AVOCA

Murray Surtees

January 2011

Walkabout Resources Pty Ltd
P.O. Box 263, WEST PERTH, 6872

ABSTRACT

AVOCA URANIUM PROJECT

The EL is located in the historic mining district of Rossarden. The district has variously been mined and explored for tungsten, tin uranium, coal and base metals. A significant feature of the geology of the district is the underlying and outcropping Devonian age granite with high uranium content. Walkabout believes that these uranium rich source rocks, erosion, a transport mechanism and potentially suitable physical and chemical traps provide a strong setting for the discovery of surficial uranium deposits.

This tenement incorporates about 20 kilometres of the St. Pauls and South Esk rivers extensive drainage system. The tenement is west of and downstream of the nearby and outcropping Royal George Devonian Granite batholith which hosts the historic Royal George tin mine (1911 to 1922).

The presence of uranium in the form of the mineral torbanite was noted on rock faces and joints in this granite during the open-cut stage of the historic tin mining operation.

In 1981 CRA Exploration recognized the potential for surficial uranium deposits in the drainage system. As an adjunct to their tin exploration program at the Royal George historic tin workings they drilled six holes for uranium across the St. Pauls river valley about one kilometre downstream from the old mine. Though this limited program was not successful, CRA concluded that potential for uranium accumulations further downstream remained valid. Walkabout has acquired 20 kilometres of the downstream drainage of the St. Pauls river and its tributaries. Uranium eroded from the granite is expected to pond downstream in traps (basins, marshes, and fault or dyke barriers).

Such traps will form the basis of Walkabout's initial exploration program at Avoca.

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Walkabout Resources Limited The Avoca & Dog Kennels Uranium EL, Tasmania

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1. INTRODUCTION

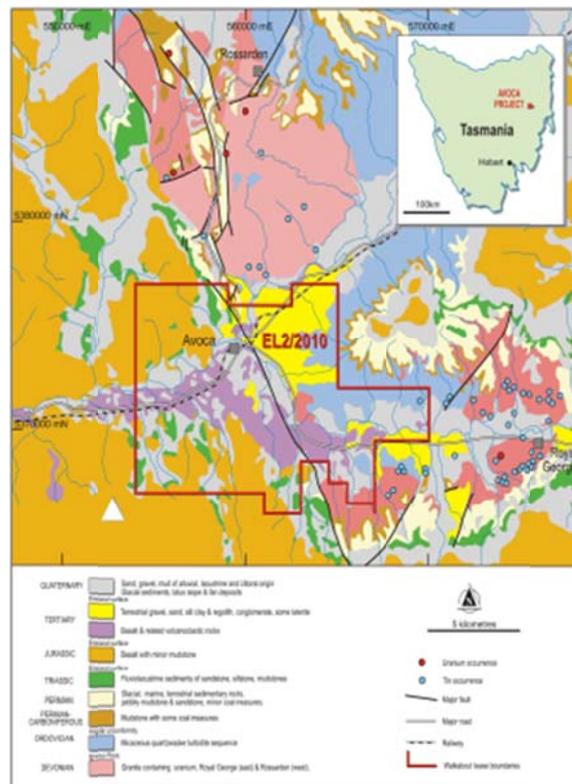
Walkabout Resources Limited (“Walkabout”) has two applications for exploration licenses (“EL(A)”) over uranium-bearing granites in Tasmania. This report describes the geology of these tenements and their potential to host uranium deposits.

- Tenement Number: PL 02/2010
- Tenement Name: AVOCA
- Reporting Period: June 2010 to June 2011
- Tenement Holder: Walkabout Resources Pty Ltd, wholly owned by Nimrodel Resources

2. LOCATION & INFRASTRUCTURE

The EL named Avoca is located in east central Tasmania. Avoca EL overlies the town of Avoca and reaches of the St Pauls River. This flows into the South Esk River at the town. The EL’s is 124 km² in area.

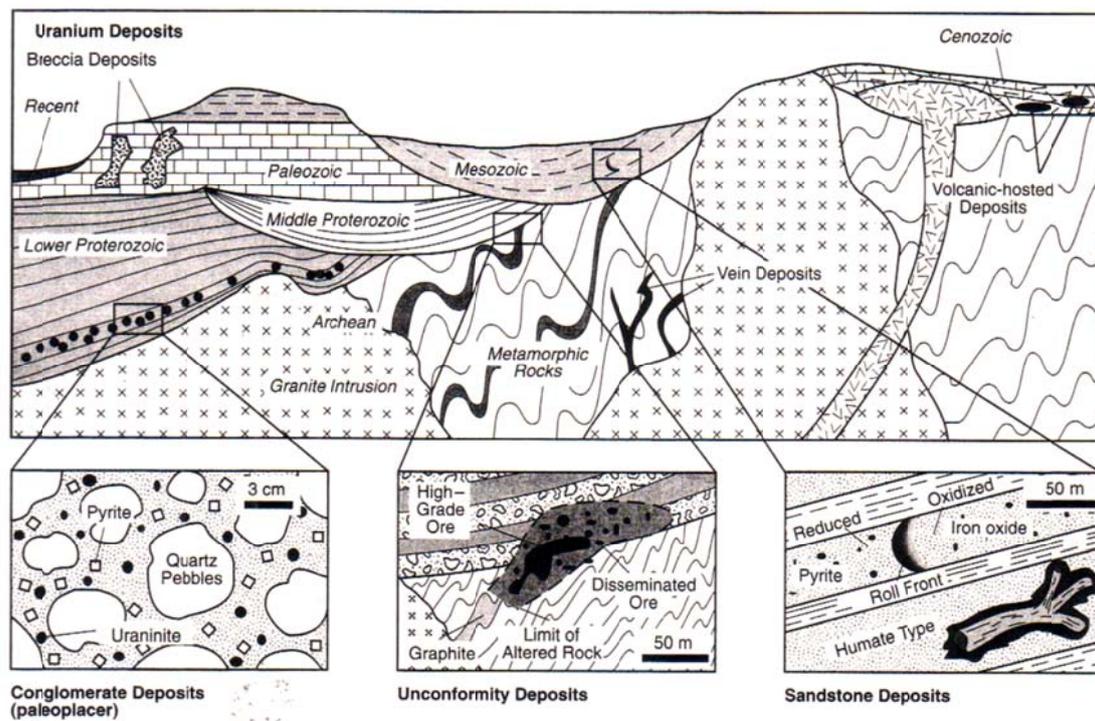
Infrastructure is well established through the servicing of the Avoca, Ormley and Royal George communities. From Avoca the arterial A4 road (the Esk Highway) goes east along the South Esk River to the coast and west to Highway 1 linking Launceston and Hobart. Water is plentiful in the rivers mentioned above.



Tenement Location Map

3. URANIUM DEPOSITIONAL MODELS

Two depositional models are valid for the area of the Walkabout EL, namely the Sandstone Hosted and the Surficial.



Cartoon illustrating various uranium deposition models¹

Sandstone Hosted Uranium Deposits

“Sandstone uranium deposits are contained in fluvial or marginal-marine sandstone. The host rocks are medium- to coarse-grained, poorly sorted, and contain pyrite and organic (plant) matter. The organic matter is either disseminated or forms lignite seams.

Uranium is mobile under oxidising conditions and precipitates under reducing conditions, and thus the presence of a reducing environment is essential for the formation of uranium deposits in sandstone. Hydrogen sulphide, which is an effective reductant and uranium precipitant, can be generated by anaerobic decomposition of organic matter or it can be introduced from underlying or overlying oil or gas horizons, thereby creating a favourable environment in an otherwise unfavourable host rock. Post-Silurian continental sandstone is a potentially favourable host because widespread development of land plants began in the Silurian. This abundant plant growth occurred in humid areas within the region bounded by latitudes 50° North and 50° South

¹ http://serc.carleton.edu/research_education/nativelands/navajo/uraniumdeposits.html. Impacts of Resource Development on Native American Lands. Uranium Deposits on the Navajo Nation

of the palaeo-equator. Because of these controls the favourable host rocks are usually confined to post-Silurian sedimentary sequences deposited between palaeo-latitudes 50 ° North and 50 ° South (Finch, Wright & Adler, 1982).

Sandstone with a slight dip, such as on the margins of continental basins and coastal plains, is more favourable than sandstone that dips steeply, because the rates of groundwater movement and oxygen intake are slowed enough to preclude destruction of reducing environments. Beds with low dips also provide large surface areas for the capture and introduction of uraniferous groundwater.

Based on shape of orebody and relationship to the depositional or structural environment, sandstone uranium deposits can be subdivided into three types (these may be gradational into each other) (Dahlkamp, 1993): tabular deposits, roll-front deposits and tectonic–lithologic deposits.

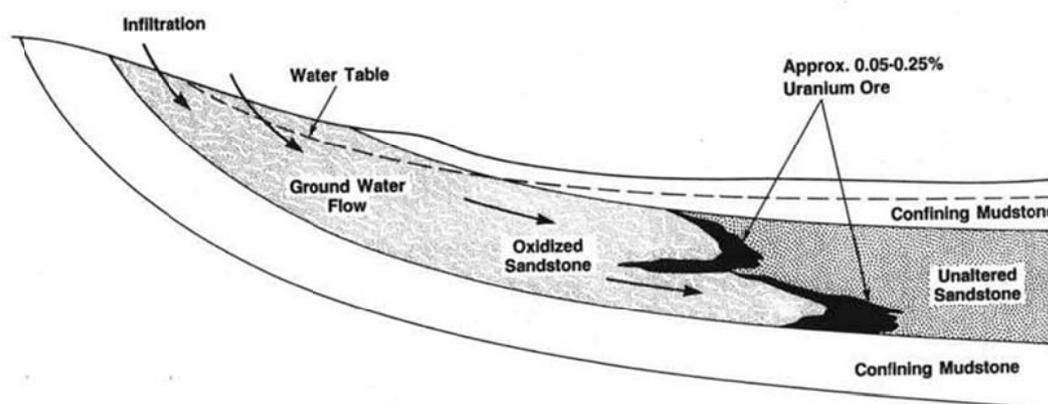
- *Tabular deposits* consist of tabular or elongate lenticular zones of uranium mineralisation within selectively reduced sediments. The mineralised zones are oriented parallel to the direction of groundwater flow, but on a small scale the ore zones may cut across sedimentary features of the host sandstone.
- *Roll-front deposits* are crescent-shaped in cross-section, and mineralisation cuts across the bedding and extends from the overlying to the underlying impervious mudstone/siltstone layers. The mineralised zone is convex down the hydraulic gradient. Mineralisation usually has a diffuse boundary with reduced sandstone on the down-gradient side and sharp contacts with the oxidised sands on the up-gradient side.
- *Tectonic–lithologic deposits* occur along permeable fault zones which cut the sandstone mudstone sequence. Mineralisation forms tongue-shaped ore zones along the permeable sandstone layers adjacent to the fault. Often there are a number of mineralised zones ‘stacked’ vertically on top of each other within sandstone units adjacent to the fault zone.

Sandstone deposits contain a large proportion of the world’s known uranium resources, although they are commonly of low to medium grade (0.05 to 0.4% U₃O₈). In each province or basin there are usually many small to medium-size deposits, some of which can contain up to 50 000 t U₃O₈. The cumulative tonnage in the province or basin is often very large — up to several hundred thousand tonnes (Dahlkamp, 1993). Major sandstone uranium provinces include the Powder River Basin in Wyoming, Colorado Plateau and Gulf Coastal Plain of the USA, and the Tim Mersoï Basin of Niger.

Sandstone deposits comprise approximately 7% of Australia’s total uranium resources. Deposits of this type occur in the Frome Embayment (Beverley, Honeymoon, East Kalkaroo and Goulds Dam), McArthur Basin (deposits in the Westmoreland area), Gunbarrel Basin (Mulga Rock), Carnarvon Basin

(Manyingee), Canning Basin (Oobagooma), Amadeus Basin (Angela, Pamela) and Ngalia Basin (Bigrlyi and Walbiri). Large areas of low-grade uranium mineralisation are known in Eocene palaeochannel sediments of the Eucla Basin in the Eyre Peninsula region (SA). These include the Warrior deposit near Tarcoola, and the Yarranna deposit east of Ceduna.

In the southern portion of the Frome Embayment, uranium deposits occur in Tertiary palaeochannel sands. Oxidising groundwater, moving slowly through the channels, leached uranium from the sand and reprecipitated it at the redox interface, to form roll-front and tabular deposits.



*Roll Front Uranium Model*²

The Redtree, Junnagunna and Huarabagoo deposits in the Westmoreland area are in late Palaeoproterozoic sandstone of the Westmoreland Conglomerate along the south-eastern margin of the McArthur Basin. This sandstone is much older than the host rocks of typical sandstone uranium deposits, and fossilised plant matter is absent. Oxidising formation-waters within the host sandstone transported uranium during circulation associated with heat flows. Mineralisation was precipitated within the sandstone adjacent to basic dykes and an overlying basalt flow. The abundant supply of divalent iron in these basic rocks created a reducing environment. The basalt flow also acted as a physico-chemical barrier restricting the circulation of formation-waters (Schindlmayr & Beerbaum, 1986).

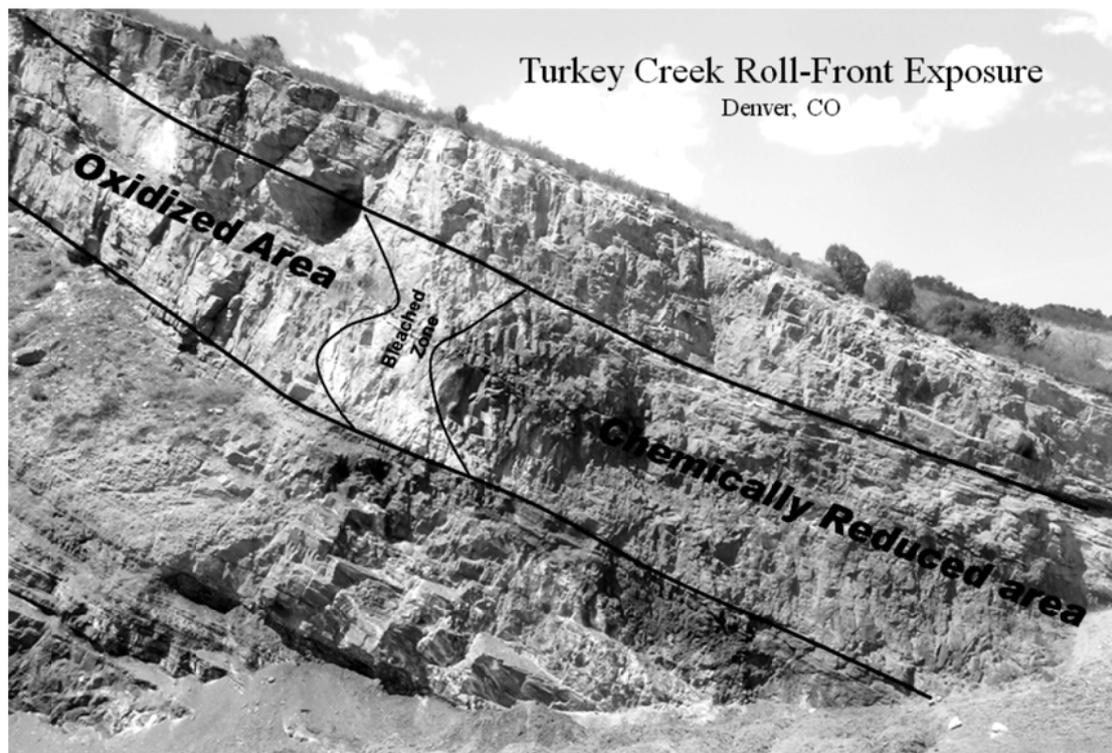
Along the northern margins of the Amadeus and Ngalia Basins, uranium deposits occur in Late Devonian to Carboniferous continental sandstone. The geological setting is similar in both basins. The sandstones contain abundant plant remains, and the uranium was deposited at redox boundaries.

The Mulga Rock deposit is in Eocene palaeochannel sediments along the south-western margin of the Gunbarrel Basin. These palaeochannel

sediments overlie metamorphic basement of the Yilgarn Craton and the Albany–Fraser Orogen.

In the Carnarvon Basin, the host rock of the Manyingee deposit is Cretaceous sandstone filling a palaeochannel eroded in the basement. Uranium has accumulated at a redox boundary in the sandstone.

In the Canning Basin, the Oobagooma deposit is hosted by Early Carboniferous sandstone in the Yampi Embayment. “³



Outcrop of the Turkey Creek roll-front uranium deposit, near Denver, Colorado, showing a sandstone layer with roll front between the oxidized and reduced zone enhanced by bleaching. Photo courtesy K. Kyser and G. Drever⁴

Surficial deposits

“Surficial uranium deposits are broadly defined as young (Tertiary to Recent) near-surface uranium concentrations in sediments or soils. These deposits usually have secondary cementing minerals including calcite, gypsum, dolomite, ferric oxide and halite. Uranium deposits in calcrete (calcium and magnesium carbonates) are the largest of the surficial deposits. The calcrete bodies are interbedded with Tertiary sand and clay, which are usually cemented by calcium and magnesium carbonates. Calcrete deposits form in regions where uranium-rich granites were deeply weathered in a semi-arid to

³ Australia’s Uranium Resources Geology and Development of Deposits, MacKay, A. D., Meizitis, Y. AGSO Geoscience Australia. 2001

⁴ From: Mineralogical Association of Canada, Short Course Series Volume 39, Michel Cuney, Kurt Kyser

arid climate. Surficial uranium deposits also occur in peat bogs, karst caverns and soils.

In Western Australia, the calcrete uranium deposits occur in valley-fill sediments along Tertiary drainage channels (e.g. Yeelirrie) and in playa lake sediments (e.g. Lake Maitland). These deposits overlie Archaean granite and greenstone basement of the northern portion of the Yilgarn Craton. The uranium mineralisation is carnotite (hydrated potassium uranium vanadium oxide).

The Yeelirrie deposit is by far the world's largest surficial deposit. It contains 52 500 t U₃O₈ in resources averaging 0.15% U₃O₈. Other significant deposits in Western Australia include Lake Way, Centipede, Thatcher Soak and Lake Maitland. Calcrete deposits represent approximately 5% of Australia's total reserves and resources of uranium.”⁵

Surficial deposits of carnotite are seen in Tanzania in recent sediments shedding downstream from “hot” (radioactive) granitic rocks into half-graben traps. Reworking of these deposits is currently forming deposits of schroekingerite at the stream break-out points from the grabens. It is presumed this deposition is a result of seasonal ebb and flow causing precipitation in the drier periods.

4. GEOLOGY

The significant feature of the geology of the EP(A)'s is the underlying, and nearby outcropping, Royal George Granite batholith. This is a late Devonian (± 385 to 362 Ma) aged, radioactive, S-type, biotite and alkali-feldspar granite. It is coarse grained and equigranular, with minor bodies of microgranite and granite porphyry.

Overlying (and intruded by) the radioactive granite are early Devonian to Permian (± 415 to 250 Ma) sediments and Jurassic dolerite. The sediments are permeable sand – silt facies, with abundant carbonaceous material bringing about a reducing environment. Expectedly, are clay units constraining the permeability vertically and facies changes constraining laterally. The Geological Survey map of the area describes the earlier Devonian rocks as a “Mudstone and micaceous quartzwacke turbidite sequence”. The Permian aged sequence is described as “Glaciomarine sequences of mudstone, sandstone, minor limestone, coal measures, Tasmanite oil shale and basal tillite.”

Younger sediments are Cenozoic (<65 Ma) in age and comprise Quaternary beach sands and alluvial, colluvial and residual deposits of sand, silt gravel etc.

Geology Map

⁵ Australia's Uranium Resources Geology and Development of Deposits, MacKay, A. D., Meizitis, Y. AGSO Geoscience Australia. 2001

5. PREVIOUS WORK

Tin lodes were discovered in the Royal George granite in the 1880's. The Royal George tin mining company was founded in 1911 and it operated until closure in 1922.⁶

In this same report the presence of uranium in the granite was mentioned for the first time. "The secondary uranium-copper-phosphate mineral torbanitie is deposited as green spangles and flakes on rock faces and joints....(in) the open cut."

In 1959 the Geological Survey of Tasmania published Bulletin # 46: "The Geology of the Rossarden-Storeys Creek District" by A H Blissett. The uranium showings in the area of the Walkabout EL formed a part to the discussion.

In 1973, EL 16/1972, owned by Tenneco Australia Inc., was prospected by Getty Oil Development Co., under a JV called the Launceston Basin Project. The EL was located over the Ben Lomond late Devonian granite – an equivalent of the radioactive Royal George Granite located to the east. Getty drilled 122 RAB holes for 12,126 metres.

Getty reported: "The only significant zone of ferruginised material that lies beneath the present surface oxidation limit is located in the north areas....(of the EL, just south of Longford). It is present over considerable vertical extent and contains ferruginised sands and clays. Some low order anomalous radioactivity is present in this zone..... but does not appear to show typical roll-front characteristics."⁷

In 1981 CRA Exploration Pty. Ltd. Reported on the drilling of 6 holes (399 metres) for uranium across the St Pauls river valley, about a kilometre downstream (west of) the village of Royal George. This was done as an adjunct to the exploration for tin at the Royal George Mine. The drilling showed that the Tertiary sediments comprise blue-grey-green silts and muds, partly indurated, with pebbles of dolerite and fragments of coal and wood. Uranium values in the sediments are low (a maximum of 7 ppm). Samples from the tailings of the Royal George tin mine had a maximum of 180 ppm uranium. CRA concluded that the purpose of the drilling was to find indications of uranium in the sediments or at least to find evidence of a reduction / oxidation boundary typical of the roll front model of uranium deposition. "No evidence of uranium accumulation were detected and all the lower sands in holes 1 – 5 were in a reduced state. The presence of some oxidised sand in Hole 6 suggests possible local oxidation but it does not appear to be part of the classical oxidation cell which has moved downstream with ground water

⁶ Notes on the Royal George Tin Mine, G Urquhart, 1966

⁷ [73_0939 - Report on Phase 1 Exploratory Drilling in the Launceston Basin Area, Tasmania.](#)

Middleton, T.W.

flow.” In the ”Recommendations” section of the report CRA states: “The potential still exists for accumulations further downstream.....”⁸

6. THE POTENTIAL OF EL2/2005 TO CONTAIN URANIUM DEPOSITS

Sandstone Hosted Deposits

The Royal George Granite batholith has intruded into the Devonian – Permian sediments. The sediments are flat-lying to low dipping and are thus draped onto the granite, in theory allowing free fluid flow from the granite carrying uranium into the sediments in oxidizing conditions. The sediments consist of layers of permeable sandstone with interbedded impermeable clay horizons which contains the flow of uranium-bearing solutions. There is abundant vegetal matter in the sediments to create a reducing environment conducive to the precipitation of uranium at the redox boundary (where the oxidized free-flowing uranium bearing solutions encounters the reducing environment).

Surficial Deposits

Surface drainage, for example the St Paul’s River and its tributaries, carrying uranium eroded from the granite is expected to pond in traps (basins, marshes, fault and/or dyke barriers). Such traps are conducive to uranium deposition.

7. WORK PROGRAM

Walkabout will conduct drainage sampling along the St Pauls river during the 2011/2012 season. The Avoca program has been delayed during the organisation of corporate activities and fund raising by Walkabout Resources. Furthermore, the international uranium market has recently been in retreat as a result of the Fukushima Nuclear Plant challenges in Japan.

8. CONCLUSIONS

The Devonian-Permian sediments draped over the Royal George Granite and Tertiary-Quaternary surficial sediments formed by drainage from that granite have a clear potential to host uranium deposits.

9. ENVIRONMENT

There are no environmental issues since Walkabout has not yet mobilised to site.

⁸ [82_1701 - Drilling of Cainozoic Sediments in the St Pauls River Valley](#)

1. [near Royal George, E.L. 7/78 N.E. Tasmania](#)

Dunn, P.R.

10. EXPENDITURE

Expenditure has been confined to the compilation of this report, tenement administration and historical review work. This has amounted to A\$17,600 during the year.