

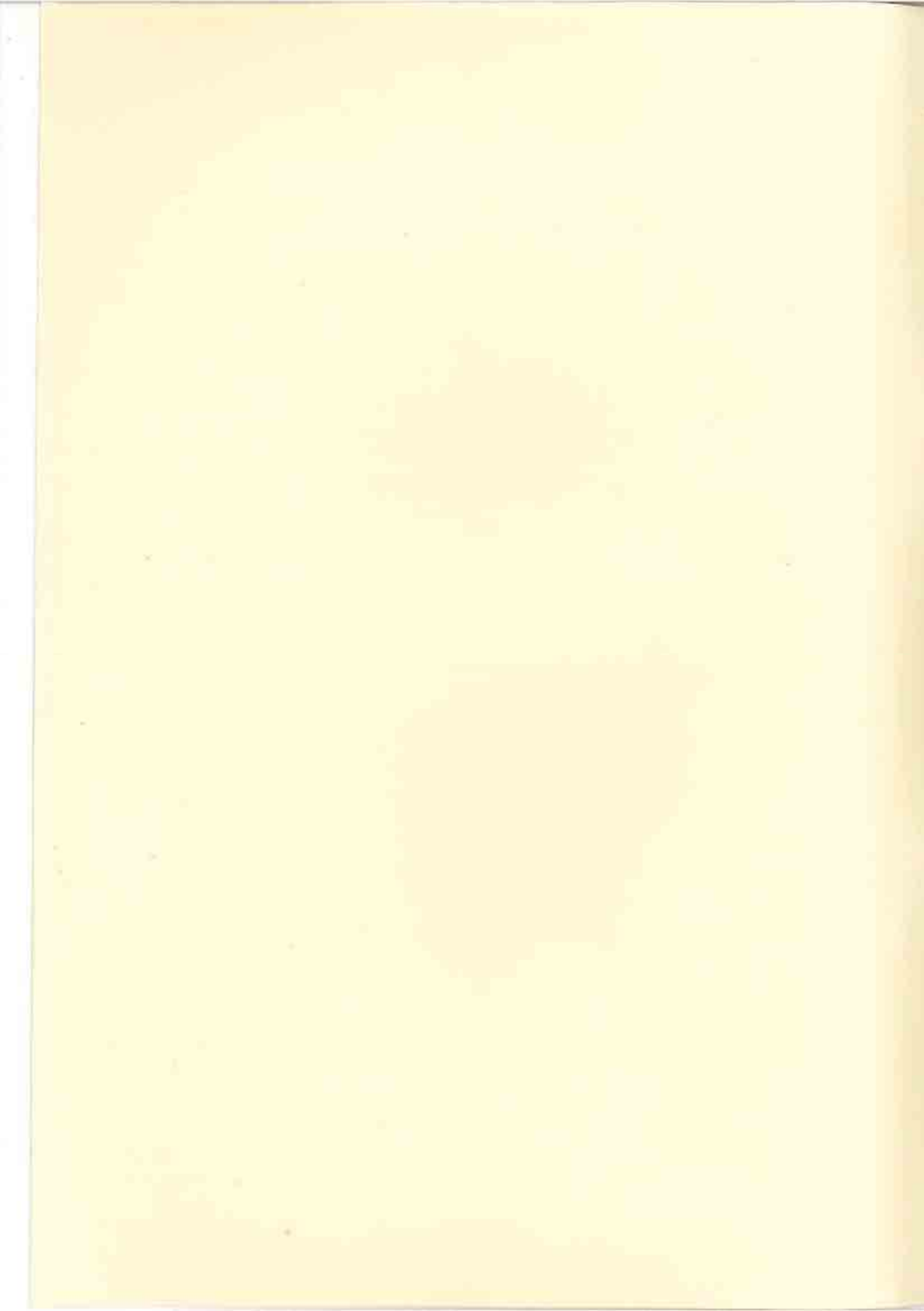


ROYALTIES AND POLICY DEVELOPMENT DIVISION

**STATISTICAL DIGEST OF
MINERAL PRODUCTION
1988**



DEPARTMENT OF MINES
WESTERN AUSTRALIA



STATISTICAL DIGEST OF MINERAL

AND PETROLEUM PRODUCTION

1988

ROYALTIES & POLICY DEVELOPMENT DIVISION
DEPARTMENT OF MINES
MINERAL HOUSE
100 PLAIN STREET
EAST PERTH WA 6004

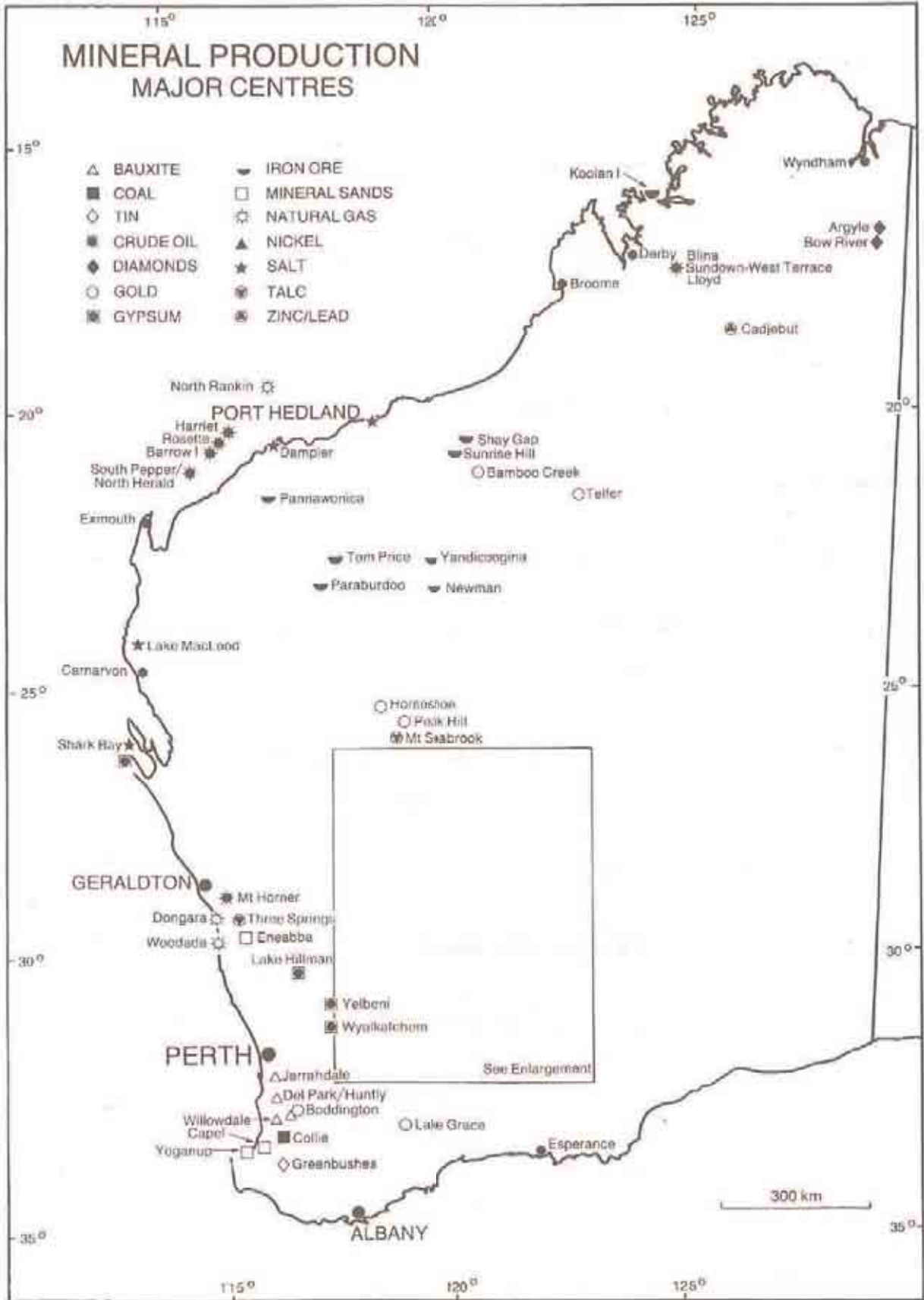
TEL : (09) 222 3102

FACSIMILE : (09) 222 3289

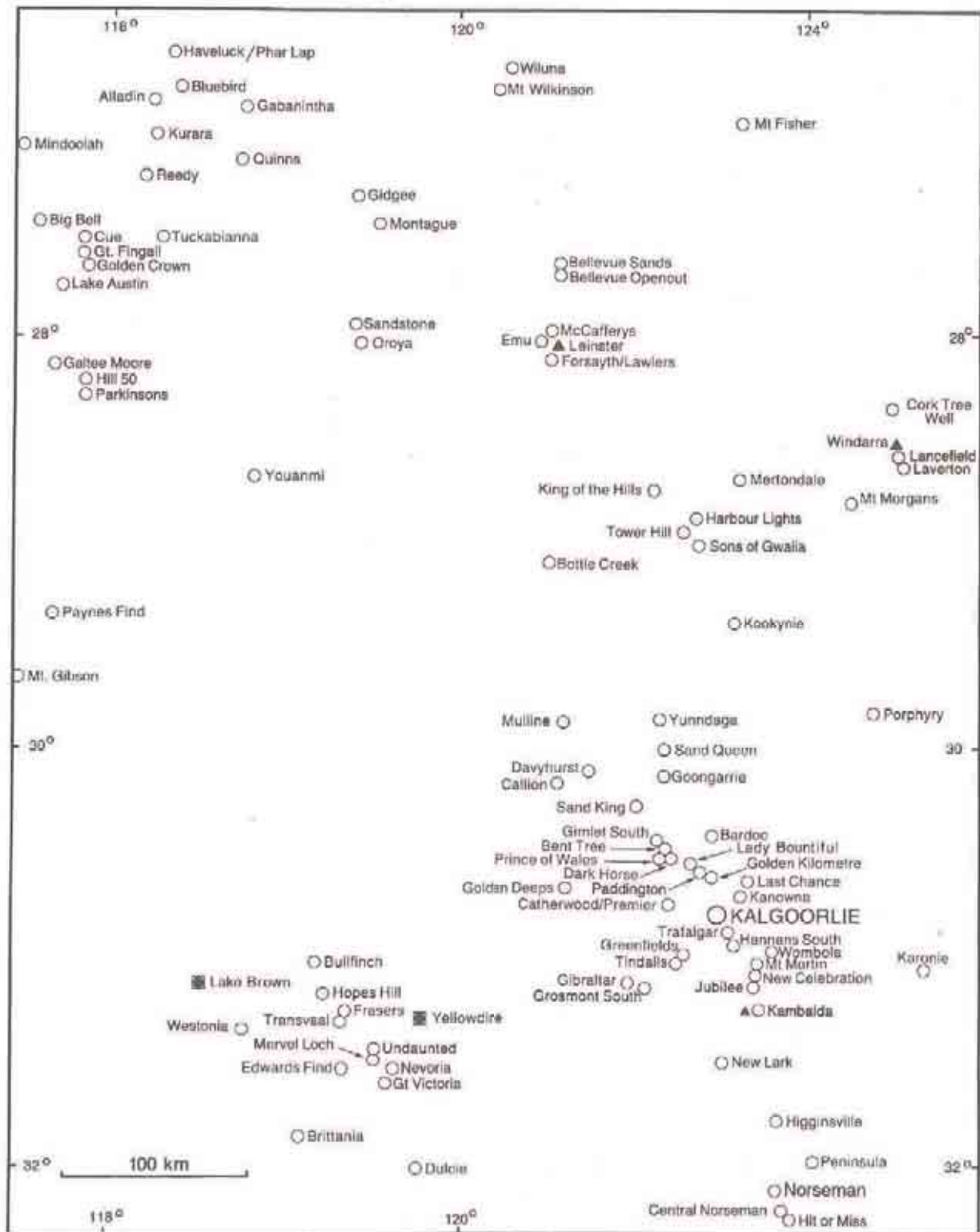
SEPTEMBER 1989

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MINERAL PRODUCTION MAJOR CENTRES



ENLARGEMENT (From previous page)



○ GOLD

▲ NICKEL

■ GYPSUM

OVERVIEW

WESTERN AUSTRALIAN MINERAL AND PETROLEUM PRODUCTION TRENDS:

Introduction

The value of Western Australia's mineral (and petroleum) production increased by \$800 million during 1988. This increase raised the total value of output to over \$7.0 billion, a rise of 11.0% on the \$6.3 billion total for 1987.

Gold, nickel, diamonds and mineral sands were the outstanding performers in terms of total value of production. Most of the sector increases were generated by international market price rises.

Downward price movements, particularly in crude oil and natural gas, resulted in output values below those recorded in 1987. For most of the commodities in the latter position rising production mitigated price falls.

With existing capacity levels and firming prices, the mining industry is well placed to register sustained growth through 1989.

Gold

In 1988 the total value of gold production was \$1.9 billion.

This figure represented a 16.5% increase over the previous year's record. With this increase, gold surpassed iron ore as Western Australia's most important mineral commodity.

The rise in value of output was achieved despite a decline to \$US439.81 per ounce in the year's average monthly gold price. The equivalent monthly average price for 1987 was \$US446.36 per ounce.

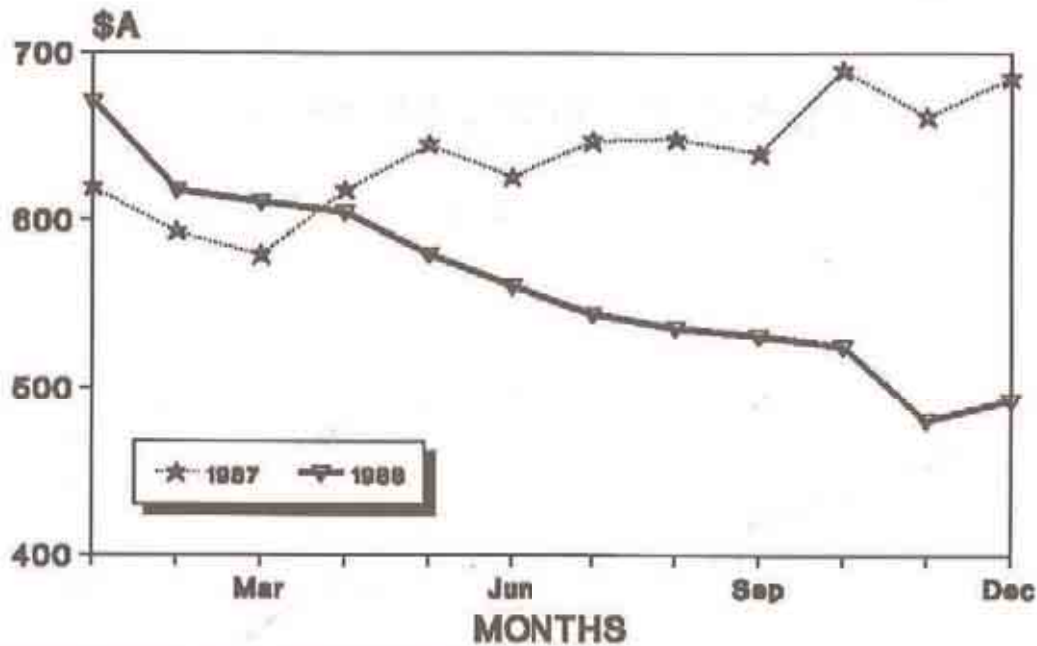
Production rose from 78.4 tonnes in 1987 to 107.2 tonnes in 1988. Thirty three new mines, each with a potential output in excess of 100kg per annum were commissioned during the year.

These new mines, plus significant development work and throughput capacity increases on existing projects, generated the tonnage rise. Significant capital expenditure was undertaken during 1988 at the Boddington, Telfer and Marvel Loch projects.

Production looks set to continue rising in 1989 with major investments in new mines and plant capacity due to come on stream. Some of the latter are the Granny Smith, Mt Hope, Labouchere and Rothsay operations.

It is projected that statewide production of gold will be in excess of 130 tonnes in 1989. If the world gold price continues to drift lower, an increase in net output during 1989 could be accompanied by some industry rationalization as producers seek to lower costs.

GOLD PRICE: \$A/oz.



SOURCE: LONDON GOLD PRICE, MONTHLY

AVERAGE OF WEDNESDAY PRICES

Iron Ore

Iron ore production increased from 84.12 million tonnes in 1987 to 98.31 million tonnes in 1988. This represented a 16.8% increase in output. Despite this significant overall rise in production, the total export value of Western Australian iron ore increased only marginally.

Iron ore prices have been depressed since the early 1980's recession and subsequent period of over supply on world markets. As the demand for steel has steadily risen, particularly during the past 18 months, there has been upward pressure on iron ore prices.

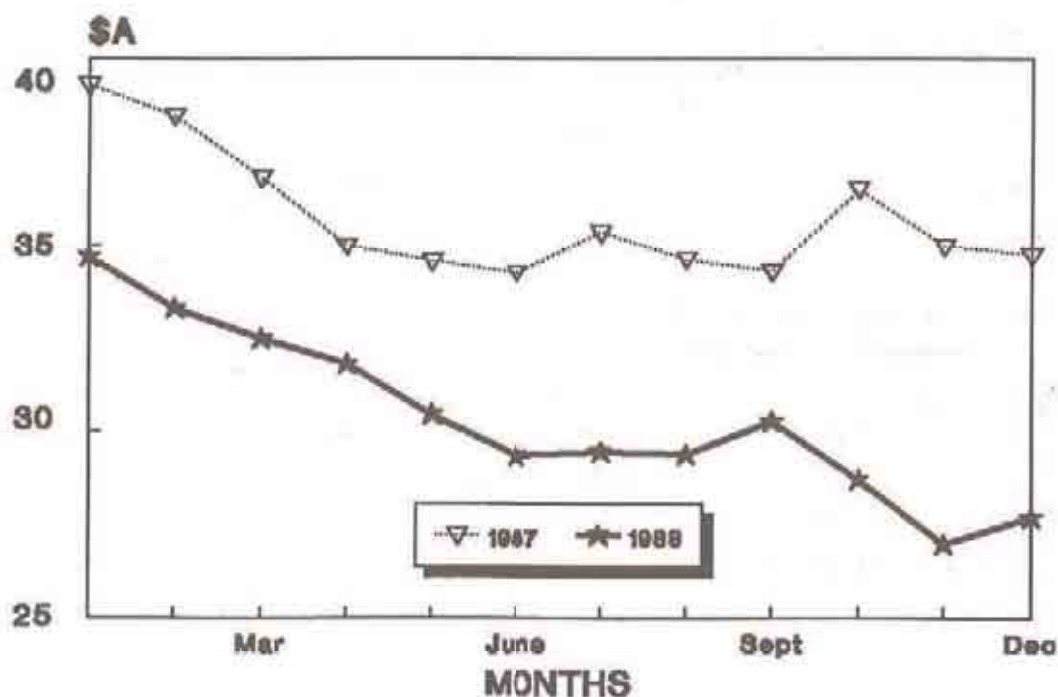
Negotiations with Japanese steelmakers have yielded price rises for 1989 of 17.3% for lump ore and a 13.0% increase for fine ore. The demand driven price increase is projected to be sustained and this has positive implications for development and production planning in the Western Australian industry.

1988 saw the first expansions in capacity for several years. Three new operations - Mt Newman's Marra Mamba (June 1988), Mt Goldsworthy's Nimingara (December 1988) and Hancock Mining's McCamey's Monster (February 1989) - are expected to boost Western Australia's iron ore capacity by 8 million tonnes per annum.

In addition to these major projects, mine development work by existing producers will result in a considerable expansion of

output during 1989. The extra capital formation and operating expenditure commitments are strong evidence of producer confidence in the industry's future.

IRON ORE PRICE : \$A/tonne



SOURCE: HIGH GRADE LUMP ORE PRICES

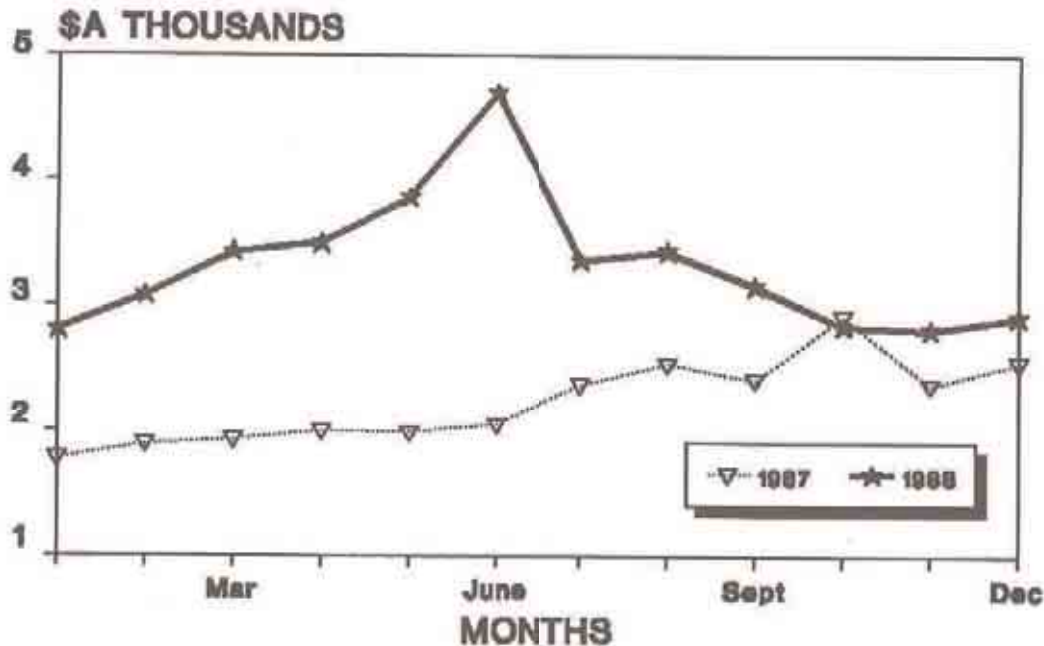
Alumina

The quantity of alumina produced in Western Australia rose from 5.92 million tonnes in 1987 to 6.17 million tonnes in 1988. This represented a 5% increase for the year.

The value of this production was \$1.3 billion in 1988, up from \$1.1 billion in 1987.

This outcome was due to the 40% increase in the world aluminium price during 1988 beginning to flow through to alumina prices. These developments place Australia, and particularly Western Australia, in an ideal position to take advantage of a strong consumption growth in the East Asian markets. Western Australia currently produces 25% of the world's alumina. Planned project expansions, together with increased demand from the East Asian region, should see Western Australia's alumina producers recording sustained growth through to at least 1989/90.

ALUMINIUM PRICE: \$A/tonne



SOURCE: L.M.E. HIGH GRADE CASH, MONTHLY

AVERAGE

Petroleum

Ten Western Australian oil fields were producing in December 1988: Barrow Island, Harriet, North Herald; South Pepper, Mount Horner, Dongara, Blina, Lloyd, Sundown and West Terrace. These oilfields produced approximately 2.1 million kls of oil in 1988. This represented a 12.5% increase on the 1987 production of 1.76 million kls.

Natural gas output from the State's five producing fields was 3.6 billion M³, a 200 million M³ increase over the 1987 total. This expansion was largely due to increased production from the North West Shelf.

Condensate production in 1988 totalled 1.1 million kls. This represented a 21.7% increase on 1987's output of 0.92 Million kls.

Despite these increases in production the value of the petroleum sector output declined from \$776.18 million in 1987 to \$693.79 million in 1988. This was largely as a result of the fall in world oil prices during 1988.

The lower oil prices led to a 21.8% drop in the value of Western Australian oil production from \$314.91 million in 1987 to \$246.06 million in 1988. Natural Gas output value fell 7.5% from its 1987 total of \$325.88 million to \$301.42 million in 1988. Condensate production increased by an amount which was sufficient to overcome

a nett price fall. The resulting value of production rose 9% from the 1987 figure of \$135.42 million to \$146.25 million in December 1988.

The Western Australian petroleum sector is expected to register strong growth in 1989 as a result of the following factors. Firstly, crude oil prices are projected to stabilise at the \$US17 - \$US20 per barrel level. Also, the \$3.7 billion investment in the LNG phase of the North West Shelf project is scheduled to begin earning export income in mid 1989.

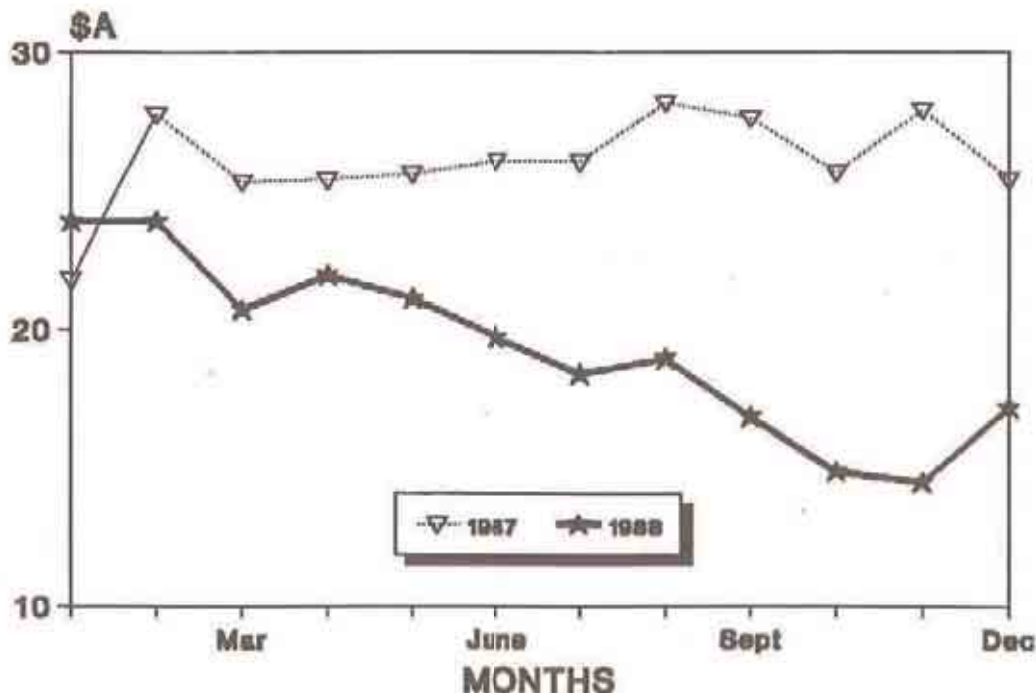
Future output prospects for the petroleum sector will also be boosted by the commencement of two major projects during 1989.

The first of these, Saladin, should reach maximum output during the year. Onsite construction of production facilities for the oilfield began in March 1988. It is expected to come on stream in October 1989 at a rate of approximately 8 000 kls per day. This capacity gives Saladin the potential to be the largest oil producing field in Western Australia.

The second, Talisman is located in an area of Commonwealth jurisdiction beyond the Territorial Sea, and is to begin production in July 1989.

Exploration investment is set to increase again in 1989, with exploratory drilling of 39 onshore and 11 offshore wells.

PETROLEUM PRICE : \$A/bbl



SOURCE: BRENT SPOT, MONTHLY AVERAGE

Nickel

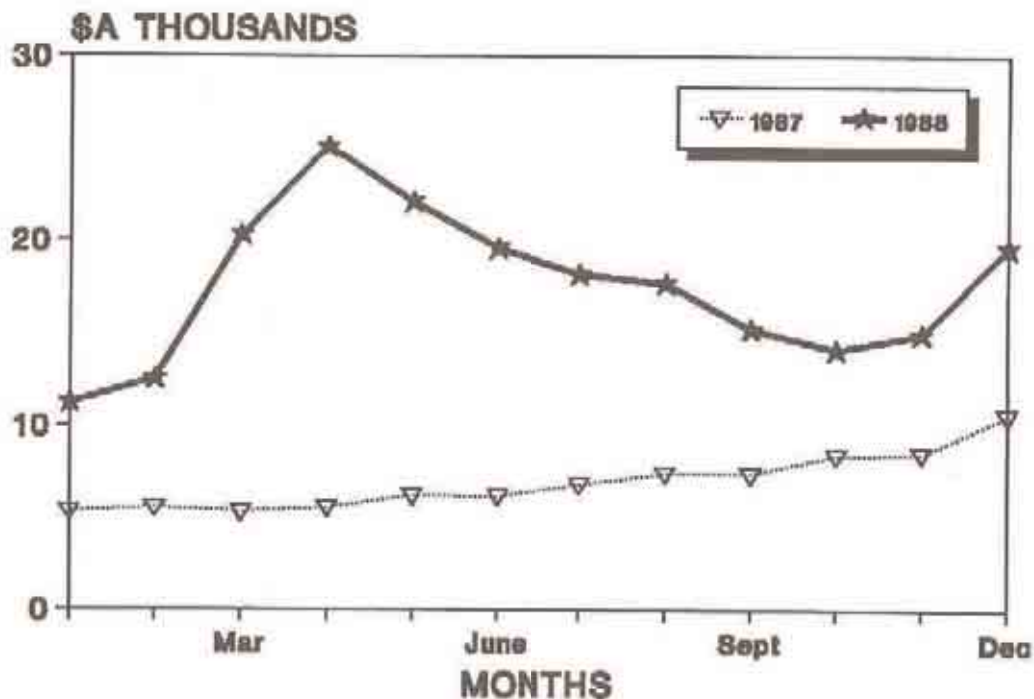
The value of Western Australian produced nickel concentrate rose again in 1988 to \$480.84 million. This was a gain of over 60% on the 1987 figure of \$294.15 million. The rise in value for the year was accompanied by a fall in nett production. The 1987 total of 416,152 tonnes of concentrate declined to 337,723 tonnes in 1988.

The steady increase in world price from mid 1987 through 1988 benefited the industry by considerably expanding the nett value of existing reserves. The record price level achieved in 1988 is shown in the graph below.

Expenditure on exploration, development and production have, for most of the past decade been constrained by the low market price of the metal.

A sustained price climb through 1988 augers well for the future of the industry. Western Mining Corporation have, during 1988, acquired and begun the rehabilitation of the extensive Agnew Mining venture at Leinster. Another relatively high grade deposit at Rocky's Reward is being developed by the Corporation to provide feedstock for the Kambalda refinery.

NICKEL PRICES: \$A/tonne



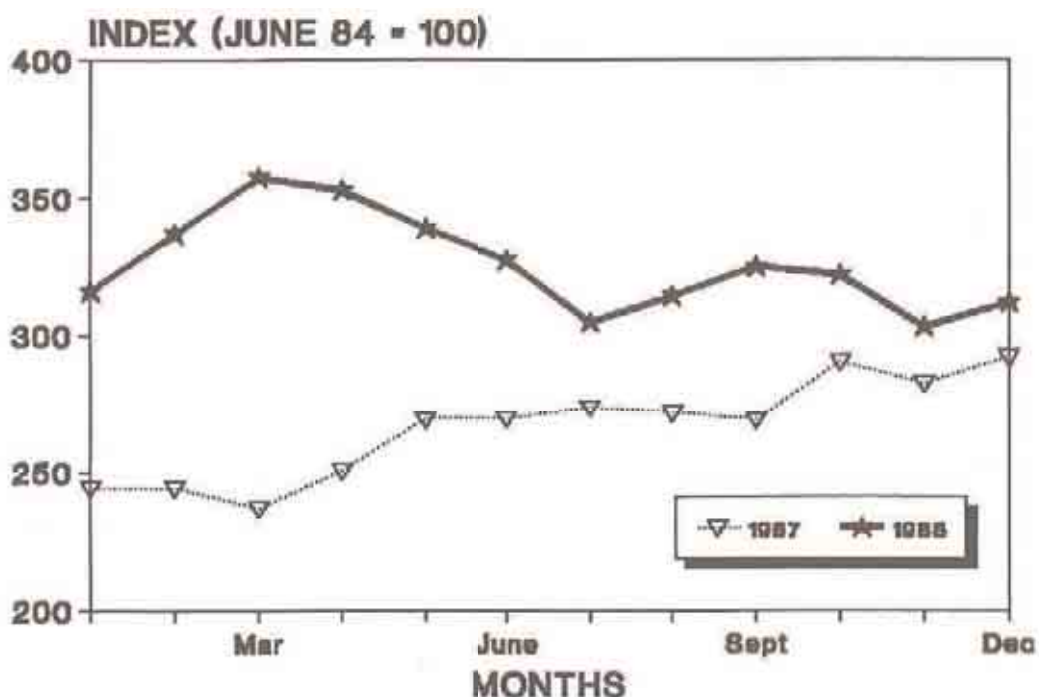
SOURCE: L.M.E. CASH, MONTHLY AVERAGE

Mineral Sands

The mineral sands industry in Western Australia enjoyed substantial growth during 1988. The value of production increased to \$328 million, a rise of 33% on the 1987 total of \$246 million. An outstanding increase of 78.6% in the value of zircon produced was the major contributor to the overall rise for 1988.

Advanced feasibility studies and the commencement of several major developments during 1988 confirmed the underlying strength of the mineral sands sector.

PRICE INDEX FOR MINERAL SANDS



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

The most noteworthy of the proposed developments was the Cooljarloo project, the first mineral sands operation to combine mining and multi-stage processing. Investment in capital works and development is to exceed \$370 million and production is due to commence in 1990.

While new processing facilities were developed at Kemerton (TiO₂ pigment plant) and Rockingham (zirconia plant), new mines are proposed for Waroona, Jangardup and Eneabba.

The rise in World demand for the products of mineral sands has led to an increase in exploration activity. Expenditure has risen steadily over the last five years, from \$0.80 million in 1982/83 to \$2.45 million in 1987/88.

Throughout 1989 world demand is projected to remain high and prices stabilise at current levels. Western Australia's extensive reserves and expanding production capacity will ensure the State remains the world's premier producer of heavy mineral sands.

Diamonds

Western Australian diamond production rose from 30.33 million carats in 1987 to 35.22 million carats in 1988. This resulted in a robust 22.7% rise in the value of production, from \$246.51 million in 1987 to \$302.49 million in 1988.

Producers can look forward to increased production values in 1989. This will be a result of the announced 15% diamond prices rise due to take effect from April 1989.

During 1988, exploration activity in the north of the State has been extensive, with more than 20 companies engaged in preliminary surveys. It was, however, the developing demand on world markets for smaller stones (0.02 - 0.05 carats) which drove capacity increases by existing producers.

The most recent Kimberley area diamond mining venture is the construction of a pilot plant at the Mt Elizabeth project in the Phillips Range. This major investment by Freeport/Triad Minerals is indicative of the region's high level of prospectivity.

Summary and Outlook

Overall, 1988 was a year of steady growth for the Western Australian minerals sector. Most commodities recorded increases in terms of both value and quantity of production.

Gold and iron ore had to overcome price falls to register increases in the value of production. Despite an increase in value of condensate production, the petroleum sector was unable to make up for the price falls in crude oil and natural gas.

Another factor which negatively influenced the value of exported mineral products was the steady rise in the \$A/\$US exchange rate during 1988. As most mineral contracts are denominated in \$US the 21% increase in the \$A value eroded posted price gains.

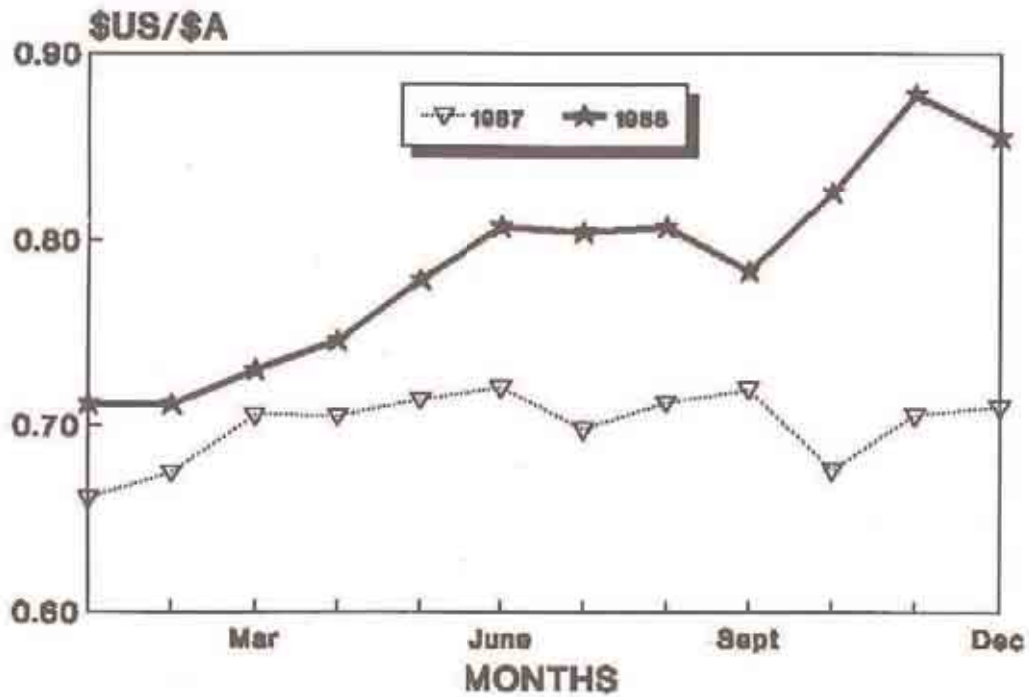
The fact that the minerals industry recorded an overall increase in value of output, is a good indication of its flexibility and fundamental strength in the face of changing market conditions.

A continuation of strong demand in prime areas of consumption will place a solid floor under most base metal prices. These areas are the transport and construction sectors of the Western European, Japanese and North American economies.

Gold output is set to expand markedly during the next 12 months as a result of long run investment decisions by producers. These developments will occur despite a continued easing of the precious metal's price on world markets.

Finally, the petroleum sector is anticipated to perform better in terms of sharply increased exploration activity, firming of prices and the commencement of the North West Shelf's LNG project export phase.

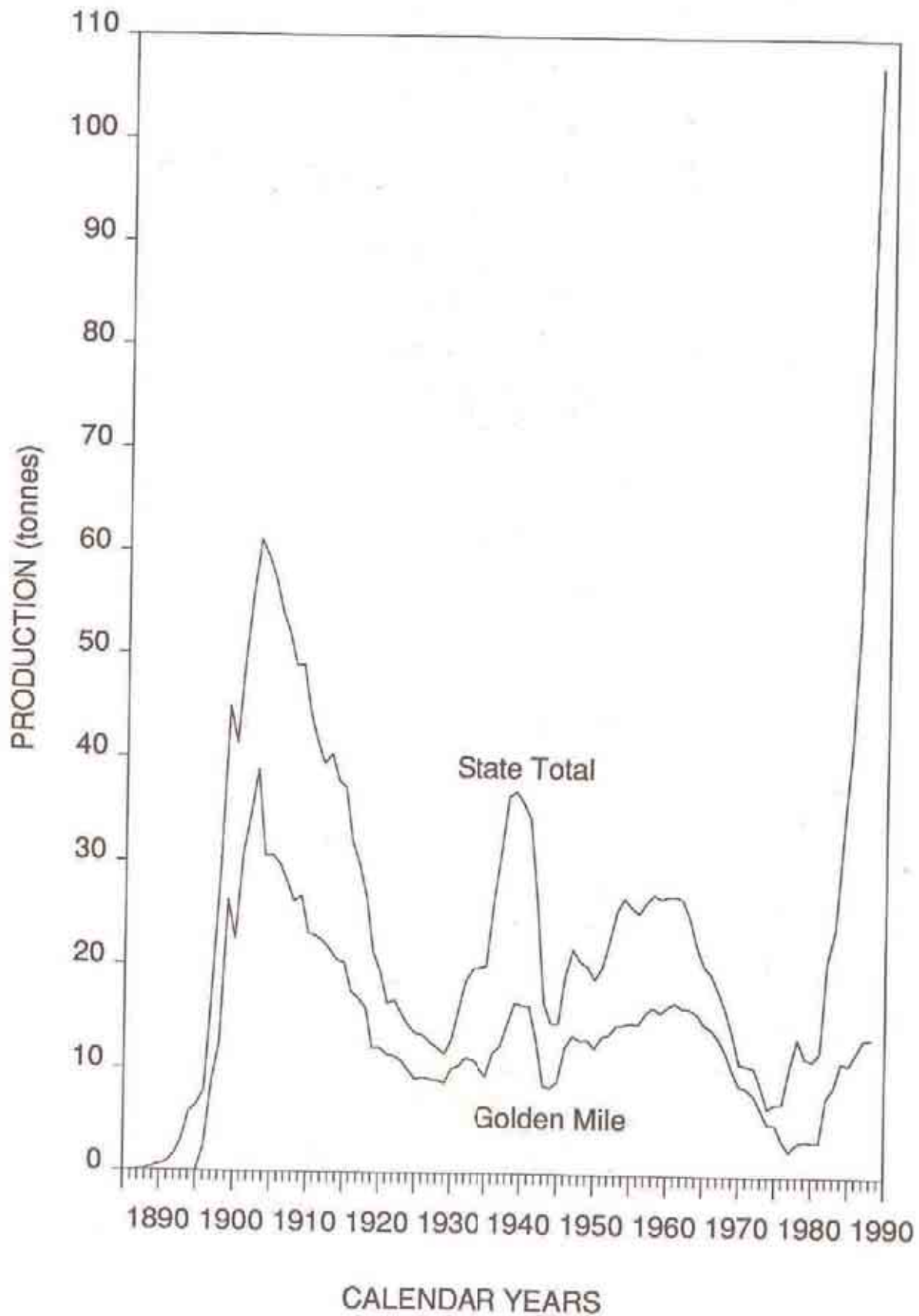
EXCHANGE RATE COMPARISON



SOURCE: A.F.R., MONTHLY AVERAGE

WESTERN AUSTRALIAN GOLD PRODUCTION

1886 - 1988



COMPARATIVE VALUE OF PRODUCTION

Figure 2

1983 VALUE OF PRODUCTION

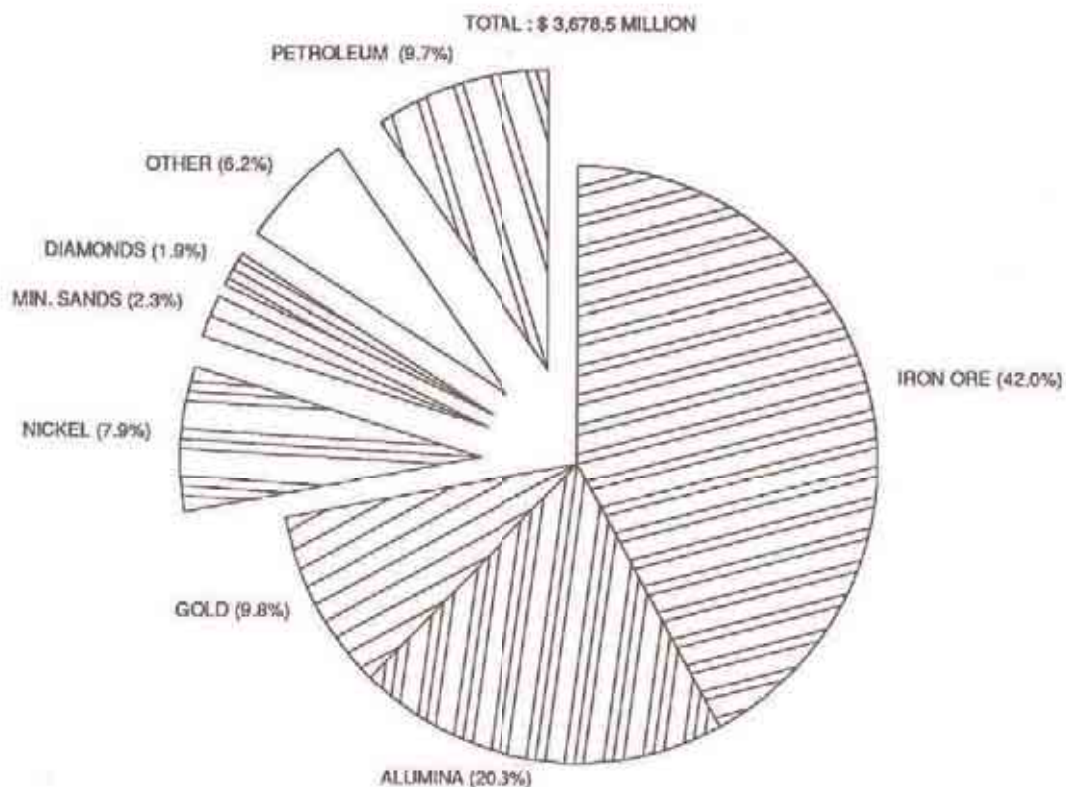


Figure 3

1988 VALUE OF PRODUCTION

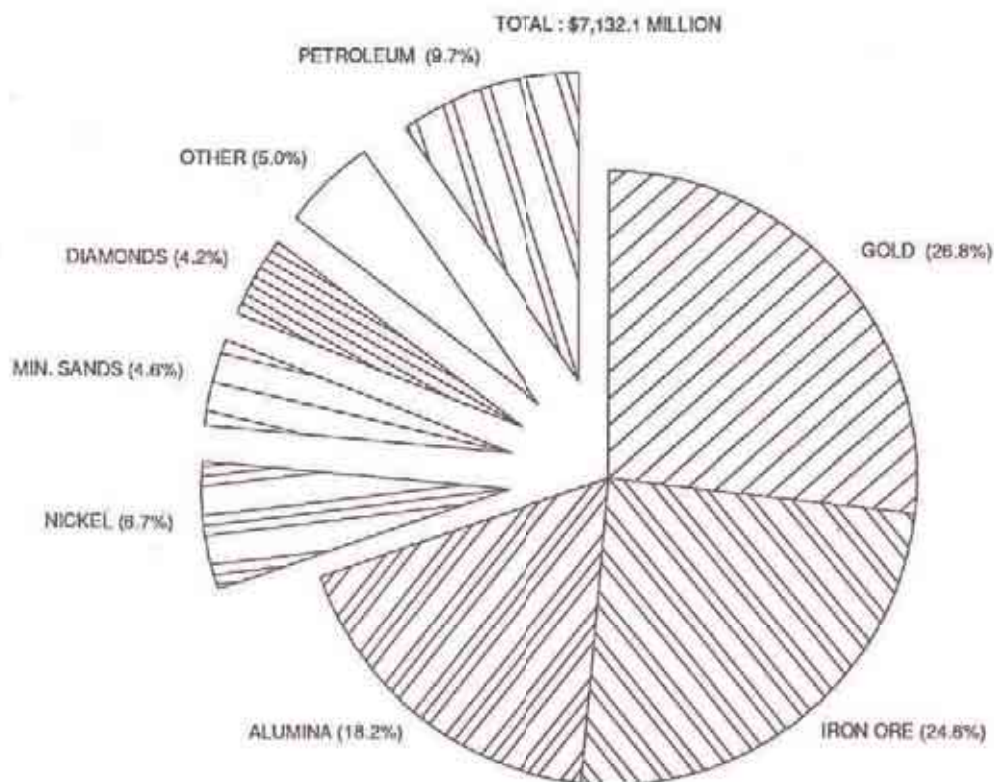


TABLE 1
QUANTITY AND VALUE OF MINERALS 1987, 1988

Mineral	Unit Quantity	1987		1988	
		Quantity	Value (\$A)	Quantity	Value (\$A)
Alumina	t	5 928 763	1 104 313 745	6 176 414	1 301 425 700
Barytes	t	-	-	9 669	1 160 280
Building Stone					
quartz	t	1 334	60 035	334	15 035
Clay					
attapulgite	t	10 960	2 013 960(r)	27 221	2 779 727
cement clay	t	23 217	58 043	22 999	57 499
clayshale	t	-	-	383	765
fire clay	t	208 631	252 009	214 533	409 289
kaolin	t	7 460	241 564	3 891	197 740
white clay	t	72 176	209 528	1 697	20 364
Coal	t	3 709 806	144 944 239	3 789 743	158 003 510
Cobalt	t	368	1 858 290	287	4 456 414
Construction Material					
aggregate	t	175 345	890 820	220 304	1 286 308
gravel	t	20 205	36 255	24 026	116 680
rock	t	112 599	1 092 626	854 653	6 091 294
sand	t	933 608	2 435 871	1 736 944	5 336 095
Copper By Product	t	2 910	4 218 249	2 679	6 961 118
Copper Concentrate	t	-	-	4 747	10 794 582
Diamond	ct	30 331 701	246 517 116	35 220 858	302 495 527
Diatomite	t	521	2 688	-	-
Dolomite	t	243	3 162	130	2 060
Emerald	g	-	-	1 930	2 200
Felspar	t	4 933	149 430	21 014	850 089
Garnet Sand	t	16 837	593 043	19 758	693 761
Gold	kg	78 438	1 622 471 286	107 290	1 913 146 088
Gypsum	t	136 045	1 333 818	112 017	1 005 163
Iron Ore	t	84 122 743	1 737 650 556	98 319 089	1 757 278 099
Kyanite	t	1 079	162 108	-	-
Limestone	t	131 866	1 311 783	239 356	2 162 676
Mica	t	-	-	3 456	900 710
Mineral Beach Sand					
ilmenite	t	996 074	62 183 292 (r)	939 139	68 289 943
upgraded ilmenite (a)	t	134 866	49 990 491 (r)	183 499	69 153 310
leucoxene	t	11 290	4 663 700	12 946	5 297 600
monazite	t	11 766	8 501 662	9 573	7 221 337
rutile	t	85 630	51 056 433	91 192	54 011 414
xenotime	t	5	38 444	-	-
zircon	t	320 163	69 347 543	368 164	123 873 011
Nickel Concentrate	t	416 152	291 185 395	337 723	480 849 980
Nickel Ore	t	20 602	2 965 739	-	-
Palladium	kg	450	2 980 875	360	2 118 657
Peat	t	1 236	53 041	1 151	67 245
Petroleum Products					
condensate	kl	921 912	135 427 471	1 129 983	146 254 032
crude oil	kl	1 764 084	314 913 379	2 056 808	246 110 792
natural gas	'000m ³	3 453 947	325 888 999	3 653 278	301 429 132
Platinum	kg	84	2 150 013	73	1 584 833
Salt	t	5 276 501	105 717 998	5 849 966	98 525 973
Semi-precious Stone					
amethyst	kg	51 000	195 500	70 464	285 926
Silica Sand	t	386 048	2 653 305	348 947	2 682 888
Silver	kg	11 353	2 282 605	20 562	3 395 589
Spodumene	t	16 621	3 320 514	27 396	4 772 858
Talc	t	189 274	13 936 216(r)	182 774	13 261 526
Tantalite	t	111	4 204 828	76	8 069 190
Tin Concentrate	t	648	4 485 426	375	2 317 099
Vermiculite	t	1 409	28 226	1 165	146 416
Zinc Concentrate	t	-	-	36 800	14 698 390
Total Value			6 330 991 319		7 132 065 914

Notes: (r) Revised from Previous Edition
(a) Also known as synthetic rutile

TABLE 2
QUANTITY AND VALUE OF MINERALS BY LOCAL GOVERNMENT AREA

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Alumina	Boddington	1 082 689		230 268 900	
	Harvey	698 759		146 532 100	
	Murray	2 866 399		600 648 300	
	Serpentine-Jarrahdale	1 528 567		323 976 400	
Total Alumina		6 176 414		1 301 425 700	(a)
Barytes	East Pilbara	9 669		1 160 280	(b)
Building stone					
- quartz rock	Mukinbudin	334		15 035	(b)
Clay					
- attapulgitic	Mullewa	27 221		2 779 727	(c)
- cement clay	Armadale	22 999		57 499)	
- clayshale	Collie	383		765)	
- fire clay	Chittering	212 783		405 629)	
	Victoria Plains	1 830		3 660)	
- kaolin	Bridgetown-Greenbushes	3 891		197 740)	(b)
- white clay	Serpentine-Jarrahdale	1 697		20 364)	
Total Clay		270 774		3 465 304	
Coal	Collie	3 789 743		158 003 510	(d)
Cobalt	Coolgardie		Co t 268,616	4 456 414	(c), (e)
Construction Materials					
- aggregate	Derby-West				
	Kimberley	6 330		58 046	
	Kalgoorlie-				
	Boulder	172 788		725 777	
	Hall Creek	1 340		13 400	
	Port Hedland	32 441		459 545	
	Wyndham-East				
	Kimberley	7 385		29 540	
		220 304		1 286 308	

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Construction Materials (cont)					
- gravel	Ashburton	900		900	
	Broome	4 250		21 250	
	Coolgardie	7 756		38 780	
	Port Hedland	10 300		42 500	
	Roebourne	820		13 250	
			24 026		116 680
- rock	Broome	104 528		1 071 872	
	Cockburn	701 289		4 407 801	
	Roebourne	48 836		611 621	
			854 653		6 091 294
- sand	Ashburton	699		3 954	
	Broome	30 750		174 451	
	Canning	264 244		409 709	
	Cockburn	1 197 316		3 749 911	
	Coolgardie	65 126		362 984	
	Dandaragan	4 301		4 301	
	G'ngin	11 417		68 500	
	Laverton	157		314	
	Meekatharra	56 248		290 240	
	Northam	69 366		93 233	
	Port Hedland	15 431		80 653	
	Roebourne	8 630		81 946	
	Wanneroo	13 249		15 899	
			1 736 944		5 336 095
Total Construction Materials		2 835 927		12 830 377	(b)
Cu t					
Copper					
- by product	Coolgardie		2 678.565	6 961 118 (c),(e)	
- concentrates	East Pilbara	7 168.58	1 503.100	2 751 837 (c)	
	Meekatharra	14 218.00	3 243.856	8 042 745	
Total Copper			7 425.521	17 755 700	
ct					
Diamonds	Wyndham-East Kimberley	35 220 858		302 495 527	(c)
ct					
Dolomite	Lake Grace	130		2 060	(d)
Grams					
Emerald	Menzies		1 930	2 200	

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Felspar	Mukinbudin	8 049		355 618	
	Port Hedland	12 965		494 471	
Total Felspar		21 014		850 089	(f)
Garnet Sand	Capel	1 112		41 151	(g)
	Northampton	18 646		652 610	(d)
Total Garnet Sand		19 758		693 761	

		Au kg		
Gold	Boddington	9 450.607	168 518 454	
	Coolgardie	7 400.732	131 966 118	
	Cue	3 497.185	62 360 038	
	Dundas	3 087.237	55 050 052	
	East Pilbara	8 861.694	158 017 255	
	Halls Creek	30.265	539 670	
	Kalgoorlie-Boulder	28 744.502	512 557 452	
	Kondinin	0.113	2 015	
	Lake Grace	304.689	5 433 061	
	Laverton	2 676.665	47 728 939	
	Leonora	10 550.058	188 123 310	
	Meekatharra	7 923.607	141 289 761	
	Menzies	4 280.533	76 328 304	
	Mt Magnet	4 021.986	71 718 025	
	Port Hedland	5.359	95 559	
	Ravensthorpe	102.108	1 820 738	
	Rocbourne	11.933	212 783	
	Sandstone	2 885.920	51 460 269	
	Upper Gascoyne	7.623	135 930	
	Westonia	1 562.787	27 866 829	
West Pilbara	2.408	42 938		
Wiluna	3 008.263	53 641 828		
Yalgoo	1 683.328	30 016 255		
Yilgarn	7 190.676	128 220 505		
Total Gold		107 290.278	1 913 146 088	(h)

Gypsum	Carnamah	3 027	30 270	(d)
	Dalwallinu	32 451	553 811	(b), (c)
	Esperance	100	500)	
	Kellerberrin	1 550	7 750)	
	Koorda	5 000	25 000)	
	Lake Grace	4 182	20 908)	
	Merredin	484	2 710)	
	Narembeen	2 700	16 200)	
	Nungarin	28 343	152 821)	(d)
	Trayning	21 303	119 301)	
Wongan-Ballidu	500	3 500)		
Wyalkatchem	12 377	72 392)		
Total Gypsum		112 017	1 005 163	

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Av. Assay Fe %					
Iron Ore					
Interstate					
- ore	Ashburton	390 472	59.13	5 576 025	
	Derby-West				
	Kimberley	1 625 228	66.32	17 877 508	
	East Pilbara	3 448 827	65.79	70 129 772	
		5 464 527		93 583 305	
Exported					
- ore	Ashburton	56 819 441	61.56	987 165 475	
	Derby-West				
	Kimberley	2 401 478	66.63	43 163 807	
	East Pilbara	33 558 818	62.61	631 703 505	
		92 779 737		1 662 032 787	
- pellets	Ashburton	74 825	63.21	1 662 007	
Total Iron Ore		98 319 089		1 757 278 099	(c)
Limestone					
	Dandaragan	887		4 435	
	Gingin	13 914		222 740	
	Irwin	536		2 680	
	Manjimup	5 562		56 620	
	Roebourne	2 725		28 211	
	Wanneroo	215 632		1 847 990	
Total Limestone		239 356		2 162 676	(b)
Mica	Port Hedland	3 456		900 710	(c)

Av. Assay TiO ₂ %					
Mineral Beach Sands					
- ilmenite	Capel	741 467	54.68	56 352 827	
	Carnamah	197 672	60.15	11 937 116	
		939 139		68 289 943	
- upgraded ilmenite	Capel	117 590	92.00	44 088 744	
	Carnamah	65 909	92.00	25 064 566	
		183 499		69 153 310	

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Mineral Beach Sands (Cont)					
			TiO ₂ t		
- leucoxene	Capel	12 946	11 698	5 297 600	
			ThO ₂ 10kg units		
- monazite	Capel	2 985	19 167	2 240 019	
	Carnamah	6 588	42 822	4 981 318	
		9 573	61 989	7 221 337	
			TiO ₂ t		
- rutile	Carnamah	91 192	86 629	54 011 414	
			ZrO ₂ t		
- zircon	Capel	109 344	71 071	29 472 217	
	Carnamah	258 820	169 469	94 400 794	
		368 164	240 540	123 873 011	
Total Mineral Beach Sands				327 846 615	(c)

Nickel Concentrates		Av. Assay Ni%		
	Coolgardie	252 721	11.10	375 605 195
	Kalgoorlie Boulder	32 706	11.28	47 488 125
	Laverton	52 296	8.71	57 756 660
Total Nickel		337 723		480 849 980
				(i)

		Pd kg		
Palladium	Coolgardie		360.071	2 118 657 (c),(e)
Peat	Manjimup	1 151		67 245 (b)

Petroleum		kl		
- condensate	Carnamah	128		23 139 (b)
	Irwin	585		94 193 (b)
	Roebourne	1 129 270		146 136 700 (c)
		1 130 104		146 254 032

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Petroleum (Cont)					
- crude oil	Derby-West				
	Kimberley	31 841		3 375 796	
	Irwin	21 180		2 352 421	
	Roebourne	2 003 787		240 382 575	
		2 056 808		246 110 792	(c)
		$m^3 \times 10^3$			
- natural gas	Carnamah	21 470		1 136 467	(j)
	Irwin	139 360		14 579 845	(j)
	Roebourne	3 492 448		285 712 820	(b)
		3 653 278		301 429 132	
Total Petroleum				693 793 956	
			Pt kg		
Platinum	Coolgardie		72.625	1 584 833	(c),(e)
Salt	Carnarvon	919 794		17 102 106	(c)
	Lake Grace	250		6 250	(d)
	Port Hedland	1 947 062		27 549 152	(c)
	Roebourne	2 373 716		43 463 429	(c)
	Shark Bay	611 857		10 387 396	(c)
	Wyalkatchem	287		17 640	(d)
Total Salt		5 849 966		98 525 973	
Semi-precious stones			t		
- amethyst	Upper Gascoyne		70.46	285 926	(d)
Silica	Canning	96 302		1 059 322	
	Capel	8 036		104 468	
	Cockburn	171 466		1 130 509	
	Coolgardie	24 998		61 242	
	Gingin	5 100		56 100	
	Gosnells	8 000		88 000	
	Wanneroo	35 045		183 247	
Total Silica		348 947		2 682 888	(c)

Mineral	Local Government Area	Quantity tonnes	Metallic Content	Value (\$)	Ref.
Silver			Ag kg		
By-product of gold mining	State-wide	15 210.653		1 977 465	
	Coolgardie	585.664		241 361 (c), (e)	
	East Pilbara	38.063		8 102 (c), (k)	
	Meekatharra	4 727.853		1 168 661 (c), (k)	
Total Silver		20 562.233		3 395 589	
Spodumene	Bridgetown-Greenbushes	27 396		4 772 858	(c)
Talc	Meekatharra	24 774		2 201 497	
	Three Springs	158 000		11 060 029	
Total Talc		182 774		13 261 526	(d)
Tantalite	Bridgetown-Greenbushes	76	Ta ₂ O ₅ kg	158 178	8 069 190 (c)
Tin	Bridgetown-Greenbushes	375	Sn t	262.20	2 317 099 (c)
Vermiculite	Ravensthorpe	1 165		146 416	(d)
Zinc	Derby-West Kimberley	36 800	Zn t	20 250	14 698 390 (c)
Value of other Minerals				5 218 919 826	
Value of Gold				1 913 146 000	
TOTAL VALUE OF ALL MINERALS				7 132 065 914	

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

- (a) Value based on the average Australian value of alumina as published by the Bureau of Mineral Resources in the Australian Mineral Industry Review.
- (b) Value at works.
- (c) Estimated f.o.b. value.
- (d) Estimated ex-mine value.
- (e) Metallic by-product of nickel mining.
- (f) Estimated f.o.r. value.
- (g) Estimated f.o.t. value.
- (h) Value based on monthly production and average gold price of that month as supplied by Gold Producers Association.
- (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	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 (2240 lbs)	1.016046	0.984207
	tonne	t	short ton (2000 lbs)	0.907185	1.102311
Volume	kilolitre	kl	barrel (bbl)	6.28981	0.158987
	kilolitre	kl	cubic metre (m ³)	1	
Energy	kilojoule (Typical natural gas)	kJ	British thermal unit (BTU) 39 MJ/M ³)	1.05506	0.94781
Prefix	kilo (k)	10 ³			
	mega (M)	10 ⁶			
	giga (G)	10 ⁹			
	tera (T)	10 ¹²			

Figure 4
1983 ROYALTY RECEIPTS

TOTAL : \$ 105.7 MILLION

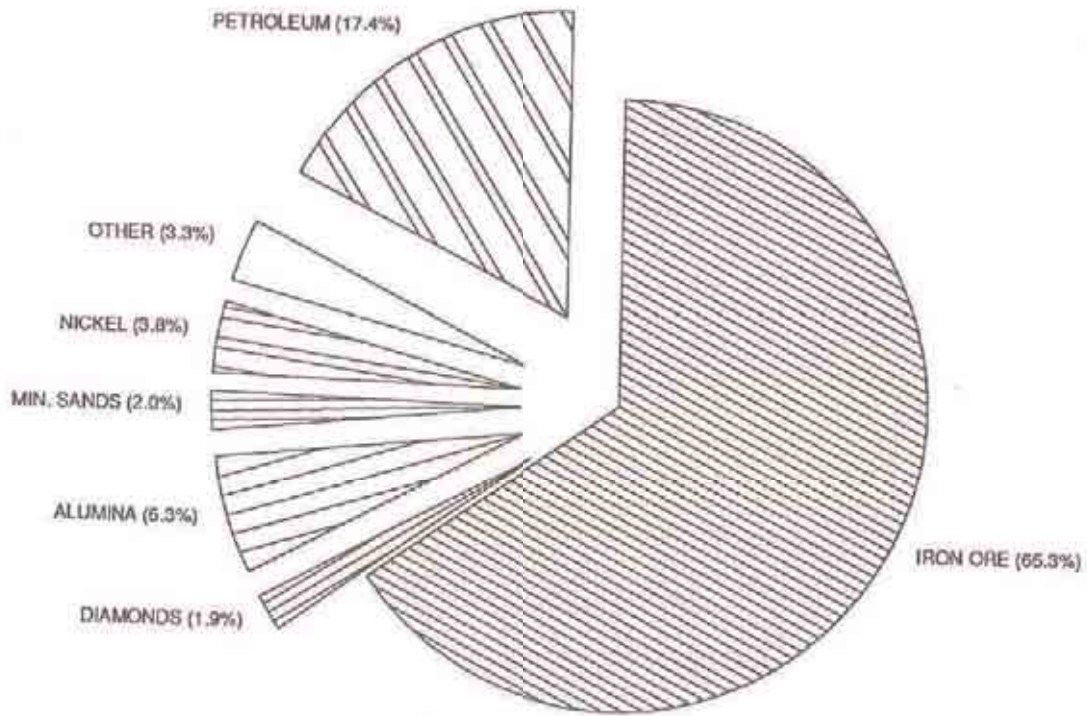


Figure 5
1988 ROYALTY RECEIPTS

TOTAL : \$ 178.5 MILLION

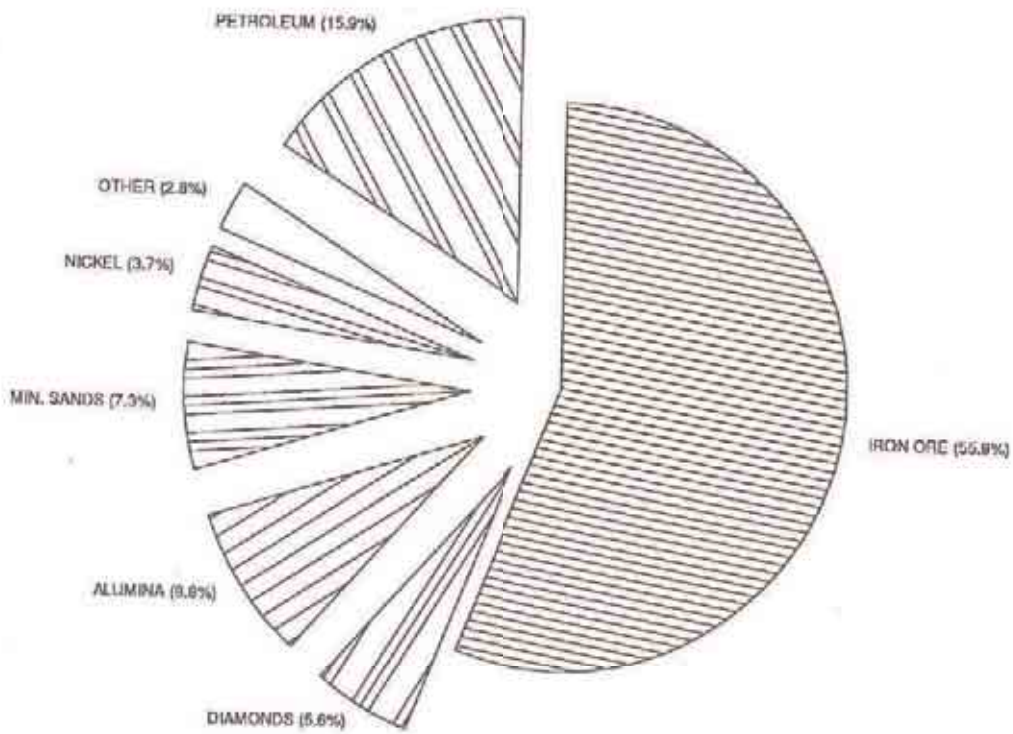


TABLE 3
ROYALTY RECEIPTS 1987, 1988

Mineral	1987	1988	Value (\$A)	% up (% down)
	(\$A)	(\$A)	Variance	
Alumina	10 484 702	15 693 844	5 209 142	50
Building stone	693	487	(206)	(30)
Clay	322 620	147 073	(175 547)	54
Coal	1 494 885	1 573 164	78 279	5
Cobalt	31 770	65 202	33 432	105
Construction materials				
aggregate	59 482	57 526	(1 956)	(3)
gravel	8 576	5 957	(2 619)	(31)
rock	35 031	70 848	35 817	102
sand	191 870	127 411	(64 459)	(34)
sandstone		25	25	n.ap.
Copper	104 820	289 045	185 025	178
Diamond	14 522 383	9 971 533	(4 550 850)	(31)
Diatomite	134		(134)	(100)
Dolomite	18	39	21	117
Feldspar	13 777	17 342	3 565	26
Garnet sand	30 515	32 278	1 763	6
Gold	138 522	155 535	17 013	12
Gypsum	59 401	32 087	(27 314)	(46)
Iron ore	89 274 397	99 783 896	10 509 499	12
Kyanite	5 455	6 141	686	13
Limestone	77 255(r)	76 905	(350)	(1)
Mica	-	18 566	18 566	n.ap.
Mineral beach sands				
ilmenite	1 625 722	3 494 021	1 868 299	115
leucoxene	175 076	82 650	(92 426)	(53)
monazite	212 062	355 191	143 129	67
rutile	1 218 234	3 349 741	2 131 507	175
xenotime	8 457	-	(8 457)	(100)
zircon	1 456 471	5 679 291	4 222 820	290
Nickel	3 364 708	6 574 034	3 209 326	95
Ochre	2 255	-	(2 255)	(100)
Palladium	22 754	19 135	(3 619)	(16)
Peat	2 596	2 050	(546)	(21)
Petroleum Products				
condensate	1 024 716	1 265 505	240 789	23
crude oil	23 321 032	23 259 324	(61 708)	(1)
natural gas	5 585 215	3 906 030	(1 679 185)	(30)
Platinum	22 754	19 135	(3 619)	(16)
Salt	777 513	986 435	208 922	27
Semi-precious stones				
amethyst	14 663	15 069	406	3
Silica sand	188 732	185 897	(2 835)	(2)
Silver	59 920	67 428	7 508	13
Spodumene	137 928	304 651	166 723	121
Talc	85 160	95 927	10 767	13
Tantalite	157 943(r)	188 245	30 302	19
Tin	195 998(r)	57 346	(138 652)	(71)
Vermiculite	1 180	6 696	5 516	467
Zinc Concentrate	-	433 925	433 925	n.ap.
Total value	156 516 595(r)	178 472 630	21 956 035	14

Note: (r) Revised from previous edition

TABLE 4
NUMBER OF PERSONS EMPLOYED IN THE WESTERN AUSTRALIAN MINING INDUSTRY
AS AT DECEMBER 31 1988

(SOURCE: AXTAT REPORTING SYSTEM, MINING ENGINEERING DIVISION)

MINERAL COMPANY	LOCATION	1983	1988
ALUMINA			
Alcoa of Australia Ltd	Jarrahdale/Kwinana	1 626	1 598
	Del Park/Huntley/Pinjerra	1 545	1 697
Worsley Alumina Pty Ltd	Wagerup	299	499
	Worsley	552	860
		4 022	4 654
COAL			
Griffin Coal Mining Co Ltd	Collie	473	542
Western Collieries Ltd	Collie	690	719
		1 163	1 261
COPPER-SILVER ZINC			
Seltrust Mining Corporation Pty Ltd	Teutonic Bore	160	-
DIAMOND			
Argyle Diamond Mines J.V.	Lake Argyle	128	675
Freeport Bow River Properties Ltd	Bow River	-	79
		128	754
GOLD			
Aur NL	Mt Martin	-	42
Australian Consolidated Minerals Ltd	Golden Crown	-	79
	Westonia	-	153
	Golden Kilometre	-	112
Australian Mine Mgmt Pty Ltd	Norseman	-	45
Australia Mining NL	Mt Morgans	-	44
Austwhim Resources NL	Ginlet South/Orban J.V.	-	137
BHP Minerals Ltd	Bamboo Creek	-	70
Bamboo Creek J.V.	Bardoc	-	43
Bardoc Gold Pty Ltd	Horseshoe	-	49
Barrack Mine Management	Wiluna	-	98
Big Bell J.V.	Big Bell	-	174
Boddington Gold Project	Boddington	-	316
Broken Hill Metals	Hopes Hill	-	126
Brunswick NL	Gaitee Moore	-	75
Callion Mining Pty Ltd	Callion	-	24
Central Norseman Gold Corp NL	Norseman	403	544
Consolidated Exploration Ltd	Lady Bountiful	-	52
	Davyhurst	-	47
Chevron Exploration Corp	Mt Wilkinson	-	63
Cyprese Minerals Aust Co	Gidgee	-	82
Eastmet Ltd	Youanmi	-	68
Edjudina Gold Mines Pty Ltd	Neda/Gawler	-	63
Endeavour Resources Ltd	Bluebird/Alladin	-	115
Forrest Gold Pty Ltd	Hannans South	-	35
Tower Hill		-	76
Forsayth NL	Lavlers	-	79
	Mt Gibson	-	127
Freeport McMoran Australia Ltd	Karonie	-	58
Gabarrintha Gold Mines	Gabarrintha	-	58
Golden Valley Mines NL	Fraser	-	81
Goongarrrie Gold Mines	Goongarrrie	-	100
Great Victoria Gold Ltd	Gt Victoria	-	101
Hampton Australia Ltd	Jubilee	-	79

MINERAL COMPANY	LOCATION	1983	1988
Hillmin Gold Mines Pty Ltd	Cork Tree Well	-	87
Harbour Lights Mining Pty Ltd	Leonora	-	110
	Mertondale	-	29
Hedges Gold Pty Ltd	Hedges	-	82
Hill 50 Gold Mine NL	Mt Magnet	178	237
KLV-Kalgoorlie	Mt Charlotte	196	296
KLV-Fimiston	Perserverance	593	656
Kunanalling Joint Venture	Gibraltar	-	12
Kurara J.V.	Kurara	-	66
Mauson Pacific Ltd	Transvaal	-	82
	Marvel Loch	80	214
	Edwards Find	-	41
Metana Minerals	Reedy	-	79
	Mt Magnet	-	130
Mt Percy Project	Mt Percy	-	73
Nevoria J.V.	Nevoria	-	88
Newmont Holdings Pty Ltd	New Celebration	-	177
Norgold Ltd	Bottle Creek	-	74
North Kalgoorlie Mines Ltd	Fimiston/Paringa	375	481
Norseman Gold Mines NL	Ravensthorpe	-	55
Pancontinental Gold Mining Areas Pty Ltd	Paddington	-	198
Peak Hill Resources	Peak Hill	-	54
Queen Margaret Gold Mines	Bellevue	-	191
Sons of Gwalia NL	Gwalia	-	113
Sundowner Minerals NL	Mt Fisher	-	49
Telfer Project	Telfer	213	556
WMC-Gt Boulder Holdings	Emu	-	87
	Kambalda	68	155
	Lancefield	88	111
	Sand King	10	40
	Meekatharra	33	162
Whim Creek Consolidated NL		1 131	1 173
All Other Operators			
TOTAL GOLD		3 368	9 373
IRON ORE			
BHP Minerals Pty Ltd	Yampf	541	426
Goldsworthy Mining Ltd	Pilbara/Port Hedland	983	755
Hamersley Iron Pty Ltd	Tom Price-Paraburdoo/Dampier	663	2 725
	Channar	-	64
Mt Newman Mining Co Ltd	Newman/Port Hedland	3 473	3 532
Robe River Mining Co Pty Ltd	Panawonica/Cape Lambert	1 260	964
		9 920	8 466
MINERAL BEACH SAND			
Allied Encabba Pty Ltd	Ereabba	199	122
Associated Minerals Cons Ltd	Capel	77	180
	Ereabba/Narngulu	108	450
Cable Sands Pty Ltd	Capel	74	239
Westralian Sands Ltd	Capel	170	424
		628	1 415
NICKEL			
Agnew Mining Co Pty Ltd	Leinster	300	31
Metals Exploration Ltd	Nepean	86	-
Western Mining Corporation	Kalgoorlie	361	334
	Kambalda	1 392	1 912
	Kwinana Refinery	445	271
	Mt Windarra	327	488
		2 911	3 036

MINERAL COMPANY	LOCATION	1983	1988
PETROLEUM PRODUCTS			
Bond Corporation Pty Ltd	Harriet/Rosette	-	80
Eromanga Energy Ltd	Blina/Sundown/Lloyd	-	2
Barrack Energy Ltd	Mt Horner	-	3
Consolidated Gas Pty Ltd	Woodada	7	6
West Australian Petroleum Pty Ltd	Barrow Island	136	166
	Dongara	9	10
Woodside Offshore Petroleum Pty Ltd	North Rankin A/Burru Peninsula	-	1 328
		152	1 595
SALT			
Dampier Salt Ltd	Dampier	189	206
	Lake McLeod	104	174
Leslie Salt Co	Port Hedland	49	114
Shark Bay Salt J.V.	Shark Bay	59	99
		401	593
ZINC COCENTRATE			
BHP Minerals Ltd	Cadjebut	-	138
ALL OTHER MATERIALS			
(Including Rock Quarries)		720	858
TOTAL		23 573	32 143

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PRINCIPAL MINERAL PRODUCERS 1988 - Head office postal address, telephone number: minesite.

ALUMINA

Alcoa of Australia (WA) Ltd, P O Box 252, Applecross 6153, (09) 364 0111: Del Park, Jarrahdale, Willowdale.

Worsley Alumina Pty Ltd, P O Box 344, Collie 6225, (097) 34 3022: Boddington.

BARYTES

Dresser Minerals Int. Inc., P O Box 441, Port Hedland 6721, (091) 73 2377: North Pole.

BUILDING STONE - quartz

Commercial Minerals Ltd, 26 Tomlinson Road, Welshpool 6106, (09) 362 1411: Munkinbudin

CLAY - attapulgite

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

- cement clay

Bell Basic Industries Ltd, 136-138 Great Eastern Hwy, South Guildford 6055, (09) 279 0000: Armadale.

- clayshale

Western Collieries, 75 Canning Hwy, Victoria Park 6100, (09) 361 8911: Collie.

- fire clay

Clackline Ltd, 45 Richardson St, West Perth 6005, (09) 322 7788: Pinnanning.

Midland Brick Company Ltd, Bassett Road, Middle Swan 6056, (09) 274 5522: Bullsbrook.

- kaolin

Greenbushes Tin Ltd, 91 Kensington St, East Perth 6004, (09) 325 8900: Greenbushes.

WHITE CLAY

Bristle Ltd, 212 Adelaide Tce, Perth 6000, (09) 325 7299: Jarrahdale.

COAL

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

Western Collieries Ltd, 75 Canning Hwy, Victoria Park 6100, (09) 361 8911: Collie.

COBALT

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Kambalda.

CONSTRUCTION MATERIALS - aggregate

Calcil Ltd, 5 Mill Street, Perth 6000, (09) 321 8552: Port Hedland.

The Reudymix Group WA, 75 Canning Hwy, Victoria Park 6100, (09) 470 2222: Berrangi Creek, Boodardie, Boulder, Karratha, Oscar Range.

Woodhead JL, 407 Packsaddle Road, Kununurra 6743, (091) 81 1472 : Kununurra.

- gravel

Brenel Pty Ltd, 8th Floor, 178 St George's Terrace, Perth 6000, (09) 321 2698: Broome

Ivanjah Pty Ltd, P O Box 159, Kalgoorlie 6430, (090) 21 3961: Gossmont.

Kane DJ, 8 Oleander Place, Wickham 6720, (091) 87 1616 : Mt Welcome.

Leslie Salt Company (Inc), 44 St George's Terrace, Perth 6000, (09) 325 4888: Pippingarra

Pioneer Concrete (WA) Pty Ltd, 123 Burswood Rd, Victoria Park 6100, (09) 362 1100: Port Hedland, Paraburdoo.

PRINCIPAL MINERAL PRODUCERS 1988 - continued.

CONSTRUCTION MATERIALS - rock

Cockburn Cement Ltd, Russell Rd, South Coogee 6166, (09) 410 1533: Coogee.
County, B S, C/- Specified Services, Unit 3/77 Hay St, Subiaco 6008, (09) 382 4488: Yeeda Station.
Specified Services Pty Ltd, 77 Hay Street, Subiaco 6008, (09) 382 4488: Mt Regal.

- sand

Amatek Ltd, 1 Newburn Rd, Kewdale 6104, (09) 353 3030: Jandakot.
Bebech M, P & Y, 167 East Road, Wanneroo 6055: Gnangarra.
Calsil Ltd, P O Box 7214, Cloisters Square, Perth 6000, (09) 321 8552: Port Hedland.
Cockburn Cement Ltd, Russell Rd, South Coogee 6166, (09) 410 1533: Cockburn Sound.
Cottiers Pty Ltd, P O Box 311, Port Hedland 6721, (09) 72 1553: Port Hedland.
Drew, M, P O Box 55, Cervantes 6511, (095) 45 7018: Cervantes.
Hastie, J W, Lot 117 Coolgardie Rd, Kalgoorlie 6430, (090) 21 3961: Coolgardie.
Marathon Roofing Pty Ltd, P O Box 5, Willetton 6155, (09) 455 1488: Jandakot.
North D E, PO Box 207, Roebourne 6718, (091) 82 1081: Point Samson.
Pioneer Concrete (WA) Pty Ltd, 123 Burswood road, Victoria Park 6100, (09) 362 1100: Paraburdoo.
PS Connolly Enterprises Pty Ltd (T/A Broome Crete), 19 Haynes Street, Broome 6725, (091) 92 1753: Waterbank Station.
Rule J K & G F, Lot 141 Robinson Street, Gingin 6503: Lancelin.
Specified Services Pty Ltd, Unit 3/77 Hay St, Subiaco 6008, (09) 382 4488: Maitland.
Stillman WJ, PO Box 71, Boulder WA 6432: Lake Lefroy.
The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 470 2222: Newman, Turner River, Warrambie Station, Warrawanda Creek, Widgiemooltha.
Tirad Pty Ltd, PO Box 126, Boulder 6432: Coolgardie.
Tomlinson JJ, 1 Bernard St, Claremont WA 6016, (09) 384 5553: Chidlow.

COPPER

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Kambalda.

COPPER CONCENTRATES

Horseshoe Lights Gold Pty Ltd, 614 Newcastle Street, Leederville 6007, (09) 427 6222: Horseshoe.
Newmont Aust Ltd, Level 18 AMP Tower, 535 Bourke Street, Melbourne Victoria 3000, (03) 629 5191: Telfer.

DIAMOND

Argyle Diamond Mines Pty Ltd, 2 Kings Park Rd, West Perth 6005, (09) 482 1188: Argyle.
- Ashton Mining Limited
AO (Aust) Pty Ltd) 4th Floor, 441 St Kilda Rd, Melbourne Victoria 3004 (03) 267 5500.
Tahaust Pty Ltd)
Capricorn Diamond Pty Ltd, 2 Kings Park Rd, West Perth 6005, (09) 482 1188: Argyle.
West Australian Diamond Trust, 28th Floor, Capita Centre, 197 St George's Tce, Perth 6000,
(09) 322 7933.
Freeport Bow River Properties Ltd, 22nd Floor, 360 Collins Rd, Melbourne Victoria 3004,
(03) 602 4811: Lissadell.
Gem Exploration and Minerals Pty Ltd, 9th Floor, 220 St George's Tce, Perth 6000,
(09) 322 1979: Lissadell.

DOLomite

Green K&P, P O Box 31, Newdegate 6355, (098) 71 1547 : Lake Magenta.

FELDSPAR

Commercial Minerals Ltd, 26 Tomlinson Road, Welshpool 6106, (09) 362 1411: Mukinbudin.
Pilbara Mica Corporation Pty Ltd, PO Box 301, Bridgetown 6255, (097) 61 7518: Pinningarra

GARNET SAND

Cable Sands P O Box 133, Bunbury 6230, (097) 21 4111 : Capel.
Target Minerals N L, P O Box 188, Geraldton 6530, (099) 23 3644: Port Gregory.

PRINCIPAL MINERAL PRODUCERS 1988 - continued

GOLD

Australian Consolidated Minerals Ltd, C/- GPO Box X2201, Perth WA 6001, (09) 325 7755: Golden Crown, Westonia.
BHP Minerals, 240 Hay St, Kalgoorlie 6430, (090) 24 2060: Gimlet South, Ora Banda Tailings, New Gimlet West, Boddington, P O Box 48, Boddington 6390, (098) 83 8260: Boddington.
Central Norseman Gold Corporation N L, P O Box 56, Norseman 6443, (090) 39 1101: Central Norseman.
Consolidated Exploration Ltd, P O Box 86, Fimiston 6433, (090) 91 2660: Davyhurst, Lady Bountiful.
East Murchison Mining Pty Ltd, GPO Box C130, Perth, (09) 426 5500 : Gidgee.
Forsyth NL & Reynolds Aust. Mines Pty Ltd, 1st Floor, 28 The Esplanade, Perth 6000, (09) 322 7221: Mt. Gibson.
Hill 50 Gold Mine N L, P O Box 83, Mt Magnet, 6638, (09) 63 4104: Hill 50.
Kalgoorlie Mining Associates, P O Box 105, Fimiston 6433, (090) 21 3411: Fimiston, Mt Charlotte.
Kia Ora Gold Corporation NL, PO Box 78, Southern Cross 6426, (090) 40 1030: Marvel Loch.
Metana Minerals NL, P O Box 792, Cloverdale 6105, (09) 277 9944 : Creedy, Parkinson, St George, Paris.
Mt Percy Gold Project, PO Box 489, Kalgoorlie 6430, (090) 21 8276: Mt Percy.
Newmont Holdings Pty Ltd, P O Box 231, Boulder 6432, (009) 19 8200: New Celebration.
North Kalgurli Mines Ltd, PMB 13, Kalgoorlie 6430, (090) 21 0600: North Kalgurli, Paringa.
Pancontinental Goldmining Areas Pty Ltd, P O Box 1161, Kalgoorlie 6430, (090) 24 2000: Paddington.
Sons of Gwalia Ltd, P O Box 669, West Perth 6005, (09) 481 1988: Sons of Gwalia.
Western Mining Corporation Ltd, P O Box 80, Belmont 6104, (09) 478 0711: Emu, Gt Boulder, Kombalda, Lancefield, Sand King.
Western Alluvials Pty Ltd, C/-Barrack Mine Management, 614 Newcastle St, Leederville 6107 (09) 328 8200: Wiluna Goldmine, Wiluna Dumps.
Whim Creek Consolidated N L, P O Box 144, West Perth 6005, (09) 325 5855: Havelock/Phar Lap.

GYPSUM

Bywaters L P, PO Box 2, Kalannie 6468: North Goodlands.
Brady H B and Company Pty Ltd, P O Box 42 Bayswater 6053, (09) 279 4422: Lake Brown.
Downie AJ, PO Box 160, Koorda 6475: Koorda.
Eaton MB & AE, PO Box 146, Narembeen 6369, (090) 64 7316: Mt. Walker.
Endeavour Resources Pty Ltd, 15th Floor, R & I Tower, 108 St Georges Terrace, Perth 6000, (09) 324 6350: Wyalkatchem.
Fitzgerald, EM & EJ, PO Box 392, Merredin 6495, (090) 41 1146: Mines Hill.
Green D B, PO Box 51, Carnamah 6517: Carnamah.
Hewson A R & K J, RMB 252, Lake Camm (via Newdegate) 6355: Lake Camm.
Kidman G, PO Box 69, Newdegate 6355, (098) 71 6044: Varley.
Lake Hillman Mining PL, P O Box 46, Kalannie 6468, (09) 66 2045: Lake Hillman.
McAndrew Mining, C/- Post Office, Yelbeni 6437, : Yelbeni.
Nixon P F and R S, P O Box 49, Kalannie 6468, (09) 66 2045: Lake Hillman.
Pustkuchen, JV & Enright, North Baandee via Booklakine 6411, (090) 44 4032: Mines Hill.
Swan Portland Cement Ltd, Burswood Rd, Rivervale 6103, (09) 361 8822: Lake Hillman.

IRON ORE

BHP Utah Minerals Int., 123 Kewdale Rd, Kewdale 6105, (09) 353 3822: Cockatoo Island, Koolan Island.
Goldsworthy Mining Ltd, 197 St George's Tce, Perth 6000, (09) 322 1788: Shay Gap.
Hamersley Iron Pty Ltd, 191 St George's Tce, Perth 6000, (09) 327 2327: Mt Tom Price.
Mt Newman Mining Company Pty Ltd, 200 St George's Tce, Perth 6000, (09) 320 4666: Newman, Yandicoogina.
Robe River Iron Associates, 9th Floor, 12-14 St George's Tce, Perth 6000, (09) 421 4747: Pannawonica.

LINESTONE

Aquarius Holdings Pty Ltd, Unit 3/104 Erindale Road, Balcatta 6021, (09) 349 6009: Wanneroo.
Commercial Minerals Ltd, 26 Tomlinson Road, Welshpool 6102, (09) 362 1411: Lancelin.
Endeavour Resources Ltd, 15th Floor, R & I Tower, 108 St George's Terrace, Perth 6000, (09) 324 6350: Gingin, Yanchepp.
Henderson Nominees Pty Ltd, 19 Rangeview Road, Landsdale 6065, (09) 342 9988: Moore River.
Jackson Bros., PO Box 40, Pemberton 6260, (097) 76 1206: Pt D'Entrecasteaux.
Specified Services Pty Ltd, Unit 3/77 Hay St, West Perth 6005, (09) 382 4488: Cleaverville.
Swan Portland Cement Ltd, P O Box 78, Rivervale 6103, (09) 361 8822: Wanneroo.
WA Limestone Co, 41 Spearwood Ave, Bibra Lake 6163, (09) 418 4440: Nowrup.

PRINCIPAL MINERAL PRODUCERS 1988 - continued

NICA

Pilbara Mica Corporation Pty Ltd, PO Box 301, Bridgetown 6255, (097) 61 7518: Pippingarra.

MINERAL BEACH SANDS

Allied Eneabba Ltd, 45 Stirling Highway, Nedlands 6009, (09) 389 1222: Eneabba.
Associated Minerals Consolidated Ltd, 45 Stirling Highway, Nedlands 6009, (09) 389 1222: Capel, Eneabba.
Cable Sands Pty Ltd, P O Box 133, Bunbury 6230, (097) 21 4111: Capel.
Westralian Sands Pty Ltd, P O Box 96, Capel 6271, (097) 27 2002: Boyanup, North Capel, Yoganup.

NICKEL

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Carnilya Hill, Kambalda, Windarra.

PALLADIUM

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104 (09) 478 0711: Kambalda.

PEAT

Magnet Industries, 665 Welshpool Rd, Wattle Grove 6107, (09) 453 6777: Manjimup.
Phillips I M & W D, C/- RMB 133 Deeside Mail Service, Manjimup 6258, (097) 69 1050: Lake Muir.

PETROLEUM - condensate

Consolidated Gas Pty Ltd, 2nd Floor Hamden House, 174 Hamden Road, Nedlands 6009, (09) 389 8344: Woodada.
West Australian Petroleum Pty Ltd, 233 Adelaide Tce, Perth 6000, (09) 325 0181: Barrow Island, Dongara.
Woodside Offshore Petroleum Pty Ltd, 1 Adelaide Tce, Perth 6000, (09) 224 4111: North Rankin.

- crude oil

Barrack Energy Ltd, 262 St George's Tce, Perth 6000, (09) 322 2288: Mt Horner.
Bond Corporation Pty Ltd, Griffin Centre, 28 The Esplanade, Perth 6000, (09) 322 7355: Harriet, Rosette.
Home Energy Company Ltd, 4th Fl, 233 Adelaide Tce, Perth 6000, (09) 325 1555: Blina, Lloyd, Sundown, West Terrace.
West Australian Petroleum Pty Ltd, 1 Adelaide Tce, Perth 6000, (09) 325 0181: Barrow Island, Dongara.
Western Mining Corporation Ltd, 233 Adelaide Tce, Perth 6000, (09) 425 4444: Herald/Pepper.

- natural gas

Consolidated Gas Pty Ltd, 2nd Floor Hamden House, 174 Hamden Road, Nedlands 6009, (09) 389 8344: Woodada.
West Australian Petroleum Pty Ltd, 233 Adelaide Tce, Perth 6000, (09) 325 0181: Dongara.
Woodside Offshore Petroleum Pty Ltd, GPO Box D188, Perth 6001, (09) 425 1211: North Rankin.

PLATINUM

Western Mining Corporation Ltd, 191 Great Eastern Hwy, Belmont 6104, (09) 478 0711: Kambalda.

SALT

Dampier Salt Operations Ltd, 191 St George's Tce, Perth 6000, (09) 327 2299: Dampier, Lake Macleod.
Leslie Salt Company, 44 St George's Tce, Perth 6000, (09) 325 4888: Port Hedland.
Shark Bay Salt Joint Venture, 22 Mount St, Perth 6000, (09) 322 4811: Useless Loop

SEMI-PRECIOUS STONES - amethyst

Soklich Trading Company, Lot 326 Dale Place, Orange Grove 6109, (09) 459 1449: Gascoyne.

PRINCIPAL MINERAL PRODUCERS 1988 - continued

SILICA SAND

Amatek Limited, 1 Newburn Road, Kewdale 6104, (09) 353 3030: Canningvale, Eclipse Hill, Jandakot.
Australian Glass Manufacturers Co, 35 Baille Road, Canning Vale 6155, (09) 455 1111: Lake Gnangara.
Bell Basic Industries Ltd, 136-138 Great Eastern Hwy, Guildford 6055, (09) 279 0000: Jandakot.
The Readymix Group (WA), 75 Canning Hwy, Victoria Park 6100, (09) 470 2222: Jandakot.
Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Mt Burges.

SILVER

Horseshoe Lights Gold Pty Ltd, 614 Newcastle Street, Leederville 6007, (09) 427 6222: Horseshoe.
Western Mining Corporation Ltd, 191 Great Eastern Highway, Belmont 6104, (09) 478 0711: Kambalda.
Newmont Aust Pty Ltd, Level 18 AMP Tower, 535 Bourke Street, Melbourne Victoria 3000, (03) 629 5191: Telfer.

SPODUMENE

Lithium Australia Ltd, 91 Kensington St, East Perth 6004, (09) 325 1966: Greenbushes.

TALC

Gwalia Minerals NL, 38 Parliament Place, West Perth 6005, (09) 481 0023: Mt Seabrook.
Western Mining Corporation Ltd, P O Box 116, Three Springs 6519, (099) 54 5047: Three Springs.

TANTALITE

Greenbushes Tin Ltd, 91 Kensington Street, East Perth 6004, (09) 325 8900: Greenbushes.

TIN

Greenbushes Tin Ltd, 91 Kensington Street, East Perth 6004, (09) 325 8900: Greenbushes.

VERMICULITE

Vermiculite Industries Pty Ltd, 15 Spencer Street, Jandakot 6164: Young River.

ZINC

BHP Minerals Ltd, Level 8, Forrest Centre, 221 St George's Tce, Perth 6000, (09) 426 5800: Cadjebut.



