Archer Exploration Limited
ABN 64 123 993 233
Level 1, 28 Greenhill Road
Wayville, SA 5034
Australia
Telephone +61 (0)8 8272 3288
Facsimile +61 (0)8 8272 3888
info@archerexploration.com.au
www.archerexploration.com.au

24th January 2011

Quarterly Activities Report

For the period ended 31st December 2010

HIGHLIGHTS FOR THE QUARTER

EXPLORATION

- **Ketchowla manganese deposits - significant assays for Yttrium, Neodymium and Cerium in four of manganese deposits K1, K2, K3 and K9. Agitated acid leach results highly encouraging demonstrating metal recoveries for Mn, Ni, Co, Cu and Zn of >90%. Secured landowner consent for a ground geophysical survey targeting manganese under surficial cover as a precursor to drilling.**
- **2011 Strategic Plan was completed to prioritise the many opportunities available to the Company. Key focus for 2011 is to be on the Company's magnesite, manganese, iron ore, gold and graphite deposits.**
- **ELA's 388/10 and 389/10 were applied for during the quarter covering prospective ground for phosphate, barite and REE.**
- **Wild Horse Plains Manganese and Iron Ore – secured landowner consent for access for geophysical surveys and drilling.**
- **Gold – on 23rd December 2010 Archer accepted the terms for the granting of ELA113/10 Napoleon's Hat covering the extensive historic Wonna gold diggings. Granting of the EL is expected during January 2011.**

METALLURGICAL STUDIES:

- **Leigh Creek Magnesite – A 750kg composite sample of Beds 5 and 9 from the Mt Hutton deposit was collected and dispatched to Calix Limited in Victoria for calcining tests.**
- **A test work program was designed to quantify the upgrade capability of approximately 20% Mn manganese ores from Ketchowla K1 deposit and the Salt Creek manganese prospect using dense media separation. Results will be available Q1 2011.**
- **Samples of graphite from the Sugarloaf graphite deposit on Eyre Peninsula were collected for flake size determination.**

EXECUTIVE PERSONNEL

- **Mr Gerard Anderson appointed as Managing Director/CEO on 25th October 2010.**
- **Mr Peter J Meers appointed as a Non Executive Director on 12th November 2010.**

FINANCIAL

- **Cash in bank on 31st December 2010 of $3.26 million.**
- **$120,999 spent on exploration during the quarter.**

A summary of the December Quarter exploration activity follows:

1. Eyre Peninsula Iron and Manganese - Wild Horse Plains

The quarter was spent planning drilling and exploration programs planned for Q1 2011. Discussions were held with numerous landowners and pastoralists regarding access to land and the timing of planned activities.

Archer continued work on the iron prospects identified on the Wild Horse Plains (EL3377), Elbow Hill (EL 3653) and North Cowell (EL4277) Licenses on Eyre Peninsula. Field work was limited due the cropping season, however landowner access was granted to key areas to strengthen the hematite model. The model is based on the hematite mineralisation at the Middleback Iron Deposits.

2. Ketchowla Manganese and REE (EL 4266)

As a part of ongoing exploration, initial metallurgical test work on the manganese prospects at Ketchowla was performed to determine the recoveries of metals Ni, Co, Cu and Zn from manganese-rich material. Analyses were also conducted for Rare Earth Elements (REE).

2.1 Bench Scale Leach Tests

25 kgs of manganese-rich drill cuttings were collected from two drill holes drilled into K1 and subjected to agitated acid leach tests at AMMTEC. Agitated acid leaching demonstrated excellent metal recoveries of 90% -95% for all elements tested (Mn, Ni, Co, Cu and Zn).

2.2 Rare Earth Elements

Rare Earth Elements (REE) analyses revealed significant assays for **Yttrium**, **Neodymium** and **Cerium in four of Archer's Ketchowla manganese deposits K1, K2, K3 and K9**. Lithium is also highly anomalous.

The potential economic significance of the REE values is not known at this time.

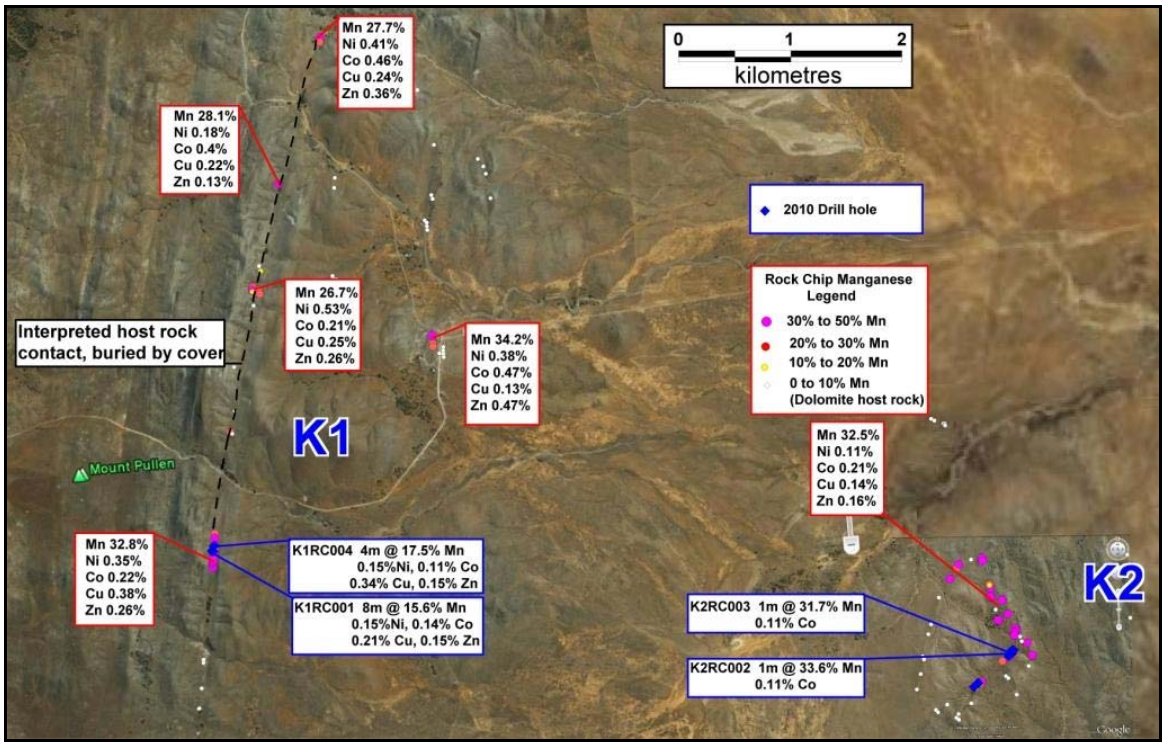

Figure 1 Rock chip grades (red) and drill hole results (blue) K1 and K2 Ketchowla

2.3. REE from Rock Chip Sampling

Previously reported manganese rich rock chip samples returned REE assays up to:

- **Cerium to 2,200ppm**
- **Yttrium to 1695ppm**

The rock chip samples also returned **Lithium values to 4400ppm**

Assaying was by four acid digest followed by ICPMS.

2.4. REE in RC Drilling

Significant REE values from K9 drilling (manganese results previously reported) were;

- **2m @ 0.30% REE** (K9RC009 3 to 5m)
- **3m @0.12% REE** (K9RC010 5 to 8m

At K9 RRE enrichment appears to be confined to **Mn poor rocks**. Shallow thin clay-rich intervals for K9RC009 and K9RC010 reported elevated REE's as well as strontium. This material appears to be a weathered intrusive rock having caused chlorite alteration to the surrounding dolomite and siltstones.

The REE's are thought to have been introduced through fluids into the rocks from a local source.

This is supported by an isolated hole (K9RC011) drilled vertically into siltstones to the north that reports **7m @ 103ppm Ce** (entire length of hole), see figure 2.

No other sampling of the siltstones or country rocks has been undertaken to the north due to the lack of manganese. The 2 anomalous holes reside in a "basin-like" area possibly reflecting an as yet unseen intrusive body, which maybe the source of the REEs.

In addition to these intervals is the presence of anomalous molybdenum (Mo) in a 1m interval in each hole that reports **1850ppm Mo (K9RC009)** and 250ppm (K9RC010).

Drilling returned intercepts of:

- **K9RC009 3 - 5m**, **2 metres** @ 0.9% Mn, 279ppm Nd, 226ppm Dy**, 1223 ppm Y**, 288ppm Ce, **149ppm Sc**, as well as Er, Gd, Sm and Yb all reporting above 100ppm
- **K9RC010 5 - 7m, 2 metres** @ 9.6% Mn, 192ppm Nd, 120ppm Dy**, 540 ppm Y**, 153ppm Ce, 60ppm Sc and 110ppm Gd.

These results indicated that other drill samples, both Mn rich and Mn poor should be re-assayed to determine the extent of REE mineralisation.

2.5 K1 Manganese Deposit

The manganese enrichment appears to be controlled by a 7.5km NS fault, with rafted blocks of siltstone being observed in the face of historic workings, these rafted blocks imply some form of emplacement of the manganese i.e. fluid origin.

Drilling to the immediate north of the workings revealed intercepts of:

- **K1RC001 6 - 14m, 6 metres** @ 15.6% Mn; 0.21% Cu; 0.14% Co; 0.24% Ni, 0.15% Zn, **0.12% Li,** 255ppm Mo, 637ppm Sr and 272ppm Yttrium
- **K1RC004 11 - 15m, 4 metres** @ 17.5% Mn; 0.34% Cu; 0.11% Co; 0.24% Ni, 0.15% Zn, **0.10% Li**, 126ppm Mo, 338ppm Sr and 311ppm Yttrium

The presence of lithophorite, (an aluminium – lithium mineral) may explain the concentrations of Ni, Co, Cu and Zn previously reported with the manganese. It may also explain the presence of elevated rare earth elements, lithium and strontium.

Similar high base metal, high REE manganese deposits are reported from Japan and Orissa in India.

2.6 K1 Rock Chip Results

Eight (8) rock chip samples were collected from an area 2.4km along strike to the north of the K1 drilling. This area has never been drill tested. These samples reported an average of;

Element	ppm	Element	%
Cerium	446	**Manganese**	**26.67**
Lanthanum	103	**Nickel**	**0.52**
Scandium	**111**	**Cobalt**	**0.23**
Yttrium	**1160**	**Zinc**	**0.25**
Dysprosium	194	**Copper**	**0.28**
Erbium	120		
Gadolinium	214		
Neodymium	**555**		
Samarium	194		
Ytterbium	133		
Total REE	**3474.9**		
NON REE's			
Strontium	111		
Lithium	**2557**		

These 8 samples were taken from an area of 70m by 40m from sub cropping manganese-rich material on the K1.

Elevated REE's are also observed at the K3 prospect and the K2 prospect, neither of which were targeted during previous drilling, see figure 3.

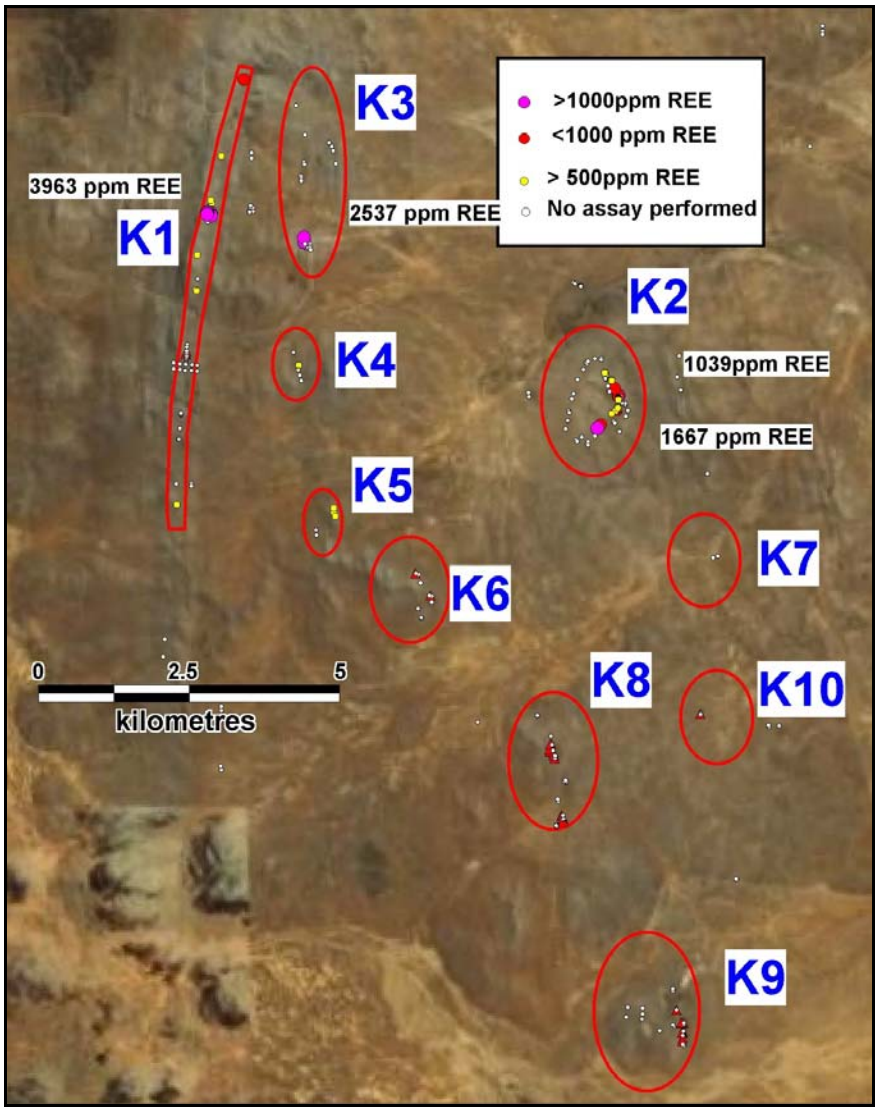

Figure 3. Plan view of anomalous REE results from rock chips at Ketchowla

2.7 Further Work

Additional work is necessary to understand the implications of the rare earths and other elevated elements, as it can be seen that scavenging by manganese is not solely responsible for the highly anomalous REEs.

Additional work planned for the first quarter of 2011 will include;

- Ground gravity to better define the potential extent of manganese buried below alluvium.
- Field mapping and sampling of all manganese outcrops and sampling to identify extensions to and repetitions of the REE rich clay horizons.
- Reverse circulation drilling to outline the extent of the manganese and REE resources.
- Petrology and SEM (scanning Electron Microscopy) to determine the chemistry of the manganese mineralisation i.e. is the ore lithiophorite dominant.
- Additional test work to determine if Ni, Co, Cu, Zn and REE's can be recovered and concentrated in the manganese.

3. Metallurgical Test Work

3.1 Leigh Creek Magnesite

During 2010, Archer applied for two tenements covering the Leigh Creek magnesite deposits that were formerly owned by Magnesium International Limited. Termination Hill EL 4567 was granted on 20th September 2010 giving Archer ownership over high grade, low impurity magnesite deposits at Mt Hutton, Mt Playfair, Pug Hill and Termination Hill. ELA173/10 Witchelina is pending approval.

Regional Magnesite Resources				
Area	**Measured (Mt)**	**Indicated (Mt)**	**Inferred (Mt)**	**MgO (%)#**
Pug Hill		10	10	42.7%
Termination Hill	4	5	20	42.8%
Mt Hutton	18.3	42	53	42.9%
Mt Playfair		11	23	42.5%

Source: SAMAG Project Report 1999

Magnesite ($MgCO_3$) has a maximum possible MgO grade of 47.8%

During the quarter a 750kg (approx) composite sample from magnesite Beds 5 and 9 at Mt Hutton was collected and dispatched for flash calcining tests to Calix Limited in Victoria. Calix has indicated that the first test will be completed in Q1 2011. This test is the first of up to four similar tests that are designed to define the grade of caustic calcined magnesia that can be produced by calcining magnesite at various temperatures.

Magnesia (MgO) has a wide range of applications including agricultural (fertilizers and food supplements, pharmaceutical, industrial, construction and high tech applications such as long-life batteries, a multitude of alloys with aluminium, manganese, zinc, as the mainstay importance to the die casting industry, aviation, defence and space industry, many automotive parts and components, uranium reduction, refractory use in iron and steel production and much more.

3.2 Ketchowla and Salt Creek Manganese

Archer has two main manganese prospects, the Ketchowla deposits near Burra and the Salt Creek deposit near Cleve on Eyre Peninsula. Rock chip sampling and RC drilling at Ketchowla has identified medium grade manganese (≈20% Mn) which has elevated Ni, Co, Cu, Zn and REE. At Salt Creek surface rock chip sampling has indicated grades from 15 - 30% Mn. Saleable manganese is generally >35% Mn.

A test work program was designed to quantify the upgrade capability of ≈20% Mn manganese ores from K1 and Salt Creek using dense media separation (used at both Woodie Woodie and Bootu Creek to upgrade run-of-mine ores). Results will be available Q1 2011.

3.3 Graphite flake size determination, Sugarloaf Hill

Significant downhole intercepts of graphite were identified during drilling on Carappee Hill EL3711, central Eyre Peninsula, in 2008. Drilling confirmed a strike length of over 1km. A significant EM anomaly extends for over 3kms. Total carbon values in excess of 30m @ 14% carbon were reported from drilling.

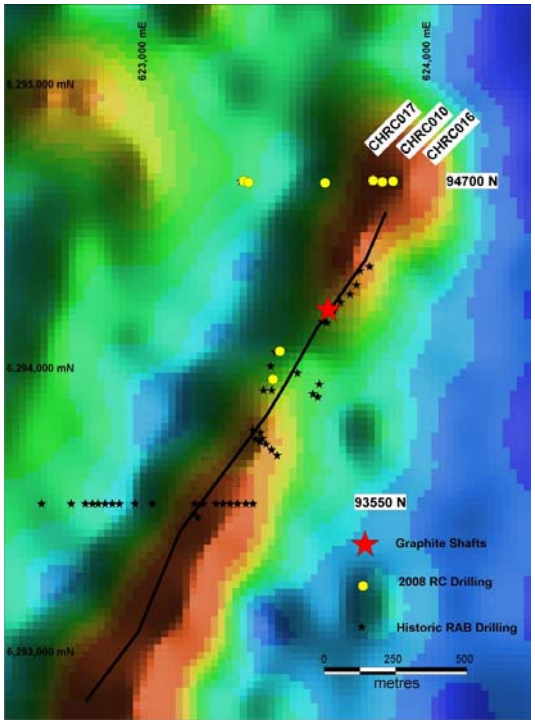

Figure 4 Sugarloaf EM response (sliced at a depth of 120m)

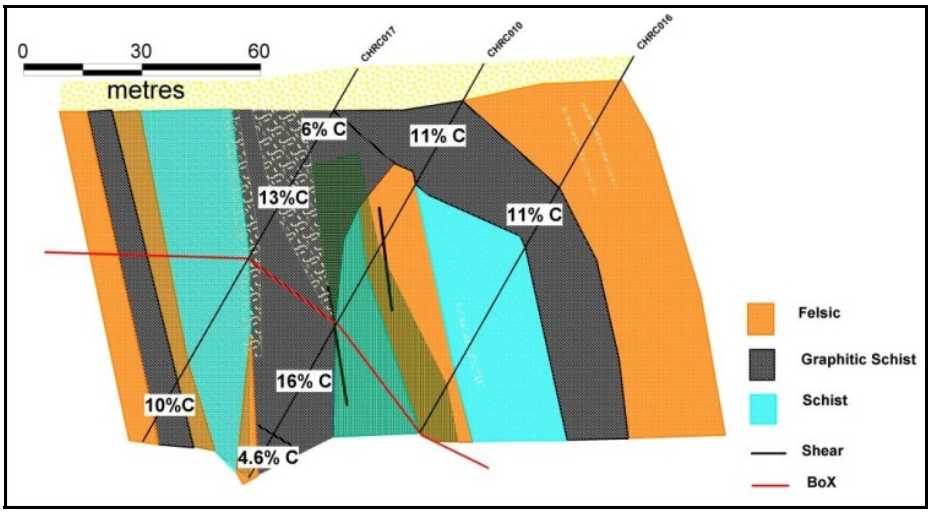

Figure 5 Sugarloaf graphite cross section showing significant Total C assays

The physical characteristics of the graphite, including flake size, are essential to determine the prospectivity of the deposit. Samples have been collected from the surface of two deep historic shafts for flake determinations.

Graphite is a key ingredient in steel, castings, lubricants, vehicle brakes and sporting goods. Graphite is stable in corrosive environments, conducts electricity and resists heat and is of growing importance for

storage batteries and nuclear-electricity generation stations. High-purity large-flake graphite is essential for lithium-ion batteries crucial to electronics industry.

Demand for graphite has been increasing for other applications especially for emerging fuel cell technologies and prices have continued to rise. Prices for natural graphite (crystalline, CIF European port, FCL, $/t) are shown below as at October 2010.

Grade	10/28/10
Fine: 90%C, -100 mesh, FCL	850-1,100
Fine: 94-97%C, -100 mesh, FCL	1,100-1,400
Medium flake: 85-87%C, +100 mesh – 80 mesh, FCL	950-1,200
Medium flake: 94-97% C, +100 mesh – 80 mesh, FCL	1,300-1,700
Large flake: 94-97% C, +80 mesh, FCL	1,400-2,000

Source http://www.ree-investor.com

A 2010 European Commission study regarding on critical materials to the European economy included graphite among the 14 materials high in both economic importance and supply risk.

Cash balance:

The Company's cash balance at the end of the quarter was $3.26 million.

For further information please contact:

Mr Greg English
Chairman
Archer Exploration Limited
Tel: (08) 8272 3288

Mr Gerard Anderson
Managing Director
Archer Exploration Limited
Tel: (08) 8272 3288

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.

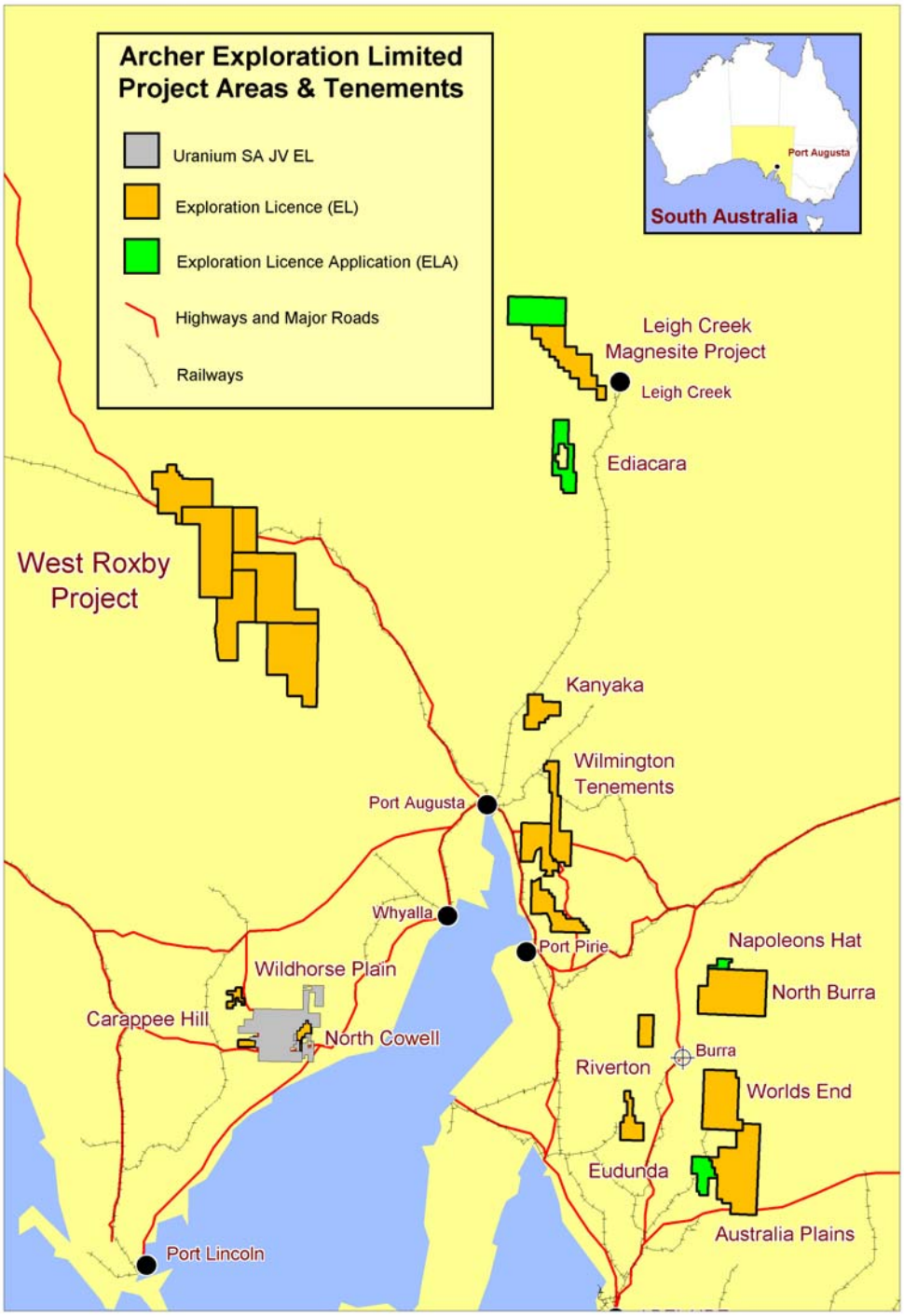

Figure 6. Archer Exploration Tenement Position December 2010.