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SELECTED AUSTRALIAN MINERAL DISCOVERIES SINCE 1970

BY

STAFF OF

IDENTIFIED RESOURCES PROJECT

MINERALS RESOURCE ASSESSMENT PROGRAM

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SELECTED AUSTRALIAN MINERAL DISCOVERIES SINCE 1970

INTRODUCTION

Over the last two decades the mining industry's contribution to the Australian economy has grown substantially. According to the Australian Bureau of Agricultural and Resource Economics, in 1970-71 mining contributed 3.0% of GDP compared to 5.8% for rural industries. By 1988-89 mining's share had risen to 4.1% while the rural contribution was down to 4.2%. In terms of export earnings minerals contributed approximately 28% ($1430 million) of total earnings in 1970-71 but by 1989-90 this had grown to almost 41% ($23917 million). Mining achieved this strong growth while maintaining a stable share of the Australian workforce of under 1.4%.

Supporting this growth is a very efficient and successful exploration industry. Although most of the attention in the 1970s was focussed on the nickel boom and in the 1980s on the gold boom the period also saw the discovery of important deposits of base metals, iron ore, mineral sands and diamonds. In the following paragraphs some of the discoveries made over the two decades are referred to briefly, to give an indication of the scope of the discoveries.

According to the Australian Mining Industry Council the area disturbed by mining is less than 0.02% of Australia's land surface. The contributions to the economy outlined above therefore come from an area of approximately 1500 square kilometres -- less than the area of the Australian Capital Territory!

GOLD

The widespread discovery of gold early in Australia's history meant that the most prospective ground had been picked over before Federation in 1901. Much of this ground supported production, either continuously or intermittently, into the 1940s and 1950s. During the gold exploration boom of the 1970s and 1980s activity again focussed on the old gold-mining centres such as the Kalgoorlie-Coolgardie District of Western Australia. Consequently, these old centres supported most of the new mining operations that came from the exploration surge.

Undoubtedly the most important factor in the rejuvenation of the Australian gold mining industry in the 1970s and '80s was the successful introduction of the carbon-in-pulp processing technology. This technology allows for the successful treatment of quite low grade ores that in earlier periods would not have been viable.

The combination of history and the introduction of new technology may make it difficult, in some instances, to decide when a discovery was actually made. This could occur with discoveries in areas where mining took place in, say, the late 1800s or early 1900s, then ceased only to be started again in the 1970-80s rejuvenation. To avoid long and complex debate this paper treats all "discoveries" made in the old mining centres during the 1970s and 80s as new discoveries, although it might be argued that they are simply extensions of known and possibly higher grade mineralisation.

DEPOSIT	YEAR
Hill 50 deposits	1976
Hannan South	1977
Bellevue	1979
Granny Smith	1979
Griffins Find	1979
Gabanintha	1980
Great Eastern	1980s
Boddington	1981
Paddington	1982
Reedy deposits	1982
Bottle Creek	1983
Caledonian	1983
Galtee More	1983
Gibson laterites	1983
Lancefield	1983
Nevoria	1983
Sons of Gwalia	1983
Gidgee	1984
Harbour Lights	1984
Matilda	1984
Mount Percy	1984
Westonia deposits	1984
Mertondale deposits	1985
Junction	1986
Fortnum	1987
Plutonic	1988
Yilgarn Star	1989
Kanowna Belle	1990

Table 1: Some Western Australian gold discoveries

Gold deposits discovered in the 1970s and '80s fall into two broad categories: those in which gold is the sole metal present (Tables 1 and 2; Map) and those in

which gold is associated with other metals in either dominant or more often secondary amounts (Tables 7 and 8; Map).

Discoveries of a few gold only deposits occurred in the 1970s, the most notable being Granny Smith in WA. Consequent upon the exploration boom of the 1970s was a marked proliferation of discoveries in the 1980s. These were concentrated in Western Australia (Table 1) but also included discoveries in Queensland, Northern Territory, and New South Wales (Table 2; Map). Some of the more prominent discoveries in this period included Pajingo, Tick Hill and Wirralie in Queensland; Sheahan-Grants and Gidginbung (Temora) in New South Wales; Tanami, Toms Gully and Dead Bullock Soak in the Northern Territory; Boddington, Paddington, Plutonic and Yilgarn Star in Western Australia. While exploration activity has slowed, significant mineralisation is still being reported in the first years of the 1990s. Kanowna Belle in the Eastern Goldfields of Western Australia and Orac near The Granites mining operations in the Northern Territory are two such discoveries.

In polymetallic deposits gold is most often associated with copper-lead-zinc-silver deposits such as The Peak in New South Wales, Rosebery in Tasmania, Wilga & Currawong in Victoria, Thalanga in Queensland and Scuddles in Western Australia. In these deposits it is a secondary component to the base

DEPOSIT	YEAR	STATE
TC8	1970s	NT
Enterprise	1980	NT
Sheahan-Grants	1980-81	NSW
Gidginbung	1983	NSW
Pajingo	1983	QLD
Tanami	1985	NT
Toms Gully	1986	NT
Wirralie	1986	QLD
Dead Bullock Soak	1988	NT
Tick Hill	1989	QLD
Orac	1990	NT

Table 2: Some gold discoveries outside Western Australia

metals. In other deposits gold associates with only one other metal. While these deposits are concentrated in eastern Australia and include Red Dome (Au, Cu), Starra (Au, Cu), Northparkes (Au, Cu), and Henty (Au, Ag) one of the most famous is the Telfer (Au, Cu) deposit in Western Australia. Perhaps the most spectacular discovery of either the '70s or '80s was the Olympic Dam deposit in South Australia where gold is associated as a minor element with copper and uranium. Tables 5 and 8 summarise the polymetallic deposits which contain gold.

DIAMONDS

Diamonds have been known in Australia since the mid-1800s. Tantalising occurrences have been recorded in New South Wales at localities between, approximately, Inverell in the north and Mittagong in the south. Despite some production no substantial deposit has been located and there has been no sustained mining operation in New South Wales.

The basis for Australia's now substantial diamond production was the discovery of the Western Australian deposits (Table 3; Map) and particularly the Argyle deposit in 1979. Australia is the world's principal diamond producer although the proportion of gem quality stones is lower than in some other countries, for example, South Africa.

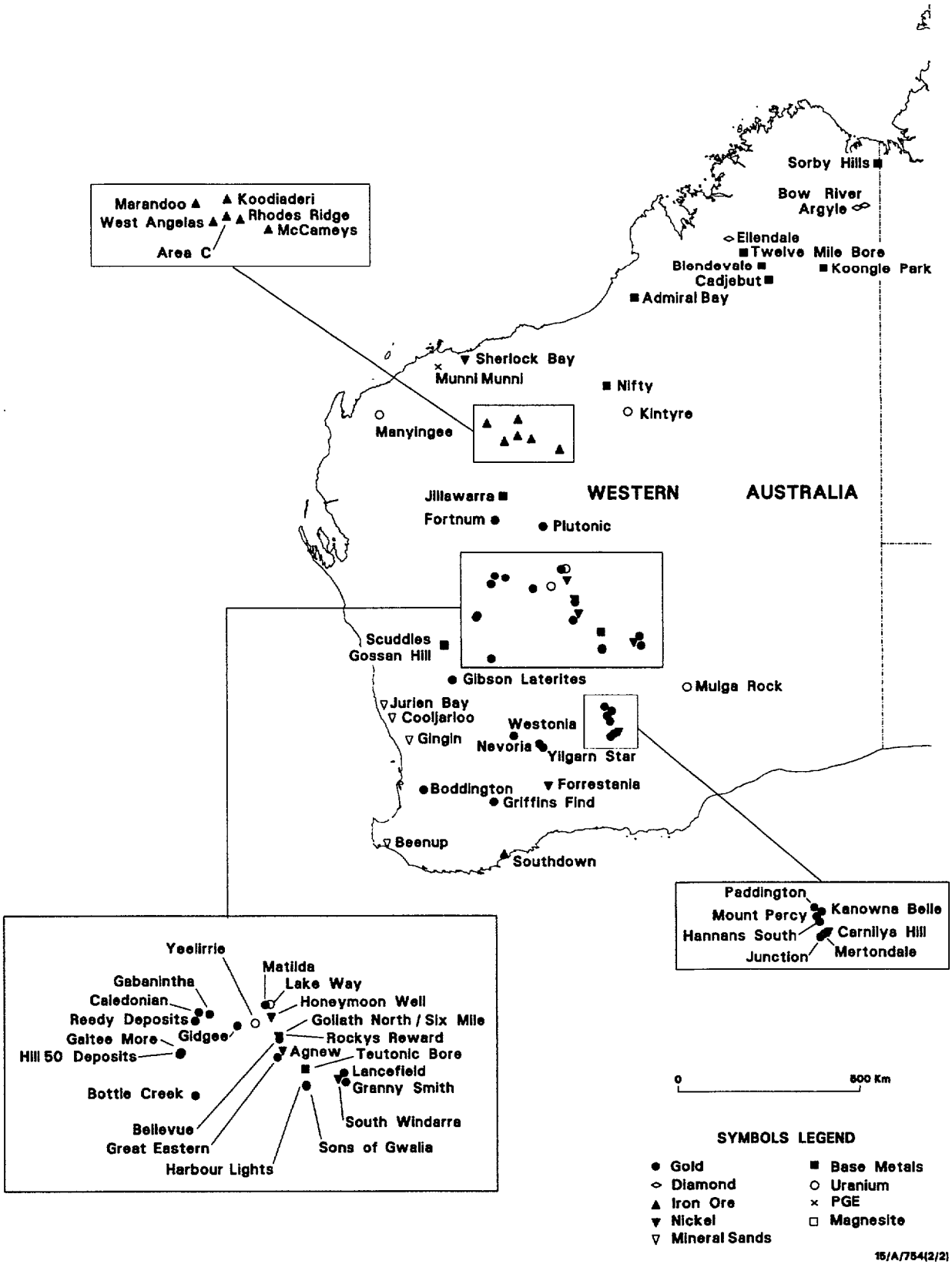
DEPOSIT	YEAR	STATE
Ellendale	1976	WA
Argyle	1979	WA
Bow River	1982	WA

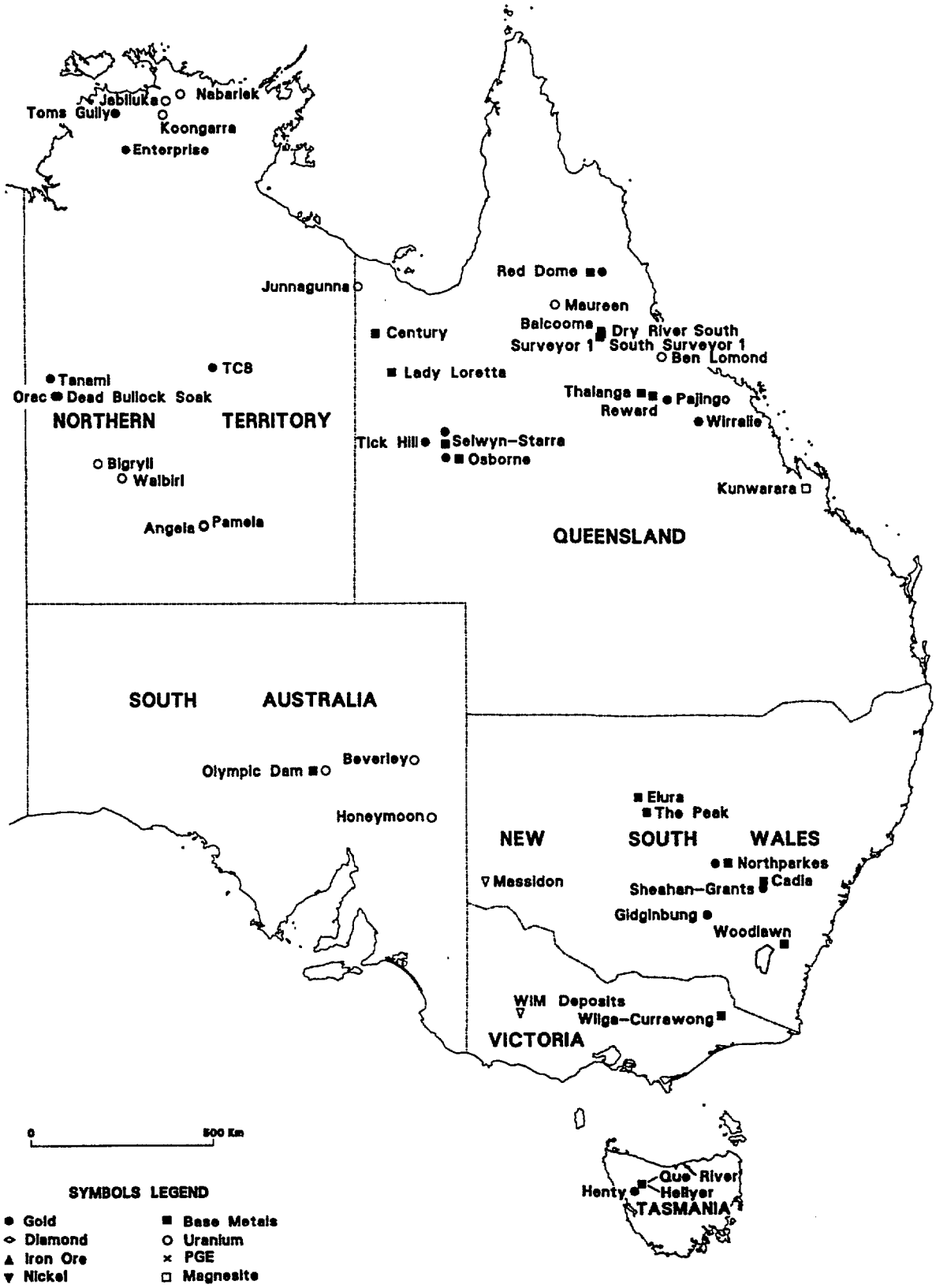
Table 3: Diamond discoveries

IRON ORE

Interest in iron ore in Australia grew rapidly after the Federal Government lifted the embargo on exports in December 1960. There followed rapidly the discovery and development of the large deposits in the Pilbara region of Western Australia at Mount Goldsworthy, Mount Tom Price, Mount Whaleback and Robe River. As a result of reconnaissance exploration associated with the discovery of these major deposits other deposits were identified which were subsequently more fully explored throughout the 1970s and 80s. These include deposits such as Paraburdoo and the various orebodies in the Mount Newman district such as Orebody 24.

By the first half of the 1970s the scale of mineralisation in the Hamersley Basin was fully appreciated. New deposits outside of the immediate area of the major deposits referred to above were discovered at, for example, McCamey's Monster (now referred to as McCameys) and Marandoo (Table 4: Map). The recognition of the potential


Marandoo
Koodiaderi
West Angelas
Rhodes Ridge
McCameys
Area C
Sorby Hills
Bow River
Argyle
Ellendale
Twelve Mile Bore
Blendevale
Koongie Park
Cadjebut
Admiral Bay
Sherlock Bay
Munni Munni
Nifty
Kintyre
Manyingee
Jillawarra
WESTERN AUSTRALIA
Fortnum
Plutonic
Scuddles
Gossan Hill
Gibson Laterites
Mulga Rock
Jurien Bay
Cooljarloo
Gingin
Westonia
Nevoria
Yilgarn Star
Boddington
Forrestania
Griffins Find
Beenup
Southdown
Paddington
Mount Percy
Kanowna Belle
Hannans South
Carnilya Hill
Junction
Mertondale
Yeelirrie
Matilda
Gabanintha
Lake Way
Caledonian
Honeymoon Well
Reedy Deposits
Goliath North / Six Mile
Gaitee More
Gidgee
Rockys Reward
Hill 50 Deposits
Agnew
Teutonic Bore
Lancefield
Granny Smith
Bottle Creek
South Windarra
Bellevue
Great Eastern
Sons of Gwalia
Harbour Lights
0
500 Km
SYMBOLS LEGEND
Gold
Base Metals
Diamond
Uranium
Iron Ore
PGE
Nickel
Magnesite
Mineral Sands
15/A/754(2/2)


Jabiluka
Nabarlek
Toms Gully
Koongarra
Enterprise
Junnagunna
Red Dome
Maureen
Balcoome
Century
Surveyor 1
Dry River South
South Surveyor 1
Ben Lomond
TCB
Tanami
Lady Loretta
Orac
Dead Bullock Soak
Thalanga
Pajingo
Reward
Wirralie
NORTHERN TERRITORY
Tick Hill
Selwyn–Starra
Osborne
Bigryll
Walbiri
Kunwarara
Angela
Pamela
QUEENSLAND
SOUTH AUSTRALIA
Olympic Dam
Beverley
Honeymoon
Elura
The Peak
NEW SOUTH WALES
Northparkes
Messidon
Cadia
Sheahan–Grants
Gidginbung
Woodlawn
WIM Deposits
Wilga–Currawong
VICTORIA
0
500 Km
Que River
Henty
Hellyer
TASMANIA
SYMBOLS LEGEND
Gold
Diamond
Iron Ore
Nickel
Mineral Sands
Base Metals
Uranium
PGE
Magnesite

18/A/754(1/2)

value of goethite-hematite ore in the Marra

DEPOSIT	YEAR	STATE
McCameys Monster*	1970	WA
Rhodes Ridge	1970	WA
Koodaideri	1971	WA
Area C	1972	WA
Marandoo	1972	WA
West Angelas	1977	WA
Southdown	1981	WA
* now referred to as McCameys		

Table 4: Iron ore discoveries

Mamba Iron Formation in the early 1970s gave a new dimension to exploration in the Pilbara. This potential was realised following the delineation and development of a Marra Mamba orebody at Orebody 29 adjacent to the Mount Whaleback open cut.

Throughout the period there was continuous exploration in the Pilbara, particularly by established iron ore producers. Most exploration was aimed at the delineation and development of known deposits but some was aimed at the discovery of concealed deposits. Recent developments of note include the development of mines on Hamersley's Channar hematite-goethite deposit in partnership with Chinese interests and BHP's development of the Yandicoogina pisolitic limonite deposits.

Outside of the Pilbara the only prominent iron ore discovery was the Southdown magnetite deposit in the south-west of Western Australia near Albany.

NICKEL

The boom in nickel exploration caused it, along with iron ore, to be the principal metal of interest during the 1960s. With respect to nickel the most significant feature of the boom was the discovery of the Kambalda deposits which are still the mainstays of the Australian nickel mining industry. Similar to iron ore, the discoveries were in Western Australia and the latter phases of the nickel exploration boom lead to further discoveries in the early 1970s (Table 5; Map). Commercially important deposits discovered in the '70s and '80s included those at South Windarra (where mining ceased in 1991), Leinster (Rockys Reward and Agnew) and Carnilya Hill (Map).

MINERAL SANDS

Australia's mineral sands industry is based on deposits discovered in or prior to 1971. Those discovered in 1971 are shown in Table 6. Subsequently there were no new 'grass roots' discoveries reported until the WIM deposits in Victoria in 1989, Massidon in New South Wales and Beenup in Western Australia in 1990. The important feature of these new deposits is that they occur outside of the established mineral sands provinces. Both WIM and Massidon occur in the Murray Basin and their discovery highlights the potential of that basin. The location of these mineral sands deposits are shown on the accompanying maps.

DEPOSIT	YEAR	STATE
Sherlock Bay	1970	WA
Six Mile*	1970	WA
Goliath North*	1971	WA
Agnew (Perseverance)	1971	WA
South Windarra	1971	WA
Forrestania	1972	WA
Honeymoon Well	1973	WA
Carnilya Hill	1974	WA
Rockys Reward	1984	WA
* Part of Yakabindie project		

Table 5: Nickel discoveries

DEPOSIT	YEAR	STATE
Gingin	1971	WA
Jurien Bay	1971	WA
Cooljarloo	1971	WA
WIM Deposits	1989	VIC
Massidon	1990	NSW
Beenup	1990	WA

Table 6: Mineral sands discoveries

BASE METALS

Base metal discoveries have been made at a steady rate over the whole of the 1970s and 1980s (Table 7; Map). This reflects the underlying importance of base metals and the steady investment in exploration. The spread of discoveries throughout the period is in marked contrast to other minerals, such as nickel, gold and diamond, where there have been periods of intense activity and discovery followed by periods of little activity or exploration success. However, it is interesting to note that all the deposits found from 1970 to 1981 (Table 7) could be considered as

'grassroots' discoveries. That is, deposits discovered away from known significant deposits.

DEPOSIT	ELEMENT	YEAR	STATE
Woodlawn	1, 2, 3, 4	1970	NSW
Lady Loretta	2, 3, 1, 4	1971	QLD
Cadia	1	1971	NSW
Elura	2, 3, 4	1973	NSW
Koongie Park	3, 2	1973	WA
Que River	3, 2, 1, 4, 5	1974	TAS
Gossan Hill	1, 3	1972	WA
Thalanga	3, 2, 1, 4, 5	1975	QLD
Sorby Hills	2, 3	1973	WA
Teutonic Bore	1, 2, 3, 4	1976	WA
Olympic Dam	1, U, 5	1975	SA
Northparkes	1, 5	1977	NSW
Blendevale	1, 2	1978	WA
Wilga-Currawong	1, 2, 3, 4, 5	1978	VIC
Red Dome	5, 1	1978	QLD
Balcooma	1, 2, 3	1978	QLD
Selwyn--Starra	1, 5	1978	QLD
Scuddles	1, 2, 3, 4, 5	1979	WA
Admiral Bay	2, 3, 4	1981	WA
The Peak	1, 2, 3, 4, 5	1981	NSW
Jillawarra (Abra)	2, 1, 4, Ba	1981	WA
Nifty	1	1983	WA
Surveyor 1	1, 2, 3, 4, 5	1983	QLD
Hellyer	1, 2, 3	1984	TAS
Cadjebut	3, 2	1984	WA
Dry River South	1, 2, 3, 4, 5	1985	QLD
Twelve Mile Bore	3, 2, 4	1985	WA
Reward	1, 5	1986	QLD
South Surveyor 1	1,2, 3, 4, 5	1987	QLD
Century	3, 2, 4	1990	QLD
Osborne	1, 5	1990	QLD

1 Copper; 2 Lead; 3 Zinc; 4 Silver; 5 Gold.

Table 7: Base metal discoveries

By contrast, only three of the twelve deposits discovered in the decade to and including 1990 are considered 'grass roots' discoveries. These are the large Century deposit in Queensland and the Nifty and Jillawarra (Abra) deposits in Western Australia.

This pattern of discoveries suggests two contiguous discovery phases: (1) significant deposits were discovered in the 70s as a result of reconnaissance exploration in areas where base metal deposits were not known and (2) in the 1980s deposits were found close to those deposits discovered in the 1970s following further exploration.

A feature which distinguishes base metals from other minerals to a large extent is the concentration of deposits in Palaeozoic aged rocks of the Eastern States of Australia. The few deposits in the west are either of Archean or, in the case of the zinc-lead deposits of the Kimberley's, Devonian age.

URANIUM

The first half of the 1970s saw several new uranium deposits discovered (Table 8; Map) as a result of increased exploration following high demand forecasts which were based on optimistic projections for growth in demand for nuclear power. With the prospects for development of mines on newly discovered deposits being poor the rate of exploration and discovery fell dramatically in the second half of the 1970s and the 1980s. The only major deposits discovered in the period since 1975 were Mulga Rock and Kintyre in Western Australia. The location of the uranium deposits referred to in this paper are shown on the Map.

DEPOSIT	METAL	YEAR	STATE
Bigrlyi	U	1973	NT
Koongara	U, Au	1970	NT
Nabarlek	U	1970	NT
Walbiri	U	1970	NT
Jabiluka	U, Au	1971	NT
Angela	U	1973	NT
Pamela	U	1973	NT
Maureen	U, Mo	1971	QLD
Ben Lomond	U, Mo	1975	QLD
Junnagunna	U, Au	1976	QLD
Beverley	U	1970	SA
Honeymoon	U	1972	SA
Olympic Dam	U, Cu, Au	1975	SA
Lake Way	U	1972	WA
Yeelirrie	U, V	1971	WA
Manyingee	U	1974	WA
Mulga Rock	U	1978	WA
Kintyre	U	1985	WA

Table 8: Uranium discoveries

The discovery of Olympic Dam in South Australia in the mid-1970s was a major boost to Australia's reserves of uranium, as well as copper and gold.

Despite the fact that there has been a decline in the number of new uranium discoveries since the late 1970s, Australia's low cost uranium resources increased substantially over this period because much of the exploration expenditure was directed towards expanding resources of known deposits.

OTHERS

Included in the other deposits discovered during the period were the Munni Munni platinum group element deposit in Western Australia and the Kunwawarra magnesite deposit in Queensland (Maps).

ACKNOWLEDGEMENTS

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