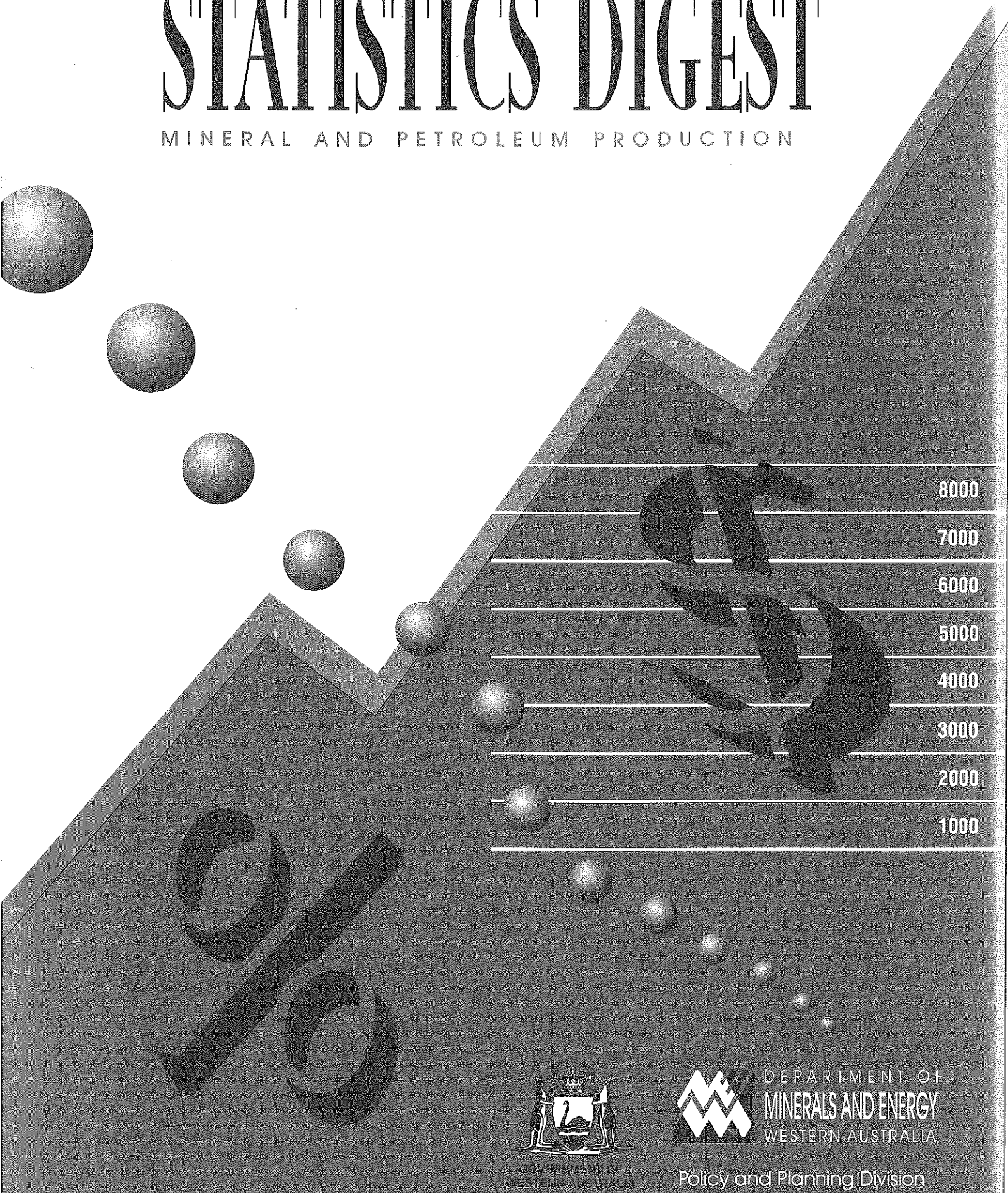


1995

STATISTICS DIGEST

MINERAL AND PETROLEUM PRODUCTION



GOVERNMENT OF
WESTERN AUSTRALIA



DEPARTMENT OF
MINERALS AND ENERGY
WESTERN AUSTRALIA

Policy and Planning Division

J | F | M | A | M | J | J | A | S | O | N | D

CONTENTS

	Page
FORWARD	
1. ECONOMIC AND SOCIAL ENVIRONMENT	1
1.1 World Economic Overview	1
1.2 Review of the Western Australian and Australian Economy	3
1.3 Economic Factors Affecting the Mining Industry	4
1.4 Social and Political Factors Affecting the Mining Industry	5
2. REVIEW OF MAJOR MINERALS AND PETROLEUM	9
2.1 Overview and Outlook	9
2.2 Petroleum	9
2.3 Gold	10
2.4 Iron Ore	12
2.5 Alumina	15
2.6 Nickel	16
2.7 Diamonds	18
2.8 Heavy Mineral Sands	19
2.9 Other Minerals	20
3. EXPLORATION AND MINING INVESTMENT	23
4. EMPLOYMENT IN THE MINERALS AND PETROLEUM INDUSTRY	24
5. OUTLOOK FOR MINERAL AND PETROLEUM PRODUCTION	24
TABLES	
1 Quantity and Value of Minerals and Petroleum 1994 - 1995	26
2 Quantity and Value of Selected Major Commodities	28
3 Quantity and Value of Minerals and Petroleum By Local Government Area	30
4 Royalty Receipts 1994 - 1995	37
5 Employment in the Mineral and Petroleum Industries	40
6 Principal Mineral and Petroleum Producers	43
Abbreviations, References, Units and Conversion Factors	52

1995 STATISTICS DIGEST

FIGURES	PAGE
1.1 Exchange Rate: \$A/YEN	4
1.2 Exchange Rate: \$A/\$US	5
1.3 Major Mineral and Petroleum Projects in Western Australia	8
2.1 Petroleum Exports	9
2.2 Oil and Condensate: Quarterly Production & Value	9
2.3 Crude Oil and Condensate Production	10
2.4 Crude Oil Price	10
2.5 Gold Quarterly Production & Value	11
2.6 Gold Production	11
2.7 Gold Exports	11
2.8 Gold Price	12
2.9 Iron Ore Quarterly Production & Value	12
2.10 Iron Ore Price	13
2.11 Iron Ore Production	13
2.12 Iron Ore Exports	13
2.13 Alumina Quarterly Production & Value	14
2.14 Alumina Production	14
2.15 Alumina Exports	15
2.16 Alumina Price	15
2.17 Contained Nickel	16
2.18 Nickel Price	16
2.19 Nickel Production	17
2.20 Nickel Exports	17
2.21 Heavy Mineral Sand Exports	18
2.22 Heavy Mineral Sands Price Index	19
2.23 Ilmenite Production	19
2.24 Ilmenite Quarterly Production & Value	20
2.25 Selected WA Mineral Commodities Relative to World Production	22
5.1 Estimates of Mineral & Petroleum Value of Production to Year 2000	24
0.1 Comparative Value of Production - 1990 and 1995	29
0.2 Comparative Royalty Receipts - 1990 and 1995	39



FOREWORD

Welcome to the 1995 issue of the Statistics Digest. This Digest contains the most comprehensive statistical information available on the Western Australian resources industry. These statistics play an important role, being used by companies and Government to assist in management and investment decisions.

The statistics on production and exports were assembled by the Department of Minerals and Energy with input from the Australian Bureau of Statistics and resource companies. I would particularly like to thank all producers for their contribution to the Digest, as it would be impossible to publish such a comprehensive document without their support.

In our efforts to continually improve the publication, this issue includes a brief outlook on the value of mineral and petroleum production to the year 2000 plus an additional table containing ten years of retrospective production data. A new chart has also been added, showing Western Australia's mineral and petroleum output by commodity as a proportion of world production.

In 1995 the value of production of Western Australia's resources sector rose by 13% to around \$14.6 billion and continued to underpin the State's economy, accounting for around 27% of Gross State Product and over 70% of its exports.

A major highlight in 1995 was Western Australia's rise to prominence as Australia's leading oil producing State. Great interest also continues in further processing of the State's iron ore resources which is made increasingly favourable thanks to improvements in Western Australia's energy market.

Whilst energy market developments have made a fundamental difference to the international competitiveness of the State's mineral industry, it has been countered by the Commonwealth Native Title Act which has substantially added to the time taken to grant mineral titles in Western Australia and to the costs borne by both Government and industry. This has unfortunately coincided with the opening up to exploration of many new areas overseas. These locations are particularly attractive for smaller Australian companies which have found it difficult to obtain access to ground with similar potential in Australia.

There are a number of projects coming on stream and \$20,000 million worth of resource projects either under construction, committed or under investigation. But these projects stem from resources identified years ago.

Coupled with continued strong Asian economic growth and favourable commodity prices, current developments augur well for a healthy resources industry in Western Australia. The challenge now is to develop workable Native Title Act processes to enable new resources to be identified and developed in reasonable time frames.

A handwritten signature in black ink, appearing to read 'K R Perry'.

K R Perry
DIRECTOR GENERAL

1. ECONOMIC AND SOCIAL ENVIRONMENT

1.1 World Economic Overview

The 1995 calendar year was characterised by a general slowdown in economic activity throughout the developed countries, while Asian economies remained on their rapid growth paths. The outlook for the world economy in 1996 is favourable since the major economies are at various stages of recovery from the 1990-91 recession. It has been forecast that the world economy will grow by 3.6% in 1996, compared with about 3.2% during 1995.

United States of America

The US economy is moving into its sixth consecutive year of economic recovery, which by historical standards is a fairly long period of expansion. However, while the 1990-91 recession was relatively mild and brief in the US, economic growth both before and after the downturn was the weakest of the post-world war period. In fact, real GDP growth did not recover above trend (estimated to be 2.5%) until 1993.

After strong GDP growth of 3.9% in 1994, the US economy expanded by only about 2.5% during 1995. Capacity utilisation fell from the very high levels recorded in 1994 and inventories remain high relative to sales. Employment expanded steadily, albeit at a slower pace than in 1994, with the unemployment rate at the end of 1995 remaining at about 5.7%.

Consequently, inflation seems to have flattened out at approximately 3%. Wage growth also remains around 3% and the rate of increase in producer prices has slowed. This lack of pressure on inflation provided the impetus for the easing of monetary policy in December 1995. Low long-term interest rates should help sustain growth in economic activity in the US over the coming year.

With the Federal Budget conflict finally resolved, the US economy showed sporadic signs of unexpectedly high levels of activity early in 1996. These include a 3% rise in housing starts and a 700,500 rise in employment in February.

In 1996 the US economy could be adversely affected by the US Presidential elections, due to be held in November, and China/Japan/US trade difficulties.

The strength of the independence movement in Taiwan and continued calls for free trade in negotiations with Japan will heighten the external constraints on the US.

Japan

The Japanese economy recorded only a 0.5% rise in GDP for 1995. Inflation remained low during the year, with the GDP deflator rising by only 0.5%, but unemployment reached a record of 3.4% by the end of 1995. The bad-debt problems in its financial markets and the sharp appreciation in the ¥ in early 1995 restricted economic growth.

However, December quarter's growth of 0.9% was the highest quarterly result since June 1992. The Government's ¥14 trillion (A\$175 billion) stimulus package announced in September 1995 seems to have begun to flow through the economy. The first round effects on public works and housing, with a 6.9% and 7.2% rise respectively in the December quarter, are expected to be followed by increased activity in rest of the economy during 1996.

Recent data suggests that the prospects for a sustained economic upturn in Japan are now better than at any time since the economy went into recession in 1991. Accordingly, it has been forecast that Japan's GDP will grow by 2.2% in 1996.

Asian Economies

In China, both economic growth and inflation continued to slow in the second half of 1995 from the exceptionally high rates of the previous year. This paved the way for credit restrictions to be selectively relaxed. While the growth in GDP and industrial production reached above 11% for 1995, this was about half the growth rate of industrial production recorded in the previous year.

This slowdown is in line with the Government's target for 1996. The Chinese government is aiming at GDP growth of 8-9% and inflation of about 12% in 1996.

In Taiwan, growth in GDP slowed to about 5% in 1995, prompting the monetary authorities to lower reserve ratios of banks. Hong Kong's growth rate also slowed, reaching about 4.2%, with consumer demand dampened by falling property prices and rising unemployment. However, economic growth in Indonesia (7.3%), Thailand (8.7%), Singapore

(9.0%), Malaysia (9.2%) and South Korea (9.9%) has continued at very rapid rates.

Thailand and Indonesia encountered inflationary pressures last year and along with Malaysia also recorded rises in current account deficits. In response, monetary policy has been tightened in all three countries and growth is expected to be slightly lower in 1996. On the other hand, inflation in Singapore and South Korea declined in 1995, suggesting these two countries will maintain their rapid growth paths, at least in the short term.

Western Europe

The United Kingdom, Germany and France all recorded modest growth rates of around 2% in 1995, with economic activity slowing towards the end of the year. There is concern that tighter fiscal policy, to comply with the conditions of monetary union, may adversely affect economic growth in these countries during 1996.

On the other hand, a slowing pace of economic activity, falling inflation and greater stability within the European Monetary System enabled a number of countries to cut official interest rates in the December quarter of 1995, including Germany and the UK. The main exceptions to this trend were Italy and Sweden, where economic activity continues to grow strongly and official interest rates have remained high.

Other World Economies

The CIS continued its slow crawl out of the depths of economic upheaval with a contraction of GDP of about 5% in 1995, compared to a fall of 15% the previous year. It is expected that 1996 will see a return to growth for the CIS, of about 2%.

However, continued unrest in republics seeking independence and an apparent resurgence of popular support for communist rule, as few economic benefits from market reforms have materialised, are the likely obstacles to further economic progress. The Presidential elections, due to be held on 16 June 1996, are expected to test the popular feeling towards the reform process.

The major Eastern European countries, such as Poland and the Czech and Slovak Republics, continue to benefit from trade with Western

European countries and increased foreign investment. Economic growth in Eastern Europe reached about 4% in 1995, on the back of 3.9% in 1994 and up markedly from 1.9% in 1993. The process of structural reform has contributed to these improvements. Eastern Europe is expected to maintain growth at around 4% per annum in the next two years, before strengthening further to about 4.5% in the medium term.

The Latin American region achieved economic growth of around 2% in 1995 which was down from 4.6% in 1994. The recession in Mexico, triggered by the peso crisis in late 1994, was the main contributor to this decline. Growth in the Latin American region is forecast to lift to 3.2% in 1996 and to 4.5% per annum over the medium term with the resurgence of resource projects and the opening up of the economies to foreign investment. However, relatively high debt levels and high inflation in many of these countries remain the main obstacles to growth in the Latin American region.

World Economic Outlook

Looking towards the end of the century, the Asia Pacific region is expected to retain its lead position in terms of economic growth. Average growth rates forecast to the year 2001 range from about 5% for Hong Kong to around 6% for Taiwan and India, around 7% for South Korea, Indonesia and Singapore, around 8% for Thailand and Malaysia, and 9.5% for China.

Australia's forecast growth rate of 3.4% for the same period therefore pales in comparison to its nearest neighbours. The major exception is Japan, with a forecast average growth rate of 2.5%. On the other hand, the CIS, Western European and North American countries are forecast to achieve growth rates of between 2% and 3% to the year 2001.

Latin America and Southern Africa are expected to grow at average annual rates of about 4%. Average growth rates of about 5.5% are forecast for Central and Eastern Europe.

In general, the more developed countries, including Australia, are forecast to exhibit steady medium term growth paths, contrasting with the more rapid growth of less developed countries in the South American continent, Eastern Europe and, in particular, in Asia.

However, much depends on whether budget deficit reduction throughout the OECD area translates into higher private sector investment and increased living standards. In Europe, the key determinant will be European Monetary Union.

1.2 Review of the Western Australian and Australian Economies

Australia's real GDP in 1995 increased by 3.1% and has now been growing for a record 18 consecutive quarters. Growth in the Western Australian economy, whilst outstripping national performance, nevertheless eased over 1995 with GSP increasing by 3.1% in real terms. This was surpassed only by Victoria (4.5%) and signified a slowing of the Western Australian economy towards the end of 1995. Whilst the building sector dampened economic growth in 1995, investment by business in new equipment underpinned Western Australia's economy, accounting for a full 3 percentage points of the State's growth.

National inflation accelerated to 4.6% in 1995 and Western Australia's headline inflation rate increased to 4.8% over the year, the highest annual rate since June 1991. However, the State's underlying inflation remained relatively moderate at around 3.1%. Inflation has edged upwards due to the lagged effects of strong economic growth in 1994, indirect tax increases announced in the 1995-96 Federal Budget and to a lesser extent, sharp currency depreciation in the first half of 1995.

Wages continued to grow strongly in Western Australia, rising by 6.1% over the year to the September quarter 1995. This was almost double the national growth rate of 3.1%. Growth was driven by buoyant labour market conditions which saw Western Australian employment rise 4.2% in 1995, marginally higher than the 4.0% national increase. Correspondingly, Western Australia's unemployment rate steadied, standing at 7.6% at the end of 1995 - the second lowest of all States and significantly below the national rate of 8.5%.

In light of inflation, the RBA has continued to maintain a cautious stance on monetary policy. In particular, the RBA is concerned that the current rate of growth in wages is incompatible with containment of underlying inflation within a range of 2-3% over the course of a full economic cycle. In

fact, interest rates began to rise in late 1994 on the expectation that the national economy would continue to grow at an unsustainable rate in 1995, necessitating substantial tightening of monetary policy. However, as it became apparent that growth had peaked and was decelerating, 90 day bank bills yields fell sharply in the first half of 1995 to remain relatively stable over the remainder of the year, reflecting market perception that official interest rates were unlikely to move.

In conjunction with a cautious monetary policy, the 1995 Federal Budget forecasted a relatively contractionary fiscal policy with a Budget surplus of \$0.7 billion. However, it is becoming increasingly evident that this target will not be met, with a budget deficit materialising instead.

The A\$ followed its US counterpart to a succession of all time lows against the Japanese ¥ in the first half of 1995, dropping to under ¥59 in May after opening in January 1995 at ¥75. This reflected the currency's weakness in the face of trade-tension related realignment of the US\$ against the ¥. However, the A\$ also fell sharply against the US\$ itself (down to US 71 cents in June, after opening at US 76 cents at the beginning of the year) reflecting monthly volatility (with a deteriorating trend) in the current account deficit and falling commodity prices (Figure 1.1 & 1.2).

Partial resolution of US/Japan trade differences, coinciding with a peaking in Australia's current account deficit and recovery in commodity prices helped boost the value of the A\$ upwards into the US 75 cent and ¥77 range, retracing ground lost in the first half of 1995. This pattern was mirrored in Trade Weighted Index (TWI) terms.

Support for the Australian currency also came from widening interest rate differentials, relaxation of restrictions on Japanese investment in foreign bonds and occasional upswings in the gold price.

Further appreciation of the Australian dollar in 1996 has been largely accounted for by the increase in commodity prices in early 1996. This is to be expected, as the international investment community considers the Australian dollar to be a surrogate commodity basket since around three quarters of Australia's exports consist of wheat, iron ore coal, gold, bauxite/alumina, base metals, wool and meat.

The effect of the increase in commodity prices on the value of the Australian dollar is reinforced by the relatively high interest rates in Australia. Although there has been some speculation from some quarters that the Reserve Bank may decrease the official rate it seems unlikely that this will eventuate in the foreseeable future.

The relatively buoyant A\$ did little to stem the flow of imports. Australia's current account deficit on its international balance of payments increased to 25 billion in 1995, a 10% increase on 1994. However, Western Australia's external sector continued to strengthen, again posting a surplus over 1995. In contrast, import growth declined in every quarter to September in 1995 since peaking in the September quarter 1994.

The consensus among those who attempt to forecast the Australian economy is that the slowdown in at least the first half of 1996 will be followed by a return to growth of around 3% per annum. However, a large question mark hangs over the degree to which wage-push inflation resurfaces from implementation of the newly elected Federal Coalition's industrial relations policies.

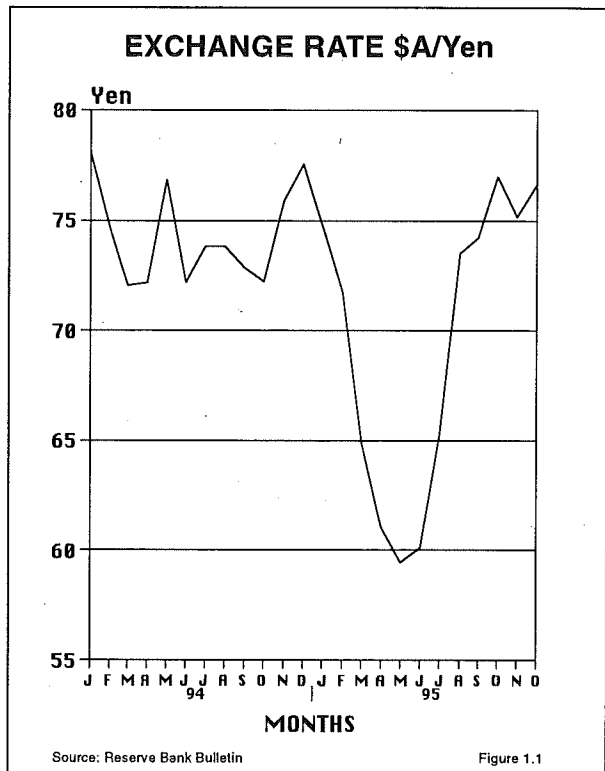
For Western Australia, despite an easing of economic growth in 1995, the State's medium to long term economic prospects remain extremely promising. As our major trading partners improve their economic performance later in 1996, an associated rebound in domestic growth is very likely to occur.

1.3 Economic Factors Affecting the Mining Industry

The resurgence of the world economy was generally welcomed by the mining sector. The IMF forecasts that world economic growth will accelerate in 1997 to its fastest rate in nearly a decade, encouraging miners to invest to take advantage of future expanding markets. The improved economic performance of Japan and other Asian economies over 1995 and the positive economic outlook for the Asian region has been and should continue to be of benefit to Western Australia's mining industry. The region currently takes about 82% of the State's mineral and energy exports, and is expected to remain the main target for exporters.

Commodity prices, in particular metals prices, increased over the course of 1995 and the first quarter of 1996.

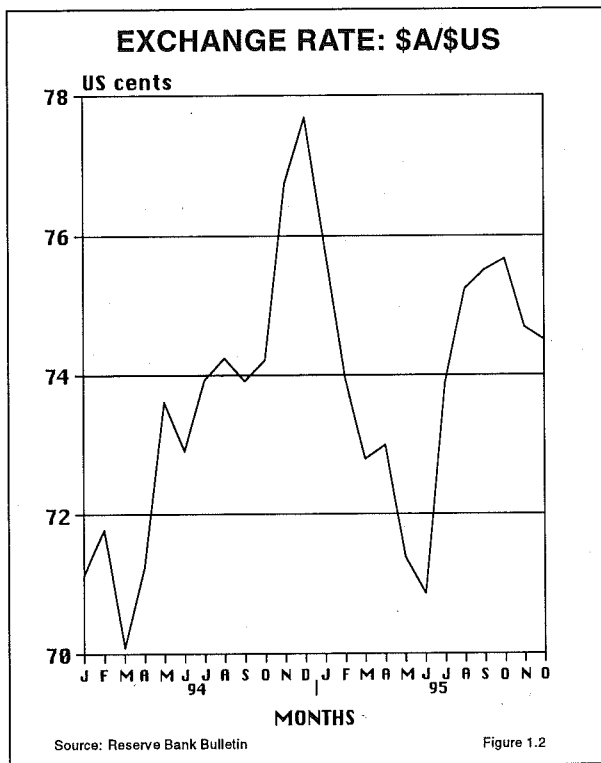
The gains to commodity producers from higher prices have been offset to some extent by the higher value of the Australian dollar. This effect is caused by the practise of writing many export contracts in US dollars. Thus, a 1% appreciation in the Australian dollar against the US dollar equates to a decrease in sales value in A\$ terms of about A\$38 million a year for gold exporters and A\$37 million for iron ore exporters.



The diesel fuel rebate compensates export industries for the costs of the fuel excise, so that exporters are not at a disadvantage against foreign competitors that do not have a similar impost on their fuel costs. The scheme, administered by the Australian Customs Service, provides for an excise rebate on diesel fuel used for offroad purposes in mining and agricultural operations.

Prior to the 1995/96 Commonwealth Budget, there was industry wide speculation that the Commonwealth Government was considering slashing the value of the rebate to the mining sector and tightening the eligibility criteria for rural and mining industries. The mining industry stated that any reduction in the diesel fuel rebate would undermine its competitiveness and lead to lower grade minerals being left in the ground.

The value of the diesel fuel rebate was not reduced in the 1995/96 Commonwealth Budget. However, the Australian National Audit Office has provided the Federal Government with ample evidence to consider scrapping the diesel fuel rebate, claiming that there was considerable scope to reduce costs. While the Government has promised to retain the rebate for farmers, it has not ruled out dropping the rebate for the mining industry.



1.4 Social and Political Factors Affecting the Mining Industry

Change of Government

The Federal election held on 2 March 1996 saw Australians vote in a Coalition Government for the first time in 13 years.

The Coalition's election commitments which, if implemented, could significantly impact on the resources sector include:

Taxation

- ♦ "... the tax burden on the mining industry will not be increased during the term of the next Parliament."
- ♦ "Fringe Benefits Tax will be reviewed to simplify the existing legislation and compliance costs."

- ♦ "Examine the need for variations to existing secondary taxation policies to encourage (petroleum) exploration and production."
- ♦ "Maintain the existing excise/royalty regime applying to companies engaged in petroleum production from the North West Shelf area."

Native Title

- ♦ "The Coalition supports the Principle of native title" but "We reserve the right, after full and thorough consultation with all interested parties, to amend the Native Title Act to make it more workable."

Uranium Mining

- ♦ "Abolish the Three Mines uranium policy of the Labor Government but not allow the sale of uranium to countries with which we do not share bilateral safeguard agreements."

International Law Making

- ♦ "Ensure that the Australian Parliament, the States, industry and wider community are given proper and timely involvement in international law making, including where appropriate undertaking a cost benefit analysis in terms of Australia's national interests prior to any ratification."

Export Controls

- ♦ "Abolish export controls on mineral commodities except controls on uranium."

Tariff Reform

- ♦ "Maintain the existing schedule for tariff reduction to the year 2000. Beyond that tariff reductions, consistent with the APEC objective of complete trade liberalisation to the year 2010, will proceed in step with other key elements of the Coalition's comprehensive program of microeconomic reform."

Environment

- ♦ "Ensure that, through proper consultation and adequate management programs, World Heritage Listings become matters of national pride rather than division." ... "Under the Coalition, sites will be proposed for listing only after the fullest consultation and with the cooperation of the relevant State or Territory government."

- "Develop mechanisms for accrediting State environmental procedures, so that wherever possible, proposals are only subject to one environmental assessment."

In general, the mining and petroleum industries have welcomed the Coalition's resources and energy policy. In particular, the abolition of export controls on certain commodities and abolition of the three mines uranium policy will see increased opportunities in the mining industry in Western Australia.

Nevertheless concern has also been expressed by the mining industry in relation to the areas targeted by the Commonwealth in its attempts to cut Commonwealth outlays by \$8 billion. The Federal Government is considering plans to cut the cost of the \$650 million research and development tax concession and the \$710 million diesel fuel rebate for the mining industry. If these cuts eventuate they will adversely impact on the competitiveness of the State's resources sector.

Native Title Issues

Without doubt the major issue over 1995 has been native title and its impact on the mining and petroleum sectors.

The High Court decided on 16 March 1995 that the State's Lands (Titles and Traditional Usage) Act was invalid, and as a result, the issuing of Western Australian titles became subject to the full provisions of the Federal Native Title Act.

Uncertainties with the Federal Act have led to significant delays in mineral title approvals in Western Australia. The issuing of Miners' Rights by the State was suspended between 16 March and 1 May 1995 and the issuing of petroleum titles was also suspended from 16 March 1995 to September 1995. This allowed the State time to assess the implications of the High Court's decision. However, the issuing of prospecting and exploration licences continued.

The Western Australian Government has now implemented procedures consistent with the Federal Government's Native Title Act and informed petroleum and mineral explorers and miners of the new requirements. All title applications are

advertised by the Department of Minerals and Energy (DME) and are then referred to the National Native Title Tribunal. If an Aboriginal group does not lodge a claim over the tenement within three months then DME may issue a title. Areas subject to a native title claim must be resolved by the National Native Title Tribunal (or a negotiated settlement acceptable to all parties is reached) before DME can issue a title to that area.

It is clear that the approval process for the granting of Mining Leases has been significantly lengthened under the Federal Native Title Act.

The Western Australian and Federal Governments are still negotiating establishment of a State based native title tribunal to complement the Federal Native Title Tribunal. It is intended that these State-based tribunals would run parallel to and act as an alternative to the Federal body. In October, 1995 the South Australian Government set up the first of such State based tribunal systems in Australia.

A key issue relevant to Western Australia is whether pastoral leases extinguish native title. This remains unresolved.

The Commonwealth Coalition Government has made a firm commitment to make the Native Title Act more workable, but details on how this is to be achieved are sketchy.

Institutional Changes

Amendments to the State's Mining Act and Regulations were passed by the State Parliament in October 1995. The amendments aim to reduce disputation and further encourage mineral exploration in the State. The changes include:

- special prospecting licenses ranging in tenure from three months to four years;
- removal of legal restrictions on aerial surveys; and
- the introduction of a ballot system where competing tenement applications were lodged on ground previously relinquished or forfeited.

The Australian Mining Industry Council (AMIC) officially changed its name to the Minerals Council of Australia (MCA) at the beginning of June as part of a strategy to position the organisation for a more

effective role as the minerals industry national representative body. Following a comprehensive internal review, the Council aims to represent a broader range of members and to become more pro-active in its approach.

Tax Changes

A December 1995 tax ruling by the Australian Taxation Office will significantly benefit open cut operations in the mining industry. The ruling states that expenditure incurred in the extension of a mine is capital, while spending on the working of the mine is a revenue expense. This opens the way for overburden removal to be allowed as an outright deduction in almost all circumstances. Previously overburden removal was considered by the Tax Office, in almost all cases, to be a capital expenditure.

Environmental Issues

The State Government has continued its policy of balancing environmental and development objectives.

In May 1992 all Australian Governments signed the International Agreement on the Environment which, amongst other things, called for the establishment of a National Environment Protection Council with a goal to set nationally uniform standards for the environment. After the Western Australian Government was satisfied that it would not become captive to an unsuitable set of standards determined by a majority of other State governments, State Cabinet agreed on 7 September 1995 that Western Australia join the National Environment Protection Council.

BHP's handling of the dispute over the OK Tedi mine in Papua New Guinea prompted Commonwealth Environmental Protection Agency (CEPA) in 1995 into the first phase of developing an environmental code which would cover Australian companies operating overseas. CEPA has indicated that consultation will take place with industry in the development of the code.

Globalisation

Increasing economic liberalisation of many countries has stimulated numerous Australian mining companies into taking a global view of their operations.

An interesting aspect of the trend towards increasing globalisation of mining operations, is the number of significant mergers which have taken place. The most telling example is the de facto merger, approved by CRA shareholders in December 1995, of CRA and RTZ. With a combined market capitalisation of A\$26.7 billion, this makes the CRA and RTZ conglomerate the world's largest mining group.

Reserves

The Department of Primary Industries and Energy has estimated that Australia has:

around 30% of the world's economically recoverable reserves of mineral sands, uranium, lead, zinc and tantalum;

over 10% of the world's economically recoverable reserves of bauxite, iron ore, silver, industrial diamonds, brown coal, manganese and cadmium; and

over 5% of the world's economically recoverable reserves of black coal, nickel, gold, copper, lithium and magnesite.

This means that Australia (and Western Australia) will continue to be a prominent player on international mineral markets for the foreseeable future.

According to the World Bank (1995) Australia's enormous natural resources, including mineral resources, makes it the world's richest nation. Australia's average net worth is US\$835,000 on a per capita basis, followed by Canada (US\$704,000) per capita.

Research

Western Australia's northern Goldfields have been chosen as the focus for a joint Federal and State Government study to identify the region's resource potential and infrastructure needs. The study aims to develop a co-ordinated approach between government and industry to develop processing opportunities and infrastructure. The northern Goldfields area was chosen for the study predominantly due to the development potential to be created by the Goldfields Gas Pipeline. The study will identify suitable cost sharing arrangements for mineral developments, such as a pool of companies contributing to major consolidated gold processing facilities or perhaps a new nickel smelter.

MAJOR MINERAL AND PETROLEUM PROJECTS IN WESTERN AUSTRALIA WITH AN ANNUAL VALUE OF PRODUCTION IN EXCESS OF \$10 MILLION

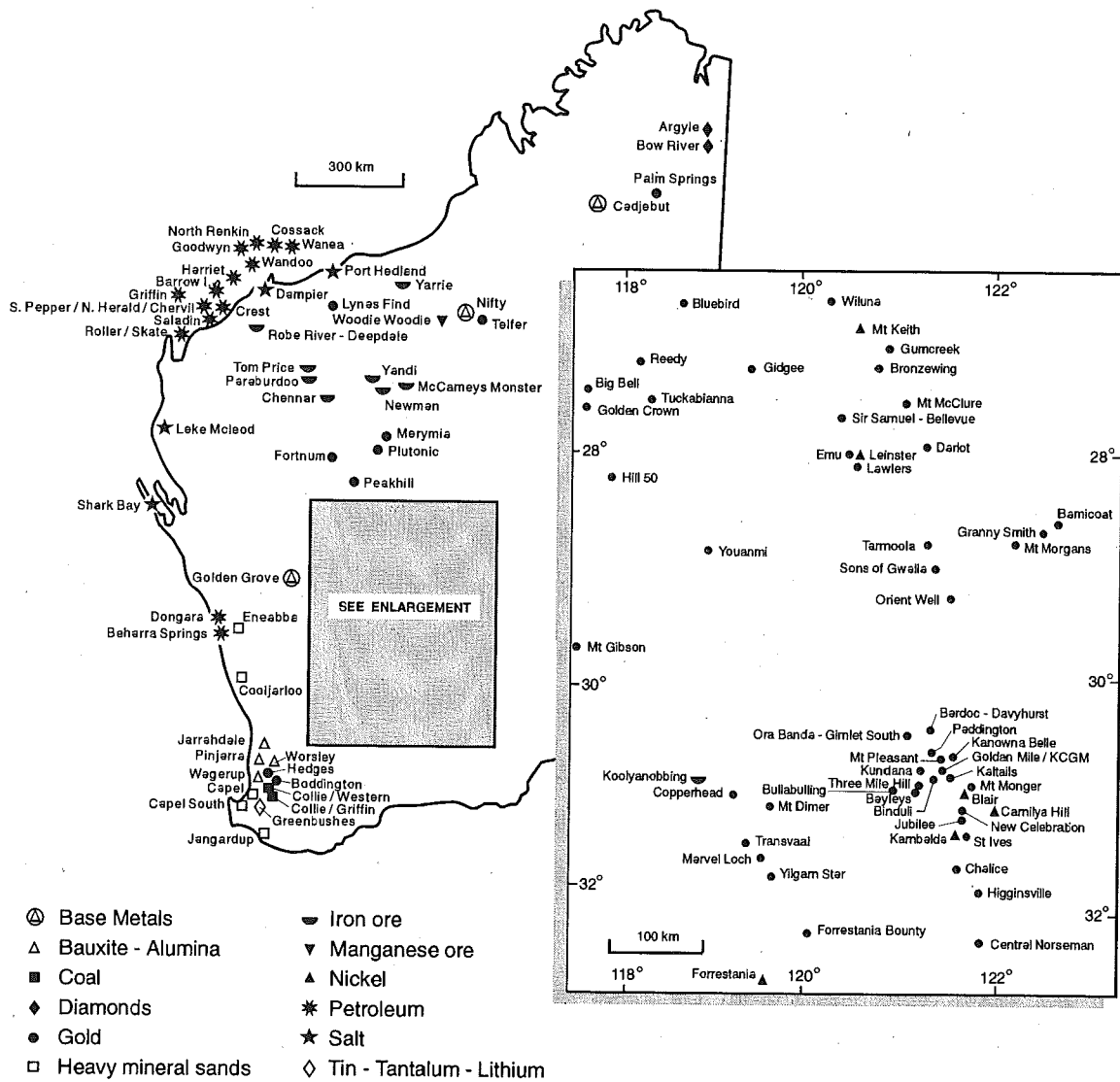


Figure 1.3

2. REVIEW OF MAJOR MINERALS AND PETROLEUM

2.1 Overview and Outlook

In 1995 Western Australia's resources sector continued to underpin the State's economy, accounting for around 27% of State Gross Product (GSP) and over 70% of its exports.

The value of production rose by 12.6% in 1995 to around \$14,582 million. The rise was mainly attributable to the strong increase in the value and production of nickel, iron ore, LNG, condensate and mineral sands.

In 1995 the industry as a whole had higher investment and exploration levels but profits were reduced.

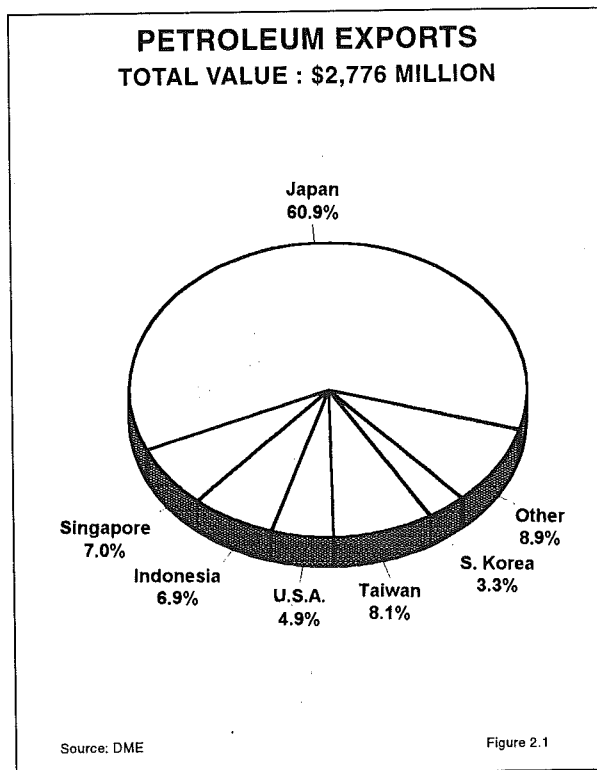
The highlights of 1995 were the emergence of the petroleum sector as the State's leading resource industry, and moves to process the State's iron ore resources.

Western Australia is now Australia's largest oil producer and BHP's announcement to proceed with its DRI plant suggests that the long-held goals of Government to achieve downstream processing of the State's resources are finally coming to fruition.

Deregulation of the gas market, construction of the Goldfields Gas Pipeline coupled with continued strong Asian economic growth and favourable commodity prices, all suggest that the outlook for Western Australia's mineral and petroleum sector is bright.

Western Australia is expected to continue to be a significant world player in many international commodity markets. The State currently produces around 14% of world production of iron ore, 8% of gold, 10% of LNG, 7% of alumina and 40% of diamonds.

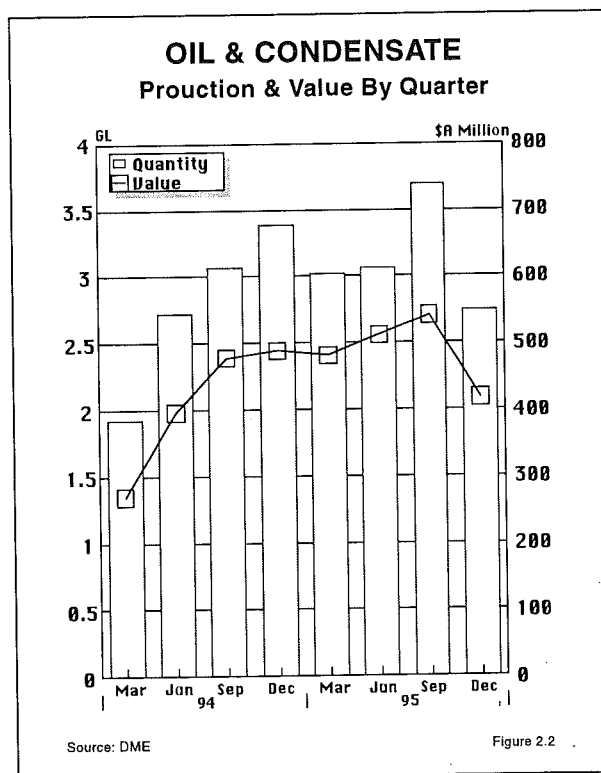
The State's prominence on the international minerals scene is expected to be maintained well into the 21st century. In 1994/95 for example, 16 resource projects with a value of \$3.5 billion were commissioned in Western Australia. Another 38 resource projects (valued at \$5.8 billion) are under construction with another 22 projects (valued at

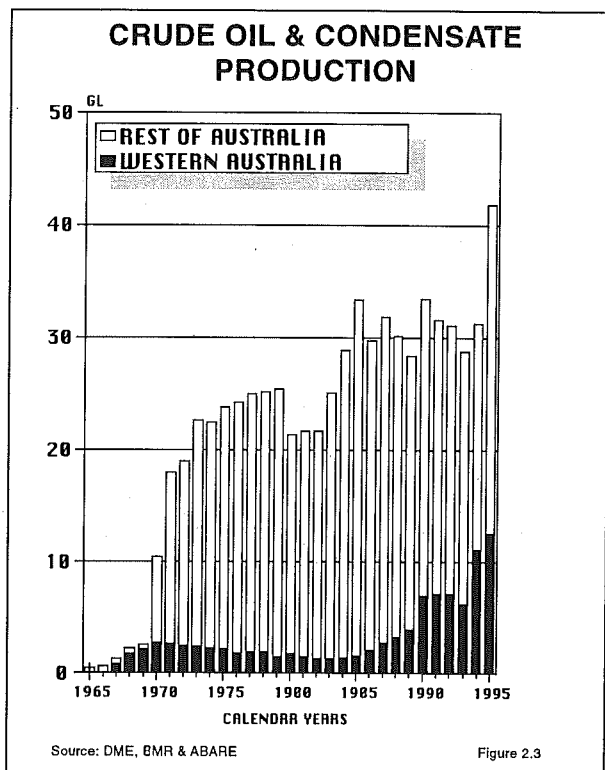


\$4.3 billion) committed. There are also 51 resource projects (valued at \$12.2 billion) under consideration.

2.2 Petroleum

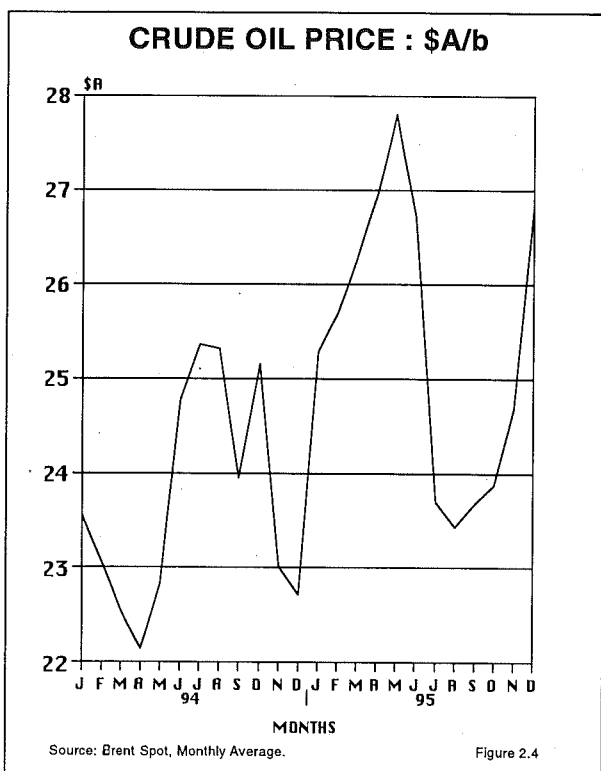
The combined value of petroleum production rose by 20% to \$3,771 million, accounting for 26% of the value of Western Australia's total minerals and





energy production. The combined value of petroleum exports totalled \$2,776 million with the major destinations being Japan (60.9%), Taiwan (8.1%), Singapore (7%), Indonesia (6.9%), USA (4.9%) and South Korea (3.3%) (Figure 2.1).

During the third quarter of 1995, Western Australia's average daily liquids (oil and condensate)



production of 37,800 kL (238,000 bbls) exceeded for the first time that of Victoria's Gippsland Basin, which averaged 35,000 kL (222,000 bbls) per day for the same period. This was a significant milestone for the Western Australian petroleum industry and reflected the concerted efforts of petroleum companies in the North West Shelf over the past decade (Figure 2.2 & 2.3).

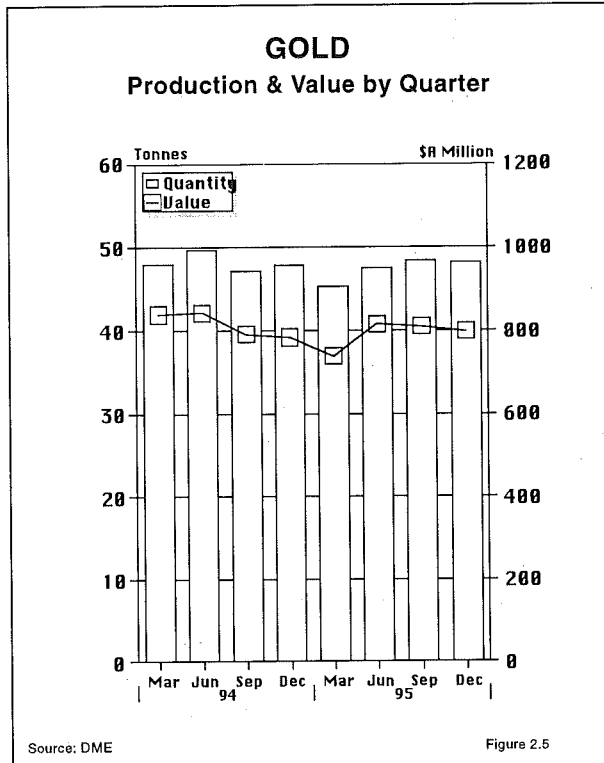
Highlights of the Western Australian petroleum industry over 1995 included:

- First production from the Goodwyn 'A' Platform in the North West Shelf Gas Project;
- First production from the Wanaea and Cossack oilfields;
- Successful production testing of horizontal wells at Apache's offshore Stag oilfields and at Santos' onshore Sundown oilfield;
- Completion of the Dampier to Port Hedland gas pipeline;
- Drilling of 58 new wells in 1995 compared with 64 in 1994 and 52 in 1993. Effort was again concentrated in the Carnarvon Basin where 48 (or 84%) of the wells were drilled; and
- Growing international interest in Western Australia's petroleum industry in recent years, with a number of foreign companies seeking to purchase local assets. The heightened focus on Western Australia is reflected in the movement of head offices of major oil companies to Perth.

A possible return to the world oil market by Iraq through an oil-for-food trading agreement with the United Nations injected some volatility into oil prices in early 1996. The talks were successful and Iraq sold its first oil since trading was boycotted after Iraq invaded Kuwait in 1990. Oil inventories fell to their lowest level in almost 20 years in early 1996 as the major refiners bought stock for the busy northern summer season.

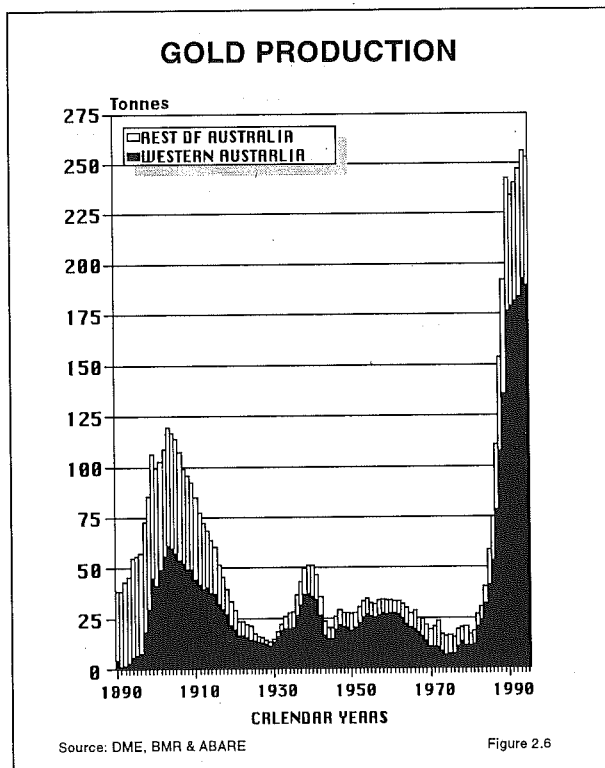
2.3 Gold

Western Australian gold production in 1995 was 189 tonnes, 2% less than in 1994. This was due to the disruptive effects on mining activity of Cyclone Bobby in February 1995. Although the average gold price in US\$ terms was higher in 1995, because of



the Australian dollar's appreciation, the price in Australian currency terms dropped from the 1994 average of A\$526 to A\$519 in 1995. This translated to a 3% decrease in the value of production which amounted to \$3,162 million (Figure 2.5).

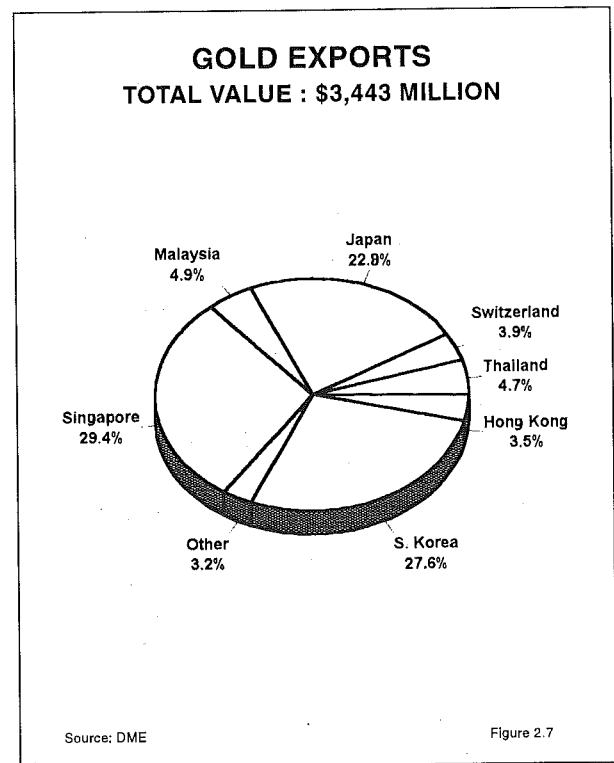
Nevertheless, the industry maintained its position as the State's second most valuable sector after



petroleum. Western Australian gold production also continued to account for approximately 75% of Australia's output, whilst Australia accounts for around 7% of world gold output (Figure 2.6).

Over half of the State's gold production was accounted for by 13 producers. The largest projects, were the Golden Mile - Kalgoorlie (19.8 tonnes), Boddington (12.2 tonnes), Telfer (12.0 tonnes), Kambalda - St Ives (10.6 tonnes), Granny Smith (6.8 tonnes), Plutonic (5.2 tonnes) and Kanowna Belle (5.1 tonnes).

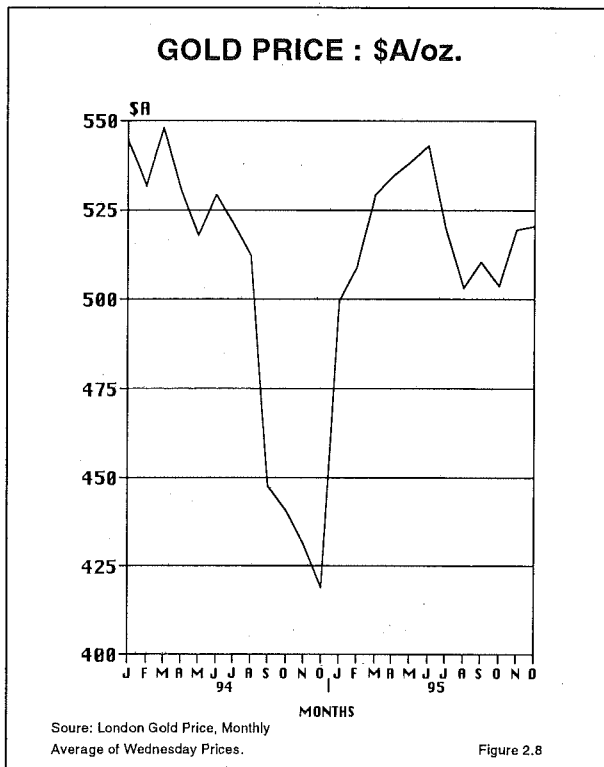
Western Australian gold exports amounted to \$3,443 million. Asia continued to be the State's major gold



export destination, accounting for more than 90% of gold exports in 1995 (Figure 2.7).

Without closure of any significant operations, production is expected to be boosted in 1996 due to several new projects which commenced operation in 1995, including Jundee, Palm Springs, Chalice, Bullabulling, Lynas Find, Marymia and Nimary. In a full year of production these mines are expected to account for approximately 10 tonnes of gold.

Production should also be boosted from new projects which could possibly commence in 1996, including St Barbara Mines' Cuddingwarra and



Western Reef's Dalgara projects near Cue, Border Gold's Karonie project near Kalgoorlie and resurrection of the Butcher Well mine near Leonora by Sons of Gwalia and Mt Burgess Gold Mining.

The world gold market saw prices begin the year in the low to mid US\$370/oz range, touching a minimum of US\$372/oz in January 1995. The price quickly recovered by April to hit a momentary high of US\$397 after which the price stabilised to trade in a narrow US\$383-389/oz range. The average price of gold for 1995 was US\$387/oz, up on the 1994 average of US\$384/oz (Figure 2.8).

Significantly, the gold price kicked off 1996 by temporarily breaching the US\$400/oz barrier for the first time in more than two years. Explanations for the gold price resurgence abounded, with a popular theory being that Asian demand was growing. However, it has been calculated that the importation of gold into Asia actually fell by around 25% in the second half of 1995. It was also erroneously suggested that inflation was pushing up the market. Financial derivatives such as futures and options actually now provide better protection against inflation than gold. In fact, for at least the past 15 years the real price of gold has been falling.

More realistically, the origins of the price increase are to be found in November 1995 when increased forward sales by producers boosted demand for

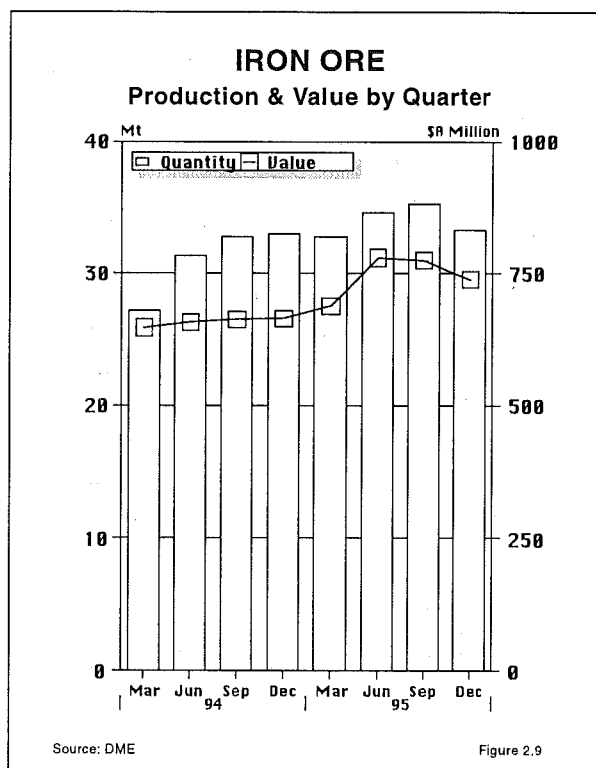
borrowed gold which coincided with a decision by central banks to reduce the amount that they were willing to lend to the market. This resulted in spot prices rising above forward prices.

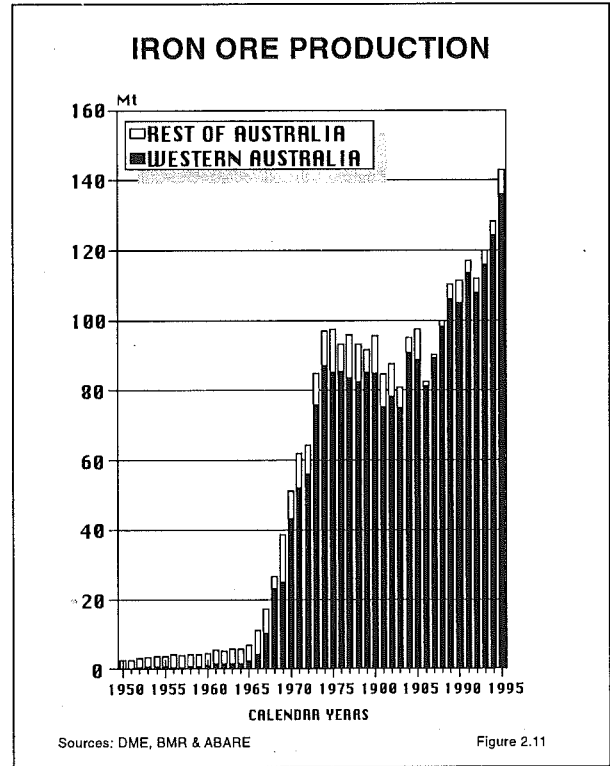
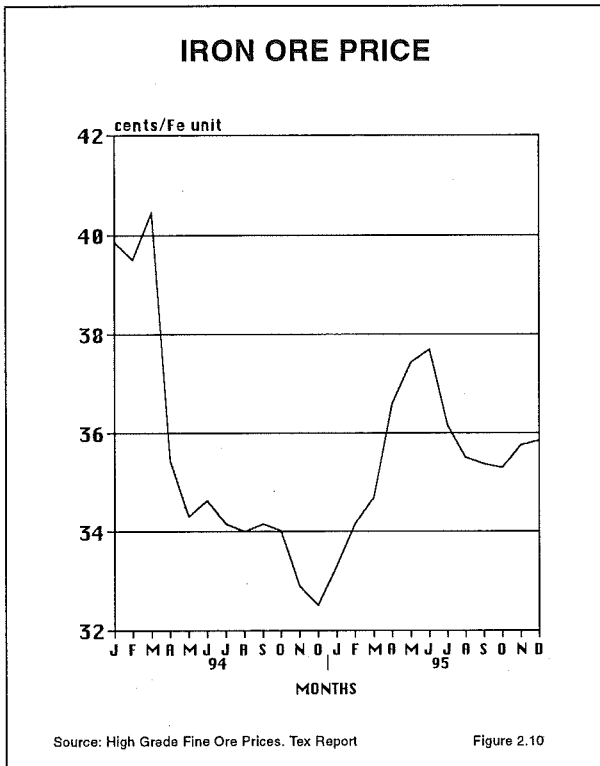
Publicity surrounding this anomaly is likely to have lured private speculators into the market who can disproportionately influence the gold price. For whilst the current annual world supply of gold to the market is around 3,700 tonnes and over 70% of this is used in jewellery fabrication, the actual turnover in gold (i.e. including speculators and derivative trading) is estimated at around 56,000 tonnes.

The gold market outlook for 1996 is not clear. Stockbroking firms are bullish, but bankers are more cautious and the World Gold Council views 1996 as a year of "consolidation". A common consensus is that gold has lost its attraction as an investment medium with world events no longer appearing to have any apparent effect on price. Importantly, there is an enormous supply, estimated at around 35,000 tonnes that is held in central banks and multilateral institutions such as the IMF and the prospect of sales from these sources will continue to weigh on prices.

2.4 Iron Ore

On the back of a 9.4% rise in the volume of iron ore production to a record of 136 million tonnes, (and





firmer prices) its value increased by 13.3% to \$2,981 million in 1995 (Figure 2.9 & 2.10).

Western Australia accounts for more than 95% of Australia's iron ore production and exports from the State totalled \$2,826 million in 1995 with Japan (44.6%), China (19.3%), Europe (15.4%) and South Korea (14.7%) the State's largest iron ore export markets (Figure 2.11 & 2.12).

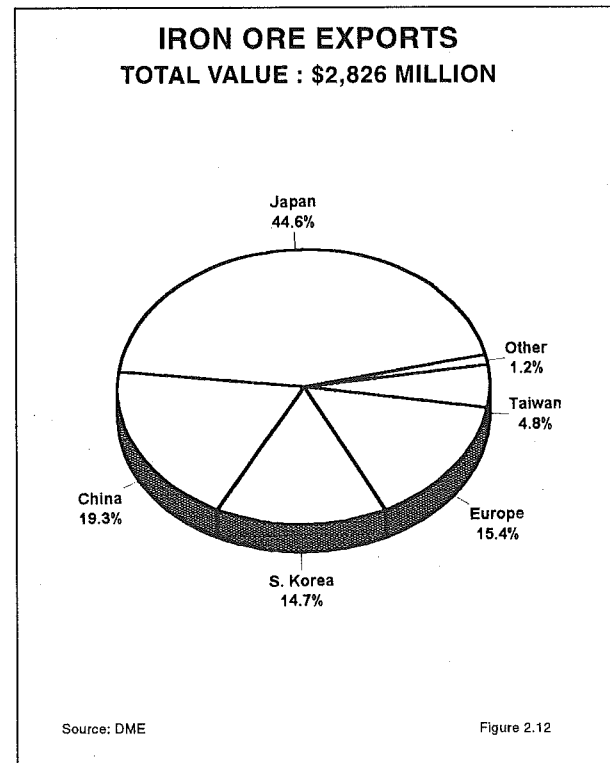
Significantly, BHP Minerals confirmed plans in June 1995 to spend almost \$1,400 million on the construction of Australia's first iron ore processing plant and associated facilities in the Pilbara.

The 2.5 million tonnes per annum Direct Reduced Iron (DRI) plant will convert iron ore fines from the BHP's Newman operations into direct reduced granules which are then briquetted (HBI). Environmental approvals were obtained in September 1995. Construction commenced in late 1995 and the plant is expected to be completed in 1997.

CRA also announced in August 1995 that its subsidiary Hamersley Iron was about to start a full feasibility study of its Yandicoogina iron ore deposit in the central Pilbara. Up to 300 million tonnes of ore has been identified for mining, meaning the project would be similar in size to Hamersley's Marandoo mine. Subject to CRA Board and Government approvals, construction of the US\$300

million project is likely to commence during 1996, with production commencing no later than mid-1998.

Hamersley Iron's Paraburdoo fines ore treatment plant commenced production in late 1995. The 13 million tonnes per annum plant will remove ultrafines resulting in lower alumina and phosphorus levels and a higher grade of ore.



Notably, indicating Robe River Iron Associate's long mining history in Western Australia, the 3,000th ship to take iron ore from its Cape Lambert port facilities was loaded in September 1995.

The recently concluded rounds of iron ore price negotiations by Australian iron ore producers and Japanese steel manufactures, in January 1996, saw a favourable outcome for the year. BHP and Hamersley have been able to secure a 5% and 6% rise for lump and fine ores respectively. Robe River also secured a 7.4% rise in the contract price of its fines.

Deregulation of the State's gas market, technology improvements in the use of fine ore and a transport advantage over South American producers mean that the Pilbara is now well placed as a DRI producer for the Asian region.

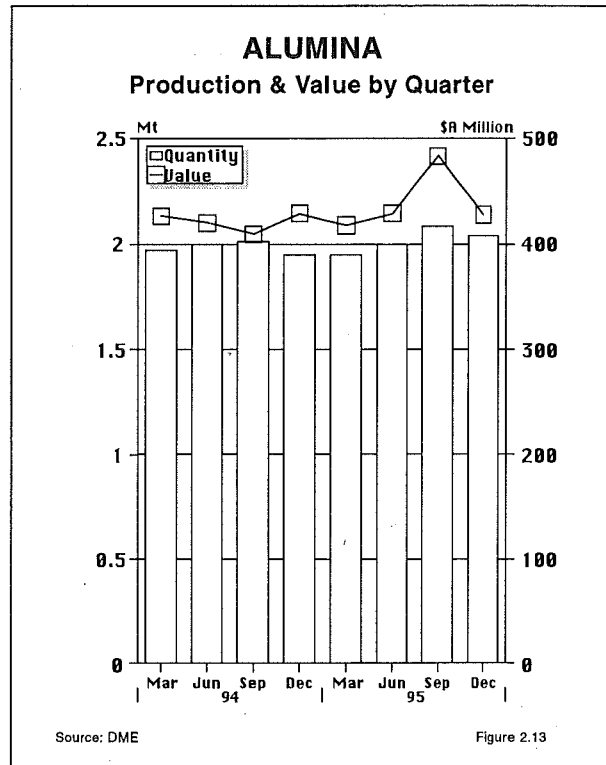
As a result a number of iron ore value added projects are under consideration or investigation including:

- The A\$4.7 billion Mineralogy Project involving a HBI plant costing A\$1.65 billion and a A\$3.1 billion DRI and integrated steel plant. Mineralogy announced in January 1996 that it will proceed with the project, with the HBI plant located at Dampier.
- The \$1 billion Australian United Steel Industry (AUSI) project consisting of a beneficiation, pellet and DRI plant to be established south of Cape Lambert capable of producing almost 3 million tonnes per annum of HBI.
- The Kingstream Resources project involving a A\$950 million 1.4 million tonnes per annum steel mill at Narngulu near Geraldton. Environmental approvals were obtained in 1995 and a feasibility study for the project was completed in November 1995.

Given that major growth in steel consumption is expected in Asia over the next decade, the outlook for the State's iron ore industry is excellent.

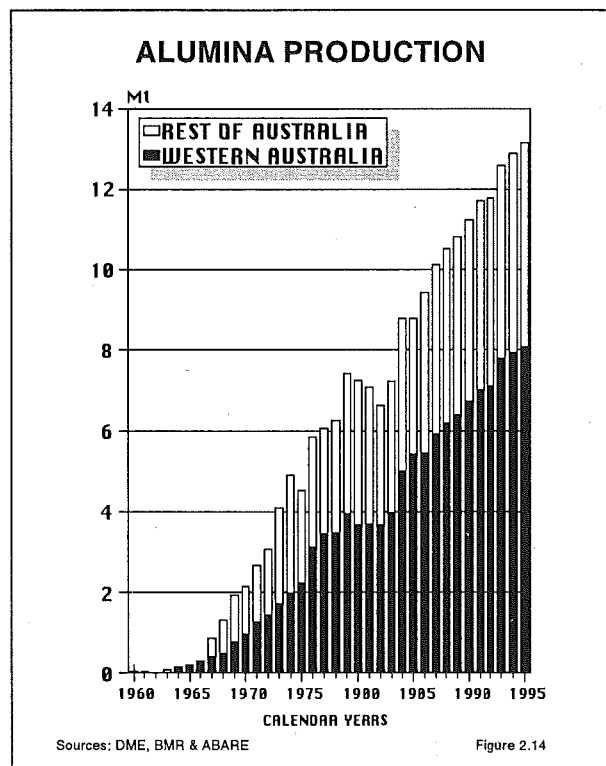
World steel production is forecast by ABARE to grow by 2.7% in 1996 which translates into stronger world iron ore demand.

ABARE forecasts world iron ore production to increase by 2.9% and by 1.5% in 1995 and 1996 respectively. The increase in world iron ore



production is expected to come mainly from Brazil, India and Australia.

In 1995, the Chinese Vice Minister, Mr Yin Ruiyu indicated that China's demand for imported iron ore will increase from 37 million tonnes in 1994 to more than 60 million tonnes in 2000. Given that Western



Australia currently supplies around 50% of China's iron ore imports, the State is in a solid position to substantially increase its iron ore sales to that country.

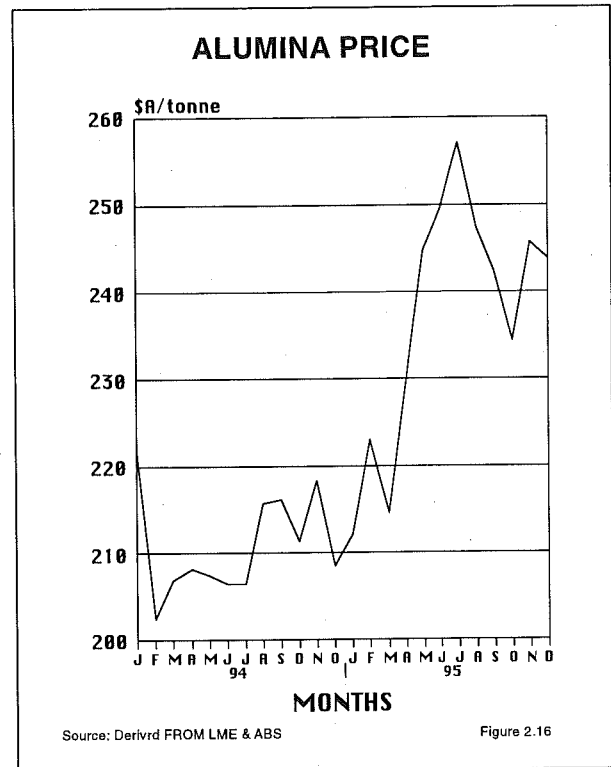
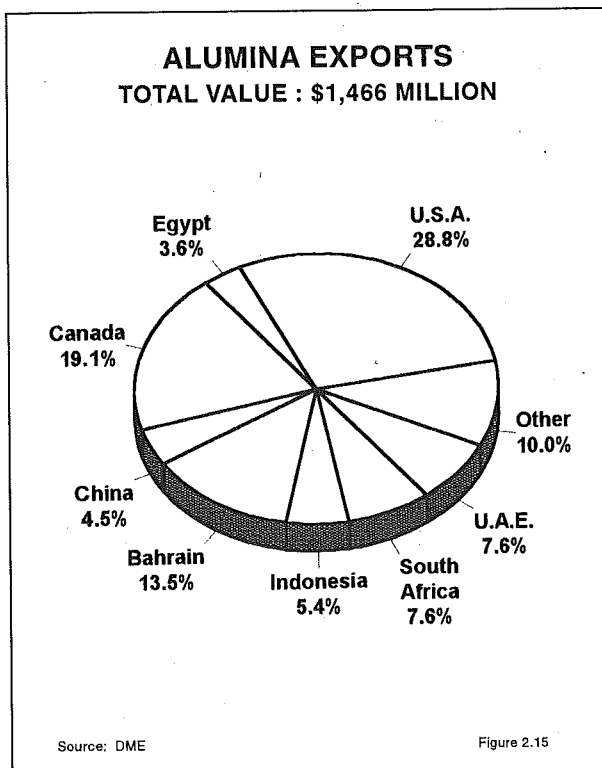
The world demand for DRI will be governed by technological shifts in steel making, particularly shifts to electric arc furnace steel making processes. Approximately 30% of Asian steel making processes by 2010 are forecast to be electric arc based, thus creating a strong demand for metallics, such as DRI and pig iron. This is providing impetus for DRI/HBI facilities to be established in the Pilbara.

2.5 Alumina

Alumina production increased by around 1.7% to 8.1 million tonnes in 1995. With firmer average world alumina prices in 1995, the value of alumina production increased by 4.3% to \$1,757 million (Figure 2.13).

Western Australia's alumina production represents 61% of national alumina output (Figure 2.14).

About 83% of the State's 1995 alumina production was exported overseas, largely as smelter grade product. The largest export markets for the State's alumina were the USA (28.8%), Canada (19.1%), Bahrain (13.5%), United Arab Emirates (7.6%), South



Africa (7.6%), Indonesia (5.4%), China (4.5%) and Egypt (3.6%) (Figure 2.15).

Sustained increases in aluminium and alumina prices in 1995 were due to aluminium stocks being drawn down. Further stock drawdown is expected to keep prices firm in 1996 (Figure 2.16).

Signatories to the Memorandum of Understanding, comprising the six leading aluminium producing countries, pledged a 10% cut in output to reduce the world stockpile of aluminium during 1995. This has been a significant factor in world primary aluminium stocks falling in 1995 and rising prices.

On 1 January 1995, Western Mining Corporation (WMC) and the Aluminum Company of America (Alcoa) merged their bauxite/alumina and alumina chemical interests. The merger has created the world's biggest supplier of alumina and consolidates Australia's alumina and chemical operations into the mainstream of international alumina developments.

Alcoa's hydrated alumina project was commissioned in 1995. The product is expected to be sold predominantly into Asian and European speciality markets where it is to be used for water treatment, in paper manufacture and in fillers.

In light of what is perceived to be a favourable long term environment for aluminium and alumina

prices, Alcoa in February 1996 resurrected its plans for a proposed A\$960 million expansion of its Wagerup facilities. If implemented, the expansion will almost double alumina output from its current level of 1.7 million tonnes per annum to 3.3 million tonnes per annum. Alcoa is waiting to commit to a \$600 million first stage expansion of its Wagerup alumina refinery. This will add 850,000 tonnes of high-quality alumina to its 25% share of the world alumina production capacity.

Environmental approvals for Alcoa's Wagerup expansion were obtained in August 1995.

The State's other alumina producer, Worsley, is currently undertaking a feasibility study of a \$670 million expansion of its refinery. As one of the world's three most efficient alumina refineries, the expansion, if given the go ahead, would double its current capacity of 1.75 million tonnes per annum. The environmental approval process commenced in October 1995. It is hoped that Stage one of the project involving an \$80 million expansion to increase alumina production by 6% to 1.85 million tonnes per annum will commence in 1996.

In another development, Alichem is working towards establishing an Aluminium Fluoride Plant in Kwinana. A feasibility study for processing alumina hydrate to produce 20,000 tonnes per annum of aluminium fluoride has been completed.

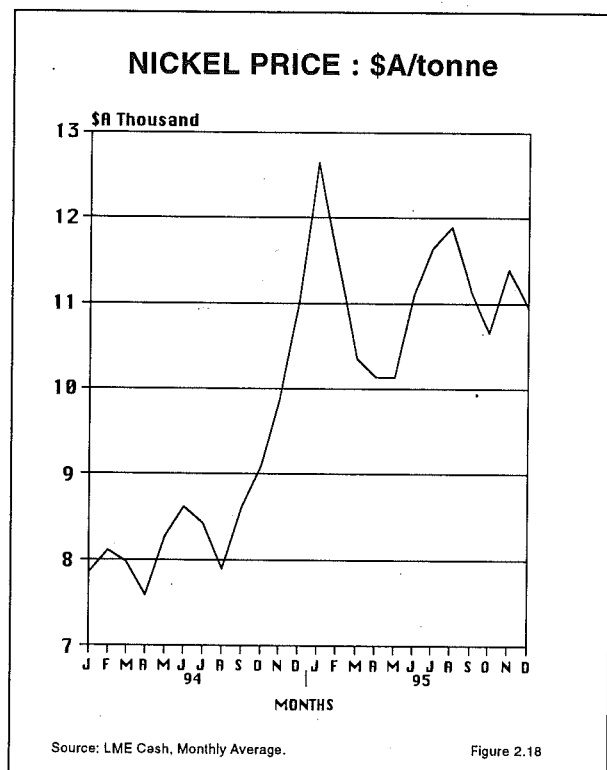
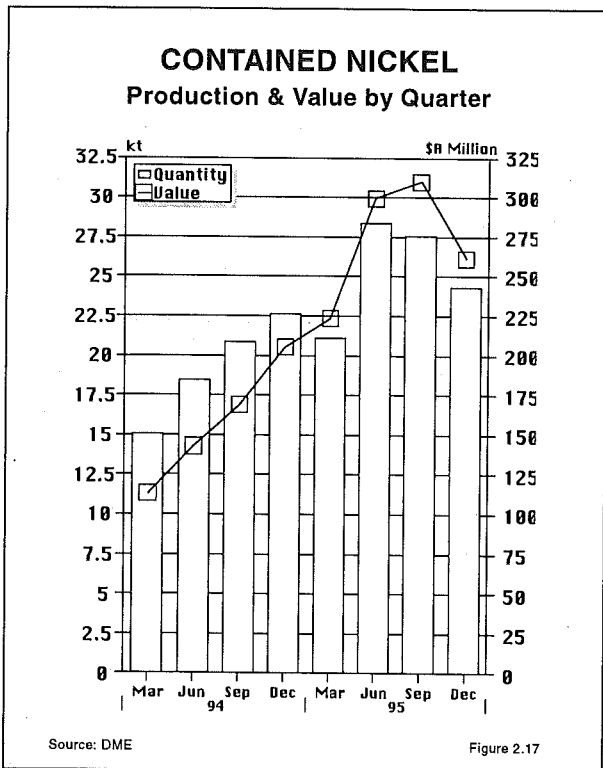
All environmental and statutory approvals have been granted. It is intended that construction of the new plant will commence in mid-1996, with commissioning about 12 months later. The total project cost is \$40 million.

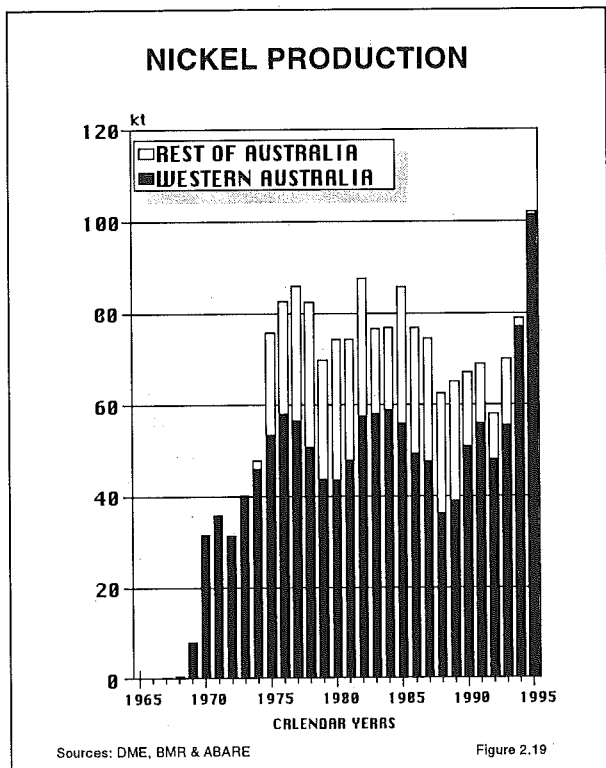
The longer term market for aluminium is positive with prices expected to rise strongly in 1997. ABARE forecasts world aluminium consumption to rise by around 2.5% in 1996 and on average to increase 2.4% pa to 2001. Asia is expected to be the fastest growing aluminium consumption region over the remaining decade.

In 1996, prices are likely to remain relatively constant as the increase in demand is met by a decrease in stocks and restart in idle aluminium production capacity in Norway and Australia. Continued worldwide excess demand should result in price rises in 1997.

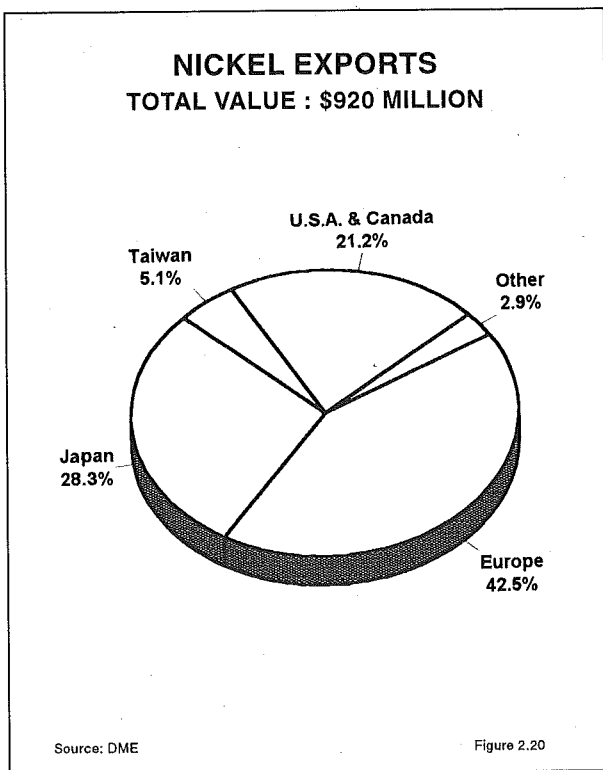
2.6 Nickel

Western Australia's nickel production continued to grow strongly with output reaching 101,358 tonnes of contained nickel in 1995. This represents an increase of 31.6% on 1994 output. The value of production over 1995 rose by 73.6% to \$1,094 million mainly due to increased nickel prices (Figure 2.17 & 2.18).





Western Australia accounted for 99% of Australia's nickel production in 1995, up from 95% in 1994/95. The increase in the State's nickel output results in part from full year output achieved from Mt Keith and improvements in existing projects. Output will also be boosted with the opening of Carr Boyd in 1996. All these developments are expected to be



accompanied by firm prices, at least in the short term (Figure 2.19).

Nickel exports totalled \$920 million in 1995 with Europe (42.5%), Japan (28.3%) and North America (21.2%) the State's largest nickel export markets (Figure 2.20).

The most significant contribution to increased nickel output came from the commencement of production from Mt Keith in late 1994. The opening of Mt Keith meant that the State's nickel metal production increased from 59,000 tonnes in 1994 to over 100,000 tonnes in 1995.

The \$450 million Mt Keith project was the largest segment of a major investment by WMC which included improvements in production from existing mines and upgrades of the Kalgoorlie nickel smelter and Kwinana nickel refinery. In 1995 all divisions were working at full capacity, including the mines at Kambalda, Leinster and Mt Keith, the smelter at Kalgoorlie and the refinery at Kwinana.

The development of Mt Keith has elevated WMC to the status of the western world's third largest producer after Canada's Falconbridge and Inco. It has also placed Australia as the world's second largest producer behind Canada, excluding the CIS.

Nickel prices at the end of 1995 were about 30% above 1994 prices. This was the result of strong demand coupled with faltering output from the CIS. The price outlook in the short term is positive, due to firm demand and continuing supply problems particularly from the CIS.

The discovery of a large high grade nickel deposit at Voisey Bay near the coast of Labrador in eastern Canada has been labelled as the most significant in the world in the last few decades. Its proximity to the surface, and the large amounts of copper and cobalt associated with the deposit, suggest that its production costs will be amongst the lowest in the industry.

Production from Voisey Bay could possibly take place before the year 2000 at a rate of around 60,000 tonnes per annum. This development would reinforce Canada as the largest and most important influence in the nickel industry and would exert downward pressure on prices. This pressure would be significantly increased if the CIS were to resume full production in the medium term.

The Goldfields Gas Pipeline has the potential to significantly reduce energy costs in the Eastern Goldfields and this would further improve the highly competitive cost position of the State's nickel industry.

The resurgence of the nickel industry, indicated by buoyant prices and increased output, was highlighted by the inaugural Australian Nickel Conference held on 4-5 December 1995 in Kalgoorlie. Two observations from the Australian Nickel Conference are that the long term forecast for the price of nickel is between US\$3.00/lb and US\$4.00/lb; and that the Voisey Bay discovery will have the ability to drive out all producers with operating costs over US\$3.00/lb.

Higher nickel prices have lead to several new projects being assessed including:

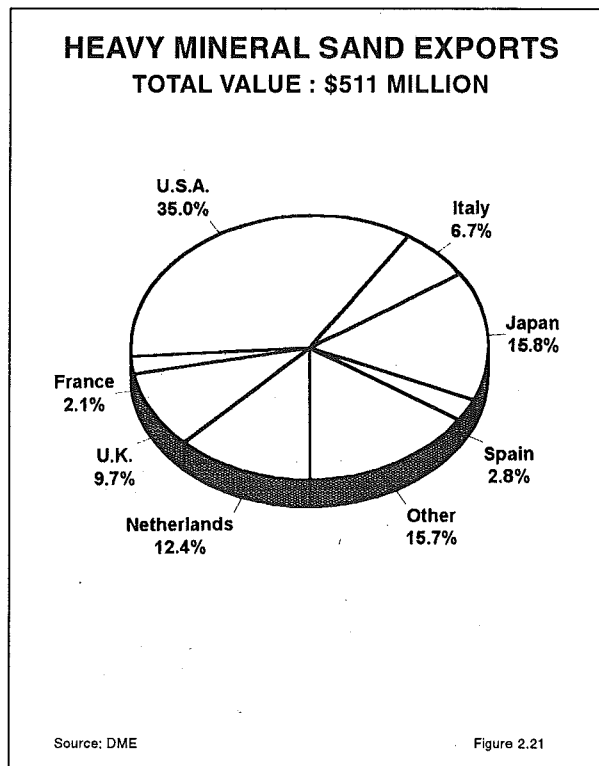
- ♦ Honeymoon Well (CRA-Outokumpu);
- ♦ Murrin Murrin (Anaconda);
- ♦ Yakabindie (Dominion Minin-North Ltd);
- ♦ Bulong (Resolute Samantha);
- ♦ Maggie Hayes (Forrestania Gold-Gencor Ltd)
- ♦ Cawse (Centaur Mining)
- ♦ Silver Swan (MPI-Outokumpu)

Although many projects are being assessed, not all of them are likely to come into into production, since the nickel price is characterised by short periods of sharp increase followed by long flat periods.

2.7 Diamonds

The Bow River alluvial diamond mine, owned by Normandy Mining Ltd, ceased production in December 1995. Normandy has kept up its exploration efforts in the vicinity of the mine but in 1995 was unsuccessful in defining further reserves to the south east of the mine. It is understood the Bow River plant will be kept on care and maintenance for some time while exploration continues in the hope of further discoveries.

The marketing agreement between the owners of the Argyle diamond mine and the CSO expired at the end of June 1996. Under that agreement the CSO was bound to purchase 78% of Argyle's output. In recent years, however, the CSO deferred the



purchase of up to 25% of Argyle's output and last year imposed an 11% price cut.

RTZ-CRA and Ashton have now abandoned the CSO and are trading Argyle output directly into the world diamond market. The companies have suggested that a direct marketing approach can be more profitable in terms of price but does not assure the sale of all diamonds produced. In efforts to secure an alternative market the Argyle joint venture has been negotiating with Indian diamond cutters, where most Argyle diamonds are currently processed.

Another response to the CSO's lower prices and deferred sales policy was a change in the production profile at the Argyle mine. Production of low margin goods (less than 1.5 millimetre stones) was decreased which reduced annual volume by about 15% but was compensated by increased revenue of about 10%. Accordingly, Argyle production was down from the record of 42.8 million carats in 1994 to about 35 million carats in 1995.

Argyle is persisting with its studies of an underground operation when the open pit life cuts out in the year 2004. The recent change in production profile is expected to make a positive contribution to the underground evaluation.

The world diamond marketing cartel controlled by De Beers was on the brink of dissolving until Russia

signed a co-operation agreement with the CSO in February 1996. The move to direct marketing by the Argyle joint venture has extensive ramifications. This move will test the cohesiveness of one of the oldest cartels in existence.

Further strong growth in the international diamond market is expected. Demand from South-East Asia has been particularly strong, making the region the principal source of the phenomenal growth in sales of smaller gem diamonds, around one carat or less.

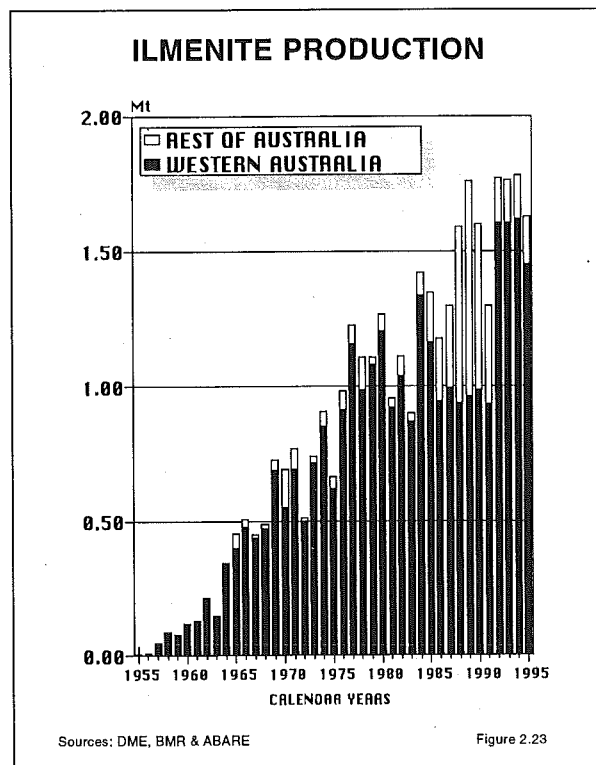
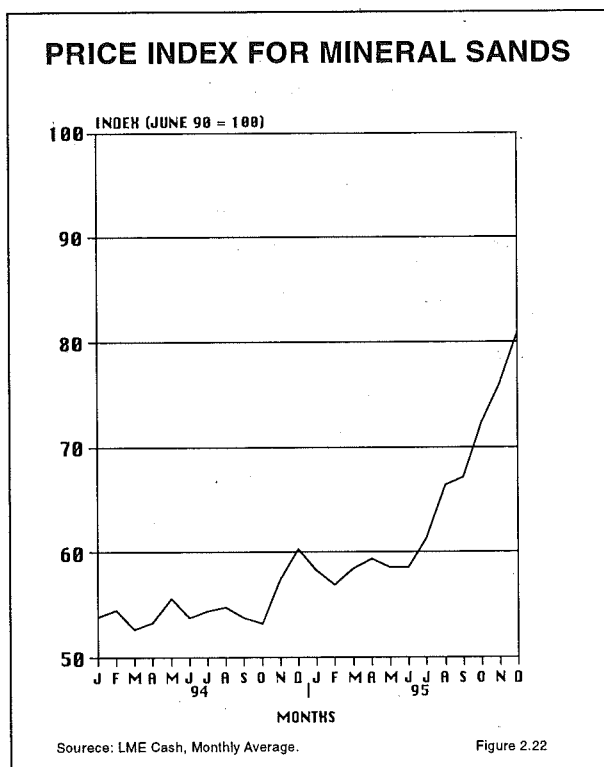
2.8 Heavy Mineral Sands

After facing weak demand from 1990 to 1994, the heavy mineral sands industry recovered in 1995 with the value of production increasing by 32% to \$548 million.

Heavy minerals sands exports totalled \$511 million in 1995 with Europe (35.7%), USA (35%), and Japan (15.8%) the State's largest heavy mineral sands export markets (Figure 2.21).

The growth in the mineral sands industry is the result of strengthening in international demand for titanium dioxide pigment and zircon.

Due mainly to an increase in prices the value of zircon production increased by 54.1% to \$153 million in 1995 (Figure 2.22).



Despite ilmenite production falling by 7.5% to 998,152 tonnes in 1995, the total value of titanium based products (ie. ilmenite, synthetic rutile, rutile leucosene) increased by almost 25% to \$388 million in 1995. An increase in the State's production of synthetic rutile (which increased in 1995 by 26.6% to 452,736 tonnes) more than offset the fall in ilmenite production.

An increase in demand for synthetic rutile has occurred due to a shortage of natural rutile resulting from the suspension of production at the world's largest natural rutile mine in Sierra Leone, West Africa.

The State's synthetic rutile production should be boosted further in the future due to expansion plans such as those of Tiwest which is planning an expansion in the synthetic rutile production capacity at its Chandala plant from 130,000 to 200,000 tonnes per annum. Commissioning will be in stages during 1996 and 1997.

Construction of BHP's Beenup mineral sands mine began in March 1995. Beenup is expected to commence production in late 1996, producing 600,000 tonnes per annum of ilmenite and 20,000 tonnes per annum of zircon.

Rhone Poulenc Chimie Australia has resurrected proposals to build and operate a rare earth plant

near Pinjarra. The current proposal includes a facility producing 16,000 tonnes per annum of rare earth nitrates, the transport of 12,000 tonnes per annum of monazite from existing mineral sand separation plants in Western Australia and the transport of 6,000 tonnes per annum of gangue residue from the plant to the Mt Walton Intractable Waste Disposal Facility (IWDF).

Following community concern over the transport of radioactive waste from Pinjarra to Mt Walton, located 100km north-west of Coolgardie, the level of environmental assessment for the project was set by Government to the highest level, being an Environmental Review and Management Program (ERMP). The ERMP was released for public comment in October 1995. The Environmental protection Authority (EPA) has assessed the proposal and found it to be acceptable on environmental grounds, subject to the proponents' commitments and recommendations set out in the assessment report.

Construction of the plant is planned to commence in the fourth quarter of 1996 subject to approval by the Rhone-Poulenc board. Commissioning of the plant is proposed for 1997.

2.9 Other Minerals

The increase in the average price of base metals in 1995 was almost matched by a decline in quantity produced and as a result the value of production was virtually constant increasing by only 0.2% to \$161 million in 1995.

The value of exports of base metals was A\$156 million in 1995. The major destinations were Japan (62%), South Korea (14%), India (11%) and Thailand (7%).

Western Metals (WML) has commenced work on a decline to access the Kapok orebody and to explore the Pinnacles resource and Cadjebut East. WML states with long-term ore feed for the Cadjebut plant assured through the progressive development of the Goongewa (in production) and Kapok orebodies, it is now considering the development of the larger Blendevale deposit.

In 1995 coal production increased by 20.4% to 6 million tonnes and value of production increased by 23.2% to \$288 million. The future of the coal industry in the Collie region looks secure, with coal-

fired power generation still a major component in Western Australia's power supply industry.

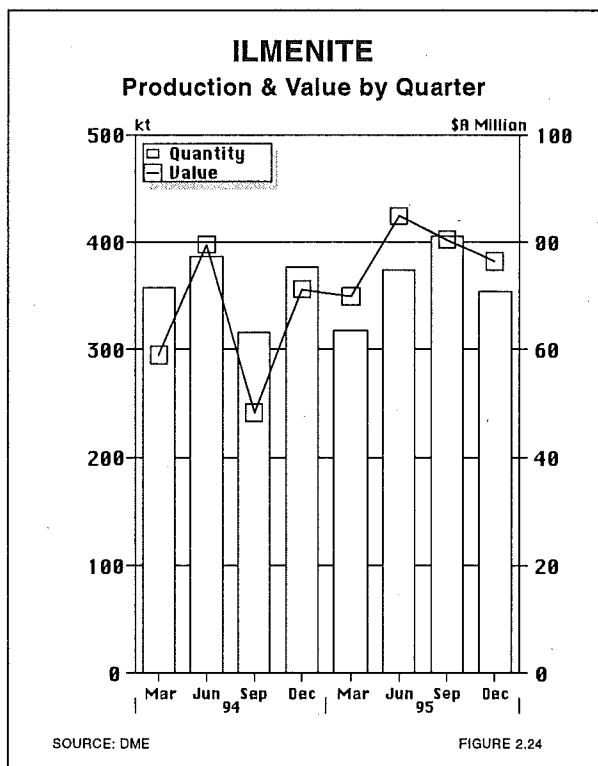
Construction of a 300 megawatt coal fired power station at Collie has been supported by the Government with the power station expected to be operational in 1999. Development of the Western Collieries Premier open cut mine for dedicated supply to the new power station is expected to start shortly. Production from Griffin's Ewington II open cut mine is also expected to commence by mid-1996.

These developments should counter the reduction in production capacity associated with the closure of Collie's underground mining operations.

Trans Global Resources have undertaken feasibility studies involving additional drilling and sampling at the O'Sullivan's Lignite (brown coal) Project at Norseman. A range of process options will be evaluated for extraction of valuable chemicals and organic products and/or gasification/power generation.

In 1995 the value of salt production increased by 1.5% to \$156 million due mainly to a 6.3% rise in salt production to 7.3 million tonnes.

Proposals for a new salt field at Onslow are due to be released by the first quarter of 1996. This new



field will have initial capacity of 1.5 million tonnes per annum with a capability to expand to 2.5 million tonnes per annum

Gwalia Consolidated Ltd recently commissioned its new lithium carbonate plant at Greenbushes. The plant is expected to produce 5,000 tonnes per annum of lithium carbonate powder.

Construction of Gwalia Consolidated's silica sand project near Bunbury is also continuing on time and within budget. Initial production capacity will be 400,000 tonnes per annum with the ability to expand to 1 million tonnes per annum as market requirements dictate. First shipments to the Japanese glass market are due to be made in the second quarter of 1996.

The building boom in Asia has boosted Asian demand for gypsum, now growing by around 5% per annum and

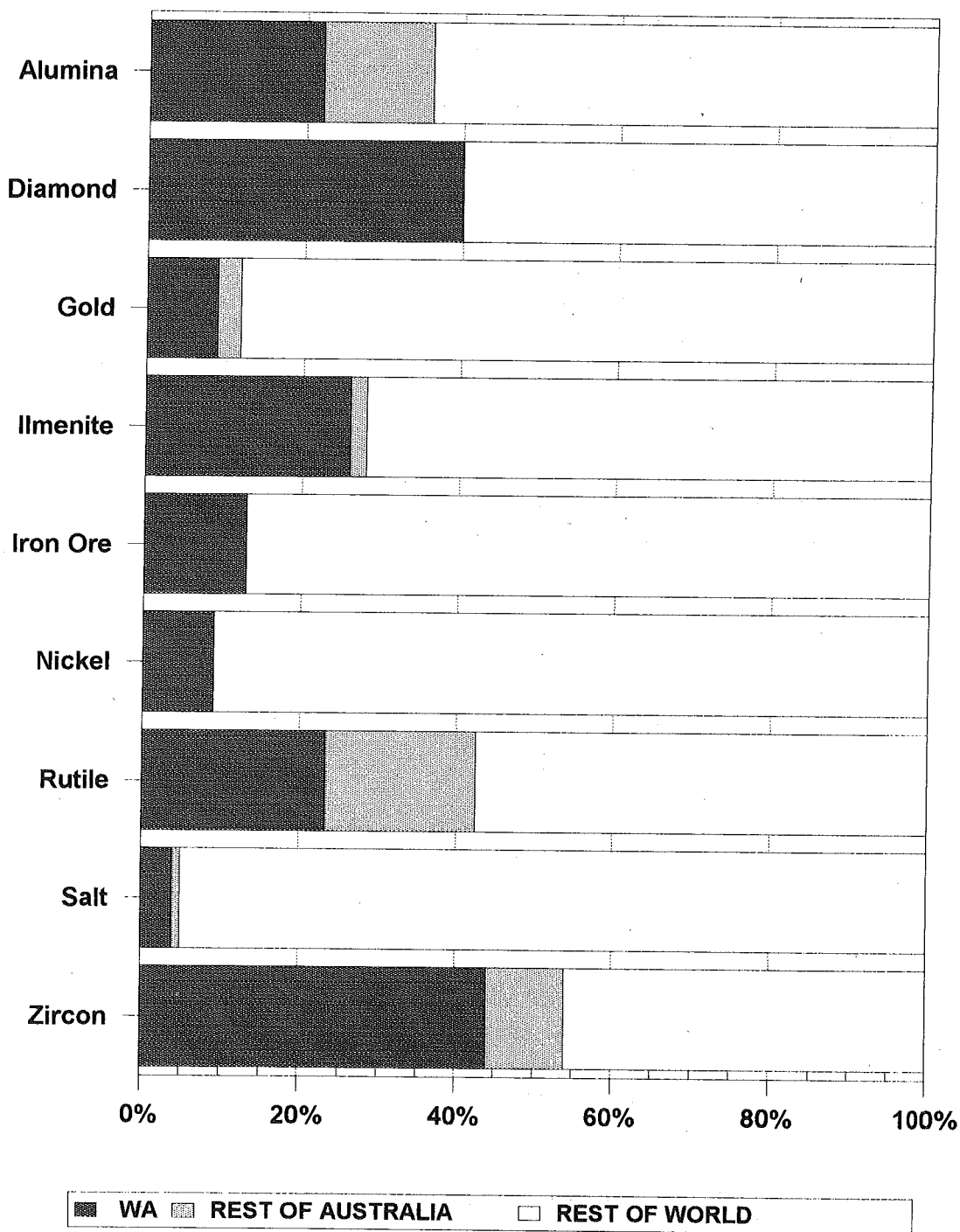
Dampier Salt is committed to developing a 2 million tonne per annum capacity gypsum deposit at Lake McCleod. Construction of the project is to commence in 1996 with production beginning in the second half of 1997. Prima Resources is also undertaking a feasibility study of its gypsum deposits at Lake McCleod. Both projects plan to supply the South-East Asian market, particularly Japan.

CRA is conducting a \$5 million feasibility study into a 100,000-500,000 tonnes per annum kaolin mining and processing operation in the South West. The study is based on deposits near Wickepin and Narrogin. The project location and decision to proceed will be known in the second quarter of 1996.

In December 1995 Westlime (WA) announced it would begin construction of a quicklime plant, with a capacity of 150,000 tonnes per annum, south of Dongara in early 1996. Cockburn cement has also announced a feasibility study for the establishment of a quicklime plant at Dongara.

Whitecrest Enterprises have released a Public Environmental Review (PER) and are assessing public comment on a proposed 200,000 tonnes per annum limestone mine and a 200,000 tonnes per annum quicklime plant at Cape Range with possible export potential.

SELECTED WA MINERAL COMMODITIES RELATIVE TO WORLD PRODUCTION



Source: ABARE, 1995 Australian Commodity Statistics

Figure 2.25

3. EXPLORATION AND CAPITAL EXPENDITURE

Mineral Exploration

Mineral exploration in Western Australia increased by 3.6% in 1995 to \$495.4 million.

The State continues to attract the majority of Australia's mineral exploration expenditure, accounting for just over 55% of the nation's total.

Gold continues to dominate exploration, increasing by 5.5% in 1995, and making up 76% of total exploration expenditure in Western Australia. In 1995 the expenditure on gold exploration was \$378 million but no significant discoveries were made.

Base metals exploration increased by 18% in 1995 to \$65 million sustaining its recent high historical level. Base metals represented 13% of the State's total mineral exploration expenditure in 1995.

In keeping with the depressed international diamond market exploration fell in 1995 by 33% to \$29 million. The entry of large mining companies, such as CRA into some of the offshore diamond joint ventures may provide an impetus for defining offshore diamond prospectivity.

Diamond exploration in the north of Australia enters an important phase in the 1996 northern dry season with a number of companies apparently on the verge of defining commercial resources. Investors are watching keenly as the Merlin prospect in the Northern Territory, the Cambridge Gulf offshore project and the Bulgurri prospect in Western Australia are more thoroughly assessed. Other activity includes companies in Western Australia investigating the upper reaches of the Keep River system and the Upper Beta Creek prospect.

Iron ore exploration increased by 36% to over \$11 million. The high level of interest in this sector is fuelled by the quickly growing markets in North and East Asia, where the steel industries are struggling to keep pace with the demands for infrastructure and consumer goods in these booming economies. The iron ore exploration effort has identified potentially developable finds at Homestead and Mount Margaret, North of the Brockman operation.

While Western Australia remains the major focus of exploration expenditure in Australia for heavy mineral sands, exploration fell by 20% to \$3.9

million in 1995. Exploration on uranium fell by 27% to \$1.6 million over the same period.

The Department of Minerals and Energy estimates that Western Australian petroleum exploration expenditure was \$350 million in 1995. This represented about 48% of the Australian total.

A potentially large gas/condensate field was discovered by Woodside at Perseus (WA-1-L). It was considered the most significant Western Australian discovery to date resulting from exploration 3D seismic. The discovery adds significantly to the company's reserves around the North Rankin/Goodwyn fields.

Further exploration of the Browse Basin, North of Broome, continued to demonstrate its potential for oil. The only well drilled in the basin in 1995 was BHP Petroleum's Gwydion-1 well, which encountered oil.

While offshore drilling and 2D seismic activity have taken place at near-record levels, onshore operations have been at relatively low levels. In an effort to remedy this, a major re-evaluation of the hydrocarbon potential of the onshore Western Australian Canning, Officer and Savory Basins was commenced by the Geological Survey division of the Department of Minerals and Energy. These initiatives are funded by the State Government, with industry liaison. The aim is to revitalise onshore hydrocarbon exploration in Western Australia.

It has been estimated that a further \$150 million per annum will be spent on new petroleum exploration off the Western Australian coast over the next six years. This continues the trend of strong expenditures offshore over the last five years.

Private capital investment expenditure in mining in 1995 increased by 16% to \$4238 million. Western Australia continues to account for more than half Australia's new capital expenditure on mining.

The Department of Resources Development (DRD) advises that at present projects worth around \$5.8 billion are under construction in Western Australia with another 22 projects valued at \$4.3 billion committed. DRD also estimates that more than \$12 billion worth of projects are under consideration.

The resources sector in Western Australia is on the brink of the greatest increase in investment in the nation's history with projects on the drawing board 10 times bigger than the construction phase of the Sydney Olympics.

4. EMPLOYMENT IN THE MINERALS AND PETROLEUM INDUSTRY

A 4.9% increase in the number of people employed in the State's mineral and petroleum industry was recorded in 1995. The industry employed 36,601 people at 30 December 1995.

All sectors of the State's mining and petroleum industries recorded an increase in employment, with the exception of coal, diamonds and salt.

In particular, employment growth was significant in the mineral sands, nickel and base metals industries. This reflects the buoyant conditions in these markets.

The number of people employed in the petroleum industry grew to 1,428 in 1995, an increase of 4.3%.

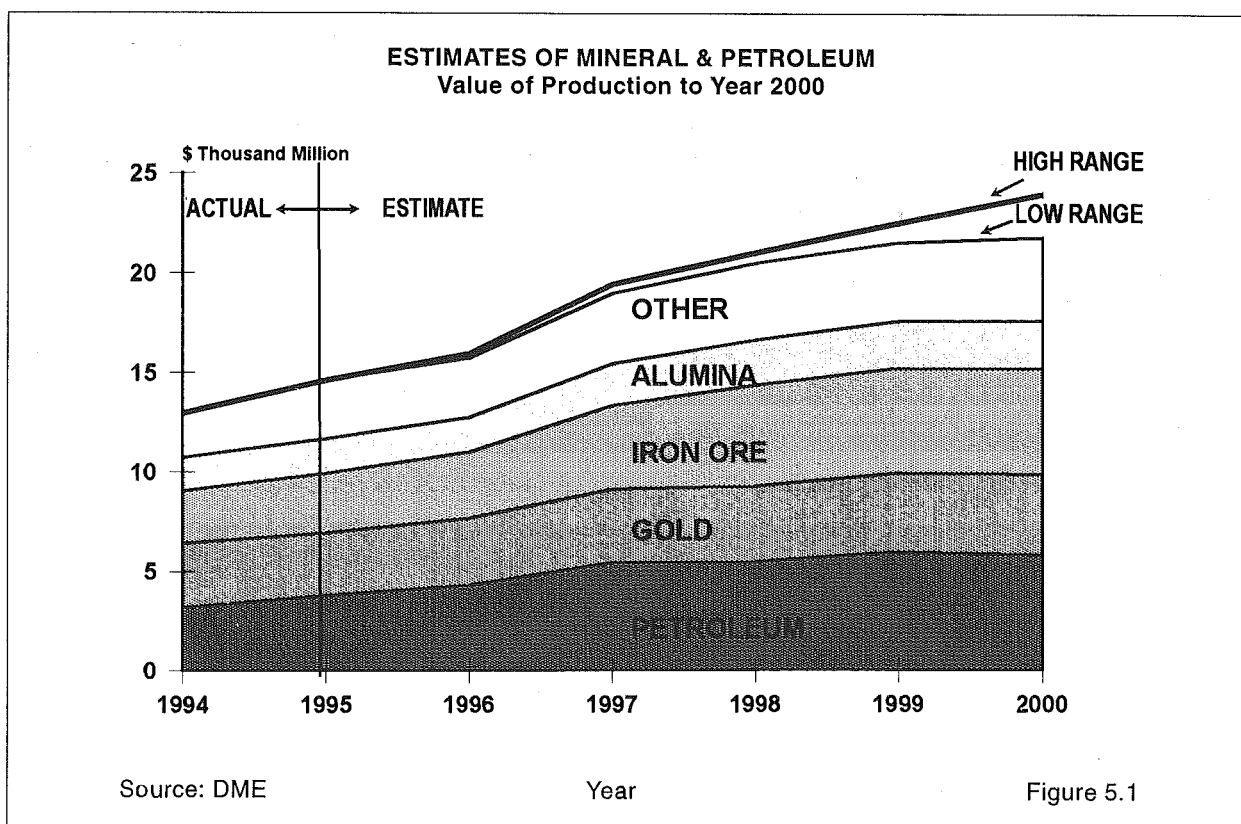
Notably employment in the iron ore sector increased by 647 persons (about 9%) in 1995. This follows a 6.3% decrease for the industry over the period 1994/95 which was largely the result of BHP's program of staff rationalisation and introduction of more efficient work practices at its Newman/Port Hedland operations.

5. OUTLOOK FOR MINERAL AND PETROLEUM PRODUCTION

Based on the Department's current production forecasts and price outlooks, it is estimated that the value of Western Australia's mineral and energy sector in the year 2000 will be in the range of \$20 billion to \$24 billion. Hence, the average growth rate of the value of production between now and the year 2000 is expected to be in the range of 7 to 10% per annum.

The estimate range depends on how many new projects and production expansions currently planned reach fruition. For example, the value of nickel production in a low growth scenario is estimated to increase at an average annual rate of 9% based on new projects that are almost certain to commence. However, in a high growth scenario, where it is assumed that all new nickel projects currently on the drawing boards eventually commence, the average annual growth rate to the year 2000 for the value of nickel output could be over 20%.

Production from most sectors is generally assumed to continue at current levels, with output being



supplemented from new projects or expansions. The forecast for the petroleum sector is an exception as crude oil and condensate output from many new fields, after peaking in 1998/99, will begin to taper off slightly by the year 2000. Nevertheless, overall, the petroleum sector is predicted to grow at a buoyant rate thanks to high production levels from recently commenced projects such as Goodwyn and Cossack/Wanaea and additional output from new projects such as East Spar, Wandoo and LPG production.

Diversification into DRI production by the iron ore sector will result in it being amongst the highest growth areas. In addition to existing production extensions, the value of BHP's DRI plant in Port Hedland alone (based on current price and production estimates) is expected to boost the annual value of this sector by around \$400 million.

Gold output is difficult to predict as production growth depends on discoveries. Nevertheless, estimates based on the assumption that at least current output can be maintained with supplementation from recent discoveries, suggests that the value of production is likely to grow to be worth approximately \$4.5 billion around the year 2000.

The value of alumina output is expected grow on average at 7% per annum. However, a high range forecast, based on all of Worsley's and Alcoa's expansion plans materialising by the year 2000 could see the value of output growing at an average rate as high as 15% per annum.

1995 STATISTICS DIGEST

TABLE 1 QUANTITY AND VALUE OF MINERALS AND PETROLEUM 1994, 1995

MINERAL	UNIT	1994		1995	
		QUANTITY	VALUE (\$A)	QUANTITY	VALUE(\$A)
BASE METALS					
Copper Metal	t	35,110 (r)	68,133,785 (r)	23,308	72,410,246
Lead Metal	t	20,287 (r)	7,320,564 (r)	13,358	6,696,795
Zinc Metal	t	123,621 (r)	85,143,904 (r)	120,256	81,737,921
TOTAL BASE METALS			160,598,253 (r)		160,844,962
BAUXITE-ALUMINA					
Alumina	t	7,933,321	1,684,580,839 (r)	8,067,380	1,757,356,480
CLAYS					
Attapulgite	t	19,412	5,642,890	18,159	3,804,561
Clay Shale	t	74,351	892,825 (r)	19,634	240,248
Fire Clay	t	10,812	12,975	67,802	81,363
Kaolin	t	4,211	227,451	3,297	170,422
White Clay	t	67,077	656,898	38,596	385,960
TOTAL CLAYS			7,433,039 (r)		4,682,554
COAL	t	5,034,977	234,017,491 (r)	6,062,404	280,656,244
CONSTRUCTION MATERIALS					
Aggregate	t	110,173	659,783	423,514	2,462,029
Gravel	t	126,389 (r)	635,400 (r)	148,365	803,407
Rock	t	118,062	1,877,173	50,242	633,258
Sand	t	1,894,690 (r)	8,834,803 (r)	1,704,734	7,664,368
Sandstone	t	0	0	92	21,823
Black Granite	t	1,028	316,058	0	0
TOTAL CONSTRUCTION MEATERIALS			12,007,159 (r)		11,584,885
DIAMOND	ct	27,716,403	470,342,571 (r)	23,451,750	480,150,004
DIAMONTE	t	2,365	18,897	7,271	58165
DIMENSION STONE					
Black Granite	t	1,208	316,058	0	0
Granite	t	0	0	40	12,000
Jasper	t	0	0	25	9,016
Quartz Rock	t	795	35,746	0	0
TOTAL DIMENSION STONE			351,804		21,016
GEM, SEMI-PRECIOUS & ORNAMENTAL STONE					
Agate	kg	10,280	9,132	7,000	5,680
Chrysoprase	kg	280,586 (r)	1,582,037 (r)	92,503	660,920
Jasper	kg	0	0	39,220	47,136
Malachite	kg	5,561	19,639	0	0
Variscite	kg	0	0	25,701	35,990
TOTAL GEM, SEMI-PRECIOUS & ORNAMENTAL STONE			1,610,808 (r)		749,726
GOLD	kg	192,480 (r)	3,257,456,132 (r)	189,353 (e)	3,161,566,210 (e)
GYPSSUM	t	209,912 (r)	2,561,194 (r)	216,735	2,440,117
HEAVY MINERAL SANDS					
Garnet	t	60,382	5,738,224	84,909	8,067,752
Ilmenite	t	1,079,227	93,520,617	998,152	96,265,511
Upgraded Ilmenite *		357,528	164,534,101	452,736	215,433,965
Leucoxene	t	21,677	8,149,179	20,283	8,011,826

1995 STATISTICS DIGEST

TABLE 1 QUANTITY AND VALUE OF MINERALS AND PETROLEUM 1994, 1995					
MINERAL	UNIT	1994		1995	
		QUANTITY	VALUE (\$A)	QUANTITY	VALUE(\$A)
HEAVY MINERAL SANDS (cont)					
Monazite	t	3,093	876,904	0	0
Rutile	t	87,161	44,463,737	124,870	68,141,539
Zircon	t	444,264	99,000,474	458,444	152,536,417
TOTAL HEAVY MINERAL SANDS			416,283,235		548,457,010
INDUSTRIAL PEGMATITE MINERALS					
Felspar	t	36,169	1,451,195	66,614	2,345,509
IRON ORE					
Domestic	t	6,434,476	150,174,086	6,533,317	154,980,117
Exported	t	117,828,830	2,480,440,822	129,432,288	2,825,709,297
TOTAL IRON ORE		124,263,306	2,630,614,908	135,965,605	2,980,689,414
LIMESAND-LIMESTONE-DOLOMITE					
Dolomite	t	2,500	25,000	3,950	39,500
Limesand-Limestone	t	2,249,595 (r)	15,123,079 (r)	2,182,161	14,635,295
TOTAL LIMESAND-LIMESTONE-DOLOMITE			15,148,079		14,674,795
MANGANESE ORE	t	202,523 (r)	22,742,452 (r)	161,493	19,649,943
NICKEL INDUSTRY					
Cobalt by-product	t	657 (r)	35,844,989 (r)	824	56,374,547
Nickel Concentrate	t	677,185 (r)	630,129,006 (r)	751,788	1,094,171,929
Palladium by-product	kg	450 (r)	2,904,466 (r)	528	3,065,446
Platinum by-product	kg	113 (r)	1,266,118 (r)	74	1,734,790
TOTAL NICKEL INDUSTRY			670,144,579 (r)		1,155,346,712
PEAT	t	786	58,531	1,113	78,400
PETROLEUM					
Condensate	kl	2,341,459	331,191,631	3,828,078	564,909,332
Crude Oil	kl	8,752,619	1,299,752,620		1,385,552,785
LNG	Btu 10 ⁶	335,106,529	1,080,172,183	375,374,192	1,390,749,933
LPG - Butane	t	0	0	19,423	4,729,257
LPG - Propane	t	0	0	14,139	3,442,453
Natural Gas	000m ³	4,915,310	441,964,508	5,827,413	421,922,592
TOTAL PETROLEUM			3,153,080,942		3,771,306,352
SALT	t	6,860,725 (r)	153,488,853 (r)	7,90,514	155,813,175
SILICA-SILICA SAND					
Silica	t	78,552	785,526	84,696	846,971
Silica Sand	t	558,699	4,979,497	525,935	4,761,899
TOTAL SILICA-SILICA SAND			5,765,023		5,608,870
SILVER	kg	58,799 (r)	12,447,668 (r)	48,263	10,491,392
TALC	t	107,339 (r)	7,846,700 (r)	122,989	9,643,014
TIN-TANTALUM-LITHIUM					
Spodumene	t	61,708 (r)	11,246,613	80,135	12,019,364
Tantalite	t	262 (r)	22,116,946	361	33,143,398
Tin Metal	t	209	1,408,719	429	2,932,51
TOTAL TIN-TANTALUM-LITHIUM			34,772,278		48,095,273
TOTAL VALUE			12,954,822,631 (r)		14,582,310,222(e)

Note: Quantities used in this table only apply to Minerals and Petroleum covered by the Mining Act 1978, the Petroleum Act 1967, the Petroleum (Submerged Lands) Act 1982 and relevant State Agreement Acts.

* Also known as synthetic rutile.

(e) Estimate.

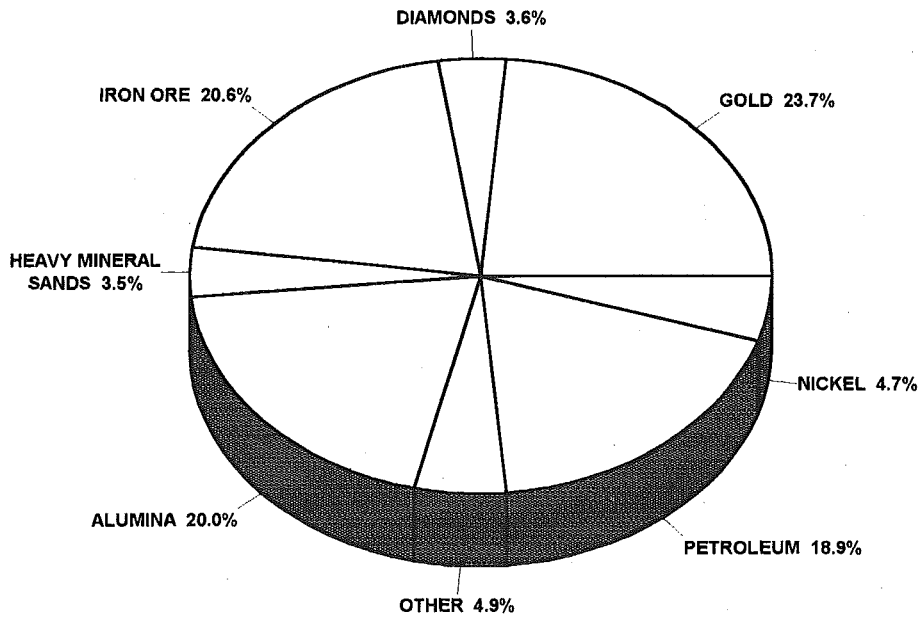
(r) Revised from previous edition.

**TABLE 2
QUANTITY AND VALUE OF SELECTED MAJOR COMMODITIES**

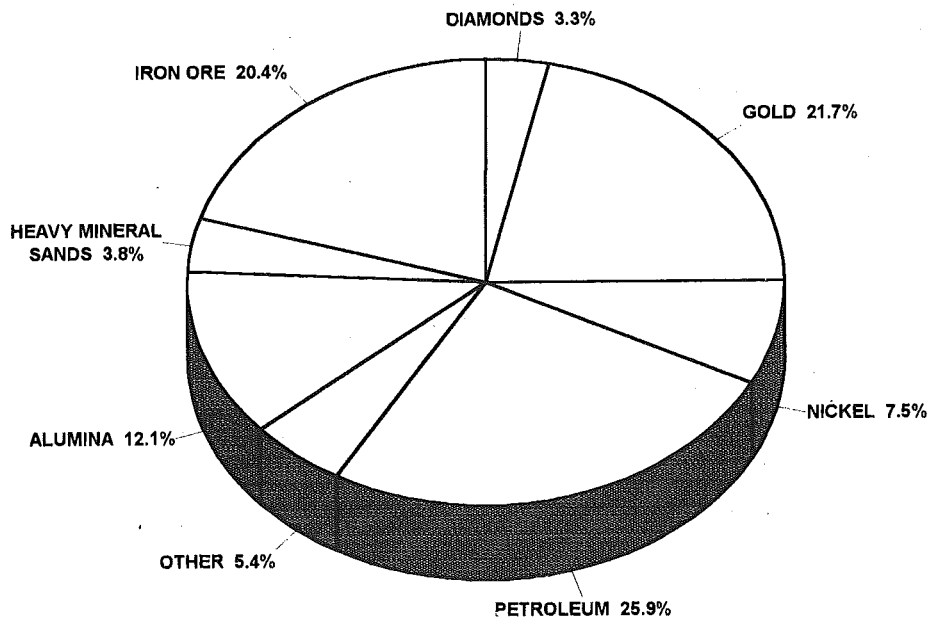
Unit	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M	Quantity Value \$M
ALUMINA	Mt 5.44 1,015.17	5.93 1,104.31	6.18 1,301.43	6.38 209.68	6.72 2,538.95	7.01 1,844.03	7.08 1,689.72	7.80 1,891.86	7.93 1,684.58	8.07 1,757.36
BASE METALS										
copper	kt 7.77 8.44	2.91 4.22	7.43 17.76	19.58 42.96	14.03 21.05	11.79 17.92	12.09 18.68	28.98 30.21	35.11 68.13	23.31 72.41
lead	kt 0.00 0.00	0.00 0.00	0.00 0.00	7.85 4.42	13.61 7.18	10.70 4.35	20.96 7.43	32.28 7.84	20.29 7.32	13.36 6.70
zinc	kt 0.99 5.23	0.00 0.00	20.25 14.70	38.06 48.15	51.70 61.55	142.92 125.58	141.39 132.98	141.10 87.02	123.62 85.14	120.26 81.74
COAL	Mt 3.83 137.14	3.71 144.94	3.70 150.97	3.83 166.80	4.83 214.25	5.49 243.54	5.66 251.76	5.47 248.44	5.03 234.02	6.06 280.66
DIAMOND	M ct 29.23 256.96	30.33 246.52	35.22 302.50	37.51 427.45	31.18 429.93	33.36 456.93	41.15 565.06	22.65 486.77	27.72 470.34	23.45 480.15
GOLD	tonnes 53.64 974.02	78.44 1,622.47	107.29 1,913.15	135.28 2,295.58	176.35 2,794.00	178.96 2,666.34	182.09 2,739.45	183.49 3,139.86	192.48 3,257.46	189.35 3,161.57
HEAVY MINERAL SANDS										
ilmenite	Mt 1.01 65.58	1.13 112.17	1.12 137.44	1.23 192.60	1.24 206.98	1.30 264.99	1.38 245.17	1.32 228.93	1.44 258.05	1.45 311.70
rutile	kt 69.89 35.29	85.63 51.06	91.19 54.01	88.97 58.36	76.07 57.91	59.13 39.66	68.96 39.05	0.06 0.45	0.09 0.67	124.87 68.14
zircon	kt 319.19 51.16	320.16 69.35	388.16 123.87	343.86 18.79	224.46 126.68	204.33 79.16	265.17 51.46	116.34 2,996.73	124.26 2,630.61	135.97 2,980.69
IRON ORE	Mt 81.29 1,914.75	84.12 1,737.65	98.32 1,757.28	106.47 2,121.94	103.85 2,426.81	114.17 2,979.77	108.15 2,921.98	116.34 2,996.73	124.26 2,630.61	135.97 2,980.69
NICKEL	kt 52.23 275.14	47.59 294.15	36.30 480.85	42.79 688.85	50.91 557.97	55.76 569.24	48.04 461.54	55.46 437.74	77.00 630.13	101.36 1,094.17
PETROLEUM PRODUCTS										
condensate	Gl 0.42 58.58	0.92 135.43	1.13 146.25	1.35 197.16	1.72 333.90	1.87 313.74	2.06 366.70	2.17 359.86	2.34 331.19	3.83 564.91
crude oil	Gl 1.61 260.58	1.76 314.91	2.06 246.11	2.51 369.85	5.20 1,023.22	5.21 901.42	5.05 917.36	4.05 709.32	8.75 1,299.75	8.68 1,385.55
lng	btu 10 ¹² 0.00 0.00	0.00 0.00	0.00 0.00	37.68 113.43	153.14 508.10	204.80 957.95	237.64 966.47	264.75 997.88	335.11 1,080.17	0.00 0.00
lpg - butane	kt 0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	19.42 4.73
lpg - propane	kt 0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	14.14 3.44
natural gas '000 m ³	2.97 264.20	3.45 325.89	3.65 301.43	3.74 321.73	3.70 366.43	3.74 372.20	3.78 368.96	4.21 422.96	4.92 441.96	5.83 421.92
SALT	Mt 4.95 103.55	5.28 105.72	5.85 98.53	5.90 112.38	6.12 130.77	6.83 149.36	6.93 153.14	6.49 158.65	6.81 152.27	7.29 155.81

COMPARATIVE VALUE OF PRODUCTION

1990 TOTAL : \$11,794 MILLION



1995 TOTAL : \$14,582 MILLION



Source: DME

Figure 0.1

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA					
Mineral Producer	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
BASE METALS			Cu Tonnes		
Copper By-Product	Coolgardie		4,994.213	10,456,176	(a)(b)
			Cu %		
Copper Concentrate	Yalgoo	42,276	19.442	3,739,715	
	East Pilbara	6,374	13.14	1,935,415	
		48,650		25,675,129	(a)
			Cu Tonnes		
Copper Cathode	East Pilbara		9,255.827	36,278,940	(a)
Total Copper				72,410,246	
			Pb %		
Lead	Derby-West Kimberley	16,842	79.32	6,696,795	(a)
			Zn %		
Zinc	Yalgoo	128,550	41.08	35,875,111	
	Derby-West Kimberley	111,912	60.27	45,862,810	
		240,462		81,737,921	(a)
TOTAL BASE METALS				160,844,962	
BAUXITE - ALUMINA					
Alumina	Boddington	1,683,540		368,139,954	
	Harvey	1,521,523		330,798,109	
	Murray	3,013,081		656,193,942	
	Serpentine-Jarrahdale	1,849,236		402,224,475	
		8,067,380		1,757,356,480	(c)
CLAYS					
Attapulgate	Mullewa	18,159		3,804,561	(a)
Clay Shale	Collie	19,634		240,248	(d)
Fire Clay	Chittering	67,802		81,363	(d)
Kaolin	Bridegetown-Greenbushes	134		34,941	(d)
	Goomalling	3,163		135,481	
		3,297		170,422	(d)
White Clay	Swan	38,596		385,960	
TOTAL CLAYS		147,488		4,682,554	
COAL	Collie	6,062,404		280,656,244	
CONSTRUCTION MATERIALS					
Aggregate	Ashburton	135		810	
	Broome	524		4,192	
	Collie	220		1,760	
	Exmouth	6,607		68,747	
	Kalgoorlie-Boulder	201,008		1,206,048	
	Port Hedland Town	157,777		837,014	
	Roebourne	18,815		112,890	
	Wyndham-East Kimberley	38,428		230,568	
		423,514		2,462,029	

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA

Mineral Producer	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
CONSTRUCTION MATERIALS (Cont)					
Gravel	Broome	4,981		22,594	
	Coolgardie	31,581		187,184	
	East Pilbara	1,500		7,500	
	Exmouth	230		1,150	
	Kalamunda	11,460		57,300	
	Kalgoorlie-Boulder	1,886		13,455	
	Port Hedland Town	7,472		38,100	
	Shark Bay	492		2,460	
	Swan	81,495		462,762	
	Wyndham-East Kimberley	7,268		10,902	
		148,365		803,407	
Rock	Broome	33,331		497,774	
	Exmouth	571		5,733	
	Port Hedland Town	15,795		126,300	
	Roebourne	213		1,491	
	Shark Bay	332		1,960	
		50,242		633,258	
Sand	Ashburton	5,512		102,048	
	Broome	30,716		150,304	
	Canning	1,193,273		4,773,092	
	Cockburn	5,600		22,400	
	Collie	20,019		120,117	
	Coolgardie	93,771		507,853	
	Coorow	3,146		15,730	
	Dandaragan	2,350		13,100	
	Derby-West Kimberley	7,385		51,695	
	East Pilbara	5,853		35,118	
	Exmouth	1,147		4,588	
	Gingin	6,001		36,008	
	Kalgoorlie-Boulder	73,347		426,626	
	Leonora	5,856		29,280	
	Meekatharra	19,325		112,940	
	Menzies	1,000		5,000	
	Northam	16,025		48,075	
	Port Hedland Town	140,208		821,066	
	Roebourne	64,406		340,558	
	Wyndham-East Kimberley	6,600		33,000	
Yilgarn	3,194		15,770		
		1,704,734		7,664,368	
Sandstone	Derby-West Kimberley	92		21,823	
TOTAL CONSTRUCTION MATERIALS				11,584,885	(d)

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA					
Mineral	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
			Carats		
DIAMOND	Wyndham-East Kimberley	23,451,750		480,150,004	(a)
DIATOMITE	Dandaragan	7,271		58,165	(d)
DIMENSION STONE					
Granite	Derby-West Kimberley	40		12,000	
Jasper	Port Hedland Town	25		9,016	
TOTAL DIMENSION STONE				21,016	(d)
GEM, SEMI-PRECIOUS AND ORNAMENTAL STONE					
			kg		
Agate	East Pilbara	7,000		5,680	
			kg		
Chrysoprase	Menzies	92,503		660,920	
			kg		
Jasper	Meekatharra	24,600		15,012	
	Port Hedland Town	14,620		32,124	
		39,220		47,136	
			kg		
Variscite	Meekatharra	25,701		35,990	
TOTAL GEM, SEMI-PRECIOUS AND ORNAMENTAL STONE				749,726	(a)
GOLD					
			Au kg		
	Boddington		15,598.712	260,443,432	
	Coolgardie		24,899.069	415,785,874	
	Cue		8,785.545	146,772,882	
	Dundas		3,375.225	56,334,932	
	East Pilbara		13,547.956	226,390,587	
	Halls Creek		550.519	9,249,832	
	Kalgoorlie-Boulder		41,142.099	686,371,825	
	Laverton		8,040.310	134,169,484	
	Leonora		23,858.104	398,317,932	
	Meekatharra		17,520.598	293,005,041	
	Menzies		1,719.445	28,659,074	
	Mt Magnet		4,686.706	78,337,724	
	Sandstone		4,245.207	70,806,281	
	Wiluna		3,416.167	56,997,826	
	Yalgoo		2,946.554	49,268,892	
	Yilgarn		15,020.398	250,654,592	
			189,352.614	3,161,566,210	(f)
GYPSUM					
	Bruce Rock	3,080		18,480	(e)
	Dalwallinu	61,216		1,522,203	(d)(e)
	Dandaragan	8,019		47,440	(e)
	Dundas	1,392		12,172	(e)
	Esperance	5,963		33,478	(e)

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA					
Mineral	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
Gypsum (Cont)					
	Irwin	26,895		134,475	(e)
	Koorda	450		4,500	(e)
	Lake Grace	28,644		178,325	(e)
	Merredin	20		160	(e)
	Nungarin	35,048		207,888	(e)
	Plantagenet	4,295		30,000	(e)
	Ravensthorpe	2,847		15,000	(e)
	Wyalkatchem	37,466		224,796	(e)
	Yilgarn	1,400		11,200	(e)
		216,735		2,440,117	
HEAVY MINERAL SANDS					
Garnet Sand	Bunbury City	67		7,840	(g)
	Northampton	84,842		8,059,912	(e)
		84,909		8,067,752	
Ilmenite	Bunbury City	345,998	TiO ₂ % 57.58	35,715,665	
	Capel	365,789	54.72	35,542,569	
	Carnamah	213,279	59.11	18,492,179	
	Dandaragan	73,086	60.66	6,515,098	
		998,152		96,265,511	(a)
Upgraded Ilmenite	Capel	165,763	TiO ₂ % 92.00	77,829,301	
	Carnamah	209,701	92.00	101,752,304	
	Dandaragan	77,272	92.00	35,852,360	
		452,736		215,433,965	(a)
Leucoxene	Bunbury City	5,192	TiO ₂ Tonnes 4,777	2,534,888	
	Capel	8,397	7,725	4,046,539	
	Dandaragan	6,694	6,134	1,430,399	
		20,283	18,636	8,011,826	(a)
Rutile	Bunbury City	8,631	TiO ₂ Tonnes 8,101	4,761,649	
	Carnamah	83,366	79,084	47,064,738	
	Dandaragan	32,873	31,194	16,315,152	
		124,870	118,379	68,141,539	(a)
Zircon	Bunbury City	18,748	ZrO ₂ Tonnes 12,188	6,323,614	
	Capel	77,785	50,737	25,028,283	
	Carnamah	290,478	190,173	97,485,480	
	Dandaragan	71,433	46,726	23,699,040	
		458,444	299,824	152,536,417	(a)
TOTAL HEAVY MINERAL SANDS				548,457,010	

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA					
Mineral	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
INDUSTRIAL PEGMATITE MINERALS					
Felspar	Mukinbudin	2,590		79,126	
	Port Hedland Town	64,024		2,266,383	
		66,614		2,345,509	(l)
IRON ORE					
Domestic Ore	Ashburton	31,791	63.00	1,178,100	
	East Pilbara	6,501,526	62.73	153,802,017	
		6,533,317		154,980,117	
Exported Ore	Ashburton	77,333,916	61.35	1,619,997,230	
	Derby-West Kimberley	272,337	65.61	5,866,367	
	East Pilbara	50,446,605	62.66	1,171,394,516	
	Yilgarn	1,379,430	63.80	28,451,184	
		129,432,288		2,825,709,297	
TOTAL IRON ORE		135,965,605		2,980,689,414	
LIMESAND - LIMESTONE-DOLOMITE					
Dolomite	Lake Grace	3,950		39,500	
Limesand - Limestone	Cockburn	1,653,720		8,644,050	
	Dandaragan	20,311		237,027	
	Dundas	66,086		991,282	
	Gingin	43,657		851,062	
	Irwin	7,721		23,162	
	Kwinana	72,990		729,900	
	Roebourne	210		6,300	
	Shark Bay	1,147		97,547	
	Wanneroo	316,319		3,054,965	
TOTAL LIMESAND-LIMESTONE		2,186,111		14,674,795	(d)
MANGANESE ORE					
	East Pilbara	161,493	48.74	19,649,943	(a)
NICKEL INDUSTRY					
Cobalt By-Product	Coolgardie		824.027	56,374,547	(a)(b)
			Ni %		
Nickel Concentrates	Coolgardie	273,707	12.42	370,803,814	
	Kalgoorlie-Boulder	28,488	12.41	38,461,190	
	Leonora	214,273	11.28	263,057,811	
	Wiluna	151,713	19.29	317,045,830	
	Yilgarn	83,607	12.41	104,803,284	
		751,788		1,094,171,929	(l)
Palladium By-Product	Coolgardie		527.654	3,065,446	(a)(b)
			Pd kg		
Platinum By-Product	Coolgardie		73.848	1,734,790	(a)(b)
			Pt kg		

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA					
Mineral	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
PEAT	Manjimup	1,113		78,400	(d)
PETROLEUM		Kilolitres			
Condensate	Carnamah	387		45,545	(d)
	Irwin	4,667		400,096	(d)
	Roebourne	3,823,024		564,463,691	(a)
		3,828,078		564,909,332	
Crude Oil	Ashburton	6,033,669		967,482,924	
	Derby-West Kimberley	16,962		2,186,283	
	Irwin	24,618		3,173,544	
	Roebourne	2,608,256		412,710,034	
		8,683,505		1,385,552,785	(a)
		Btu 10 ⁶			
Liquefied Natural Gas	Roebourne	375,374,192		1,390,749,933	(a)
		Tonnes			
L.P.G. - Butane	Roebourne	19,423"		4,729,257	(a)
		Tonnes			
L.P.G. - Propane	Roebourne	14,139		3,442,453	(a)
		'000 m ³			
Natural Gas	Ashburton	346,611		29,745,103	(j)
	Carnamah	41,736		6,056,922	(j)
	Irwin	256,783		29,698,687	(j)
	Roebourne	5,182,283		356,421,880	(d)(j)
		5,827,413		421,922,592	
TOTAL PETROLEUM				3,771,306,352	
SALT	Carnarvon	1,010,096		23,181,920	(a)
	Esperance	11,469		401,112	(e)
	Lake Grace	260		7,800	(e)
	Port Hedland Town	2,318,512		48,758,770	(a)
	Roebourne	2,994,678		62,986,349	(a)
	Shark Bay	860,401		16,718,411	(a)
	Wyalkatchem	166		13,280	(e)
	Yilgarn	94,932		3,745,533	(e)
		7,290,514		155,813,175	
SILICA - SILICA SAND					
Silica	Moora	84,696		846,971	
Silica Sand	Albany	24,682		367,242	
	Canning	3,903		42,933	
	Cockburn	268,637		2,955,007	
	Coolgardie	114,746		281,125	
	Swan	83,587		919,457	
	Wanneroo	30,380		196,135	
TOTAL SILICA - SILICA SAND		610,631		5,608,870	(a)

1995 STATISTICS DIGEST

TABLE 3 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA					
Mineral	Local Government Area	Quantity Tonnes	Metallic Content	Value \$A	Ref
		Ag kg			
SILVER: BY-PRODUCT	Coolgardie	140.707		38,217	(a)(b)
	Meekatharra	3,313.401		708,157	(a)
	State-Wide	28,747.686		6,271,939	
	Yalgoo	16,061.305		3,473,079	(a)
		48,263.099		10,491,392	
TALC	Meekatharra	2,830		198,100	
	Three Springs	120,159		9,444,914	
		122,989		9,643,014	(e)
TIN - TANTALUM - LITHIUM			Li ₂ O %		
Spodumene	Bridegetown-Greenbushes	80,135	4.27	12,019,364	(a)
			Ta ₂ O ₅ kg		
Tantalite	Bridegetown-Greenbushes	246	129,150	24,816,659	
	East Pilbara	115	60,375	8,326,739	
		361	189,525	33,143,398	(a)
			Sn Tonnes		
Tin	Bridegetown-Greenbushes	n.ap.	411.000	2,784,240	
	East Pilbara	n.ap.	17.831	148,271	
			428.831	2,932,511	(a)
VALUE OF MINERALS				7,649,437,660	
VALUE OF PETROLEUM				3,771,306,352	
VALUE OF GOLD				3,161,566,210	
TOTAL VALUE				14,582,310,222	

1995 STATISTICS DIGEST

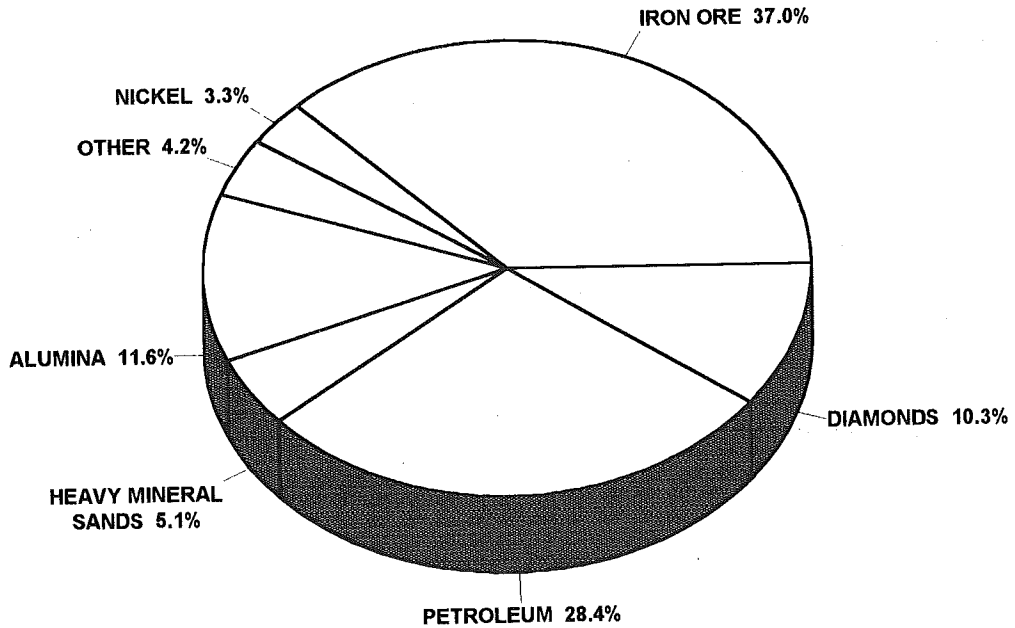
TABLE 4		ROYALTY RECEIPTS 1994, 1995		
Mineral	1994	1995	1995 GROWTH	
	\$A	\$A	\$A	%
BASE METALS				
Copper	1,903,749.79	3,320,227.21	1,416,477.42	74
Lead	176,323.32	531,126.77	354,803.45	201
Zinc	4,315,390.85	4,283,710.05	(31,680.80)	(1)
TOTAL BASE METALS	6,395,463.96	8,135,064.03	1,739,600.07	27
BAUXITE-ALUMINA				
Alumina	29,077,739.10	28,353,370.97	(724,368.13)	(2)
CLAYS	324,413.65	249,608.22	(74,805.43)	(23)
COAL	11,043,351.29	13,726,995.42	2,683,644.13	24
CONSTRUCTION MATERIALS				
Aggregate	3,325.50	152,582.70	149,257.20	4,488
Gravel	43,683.17	38,956.07	(4,727.10)	(11)
Rock	39,882.07	8,469.30	(31,412.77)	(79)
Sand	643,463.89	449,292.54	(194,171.35)	(30)
Sandstone	0.00	46.18	46.18	n.ap.
TOTAL CONSTRUCTION MATERIALS	730,354.63	649,346.79	(81,007.84)	(11)
DIAMOND	39,937,640.68	32,381,879.96	(7,555,760.72)	(19)
DIATOMITE	0.00	3,853.09	3,853.09	n.ap.
DIMENSION STONE	4,057.88	0.00	(4,057.88)	(100)
GEM, SEMI-PRECIOUS & ORNAMENTAL STONE	49,574.10	53,485.61	3,911.51	8
GOLD	352,126.87	372,312.47	20,185.60	6
GYPSUM	63,001.33	63,719.32	717.99	1
HEAVY MINERAL SANDS				
Garnet	261,290.07	412,331.28	151,041.21	58
Ilmenite	3,754,734.49	6,588,768.52	2,834,034.03	75
Leucoxene	247,465.14	353,407.35	105,942.21	43
Monazite	81,712.33	1,900.00	(79,812.33)	(98)
Rutile	1,519,749.17	3,634,080.25	2,114,331.08	139
Zircon	2,460,723.49	7,968,601.15	5,507,877.66	224
TOTAL HEAVY MINERAL SANDS	8,325,674.69	18,959,088.55	10,633,413.86	128
INDUSTRIAL PEGMATITE MINERALS				
Felspar	82,823.88	100,342.82	17,518.94	21
IRON ORE	139,440,648.63	153,027,087.21	13,586,438.58	10
LIMESAND-LIMESTONE-DOLOMITE				
Dolomite	186.20	582.54	396.34	213
Limesand-Limestone	383,752.53	60,826.43	(322,926.10)	(84)
TOTAL LIMESAND-LIMESTONE-DOLOMITE	383,938.73	61,408.97	(322,529.76)	(84)
MANGANESE	2,040,289.00	859,924.12	(1,180,364.88)	(58)

1995 STATISTICS DIGEST

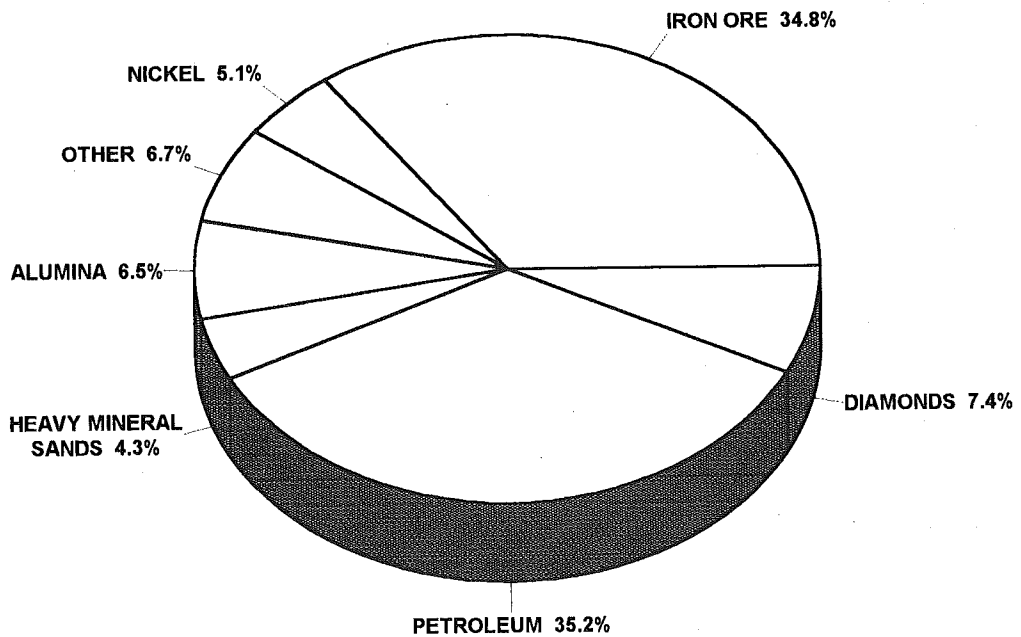
TABLE 4 ROYALTY RECEIPTS 1994, 1995				
Mineral	1994	1995	1995 GROWTH	
	\$A	\$A	\$A	%
NICKEL				
Cobalt by-product	575,241.30	1,375,535.32	800,294.02	139
Nickel	10,872,022.58	22,481,707.07	11,609,684.49	107
Palladium by-product	66,513.54	74,433.28	7,919.74	12
Platinum by-product	22,947.37	43,167.28	20,219.91	88
TOTAL NICKEL INDUSTRY	11,536,724.79	23,974,842.95	12,438,118.16	108
PEAT	1,934.06	2,291.85	357.79	18
PETROLEUM				
Condensate	7,665,311.57	19,778,625.58	12,113,314.01	158
LPG - Butane	0.00	117,397.83	117,397.83	n.ap.
LPG - Propane	0.00	107,851.82	107,851.82	n.ap.
Liquefied Natural Gas	25,941,709.85	63,598,940.71	37,657,230.86	145
Natural gas	12,249,146.54	20,084,374.53	7,835,227.99	64
Oil	38,338,639.05	50,892,279.73	12,553,640.68	33
TOTAL PETROLEUM	84,194,807.01	154,579,470.20	70,384,663.19	84
SALT	1,370,295.11	1,692,155.24	321,860.13	23
SILICA SAND	316,160.68	236,042.48	(80,118.20)	(25)
SILVER	364,204.99	248,528.59	(115,676.40)	(32)
TALC	60,181.00	31,387.50	(28,793.50)	(48)
TIN-TANTALUM-LITHIUM				
Spodumene	433,310.27	633,653.19	200,342.92	46
Tantalite	392,660.70	816,838.23	424,177.53	108
Tin	42,034.45	70,256.38	28,221.93	67
TOTAL TIN-TANTALUM-LITHIUM	868,005.42	1,520,747.80	652,742.38	75
TOTAL ROYALTY RECEIPTS	336,963,411.48	439,282,954.16	102,319,542.68	30
IRON ORE ADDITIONAL RENTAL	25,392,184.66	26,148,120.36	755,935.70	3
TOTAL REVENUE	362,355,596.14	465,431,074.52	103,075,478.38	28

COMPARATIVE ROYALTY RECEIPTS

1990 TOTAL : \$301.8 MILLION



1995 TOTAL: \$439.3 MILLION



Source: WA Treasury

Figure 0.2

1995 STATISTICS DIGEST

TABLE 5 PERSONS EMPLOYED IN THE W.A. MINERALS & PETROLEUM INDUSTRIES AS AT DECEMBER 31, 1995

MINERAL\Company	LOCATION	1994	1995
BASE METALS			
Murchison Zinc Co. Pty Ltd	Golden Grove	236	255
Western Metals NL	Cadjebut	142	193
Western Mining Corporation Ltd	Nifty	114	191
TOTAL BASE METALS		492	639
BAUXITE - ALUMINA			
Alcoa of Australia Ltd	Del Park/Huntley	315	300
	Jarrahdale	264	233
	Kwinana	1,727	1,523
	Pinjarra	1,390	1,505
	Wagerup	606	1,006
	Willow Dale	187	155
Australian Fused Materials Pty Ltd	East Rockingham	54	63
Worsley Alumina Pty Ltd	Boddington	137	131
	Worsley	1,001	1,020
TOTAL BAUXITE - ALUMINA		5,681	5,936
COAL			
Griffin Coal Mining Co. Ltd	Muja	368	351
	Central Services	28	26
Western Collieries Ltd	Western #5	367	363
TOTAL COAL		763	740
DIAMOND			
Argyle Diamond Mines Pty Ltd	Lake Argyle	1,135	1,089
Poseidon Ltd	Bow River	121	103
TOTAL DIAMOND		1,256	1,192
GOLD			
Australian Resources & Mining Co. NL	Gidgee	99	125
	Mt McLure	41	67
Aztec Mining Co Ltd	Bounty	239	286
Burmine Ltd	Copperhead	126	135
Central Norseman Gold Corp. NL	Central Norseman	285	235
Coolgardie Gold NL	Greenfield	128	99
Consolidated Resources NL	Nevoria	120	126
Dominion Mining Ltd	Bannockburn	135	0
	Meekatharra	184	0
	Mt Morgans	234	203
Eagle Mining Corp NL	Nimary	0	90
Goldfan Ltd	Three Mile Hill	208	208
Gold Mines of Kalgoorlie Ltd	Jubilee	129	181
Great Central Mines NL	Bronzewing	175	259
	Jundee	0	250
Hedges Gold Pty Ltd	Hedges	93	96
Kalgoorlie Consolidated Gold Mines Pty Ltd	Kalgoorlie	1,355	1,307
Gold Mines of Australia Ltd	Reedy	124	134
	Youanmi	103	99
Mining Corporation of Australia Ltd	Mt Pleasant	157	64
Mt Edon Gold Mines Ltd	Tarmoola	84	220
Newcrest Mining Ltd	Gimlet South	196	127
	New Celebration	349	217
	Telfer	711	402

1995 STATISTICS DIGEST

TABLE 5 PERSONS EMPLOYED IN THE W.A. MINERALS & PETROLEUM INDUSTRIES AS AT DECEMBER 31, 1995

MINERAL\Company	LOCATION	1994	1995
GOLD (cont)			
North Gold (WA) Ltd	Peak Hill	80	91
	Kanowna Belle	181	182
Oriole Resources Ltd	Mt Gibson	136	86
Pancontinental Pty Ltd	Kundana	167	206
	Paddington	210	295
	Granny Smith	319	353
Placer Pacific Pty Ltd	Bellevue	131	84
Plutonic Operations Ltd	Darlot	66	71
	Lawlers	128	157
	Plutonic	211	261
	Big Bell	334	312
	Golden Crown	78	168
Poseidon Ltd	Kaltails	103	108
	Bullabulling	0	117
	Chalice	0	102
Resolute Samantha Ltd	Higginsville	132	169
	Hopes Hill	44	0
	Marymia	60	70
	Barnicoat	61	97
Sons of Gwalia NL	Marvel Loch	255	196
	Sons of Gwalia	207	241
	Meekatharra	309	349
St. Barbara Mines Ltd	Emu	176	156
Western Mining Corporation Ltd	Kambalda/St. Ives	714	803
	Lancefield	114	0
	Mt Magnet	360	314
	Tuckabianna	133	105
	Wiluna	203	218
Westgold Resources NL	Boddington	500	491
Wiluna Mines Ltd	Yilgarn Star	229	156
Worsley Alumina Pty Ltd		968 (r)	1,021
Yilgarn Star Pty Ltd			
All Other Operators			
TOTAL GOLD		11,884	11,909
HEAVY MINERAL SANDS			
BHP Minerals Ltd	Beenup	0	108
Cable Sands Pty Ltd	Bunbury	297	304
RGC Mineral Sands Pty Ltd	Capel	221	200
	Eneabba	335	438
	Narngulu	216	237
	Chandala/Muchea	148	162
TiWest Pty Ltd	Cooljarloo	112	119
Westralian Sands Ltd	Capel	363	387
All Other Operators		32	38
TOTAL HEAVY MINERAL SANDS		1,724	1,993
IRON ORE			
BHP Iron Ore (Goldsworthy) Ltd	Finucane Island	330	308
	Harbour Tunnel	0	9
	Railways	61	54
	Yarrie	119	134
BHP Iron Ore (Jumblebar) Ltd	Jumblebar	69	74

1995 STATISTICS DIGEST

TABLE 5 PERSONS EMPLOYED IN THE W.A. MINERALS & PETROLEUM INDUSTRIES AS AT DECEMBER 31, 1995

MINERAL\Company	LOCATION	1994	1995
BHP Iron Ore (Yandicoogina) Ltd	Yandicoogina	107	107
BHP Iron Ore Ltd	Mt Whaleback	1,421	1,433
	Nelson Point	608	888
	Orebody 25	83	84
	Railways	429	552
Hamersley Iron Pty Ltd	Brockman	81	123
	Dampier Port Operations	699	666
	Hismelt/Kwinana	141	135
	Marandoo	150	196
	Paraburdoo/Channar	768	637
	Railways	423	411
	Tom Price	767	933
Kooyanobbing Iron Pty Ltd	Cockatoo Island	4	22
	Kooyanobbing	36	30
Robe River Mining Co. Pty Ltd	Cape Lambert	362	421
	Pannawonica	242	329
	Railways	90	91
TOTAL IRON ORE		6,990	7,637
NICKEL			
Outokumpu Australia Ltd	Forrestania	195	261
Western Mining Corporation Ltd	Kalgoorlie Nickel Smelter	365	506
	Kambalda/Blair	1,138	1,121
	Kwinana Refinery	441	494
	Leinster	587	431
	Mt Keith	443	685
TOTAL NICKEL		3,169	3,498
PETROLEUM PRODUCTS			
Ampolex Ltd	Wandoo	63	65
Apache Energy Ltd	Harriet/Rosette	122	131
BHP Petroleum (Australia) Pty Ltd	Griffin & Gas Plant	61	68
Discovery Petroleum Ltd	Mt Horner	24	21
West Aust Petroleum Pty Ltd	North West Area/Dongara	371	229
Western Mining Corp. Ltd	North Herald/South Pepper/Chervil	28	27
Woodside Offshore Pet. Pty Ltd	North Rankin A/Burrup Peninsula	682	872
All Other Operators		18	15
TOTAL PETROLEUM PRODUCTS		1,369	1,428
SALT			
Cargill Salt Co.	Port Hedland	107	111
Dampier Salt Ltd	Dampier	223	175
	Lake MacLeod	119	88
Shark Bay Salt JV	Useless Loop	71	88
Other		10	10
TOTAL SALT		530	472
ALL OTHER MATERIALS (including Rock Quarries)		1,040	1,157
TOTAL		34,898	36,601

(Sources: Mining Operations Division; Policy & Public Affairs Division)

TABLE 6**PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1995**
Address, Telephone Number: Project**BASE METALS****Copper**

Murchison Zinc Co. Pty Ltd, c/o Normandy Mining Ltd, 100 Hutt St, Adelaide, S.A., (08) 303 1700: Golden Grove.

Newcrest Mining Ltd, 600 St Kilda Rd, Melbourne Vic, 3004, (03) 9522 5333: Telfer.

Western Mining Corp. Ltd, 168 Greenhill Rd, Parkside 5063, (08) 372 7200: Nifty.

Lead - Zinc

Murchison Zinc Co. Pty Ltd, c/o Normandy Mining Ltd, 100 Hutt St, Adelaide 5000, S.A., (08) 303 1700: Golden Grove.

Westmet Metals Zinc NL, 263 Adelaide Tce, Perth 6000, (09) 221 2555: Cadjebut.

BAUXITE - ALUMINA**Alumina**

Alcoa of Australia (WA) Ltd, cnr Davey & Marmion Sts Booragoon 6154, (09) 316 5111: Del Park, Jarrahdale, Willowdale.

Worsley Alumina Pty Ltd, PO Box 344, Boddington WA 6225, (097) 34 8311: Boddington.

CLAY**Attapulgitite**

Mallina Holdings Ltd, 249 Stirling Hwy, Claremont 6010, (09) 384 7077: Lake Nerramyne.

Clay Shale

Western Collieries Ltd, 40 The Esplanade, Perth 6000, (09) 327 4511: Collie.

Kaolin

Gwalia Consolidated Ltd, PMB 16, West Perth 6872, (09) 481 1988: Greenbushes.

White Clay

Metro Brick, Locked Bag 100, Midland 6056, (09) 250 2111: Middle Swan.

COAL

Griffin Coal Mining Co. Ltd, 28 The Esplanade, Perth 6000, (09) 325 8155: Collie.

Western Collieries Ltd, 40 The Esplanade, Perth 6000, (09) 327 4511: Collie.

CONSTRUCTION MATERIALS**Aggregate**

The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 472 2000: Boodarrie, Boulder, Oscar Range.

Gravel

Vinci and Sons Pty Ltd, Lot 3 Pickering Brook Rd, Pickering Brook 6076, (09) 293 8295: Pickering Brook.

Rock

County B.S., c/o Pioneer Concrete, 123 Burswood Rd, Victoria Park 6100, (09) 311 8811: Yeeda Station.

Sand

Amatek Ltd, 1 Newburn Rd, Kewdale 6104, (09) 353 3030: Gnangarra, Jandakot.

Pioneer Concrete, 123 Burswood Rd, Victoria Park 6100, (09) 311 8811: Coolgardie.

TABLE 6 (cont)

PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1995
Address, Telephone Number: Project

CONSTRUCTION MATERIALS (cont)

Sand (Cont)

The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 472 2000: Comet Vale, Maitland, Nickol Bay, Pinnacles, Rocklea, Sandy Creek, Sullivan's Creek, Turner River, Warrawanda Creek, Widgiemooltha.

DIAMOND

Argyle Diamond Mines, 2 Kings Park Rd, West Perth 6005, (09) 482 1166: Argyle.

Poseidon Bow River Diamond Mines Ltd, 100 Hutt St, Adelaide, S.A., (08) 303 1700: Bow River.

DIMENSION STONE

Black Granite

Fraser Range Granite NL, 164 Burswood Rd., Victoria Park 6010, (09) 470 4487: Mt Malcolm.

Quartz Rock

Commercial Minerals Ltd, 26-28 Tomlinson Rd, Welshpool 6106, (09) 362 1411: Mukinbudin.

GEM, SEMI-PRECIOUS & ORNAMENTAL STONE

Chrysoprase

Gembank Ltd, 26-28 King St, Perth 6000, (09) 481 1401: Yerilla.

GOLD

Aberfoyle Ltd, 525 Collins St, Melbourne 3000, (03) 9270 6666: Bardoc-Davyhurst.

Australian Resources & Mining Co. NL, 20 Berry St, North Sydney, NSW 2060, (02) 955 1722: Gidgee, Mt McClure.

Australasian Gold Mines NL, 47-79 Stirling Highway, Nedlands 6009, (09) 386 7211: Red White & Blue.

Burmine Ltd, 10-16 Queen St, Melbourne 3000, (03) 9614 6788: Copperhead.

Camelot Resources Ltd, 46-50 Kings Park Rd, West Perth 6005, (09) 321 0616: Mt Gibson.

Centaur Mining and Exploration Ltd, 580 St Kilda Rd, Melbourne Vic. 3004, (03) 9276 7870: Lady Bountiful
Extended Mt Pleasant-Golden Kilometre.

Central Norseman Gold Corp. NL, PO Box 56, Norseman 6443, (090) 39 1101: Central Norseman.

Coolgardie Gold NL, 428 George St, Sydney 2000, (02) 233 7655: Bayley's Reward-Greenfields.

Consolidated Resources NL, 30 Ledger Rd, Balcatta 6021, (09) 345 1588: Nevorla.

Croesus Mining NL, 39 Porter St, Kalgoorlie 6430, (090) 91 2222: Binduli.

Delta Gold NL, 99 Walker St, North Sydney 2060, (02) 9903 4000: Kanowna Belle.

Eltin Minerals Pty Ltd, 74 Gt Eastern Hwy, Sth Guildford 6055, (09) 334 8888: Grosmont-Norris.

Gold Mines of Australia Ltd, 226 Great Eastern Hwy, Belmont 6104, (09) 479 4844: Reedy, Youanmi.

Great Central Mines NL, 580 St Kilda Rd, Melbourne 3004, (03) 9276 7888: Bonzewing.

Hampton Australia Ltd, 100 Hutt St, Adelaide, S.A., (08) 303 1700: Jubilee.

Hedges Gold Pty Ltd, Williams Rd, Boddington 6390, (09) 538 4512: Hedges.

Herald Resources Ltd, 40 Kings Park Rd, West Perth 6005, (09) 322 2788: Sandstone, Three Mile Hill.

Kalgoorlie Consolidated Gold Mines Pty Ltd, Private Bag 27, Kalgoorlie 6430, (090) 22 1100: Super Pit, Mt Charlotte, Mt Percy.

Kitchener Mining NL, 411 Collins St, Melbourne 3000, (03) 9629 6888: Bamboo Creek.

Lynas Gold NL, 40 Kings Park Rd, West Perth 6005, (09) 322 2788: Lynas Find.

TABLE 6 (cont) PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1995-1996
Address, Telephone Number: Project

GOLD (cont)

Melita Mining NL, 16 Altona St, West Perth 6005, (09) 321 2400: Orient Well.
Mt Edon Gold Mines (Aust) NL, 30 Ledger Rd, Balcatta 6021, (09) 345 1588: Tarmoola-King Of The Hills.
National Resources Exploration Ltd, 106 Briggs St, Welshpool 6106, (09) 470 3555: Gullewa.
Newcrest Mining Ltd, 179 Gt Eastern Hwy, Belmont 6401, (09) 270 7070: New Celebration, Ora Banda, Telfer.
Orion Resources NL, 16 Ogilvie Rd, Mt Pleasant 6153, (09) 364 8355: Yilgarn Star.
Pancontinental Mining Ltd, 1 Alfred St, Sydney NSW 2000, (02) 934 8888: Kundana, Paddington.
Perylya Mines NL, 278 Stirling Hwy, Claremont 6010, (09) 385 2400: Fortnum.
Placer Pacific Ltd, 1 Alfred St, Sydney Cove 2000 (02) 256 3800: Granny Smith.
Plutonic Resources Ltd, 100 Miller St, Nth Sydney 2060 (02) 9900 5000: Darlot, Lawlers, Mt Morgans, Peak Hill, Plutonic, Sir Samuel-Bellevue.
Posgold Ltd, 100 Hutt St, Adelaide S.A., (08) 303 1700: Big Bell, Forrestania-Bounty, Golden Crown, Kaltails.
Precious Metals Australia Ltd, 37 St Georges' Tce, Perth 6000, (09) 221 3711: Palm Springs.
Ramsgate Resources Ltd, 229 Stirling Highway, Claremont 6010, (09) 383 4321: Mt Monger-Randalls.
Resolute Samantha Ltd, 28 The Esplanade, Perth 6000, (09) 481 1912: Bullabulling, Chalice, Higginsville, Marymia Hill.
Roehampton Resources NL, 15 Colin Grove, West Perth 6005, (09) 322 6700.
St Barbara Mines Ltd, 28 The Esplanade, Perth 6000, (09) 324 6350: Bluebird.
Sons of Gwalia NL, 16 Parliament Pl, West Perth 6005, (09) 263 5555: Barnicoat, Marvel Loch-Southern Cross, Sons of Gwalia.
Tectonic Resources Ltd, 100 Hay St, Subiaco 6008, (09) 388 3872: Mt Dimer.
Western Mining Corp. Ltd, 250 St Georges Terrace, Perth 6000, (09) 442 2000: Emu-Leinster, Hill 50 - Mt Magnet, Kambalda-St Ives.
Westgold Resources NL, 108 St Georges' Tce, Perth 6000, (09) 324 2877: Tuckabianna.
Wiluna Mines Ltd, 10 Ord St West Perth 6005, (09) 481 2050: Jundee, Wiluna.
Worsley Alumina Pty Ltd, PO Box 48, Boddington 6390, (098) 83 8260: Boddington.

GYPSUM

H.B. Brady & Co. Pty Ltd, PO Box 42, Bayswater 6053, (09) 279 4422: Lake Brown.
Lake Hillman Mining Pty Ltd, Kalannie 6468, (096) 66 2045: Lake Hillman.
Swan Portland Cement Ltd, Burswood Rd, Rivervale 6103, (09) 361 8822: Lake Hillman.
Westdeen Holdings Pty Ltd, 7 Armstrong Rd, Applecross 6153, (09) 364 4951: Lake Cowcowing.

HEAVY MINERAL SANDS

Garnet Sand

GMA Garnet Pty Ltd, PO Box 188, Geraldton 6530, (099) 23 3644: Port Gregory.

Ilmenite, Rutile, Zircon & Leucoxene

Cable Sands (WA) Pty Ltd, PO Box 133, Bunbury 6230, (097) 21 4111: Busselton, Jangardup, Waroona.
RGC Mineral Sands, PO Box 62, Geraldton 6530, (099) 568 822: Capel, Eneabba North, Eneabba West, Narngulu.
TiWest Pty Ltd, 1 Brodie Hall Dve, Bentley 6102, (09) 365 1390: Cooljarloo, Chandala.
Westralian Sands Ltd, PO Box 96, Capel 6271, (097) 27 2002: Yoganup, Yoganup Extended.

TABLE 6 (cont) PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1995
Address, Telephone Number: Project

INDUSTRIAL PEGMATITE MINERALS

Felspar

Commercial Minerals Ltd, 26-28 Tomlinson Rd, Welshpool 6106, (09) 362 1411: Mukinbudin, Pippingarra.

IRON ORE

BHP Iron Ore (Goldsworthy) Ltd, 200 St George's Tce, Perth 6000, (09) 320 4444: Nimingarra, Yarrie.

BHP Iron Ore (Jimblebar) Ltd, 200 St George's Tce, Perth 6000, (09) 320 4444: Jimblebar.

BHP Iron Ore Ltd, 200 St George's Tce, Perth 6000, (09) 320 4444: Newman, Yandicoogina.

Channar Mining Pty Ltd, 152 St George's Tce, Perth 6000, (09) 327 2327: Channar.

Hamersley Iron Pty Ltd, 152 St George's Tce, Perth 6000, (09) 327 2327: Brockman, Marandoo, Tom Price, Paraburdoo.

Koolyanobbing Iron Pty Ltd, 56 Adelaide Tce, Perth WA 6000, (09) 268 3388: Cockatoo Island, Koolyanobbing.

Robe River Iron Associates, 12 St George's Tce, Perth 6000, (09) 421 4747: Pannawonica.

LIMESAND - LIMESTONE

Cockburn Cement Ltd, Russell Rd, East Munster 6166, (09) 411 1000: Cockburn Sound, Coogee.

Limestone Building Blocks Co. Pty Ltd, Hopkins Rd, Carabooda 6033, (09) 407 5005: Nowerup.

Loongana Lime Pty Ltd, PO Box 808, Kalgoorlie 6430, (090) 21 8055: Loongana.

Swan Portland Cement Ltd, Burswood Rd, Rivervale 6103, (09) 361 8822: Wanneroo.

Westdeen Holdings Pty Ltd, 7 Armstrong Rd, Applecross 6153, (09) 364 4951: Dandaragan, Gingin, Irwin, Yanchep.

MANGANESE

Portman Mining Ltd, 256 Adelaide Tce, Perth 6000, (09) 268 3333: Mt Sydney.

Valiant Consolidated Ltd, 250 St Georges' Tce, Perth 6000, (09) 321 3797: Pearana.

NICKEL

Outokumpu Australia Pty Ltd, 141 Burswood Rd., Burswood 6100, (09) 472 3144: Forrestania.

Western Mining Corp. Ltd, 250 St Georges Terrace, Perth 6000, (09) 442 2000: Blair, Carnilya Hill, Kambalda, Leinster, Mt Keith.

PETROLEUM

Ampolex Ltd, 250 St George's Tce, Perth 6000, (09) 429 3200: Wandoo.

Apache Energy Ltd, 256 St Georges' Tce, Perth WA 6000, (09) 422 7222: Campbell, Harriet, Rosette, Sinbad & Tanami.

BHP Petroleum Pty Ltd, 221 St Georges Tce, Perth 6000, (09) 426 5600: Griffin.

Boral Energy Resources Ltd, 60 Hindmarsh Sq, Adelaide SA 5000, (08) 235 3737: Beharra Springs, Tubridgi.

Consolidated Gas Pty Ltd, 325 Churchill Ave, Subiaco 6008, (09) 380 4920: Woodada.

Discovery Petroleum NL, 31 Ventnor Ave, West Perth WA, 6005, (09) 480 4100: Mt Horner.

Santos Ltd, 39 Grenfell St, Adelaide SA 5001, (08) 224 7162: Blina, Boundary, Lloyd, Sundown, West Terrace.

West Aust. Petroleum Pty Ltd (WAPET), QV1, 250 St Georges Tce, Perth 6000, (09) 263 6000: Barrow Island, Cowle, Crest, Dongara, Mondara, Roller-Skate, Saladin, Yammaderry.

TABLE 6 (cont) PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1995-1996
Address, Telephone Number: Project

PETROLEUM (cont)

Western Mining Corp. Ltd, 250 St Georges Terrace, Perth 6000, (09) 442 2000: Chervil, North Herald, South Pepper, Airlie Island.

Woodside Offshore Pet. Pty Ltd, 1 Adelaide Tce, Perth 6000, (09) 224 4111: Cossack/Wanaea, Goodwyn, North Rankin.

SALT

Cargill Australia Ltd, PO Box 420, Port Hedland 6721, (091) 40 1255: Port Hedland.

Dampier Salt (Operations) Pty Ltd, 152-158 St George's Tce, Perth 6000, (09) 327 2299: Dampier, Lake Macleod.

Shark Bay Salt Joint Venture, 22 Mount St, Perth 6000, (09) 322 4811: Useless Loop.

WA Salt Koolyanobbing Pty Ltd, Cockburn Rd, Hamilton Hill 6163, (09) 430 5495: Lake Deborah East, Pink Lake.

SILICA - SILICA SAND

Silica

Simcoa Operations Pty Ltd, P.O. Box 1389, Bunbury 6231, (097) 912 588: Dalaroo.

Silica Sand

ACI Operations Pty Ltd, 35 Baille Rd, Canning Vale 6155, (09) 455 1111: Lake Gngangara.

Amatek Ltd, 1 Newburn Rd, Kewdale 6104, (09) 353 3030: Jandakot, Gngangara.

Boral Resources WA Ltd, 136-138 Gt Eastern Hwy, South Guildford 6055, (09) 279 0000: Jandakot.

The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 472 2000: Jandakot.

Western Mining Corp. Ltd, 250 St Georges Terrace, Perth 6000, (09) 442 2000: Mt Burgess.

TALC

Gwalia Minerals NL, PMB 16, West Perth 6872, (09) 481 1988: Mt Seabrook.

Western Mining Corp. Ltd, PO Box 116, Three Springs 6519, (099) 54 5047: Three Springs.

TIN - TANTALUM - LITHIUM

Spodumene

Lithium Australia Ltd, PMB 16, West Perth 6872, (09) 481 1988: Greenbushes.

Tantalite - Tin

Goldrim Mining Australia Ltd, 562 Pacific Hwy, Belmont NSW 2280, (049) 477 288: Wodgina.

Gwalia Consolidated Ltd, PMB 16, West Perth 6872, (09) 481 1988: Greenbushes.

Pan West Tantalum Pty Ltd, 1 Alfred St, Sydney NSW 2000, (02) 934 8888: Wodgina.

ABBREVIATIONS, REFERENCES, UNITS AND CONVERSION FACTORS

As the document makes use of abbreviations and references, an explanation of each has been included below. A conversion table, relating the units by which various commodities are measured, has also been provided.

ABBREVIATIONS

cons	concentrates	n.ap.	not applicable
f.o.t.	free on truck	f.o.b.	free on board
f.o.r.	free on rail	¥	Japanese Yen
A\$	Australian Dollar	US\$	United States Dollar
ABS	Australian Bureau of Statistics	GDP	Gross Domestic Product
AFR	<i>Australian Financial Review</i>	BMR	Bureau of Mineral Resources
CSO	Central Selling Organisation	HBI	Hot Briquetted Iron
DRI	Direct Reduced Iron	IMF	International Monetary Fund
RBA	Reserve Bank of Australia		
ABARE	Australian Bureau of Agricultural and Resource Economics		

REFERENCES

- (a) Estimated f.o.b value.
- (b) Metallic by-product of nickel mining.
- (c) Value based on the average Australian Value of Alumina as published by the ABS
- (d) Value at works.
- (e) Estimated ex-mine value.
- (f) Value based on monthly production and average gold price of that month as supplied by GoldCorp.
- (g) Estimated f.o.t value.
- (h) Estimated f.o.r value.
- (i) Estimated f.o.b value based on the current price of nickel containing products.
- (j) Delivered value.
- (k) Metallic by-product of copper mining.
- (r) Revised from previous edition.

UNITS AND CONVERSION FACTORS

	Metric Unit	Symbol	Imperial Unit
Mass	1 gram	(g)	= 0.032151 troy (fine) ounce (oz)
	1 kilogram	(kg)	= 2.204624 pounds (lbs)
	1 tonne	(t)	= 1.10231 United States short ton (1 US short ton = 2,000 lbs)
	1 tonne	(t)	= 0.98421 United Kingdom long ton (1 UK long ton = 2,240 lbs)
Volume	1 kilolitre	(kl)	= 6.28981 barrels (bbls)
	1 kilolitre	(kl)	= 1 cubic metre (m ³)
	1 cubic metre	(m ³)	= 35.3147 cubic feet (ft ³)
Energy	1 kilojoule	(kj)	= 0.94781 British Thermal Units (Btu)
	1 gigajoule	(GJ)	= 0.94781 million British Thermal Units (Btu 10 ⁶)
	1 petajoule	(PJ)	= 0.94781 million million British Thermal Units (Btu 10 ¹²)
Prefix	kilo (k)	10 ³	
	mega (M)	10 ⁶	
	giga (G)	10 ⁹	
	tera (T)	10 ¹²	
	peta (P)	10 ¹⁵	



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