Overview

Australian mineral exploration spending in 2006–071 rose by 38% to a record $1714.6 million2 of which 36% was spent on the search for new deposits3.

Spending rose in all States and the Northern Territory with South Australia up by 78% to $260.7 million while Western Australia dominated with 49% of Australian mineral exploration spending.

The base metal group4 was the dominant target accounting for 32% of exploration spending overtaking gold (27%) for the first time since 1983.

Exploration results were announced for a wide range of commodities with the most significant being the announcement of a 38% increase in contained copper in the Olympic Dam deposit, South Australia, and of an initial 4 Moz gold resource in the Tropicana deposit, Western Australia.

Exploration review

Australian mineral exploration expenditure rose by 38% to a record $1714.6 million in 2006–071 according to the Australian Bureau of Statistics (ABS). In 2006–07 constant dollars expenditure was also a record (Figure 1).

Spending increased in all States and the Northern Territory. Western Australia remained dominant attracting $839.1 million, an increase of 42%. In South Australia spending rose by 78%, the largest increase for any jurisdiction, to $260.7 million. In Queensland spending was up 24% to $272.3 million; New South Wales up 26% to $144.1 million; Victoria up 11% to $82.5 million; Northern Territory up 23% to $92.2 million and in Tasmania spending rose by 5% to $23.7 million.

The base metal group became the major exploration target as spending rose to $555.0 million: copper $234.5 million (up 68%), zinc-lead-silver $139.4 million (up 49%) and nickel $181.1 million (up 24%). Gold remained the largest individual commodity targeted in 2006–07 but its share of total exploration spending fell to 27% ($455.8 million) due to growth in spending on base metals, iron ore, uranium, coal, and mineral sands. Following the surge in interest in uranium exploration spending rose by 103% to $114.1 million.

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1Australian financial year from 1 July 2006 to 30 June 2007.
2All monetary references in this paper are to Australian dollars unless otherwise stated.
3Exploration spending on the search for new deposits covers exploration for previously unknown mineralisation or exploration on known mineralisation which is not yet classified as a resource.
4Copper, lead, zinc, silver, nickel, cobalt.
ABS survey data showed that, nationally, 36% of spending was on exploration for new deposits, compared to 37% in 2005–06. Victoria (46%) had the highest proportion of its exploration directed to the search for new deposits while South Australia had the lowest at 24%. The national share of exploration for new deposits is slightly lower than the Metals Economics Group (MEG) world survey of non-ferrous minerals exploration budgets for 2007 which found that 39% of exploration budgets in Australia was for grassroots exploration.

In 2006–07, ABS reported that exploration drilling totalled 8.455 million metres, an increase of 1.618 million metres (24%) from 2005–06. Of this increase, exploration drilling in the search for new mineralisation rose by 0.622 million metres to 3.240 million metres. Exploration of existing mineralisation rose by 0.996 million metres to 5.215 million metres.

The MEG survey of world non-ferrous mineral exploration budgets for 2007 reported an increase of 40% to an estimated record total budget of US$10.5 billion. MEG included uranium in the survey for the first time in 2007 and estimates that, including uranium, world budgets for non-ferrous mineral exploration was US$11.4 billion. Of this, US$1183.2 million was for exploration in Australia. Australia’s share of global non-ferrous mineral exploration budgets (excluding uranium) rose to 11.9% and Australia had the second highest share of budgets after Canada (19%).

According to the MEG survey, 60% of the 2007 non-ferrous mineral exploration budgets for Australian-based companies was for exploration in Australia. The survey included 512 companies with non-ferrous exploration budgets of more than US$100 000 that were exploring in Australia. Budgets for Australian non-ferrous mineral exploration included: gold (US$387.5 million), base metals (US$585.9 million) and uranium (US$154.2 million).

Funds raised from over 100 initial public offerings on the Australian Securities Exchange in 2007 were fully or partially for mineral exploration in Australia. These companies aimed to raise over of $520 million for Australian exploration and many were heavily oversubscribed.

Figure 1: Australian mineral exploration expenditure in constant 2006–07 dollars. Based on ABS data deflated by Consumer Price Index.
GOVERNMENT PROGRAMS

The Australian, State and Northern Territory governments continued to support the sector with programs designed to help reduce the inherent risk in exploration.

GEOSCIENCE AUSTRALIA

Geoscience Australia completed the first major surveys under its $58 million five-year program to stimulate discovery of hydrocarbon and energy minerals in onshore Australia. A continent-wide 145 000 line km airborne magnetic and gamma-ray tie-line survey was completed and will provide a uniform national gamma-ray spectrometric database and map and an improved magnetic map. In partnership with the Geological Survey of Queensland, a 1175 km deep crustal seismic reflection transect was completed from the eastern margin of the Mount Isa Province to the Georgetown Province and to the northern margin of the Drummond Basin. Magnetotelluric and gravity data was also acquired along this transect. Phase 1 of a major regional AEM survey in the Paterson Province in Western Australia was completed. A continent-wide surficial geochemical survey has commenced.

NEW SOUTH WALES

EXPLORATION NSW is a $30 million, seven-year (2000–07) program supporting minerals and petroleum exploration and it has been extended to 2008 with an additional $8 million, for ‘New Frontiers’ projects. It aims to provide world class geoscience information to assist explorers with online access to data. The current focus is on frontier terrains and the 3rd dimension, targeting the Thomson Orogen and extensions to the Stawell/Bendigo zones.

QUEENSLAND

The SMART EXPLORATION and SMART MINING – FUTURE PROSPERITY programs with funding of nearly $50 million from 2005–06 to 2009–10 are providing new geological and geophysical data for the Mount Isa region, the Bowen, Surat, Cooper and Drummond Basins, and the Charters Towers and Mount Rawdon regions. These data include airborne magnetic and radiometric, gravity, deep seismic, airborne hyperspectral surveys and geological mapping programs. It also includes funds for collaborative drilling with explorers, for mobilisation costs for drilling and geophysical surveys, and funds for junior mineral explorers for research and interpretation for target generation.

TASMANIA

TasExplore is a four-year $5.05 million program consisting of $4.1 million for new geoscientific information and $0.95 million for promotion of exploration opportunities. Aeromagnetic and radiometric data have been acquired over NE Tasmania and the Furneaux Group and geological mapping has been undertaken in the central North and is taking place in NE Tasmania and on King Island. The aim of the project is an upgraded 3D geological model of Tasmania.

VICTORIA

The Victorian Government’s $5 million, four-year, Rediscover Victoria initiative started in 2007 and has completed its first of three rounds of support for industry drilling, as well as accelerating the development of a world-class 3D geological map of Victoria to assist explorers. Rediscover Victoria complements the Victorian Government’s other geoscience programs including the Victorian Initiative for Minerals and Petroleum (VIMP) and Developing Gold Undercover, a $9 million initiative over three years from 2006 aimed at delivering new geoscience data and information to aid discovery of concealed gold resources.

WESTERN AUSTRALIA

The Western Australian Government continued to provide an additional $3 million per year to the Geological Survey of Western Australia to stimulate exploration. This funding accelerates the acquisition and release of new pre-competitive geoscience information in greenfields areas of the State and focuses particularly on new regional geophysical information. A three year, $1.2 million program of scanning and release on the web of a further 21 000 open file company mineral exploration reports ended in mid-2007. These reports were released under amended provisions of the Mining Act that allow for a reduced (five year) confidentiality period for statutory mineral exploration information.

NORTHERN TERRITORY

The Northern Territory Government announced a new four-year, $12 million exploration initiative named ‘Bringing Forward Discovery’ commencing in July 2007. This initiative includes extensive regional gravity surveys and major field-based prospectivity assessments, with an emphasis on under-explored ‘greenfield’ regions. Highlights during 2007 included a detailed airborne magnetic and radiometric survey over the Dunmarra Basin, and release of a major report on the geology and resource potential of the southern Georgina Basin.

SOUTH AUSTRALIA

The Plan for Accelerating Exploration (PACE), launched in 2004, is a five-year $22.5 million initiative that aims to increase exploration and mineral production in South Australia, as well as ensuring that the state is showcased as a premier destination for resource exploration and investment. In April 2007, the PACE initiative was extended by $8.4 million over two years, with the new funding taking its value to $30.9 million over seven years. During 2007, the state’s largest gravity survey was completed under PACE, covering more than 45 000 square kilometres of the remote north of South Australia within the highly prospective Gawler Craton.
EXPLORATION

High levels of exploration spending in Australia in 2007 generated a large number of drill intersections of economic grade or which are encouraging for others reasons for most commodities. An indicative selection of intersections of these types is reported below. In addition, earlier stage exploration activities including, rock chip sampling, geochemical and geophysical surveying identified a large number of prospects for further, more detailed exploration. These are not reported below. A selection of Australian mineral discoveries in recent years is shown in Table 1.

Table 1: A selection of Australian mineral discoveries since 2000.

<table>
<thead>
<tr>
<th>Year</th>
<th>State</th>
<th>Deposit/Project</th>
<th>Commodities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>WA</td>
<td>West Musgraves</td>
<td>Ni, Cu, Co</td>
<td>Exploration; Preliminary resource: 392 Mt @ 0.3% Ni, 0.33% Cu</td>
</tr>
<tr>
<td>2000 and later</td>
<td>WA</td>
<td>Golden Grove Orebodies (Incl. Amity, Hougoumont, Ethel)</td>
<td>Cu, Pb, Zn, Ag</td>
<td>Mine; Resources of 1.3 Mt Zn, 0.6 Mt Cu, 0.8 Mozs Au, 41 Mozs Ag, 0.14 Mt Pb</td>
</tr>
<tr>
<td>2000 and later</td>
<td>WA</td>
<td>Flying Fox (T0-T7 Zones)</td>
<td>Ni</td>
<td>Mine; Total resource 3.7 Mt @ 3.4% Ni for 126 330 t Ni</td>
</tr>
<tr>
<td>2000</td>
<td>NSW</td>
<td>Hera</td>
<td>Cu, Zn, Pb, Cu, Ag</td>
<td>Exploration; Resources of 2.2 Mt @ 3.4 g/t Au, 4.2% Zn, 3.1 Pb, 0.2% Cu, 18 g/t Ag</td>
</tr>
<tr>
<td>2001</td>
<td>NSW</td>
<td>Wyoming</td>
<td>Au</td>
<td>Exploration; Resources of 0.6 Mozs contained Au</td>
</tr>
<tr>
<td>2001</td>
<td>SA</td>
<td>Prominent Hill</td>
<td>Cu, Au</td>
<td>Development; Production 2008; Reserves 0.9 Mt contained Cu, 1.3 Mozs contained Au</td>
</tr>
<tr>
<td>2002</td>
<td>WA</td>
<td>Jaguar</td>
<td>Cu, Pb, Zn, Ag</td>
<td>Mine; First product shipped October 2007</td>
</tr>
<tr>
<td>2002</td>
<td>WA</td>
<td>Copernicus</td>
<td>Ni, Cu, Co</td>
<td>Feasibility; Total resource 0.85 Mt @ 1.2% Ni, 0.81% Cu, 0.05% Co</td>
</tr>
<tr>
<td>2004 and later</td>
<td>WA</td>
<td>Alec Mairs (various zones discovered later)</td>
<td>Ni</td>
<td>AM 2: Indicated Resources 38 000 t @ 14.05% Ni, Inferred Resources 17 000 @ 10.38% Ni</td>
</tr>
<tr>
<td>2004</td>
<td>WA</td>
<td>Trident</td>
<td>Au</td>
<td>Mine; Total resource 4.36 Mt @ 5.7 g/t Au for 0.8 Mozs Au</td>
</tr>
<tr>
<td>2004</td>
<td>SA</td>
<td>Jacinth &amp; Ambrosia</td>
<td>Mineral sands</td>
<td>Exploration; Eucla Basin; Bankable Feasibility Study for completion mid-2008</td>
</tr>
<tr>
<td>2004</td>
<td>WA</td>
<td>Prospero</td>
<td>Ni</td>
<td>Development; Probable Reserves 1.19 Mt @ 4.45% Ni</td>
</tr>
<tr>
<td>2005</td>
<td>WA</td>
<td>Tropicana</td>
<td>Au</td>
<td>Exploration; Tropicana-Havana Resources: 4.05 Mozs Au</td>
</tr>
<tr>
<td>2005</td>
<td>SA</td>
<td>Four Mile</td>
<td>U</td>
<td>Exploration; Four Mile West inferred resource 3.9 Mt @ 0.37% U3O8</td>
</tr>
<tr>
<td>2005</td>
<td>SA</td>
<td>Tripitaka</td>
<td>Mineral sands</td>
<td>Exploration; Drilling for water supply; Prefeasibility study</td>
</tr>
<tr>
<td>2005</td>
<td>SA</td>
<td>Carrapateena</td>
<td>Cu, Au</td>
<td>Exploration; 905 m @ 2.1% Cu, 1.0 g/t Au</td>
</tr>
<tr>
<td>2006</td>
<td>SA</td>
<td>Gulliver’s</td>
<td>Mineral sands</td>
<td>Exploration; Part of Eucla Basin Mineral Sands Project</td>
</tr>
<tr>
<td>2006</td>
<td>WA</td>
<td>Cooljarloo North</td>
<td>Mineral sands</td>
<td>Exploration; Thick, +10% HM intersections</td>
</tr>
<tr>
<td>2006</td>
<td>QLD</td>
<td>Rocklands</td>
<td>Cu</td>
<td>Exploration; Bankable Feasibility study by June 2008</td>
</tr>
<tr>
<td>2007</td>
<td>WA</td>
<td>Spotted Quoll</td>
<td>Ni</td>
<td>Exploration; 8.72 m @ 11.35% Ni</td>
</tr>
<tr>
<td>2007</td>
<td>SA</td>
<td>Dromedary</td>
<td>Mineral sands</td>
<td>Exploration; Eucla Basin; 1-14.6% HM</td>
</tr>
<tr>
<td>2007</td>
<td>WA</td>
<td>Cyclone &amp; Hurricane</td>
<td>Mineral sands</td>
<td>Exploration; Eucla Basin; 4.5% HM over an average 5 m; zircon content of up to 50%</td>
</tr>
</tbody>
</table>
BASE METALS (FIGURE 2)

New South Wales

CBH Resources Ltd reported that infill drilling at the Hera deposit near Nymagee was likely to upgrade the resource estimated at 2.2 Mt @ 3.4g/t Au, 4.2% Zn, 3.1% Pb, 0.2% Cu and 18g/t Ag. Intersections reported included 6.0 m @ 5.5g/t Au, 0.3% Cu, 8.9% Pb, 9.3% Zn, 50g/t Ag which included a 1.95 m zone @ 11.7g/t Au, 0.5% Cu, 21.0% Pb, 20.9% Zn and 119g/t Ag. At the Browns Reef project, 5 km W of Lake Cargelligo, drilling by Comet Resources Ltd has confirmed the project’s potential with an intersection of 6 m @ 11.4% Zn, 4.8% Pb, 1.2% Cu, 74g/t Ag reported within a 58 m intersection of 2% Zn, 0.9% Pb, 0.45% Cu, 19g/t Ag. Other intersections included 20 m @ 5% Zn, 2.8% Pb, 0.16% Cu and 13.5g/t Ag, and 11 m @ 3.7% Zn, 1.5% Pb, 0.4% Cu and 10.5g/t Ag.

Northern Territory

At the Browns East prospect, 80 km S of Darwin, Compass Resources NL reported encouraging copper-uranium mineralisation in drill intersections. They included 10 m @ 6.61% Cu, 0.46% Co, 0.33% Ni, 165g/t Ag and 3.6 lb/t U₃O₈; 15 m @ 5.79% Cu, 0.17% Co, 0.21% Ni, 203g/t Ag, and 3 m @ 2.25% Cu, 0.10% Co, 0.09% Ni, 10.9 lb/t U₃O₈.

At the Explorer 108 prospect 100 km WSW of Tennant Creek, deep drilling returned wide zones of high-grade mineralisation. Westgold Resources NL reported an intersection in an extension of the main high-grade zone of 42 m @ 4.3% Zn, 1.7% Pb, 13.4g/t Ag, 0.4g/t Au from 345 m. This intersection included two 7 m intersections of 9.1% Zn and 6.5% Zn respectively.

Queensland

CuDeco Ltd continued to report high-grade copper intersections from its Rocklands project near Cloncurry. These included 14 m @ 3.91% Cu from 58 m; 58 m @ 1.68% Cu, 0.26g/t Au and 436ppm Co from 92 m, and 19 m @ 2.94% Cu and 0.24g/t Au from 51 m.

Drilling by Copper Strike Ltd in the Einasleigh district returned significant intersections of zinc-lead-silver mineralisation at the Chloe and Jackson prospects. Indicative of these intersections were, at Chloe, 40 m @ 6.6% Zn, 2.8% Pb, 41g/t Ag, 0.3% Cu from 244 m, and 23.6 m @ 7.9% Zn, 3.2% Pb, 55g/t Ag and 0.4% Cu from 394.2 m. At Jackson an intersection of 15 m @ 6.4% Zn, 5.3% Pb, 194g/t Ag and 0.1% Cu was reported.

South Australia

Teck Cominco Ltd reported a spectacular drill intersection from the Carrapateena prospect, discovered in 2005, of 905 m @ 2.1% Cu and 1.0g/t Au which included 191 m @ 3% Cu and 0.9g/t Au, and 95 m @ 3.3% Cu and 0.6g/t Au. Teck is continuing exploration at Carrapateena.

At the Kanmantoo project, Hillgrove Resources NL continued drilling to increase the existing inferred resource of 33.4 Mt @ 0.9% Cu and 0.2g/t Au. Intersections included 14 m @ 2.50% Cu, 0.61g/t Au; 19 m @ 1.88% Cu; 6 m @ 4.19% Cu, 0.25g/t Au, and 13 m @ 1.01% Cu, 1.60g/t Au.

Tasmania

At the Hellyer mine, Bass Metals Ltd reported results for a drill hole aimed at testing the Southern barite zone which is along strike from the old Hellyer mine. A 57.5 m downhole intercept returned 9.2% Zn, 4.7% Pb, 94g/t Ag and 2.89g/t Au. Included in this was 11.65 m @ 13.8% Zn, 8.3% Pb, 144g/t Ag and 3.2g/t Au.

Western Australia

Encouraging zinc intersections were reported by Prairie Downs Metals Ltd from the Prairie Downs prospect 60 km SW of Newman. Intersections reported late in the year included 3 m @ 12.1% Zn, 2.75% Pb, 35g/t Ag; 4 m @ 11.8% Zn, 3.0% Pb, 38g/t Ag; and 5 m @ 8.2% Zn, 2.5% Pb and 29g/t Ag.

Northern Star Resources Ltd intersected significant mineralisation at its Emull prospect 50 km SW of Halls Creek in the Kimberley region. These intersections included 15 m @ 4.27% Zn, 0.76% Cu, 6.8g/t Ag which included a higher grade zone of 4 m @ 11.29% Zn, 1.03% Cu, 5.6g/t Ag; 18 m @ 4.06% Zn, 0.76% Cu and 5.8g/t Ag including 6 m @ 8.19% Zn, 0.82% Cu and 5.0g/t Ag.

NICKEL (FIGURE 3)

Northern Territory

At its Chinese Big Pit zone in the Pine
Creek area during gold exploration intersected high-grade nickel mineralisation. The intersection was 2 m @ 5.4% Ni, 0.8% Co from 73 m downhole.

**Queensland**

Metallica Minerals Ltd reported the results of infill drilling on the inferred resource at the Minnamoolka lateritic deposit in its NORNICO project. Intersections reported included 33 m @ 1.27% Ni from surface, 11 m @ 1.01% Ni from 1 m, and 22 m @ 1.07% Ni from 2 m.

**South Australia**

Lincoln Minerals Ltd discovered lateritic nickel in the Cockabidnie project, 130 km WSW of Whyalla with an initial intersection of 6 m @ 0.42% Ni, 0.06% Co, and 0.02% Cu from 21 m. Subsequent intersections included 4 m @ 0.68% Ni, 0.05% Co and 0.03% Cu above a 12 m mineralised saprolite zone which yielded 0.34% Ni, 0.02% Co and 0.02% Cu.

**Tasmania**

Exploration by Allegiance Mining NL in the vicinity of its Avebury nickel mine near Zeehan continued to yield encouraging results. At the Bison prospect drill intersections of 7 m @ 1.5% Ni and 24 m @ 0.7% Ni were encountered. At the Melba Flats project further encouraging intersections were reported including 1.6 m @ 2.38% Ni, 1.83% Cu, 0.37g/t Au, 0.41g/t Pt, 0.79g/t Pd, and 3.5 m @ 1.29% Ni, 1.29% Cu, 0.24g/t Au, 0.34g/t Pt and 0.49g/t Pd.

**Western Australia**

In October, Western Areas NL, reported a high-grade nickel discovery at the Spotted Quoll prospect 6 km S of the Flying Fox mine. The first diamond drill hole intersected 6.2 m @ 4.8% Ni which included 3.6 m @ 6.9% Ni from 121.5 m down hole.

Jubilee Mines NL announced an extension to its Sinclair nickel deposit near Leonora. Drill intersections included 5.4 m @ 4.7% Ni, 10.4 m @ 3.4% Ni and 34.4 m @ 3.0% Ni. The deposit remains open down plunge.

Exploration at the Alec Mairs deposit 500 m S of the Cosmos Deeps mine by Jubilee Mines NL returned high-grade drill intercepts. At AM2, intersections reported included 3.3 m @ 10.6% Ni, 5.3 m @ 7.3% Ni and 3.1 m @ 9.8% Ni. At AM5 results from drilling included 52 m @ 3.2% Ni, 3.1 m @ 19.4% Ni and 23.7 m @ 3.6% Ni which included 1.5 m @ 20.0% Ni.

**GOLD (FIGURE 4)**

**New South Wales**

Ongoing exploration by Alkane Exploration Ltd at the Tomingley Gold Project near Peak Hill returned encouraging results. At the Caloma prospect, 600 m E of the Wyoming Three deposit, intersections included 4 m @ 14.00g/t Au from 80 m, 3 m @ 5.54g/t Au from 24 m and 7 m @ 9.12g/t Au from 132 m.

Exploration drilling 7 km SE of West Wyalong by Golden Cross Resources Ltd intersected a possible new gold reef. Drill intersected gold mineralisation including 2 m @ 19.1g/t Au from 106 m downhole. In addition, holes drilled under old workings identified the Mallee Vale reef with an intersection of 4 m @ 6.11g/t Au from 28 m and the Pine Ridge reef returned 2 m @ 1.48g/t Au from 36 m.

**Northern Territory**

GBS Gold International Inc. reported continuing encouraging drilling intersections from the Chinese Big Pit zone located about 55 km NW of its Union Reefs plant near Pine Creek. Intersections reported include 11 m @ 35.7g/t Au, 13 m @ 4.8g/t Au and 4 m @ 4.6g/t Au.

**Queensland**

Drilling by Mantle Mining Corporation Ltd extended the known mineralisation at the Granite Castle prospect 165 km W of Charters Towers, and returned encouraging results. These included 3 m @ 6.26g/t Au, 313.6g/t Ag from 45 m, 5 m @ 8.64g/t Au, 132.2g/t Ag from 97 m; and 7 m @ 3.48g/t Au, 79.7g/t Ag from 125 m. All contained higher grade zones.
South Australia

Southern Gold Ltd reported high-grade gold intersections from its initial drilling at the Golf Bore deposit near the Challenger mine. Golf Bore is part of the Challenger Area Joint Venture with Dominion Mining Ltd. Intersections included 12 m @ 7.56g/t Au from 81 m, 9 m @ 5.79g/t Au from 54 m, and 9 m @ 2.69g/t Au from 63 m.

Drilling over parts of the Area 223 deposit at Tunkilla by Minotaur Exploration Ltd continued to yield good intersections. Among the better results were 10 m @ 8.3g/t Au from 51 m, 3 m @ 16.2g/t Au from 54 m, and 9 m @ 4.1g/t Au from 60 m, all from the oxide zone.

Victoria

Bendigo Mining Ltd’s drilling on the Gill reef at the Bendigo project at Bendigo encountered very high-grade intersections over 460 m strike length. Included were 0.9 m @ 4070g/t Au from 51 m, 3 m @ 16.2g/t Au from 54 m, and 9 m @ 4.1g/t Au from 60 m, all from the oxide zone.

Western Australia

The Joint Venture partners AngloGold Ashanti Ltd (70%) and Independence Group NL (30%) reported an initial resource estimate for the Tropicana – Havana deposits 230 km ESE of Laverton of 4.05 Moz Au. Exploration outside the conceptual pit zone continues to yield significant results. At Tropicana intersections included 19 m @ 4.0g/t Au, 29 m @ 3.2g/t Au, and 22 m @ 3.5g/t Au. At Havana, intersections included 30 m @ 23.1g/t Au, 5.0% Sb; and 2.25 m @ 20.8g/t Au, 10.93% Sb.

Avoca Resources Ltd announced the discovery of significant gold mineralisation at shallow depths on the Wills Prospect, 25 km N of Trident. Wills occurs in an area of no previous drilling or evidence of historical workings and is under about 20 m of cover. Intersections reported include 2 m @ 10.1g/t Au from 17 m, 5 m @ 5.7g/t Au from 23 m, and 2 m @ 5.8g/t Au from 23 m.

IRON ORE (FIGURE 3)

South Australia

Centrex Metals Ltd reported encouraging hematite mineralisation from the Wilgerup deposit located 30 km SE of Lock. In the Wilgerup North pod intersections included 23 m @ 65.5% Fe, 2.16% SiO₂, 1.38% Al₂O₃, 0.057% P, and 30 m @ 60.6% Fe, 4.97% SiO₂, 2.03% Al₂O₃, and 0.39% P.

Early drill results from the Tui prospect at the Hawks Nest project reported by Western Plains Resources Ltd included 64 m @ 61.3% Fe, 12.6% SiO₂, 0.61% Al₂O₃, 0.02% P and 0.08% LOI, and 18 m @ 55.6% Fe, 16.2% SiO₂, 0.63% Al₂O₃, 0.02% P and 2.02% LOI.

Western Australia

Gindalbie Metals Ltd reported the discovery of magnetite mineralisation beneath the BH2 hematite deposit at the Karara deposit, 45 km E of Koolanooka. Typical drill intersections include 64 m @ 49.5% Fe, 26.0% SiO₂, 0.129% P, 0.041% S; 88 m @ 44.0% Fe, 32.4% SiO₂, 0.086% P, 0.024% S, and 64 m @ 45.0% Fe, 32.9% SiO₂, 0.096% P and 0.014% S.

FerrAus Ltd announced the discovery of iron mineralisation at its Davidson Creek project 20 km W of Jigalong in the east Pilbara region. The mineralisation is Marra Mamba ore and intersections reported include 32 m @ 59.6% Fe, 0.070% P, 3.3% SiO₂, 2.3% Al₂O₃, 8.6% LOI, and 30 m @ 57.3% Fe, 0.091% P, 4.9% SiO₂, 2.9% Al₂O₃, and 9.5% LOI.

Encouraging results were reported by BC Iron Ltd from drilling on the Outcamp Well channel iron prospect 40 km SW of Nullagine. Intersections included 14 m @ 57.9% Fe, 3.4% SiO₂, 1.8% Al₂O₃, 0.02% P, 10.8% LOI, and 10 m @ 58.9% Fe, 2.6% SiO₂, 1.3% Al₂O₃, 0.02% P, and 11.5% LOI.

MINERAL SANDS (FIGURE 5)

New South Wales

Bemax Resources Ltd discovered the Atlas Prospect in the Murray Basin. Assays delineated a zone 4.9 m thick over a width of 135 m averaging 15.4% heavy minerals (HM) at a 3% HM cut-off.
Iluka Resources Ltd discovered the Nepean deposit, 70 km N of Balranald. Nepean has a heavy mineral core with grades of greater than 30% HM and combined rutile and zircon assemblages of greater than 20%.

South Australia

Iluka Resources Ltd announced the discovery of the Typhoon prospect 5 km SE of its Jacinth-Ambrosia deposits in the Eucla Basin. Drilling intersected HM sands over a width of approximately 1000 m and up to 21 m thick. A provisional analysis of composited samples returned an average zircon grade of 17%.

Iluka also announced the discovery of the Dromedary prospect, 45 km NE from Ceduna. Four drill traverses returned intersections of mineral sands over an apparent width of up to 500 m and up to 1 km along strike. Mineralisation is up to 4.5 m thick from an average depth of 25 m. The HM grade ranges from 1% to 14.6% and mineralogy suggests an average zircon assemblage of 17%.

Victoria

Bemax Resources Ltd reported drill results from its Kulwin North deposit ENE of Ouyen confirmed a strike length of over 5 km for the deposit with potential to extend this to the north. Some of the better intersections reported were 6.0 m @ 19.3% HM, 6.0 m @ 15.6% HM, and 4.5 m @ 24.2% HM. In the southern part of the deposit the HM composition is 15% rutile, 15% zircon and 61% ilmenite.

Western Australia

Image Resources NL reported further encouraging drill intersections at Cooljarloo North, 3 km N of the Cooljarloo mine near Cataby. Included were 6 m @ 15.7% HM from the Hyperion zone and 6 m @ 16.0% HM and 3 m @ 21.1% HM from the Target 2 zone. At Target 7 which is 0.5 km W of Hyperion initial drilling returned intersections including 6 m @ 7.1% HM, 7 m @ 6.8% HM and 7 m @ 6.2% HM.

Diatreme Resources Ltd and Minerals Corporation Ltd announced a mineral sands discovery in the Eucla Basin on the South Australia-Western Australia border. Drilling identified the Cyclone and Hurricane prospects. At Hurricane the best results had an average grade of 4.5% HM over an average 5 m thickness and a zircon content of up to 50%. At Hurricane drilling returned 2 m @ 10% HM (estimated) and 4.5 m @ 3.8% HM (estimated).

RARE EARTH ELEMENTS

Northern Territory

Arafura Resources Ltd undertook infilling drilling at the Nolans deposit to upgrade the existing indicated and inferred resource of 18.6 Mt @ 3.1% REO, 14% P2O5 and 0.47 lb/t U3O8. Significant intersections were reported including 5.4 m @ 23.8% REO, 4.7 lb/t U3O8, 8.3 m @ 11.4% REO, 2.2 lb/t U3O8, 4.7 m @ 7.9% REO, 1.2 lb/t U3O8, and 17.3 m @ 6.6% REO and 1.2 lb/t U3O8. Nolans is 135 km NNW of Alice Springs.

Western Australia

Navigator Resources Ltd reported initial results from drilling at the Cummins Range project 130 km SW of Halls Creek. Preliminary assays from 4 m composite intersections were 48 m @ 3.5% REO from 24 m and 64 m @ 3.3% REO from 16 m. In addition, preliminary uranium intersections included 44 m @ 881ppm U3O8 from 28 m and 24 m @ 798ppm U3O8 from 72 m.

TIN

New South Wales

High-grade tin intersections with associated copper, zinc and indium were reported by YTC Resources Ltd from the Doradilla project, 45 km SE of Bourke. Intersections included 40 m @ 1.5% Sn, 0.52% Cu, 110ppm In, and 0.35% Zn from 6 m, which included 18 m @ 3.04% Sn, 0.85% Cu, 230ppm In, and 0.73% Zn from 18 m.

Tasmania

At the St Dizier deposit on the west coast near Zeehan, Stellar Resources Ltd reported encouraging tin intersections from the first hole of a three hole diamond drilling program. Intersections included 22 m @ 1.12% Sn from 13m, 4.5 m @ 3.82% Sn from 39.2 m, and 57 m @ 0.6% Sn from 44 m.

URANIUM

Northern Territory

Energy Metals Ltd, manager of the Bigrlyi joint venture, continued to report significant uranium.
mineralisation from the project. Results included 2.34 m @ 0.56% eU₃O₈, 1.98 m @ 0.45% eU₃O₈, and 3.60 m @ 0.39% eU₃O₈. The company reported resources at Bigrlyi of 14.3 million pounds U₃O₈ and 16.3 million pounds V₂O₅. Bigrlyi is 350 km NW of Alice Springs.

Uranium Equities Ltd reported that core from a diamond drill hole at the N147 prospect 82 km WSW of Maningrida, returned 22.1 m @ 0.36% U₃O₈ from a depth of 114.1 m. Results from a second hole returned 28.1 m @ 0.125% eU₃O₈ from 88.3 m, and 21.7 m @ 0.306% eU₃O₈ from 129.4 m.

Queensland

At the Valhalla North project in northwest Queensland, Fusion Resources Ltd intersected high grade uranium mineralisation. At the Duke Batman prospect downhole intersections included 10 m @ 1289ppm U₃O₈ which included 5 m @ 2278ppm U₃O₈. Other intersections included 4 m @ 1133ppm U₃O₈ and 7 m @ 314ppm U₃O₈.

Bowen Energy Ltd reported that drilling on the Glen Isla prospect, 45 km NNW of Cloncurry had returned encouraging uranium grades. Intersection included 1 m @ 1705ppm U, 1 m @ 389ppm U and 1 m @ 159ppm U. Drilling also indicated anomalous uranium levels in another palaeochannel.

South Australia

Alliance Resources Ltd continued exploration at its Four Mile East project located 110 km ENE of Leigh Creek. High-grade uranium intersections reported included 0.7 m @ 2.51% pU₃O₈, 1.85 m @ 1.94% pU₃O₈, 4.70 m @ 0.69% pU₃O₈, and 4.10 m @ 1.69% pU₃O₈. The Company expects a resource estimate for the northern part of Four Mile East to be available in about April 2008.

Curnamona Energy Limited reported that ongoing drilling at the Oban prospect, 100 km NW of Broken Hill, encountered encouraging uranium intersections, including 5.3 m @ 0.085 % eU₃O₈ and 8.20 m @ 0.08% eU₃O₈.

WESTERN AUSTRALIA

Metex Resources NL reported that reconnaissance drilling on its Nyang prospect, 150 km N of Carnarvon, encountered uranium mineralisation. Intersections included 8 m @ 1320ppm U₃O₈ which included 1 m @ 2323ppm U₃O₈ and 1 m @ 2983ppm U₃O₈, 15 m @ 546ppm U₃O₈ including 1 m @ 1640ppm U₃O₈ and 3 m @ 595ppm U₃O₈ including 1 m @ 1202ppm U₃O₈.

Scimitar Resources Ltd reported encouraging uranium intersections in drilling at its Yanrey prospect 85 km S of Onslow. The intersections included 2.4 m @ 1614ppm eU₃O₈, 3.8 m @ 1309ppm eU₃O₈, and 1.4 m @ 1284ppm eU₃O₈.

RESOURCES

During 2007 approximately 66% of exploration expenditure in Australia was on deposits for which at least an inferred resource had been established with the aim of further defining the resource and understanding the nature of the deposit. The resource information presented below and in Figure 6 is an indicative selection new resources reported during the year and not a comprehensive listing.

BASE METALS

Queensland

Copper Strike Ltd announced initial inferred resources for the Chloe and Jackson prospects in the Einasleigh area. Using a cut-off grade of 3% Zn equivalent over a minimum of 4 m the resource estimates are: Chloe 1.82 Mt @ 5.12% Zn, 2.23% Pb, 42g/t Ag, and 0.25% Cu and Jackson 0.49 Mt @ 5.26% Zn, 4.06% Pb, 115g/t Ag and 0.11% Cu.

South Australia

BHP Billiton Pty Ltd reported a 77% increase in resource tonnage and 38% increase in contained copper metal at its Olympic Dam deposit in the Gawler Craton, South Australia. Ongoing drilling and geological interpretation has allowed a resource estimate to be prepared which put total resources in the deposit at 7738 Mt @ 0.87% Cu, 0.29 kg/t U₃O₈, 0.30g/t Au and 1.61g/t Ag and a separate gold only resource of 117 Mt @ 1.19g/t Au. Included in the resource is a combined proved and probable reserve estimated by the company at 399 Mt @ 1.87% Cu, 0.58 kg/t U₃O₈, 0.68g/t Au and 4.0g/t Ag.

Tasmania

Ongoing exploration at Bass Metals Ltd’s Que River deposit near Queenstown resulted in a 34% increase in its resource inventory. Total mineral resources in June 2007 were 0.736 Mt @ 5.7% Zn, 2.9% Pb, 1.1% Cu, 84g/t Ag, 0.93g/t Au of which almost 75 percent is in the measured and indicated resource categories.

Western Australia

At its Whundo and West Whundo deposits Fox Resources Ltd reported that copper metal content of resources rose by 10% and 29% respectively to 11 000 t Cu for each. In addition, at Whundoo there is 4410 t of contained zinc in a resource of 0.42 Mt @ 1.05% Zn.

NICKEL

Queensland

Metallica Minerals Ltd announced that its NORNICO Nickel Project has a total resource of 34.8 Mt @ 0.71% Ni for an in situ 247 800 t of nickel metal. This resource includes the Bell Creek and Minnamoolka deposits.

Western Australia

A 41% increase in nickel resources was announced for the Sinclair deposit.
A deposit located near Leonora, by Jubilee Mines NL in September. Jubilee reported that the deposit contains 47,300 t Ni in a total resource of 1.89 Mt @ 2.5% Ni. Almost 41% of the contained nickel is in the indicated resource category while the remainder are inferred resources.

In August, Sally Malay Mining Ltd reported a 23% increase in reserves at the Sally Malay operation which will add at least one year to the mine life. The probable reserve increased to 2.79 Mt @ 1.32% Ni, 0.61% Cu and 0.07% Co for a contained 36,800 t Ni. The measured and indicated resource at the end of June 2007 was 2.83 Mt @ 1.73% Ni, 0.80% Cu and 0.09% Co.

GOLD
Queensland
Conquest Mining Ltd announced an indicated and inferred resource of 16 Mt @ 1.85 g/t Au, 58 g/t Ag and 0.33% Cu for its Silver Hill deposit, part of its Mount Carlton project near Collinsville. Total resources at Mount Carlton are 17.8 Mt @ 1.79 g/t Au, 58.7 g/t Ag and 0.31% Cu.

Western Australia
The Joint Venture partners AngloGold Ashanti Ltd (70%) and Independence Group NL (30%) reported an initial open cut resource estimate for the Tropicana – Havana deposits located on the eastern margin of the Yilgarn Craton 230 km ESE of Laverton. At a 0.6 g/t Au cut-off grade a total resource of 62.8 Mt @ 2.01 g/t Au for a contained 4.05 Moz Au was reported. This was made up of 31.1 Mt @ 2.09 g/t Au for 2.09 Moz Au in the indicated resource category and 31.7 Mt @ 1.93 g/t Au for 1.96 Moz Au in the inferred resource category.

IRON ORE
South Australia
Western Plains Resources Ltd published resource estimates for the Hawks Nest magnetite deposits 100 km NE of Tarcoola. The largest deposit is Kestrel for which the company reported a total resource of 220 Mt @ 36% Fe, 0.06% P, 38% SiO₂, 0.94% Al₂O₃ and 0.69% LOI.

Western Australia
Exploration of channel iron mineralisation in its Solomon project area by Fortescue Metals Group Ltd resulted in an announcement of an inferred resource estimate for the Serenity area 60 km NNE of Tom Price. The resource estimate is 1014 Mt @ 56% Fe, 7.3% SiO₂, 3.8% Al₂O₃, 0.81% P and 8.06% LOI.

URANIUM
Queensland
Summit Resources Ltd announced an inferred resource of 2 Mt at 0.105% U₃O₈ (using a 0.023% U₃O₈ cut-off) for the Andersons uranium deposit near Mount Isa. An inferred resource of 4.2 Mt @ 0.041% U₃O₈ (using a 0.023% U₃O₈ cut-off) was also announced for the Watta deposit.

South Australia
Marathon Resources Ltd reported a new resource estimate for its Mt Gee deposit in the Flinders Ranges. At a cut-off grade of 300 ppm U₃O₈ the company reported resources of: indicated resources 3.1 Mt @ 717 ppm U for 2200 t U₃O₈ and an inferred resource of 39.7 Mt @ 622 ppm U for 24,700 t U₃O₈.

Western Australia
The first resource for Maximus Resources Ltd’s Windimurra prospect, located about 70 km ESE of Mount Magnet was announced in December. The inferred resource is 19 Mt @ 180 ppm U₃O₈ for a contained 3400 t (7.5 million pounds) U₃O₈ at a cut-off grade of 100 ppm U₃O₈.

PROJECT DEVELOPMENTS
A large number of mineral projects were at various stages of development during 2007. The following is an illustrative listing to highlight the range of projects under investigation and their distribution across the continent (Figure 7). For a more comprehensive review of major project activity see the Australian Bureau of Agricultural and Resource Economics publication Australian.

**BASE METALS**

**New South Wales**

CBH Resources Ltd has opened a decline into the Western Mineralisation from the old Kintore open pit in the centre of the Broken Hill Main Lode. The Rasp Mine will initially exploit the Western Mineralisation at a rate of 750 000 tpa. Output will be 65 000 tpa zinc concentrate (50% Zn), 35 000 tpa lead concentrate (70% Pb) and 800 000 oz/pa Ag in the lead concentrate.

**Queensland**

CopperCo Ltd announced that copper production had commenced at the Lady Annie project, NW of Mount Isa, with commissioning completed in the September quarter and plating of copper cathode commencing at the end of September. Full production at the design capacity of 19 000 tpa was achieved in October 2007 with expansion to 25 000 tpa planned for 2008.

**GOLD**

**New South Wales**

Hill End Gold Ltd announced that mining commenced at the Hill End project in June. The high-grade Reward area has a resource of 124 000 t @ 19g/t Au. Bulk sampling of the deposit will be used to obtain more reliable information on the grade and tonnage estimates for the deposit.

**Northern Territory**

GBS Gold International Inc. will bring the Tom’s Gully project into production. The project will be based on an initial probable reserve of 740 000 t @ 7.1 g/t Au and the company is targeting a mid-2008 start to production. Production is expected to be at an average of 35 000–40 000 ozs/year over the initial reserve life of about 3.5 years.

**South Australia**

The development of the Prominent Hill project continued on schedule for mining the first ore in early 2008 and first commercial concentrate production in the third quarter of 2008. Oxiana Ltd report that the first full year of production will be 2009 with an expected output of copper concentrates containing 117 000 t Cu, 86 000 oz Au and 390 000 oz Ag.

**Western Australia**

Underground development and production commenced at Avoca Resources Ltd’s Trident deposit at Higginsville. Annual production levels of around 160 000 to 190 000 ozs are expected over the life of the mine.

**IRON ORE**

**Northern Territory**

Territory Resources Ltd exported the first shipment of iron ore from its Frances Creek mine 190 km S of Darwin. The company expected to ship an additional 200 000 t from Darwin to China by the end of 2007.

**Western Australia**

Fortescue Metals Group Ltd reported favourable progress at the Cloud Break mine and associated rail and port developments in the Pilbara region. At the end of November the Company was on schedule to make its first export shipment in May 2008. A commitment to an expansion from 50 Mtpa to 100 Mtpa has been made.

Late in the year BHP Billiton Ltd’s 85% owned RGP3 program was on schedule for completion by year’s end. The project will add 20 Mtpa to the company’s annual production capacity in the Pilbara. BHP’s estimated share of the cost for RGP3 was US$1300 million. The company’s RGP4 project in the Pilbara was reported to be on schedule and when completed in the first half of 2010 will add 26 Mtpa to the company’s production capacity. BHP’s share of the estimated cost of the project is US$1850 million.

Rio Tinto Ltd-Hancock Prospecting Pty Ltd will fast-track the expansion of the Hope Downs project at an estimated cost of US$350 million. The expansion will give the project a capacity of 30 Mtpa on completion in 2009. Work on the initial 22 Mtpa project commenced in 2006 with first production expected by early 2008.
MINERAL SANDS
South Australia
Iluka Resources Ltd will undertake a Definitive Feasibility Study for the potential development of its Jacinth and Ambrosia deposits in the Eucla Basin. It is expected to be completed by mid-2008 to allow a development decision and possible first production by mid-2010. The study will consider a wet concentrator plant with a capacity of 1000 tph of sand. This would allow production of about 300 000 tpa of zircon.

NICKEL
Tasmania
At Avebury, Allegiance Mining NL reported that construction continued and the project will have a mill throughput of 900 000 tpa of ore producing more than 8500 t of nickel-in-concentrates per annum with production scheduled for the first quarter of 2008.

Western Australia
At the Ravensthorpe project in southern Western Australia, BHP Billiton Ltd anticipates first production in the first quarter of 2008. The project will have a capacity of up to 50 000 tpa of nickel in concentrates. Late in the year the company noted that construction and pre-commissioning were essentially complete and process commissioning of the plant was on schedule. Capital expenditure on the project was reported as totalling US$2200 million.

URANIUM
Northern Territory
Energy Metals Ltd, manager of the Biglyi Joint Venture announced positive results from an Initial Scoping Study for the Biglyi uranium-vanadium project 350 km NW of Alice Springs. Highlights of the study included: Production of 8.43 Mlb of U3O8 and 6.97 Mlb of V2O5 over eight years from 2.73 Mt of ore using a conventional acid leach and solvent extraction process.