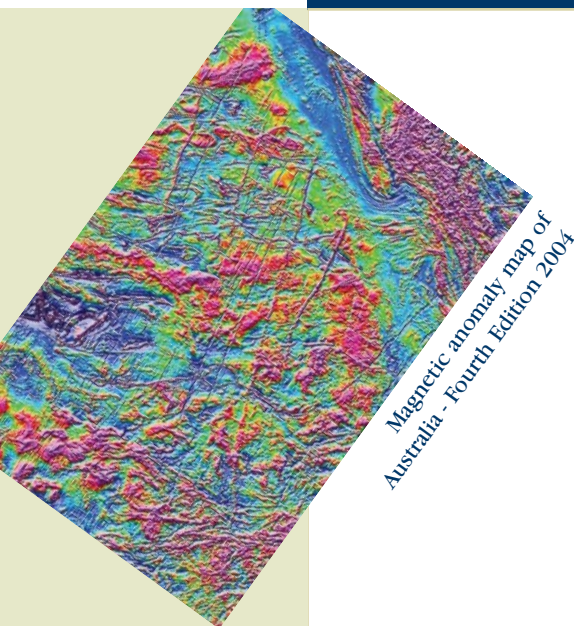




Australian *Mineral* EXPLORATION

FEBRUARY 2005

A REVIEW OF EXPLORATION FOR THE YEAR **2004**



OVERVIEW

- Australian mineral exploration spending in 2003-04 rose by 7.4% to \$786.7 million of which 39% was spent on the search for new¹ deposits.
- Total global non-ferrous mineral exploration budgets rose 58% to an estimated US\$3.8² billion in 2004.
- All States except New South Wales and the Northern Territory recorded increases in mineral exploration activity. Western Australia dominated with \$465.8 million, 59.2% of total Australian mineral exploration expenditure in 2003-04.
- Gold was the major commodity sought with spending of \$397.1 million (50.5% of the total). There were significant increases in iron ore, nickel and uranium exploration.
- Company exploration activities generated a substantial number of drill intersections of economic interest, particularly for gold and nickel, in a number of mineral provinces.

EXPLORATION REVIEW

Australian mineral exploration expenditure rose by 7.4% to \$786.7 million in 2003-04 (year ending 30 June 2004) according to the Australian Bureau of Statistics (ABS). This was the highest annual current dollar expenditure since 1998-99. In constant 2003-04 dollars, spending was 4.9% higher than in 2002-03 (Figure 1) and was slightly more than two-thirds of the 1996-97 peak. It built on the strong 14% growth reported in 2002-03.

ABS, for the first time, reported statistics on spending on exploration for new deposits and for the further delineation and/or extension of known mineralisation that has resources delineated. Nationally, 39% of exploration spending was directed at the search for new deposits. Tasmania had the highest proportion of exploration for new deposits with 54.7% of its spending in that category whereas the Northern Territory had the lowest at 31.3%. This share of exploration directed to the search for new deposits is in line with the Metals Economics Group (MEG) world survey of non-ferrous minerals exploration budgets for 2004 which found that 39% of exploration budgets in Australia were for grassroots exploration.

Spending increased in all jurisdictions except New South Wales and the Northern Territory in 2003-04 with Western Australia, the leader, attracting \$465.8 million, an increase of 10% on 2002-03. Western Australia was followed by Queensland where spending rose by 9.6% to \$125.2 million and Victoria where spending rose by 15.8% to \$53.5 million resulting in Victoria overtaking both New South Wales and the Northern Territory. In New South Wales, spending fell by 14.1% to \$50.5 million, and in the Northern Territory by 13.5% to \$42.4 million. In South Australia there was a 13.6% increase to \$41.7 million and in Tasmania exploration rose by 76.7% to \$7.6 million.

¹Exploration 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.

²All monetary references in this paper are to Australian dollars unless otherwise stated.

Gold dominated exploration spending (50.5%) and, at \$397.1 million, was at its highest level since 1998-99. Iron ore, nickel and uranium recorded strong growth with increases of 43.5% (to \$63.7 million), 27.8% (to \$84.2 million) and 52.2% (to \$10.5 million) respectively. Copper exploration fell by 4.8% to \$37.8 million and zinc-lead-silver exploration fell by 18.9% to \$29.7 million. Mineral sands exploration spending fell again in 2003-04 to \$23.8 million, a fall of 12.8%.

In 2003-04 ABS reported that exploration drilling totalled 5.68 million metres, an increase of 0.52 million metres (10%) from 2002-03. Of the total, 2.68 million metres (47%) was on the search for new deposits. The MEG survey of world non-ferrous mineral exploration budgets for 2004 reported an increase of 58% to an estimated total budget of US\$3.8 billion. The budgets of companies responding to the survey amounted to US\$3.55 billion. Of the respondents budgets, US\$524.1 million (14.7%) was directed to exploration in Australia and this was the highest since 1998. According to the MEG survey, 59% of 2004 mineral exploration budgets for Australian-based companies was for exploration in Australia. The survey included 287 companies with non-ferrous exploration budgets of more than US\$100 000 that were exploring in Australia, an increase of 44 over 2003. Budgets for Australian exploration were directed to gold (US\$323.9 million), base metals (US\$136.4 million) and diamonds (US\$24.6 million).

Government programs

The Australian, State and Northern Territory Governments continued to release new geoscientific information to support mineral exploration. Highlights for 2004 included:

Geoscience Australia

- Online delivery of all airborne geophysical data acquired by the State/Northern Territory and Australian Governments through the Australian Geoscience Portal at www.geoscience.gov.au.
- Release of 146 000 line km of new airborne geophysical data over the Murchison Province, Western Australia.
- Release of the 4th edition 1:5 million scale magnetic anomaly map of Australia and associated grids of TMI data. The new map includes some 19 million line km of survey data.
- A deep crustal seismic reflection survey across the northeastern margin of the Gawler Craton near the Olympic Dam copper-uranium-gold deposit.

New South Wales

- Interpretation of a major geophysical program in the State's southwest revealed the continuation into the State of highly prospective rocks from the Victorian gold-bearing Bendigo Zone.
- A synthesis of the Eastern Lachlan Orogen datasets, including seamless geology for the eastern Lachlan Orogen and new, comprehensive time-space plots, has been completed.

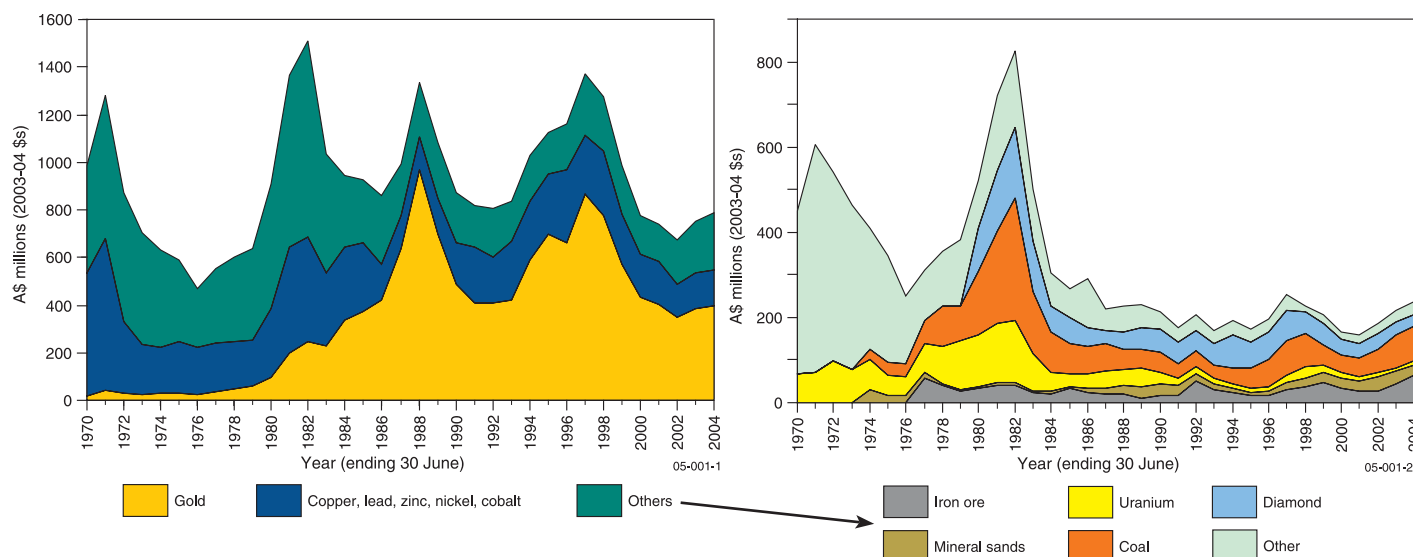
Northern Territory

- Release of 113 000 line km of airborne geophysics took modern airborne geophysical coverage of the Territory to 91%.
- The Spatial Territory Resource Information Kit for Exploration (STRIKE) was launched. It is a web mapping system featuring geology, geophysics, geochemistry, drilling, mineral occurrences, exploration and mining tenure and cadastre.

Queensland

- New geological and mineral occurrence mapping in areas of the Northern Drummond Basin prospective for gold and release of new 1:100 000 geological maps over areas of Central Queensland.
- Advances in online services saw almost half of all non-confidential, historical company exploration reports scanned and loaded onto the QDEX web-searchable document management system and the improved Interactive Resource and Tenure Maps system (IRTM) allows global access to spatial geoscience, tenement and exploration data with tenures updated daily.

Figure 1: Australian mineral exploration expenditure in constant 2003-04 dollars.
Based on Australian Bureau of Statistics data deflated by Consumer Price Index.



South Australia

- New \$22.5 million exploration initiative The Plan for Accelerating Exploration (PACE) was launched. It aims to improve land access, increase exploration expenditure, develop sustainable communities with indigenous communities and become recognised as a world-class centre of excellence for exploring undercover. Theme 2 of PACE is a collaborative drilling program between the SA Government and industry that will see the Government contribute \$10 million over 5 years to drilling to be matched dollar for dollar by industry.

Tasmania

- Release of a state-wide 3D model and prospectivity analysis, incorporating new aeromagnetic, radiometric, airborne EM, side-scan radar, multispectral and hyperspectral data, to assist with project generation.
- A 2 year program to update over 100 multilayer GIS geological maps with new fieldwork and interpretations is in progress and products are being progressively released.

Victoria

- A number of new reports and maps were released including:
 - GSV Report 123 Glenelg Special Map Area Geological Report and maps;
 - GSV Report 124 Buffalo 1:100 000 Map Area Geological Report and maps;
 - VIMP Report 81 The Regolith of the Ararat 1:100 000 Map Area and maps;
 - VIMP Report 82 St Arnaud 1:250 000 Map Area - A Geological Interpretation of the Geophysical Data plus one map.

Western Australia

- New Geological Exploration Packages or 1:100 000 Geological Information Series for the East Yilgarn, Pilbara, Capricorn Orogen and West Musgraves containing geoscientific data and information. Some products include free GIS viewing software.
- Company exploration reports over 5 years old now able to be released and will be available on the web.

The Victorian Government has introduced pro-forma native title agreements. The nine pro-forma templates contain terms and conditions agreed to by the Minerals Council of Australia - Victoria Division and Native Title Services Victoria that are expected to streamline land access.

New South Wales has a high level of land access for exploration. Native title, for example, is generally not an issue for the exploration industry in the State.

Recent amendments to Western Australia's Mining Act provide for streamlining of processes associated with obtaining a mining lease and for companies currently on mining leases to revert to a longer term exploration licence. The Government has also finalised new agreements between the mining industry, native title claimants and the State Government that will mean faster access to land under native title claim. The new standard Aboriginal heritage agreements will allow prospecting and exploration licences to be fast-tracked in the Pilbara, Mid-West, Central Desert, Goldfields and South-West Regions, where approximately 92% of exploration and prospecting applications were made.

Land Access

The past year saw continued progress in facilitating land access for mineral exploration, particularly in many areas potentially subject to Native Title claims, notably through the development of model or template indigenous land use agreements (ILUAs) and heritage agreements that have been developed by most jurisdictions. There were also amendments to the Mining Act in Western Australia.

A Guide to Exploration and Mining on Aboriginal Land, a handbook for explorers applying for tenure on Aboriginal freehold land, was launched in June following meetings in 2003 between the Northern Territory Government and the NT Aboriginal Land Councils.

Queensland has made significant progress with land access/native title procedures over the last 2 years. Grants of Exploration Permits have significantly increased since the introduction of the Expedited Procedures with its standard Native Title Protection conditions. More than 18 Native Title groups have agreed to the State-wide model indigenous land use agreements (ILUAs) with 60% of all 135 ILUAs in Australia being registered in Queensland.

In South Australia Exploration Licences are being approved without delay and there is no backlog. Two ILUAs are in place in the Gawler Craton. They were negotiated between government, native title holders and third parties, including miners and explorers. Negotiations are underway on a third ILUA in the State's west.

EXPLORATION

The increase in exploration activity saw greater numbers of reported intersections of mineralisation and several new discoveries. The more significant announcements during the year included:

- A major increase in resources at Olympic Dam, South Australia.
- Release of an initial resource estimate for the Prominent Hill deposit in South Australia.
- A first indication of the size of the West Musgrave Ni-Cu-Co-PGM deposits, Western Australia.
- Discovery of the Collurabbie Ni-Cu-PGM prospect in Western Australia.
- Discovery of the Jacinth mineral sands deposit in the Eucla Basin, South Australia.



Gold

New South Wales

- Alkane Exploration Ltd reported further encouraging drilling from its Tomingley project which hosts the **Wyoming** gold deposits. Among new targets identified was the McLeans prospect which has mineralisation in two zones over 1 km strike length and intersections of 4 m @ 3.68 g/t Au, 2 m @ 4.24 g/t Au and 33 m @ 0.54 g/t Au. It also identified Tomingley Two with intersections including 3 m @ 4.93 g/t Au, 24 m @ 1.29 g/t Au and 102 m @ 0.66 g/t Au.
- At **Dargues Reef** south southwest of Braidwood, Hibernia Gold Ltd reported strong drill-intersections including 24 m @ 7.9 g/t Au which included 3 m @ 25.9 g/t Au and 2 m @ 18.0 g/t Au, and 9 m @ 8.0 g/t Au including 3 m @ 14.6 g/t Au.

Northern Territory

- Giants Reef Mining Limited reported resources for its **Malbec West** deposit located near its Chariot Mine west of Tennant Creek. Total resources of 17 103 ozs are made up of measured resources of 23 100 t @ 17.1 g/t Au, indicated resources of 11 900 t @ 7.9 g/t Au and inferred resources of 11 300 t @ 3.8 g/t Au.

Queensland

- Strategic Minerals Corporation NL undertook a drilling program at its **Woolgar** project, 100 km north of Richmond, to investigate untested epithermal veins. Results included 7 m @ 5.69 g/t Au, and 2 m @ 12.03 g/t Au at Shanghai, 5 m @

4.40 g/t Au at Hillview, 2 m @ 4.57 g/t Au and 1 m @ 6.80 g/t Au at Grand Central and 2 m @ 44.5 g/t Au and 2 m @ 46.5 g/t Au at Explorer South.

- At **Manumbar** near Kilkivan, D'Aguilar Gold Ltd reported encouraging results from drilling to test an epithermal system beneath old open pits. Assaying of core not previously analysed returned 1.3 m @ 14.5 g/t Au and 1.2 m @ 6.61 g/t Au from 104 m and 84.4 m respectively. New drilling returned 6.0 m @ 7.65 g/t Au from 94 m and 0.6 m @ 3.23 g/t Au from 135.2 m.
- At **Mungana**, Kagara Zinc Ltd reported an intersection of 58 m @ 4.12 g/t Au within a lower grade zone of 179.7 m @ 1.76 g/t Au of porphyry gold mineralisation with a known strike extent of 190 m.

South Australia

- Exco Resources NL reported an initial resource for the **White Dam** deposit located 100 km west of Broken Hill, of 258 000 ozs of which 199 800 ozs are oxide resources in the top 30 m of the deposit. The resource (indicated and inferred) is 7.39 Mt @ 1.09 g/t Au.
- Dominion Mining Ltd reported intersecting high-grade mineralisation while testing the M2 and M3 lodes at the **Challenger** mine which are outside the current reserves. Intersections reported included 15 m @ 16 g/t Au, 2 m @ 92.3 g/t Au, 3.45 m @ 1018 g/t Au and 5.85 m @ 23.6 g/t Au.

Tasmania

- TasGold Limited intersected low grade gold mineralisation in altered granodiorite at the **Potoroo** prospect in northeast Tasmania. An intersection of 106.5 m @ 0.19 g/t Au included a higher grade interval of 6.9 m @ 1.8 g/t Au.

Victoria

- Bendigo Mining Ltd announced a major upgrade in resources at the **New Bendigo** project at Bendigo. Following extensive sampling and assessment work, they announced an inferred resource of 23.5 Mt @ 14.5 g/t Au for 11 Moz of gold in addition to the previously announced indicated resource of 0.72 Mt @ 10 g/t Au for 236 000 ozs.
- Continuing exploration by Ballarat Goldfields NL at the **Ballarat** project yielded more high-grade intersections including 5.3 m @ 7.2 g/t Au, 2.8 m @ 17.5 g/t Au and 2.4 m @ 11.6 g/t Au. Visible gold is present in many high-grade cores.
- Perseverance Corporation reported the discovery of the **Wirrawilla** mineralisation at its Fosterville project. Wirrawilla, which is under alluvial cover, returned intersections of 10 m @ 2.9 g/t Au, 4 m @ 1.3 g/t Au and 6 m @ 1.4 g/t Au.
- To the north of its Stawell operation, MPI Mines Ltd continued work on the **Kewell** and **Wildwood** projects. Results from Kewell included 6.3 m @ 10.2 g/t Au, 6.0 m @ 3.0 g/t Au and 1.4 m @ 17.6 g/t Au. At Wildwood results included 6 m @ 4.62 g/t Au, 8 m @ 1.45 g/t Au and 8.5 m @ 3.6 g/t Au.

Western Australia

- The discovery of the **Lord Henry** and **Lord Nelson** mineralisation near Sandstone was announced by Troy Resources NL. Lord Nelson has shallow oxide mineralisation with intersections including 10 m @ 7.90 g/t Au from 20 m, 7 m @ 38.60 g/t Au from 48 m and 17 m @ 19.50 g/t Au from 58 m. The Lord Henry intersections included 5 m @ 6.40 g/t Au from 5 m and 3 m @ 15.4 g/t Au from 32 m.
- Tanami Gold NL reported more high-grade intersections from the **Coyote** deposit some 200 km southeast of Halls Creek including 9 m @ 43.1 g/t Au, 1 m @ 68.8 g/t Au and 3 m @ 17.5 g/t Au. Some 35 km north of Coyote at the **Sandpiper** and **Kookaburra** prospects drilling has increased confidence

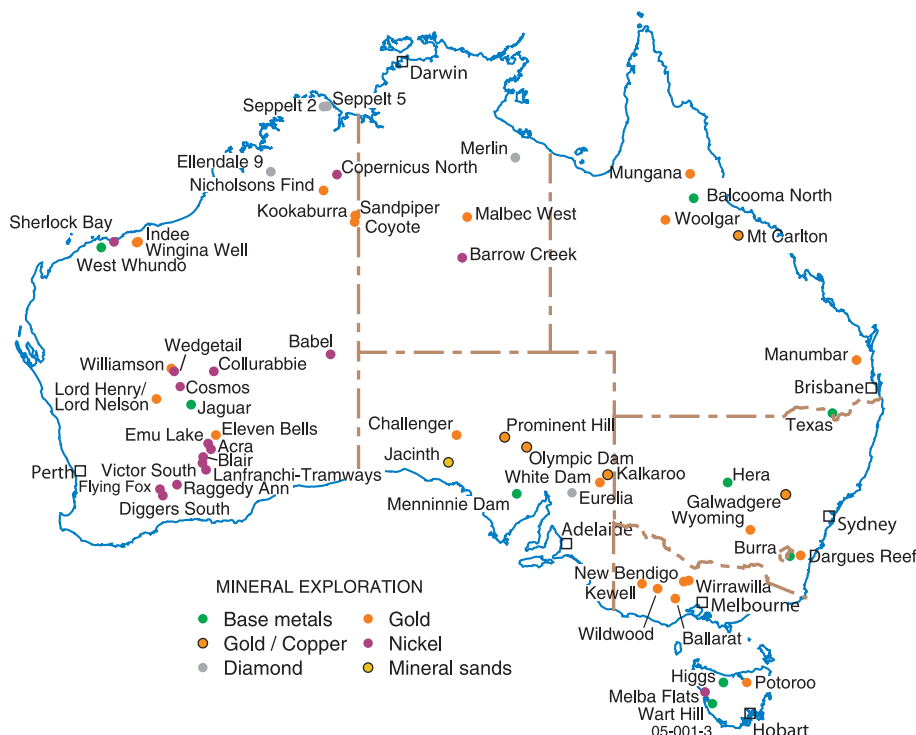


Figure 2: Selected mineral exploration projects, 2004.

in the continuity and grade of mineralisation. At Sandpiper intersections include 13 m @ 2.3 g/t Au and 7 m @ 9.5 g/t Au while at Kookaburra results included 11 m @ 3.3 g/t Au and 15 m @ 2.6 g/t Au.

- De Grey Mining Ltd advised that resource definition drilling at **Wingina Well**, 60 km south of Port Hedland, intersected further high-grade zones. These included 13 m @ 7.97 g/t Au from 62 m and, in the same hole, 32 m @ 2.5 g/t Au. Other results included 2 m @ 16.45 g/t Au from 143 m and 11 m @ 4.4 g/t Au from 168 m.
- At the **Indee** project, 80 km southwest of Port Hedland, Range River Gold Ltd reported further high-grade intersections from the Camel 1 and Withnell deposits including 6 m @ 47.9 g/t Au, 3 m @ 15.7 g/t Au and 10 m @ 8.4 g/t Au. The company indicated that a significant increase in resources at Camel 1 was likely.
- At the **Williamson** prospect, 15 km from its Wiluna plant (7 km south of Wiluna), Agincourt Resources Ltd reported that a significant open pit oxide resource may occur with drill results including 53 m @ 3.97 g/t Au, 16 m @ 8.0 g/t Au and 20 m @ 4.4 g/t Au.
- Drilling at the Wallbrook project, 160 km northeast of Kalgoorlie, by Jackson Gold Ltd, provided the opportunity for increased resources at the **Eleven Bells** deposit (1.14 Mt @ 1.94 g/t Au) by confirming primary mineralisation continues at depth and maintains thickness. It is of higher grade than the already defined oxide resource. Results include 26 m @ 3.71 g/t Au, 7 m @ 2.87 g/t Au and 6 m @ 3.80 g/t Au.
- Exploration near the old open pit at **Nicholsons Find**, 40 km southwest of Halls Creek, suggests extensions of the mineralised zone. Terra Gold Mining Ltd reported intersections of 3 m @ 33.7 g/t Au from 104 m, including 1 m @ 90.7 g/t Au and 3 m @ 34.5 g/t Au from 103 m including 1 m @ 67.1 g/t Au from the southern prospect. The best intersection from the northern zone was 3 m @ 2.17 g/t Au from 193 m.

Copper-Gold

- WMC Resources Ltd reported an increase of 29.2% in total mineral resources at its **Olympic Dam** mine, SA. Total mineral resources are estimated to be 3.81 billion tonnes @ 1.1% Cu, 0.4 kg/t U₃O₈ and 0.5 g/t Au. Total copper in the resource increased by 7 Mt to an estimated 42.7 Mt while uranium increased by 230 000 t to an estimated 1.4 Mt. Gold resources have risen by about 24% to an estimated 55.1 Moz.

- Drilling to test the eastern extension of mineralisation at the **Prominent Hill** deposit in central SA, by Minotaur Resources Ltd continued to yield good intersections. Some were: 41.0 m @ 2.85 g/t Au, 30.0 m @ 3.52% Cu and 0.93 g/t Au and 111.5 m @ 1.30% Cu and 0.59 g/t Au. An initial estimate announced for part of the deposit was an inferred resource of 97 Mt @ 1.5% Cu and 0.5 g/t Au does not include gold resources from areas of gold-only mineralisation.
- In the Curnamona Craton, SA, 100 km west of Broken Hill, Havilah Resources NL reported an intersection of 36 m @ 3.1% Cu and 1.0 g/t Au at its **Kalkaroo** prospect. They note that mineable grades of molybdenum are also present. Mineralisation has been traced over 1400 m around a large arc.
- Alkane Exploration Ltd reported encouraging first results from its **Galwagere** prospect, 15 km southeast of Wellington, NSW. Results include 4 m @ 1.69% Cu and 0.08 g/t Au, 26 m @ 1.09% Cu and 0.26 g/t Au and 47 m @ 0.9% Cu and 1.58 g/t Au.
- Pre-feasibility drilling at Conquest Mining Ltd's **Mount Carlton** epithermal project, Qld, returned intersections including 20 m @ 3.52 g/t Au, 61.3 g/t Ag and 0.65% Cu from 35 m and 25 m @ 2.08 g/t Au, 88.2 g/t Ag, and 1.26% Cu from 67 m.

Nickel

- WMC Resources Ltd & Falcon Minerals Ltd announced that drilling at the **Collurabbie** project, 170 km northeast of the Mt Keith nickel mine, WA, indicated potential for a new nickel province. Drill results from the Olympia prospect include 5.77 m @ 3.00% Ni, 1.96% Cu and 5.29 g/t PGMs from 279.43 m and 8 m @ 1.23% Ni, 1.62% Cu and 3.84 g/t PGMs from 64 m. The Collurabbie Project covers over 500 km² of the northern extension of the Gerry Well Greenstone Belt. Diamond drilling intersected disseminated sulphide mineralisation over 7 km of strike in the first of two parallel mineralised horizons. The Olympia Prospect occurs within the second mineralized horizon. It is the only part within the second horizon drilled to bedrock to date.
- WMC Resources Ltd gave a first indication of the size of the West Musgrave Ni-Cu-Co-PGM deposits at the Mining 2004 conference in October. They reported the low grade (~ 0.47% Ni equivalent) mineralisation at **Babel** had an inventory of approximately 1 Mt Ni and 1 Mt Cu plus unspecified Co and PGMs. WMC stressed that these estimates were not yet able
- to be classified as resources and noted the potential for higher-grade mineralisation at depth.
- MPI Mines Ltd reported an indicated resource for the **Wedgetail** nickel deposit at its Honeymoon Well project of 650 000 t @ 6.6% Ni and an inferred resource of 420 000 t @ 7.3% Ni. It also reported intersections of 1 m at 16% Ni and 1.3m at 14% Ni at the Harrier prospect, 8 km south of Wedgetail.
- Western Areas NL reported intersections of massive sulphides including 11.7 m @ 7.3% Ni from 454.2 m, 5.3 m @ 7.6% Ni and 0.5 m @ 5.3% Ni in the T1 zone at **Flying Fox** and 21.5 m @ 1.7% Ni from a depth of 334.1 m in the northern part of the **Diggers South** deposit.
- Independence Group NL reported significant nickel intersections at its **Victor South** deposit, near Kalgoorlie, including 16.75 m of massive and matrix nickel sulphide @ 9.4% Ni, 9.2 m @ 3.8% Ni and 4.4 m @ 11.5% Ni.
- Jubilee Mines NL started construction of a 350 m exploration decline from the **Cosmos Deep** underground mine, to the Alec Mairs deposit (formerly called '1200' deposit) and the adjacent disseminated nickel sulphide orebody at Anomaly 1. Drilling at Alec Mairs intersected 1.8 m @ 3.72% Ni, 1.21 m @ 12.62% Ni and 4.64 m @ 4.31% Ni. Drilling at Anomaly 1, returned 80 m @ 1.11% Ni from 147 m, 71 m @ 1.07% Ni from 350 m and 145 m @ 1.01% Ni from 252 m.
- Sally Malay Mining Limited reported that the total resources at the **Lanfranchi** mine and Tramway tenements near Kambalda, rose from an initial inferred resource of 1.16 Mt @ 2.61% Ni in four deposits, to 3.65 Mt @ 2.02% Ni including an indicated 2.43 Mt @ 2.25% Ni.
- At the **Raggedy Ann** nickel prospect, LionOre Mining International Ltd supplemented previous drilling with an intersection of 2.93 m at 3.29% Ni from 360 m. This is a new mineralised zone 800 m north-west of the Emily Ann mine.
- Pioneer Nickel Ltd confirmed a large disseminated nickel sulphide system at its **Acra** project, 80 km east of Kalgoorlie, with known mineralisation having 600 m strike length and open at 250 m depth. Intersections include 18 m @ 0.54% Ni from 15 m, 25 m @ 0.48% Ni from 16 m and 1 m at 1.23% Ni from 81 m.
- Drilling reported by Image Resources NL at the **Emu Lake** joint venture (Image 30%, Jubilee Mines 60% & Skryne Hill Pty Ltd 10%), 70 km



northeast of Kalgoorlie, confirmed massive and stringer nickel sulphides at or near the basal contact of the main ultramafic unit. Results included 0.28 m @ 6.66% Ni from 377.07 m and 0.15 m @ 7.54% Ni from 366.5 m.

- Sherlock Bay Nickel Corporation reported significant intersections at **Sherlock Bay** including 21 m @ 0.58% Ni (including 1m @ 1.15% Ni) and 10 m @ 0.94% Ni (including 8 m @ 1.02% Ni).
- Drilling by Thundelarra Exploration Ltd and Sally Malay Mining Ltd intersected a broad zone of mineralisation grading 1.45% Ni and 1.16% Cu over 14 m from 260 m including 12 m grading 1.55% Ni, 1.17% Cu and 0.054% Co at its **Copernicus North** prospect in the East Kimberley.
- Australian Mines Limited reported intersections of massive sulphides of 7.7 m @ 7.14% Ni, 6.25 m @ 7.16% Ni and 13.1 m at 2.89% Ni at its **Blair** mine near Kambalda. They also intersected massive and stringer mineralisation in two holes testing depth extensions to the Area 57 orebody including 2.51 m @ 4.65% Ni, including 1.53 m @ 6.19% Ni from 177 m depth and 1.56 m @ 3.95% Ni from 193 m depth.
- At the **Barrow Creek**, NT, project the joint venture companies (BHP Billiton, Mithril Resources, Goldstake Exploration & Imperial Granite and Mining) encountered encouraging mineralisation in two drill holes. One intersected 0.35 m @ 8.27% Cu, 1.22% Ni and 26.2

g/t Ag 110 m below surface and a second intersected 0.6 m @ 2.86% Ni, 2.27% Cu and 8.5 g/t Ag 170 m below surface.

- Drilling at the Genet - North Cuni prospect, on its **Melba Flats**, Tas, project, by Allegiance Mining NL returned intersections of 0.8 m of massive sulphides averaging 11.5% Ni, 4.3% Cu, 0.18% Co, 1.2 g/t Au, 0.95g/t Pt and 3.2g/t Pd from 15m and 1.4 m grading 9.55% Ni, 3.9% Cu, 0.25 g/t Au, 0.18% Co, 0.76 g/t PGM from a vertical depth of 25 m.

Copper, Zinc, Lead

- Universal Resources Ltd reported further encouraging intersections from the **Burra** prospect, south of Queanbeyan, NSW. Some of the more significant intersections were 25 m @ 5.05% Zn, 0.44% Pb and 18.2 g/t Ag, 22 m @ 3.22% Zn, 0.33% Pb, <1 g/t Ag and 6 m @ 7.14% Zn, 0.59% Pb and 5.5 g/t Ag.
- High-grade drill intersections were reported by Triako Resources Ltd from the **Hera** prospect at Nymagee, NSW. These included 5 m @ 17.9 g/t Au, 0.8% Cu and 10.3% Pb+Zn and 7 m @ 8.1 g/t Au, 12.7% Pb+Zn and 16 g/t Ag.
- Kagara Zinc Ltd undertook a limited drilling program at **Balcooma North** near Greenvale, Qld, to test for extensions of the deposit and obtain metallurgical samples. One intersected 12.2 m @ 15.7% Cu and a second 15.6 m @ 6.1% Cu.
- Macmin Silver Ltd reported intersecting high-grade copper-silver mineralisation in drilling at the

Tuliamba prospect in its **Texas** silver project, 200 km west southwest of Brisbane, Qld. Results included 9 m @ 2.5% Cu, 98 g/t Ag and 0.4% Zn from 40 m downhole and 5 m @ 6.0% Cu, 328 g/t Ag, 3.4% Zn and 0.5% Pb from 93 m downhole.

- Terramin Australia Ltd reported high lead grades in near-surface mineralisation at **Menninnie Dam** about 150 km west northwest of Port Pirie, SA. An intersection of 81 m returned 0.26% Zn, 2.11% Pb and 4.1 g/t Ag including 8 m @ 0.03% Zn, 17.95% Pb and 18.0 g/t Ag.
- In Tasmania, at **Wart Hill**, 125 km south of Rosebery, Tasgold Ltd reported significant intersections in the only hole it had drilled. A 7 m intersection returned 7.75% Zn, 4.43% Pb, 0.06% Cu, 77.6 g/t Ag and 0.41 g/t Au. Deeper in the hole a 1 m interval returned grades of 5.18 g/t Au, 1.5 g/t Ag, 0.11% Zn, 0.14% Pb and 0.02% Cu.
- Tasgold Ltd also reported further successful drilling at the **Higgs** deposit near Moina, Tas. An intersection of 18 m @ 76 g/t Ag, 0.99 g/t Au, 5.75% Pb, 3.76% Zn and 0.1% Cu included a 9 m zone which returned 135 g/t Ag, 1.49 g/t Au, 9.74% Pb, 5.9% Zn and 0.11% Cu from 53 m depth.
- At the **West Whundo** prospect near the Radio Hill mine in the Pilbara District, WA, Fox Resources Ltd reported a drill intersection of 10 m @ 23% Cu, 0.41% Co and 2.6% Zn. West Whundo is part of the Whundo project which is based on the old Whundo copper mine.
- Jabiru Metals Ltd (formerly Pilbara Mines Ltd) reported that at the **Jaguar** deposit, 260 km north of Kalgoorlie, WA, 6.6 m of massive sulphides were encountered in an unexpected area. The intersection returned grades of 5.54% Cu, 10.51% Zn, 0.81% Pb and 190 g/t Ag. Other results from Jaguar include 25.66 m (downhole width) @ 2.1% Cu, 19.4% Zn, 0.55% Pb and 111 g/t Ag and 23.22 m (downhole) @ 3.6% Cu, 17.3% Zn, 0.53% Pb and 157 g/t Ag.

Diamond

- Striker Resources announced that remodelling of the Sacramore-Palomides and Launfal kimberlites at the former Rio Tinto **Merlin** mine, NT, had identified a remaining inferred resource of 9 Mt @ 20 carats per hundred tonnes (cpht). A drilling program is underway to define further resources.
- Striker Resources commenced trial mining of the high-grade **Seppelt 2** kimberlite in the North Kimberley region, WA, recovering 5 730 ct from 13 000 t of ore. Striker also



Figure 3: Selected mineral development projects, 2004.

reported it planned trial mining at the Seppelt 5 kimberlite dyke where it has reported grades of over 200 cpht and recovered commercial sized diamonds.

- Kimberley Diamond Company reported the discovery of 3 new diamondiferous lamproites surrounding its mine at **Ellendale 9** in the West Kimberley including the first economic lamproite found in the Ellendale Field for 30 years. They reported continued high prices for their 'fancy' yellow diamonds from Ellendale 9 (US\$187-361 ct) and a combined resource for Ellendale 4 and 9 at 68 Mt @ an average 7.3 cpht.
- Flinders Diamonds Limited reported the discovery of twelve new kimberlites in the **Eurelia** area of its Flinders Ranges Project following an airborne magnetic survey. Dyke sampling carried out to date has identified one diamondiferous kimberlite (two micro-diamonds in a 20 kg sample).

Mineral Sands

- Iluka Resources Limited announced the discovery of the zircon-rich **Jacinth** deposit in the Eucla Basin, about 200 km northwest of Ceduna, SA. Subsequently the company reported an inferred resource of 108 Mt containing 6.5 Mt of heavy minerals (55% zircon, 7% rutile and 22% ilmenite). Iluka later announced the discovery of the Ambrosia prospect, 2 km north of Jacinth, which, may have a higher zircon content than Jacinth.

PROJECT DEVELOPMENT Gold

New South Wales

- Barrick Gold Corporation has commenced construction of the **Cowal** gold mine north of West Wyalong. The Cowal project contains 2.5 Moz of proven and probable reserves in 63.6 Mt of ore grading 1.3 g/t Au. Mine and process plant construction is expected to take 21 months with production commencing in early 2006.
- Newcrest Mining Limited has lodged a Development Application for an extension of its **Ridgeway** mine at depth. If approved, the development will allow production from Ridgeway to continue at existing rates for over 12 years and remove an additional 53 Mt ore. Newcrest will proceed to the next stage of development of the **Cadia East** project which will involve work over three to four years to support a bankable feasibility study. The Cadia East

resource has about 18 Moz of gold and 2.9 Mt of copper. Work will include development of an 11 km decline to facilitate bulk sampling, diamond drilling and the collection of geotechnical data.

Northern Territory

- Giants Reef Mining Limited commenced production in September at its **Malbec West** high-grade deposit near its Chariot mine west of Tennant Creek. The ore is under 5 m of cover and initially a 65 m deep pit will mine up to 15 000 ozs with an expected cash margin of \$300/oz. The company also started mining the small high-grade **Cat's Whisker** deposit, 6 km southeast of Tennant Creek, which has 5 500 t @ 24 g/t Au.

South Australia

- Dominion Mining Ltd received approvals from the South Australian Government to mine underground resources at its **Challenger** mine. Development commenced in February with construction of a decline and associated surface facilities adjacent to the open pit

Queensland

- At Charters Towers, Citigold Corporation announced completion of the second stage of the **Warrior** mine development, which involved the construction of a portal for the decline from the Washington open pit. The third stage will be a 1 km decline to the gold resource and gold production is expected around the end of 2004 at an annual rate of 40 000 ozs.
- Sedimentary Holdings Ltd and Newcrest Mining Ltd continued development of the **Cracow** mine at Cracow, with the first ore processed and gold poured in November 2004. After one year, production will rise to 120 000 oz Au and 60 000 oz Ag per year.

Western Australia

- Newcrest Mining Ltd reported that at **Telfer** all elements of the first processing train had been commissioned in November. Ore grade material was being processed to produce a gold-copper concentrate. Over a 24 year mine-life annual production from Telfer is expected to be 800 000 oz Au and 30 000 t Cu. Current in situ resources at Telfer are 26 Moz Au and 0.96 Mt Cu.
- Metex Resources Ltd commenced mining of **Whisper** trial pit in the June quarter as part of a feasibility study on the Whisper resource scheduled for completion by the end of 2004.

- At the East Kundana project Tribune Resources NL announced that the **Raleigh** underground mine would be developed. The mine is expected to produce 487 000 ozs over seven years with the ore processed at the Paddington plant.

Nickel

- BHP Billiton Ltd approved development of the **Ravensthorpe** Nickel Project, near Ravensthorpe, WA. The project includes the development of a mine, treatment plant and associated infrastructure and the production of a mixed nickel-cobalt hydroxide intermediate product (MHP). Capital costs for the project were estimated at \$720 million with the first shipment of MHP expected by the second quarter of 2007. Mining will be at 5.5 Mtpa with an annual production of 0.145 Mt of MHP.
- WMC Resources plans to spend \$15-20 million on a feasibility study into an additional concentrator module and low-pressure leach plant at its **Mt Keith** operation, WA. It could add around 25 000 tpa of Ni from 2008-09 as an intermediary product (hydroxide). Feed would come from a stockpile of low grade material at Mt Keith that contains around 113 000 t Ni and which is growing at about 10 000 tpa.
- Sally Malay Mining Ltd shipped its first Ni-Cu-Co concentrates in September from its **Sally Malay** mine in the East Kimberly, WA, to China. This was the first shipment under the Life of Mine Sales Agreement between the Company and Sino Nickel (a joint venture between Jinchuan Group and Sino Mining International). It is expected that the plant will produce 344 500 t of bulk concentrate containing 91.2 M pounds Ni, 43.4 M pounds Cu and 4.5 M pounds Co over an initial project life of 5.5 years.
- In Tasmania, Allegiance Mining N.L. completed a 1200 m decline into the **Avebury** deposit near Zeehan and is carrying out 10 000 m of infill drilling. Permit applications and preparation of a definitive bankable feasibility study will proceed in parallel, with the latter scheduled for completion in April 2005.

Copper

- Triton Resources Ltd developed the **Triton** copper mine near Nyngan, NSW, and commissioning commenced in December. The project feasibility study indicates a mine life of 11.5 years yielding about 22 000 tpa of copper-in-concentrates. Start up costs were estimated at \$38.5 million.
- Rio Tinto Ltd has started pre-feasibility studies at its E48



underground project at the **Northparkes** mine in central NSW. E48 has reserves of 45 Mt at 0.98% Cu and 0.42 g/t Au.

Lead, Zinc, Silver

- Ivonia West Inc announced that the **Magellan** lead deposit, near Wiluna, WA, was to be developed in two phases. The first would involve an open pit mine and associated plant with production scheduled for the first quarter 2005 rising to an annual rate of 70 000 t of lead-in-concentrate. Phase two will involve construction of a refinery with production expected to start in 2006.
- Kagara Zinc Ltd continued development of the **Mt Garnet** project in north east Queensland, with mining underway at Surveyor, pre-strip work at Balcooma and underground development at Dry River South to commence in January 2005.

Mineral Sands

- BeMax Resources NL approved the development of the Pooncarie minerals sands project which will initially consist of three main operations – the **Ginkgo** mine near Pooncarie in the Murray Basin, NSW; a mineral separation plant at **Broken Hill**, NSW and an existing mineral separation plant at **Bunbury**, WA. Production from the mine is likely from the fourth quarter 2005.
- Iluka Resources Ltd approved an expanded **Douglas** project in the Murray Basin, Vic. An initial investment of \$270 million will be used to develop the Douglas mine, a mineral concentrating plant at Balmoral and a mineral separation plant near Hamilton. Cumulative production from Douglas in 2005 and 2006 is expected to be 98 000 t rutile and 135 000 t zircon.

- Southern Titanium announced an increased mining reserve of 84.5 mt at 3.8% heavy minerals for its **Mindarie** Zircon Project in the Murray Basin of SA. Funding was secured for construction to start in the fourth quarter, 2004. Mining is expected to begin in 2005 at a total project cost of \$68 million.

Diamond

- Argyle Diamonds continued a feasibility study for underground mining at the **Argyle** open pit mine after 2008 with development of a 2.5 km decline enabling grade control and geo-technical drilling.
- Kimberley Diamond Company gave in principle support to development of a mining and processing plant at **Ellendale 4** in the west Kimberley. The proposal would increase Ellendale production to some 700 000 carats per annum in 2006.

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