1992-93

MINERAL AND PETROLEUM PRODUCTION

STATISTICAL DIGEST

Royalties, Economic Policy and Public Affairs Division

DEPARTMENT OF MINERALS AND ENERGY

WESTERN AUSTRALIA

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STATISTICAL DIGEST OF MINERAL AND PETROLEUM PRODUCTION 1992-93

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ABBREVIATIONS, REFERENCES, UNITS AND CONVERSION FACTORS

As the following 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	f.o.t.	free on truck
f.o.b.	free on board	n.a.	not available
f.o.r.	free on rail	n.ap.	not applicable

REFERENCES

N.A.	Not available for publication.
(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 by the Australian Bureau of Statistics.
(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.b 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.

UNITS AND CONVERSION FACTORS

	Metric Unit	Symbol	Imperial Unit	Conversion factors: Multiply Imperial Unit by	Conversion factors: Multiply Metric Unit by
Mass	gram	g	troy (fine) ounce (oz)	31.103522	0.032151
	kilogram	kg	pound (lb)	0.453592	2.204624
	tonne	t	long ton (2,240 lbs)	1.016046	0.984207
	tonne	t	short ton (2,000 lbs)	0.907185	1.102311
Volume	kilolitre	kl	barrel (bbl)	6.28981	0.158987
	kilolitre	kl	cubic metre (m^3)	1	
Energy	gigajoule	GJ	million million British Themal units (mmBTu)	1.055072	0.947803

Prefix	kilo (k)	10^3
	mega (M)	10^6
	giga (G)	10^9
	tera (T)	10^{12}
	peta (P)	10^{15}

NW Shelf Gas

1 TCF = 1082 petajoules
1 Mt = 54 petajoules

1. OVERVIEW

1.1 Review of the World Economy

The relatively patchy, but strengthening, growth which became evident in the United States of America's (USA) economy late in 1992 slowed during the first and second quarters of 1993. This was largely as a result of the effect on trade of a stagnating Japanese economy and a serious and protracted European downturn. Europe was particularly affected by political and economic problems within the Commonwealth of Independent States (CIS) and in the eastern state's protracted adjustment away from central planning. Growth, driven mainly by regional trade, has been maintained in East and North Asia. While there is evidence a slight overall upturn in activity, the general picture is one of stagnation with the outlook for a medium term return to growth in the world's major economies remaining poor.

The economy of the USA grew slowly for most of the past six quarters. There is now some evidence that this limited expansion of capacity has restored historical rates of employment and capacity utilisation, and that further growth will be harder to achieve. Although the USA has traditionally provided the investment and final demand impulse to restore economic growth to the major western economies, there is as yet little evidence of that occurring in this cycle. With Europe and Japan in recession, and given its overhang of domestic debt, the Government seems reluctant to provide any additional fiscal stimulus. The Administration's stated policy to control, if not reduce, the huge public debt makes the adoption of any new spending initiatives fairly remote possibilities. The prevailing mood of protectionism in the Congress is being mitigated by ongoing General Agreement on Tariffs and Trade (GATT) negotiations, by progress on the North American Free Trade Association (NAFTA) and by a nascent domestic recovery.

The serious decline in the Japanese economy continued through 1992-93. Uncertainty, and a general lack of confidence, is having a profound effect on financial markets, private spending and on corporate investment. In an effort to overcome this malaise the Japanese Government introduced two large stimulatory fiscal packages during the year. The effects of these mainly infrastructure spending initiatives on domestic demand are yet to become apparent. The new coalition Government is recognised as having political and development priorities that are sharply different from its LDP predecessor and, because of this, further stimulation of the economy is now highly unlikely. Analysts are forecasting a steady though restrained upswing in activity during 1993-94.

The main Western European countries have, if anything, fallen more deeply into recession over the past 6 months. Germany has experienced a severe contraction, with faltering domestic and regional demand, ballooning fiscal deficits and high structural unemployment. Continuing economic uncertainty and political dislocation, particularly in the former Eastern Bloc, has prevented any general recovery from taking place in the European Community.

The Bundesbank's strategy of controlling inflation through the mechanism of a relatively high exchange rate has also impacted severely on trade. The system of exchange control agreements, which were adopted by the European Community as a precursor to full monetary union, effectively collapsed during the year. The UK and Italian currencies were withdrawn from the Exchange Rate Mechanism (ERM) after a period of speculative upheaval and a general devaluation against the Deutschmark has occurred. France continues to suffer from record levels of unemployment, slack demand and some uncertainty over trade policy.

Forecasts for the current year are that the economy of the USA will grow by about 2.5 %, Japan's by less than 1 % and activity in the overall European Community will shrink marginally. These predictions offer little medium term hope of a positive flow-on effect to commodity demand, and for Australian exports.

The extensive negotiations to liberalise trade under the General Agreement on Tariffs and Trade (GATT), have reached a conclusion. Most of Australia's arguments on GATT focussed on agriculture. It has been estimated that the resolution of the Uruguay round will boost total Australian farm output by $900 million, or 7.5%, a year. The Government also expects large benefits to flow to Australia from the opening up of the services industry, particularly in providing banking, insurance and communications services to Asia.

The Commonwealth of Independent States (CIS), and to a lesser degree its former republics and satellite countries, continues through a period of protracted and painful adjustment, both economic and political. Economic reforms, which depend for implementation on a strong and determined Government, have been delayed while the political situation moves towards resolution. A direct consequence of the weak currency and stalled economic changes is that commodity producers are able, and indeed are constrained, to sell large volumes of primary commodities, such as nickel and aluminium, onto Western markets. This has depressed the price of several commodities, including nickel and alumina, which are of particular significance to the economy of Western Australia.

In contrast to the main industrialised nations, economic growth in East and North Asia was solid. The area was buoyed by capital and infrastructure investment, and a strong level of intra-regional trade. As a result of this activity, the demand for a range of mineral and energy products was good, cushioning the effect for Western Australian producers of softening traditional markets.

Asian regional growth was not, however, enough to offset weak demand elsewhere and international mineral and energy prices remained broadly depressed. Inappropriate supply responses by some producer countries led to a build up of inventories by end users, and reduced the chance of a quick recovery for some key minerals.

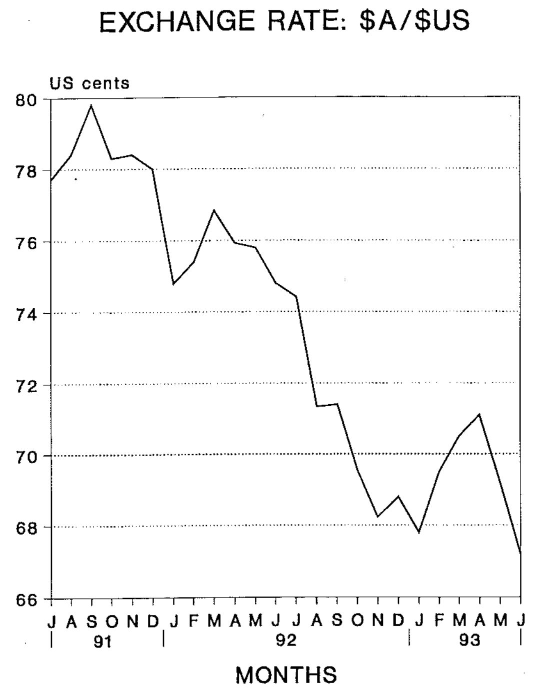
1.2 Review of the Australian Economy

The national economy continued to show signs of recovery without recording any significant growth. Unemployment is still at record levels, and the balance of payments deficit is being maintained at around $1 000 million a month. Net foreign debt is continuing to grow and currently stands at over $170 000 million. Low levels of final demand and no real wages growth has resulted in underlying inflation falling to around 2%, this in turn has allowed the Government to reduce nominal interest rates to the lowest levels for 30 years.

The combination of a fall in demand for Australia's commodity dominated exports and low interest rates has tended to place downward pressure on the currency. The exchange rate against the $US is shown in Figure 1.1.

While the $A strengthened briefly in the early months of 1993, the downward trend is still very strong. The net 8% decline over the year reflected in part the weak outlook for world economic growth and commodity prices.

Subsidiary factors which contributed to the weakness of the currency were the low rate of increase in exports of a non-commodity nature and a fall off in receipts from tourism. There are no indications that any of the pressures on the exchange rate will lessen during the current year, and this will tend to help exporters facing another year of low commodity prices.



SOURCE: A.F.R., MONTHLY AVERAGE.

FIGURE 1.1

The Commonwealth Government is predicting growth of 2.8 % for the 1993-94 year and the persistence of rates of unemployment at around 10 %. The fall of the currency is expected to have a slight inflationary effect. The Consumer Price Index is predicted to rise slightly as the import bill rises. As a result of historically low prices real interest rates remain relatively high and capital raising for new business is tight. Although some capital raisings have been undertaken offshore most borrowers remain cautious due to the exchange risk. Substantial disinvestment by major Japanese investors, especially in the property market, may put upward pressure on interest rates by absorbing some available capital.

While most of the indicators of Australia's economic recovery remain positive, the rate of growth was slow. Poor business investment, low levels of consumer confidence and a tight fiscal environment ensured that unemployment remained high. Minerals developers did, however, welcome the associated low inflation, sustained downward pressure on interest rates and renewed focus on improving aspects of Australia's export culture.

The outlook for the Australian resources sector is for a year of continued low prices and low demand. There will be some slight cushioning effect from the fall in the currency, and from rationalisation by some overseas producers, but prospects for general improvement in commodity markets is small. Despite the improvement in corporate profits and declining interest rates, investment spending is assumed to remain subdued in 1993-94.

1.3 Economic Factors Affecting the Mineral Industry

While the major Western economies remain stagnant, demand for Western Australia's mineral products will remain low. Producers are not expecting any medium term improvements.

The extent of the economic slowdown in Japan and western Europe has been severely underestimated in some areas. As a result there has been considerable reluctance on the part of producers worldwide to adjust to a situation of prolonged weak demand. There is now evidence that some producer countries are beginning to rationalise output in the face of continued oversupply and depressed prices. It is, however, unlikely that the full extent of required cuts in production will occur.

The deep recession in our major markets means the minerals industry is unlikely to expand significantly before 1995. The present period of austerity is therefore likely to continue. Western Australia's aggregate production is forecast to expand slightly although several sectors will be operating with excess capacity. While the continuing erosion of the exchange rate may provide some relief, there is no indication that all commodity prices have bottomed. Most producers will remain under pressure to reduce all operational costs. While this may in the short term render sections of the industry more competitive, a more protracted period of low prices will place financial pressure on many producers.

The continued rapid economic growth in many east Asian countries provides opportunities for some producers. The potential for further sales may alleviate the downward pressure on prices for some commodities, and will represent an expanding market for Western Australian mineral commodities. Due to the present size of the market, and the existence of some barriers to entry, it will not have a major demand impact on the State's industry in the medium term.

The minerals industry in Australia has continued to see significant changes in ownership and disbursements of assets. Several companies have curtailed activities and divested what are no longer seen as core assets. Further merger activity and rationalisations are occurring in the gold sector.

1.4 Social And Political Factors Affecting The Mineral Industry

The establishment in principle of the concept of native title to land, handed down by the High Court's ruling on the Mabo case, has been by far the major issue facing the resources industry and Governments this year. The initial effect of the decision was to create uncertainty, in that the ruling did not specify all the conditions under which native title could be considered extinguished, or could be considered to have effectively lapsed. The ruling left resolution of these matters to later court decisions.

The possibility that the High Court may recognise the existence of native title in some areas of the State presents developers with major uncertainty about the ultimate legitimacy of otherwise normal commercial activities. While this "sovereign risk" remains, it has the potential to make continued exploration and development in some high-risk areas unattractive. The Commonwealth Government has attempted to establish and legislate principles for dealing with practical aspects of title, such as compensation for loss of utility which, even if established by the court, would be extinguished by Governments in the public interest. Significant difference of emphasis have arisen between Governments, and in particular between the Commonwealth and Western Australian Governments. The political process has become prolonged and increasingly polarised.

In other areas the States and the Commonwealth are cooperating in an attempt to establish standard legislation on several resource issues using the ANZMEC forum. Progress is being made on uniform gas pipeline legislation to promote freer marketing of natural gas, especially that sourced from new discoveries The major concerns are that the statutory agreements which established the pipelines, may now act to control and limit access to markets by potential competitors. Consensus is being pursued through comprehensive negotiations.

Another ANZMEC concern is the development of an inclusive royalty regime which can be applied to the exploitation of offshore minerals.

While the State's mineral and petroleum industry's sensitivity to international market developments is well recognised, political considerations are also currently to the fore. One legacy of the continuing upheaval in the Commonwealth of Independent States (CIS) is that producers of mineral commodities in those States are dumping large volumes onto western markets. These below cost sales are resulting in a further depression of already weak prices. A speedy resolution to political fragmentation in the CIS, and a return to some form of economic stability there, would greatly benefit the local producers of several vulnerable commodities.

Similar political changes have liberalised and opened the economies of several countries which now may provide opportunities for exploration and investment for Western Australian based resource companies. The attractiveness of some of these opportunities may temporarily reduce the level of exploration in the State. Such an effect however is expected to be minor, given the high degree of prospectivity of the State's metallogenic areas. Most importantly, those changes also provide opportunities for local companies to market their technical expertise, an area which is expected to provide increasing opportunities for exports in the next few years.

MAJOR MINERAL AND PETROLEUM PROJECTS IN WESTERN AUSTRALIA

WITH AN ANNUAL VALUE OF PRODUCTION IN EXCESS OF $10 MILLION

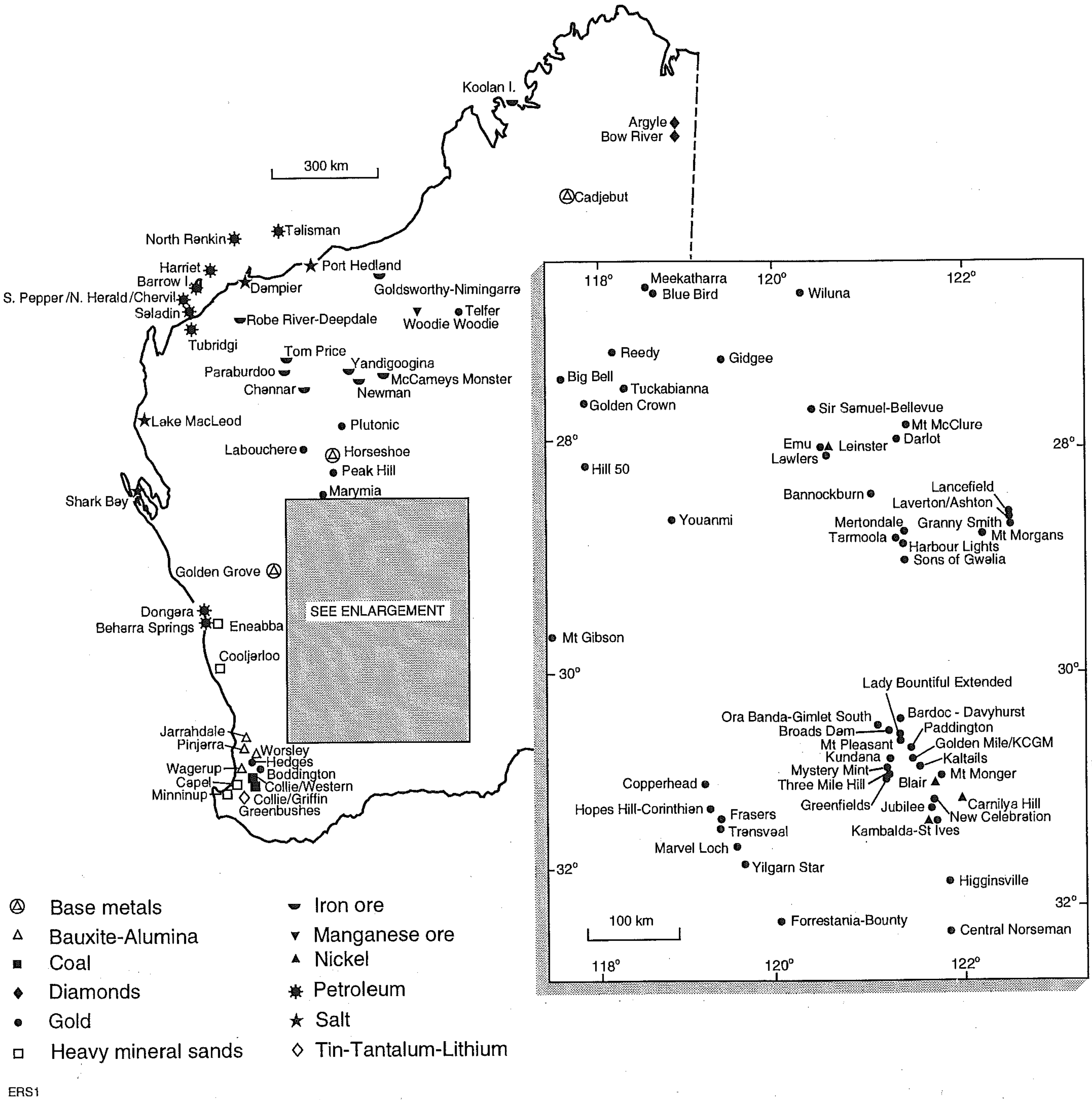


Figure 1.2

2. REVIEW OF MAJOR MINERALS AND PETROLEUM

2.1 Iron Ore

The total tonnage of iron ore produced from Western Australian mines remained steady at 111 million tonnes during the trading period (Figure 2.1).

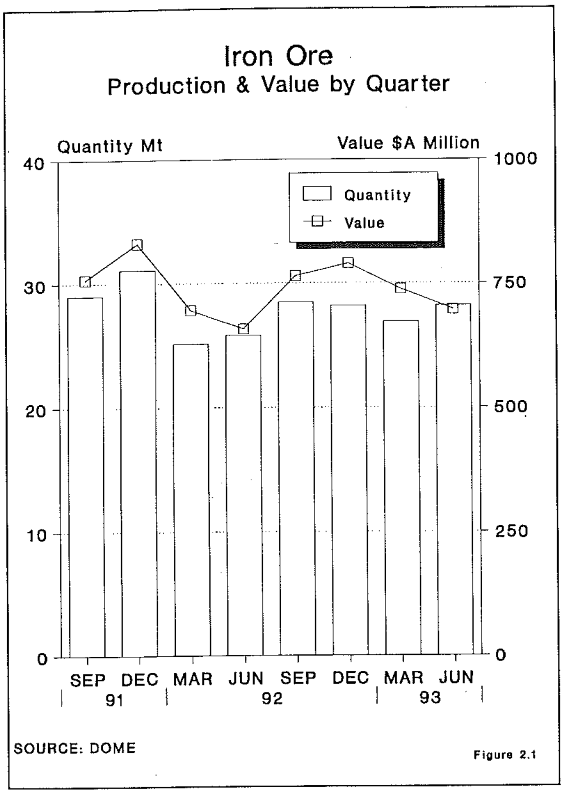


Figure 2.1

Most operations maintained the high output levels attained in 1991-92. Among producers the exception was the Robe River operation at Pannawonica where production was down by 15 %. BHP's new Yandi/Marillana Creek operation reached its initial production target of 5 million tonnes.

The value of production increased slightly (Figure 2.1). Receipts rose from $2 941 million in 1991-92 to $2 991 million, a gain of 2 %. Returns to the State's producers rose during the first three quarters as the $A weakened. Major contract prices were renegotiated at the end of 1992 in a climate of continuing poor market conditions. As a result of these negotiations, producers were forced to accept a 11 % price cut which immediately affected receipts in the second quarter of 1992 and flowed on through the rest of the trading period (Figure 2.2).

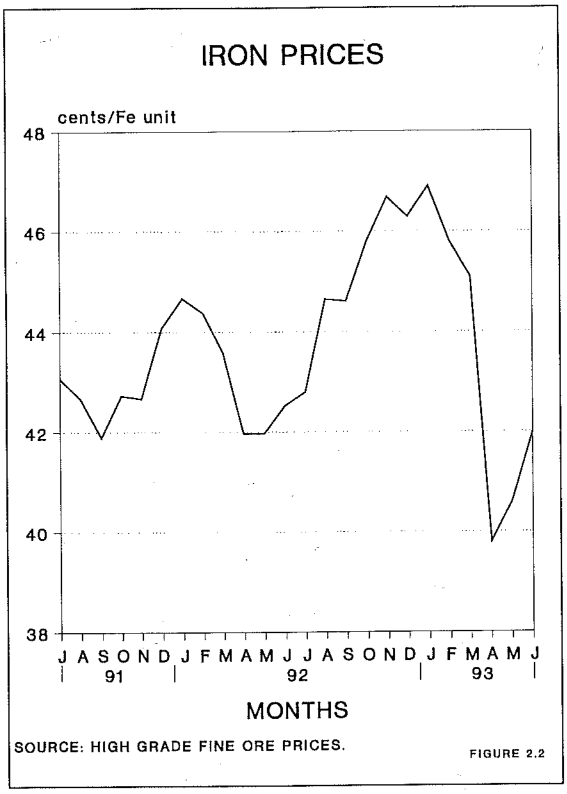


FIGURE 2.2

World steel production was again subdued as Europe's producers were severely affected by a contraction in domestic final demand. The other major producing regions of North America and Japan both improved slightly during the year as the US began a tentative recovery from the recession and Japan's infrastructure spending commenced. The Japanese Government's two fiscal stimulation packages pushed steel output back over 100 Mt and this should be complemented by a cyclical recovery in private sector demand during 1993-94. While iron ore consumption by Japan's steel mills should remain relatively subdued, it will be more than made up by growth in the other Asian markets.

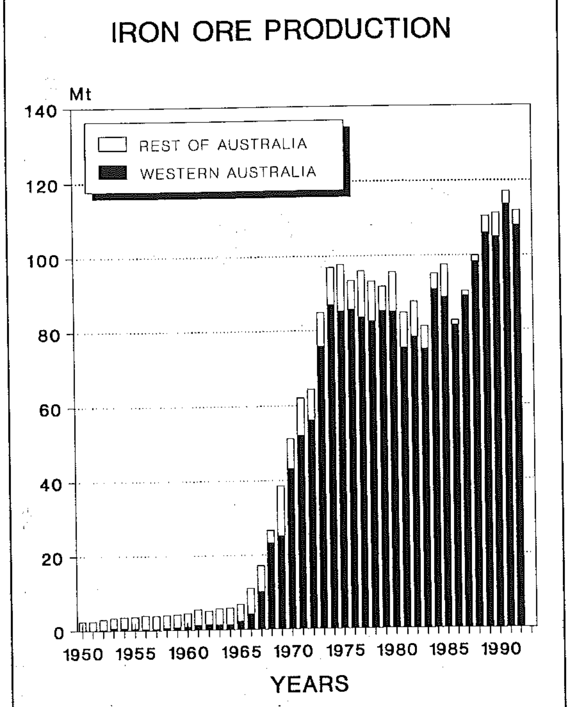
China's steel industry expanded strongly, driven by a 10% economic growth rate. South Korea and Taiwan continued to increase steel producing capacity. These significant structural changes in developing markets are expected to further increase iron ore demand in the medium term.

Producers steadily expanded the State's output capacity during the year. These expansions were undertaken on the expectation that prices have bottomed out and the industry is entering a period of moderate growth. Much of this investment was to enable the efficient blending of different ores, thus extending the mine life of higher grade deposits. The commencement of the $300 million Marandoo project, which, upon its completion in 1994, will complement the Mount Tom Price operation, is characteristic of the iron ore industry's investment strategy. The $80 million Mesa J development (Robe River Iron Associates), the Yarrie mine (BHP Goldsworthy) and the $200 million loading facility upgrade at Port Hedland were all well advanced. On a relatively smaller scale, a feasibility study was undertaken to reopen the now closed Koolyanobbing mine. It is planned that ore from the deposit will be blended with beneficiated product from Cockatoo Island for sales to China's Anshan Steelworks. The HIsmelt research and development facility at Kwinana progressed steadily and was commissioned in late 1993.

As a result of the latest fall in contract prices, income for the State's iron ore producers is expected to fall slightly in 1993-94. A small projected rise in export tonnages should mitigate this market development. As approximately 80% of exports will continue to flow to Japan and other North Asian destinations producers are expected to benefit from steady levels of regional demand growth, and be cushioned from the severe contraction which is developing in European markets. Total exports should be in the region of 115 million tonnes in 1993-94. Western Australia continues to be the only major iron ore producing and exporting region in Australia (Figure 2.3).

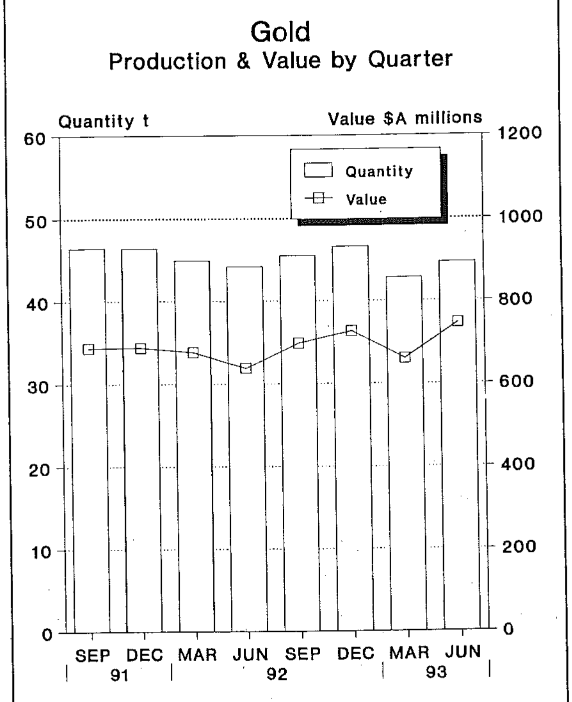
2.2 Gold

The total amount of gold mined in the State fell marginally to 180 tonnes during 1992-93 (Figure 2.4). Overall industry activity was relatively subdued during the period and there was some rationalising of capacity in response to low world prices and steadily increasing costs. Only one major new mine - Kanowna Belle - came on stream during the year.



SOURCES: DOME, BMR & ABARE

FIGURE 2.3



SOURCE: DOME

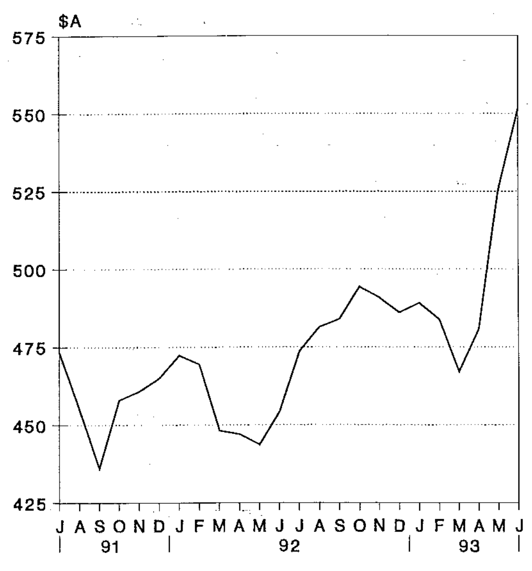
Figure 2.4

The value of production continued to grow (Figure 2.4). Receipts increased from $2 690 million in 1991-92 to $2 834 million, a rise of 5 %. Prices showed a marked instability during the year, especially during the last two quarters. After several years of slowly declining sales values, which saw the price fall to $US320 (per fine ounce) in early 1993, the market rose sharply to a peak of $US420/oz early in the current financial year (Figure 2.5). This bubble was subsequently burst, however, and the metal is currently being traded at around $US375/oz. The net increase has provided a fillip to existing producers, exploration activity and mining industry investors. Growth in the traded value of mining stocks preceded the leap in gold bullion prices by about 6 months.

financial year rose by about 10%, and a further modest increase is forecast for 1993-94. As primary production only constitutes a part of all gold traded the relatively slow growth of mine output has resulted in a bullion shortfall which has to be made up by sales of scrap, net official sales and disinvestment. This structural imbalance should contribute to a stronger floor price for the metal at least in the medium term.

South East and North Asia were again regions of particularly strong demand growth for gold. This was manifested in increased sales of both 22 carat jewellery and in the hoarding of gold bars. Both of these developments were a function of markedly higher aggregate incomes and large scale speculative activity.

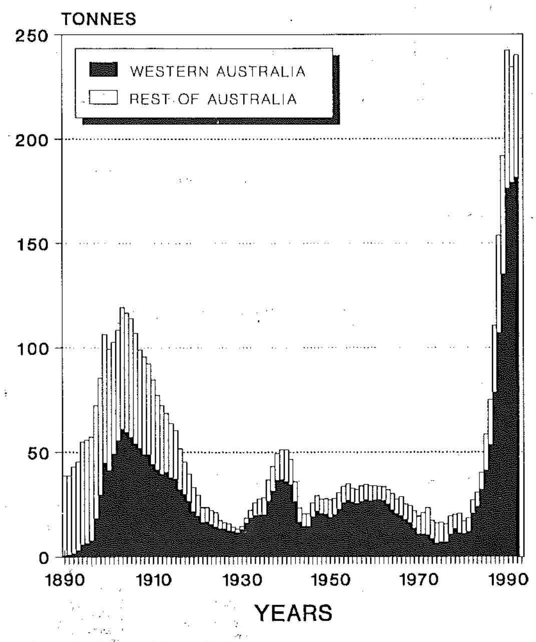
GOLD PRICES: $A/oz.



SOURCE: LONDON GOLD PRICE, MONTHLY AVERAGE OF WEDNESDAY PRICES.

FIGURE 2.5

GOLD PRODUCTION



SOURCES:DOME, BMR & ABARE

FIGURE 2.6

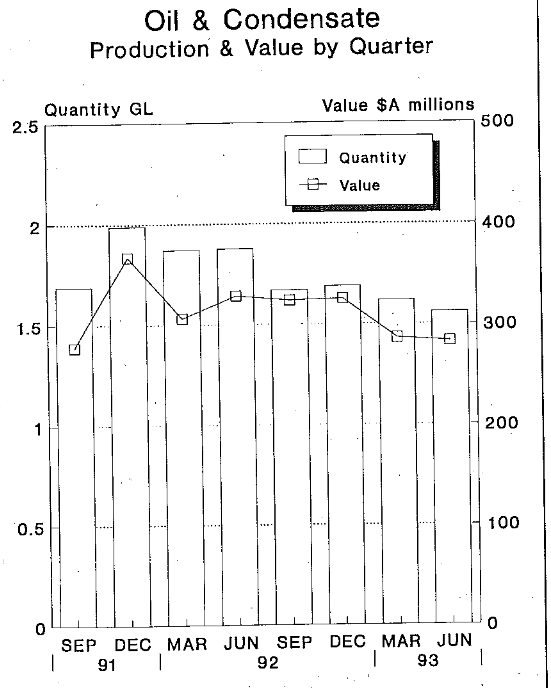
In retrospect, the price pattern appears characteristic of an over-reaction by traders to temporary market imbalances. The speculation driven upturn did not address the structural disequilibrium between the rate of production of gold from primary sources and the much higher and increasing consumption of the metal by jewellery fabricators. The total amount of physical gold traded during the

Three substantial projects, Mount McClure, Butcher Well and Mount Monger, were brought on stream during the year. These were in addition to the large Kanowna Belle operation which has an $80 million first stage opencut development and a $130 million second and third stages. While exploration in new areas was relatively subdued, there was extensive activity in proving up reserves for existing operations. As a result many companies announced expansions or extended mine lives.

The industry is continuing to go through a period of rationalising and consolidating existing operations. One such market driven play was the takeover of Forsayth by Plutonic Gold. During the year a number of open cut mines, including Boddington, Mt Magnet, New Celebration and Paddington, commenced the development of their underground reserves mining. While the State's gold production appears to be stabilising at the current high level, Western Australia is still the source of the majority of the nation's output of the precious metal (Figure 2.6).

2.3 Petroleum

Western Australian oil and condensate production contracted by 12 % to 6.5 gigalitres (GL) in 1992-93 (Figure 2.7). During the period, the volume of natural gas and LNG extracted rose by 12 % to the equivalent of 11 000 million cubic metres.

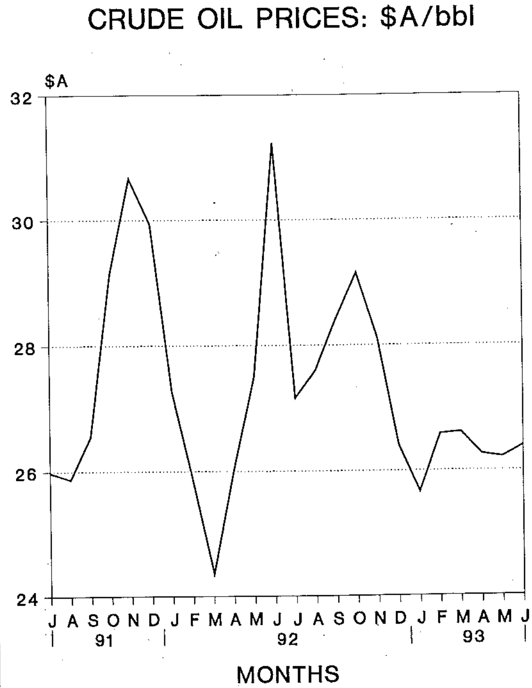


SOURCE: DOME

Figure 2.7

The value of production rose by 7% to $2651 million (Figure 2.7). The rise was mainly due to increased LNG sales, which passed $1000 million for the first time. A third LNG compression train was commissioned during the year.

While the benchmark price of oil on world markets continued to erode during the year (Figure 2.8), the effect on local producers was cushioned by a devaluation of the $A. Generally, returns to local producers remained steady during the year. Crude oil receipts contracted slightly to $840 million on slightly lower production. As gas prices firmed gross returns to producers rose by 10 %.



SOURCE: BRENT SPOT, MONTHLY AVERAGE.

FIGURE 2.8

While final demand was the main determining factor in oil sales, the market was disrupted by unexpected supply surges from some OPEC producers. Although the cartel attempted to rein in unauthorised output, the international market was also unsettled by cautious moves in the UN to remove the embargo on Iraqi exports.

The only real growth in demand came from the expanding economies of East and North Asia. North America had a slight upturn, and marginal increases in consumption were recorded by most OECD countries. This was offset by Western European oil refinery feedstocks remaining particularly high. Although prices remain soft, there is a slight chance of improvements being recorded during 1993-94.

In Western Australia the development of new offshore fields and plant upgrades progressed steadily during the year, with a further $1500 million of committed investment. The development phases of the Griffin, Roller/Skate and Wandoo projects advanced strongly. All three fields will be commissioned during the current financial year.

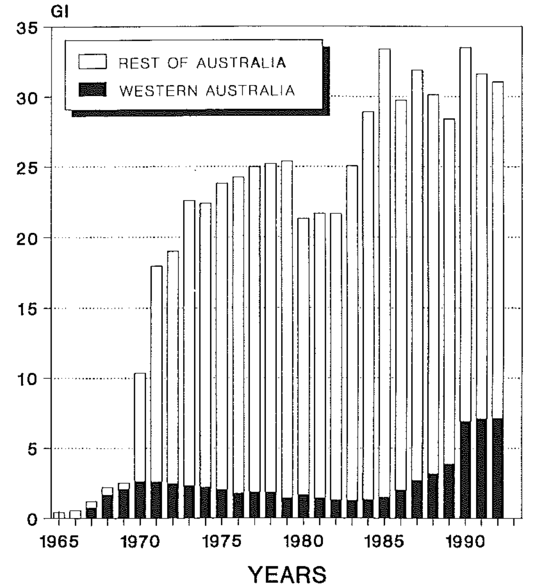


FIGURE 2.9

On the North West Shelf gas project, the third LNG train was largely completed and progress was achieved in removing bottlenecks from the existing production infrastructure. The joint venturers did, however, suffer a set back when trying to install the Goodwyn A offshore production platform. Damage to the main piles occurred during the primary installation phase, and start up is now not expected until late 1994. This resulted in an opportunity cost associated with the delay, through lost condensate production and foregone chances to expand gas sales. The steadily growing level of LNG exports was not affected by the holdup. The construction phase of the $800 million Wanaea/Cossack project is progressing as expected.

The development of the massive Gorgon and, more remote, Scarborough gasfields is not under consideration. Any future moves on these resources will be tied to the growth of LNG demand in regional markets.

After a slight fall in output during 1993-94, the medium to long term outlook for the local industry is for a steady increase in investment and production. This assessment is based on predictions for small rises in the crude oil price continuing over the rest of the decade. A significant increase in price would lift profitability and result in more high-risk, high-cost projects being considered. As it is, output from Western Australia is expected to increase substantially as a percentage of total Australian production (Figure 2.9).

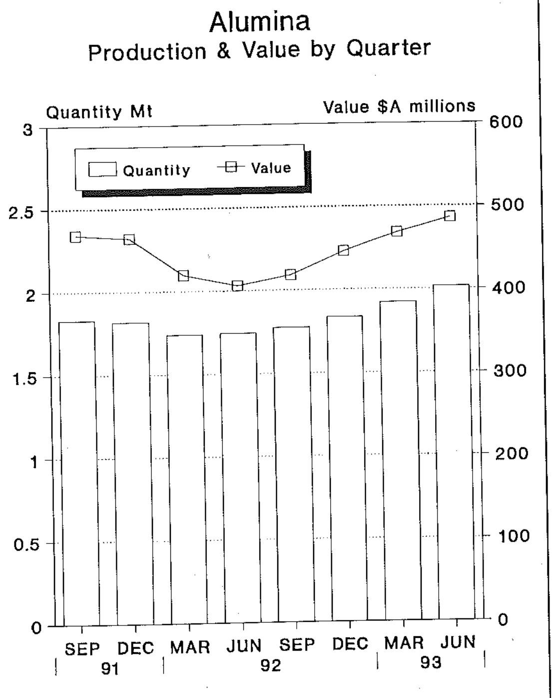
2.4 Alumina

Alumina production from Western Australian operations rose approximately 6 % to just over 7.5 million tonnes in 1992-93 (Figure 2.10). Local producers continued their efforts to maintain high levels of production in order to minimise unit costs.

Although international prices continued to drift, the value of production rose slightly as a result of increased output (Figure 2.10) and a fall in the $A. Gross receipts rose by 3% to just over $1818 million. World prices continued to fall during the year, but as a result of the $A devaluation returns to local producers remained at about A$180 per tonne.

The primary aluminium market, which with a lag drives the demand for alumina, continued to be plagued by a precipitous rise in inventories of unsold metal. London Metals

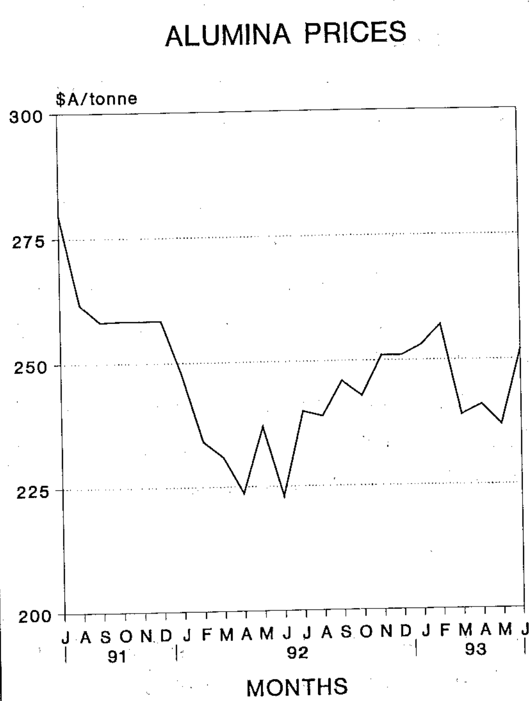
Exchange (LME) stocks increased to over 2 million tonnes, as did producer inventories and unreported production.



SOURCE: DOME

Figure 2.10

Output increases in Europe and a rise in CIS exports more than offset a modest rise in global demand and further added to inventories.

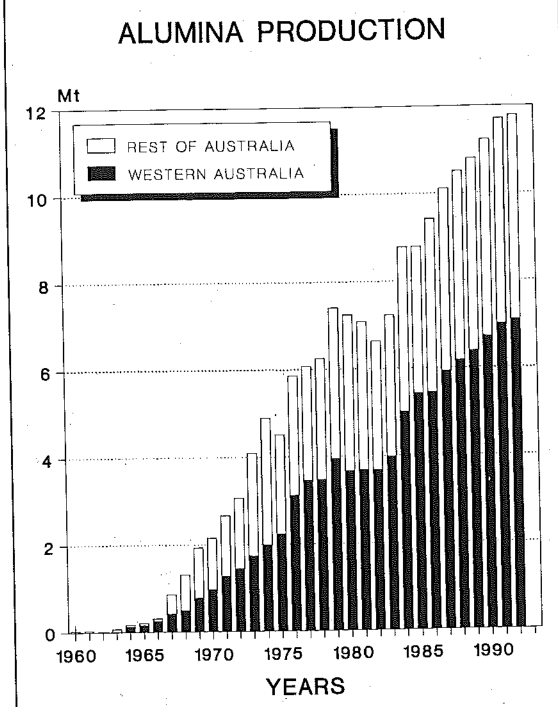


SOURCE: DERIVED FROM L.M.E. & A.B.S.

Figure 2.11

A flood of Russian ingot of discounted lower grades disrupted the crucial US market and resulted in moves towards anti-dumping action. Steady growth in the scrap market, which now supplies 25% of all sales, was another structural factor working to push down prices.

Major American producers have closed in excess of 500 000 tonnes/year of capacity in response to high inventory levels. Comalco has also announced plans to close the Bell Bay smelter in Tasmania, with a capacity of 112 000 tonnes/year. These initiatives are insufficient to remove the present level of overproduction. As with most of the other metals, only a broad based economic recovery can provide the boost in demand necessary to reduce stockpiles and absorb current supply capacity. The price remained relatively stable in $A terms during the year (Figure 2.11). In the face of the immediate structural problems in the market, and unclear signs of recovery, aluminium prices, although at a 6 year low, are unlikely to recover significantly within the year.



SOURCES: DOME, BMR & ABARE

FIGURE 2.12

The alumina sector in Western Australian has been producing for over 30 years, and is a mature industry. Recent expansions have been completed at the Wagerup and Worsley refineries together with continuing programs to increase efficiency, will retain the State industry's position as Australia's major producer (Figure 2.12).

2.5 Diamonds

Total sales of diamonds produced in Western Australia fell significantly to 25 million carats in 1992-93. Sales in 1991-92 were a record 47 million carats due to massive inventory reductions. The world recession has severely depressed demand, except for the highest quality stones, and the Central Selling Organisation (CSO), which markets most of the State's production, responded by reducing purchases by 25%. The market is not expected to be able to absorb the previous level of production for some time.

The value of production also fell, but less drastically. Receipts were down from $565 million in 1991-92 to $520 million, a fall of 9 %. The CSO changed its price structure early in 1993 to increase the price per carat of better quality stones, and reduce the price per carat of lower quality and industrial stones. Returns to the State's two producing companies reflect the increasing contribution of the value of quality stones to total revenue.

The world diamond market remained depressed. Demand in the principal consuming regions of North America and Europe remains low and there has been little growth in the relatively new Japanese market. In this trading environment there was a noticeable relative shift in sales focus to quality stones. The market for poorer quality and industrial stones remained very weak.

During the year the CSO reached agreements with the Governments of Angola and Zaire aimed at controlling and policing contraband export of diamonds from those countries. At this stage it is not certain whether the agreements will remain effective. The Organisation has also negotiated marketing agreements with producing cooperatives within the CIS. This has also had the effect of reducing the actual and potential supply to the market of non-cartel diamonds. This should allow the CSO to enforce quotas and maintain prices in the short term.

Analysts of the current market are predicting a return to stability and a steady improvement during 1993-94. Factored into this scenario is a general resurgence of economic activity and an associated increase in demand for luxury goods. Even under these assumptions, the demand for lower value grades is expected to remain weak for at least the next two years.

Locally, the Argyle joint venturer is completing a $100 million expansion of its hard rock treatment plant. Capacity will be increased from 6 million to 8.5 million tonnes, and diamond production will increase by 5 million carats to an average of around 40 million carats a year. The expansion will compensate for the declining grades which are being encountered at depth. While considerable profits are generated by the sale of the rare pink gems, the company is continuing a marketing focus on promoting yellow and brown diamonds. The relatively small Bow River operation had another solid year but has reserves to last only until 1995.

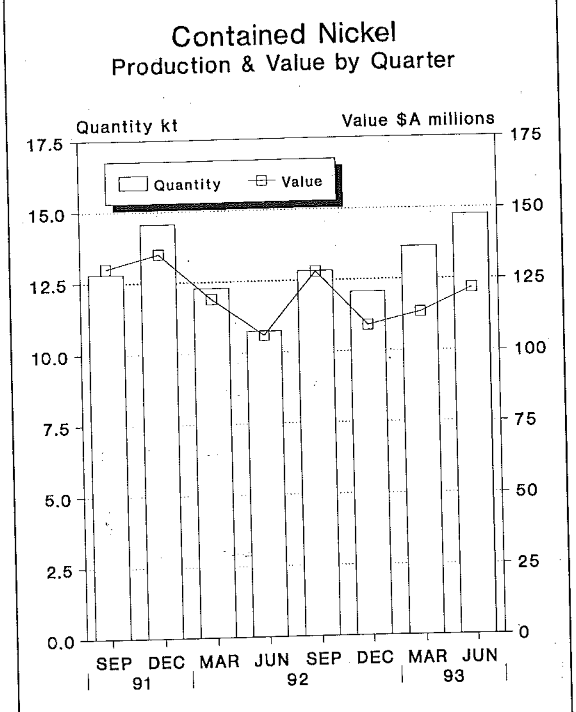
There is a relatively high level of diamond exploration activity currently underway in the State. The wide distribution of programs range from the Eastern Goldfields, through the Murchison, Pilbara and Kimberley. Extensive pilot plant trials are under way at the Mt Elizabeth prospect in the central Kimberley, but results so far are inconclusive.

2.6 Nickel

The total contained nickel produced from Western Australian mines rose by 6 % to just over 53000 tonnes in 1992-93 (Figure 2.13).

The small increase was as a result of the completion of a rationalisation plan, small gains in throughput at the Kambalda operations and the coming on stream of the Forrestania project,

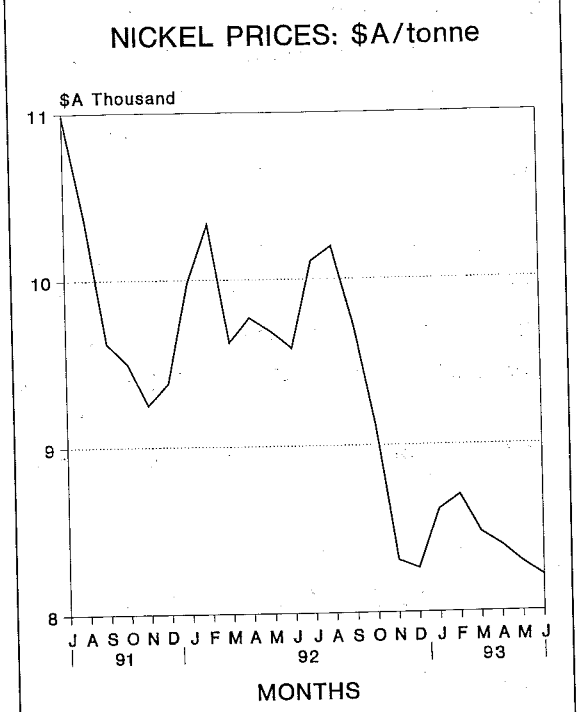
Driven by sharply lower prices, the value of local production fell again during the trading period, with receipts contracting by 4% to $472 million (Figure 2.13).



SOURCE: DOME Figure 2.13

Returns to the State's producers were cushioned to some extent by the continued weakness of the $A. However after a small rally in mid to late 1992, the nickel metal price fell in real terms to the June 1993 level of around $7.70 per kilogram (Figure 2.14).

A chronic situation of global oversupply is the main cause of prevailing low market prices. Commercial stocks held by end users and the London Metals Exchange inventories both rose significantly during the year. Producers have continued to maintain capacity well in excess of current demand. For some producers, especially those in the CIS, this was driven by a collapse of domestic demand and by a need to generate hard currency earnings. Other producers have maintained production in the belief that a manufacturing led recovery from the recession amongst the industrialised countries would occur earlier and at a faster rate than has actually occurred.



SOURCE: L.M.E CASH, MONTHLY AVERAGE. FIGURE 2.14

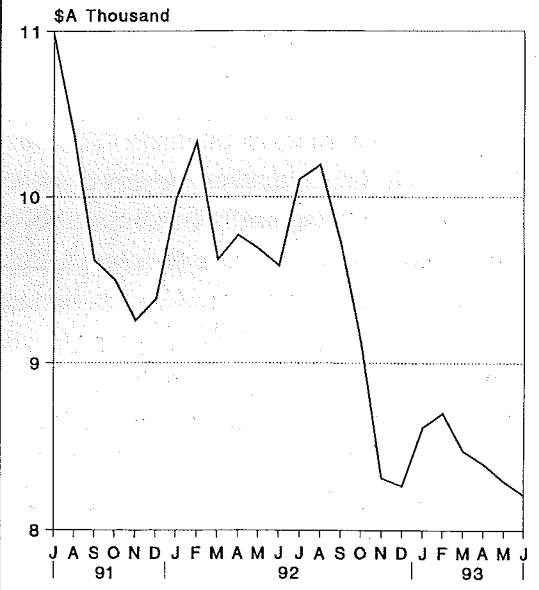
The outlook for a marked recovery in the global manufacturing sector has improved, but is still unconvincing. Given a general upturn in activity, no significant increase in demand during 1994 is expected. On the supply side, output from the CIS should begin to taper off due to capacity reductions. Refineries in Japan and Canada are scheduled to announce production cuts, and a major North American mine is to be closed.

In the prevailing poor market conditions, it is encouraging that Western Australian metal producers are undertaking capital investment to increase production. Concentrate production capacity is being increased at both Leinster and Kambalda, while the capacity upgrades are proceeding at both the Kalgoorlie smelter and Kwinana refinery. The extra smelter and refinery capacity is scheduled to be operational by 1994. The efficiency improvements should significantly enhance the competitiveness of the Western Australian industry.

Construction has started on the $450 million Mt. Keith project, which is expected to be in production by early 1995. Both new and expanded capacity is well placed to take advantage of any medium term improvement in the metal price. Given market conditions, it is also encouraging that a high level of exploration is being maintained.

While Western Australian nickel output is increasing, other Australian production is severely affected by low commodity prices. The State's share of national export tonnages should continue to improve from the present of over 75% during the next few years (Figure 2.15).

NICKEL PRICES: $A/tonne



SOURCE: L.M.E CASH, MONTHLY AVERAGE.

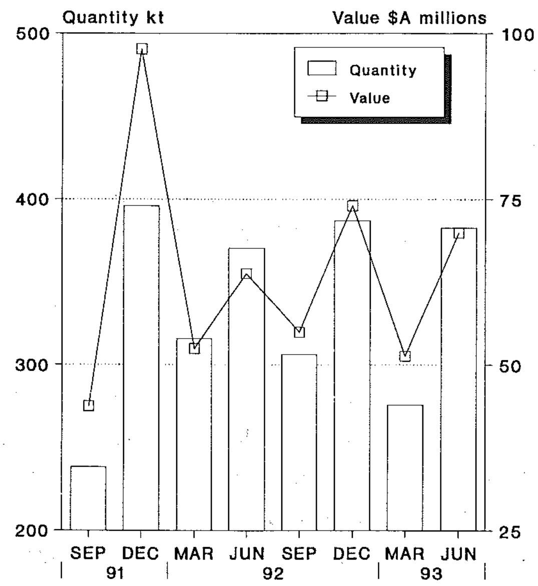
FIGURE 2.14

2.7 Heavy Mineral Sands

The State's output of heavy mineral sands products rose by approximately 11 % to 1.8 million tonnes during the trading period (Figure 2.16). Ilmenite, rutile, zircon and synthetic rutile production all increased substantially, while leucoxene and monazite remained steady. Overall increases were the result of producers attempting to maintain gross income in the face of several years of falling prices.

The value of production also rose. Receipts increased from $336 million in 1991-92 to $351 million, a rise of 4 % (Figure 2.16). Prices continued to fall during the year, especially during the last quarter of 1992. Returns to WA producers were cushioned to some extent by the continued weakness of the $A which fell 8 % during the year. In $A terms, prices for most products were little less than the previous year, however zircon and leucoxene receipts were severely affected. Average zircon prices were only 60 % of the already depressed prices of the previous year.

Ilmenite
Production & Value by Quarter

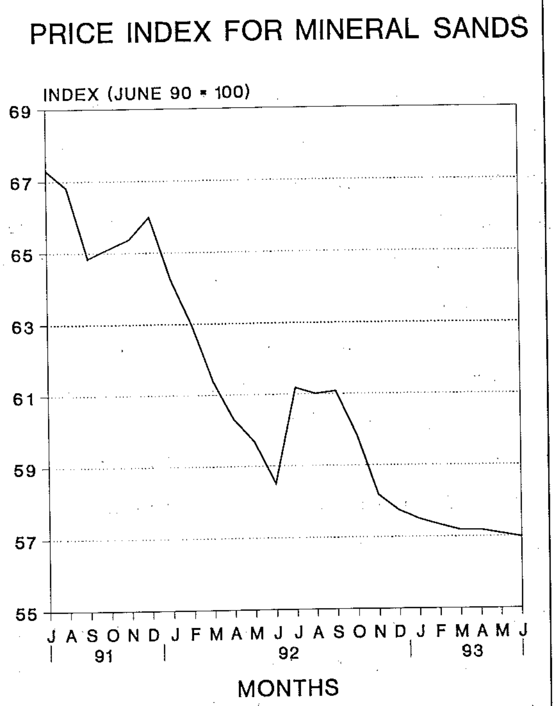


SOURCE: DOME

Figure 2.16

The industry experienced another year of weak product demand and falling prices(Figure 2.17). Working on the assumption of a steady, if unspectacular, global economic recovery during the trading period local producers did not significantly rationalise capacity.
The combination of a more generalised recession and very weak sectoral growth in

key markets of Western Europe and North America continued to impact on final demand. The production of titanium dioxide pigment was particularly hard hit. The anticipated closure of some sulphate route capacity has not occurred, in fact some plants have been refitted. There is therefore little chance of immediate production cut-backs, and oversupply is expected to continue until a sustained economic recovery results in substantially increased demand.

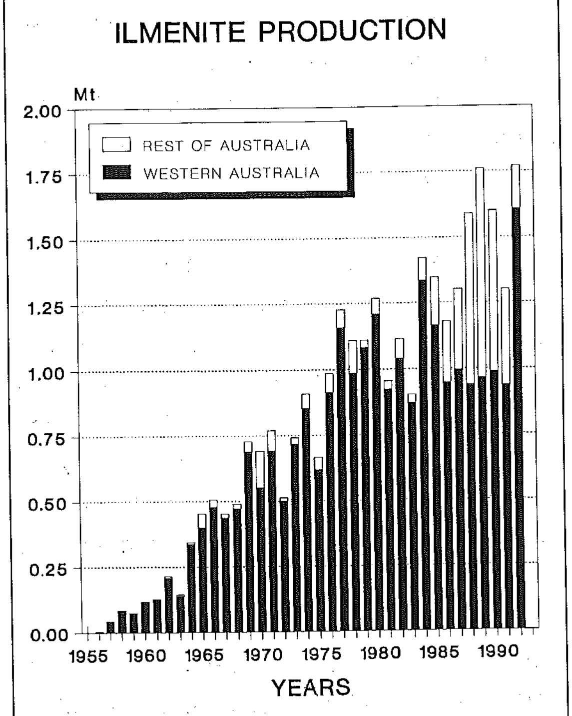


SOURCE: L.M.E. CASH, MONTHLY AVERAGE. FIGURE 2.17

There is some concern, however, that even when pigment capacity becomes better utilised, it is likely that feedstock may still be in oversupply. Any medium to long term improvement in ilmenite prices is likely to be modest.

While the market value of most heavy mineral sands products appears to be stabilising, there is continuing pressure on the zircon price. Producers both within Australia and outside have increased output as an effect of increasing overall heavy mineral sands processing. As a result of this structural factor it is possible that the price could fall by another 15% in 1993-94, after a 40% fall in 1992-93. Competition from South African producers is particularly strong, with major planned new projects and expansions of existing ilmenite/zircon capacity.

Although some developments are on hold, Western Australian miners are maintaining their competitive edge and looking forward to a steady recovery. The production of zircon, rutile, synthetic rutile and ilmenite from current facilities is forecast to again rise during 1993-94. As well, construction is progressing at the Jangardup project which is expected to begin producing in late 1994. Bulk sampling has been completed for the proposed Beenup project, although there are no immediate plans to begin production. Westralian Sands' proposed new $100 million synthetic rutile plant is still under active consideration.



SOURCES: DOME, BMR & ABARE FIGURE 2.18

Action taken by the industry to overcome low world prices, including upgrading of existing plant and infrastructure, plus planned expansions, will ensure Western Australia's position as a major global titanium minerals producing region. Western Australia will continue to produce the bulk of the national output of heavy mineral sands (Figure 2.18).

2.8 Summary and Outlook

The total value of minerals and petroleum produced in the State during 1992-93 was $12 331 million, a marginal increase on that recorded in the previous period. Although most commodity prices fell in nominal terms, the effective devaluation of the currency roughly maintained gross incomes.

Most sectors in Western Australia have already adjusted as far as possible to the protracted period of low demand and soft prices for mineral commodities. These adjustments have made most sectors particularly competitive on an open world market. As a result, local producers are generally well placed to profit from any sustained improvement in market conditions. There is, however, little evidence of improved trading conditions occurring during the current year, and producers of most commodities are facing ongoing low prices, tight markets and poor profitability.

Although some signs are emerging of an economic recovery in the US, there is still no real evidence for a general return to economic growth in the World's major economies. The end of the recession in the main industrialised countries has been predicted confidently for some time, and there is substantial evidence that belief in those predictions has prevented major restructuring in many minerals sectors.

Although there is some evidence that mineral producers, particularly those most affected by the global downturn, have begun to rationalise output it is not of a magnitude to significantly address the oversupply problem. Only a worldwide return to economic growth by the major manufacturing countries will comprehensively right that structural imbalance. This slight reduction in product entering the market may alleviate the downward pressure on prices for some commodities, and is good new for producers in Western Australia.

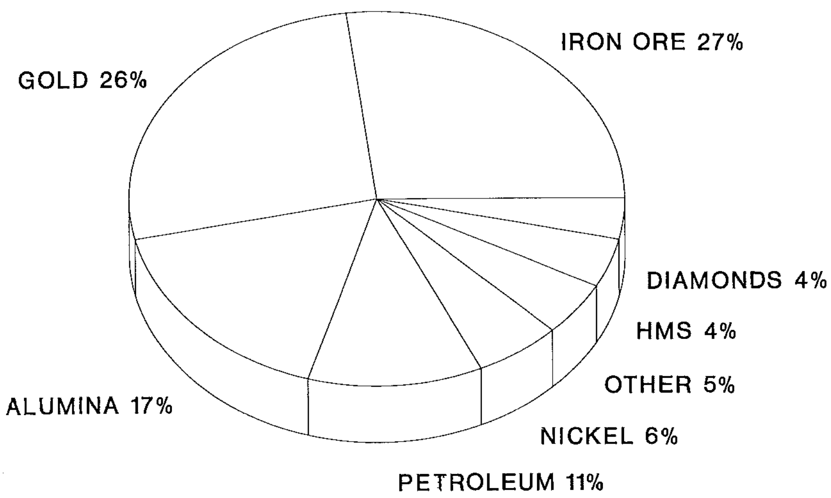
Although the US economy appears to be gathering strength, sectoral performances are very mixed. There is some evidence that, even if growth is maintained for several quarters in a row, this will only slowly translate to the economies of other countries. This is especially true if the protectionist leaning of the present administration hardens and new tariffs or trade enhancement systems emerge. Significant sanction mechanisms could be directed against some sectors of the Japanese economy.

It is now considered unlikely that the two fiscal stimulatory packages implemented by the Japanese Government will be effective in promoting rapid growth in that economy. Further measures are unlikely in the short term, especially as the new regime has different political priorities. The major economies of Western Europe are still deeply in recession, and show no signs of an early return to growth. There is therefore little chance of a substantial improvement in the global economy during 1993-94.

The short term outlook is for continued poor demand, and a continuation of relatively low commodity prices. It is very likely that there will be a further rationalisation of production in some competitor countries.

COMPARATIVE VALUE OF PRODUCTION

1987-88 VALUE OF PRODUCTION
TOTAL : $6,945 MILLION



1992-93 VALUE OF PRODUCTION
TOTAL : $12,331 MILLION

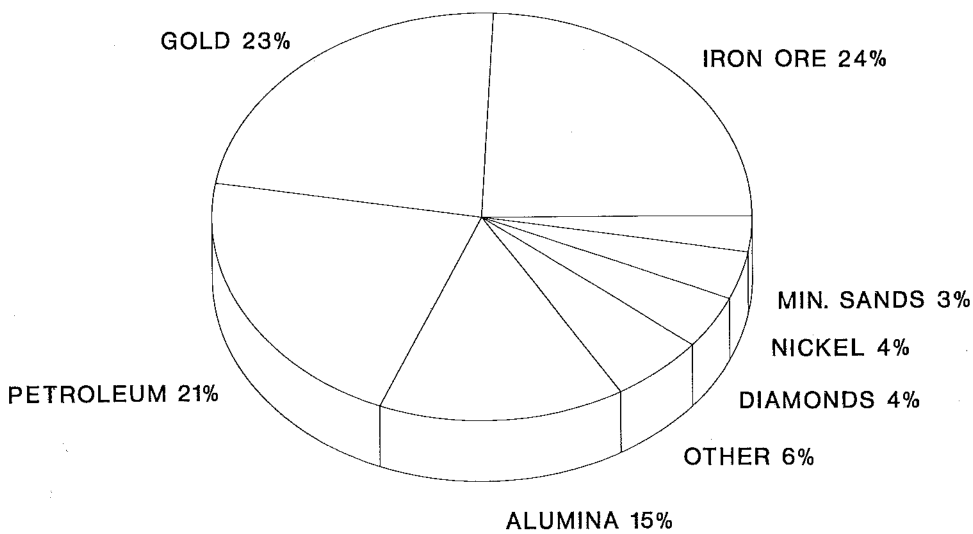


TABLE 3.1 **QUANTITY AND VALUE OF MINERALS AND PETROLEUM 1991-91, 1992-93**

MINERAL	UNIT	1991-92 QUANTITY	1991-92 VALUE($)	1992-93 QUANTITY	1992-93 VALUE($)
BASE METALS					
Copper Metal	t	12 018	17 440 805	**24 865**	**27 438 799**
Lead Metal	t	21 678	7 297 295	**22 302**	**6 649 704**
Zinc Metal	t	142 919	125 578 837	**127 963**	**104 106 685**
TOTAL BASE METALS			150 316 937		**138 195 188**
BAUXITE-ALUMINA					
Alumina	t	7 129 199	1 758 150 370	**26 537 161**	**1 818 116 459**
CLAYS					
Attapulgite	t	19 329	5 860 557	**20 208**	**5 891 735**
Cement Clay	t	16 741	170 243	**0**	**0**
Fire Clay	t	0	0	**29 927**	**35 913**
Kaolin	t	3 120	218 131	**2 840**	**175 794**
White Clay	t	22 575	225 745	**22 984**	**249 946**
TOTAL CLAYS			6 474 676		**6 353 388**
COAL	t	5 491 310	243 540 117	**5 428 053**	**244 770 356**
CONSTRUCTION MATERIALS					
Aggregate	t	121 343	737 177	**298 943**	**1 791 423**
Gravel	t	120 716	620 463	**57 740**	**283 399**
Rock	t	144 617	538 908	**58 614**	**494 327**
Sand	t	1 031 609	5 752 069	**1 304 088**	**6 098 122**
TOTAL CONSTRUCTION MATERIALS			7 648 617		**8 667 271**
DIAMOND	ct	47 485 294	564 768 721	**24 827 163**	**519 981 370**
DIATOMITE	t	169	1 300	**445**	**5 171**
DIMENSION STONE					
Black Granite	t	5 687	1 932 444	**1 486**	**443 200**
Quartz Rock	t	295	13 258	**1 002**	**45 047**
Spongolite	t	376	26 836	**200**	**16 400**
TOTAL DIMENSION STONE			1 972 538		**504 647**
GEM, SEMI-PRECIOUS & ORNAMENTAL STONE					
Agate	kg	0	0	**28 384**	**22 012**
Amethyst	kg	17 659	127 910	**25 352**	**308 045**
Chalcedony	kg	0	0	**13 000**	**9 117**
Chrysoprase	kg	18 555	342 249	**27 773**	**1 450 587**
Jasper	kg	8 844	7 499	**70 819**	**45 116**
Tourmaline	kg	0	0	**88**	**17 138**
Malachite	kg	0	0	**1 960**	**7 415**

TABLE 3.1 (cont)		1991-92		1992-93	
MINERAL	UNIT	QUANTITY	VALUE($)	QUANTITY	VALUE($)
GEM, SEMI-PRECIOUS & ORNAMENTAL STONE (cont)					
Variscite	kg	0	0	1 863	7 550
TOTAL GEM, SEMI-PRECIOUS & ORNAMENTAL STONE			477 658		1 866 980
GOLD	kg	182 043 (r)	2 689 922 065 (r)	179 800 (e)	2 834 190 199 (e)
GYPSUM	t	101 822	1 041 012	124 486	1 100 095
HEAVY MINERAL SANDS					
Garnet	t	35 993	3 385 985	42 517	4 038 822
Ilmenite	t	974 801	83 153 556	990 351	81 661 030
Upgraded Ilmenite (a)	t	305 118	153 117 864	361 421	168 546 726
Leucoxene	t	11 782	6 517 864	11 215	4446491
Monazite	t	7 372	2 131 269	6 211	1813910
Rutile	t	47 466	26 878 559	75 928	42135260
Zircon	t	226 930	61 114 152	302 463	49191977
TOTAL HEAVY MINERAL SANDS			336 299 249		351 834 216
INDUSTRIAL PEGMATITE MINERALS					
Felspar	t	22 793	1 057 900	22311	858 398
Mica	t	164	6 483	0	0
TOTAL INDUSTRIAL PEGMATITE MINERALS			1 064 383		858 398
IRON ORE					
Domestic	t	5 797 570	157 663 947	5 037 380	144 446 749
Exported	t	105 845 490	2 795 606 350	106 692 763	2 846 693 812
TOTAL IRON ORE		111 643 060	2 953 270 297	111 730 143	2 991 140 561
LIMESAND-LIMESTONE-DOLOMITE					
Dolomite	t	280	1 120	0	0
Limesand-Limestone	t	2 053 239	12 143 544	2103 555	13 587 083
TOTAL LIMESAND-LIMESTONE-DOLOMITE			12 144 664		13 587 083
MANGANESE ORE	t	395 303	71 855 982	251 532	46 887 348
NICKEL INDUSTRY					
Cobalt by-product	t	634	28808544	287	12 109 563
Nickel Concentrate	t	475 305	485 907 939 (r)	521 030	470 435 536
Nickel Matte	t	221	464 942	835	1 737 236
Nickel Ore	t	5210	3 135 393	0	0
Palladium by-product	kg	555	1 386 855	422	1 626 008
Platinum by-product	kg	126	1 646 045	112	1 246 898
TOTAL NICKEL INDUSTRY			521 349 718 (r)		487 155 241
PEAT	t	762	56 685	1134	84 432

TABLE 3.1 (cont)		1991-92		1992-93	
MINERAL	UNIT	QUANTITY	VALUE($)	**QUANTITY**	**VALUE($)**
PETROLEUM					
Condensate	kl	1 996 708	338 981 745	**1 995 401**	**363 038 053**
Crude Oil	kl	5 432 496	941 287 650	**4 538 080**	**855 690 950**
LNG	MMBtu	219 701 000	846 334 383	**254 465 858**	**1 025 056 102**
Natural Gas	'000m3	3 768 848	349 257 426	**3 960 289**	**407 019 305**
TOTAL PETROLEUM			2 475 861 204		**2 650 804 410**
SALT	t	6 927 198	153 141 494	**6 632 911**	**158 377 590**
SILICA-SILICA SAND					
Silica	t	74 171	749 846	**61 263**	**652 157**
Silica Sand	t	580 467	5 489 268	**456 896**	**4 332 324**
TOTAL SILICA-SILICA SAND			6 239 114		**4 984 481**
SILVER	kg	42 697	6 540 741	**81 833**	**12 371 221**
TALC	t	168 891	11 822 370	**158 789**	**11 525 240**
TIN-TANTALUM-LITHIUM					
Spodumene	t	42 516	8 893 387	**42 550**	**7 341 552**
Tantalite	t	873	25 005 667	**537**	**19 741 076**
Tin	t	273	1 286 279	**209**	**1 139 902**
TOTAL TIN-TANTALUM-LITHIUM			35 185 333		**28 222 530**
VERMICULITE	t	225	39 943	**199**	**35 293**
TOTAL VALUE			12 009 185 188 (r)		**12 331 619 167** (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.

(a) Also known as synthetic rutile

(e) Estimate

(r) Revised from previous edition

TABLE 4.1 QUANTITY AND VALUE OF MINERALS AND PETROLEUM BY LOCAL GOVERNMENT AREA

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
BASE METALS			Cu Tonnes		
Copper By-Product	Coolgardie		5 161.885	6 003 045	
	Roebourne		159.234	206 109	
			5 321.119	6 209 154	(a),(b)
			Cu %		
Copper Concentrates	Boddington	12 216	27.14	5 643 242	
	Meekatharra	47 657	24.17	10 113 399	
	Yalgoo	14 768	31.88	5 473 004	
		74 641		21 229 645	(a)
Total Copper				27 438 799	
			Pb %		
Lead	Derby-West Kimberley	27 673	80.59	6 649 704	(a)
			Zn %		
Zinc	Derby-West Kimberley	92 502	61.18	46 004 233	
	Yalgoo	170 143	41.95	58 102 452	
		262645		104 106 685	(a)
TOTAL BASE METALS				138 195 188	
BAUXITE - ALUMINA					
Alumina	Boddington	1 606 063		388 436 575	
	Harvey	1 252 327		301 874 462	
	Murray	2 918 779		701 982 874	
	Serpentine-Jarrahdale	1 770 687		425 822 548	
		7 547 856		1 818 116 459	(c)
CLAYS					
Attapulgite	Mullewa	20 208		5 891 735	(a)
Fire Clay	Chittering	29 927		35 913	(d)
Kaolin	Bridegetown-Greenbushes	2 840		175 794	(d)
White Clay	Swan	22 984		249 946	(d)
TOTAL CLAYS				6 353 388	
COAL	Collie	5 428 056		244 311 787	(e)
CONSTRUCTION MATERIALS					
Aggregate	Derby-West Kimberley	2 759		16 554	
	Kalgoorlie-Boulder	180 855		1 102 458	
	Port Hedland	100 282		593 896	
	Roebourne	8 639		40 067	
	Wyndham-East Kimberley	6 408		38 448	
		298 943		1 791 423	

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
CONSTRUCTION MATERIALS (cont)					
Gravel	Ashburton	162		972	
	Broome	9 134		39 767	
	Coolgardie	2 840		14 640	
	Kalamunda	33 434		167 170	
	Port Hedland	12 000		60 000	
	Shark Bay	170		850	
		57 740		283 399	
Rock	Broome	16 909		229 339	
	Exmouth	11 830		82 519	
	Port Hedland	341		5 161	
	Roebourne	25 534		169 308	
	Yilgarn	4 000		8 000	
		58 614		494 327	
Sand	Ashburton	8 795		43 975	
	Broome	15 781		70 905	
	Canning	567 657		2 270 628	
	Cockburn	19 218		76 871	
	Collie	14 592		84 306	
	Coolgardie	85 111		429 355	
	Dandaragan	790		4 740	
	Derby-West Kimberley	766		5 132	
	East Pilbara	5 155		29 968	
	Gingin	5 054		30 329	
	Leonora	8 273		49 638	
	Meekatharra	149 069		894 414	
	Menzies	514		2 570	
	Northam	9 385		28 155	
	Port Hedland	39 039		214 487	
	Roebourne	346 805		1 783 927	
	Swan	17 256		28 825	
	Wanneroo	238		357	
	Wyndham	3 590		21 540	
	Yilgarn	7 000		28 000	
		1 304 088		6 098 122	
TOTAL CONSTRUCTION MATERIALS				8 667 271	(d)

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
		Carats			
DIAMOND	Wyndham-East Kimberley	24 827 163		519 981 370	(a)
DIATOMITE	Dandaragan	445		5 171	(d)
DIMENSION STONE					
Black Granite	Dundas	1 486		443 200	(d)
Quartz Rock	Mukinbudin	1 002		45 047	(d)
Spongolite	Plantagenet	200		16 400	(e)
TOTAL DIMENSION STONE				504 647	
GEM, SEMI-PRECIOUS AND ORNAMENTAL STONE		kg			
Agate	East Pilbara	28 384		22 012	
		kg			
Amethyst	Upper Gascoyne	25 352		308 045	
		kg			
Chalcedony	Carnarvon	13 000		9 117	
		kg			
Chrysoprase	Laverton	8 188		144 000	
	Menzies	19 585		1 306 587	
		27 773		1 450 587	
		kg			
Jasper	East Pilbara	70 819		45 116	
		kg			
Malachite	Meekatharra	1 960		7 415	
		kg			
Tourmaline	Yilgarn	88		17 138	
		kg			
Variscite	Meekatharra	1 863		7 550	
TOTAL GEM, SEMI-PRECIOUS AND ORNAMENTAL STONE				1 866 980	(e)
GOLD			Au kg		
	Ashburton		14.107	222 388	
	Boddington		15 687.988	247 735 406	
	Coolgardie		17 026.433	268 501 378	
	Cue		10 062.422	158 024 965	
	Dundas		1 938.745	30 687 885	
	East Pilbara		12 553.027	197 779 908	
	Kalgoorlie-Boulder		44 049.893	694 568 295	
	Laverton		11 972.563	188 158 047	
	Leonora		19 273.229	304 100 718	

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
GOLD (cont)			Au kg		
	Meekatharra		17 941.689	282 699 535	
	Menzies		1 225.072	19 240 863	
	Mt Magnet		5 052.577	79 697 573	
	Roebourne		4.669	73 609	
	Sandstone		3 176.589	49 963 702	
	Wiluna		3 227.300	50 754 042	
	Yalgoo		1 689.543	26 502 793	
	Yilgarn		14 904.312	235 479 092	
			179 800.158	2 834 190 199	(f)
GYPSUM	Dalwallinu	36 660		585 306	(d),(e)
	Esperance	4 284		25 310	(e)
	Kellerberrin	1 725		12 075	(e)
	Lake Grace	7 773		38 865	(e)
	Merredin	2 025		16 200	(e)
	Nungarin	19 372		116 232	(e)
	Plantagenent	8 123		52 976	(e)
	Ravensthorpe	12 543		70 000	(e)
	Wyalkatchem	28 381		156 131	(e)
	Yilgarn	3 600		27 000	(e)
		124 486		1 100 095	
HEAVY MINERAL SANDS					
Garnet Sand	Capel	747		70 694	(g)
	Northampton	41 770		3 968 128	(e)
		42 517		4 038 822	
			TiO_2 %		
Ilmenite	Capel	632 257	54.71	53 040 873	
	Carnamah	105 839	60.73	7 671 875	
	Dandaragan	208 887	62.73	17 427 747	
	Waroona	43 368	54.69	3 520 535	
		990 351		81 661 030	
			TiO_2 %		
Upgraded Ilmenite	Capel	157 921	92.00	73 069 083	
	Carnamah	175 787	92.00	83 969 931	
	Dandaragan	27 713	92.00	11 507 712	
		361 421		168 546 726	
TOTAL ILMENITE		1 351 772		250 207 756	(a)

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
HEAVY MINERAL SANDS (cont)			TiO_2 Tonnes		
Leucoxene	Capel	10 117	9 241	4 106 091	
	Waroona	1 098	1 006	340 400	
		11 215	10 247	4 446 491	(a)
			ThO_2 Units		
Monazite	Capel	2 110	13 553	583 860	
	Carnamah	4 101	26 212	1 230 050	
		6 211	39 765	1 813 910	(a)
			TiO_2 Tonnes		
Rutile	Carnamah	60 915	57 010	34 408 850	
	Dandaragan	15 013	14 412	7 726 410	
		75 928	71 422	42 135 260	(a)
			ZrO_2 Tonnes		
Zircon	Capel	71 460	46 464	12 039 841	
	Carnamah	156 892	102 991	25 906 709	
	Dandaragan	69 959	46 172	10 576 767	
	Waroona	4 152	2 698	668 660	
		302 463	198 325	49 191 977	(a)
TOTAL HEAVY MINERAL SANDS				351 834 216	
INDUSTRIAL PEGMATITE MINERALS					
Felspar	Mukinbudin	8 761		345 042	
	Port Hedland	13 550		513 356	
		22 311		858 398	(h)
IRON ORE			Fe%		
Domestic Ore	Ashburton	447 381	60.08	11 755 732	
	Derby-West Kimberley	1 149 113	64.33	34 464 009	
	East Pilbara	3 440 886	62.28	98 227 008	
		5 037 380		144 446 749	
			Fe%		
Exported Ore	Ashburton	64 823 346	61.53	1 686 919 365	
	Derby-West Kimberley	2 122 846	64.82	53 470 316	
	East Pilbara	39 746 571	62.78	1 106 304 131	
		106 692 763		2 846 693 812	
TOTAL IRON ORE		111 730 143		2 991 140 561	(a)
LIMESAND - LIMESTONE	Cockburn	1 682 437		8 732 415	
	Dandaragan	2 656		37 444	
	Dundas	50 466		555 126	
	Gingin	46 702		1 152 490	

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
LIMESAND - LIMESTONE	Irwin	3 585		10 858	
	Wanneroo	317 709		3 098 750	
TOTAL LIMESAND-LIMESTONE		2 103 555		13 587 083	(d)
			Mn %		
MANGANESE ORE	East Pilbara	251 532	48.39	46 887 348	(a)
NICKEL INDUSTRY			Co Tonnes		
Cobalt By-Product	Coolgardie		285.88	11 999 174	
	Roebourne		1.53	110 389	
			287.41	12 109 563	(a),(b)
			Ni %		
Nickel Concentrates	Coolgardie	274 877	10.47	256 508 818	
	Kalgoorlie-Boulder	40 355	10.11	36 461 101	
	Leonora	199 788	9.88	173 584 888	
	Yilgarn	6 010	8.24	3 880 729	
		521 030		470 435 536	
			Ni %		
Nickel Matte	Roebourne	835	22.16	1 737 236	
TOTAL NICKEL PRODUCTION				472 172 772	(i)
			Pd kg		
Palladium By-Product	Coolgardie		420.261	1 619 057	
	Roebourne		1.752	6 951	
			422.013	1 626 008	(a),(b)
			Pt kg		
Platinum By-Product	Coolgardie		112.000	1 244 033	
	Roebourne		0.181	2 865	
			112.181	1 246 898	(a),(b)
PEAT	Manjimup	1 134		84 432	(d)
PETROLEUM		Kilolitres			
Condensate	Carnamah	572		25 044	(d)
	Irwin	3 035		465 518	(d)
	Roebourne	1 991 794		362 547 491	(a)
		1 995 401		363 038 053	
Crude Oil	Derby-West Kimberley	19 391		3 115 947	
	Irwin	39 230		5 937 372	
	Roebourne	4 479 459		846 637 631	
		4 538 080		855 690 950	(a)

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
PETROLEUM (cont)		MMBtu			
Liquified Natural Gas	Roebourne	254 465 858		1 025 056 102	(a)
		'000 m3			
Natural Gas	Ashburton	163 902		12 809 041	(j)
	Carnamah	69 457		7 854 613	(j)
	Irwin	241 482		29 232 938	(j)
	Roebourne	3 485 448		357 122 713	(d)(j)
		3 960 289		407 019 305	
TOTAL PETROLEUM PRODUCTS				2 650 804 410	
SALT	Carnarvon	1 300 189		32 952 306	
	Esperance	10 262		271 900	
	Lake Grace	40		3 200	
	Port Hedland	2 037 507		46 885 660	
	Roebourne	2 662 902		62 388 244	
	Shark Bay	529 326		12 252 080	
	Wyalkatchem	40		3 200	
	Yilgarn	92 645		3 621 000	
		6 632 911		158 377 590	(a)
SILICA - SILICA SAND					
Silica	Moora	61 263		652 157	(a)
Silica Sand					
	Canning	148 652		1 635 172	(a)
	Cockburn	215 647		2 372 117	
	Coolgardie	68 421		167 633	(a)
	Wanneroo	24 176		157 402	(a)
TOTAL SILICA - SILICA SAND		518 159		4 984 481	
		Ag kg			
SILVER: BY-PRODUCT	Boddington	1 923.410		288 706	(a),(l)
	Coolgardie	164.369		29 724	(a),(b)
	Meekatharra	20 042.736		3 029 842	(a),(k)
	Roebourne	1 260.903		146 367	(a),(b)
	State-Wide	30 045.539		4 463 500	
	Yalgoo	28 395.959		4 413 082	(a),(l)
		81 832.916		12 371 221	
TALC	Meekatharra	26 783		1 878 680	
	Three Springs	132 006		9 646 560	
		158 789		11 525 240	(e)

TABLE 4.1 (cont) Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value ($)	Ref
TIN - TANTALUM - LITHIUM			Li_2O %		
Spodumene	Bridegetown-Greenbushes	42 550	5.68	7 341 552	(a)
			Ta_2O_5 kg		
Tantalite	Bridegetown-Greenbushes	352	89 114	10 142 685	
	East Pilbara	185	65 814	9 598 391	
		537	154 928	19 741 076	(a)
			Sn Tonnes		
Tin	Bridegetown-Greenbushes	209	143	1 109 557	
	East Pilbara	n.ap.	7	30 345	
		209	150	1 139 902	(a)
VERMICULITE	Ravensthorpe	199		35293	(e)

VALUE OF MINERALS	6 846 165 990
VALUE OF PETROLEUM	2 650 804 410
VALUE OF GOLD	2 834 190 199
TOTAL VALUE	**12 331 160 599**

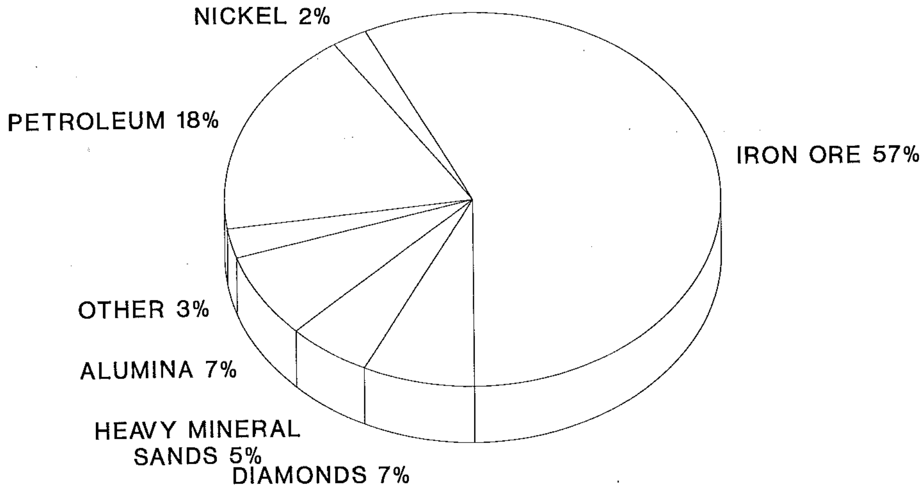
TABLE 5.1 **ROYALTY RECEIPTS 1991-92, 1992-93**

Mineral	1991-92 $A	**1992-93 $A**	Value $A Variance	%up (%down)
BASE METALS				
Copper	697 081.32	**1 081 742.27**	384 660.95	55
Lead	255 500.19	**425 963.28**	170 463.09	67
Zinc	5 020 467.96	**6 331 679.73**	1 311 211.77	26
TOTAL BASE METALS	5 973 049.47	**7 839 385.28**	1 866 335.81	31
BAUXITE-ALUMINA				
Alumina	29 315 958.26	**28 715 039.49**	(600 918.77)	(2)
CLAYS	269 193.35	**313 347.59**	44 154.24	16
COAL	8 560 139.80	**12 535 119.33**	3 974 979.53	46
CONSTRUCTION MATERIALS				
Aggregate	11 238.80	**43 614.84**	32 376.04	288
Gravel	34 080.42	**26 664.48**	(7 415.94)	(22)
Rock	40 737.09	**16 465.49**	(24 271.60)	(60)
Sand	329 922.91	**293 304.32**	(36 618.59)	(11)
Sandstone	58.00	**28.00**	(30.00)	(52)
TOTAL CONSTRUCTION MATERIALS	416 037.22	**380 077.13**	(35 960.09)	(9)
DIAMOND	30 985 305.96	**40 819 425.45**	9 834 119.49	32
DIMENSION STONE	21 949.43	**2 206.86**	(19 742.57)	(90)
GEM, SEMI-PRECIOUS & ORNAMENTAL STONE	21 360.03	**149 094.17**	127 734.14	598
GOLD	204 375.08	**254 114.81**	49 739.73	24
GYPSUM	30 657.62	**29 965.20**	(692.42)	(2)
HEAVY MINERAL SANDS				
Garnet	157 601.51	**194 763.16**	37 161.65	24
Ilmenite	4 736 252.73	**4 772 449.96**	36 197.23	1
Leucoxene	226 390.50	**146 634.20**	(79 756.30)	(35)
Monazite	138 056.77	**100 883.35**	(37 173.42)	(27)
Rutile	1 295 023.91	**2 220 911.78**	925 887.87	71
Zircon	3 788 578.53	**2 316 518.43**	(1 472 060.10)	(39)
TOTAL HEAVY MINERAL SANDS	10 341 903.95	**9 752 160.88**	(589 743.07)	(6)
INDUSTRIAL PEGMATITE MINERALS				
Felspar	20 826.50	**71 801.25**	50 974.75	245
Mica	324.00	**0.00**	(324.00)	(100)
TOTAL INDUSTRIAL PEGMATITE MINERALS	21 150.50	**71 801.25**	50 650.75	239
IRON ORE	152 880 227.56	**152 674 073.14**	(206 154.42)	0

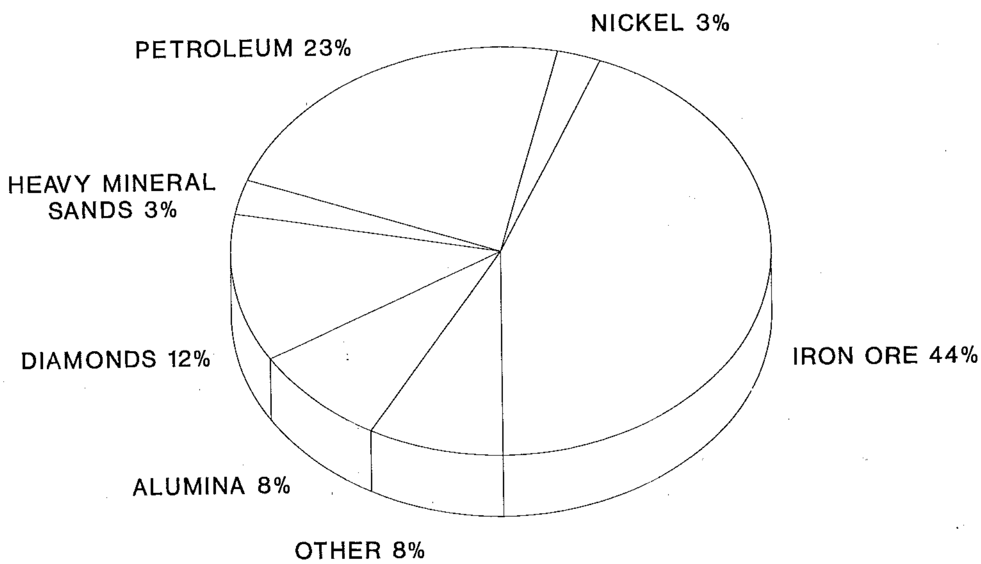
TABLE 5.1 (cont) Mineral	1991-92 $A	**1992-93 $A**	Value $A Variance	%up (%down)
LIMESAND-LIMESTONE-DOLOMITE				
Dolomite	84.00	**0.00**	(84.00)	(100)
Limesand-Limestone	144 700.81	**189 365.84**	44 665.03	31
TOTAL LIMESAND-LIMESTONE-DOLOMITE	144 784.81	**189 365.84**	44 581.03	31
MANGANESE	5 089 927.45	**2 874 157.00**	(2 215 770.45)	(44)
NICKEL				
Cobalt by-product	480 605.24	**307 949.77**	(172 655.47)	(36)
Nickel	10 589 461.24	**9 242 491.13**	(1 346 970.11)	(13)
Palladium by(product	26 113.95	**26 830.61**	716.66	3
Platinum by(product	35 560.33	**23 321.77**	(12 238.56)	(34)
TOTAL NICKEL INDUSTRY	11 131 740.76	**9 600 593.28**	(1 531 147.48)	(14)
PEAT	1 623.78	**2 395.28**	771.50	48
PETROLEUM				
Condensate	2 879 224.65	**3 395 641.06**	516 416.41	18
Liquified Natural Gas	7 144 851.72	**9 299 092.28**	2 154 240.56	30
Natural gas	4 944 107.97	**7 190 160.50**	2 246 052.53	45
Oil	71 552 596.06	**59 843 155.86**	(11 709 440.20)	(16)
TOTAL PETROLEUM	86 520 780.40	**79 728 049.70**	(6 792 730.70)	(8)
SALT	1 410 094.74	**1 426 492.87**	16 398.13	1
SILICA SAND	358 707.05	**258 582.40**	(100 124.65)	(28)
SILVER	154 896.97	**229 484.37**	74 587.40	48
TALC	84 649.50	**82 549.00**	(2 100.50)	(2)
TIN-TANTALUM-LITHIUM				
Spodumene	416 760.90	**422 861.97**	6 101.07	1
Tantalite	491 352.52	**698 767.71**	207 415.19	42
Tin	31 771.14	**33 570.15**	1 799.01	6
TOTAL TIN-TANTALUM-LITHIUM	939 884.56	**1 155 199.83**	215 315.27	23
VERMICULITE	2 206.38	**2 014.94**	(191.44)	(9)
TOTAL VALUE	344 880 604.63	**349 084 695.09**	4 204 090.46	1

COMPARATIVE ROYALTY RECEIPTS

1987-88 ROYALTY RECEIPTS
TOTAL : $166.2 MILLION



1992-93 ROYALTY RECEIPTS
TOTAL : $349.1 MILLION



6.1 Employment in the Mineral and Petroleum Industries

The Western Australian mineral and petroleum industries increased employment during 1992-93. Statistics compiled from industry returns showed that 35427 people were employed at the end of the year, a marginal improvement on the same period in 1991-92.

While there were discreet shifts in employment, representing the closure of depleted deposits and the development of new ones, most sectors reported little change in employee numbers. It was the case, however, that employment continued to decline in all sectors where significant developments and expansions are not taking place, suggesting that the prolonged period of low prices is forcing further staff reductions upon employers. There is no evidence that this process has reached its limit.

The major reduction in full-time employees was in the diamond and iron ore sectors. Diamond producers cut employment by 23 %, although this was mainly associated with the completion of the expansion of the Argyle treatment plant. Iron ore industry employment was reduced by 3 %, principally as a result of production cuts at Pannawonica and Yampi Sound. The largest single reduction was in employment at the Hamersley Iron operations, where a planned program of staff rationalisation was put in place. A further reduction in numbers can be expected during 1993-94.

The heavy mineral sands, nickel and alumina sectors have been most severely affected by protracted low prices. In each case producers have reacted by increasing production to reduce average costs of production.

Although major restructuring by nickel producers resulted in initial job losses the results of investments are beginning to flow through into increased employment. The number of full time jobs in the sector rose by 3 %. The expansion of capacity in primary production and in smelting and refining, over the next two years should result in further increases.

As well as expanding capacity, the State's alumina sector has also deepened investment in its product range. While overall employment rose by 8 %, there is little scope for further increases in the present trading environment.

As part of an overall strategy to address the protracted market downturn heavy mineral sands producers have increased investment in further processing, with synthetic rutile capacity the main area of activity. Despite the closure of the ISK operations, and the completion of the Beenup feasibility study, employment in the rest of the industry increased to maintain sector employment.

Employment in the petroleum sector remained steady. However projected new operations due to be commissioned during 1993-94 and into 1994-95 `will see a sustained rise in production based employment.

Most sectors are faced with at least another year of depressed commodity prices and poor demand. Producers are under increased pressure to increase productivity and seek even further economies in employment. The scope for further efficiencies is now small. However the increasing application of productivity-based enterprise agreements, including the increased willingness of employees to accept significant productivity-based rationalisation as a trade-off for wages gains suggests that employment cuts in existing operations will continue. This is consistent with industry-wide moves to multi-skilling, general skills development and a significant investment in training.

Note on statistics. The statistics reported herein for mineral producers are based on production sites, and therefore represent employment in the operational side of the resources industry. Figures do not include employees in exploration and general administration, and also excludes some people working on a contract or sub-contract basis.

TABLE 6.1 PERSONS EMPLOYED IN THE W.A. MINERALS & PETROLEUM INDUSTRIES AS AT JUNE 30, 1993

MINERAL/Company	LOCATION	1991-92	1992-93
BASE METALS			
BHP Minerals Ltd	Cadjebut	153(r)	152
Murchison Zinc Co. Pty Ltd	Golden Grove	408(r)	318
Western Mining Corporation Ltd	Nifty	0(r)	52
TOTAL BASE METALS		561(r)	522
BAUXITE - ALUMINA			
Alcoa of Australia Ltd	Del Park-Huntley/Pinjarra	1 752(r)	1 896
	Jarrahdale/Kwinana	1 602(r)	1 670
	Wagerup/Willow Dale	627(r)	664
Australian Fused Materials Pty Ltd	East Rockingham	26(r)	30
Worsley Alumina Pty Ltd	Boddington/Worsley	1 040(r)	1 175
TOTAL BAUXITE - ALUMINA		5 047(r)	5 435
COAL			
Griffin Coal Mining Co. Ltd	Chicken Creek	57(r)	56
	Muja	418(r)	425
Western Collieries Ltd	Central Services	71(r)	75
	Western #2	102(r)	118
	Western #5	289(r)	292
	Western #6	167(r)	137
TOTAL COAL		1 104(r)	1 103
DIAMOND			
Argyle Diamond Mines Pty Ltd	Lake Argyle	1 303(r)	1 016
Poseidon Ltd	Bow River	136(r)	98
TOTAL DIAMOND		1 439(r)	1 114
GOLD			
Asarco Australia Ltd	Wiluna	194	136
Australian Resources & Mining Co. NL	Gidgee	132	148
	Mt McLure	108	138
Aztec Mining Co Ltd	Bounty	191	270
Burmine Ltd	Copperhead	78	101
Central Norseman Gold Corp. NL	Central Norseman	207	207
Coolgardie Gold NL	Greenfield	120	132
Dominion Mining Ltd	Bannockburn	112	128
	Labourchere/Nathans	89	108
	Meekatharra	243	183
	Mt Morgans	190	194
Goldfan Ltd	Three Mile Hill	187	221
Hampton Australia Ltd	Jubilee	103	132
Hedges Gold Pty Ltd	Hedges	122	104

MINERAL/Company	**LOCATION**	**1991-92**	**1992-93**
GOLD (cont)			
Hill 50 Gold Mine NL	Mt Magnet	298	328
Kalgoorlie Consolidated Gold Mines Pty Ltd	Kalgoorlie	1389	1362
Metana Minerals	Reedy	177	127
Mining Corporation of Australia Ltd	Mt Pleasant	107	144
Mt Burgess Goldmining Co. NL	Butcher Well	0	102
Newcrest Mining Ltd	Gimlet South	170	190
	New Celebration	479	458
	Telfer	643	707
	Tuckabianna	135	157
Pancontinental Pty Ltd	Kundana	70	66
	Paddington	229	174
Peko Gold Ltd	Peak Hill	81	78
	Kanowna Belle	0	141
Placer Pacific Pty Ltd	Granny Smith	213	199
Plutonic Operations Ltd	Bellevue	198	218
	Darlot	122	76
	Lawlers	107	118
	Plutonic	130	194
Poseidon Ltd	Big Bell	194	97
	Golden Crown	75	69
	Kaltails	99	82
Reynolds Australia Metals Ltd	Mt Gibson	110	130
	Yilgarn	195	266
Samantha Gold NL	Higginsville	85	93
	Hopes Hill	104	109
Sons of Gwalia NL	Sons of Gwalia	117	145
St. Barbara Mines Ltd	Meekatharra	185	200
Western Mining Corporation Ltd	Emu	120	125
	Kambalda\St. Ives	253	614
	Lancefield	130	249
Worsley Alumina Pty Ltd	Boddington	392	488
All Other Operators		2 161(r)	2 012
TOTAL GOLD		**10 173**	**10 720**
HEAVY MINERAL SANDS			
Cable Sands Pty Ltd	Capel	208	226
RGC Mineral Sands Pty Ltd	Capel	211	235
	Eneabba	280	268
	Narngulu	264	279
TiWest Pty Ltd	Cataby/Chandala	242	267
Westralian Sands Ltd	Capel	365	359
All Other Operators		97	1
TOTAL HEAVY MINERAL SANDS		**1 667**	**1 635**

MINERAL/Company	LOCATION	1991-92	1992-93
IRON ORE			
BHP Iron Ore (Goldsworthy) Ltd	Yarrie	0	105
	Nimingarra/Port Hedland	739	732
BHP Iron Ore Ltd	Newman/Port Hedland	3 487	3 610
	Yandicoogina	81	87
BHP Minerals Ltd	Yampi	269	120
Hamersley Iron Pty Ltd	Tom Price - Paraburdoo/Dampier/Channar	3 295	2 824
	Hismelt - Kwinana	0	250
Portman Mining Ltd	Ferro Gully	52	0
Robe River Mining Co. Pty Ltd	Pannawonica/Cape Lambert	769	722
TOTAL IRON ORE		**8 692**	**8 450**
NICKEL			
Outokumpu Australia Ltd	Forrestania	71	183
Western Mining Corporation Ltd	Kalgoorlie	387	441
	Kambalda	1 363	1 174
	Kwinana Refinery	343	463
	Leinster	751	611
	Mt Keith	0	145
	Mt Windarra	139	0
All Other Operators		10	0
TOTAL NICKEL		**2 922**	**3 017**
PETROLEUM PRODUCTS			
Hadson Energy Pty Ltd	Harriet/Rosette	130	136
West Australian Petroleum Pty Ltd	Dongara	9	9
	North West Area	223	233
Western Mining Corporation Ltd	North Herald/South Pepper/Chervil	110	102
Woodside Offshore Petroleum Pty Ltd	North Rankin A/Burrup Peninsula	1 661	1 574
All Other Operators		21	20
TOTAL PETROLEUM PRODUCTS		**2 154**	**2 074**
SALT			
Cargill Salt Co.	Port Hedland	129	123
Dampier Salt Ltd	Dampier	167	159
	Lake MacLeod	115	114
Shark Bay Salt JV	Useless Loop	71	60
Other		6	6
TOTAL SALT		**488**	**462**
ALL OTHER MATERIALS (including Rock Quarries)		**930**	**895**
TOTAL		**35 177(r)**	**35 427**

(SOURCE: AXTAT REPORTING SYSTEM, MINING ENGINEERING DIVISION)

7.1 PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1992, address, telephone number: minesite.

BASE METALS

Copper

Murchison Zinc Co. Pty Ltd, C/- Normandy Poseidon Ltd, 100 Hutt St, Adelaide, S.A., (08) 303 1700: Golden Grove.

Newcrest Mining Ltd, 600 St Kilda Rd, Melbourne 3004, (03) 522 5333: New Celebration, Telfer.

Western Mining Corp. Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 479 0711: Nifty, Kambalda.

Lead - Zinc

BHP Minerals Ltd, 44 Hamersley St, Broome 6725, (091) 92 2006: Cadjebut.

Murchison Zinc Co. Pty Ltd, C/- Normandy Poseidon Ltd, 100 Hutt St, Adelaide, S.A., (08) 303 1700: Golden Grove

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, Collie 6225, (097) 34 8311: Boddington.

CLAY

Attapulgite

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

Kaolin

Greenbushes Ltd, 16 Parliament Pl, West Perth 6005, (09) 481 1988: Greenbushes.

White Clay

Pilsley Investments Pty Ltd, Military Rd, Midland 6056, (09) 250 2111: Middle Swan.

COAL

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

Western Colleries 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

Leslie Salt Company (Inc), 225 St Georges Tce, Perth 6000, (09) 321 1668: Port Hedland.

7.1 PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1992, address, telephone number: minesite.

CONSTRUCTION MATERIALS (cont)

Gravel (cont)

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

Rock

Boral Resources Ltd, 68 Bickley Rd, Cannington 6107, (09) 350 5995: Port Hedland.

County B.S., C/- Specified Services, 123 Burswood Rd, Victoria Park 6100, (09) 362 1100: Yeeda Station.

Specified Services Pty Ltd, 123 Burswood Rd, Victoria Park 6100, (09) 362 1100: Learmonth, Mt Regal.

Sand

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

Quinton Pty Ltd, Lot 117 Cnr Great Eastern Hwy Coolgardie Rd, Kalgoorlie 6430, (090) 213 961: Coolgardie.

The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 472 2000: Comet Vale, Ethel Creek, Karratha, Newman, Nickol Bay, Pinnacles, Sandy Creek, Sullivan's Creek, Turner River, Warrawanda Creek, Warroora, 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 Tomlinson Rd, Welshpool 6106, (09) 362 1411: Mukinbudin.

Spongolite

Woodbridge Investments Pty Ltd, PO Box 591, South Perth 6151: Mt Barker

GEM, SEMI-PRECIOUS & ORNAMENTAL STONE

Agate

Bennett, JSC, PO Box 677, Subiaco 6008, (09) 368 1764: Marillana Station

Amethyst

Soklich F, Lot 326 Dale Pl, Orange Grove 6109, (09) 459 1449: Gascoyne.

Chrysoprase

WA Gem Explorers, 326 Hay St, Perth 6000, (09) 325 4988: Boyce Creek.

7.1 PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1992, address, telephone number: minesite.

GEM, SEMI-PRECIOUS & ORNAMENTAL STONE (cont)

Jasper

The Gemstone Factory, Lot 325 Dale Pl, Orange Grove 6109, (09) 459 4878: Divide Creek.

Variscite

Bennett, JSC, PO Box 677, Subiaco 6008, (09) 368 1764: Milgun Station.

GOLD

Asarco Australia Ltd, 10 Ord St West Perth 6005, (09) 481 2050: Jundee, Wiluna.

Ashton Mining Ltd, 24 Outram St, West Perth 6005, (09) 482 4444: Bardoc-Davyhurst, Harbour Lights-Mertondale, Laverton.

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

Aztec Mining Company Ltd, 99 Shepperton Rd, Victoria Park 6100, (09) 470 1444: Forrestania-Bounty.

Burmine Ltd, Copperhead Mine, Bullfinch 6484, (090) 49 5066: Frasers, Copperhead.

Centaur Mining and Exploration Ltd, 580 St Kilda Rd, Melbourne Vic. 3004, (03) 276 7888: Lady Bountiful Extended.

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

Coolgardie Gold NL, 56b Bayley St, Coolgardie 6429, (090) 26 6132: Bayley's Reward-Greenfields.

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

Dominion Mining Ltd, 10 Richardson St, West Perth 6005, (09) 426 6400: Bannockburn, Gabanintha, Labouchere, Meekatharra, Mt Morgans.

Eltin Minerals Pty Ltd, PMB 31, Kalgoorlie 6430, (090) 21 4844: Grosmont.

Hampton Australia Ltd, C/_ Gold Mines of Kalgoorlie Ltd, 100 Hutt St, Adelaide, S.A., (08) 236 1700: Jubilee.

Hedges Gold Pty Ltd, C/_ Alcoa of Australia Ltd, cnr Davy and Marmion Sts, Booragoon 6153, (09) 364 0111: Hedges.

Herald Resources Ltd, 45 Richardson St, West Perth 6005, (09) 322 2788: Gum Creek-Montague, Sandstone, Three Mile Hill.

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

Kitchener Mining NL, Suite 21, Piccadilly Sq, cnr Short St & Nash St, Perth 6000, (09) 325 4997: Bamboo Creek, Normay.

Metall Mining Aust. Pty Ltd, cnr Throssell & Forrest Sts. Kalgoorlie 6430, (090) 21 1766: Round Dam, West Black Flag-Broads Dam.

Metana Minerals, 161 Great Eastern Hwy, Belmont 6104, (09) 479 0222: Reedy, Youanmi.

Mining Corporation of Australia Ltd, 32 Lane St, Kalgoorlie 6430, (090) 21 5144: John West, Mt Pleasant-Golden Kilometre.

Mt Edon Gold Mines (Aust) NL, 30 Ledgar Rd, Balcatta 6021, (09) 345 1588: Tarmoola-King Of The Hills.

Mt Martin Gold Mines NL, 9 Bowman St, South Perth 6151, (09) 368 2011: Mt Martin.

Newcrest Mining Ltd, 179 Gt Eastern Hwy, Belmont 6401, (09) 270 7070: Comet-Pinnacles, New Celebration, Ora Banda-Gimlet South, Orban JV, Telfer, Tuckabianna.

7.1 PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1992, address, telephone number: minesite.

GOLD (cont)

North Broken Hill-Peko Ltd, 476 St Kilda Rd, Melbourne Vic 3004, (03) 829 0000: Kanowna, Peak Hill.

Orion Resources NL, 42 Ardross St, Applecross 6153, (09) 364 8355: Burbidge-Great Victoria, Yilgarn Star.

Pancontinental Mining Ltd, PO Box 1161, Kalgoorlie 6430, (090) 24 2000: Paddington, Kundana.

Placer Pacific Ltd, PO Box 33, Laverton WA 6440, (090) 31 3111: Granny Smith.

Plutonic Resources Ltd, PMB 46 Meekatharra 6642, (09) 370 8201: Darlot, Lawlers, Plutonic, Sir Samuel-Bellevue.

Poseidon Gold Ltd, 100 Hutt St, Adelaide S.A., (08) 303 1700: Big Bell, Golden Crown, Kaltails, Karonie.

Ramsgate Resources Ltd, 229 Stirling Highway, Claremont 6010, (09) 383 4321: Grace Darling, Mt Monger.

Resolute Resources Ltd, 28 The Esplanade, Perth 6000, (09) 321 4011: Marymia Hill.

Reynolds Australia Metals Ltd, 28 The Esplanade, Perth 6000, (09) 322 2313: Cornishman, Marvel Loch-Southern Cross, Mt Gibson.

St Barbara Mines Ltd, Gt Northern Highway, Meekatharra 6642, (099) 81 8111: Bluebird, Nannine, South Junction.

Samantha Gold NL, 28 The Esplanade, Perth 6000, (09) 481 5288: Higginsville, Hopes Hill-Corinthia.

Sons of Gwalia NL, 16 Parliament Pl, West Perth 6005, (09) 481 1988: Barnicoat, Sons of Gwalia.

Southern Goldfields Ltd, 35 Outram St, West Perth 6005, (09) 321 5115: Nevoria.

Western Mining Corp. Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 479 0711: Emu-Leinster, Hill 50-Mt Magnet, Kambalda-St Ives, Lancefield.

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 Armstromg Rd, Applecross 6153, (09) 364 4951: Wyalkatchem

HEAVY MINERAL SANDS

Garnet Sand

Target Minerals NL, PO Box 188, Geraldton 6530, (099) 23 3644: Port Gregory.

Ilmenite, Rutile, Zircon, Leucoxene & Monazite

Cable Sands (WA) Pty Ltd, PO Box 133, Bunbury 6230, (097) 21 4111: Capel.

ISK Minerals Pty Ltd, PO Picton 6229, (097) 25 4899: Waroona.

RGC Mineral Sands, PO Box 62, Geraldton 6530, (090) 64 2245: Capel, Eneabba North, Eneabba South

TiWest Pty Ltd, 1 Brodie Hall Dve, Bentley 6102, (09) 365 1390: Cooljarloo.

Westralian Sands Ltd, PO Box 96, Capel 6271, (097) 27 2002: Yoganup.

INDUSTRIAL PEGMATITE MINERALS

Felspar

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

7.1 PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1992, address, telephone number: minesite.

IRON ORE

BHP Iron Ore (Goldsworthy) Ltd, 200 St George's Tce, Perth 6000, (09) 320 4444: Shay Gap.
BHP Iron Ore (Jimblebar) Ltd, 200 St George's Tce, Perth 6000, (09) 320 4444: McCamey's.
BHP Iron Ore Ltd, 200 St George's Tce, Perth 6000, (09) 320 4444: Newman, Yandi.
BHP Minerals Ltd, P.O Koolan Island 6733, (091) 910 575: Koolan Island.
Channar Mining Pty Ltd, 191 St George's Tce, Perth 6000, (09) 327 2327: Channar.
Hamersley Iron Pty Ltd, 191 St George's Tce, Perth 6000, (09) 327 2327: Tom Price, Paraburdoo, Brockman.
Robe River Iron Associates, 12 St George's Tce, Perth 6000, (09) 421 4747: Pannawonica.

LIMESAND - LIMESTONE

Cockburn Cement Ltd, Russell Rd, South Coogee 6166, (09) 410 1988: Cockburn Sound, Coogee.
Limestone Building Blocks Co. Pty Ltd, 41 Spearwood Ave, Bibra Lake 6163, (09) 418 4440: 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 Armstromg Rd, Applecross 6153, (09) 364 4951: Dandaragan, Gingin, Irwin, Yanchep.

MANGANESE ORE

Portman Mining Ltd, Level 13, 256 Adelaide Tce, Perth 6000, (09) 268 3333: Woodie Woodie.

NICKEL

Outokumpu Australia Pty Ltd, 141 Burswood Rd., Victoria Park 6010, (09) 472 3144:
Western Mining Corp. Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Blair, Carnilya Hill, Kambalda, Leinster.

PEAT

Peat Resources of Australia Pty Ltd, P.O Box 203, Bentley 6102, (09) 453 3388: Manjimup.

PETROLEUM

Consolidated Gas Pty Ltd, 174 Hamden Rd, Nedlands 6009, (09) 389 8344: Woodada.
Discovery Petroleum NL, 99 Shepparton Rd, Victoria Park 6010, (09) 470 0400: Mt Horner.
Doral Resources NL, 31 Ventnor Ave, West Perth 6005, (09) 481 5866: Tubridgi.
Hadson Energy Ltd, 35 Ventnor Ave, West Perth 6005, (09) 481 8555: Campbell, Harriet, Rosette, Sinbad & Tanami.
Marathon Petroleum Aust. Ltd, 239 Adelaide Tce, Perth 6000, (09) 325 1988: Talisman.
Minora Resources NL, 263 Adelaide Tce, Perth 6000, (09) 307 1345: Blina, Boundary, Lloyd, Sundown, West Terrace.
Sagasco Holdings Ltd, 60 Hindmarsh Sq, Adelaide SA 5000, (08) 235 3700: Beharra Springs.
West Aust. Petroleum Pty Ltd (WAPET), QV1, 250 St Georges Tce, Perth 6000, (09) 263 6000: Barrow Island, Cowle, Dongara, Mondara, Saladin, Yammaderry.

7.1 PRINCIPAL MINERAL & PETROLEUM PRODUCERS 1992, address, telephone number: minesite.

PETROLEUM (cont)

Western Mining Corp. Ltd, 28 Ventnor Ave, West Perth 6005, (09) 482 2444: Chervil, North Herald, South Pepper.

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

SALT

Cargill Australia Ltd, 225 St George's Tce, Perth 6000, (09) 325 4888: Port Hedland.

Dampier Salt (Operations) Pty Ltd, 177A 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

Simoca Operations Pty Ltd, P.O Box 1389 , Bunbury 6230, (097) 912 588: Dalaroo.

Silica Sand

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

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

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, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Mt Burgess.

TALC

Gwalia Minerals NL, 16 Parliament Pl, West Perth 6005, (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, 16 Parliament Pl, West Perth 6005, (09) 481 1988: Greenbushes.

Tantalite - Tin

Goldrim Mining Australia Ltd, 317 Hunter St, Newcastle NSW 2300, (049) 29 2433: Wodgina.

Greenbushes Ltd, 16 Parliament Place, West Perth 6005, (09) 481 1988: Greenbushes.

Pan West Tantalum Pty Ltd, Gateway, 1 Macquarie Place, Sydney NSW 2000, (02) 256 2000: Wodgina.

VERMICULITE

Vermiculite Industries Pty Ltd, 15 Spencer St, Jandakot 6164, (09) 417 9900: Young River.