



Government of **Western Australia**
Department of **Mines and Petroleum**

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2010

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LIST OF FIGURES, TABLES AND MAPS

FIGURES

Figure 1	Value of WA's Mineral and Petroleum Industry	3
Figure 2	Mining Investment	3
Figure 3	Average Price Comparison 2009 and 2010	3
Figure 4	Mineral Exploration Expenditure	3
Figure 5	Petroleum Exploration Expenditure	3
Figure 6	New Capital Investment	3
Figure 7	Australian Merchandise Exports 2010	4
Figure 8	Major Commodities by Value 2009 and 2010	5
Figure 9	Selected WA Commodities Relative to World Production	6
Figure 10	Value of Minerals and Petroleum by Commodity	6
Figure 11	Exchange Rate US\$/A\$	7
Figure 12	Exchange Rate Trade Weighted Index	7
Figure 13	Australian Dollar Exchange Rate Against Major Currencies	7
Figure 14	Non-Rural Commodity Price Index	7
Figure 15	WA Mineral and Petroleum Exports 2010	8
Figure 16	WA Merchandise Exports 2010	8
Figure 17	WA Merchandise Exports 2010	8
Figure 18	Gold Exports	8
Figure 19	Petroleum Exports	9
Figure 20	Crude Oil and Condensate Exports	9
Figure 21	Iron Ore Exports	9
Figure 22	Alumina Exports	9
Figure 23	Nickel Exports	9
Figure 24	Heavy Mineral Sands	9
Figure 25	Iron Ore Contract Price	10
Figure 26	Average Iron Ore Fines	10
Figure 27	Gold Price	11
Figure 28	Tapis Crude Oil Price	11
Figure 29	Nickel Price	11
Figure 30	Alumina Price	11
Figure 31	Copper Price	12
Figure 32	Lead Price	12
Figure 33	Zinc Price	12
Figure 34	LNG Import Prices	13
Figure 35	Average LNG Import Prices	13
Figure 36	Average Natural Gas Prices	13
Figure 37	Historic Gold Prices	14
Figure 38	Historic Nickel Prices	14
Figure 39	Gold Quantity and Value by Quarter	15
Figure 40	Nickel Quantity and Value by Quarter	15
Figure 41	Heavy Mineral Sands Value by Quarter	15
Figure 42	Iron Ore Quantity and Value by Quarter	15
Figure 43	Alumina Quantity and Value by Quarter	15
Figure 44	Crude Oil and Condensate Quantity and Value by Quarter	15

Figure 45	Nickel Quantity	16
Figure 46	Heavy Mineral Sands Value of Production	16
Figure 47	Gold Production	16
Figure 48	Crude Oil and Condensate Quantity	17
Figure 49	Iron Ore Quantity	17
Figure 50	Alumina Quantity	17
Figure 51	Crude Oil and Condensate Production 2010	18
Figure 52	Natural Gas Production 2010	18
Figure 53	OPEC Share of World Crude Oil Reserves	18
Figure 54	China's Crude Steel Production and Iron Ore Imports	18
Figure 55	Australian Natural Gas Resources	19
Figure 56	Sales by Commodity 2010	21
Figure 57	Value of Minerals and Petroleum by Region 2010	24
Figure 58	Royalty Receipts 2010	26
Figure 59	Royalty Receipts by Commodity	26

TABLES

Table 1	Tenements in Force 1978 Act	19
Table 2	Quantity and Value of Minerals and Petroleum	20
Table 3	Quantity and Value of Selected Major Commodities	22
Table 4	Value of Minerals and Petroleum by Region by LGA	24
Table 5	Value of Minerals and Petroleum by Region by Commodity	25
Table 6	Royalty Receipts 2009 and 2010	26
Table 7	Average Number of Persons Employed in the WA Minerals and Petroleum Industries	27
Table 8	Principal Mineral and Petroleum Producers	33

MAPS

Map 1	Local Government Boundaries	40
Map 2	Local Government Boundaries – Inset	41
Map 3	Major Mineral and Petroleum Projects in WA	42
Map 4	Major Mineral and Petroleum Projects in WA – Inset A & B	43

Abbreviations	38
Weights and Measures	38
Units and Conversion Factors	38
Data Sources	39

The value of Western Australia's mineral and petroleum industry reached a record \$91.6 billion in 2010. Iron ore remained the State's most valuable resource in 2010 accounting for \$48.5 billion or 53 per cent of all mineral and petroleum sales. Strong results were also recorded for the petroleum and gold sectors.

A robust Australian dollar did little to dampen returns to producers as commodity prices reached new highs in 2010 reflecting continued growth in demand for Western Australia's mineral and petroleum resources. Higher commodity prices and increased volumes saw the value of the State's resources industry in 2010 increase by 49 per cent over the previous year's result of \$61.5 billion. During the past ten years the value of Western Australia's mineral and petroleum industry has grown strongly achieving average annual growth of 15 per cent.

Iron ore, petroleum, and gold together accounted for 87 per cent or \$79 billion of all mineral and petroleum sales in 2010. These three sectors continue to drive strong economic growth in Western Australia.

Western Australia's mineral and petroleum resources in order of value for 2010 are:

Commodity	Billion
Iron Ore	\$48.5
Crude Oil and Condensate	\$12.0
LNG	\$8.8
Gold	\$7.8
Nickel	\$4.3
Alumina	\$4.0
Others	\$6.2
Total	\$91.6

Western Australia leads all other states with regard to investment expenditure by the mining industry. In 2010, the State accounted for 62 per cent of national mining investment expenditure. According to ABS statistics, the value of private new capital expenditure by Western Australia's mining industry amounted to \$24.5 billion in 2010, an increase of 13 per cent over the previous year. In the same period, mining accounted for 75 per cent of all business investment in Western Australia which totalled \$32.9 billion.

Mineral and petroleum resources dominate the State's exports, contributing a substantial 91 per cent towards the State's total merchandise exports in 2010. China was again the State's largest export market taking in 40 per cent of all merchandise exports.

Western Australia maintained its status as the nation's leading exporter in 2010 contributing a record 44 per cent towards Australia's merchandise export earnings worth \$230.8 billion. Queensland followed with 22 per cent, New South Wales with 15 per cent and Victoria contributed around eight per cent.

In 2010, the Australian dollar appreciated against the US dollar rising by 16 per cent to average US92 cents for the year, reflecting a strengthening of the Australian economy. The Australian dollar reached parity with the US dollar on 15 October 2010 for the first time since it was floated in 1983. Since late 2010, the Australian dollar has traded close to parity and has fluctuated around that mark into 2011.

The improving global economy during 2010 saw commodity prices rebound strongly from the lows reached in early 2009. The list below shows average commodity price movements between 2009 and 2010 in both US and Australian dollar terms.

Commodity	US\$	A\$
Iron Ore Spot Fines	Up 96%	Up 68%
Iron Ore Spot Lump	Up 80%	Up 64%
Tin	Up 51%	Up 29%
Nickel	Up 48%	Up 29%
Copper	Up 46%	Up 28%
Zinc	Up 31%	Up 14%
Crude Oil	Up 29%	Up 12%
Alumina	Up 29%	Up 10%
Gold	Up 26%	Up 8%
Lead	Up 25%	Up 9%
Cobalt	Up 17%	Up 1%

Western Australia's resources industry is expected to grow solidly in 2011 and beyond with \$107 billion worth of mineral and petroleum projects committed or under construction and a further \$194 billion planned or possible (updated as at 1 March 2011). In addition, strong economic growth in developing economies including China and India will underpin steady demand for the State's mineral and petroleum products in coming years. Finally, Western Australia is well positioned to build on its strengths as a reliable supplier of quality resources at world cost-competitive prices.

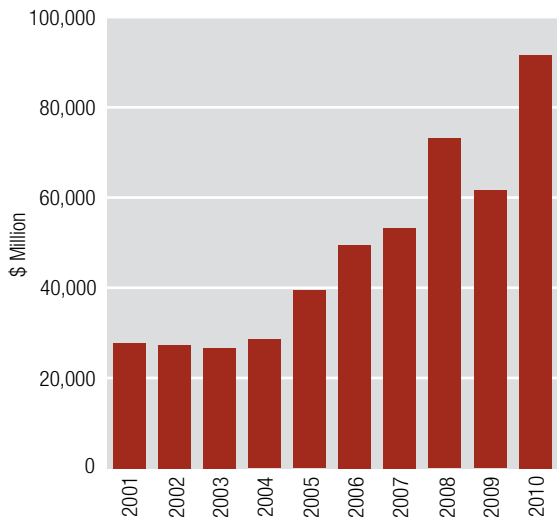


Figure 1. Value of Western Australia's Mineral and Petroleum Industry Source: DMP

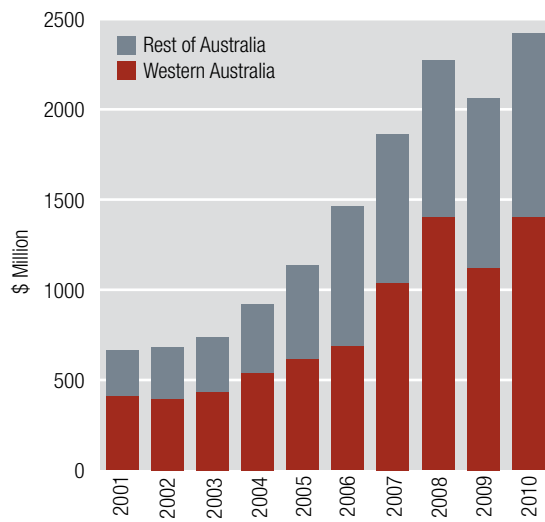


Figure 4. Mineral Exploration Expenditure Source: ABS

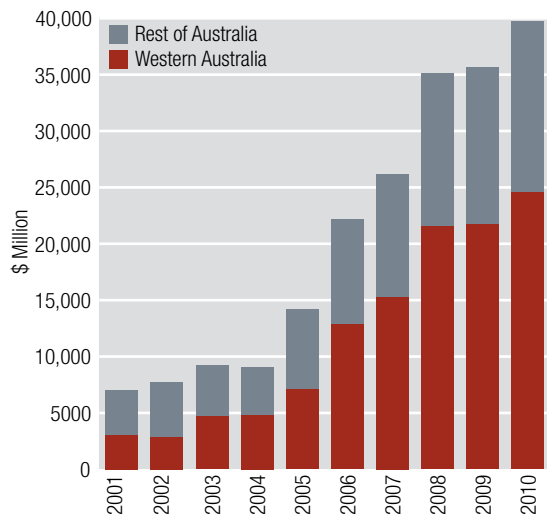


Figure 2. Mining Investment Source: ABS

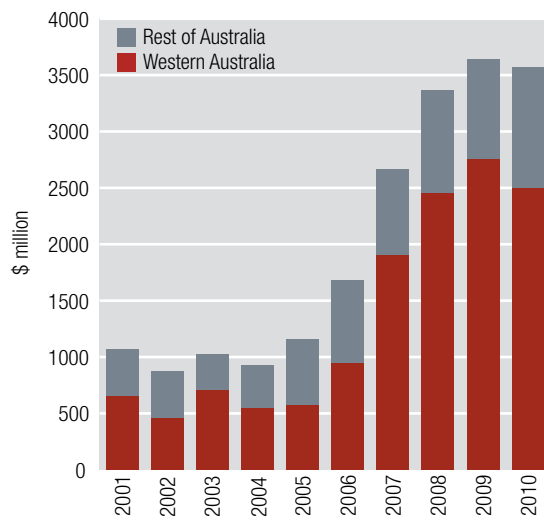


Figure 5. Petroleum Exploration Expenditure Source: ABS

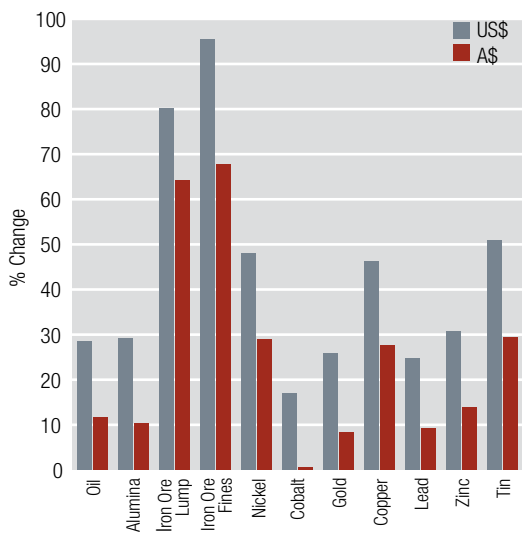


Figure 3. Average Price Comparison 2009 and 2010 Source: LME, Kitco, Interfax China Ltd, Metal Prices and DMP

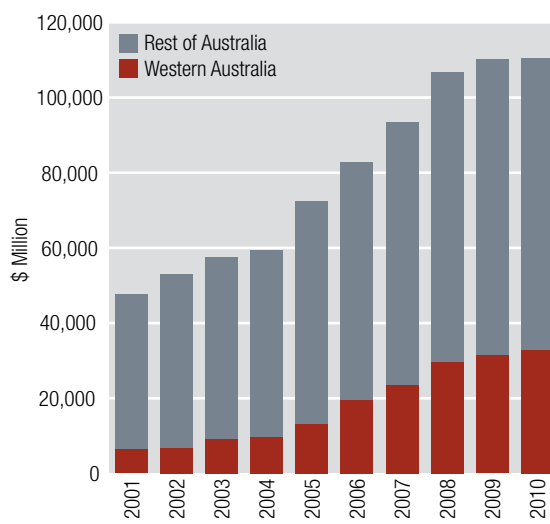


Figure 6. New Capital Investment Source: ABS

A key feature in 2010 has been the strong growth in iron ore prices following the breakdown of the forty-year-old iron ore annual benchmark pricing system. In 2010, spot pricing became the new basis for establishing contract sales with producers using a variety of methodologies to arrive at an average price for contracted ore sales. Strong demand during the latter half of 2009 continued throughout 2010 pushing iron ore prices to record levels, up 96 per cent in US dollar terms and 68 per cent in Australian dollar terms for spot fines. During the year, there were also a large number of spot price iron ore shipments.

Iron ore remained the State's largest sector in terms of value accounting for \$48.5 billion or 53 per cent of total sales in 2010. This represented a 72 per cent increase in value compared to 2009. On average, during the past ten years the value of iron ore has increased by 31 per cent per annum, which is an outstanding performance. The sector shipped record tonnages in 2010, increasing by 10 per cent to reach 391 million tonnes.

Petroleum, which includes crude oil, condensate, LNG, natural gas, LPG butane and propane, is Western Australia's second largest sector accounting for \$22.9 billion or 25 per cent of total sales. This represents a 36 per cent increase in overall value mainly due to the commencement of the Pyrenees and Van Gogh oil fields and higher oil and LNG prices.

In 2010, **LNG** production increased by eight per cent to 16.5 million tonnes with the value of sales increasing by 39 per cent to \$8.8 billion elevating LNG as the second most valuable commodity in the State.

The Tapis oil price averaged US\$84 per barrel in 2010, up 29 per cent from 2009. The value of crude oil sales from Western Australia rose by 50 per cent to \$8.2 billion in 2010, making **crude oil** the third most valuable commodity. Output increased by 31 per cent to 92.6 million barrels.

Condensate output fell by four per cent to 45.4 million barrels, while sales value increased by 15 per cent to \$3.7 billion.

Gold ranked fourth in terms of overall value and now accounts for nine per cent of all sales. In 2010, the value of the sector increased sharply by 35 per cent to be worth a record \$7.8 billion. This impressive result can be attributed to continued strength in the gold price which averaged US\$1224 per ounce, an increase of 26 per cent from 2009. The State's gold producers have responded to higher gold prices with output increasing by 25 per cent to 5.9 million ounces.

Nickel, in fifth place, contributed \$4.3 billion to the total value of the State's resources in 2010. A strong 48 per cent increase in the US dollar nickel price resulted in the value of nickel sales rising by 27 per cent. Nickel production rose by ten per cent to 188 thousand tonnes.

Alumina claimed sixth place in 2010 with 12.6 million tonnes of alumina being shipped. This represents an increase in output of just one per cent compared with 2009. Strengthening of the Australian dollar offset the 29 per cent rise in the US dollar price for alumina, resulting in the value of alumina sales increasing by only 11 per cent to \$4 billion.

The recovery in global economic activity and stronger commodity prices saw the value of **base metals** increase by 23 per cent to \$1.5 billion in 2010.

Copper recorded a five per cent increase in output which totalled 157 thousand tonnes in 2010. Copper prices bounced back strongly in 2010, up by 46 per cent in US dollar terms compared to 2009. This resulted in the value of copper sales rising sharply by 24 per cent to \$1.2 billion.

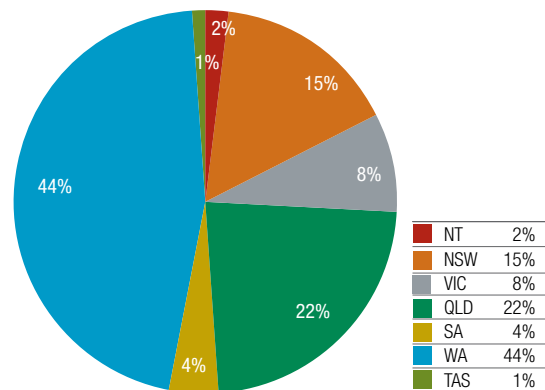


Figure 7. Australian Merchandise Exports 2010 \$230.8 billion Source: ABS

Note: These percentages are based on data which includes \$8.1 billion of re-exported goods and of no State origin available and account for around 3% of the total.

Sales volumes of **zinc** were down by 20 per cent to 80 thousand tonnes in 2010. Despite a solid 31 per cent rise in the US dollar price of zinc, sales values fell by 11 per cent to \$189 million.

Lead sales rose by 132 per cent to 53 thousand tonnes in 2010 due to the recommencement of activities by Magellan Metals. The US dollar price of lead rose by 25 per cent in 2010 which coincided with the value of lead sales increasing by 152 per cent to \$117 million.

Domestic **natural gas** sales volumes remained static at 9.3 billion cubic meters in 2010 with the sales value of this gas increasing by 20 per cent to \$1.4 billion. This increase was partly due to a contract settlement between North West Shelf Gas and Alinta Gas. LPG butane and propane's output rose a modest four per cent in 2010 whilst sales values were up by 25 per cent to \$763 million.

The total value of **mineral sands** sales was down by 24 per cent to \$511 million in 2010. The reduction in the value of sales was mainly due to volumes being down for synthetic rutile (38 per cent), rutile (12 per cent) and leucoxene (60 per cent). In 2010, zircon volumes rose by 22 per cent whilst values remained steady at \$217 million.

Ilmenite was the only other commodity in the group to record an increase, with output rising by six per cent to 493 thousand tonnes which was valued at \$66 million.

In 2010, the value of **salt** sales fell by 13 per cent to \$388 million largely due to a strong Australian dollar. Volumes increased by 15 per cent to 11.6 million tonnes.

Coal production rose by seven per cent to 7 million tonnes in 2010 with sales revenue increasing by a similar amount to reach \$330 million.

Diamond sales volumes recovered from a weak market in 2009, rising by 21 per cent to reach 14.4 million carats in 2010.

Output for **Cobalt**, as a by-product of nickel mining, fell by 11 per cent in 2010. A strong appreciation in the Australian dollar offset higher cobalt prices resulting in sales values falling by eight per cent to \$169 million.

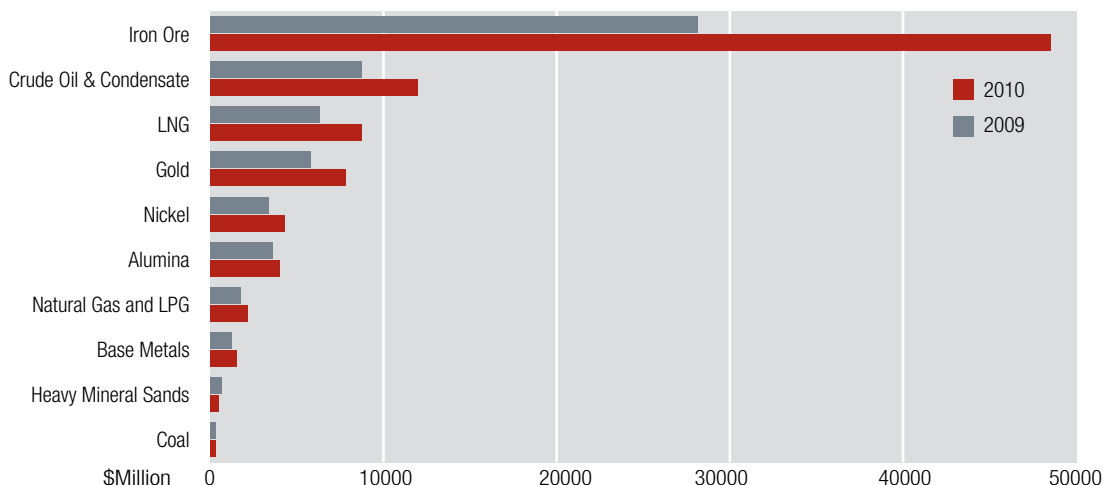


Figure 8. Major Commodities by Value 2009 and 2010 Source: DMP

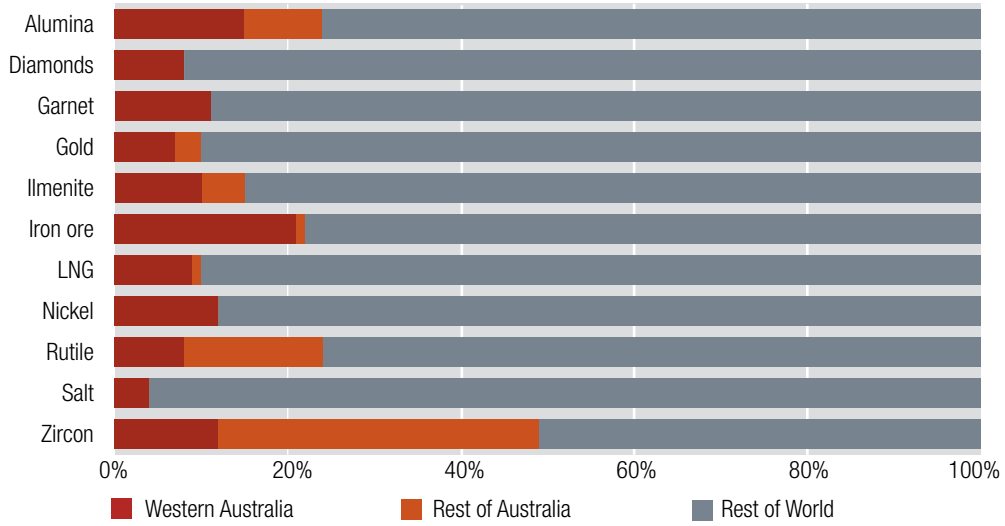


Figure 9. **Selected WA Commodities Relative to World Production Ending 2010 by Quantity**

Source: DMP, ABARE, USGS

The latest comparable data show that the Western Australian share (by quantity) of the world's output of the following products was: alumina 15%, garnet 11%, gold 7%, ilmenite 10%, iron ore 21%, LNG (sea-borne trade) 9%, nickel 12%, rutile 8%, salt 4%, zircon 12% and 8% of diamonds (mainly industrial grade)

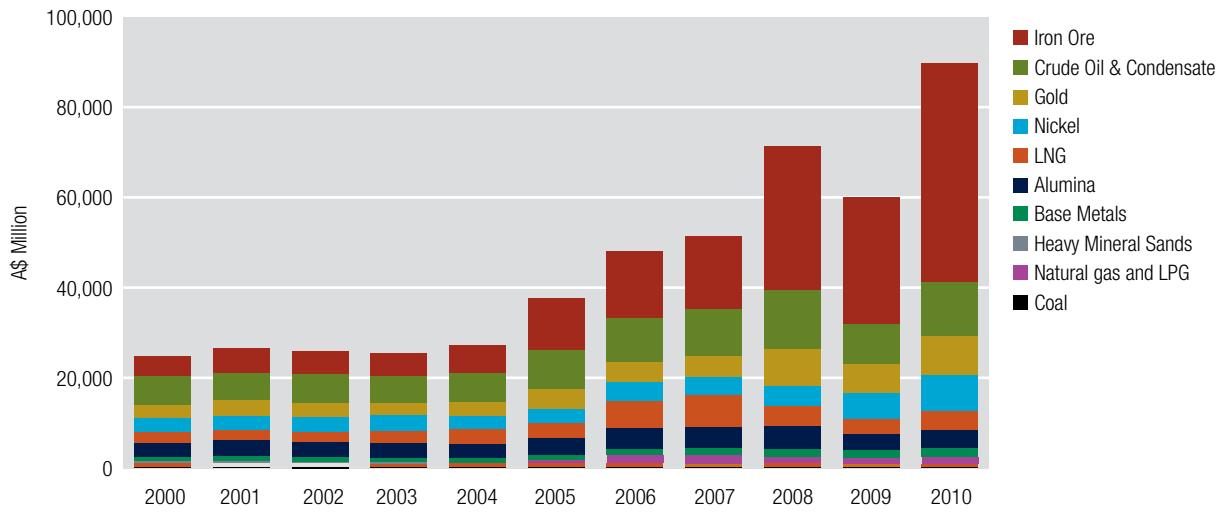


Figure 10. **Value of Minerals and Petroleum by Commodity** Source DMP

EXCHANGE RATES

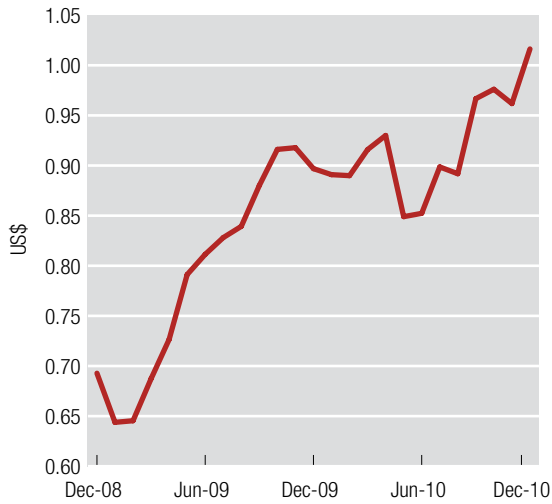


Figure 11. Exchange Rate US\$/A\$ Source: Reserve Bank of Australia

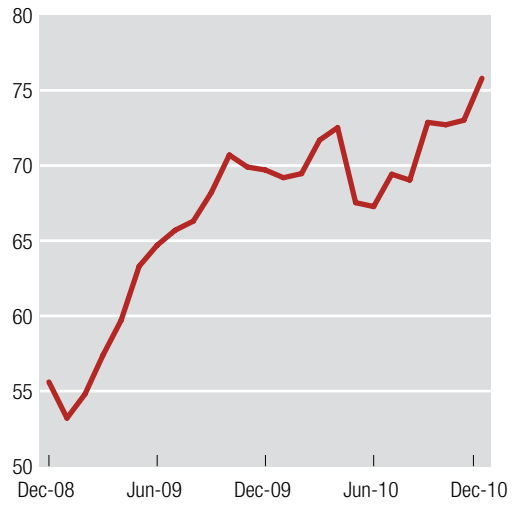


Figure 12. Exchange Rate Trade Weighted Index (units of foreign currency per A\$)

Source: Reserve Bank of Australia
 Definition: "Trade weighted index" is the average value of A\$ in relation to the currencies of Australia's major trading partners. (May 1970 = 100)

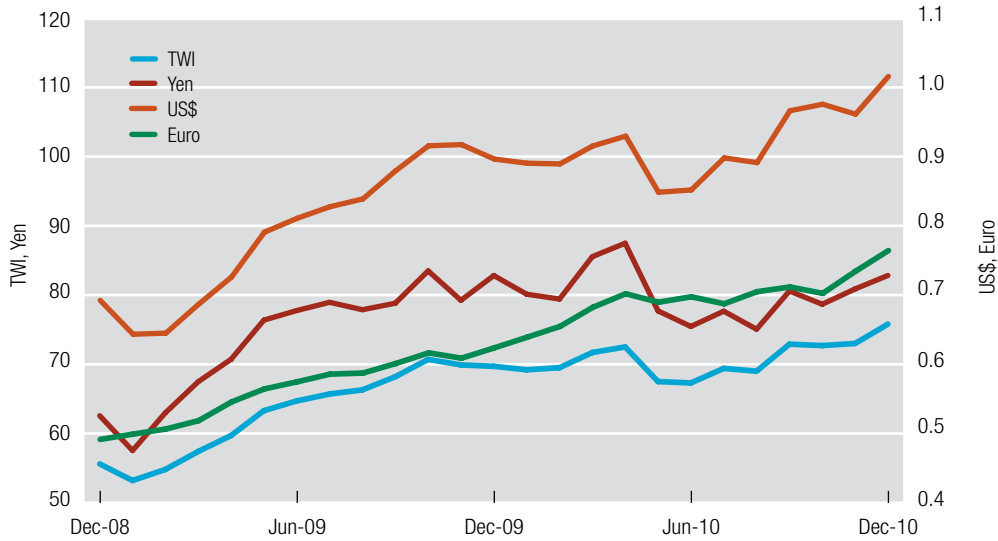


Figure 13. Australian Dollar Exchange Rate Against Major Currencies Source: Reserve Bank of Australia

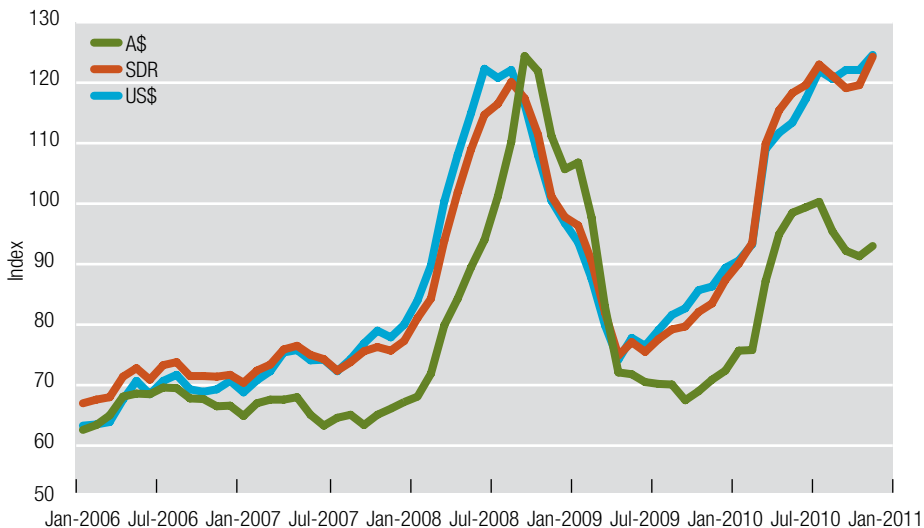


Figure 14. Non-Rural Commodity Price Index (2008-09 = 100) Source: Reserve Bank of Australia

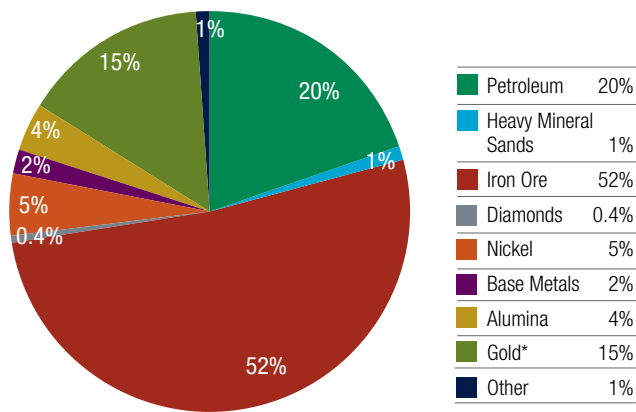


Figure 15. **Western Australian Mineral and Petroleum Exports 2010**
 Total Value A\$93.2 billion Source: DMP
 * Includes \$6.4 billion of gold refined/processed and exported from Western Australia, but produced from mining operations in other States, Territories and overseas.

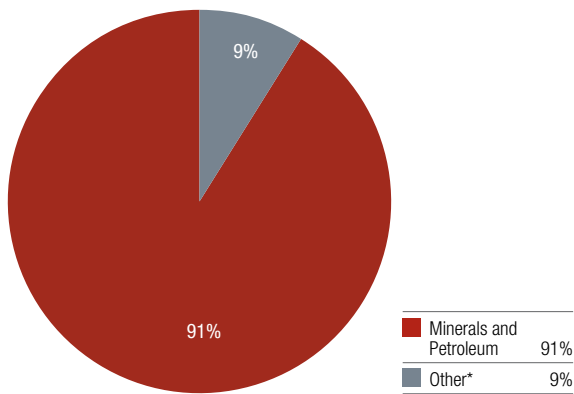


Figure 16. **Western Australian Merchandise Exports 2010**
 \$102 billion Source: DMP and ABS
 * Other includes wheat, wool, wood chips, live animals, seafood, meat, pearls and other agricultural and manufactured items.

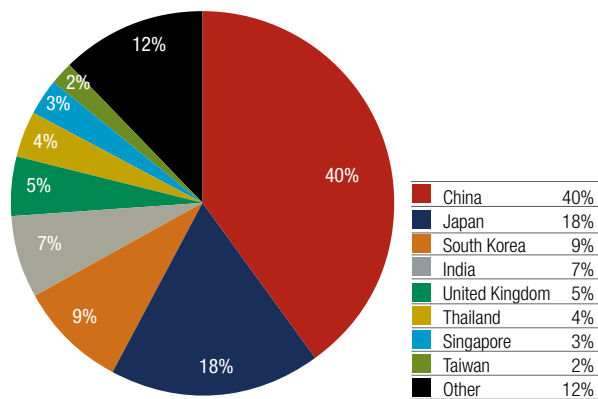


Figure 17. **Western Australian Merchandise Exports 2010**
 \$102 billion Source: ABS

Gold Export update 2010

The Australia Bureau of Statistics (ABS) release trade data that indicates a significant rise in Western Australian gold exports. However, this apparent increase in gold exports from Western Australia is due to a restructuring of Australia’s gold refining industry in the late 1990’s through to October 2002 when the AGR Matthey partnership was created. The latest change occurred in March 2010 when the AGR Matthey partnership was dissolved and full ownership returned to the Western Australian Mint.

As a result of the mergers made in 2002, all Australian gold is now refined at the Western Australian Mint (usually known as The Perth Mint). The Victorian refinery still refines silver and jewellery products.

Gold export data published by the ABS from Western Australia must therefore be interpreted with some caution. It includes gold produced in other States and Territories, in addition to production from overseas operations, namely Papua New Guinea and Asia, which is refined and exported from Western Australia. This export figure is therefore larger than Western Australia’s own level of gold production.

The ABS estimates that gold exports from Western Australia in 2010 amounted to approximately \$14.25 billion. Approximately 55% or \$7.83 billion was gold produced in Western Australia. The remaining 45% (approximately \$6.42 billion) can be attributed to gold refined and exported from Western Australia but produced from mining operations in other States, Territories and overseas. Overseas imported gold also includes scrap which is refined in Western Australia and exported.

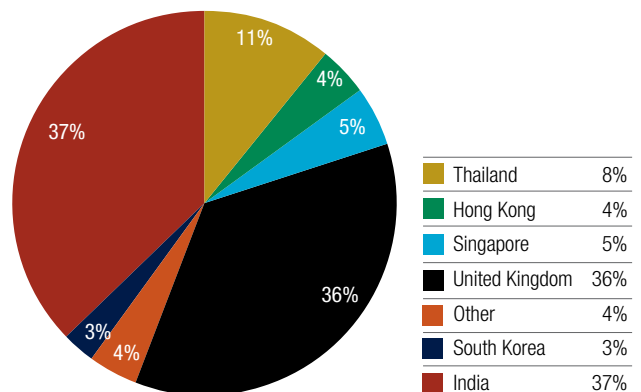


Figure 18. **Gold Exports**
 Total Value \$14.3 billion Source: ABS and DMP
 Note: Includes gold refined/processed and exported from Western Australia, but produced from mining operations in other States, Territories and overseas.

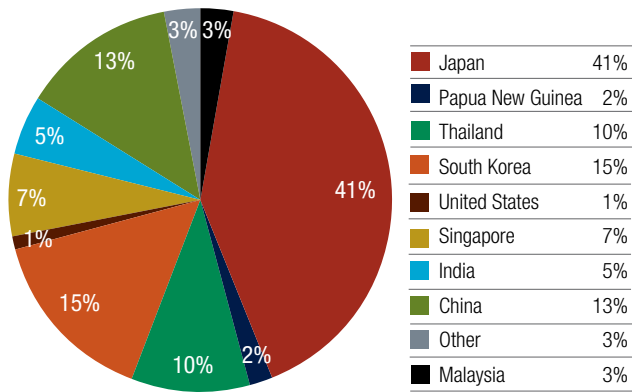


Figure 19. **Petroleum Exports**
Total Value \$18.5 billion Source: DMP and ABS

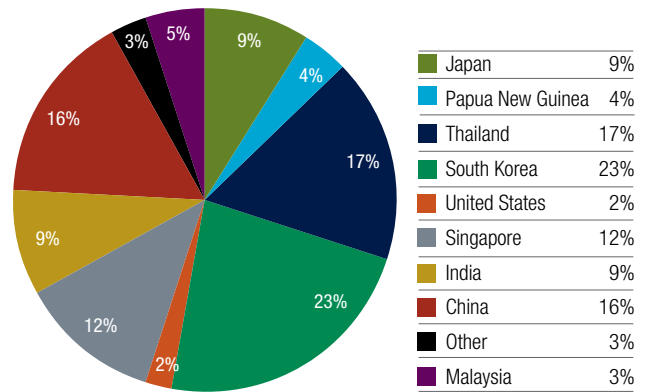


Figure 20. **Crude Oil and Condensate Exports**
Total Value \$10.4 billion Source: DMP and ABS

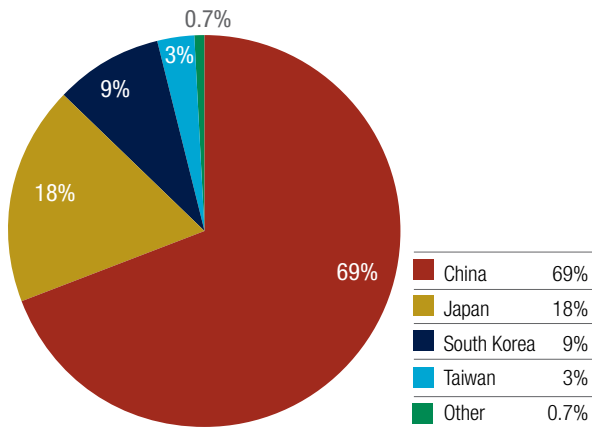


Figure 21. **Iron Ore Exports** Total Value \$47.9 billion Source: DMP

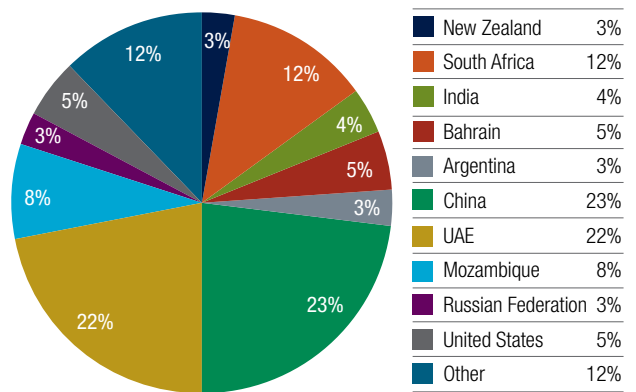


Figure 22. **Alumina Exports** Total Value \$3.8 billion Source: DMP

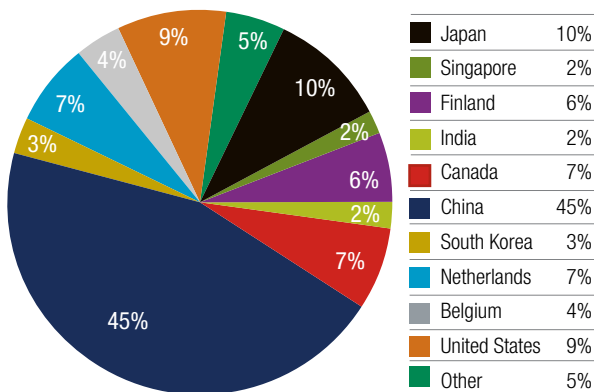


Figure 23. **Nickel Exports** Total Value \$3.7 billion Source: DMP

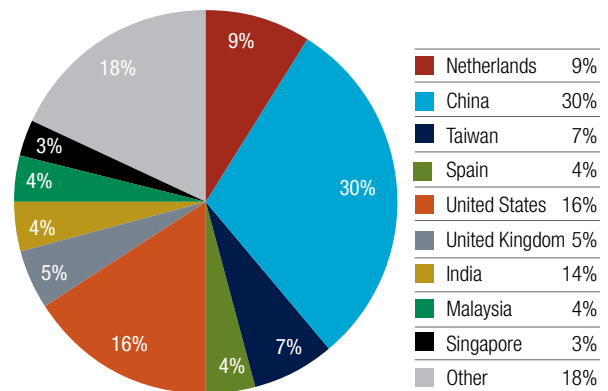


Figure 24. **Heavy Mineral Sands Exports**
Total Value \$695.84 million Source: DMP
Note: Exports include titanium dioxide and product sourced from private land, overseas and other States and processed in Western Australia

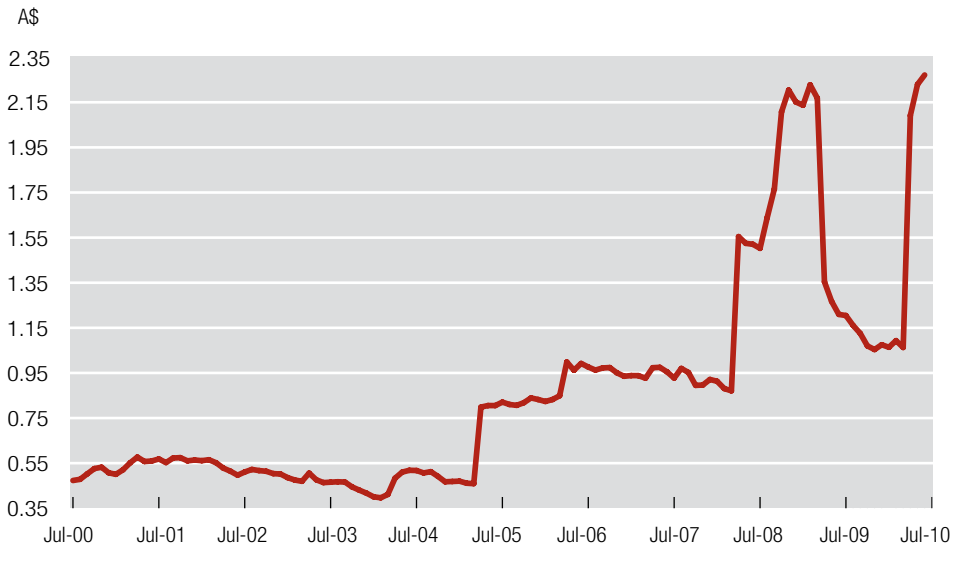


Figure 25. **Iron Ore Contract Price A\$/Fe unit** Source: Tex Report, High Grade Fine Ore Prices
 Note: Price is per 1%. An 'Fe unit' is equivalent to each 1% of iron ore. Hence, ore shipped at 63% Fe commands a price of 63 x 'Fe unit price'.

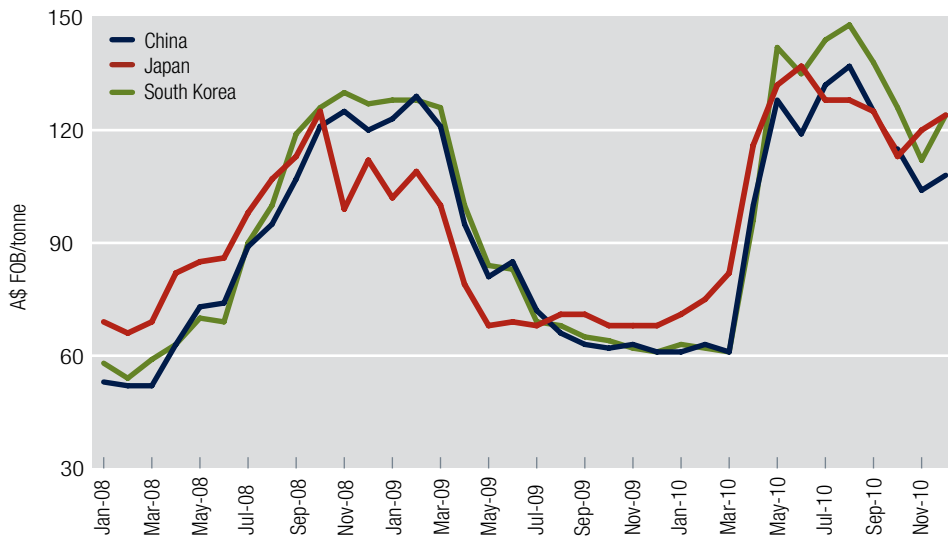


Figure 26. **Average Iron Ore Fines (all grades)** Source: DMP

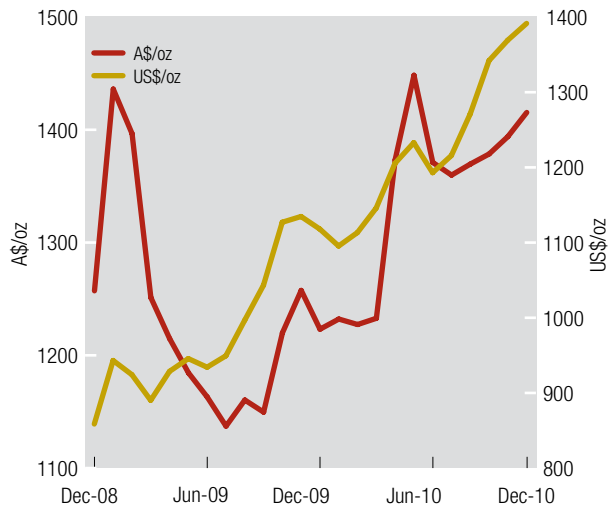


Figure 27. **Gold Price** Source: Perth Mint and London Fix

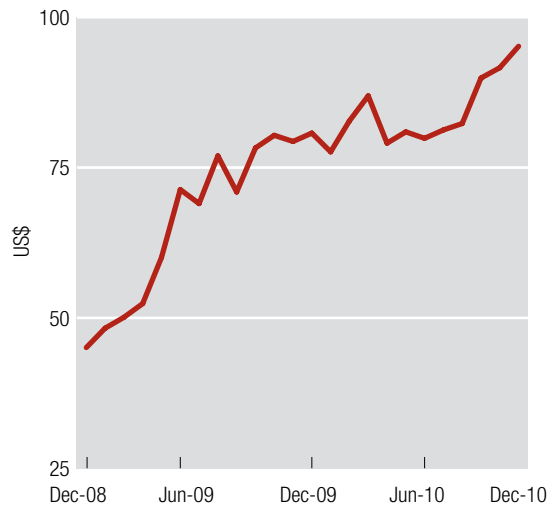


Figure 28. **Tapis Crude Oil Price US\$/bbl**
Source: WA Treasury Corporation

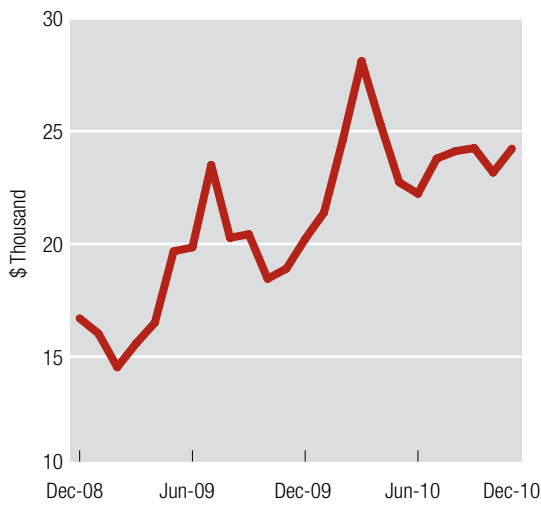


Figure 29. **Nickel Price A\$/tonne**
Source: LME Cash, Monthly Average



Figure 30. **Alumina Price A\$/tonne** Source: ABS

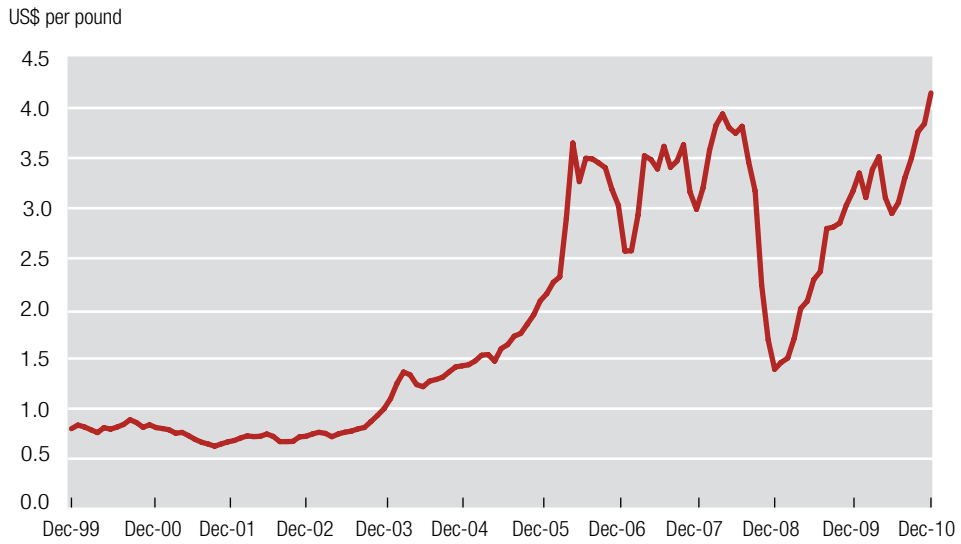


Figure 31. **Copper Price** Source: Metalprices.com

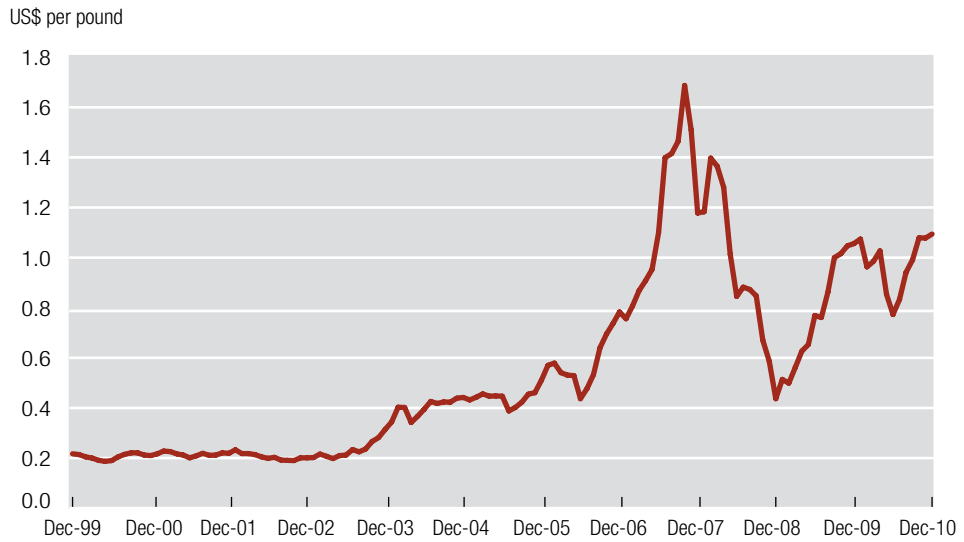


Figure 32. **Lead Price** Source: Metalprices.com

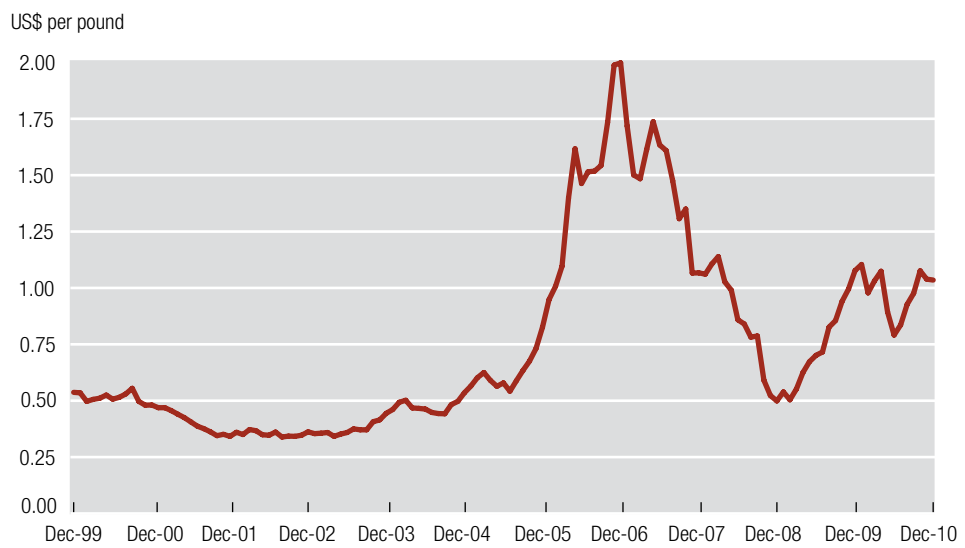


Figure 33. **Zinc Price** Source: Metalprices.com

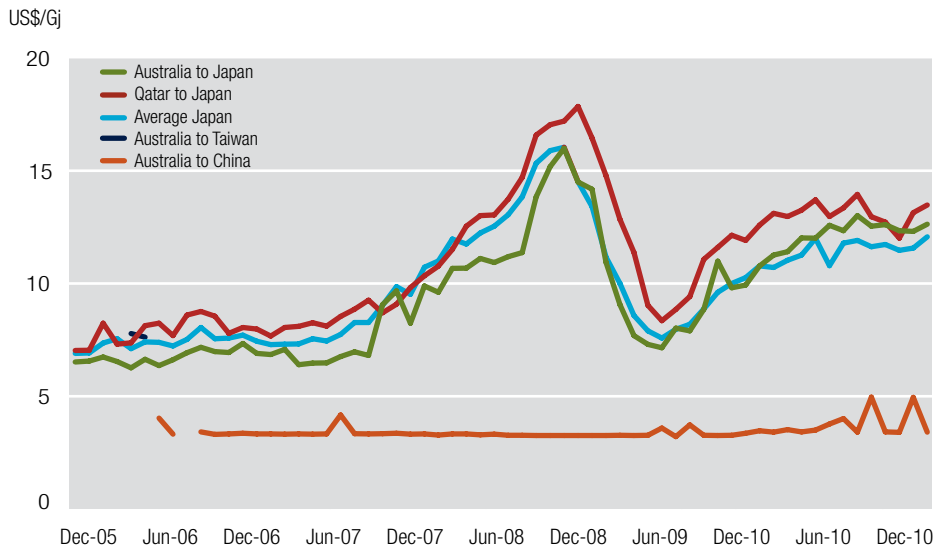


Figure 34. **LNG Import Prices** Source: Argus Monthly LNG (prices include freight and regassing)

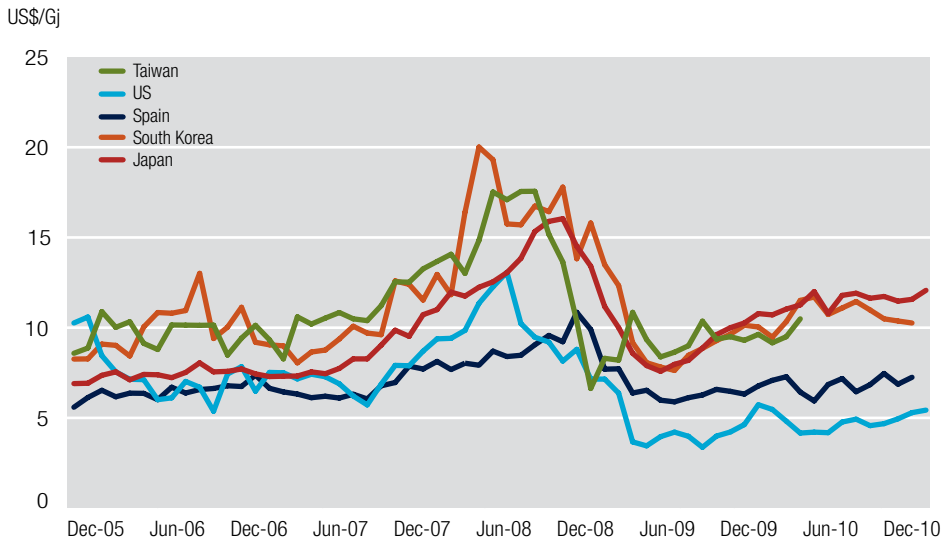


Figure 35. **Average LNG Import Prices** Source: Argus Monthly LNG (prices include freight and regassing)

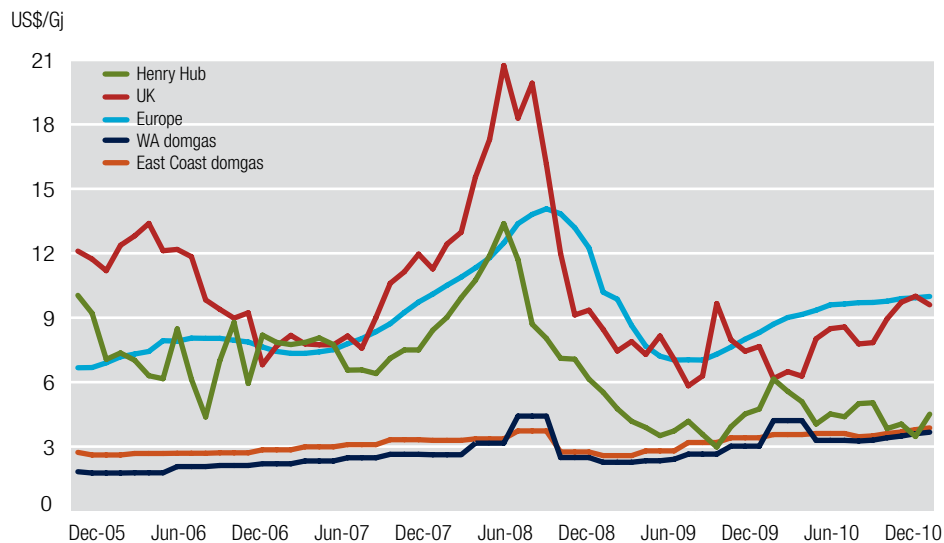


Figure 36. **Average Natural Gas Prices** Source: Argus Monthly LNG, EnergyQuest and DMP

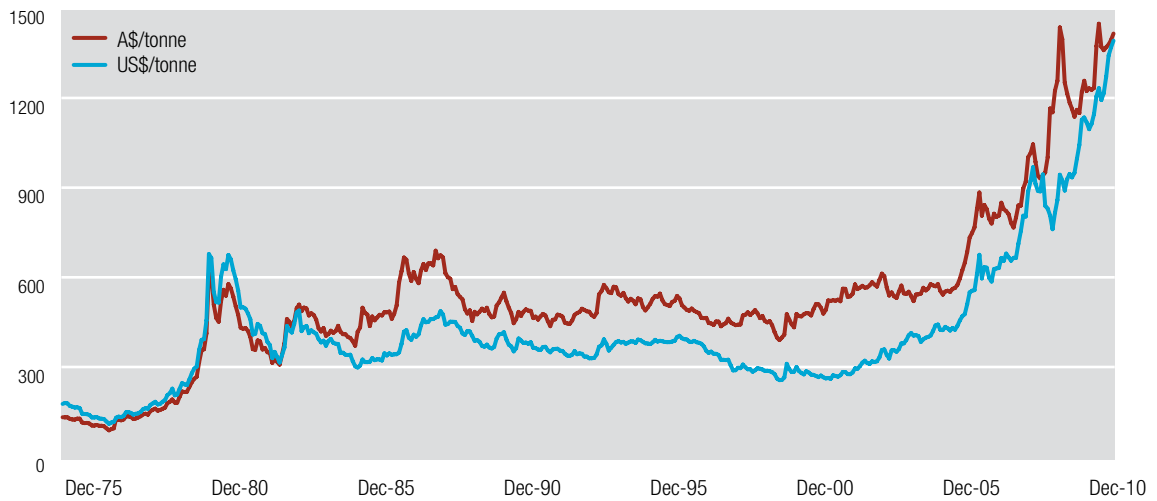


Figure 37. **Historic Gold Prices, US\$/A\$ per ounce** Source: World Gold Council, Perth Mint and London PM Fix

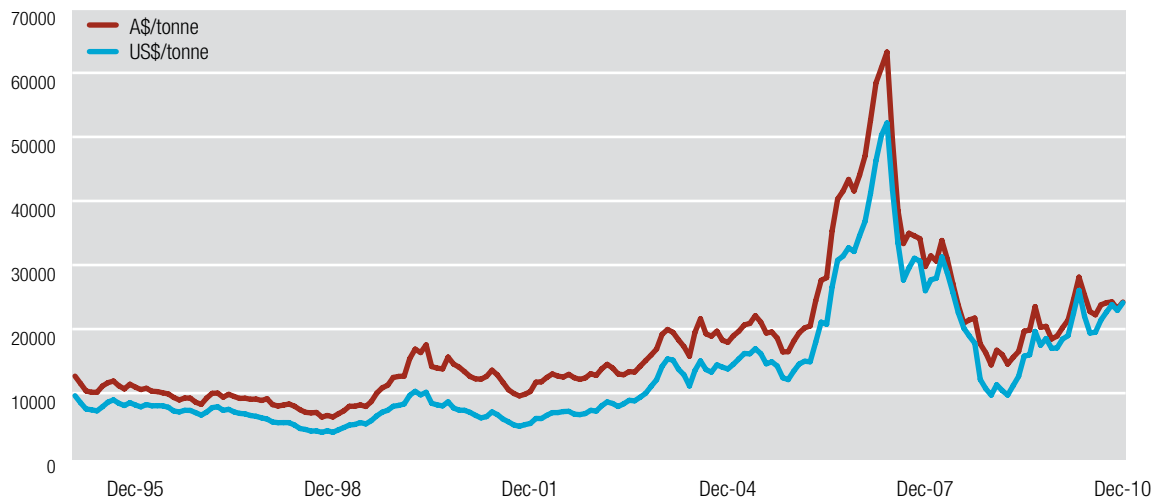


Figure 38. **Historic Nickel Prices** Source: LME

QUANTITY AND VALUE BY QUARTER

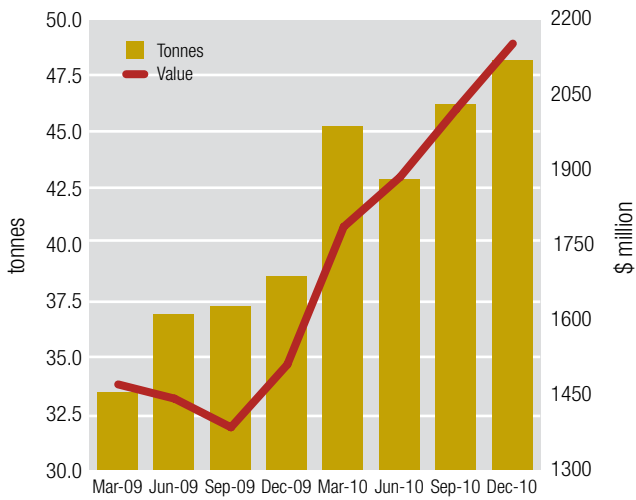


Figure 39. Gold Quantity and Value by Quarter

Source: DMP

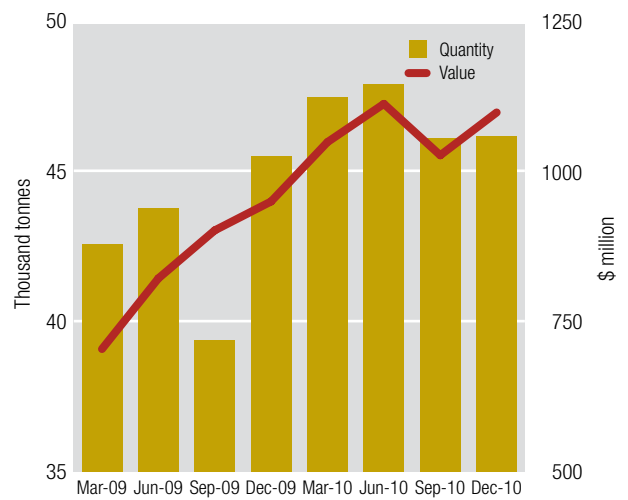


Figure 40. Nickel Quantity and Value by Quarter

Source: DMP

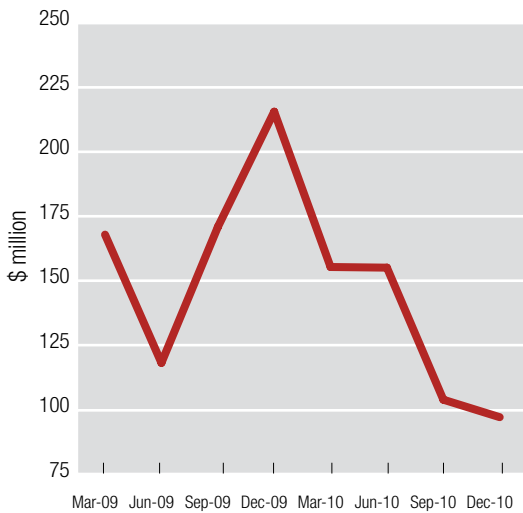


Figure 41. Heavy Mineral Sands Value by Quarter

Source: DMP

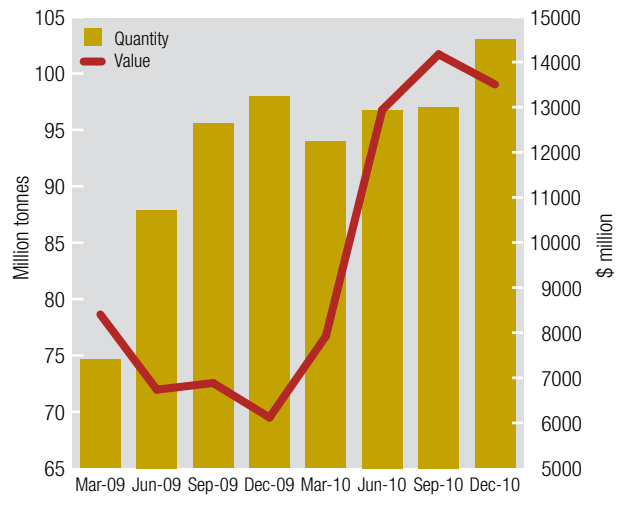


Figure 42. Iron Ore Quantity and Value by Quarter

Source: DMP

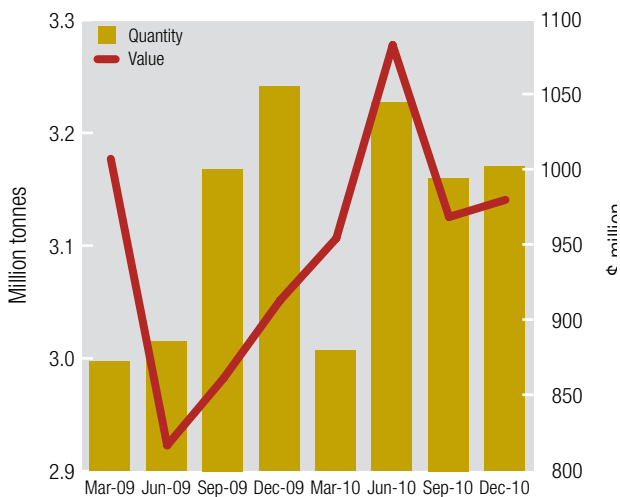


Figure 43. Alumina Quantity and Value by Quarter

Source: DMP

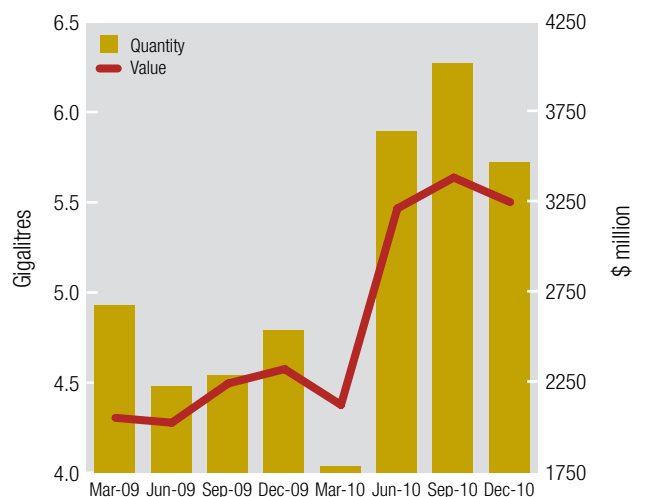


Figure 44. Crude Oil and Condensate Quantity and Value by Quarter

Source: DMP

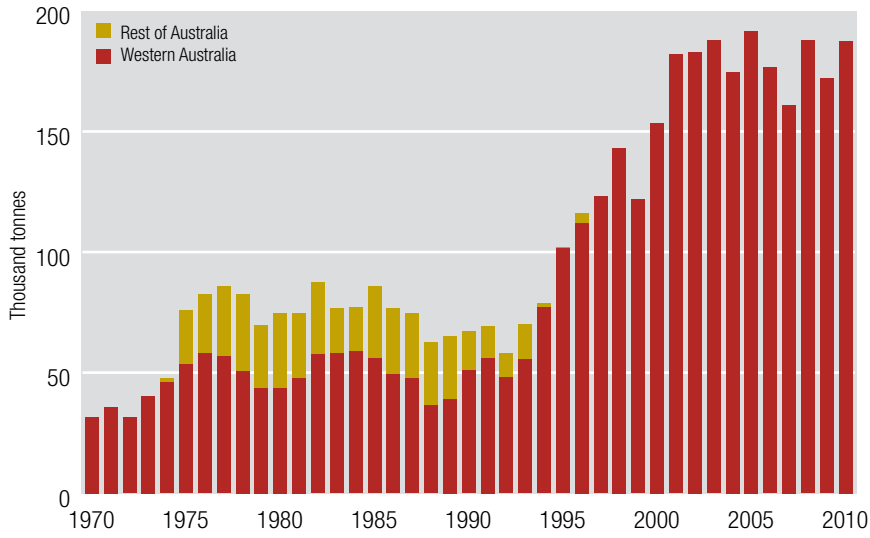


Figure 45. **Nickel Quantity up to 2010** Source: DMP and ABARE

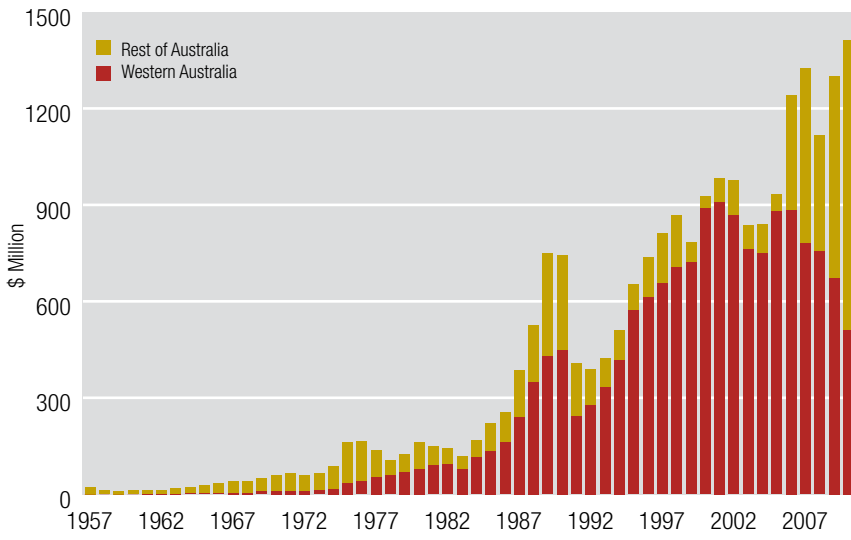


Figure 46. **Heavy Mineral Sands Value of Production**
Includes Ilmenite, Leucoxene, Upgraded Ilmenite, Rutile, Zircon and Monazite
Source: DMP and ABARE

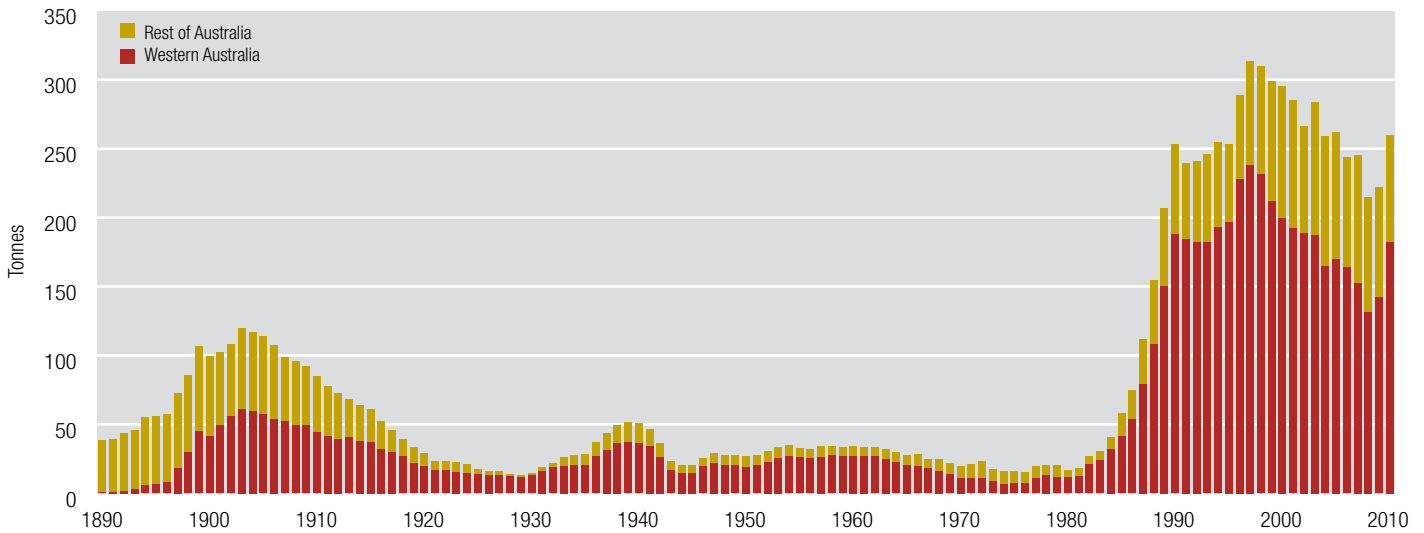


Figure 47. **Gold Production** Source: DMP and ABARE

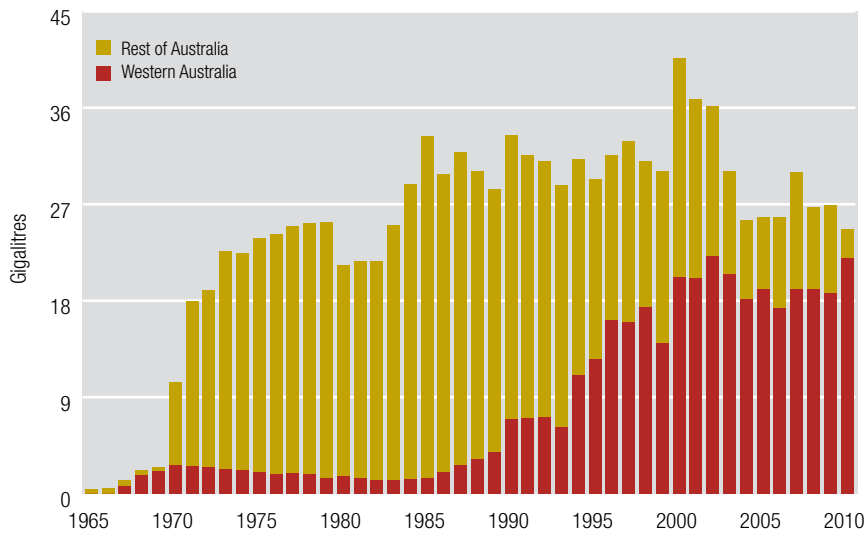


Figure 48. **Crude Oil and Condensate Quantity** Source: DMP and ABARE

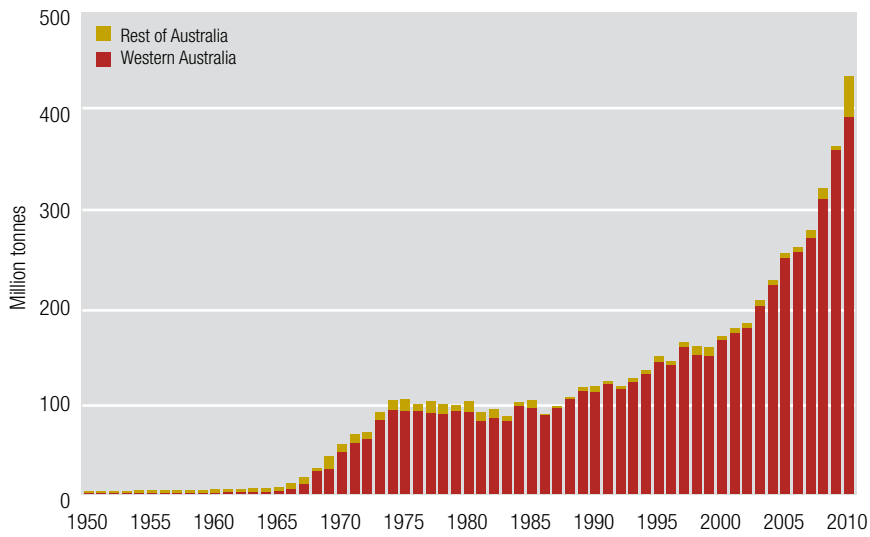


Figure 49. **Iron Ore Quantity** Source: DMP and ABARE

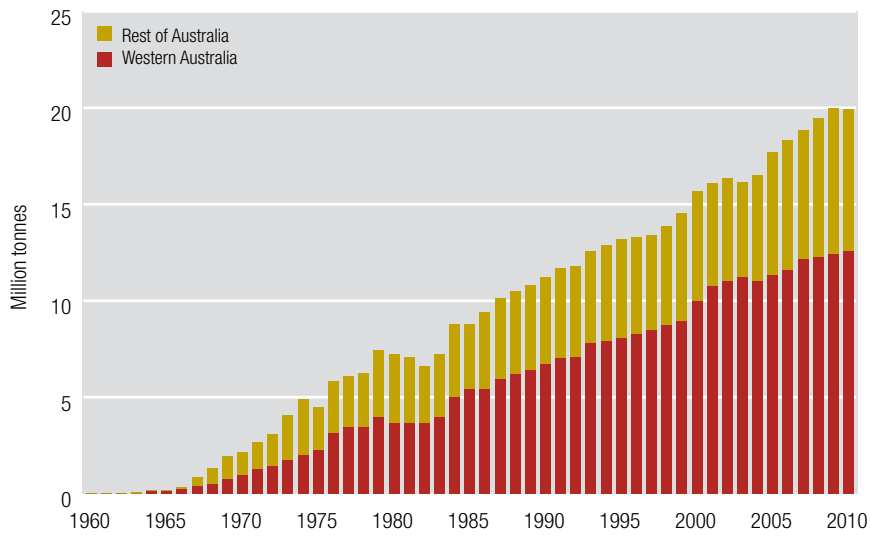


Figure 50. **Alumina Quantity** Source: DMP and ABARE

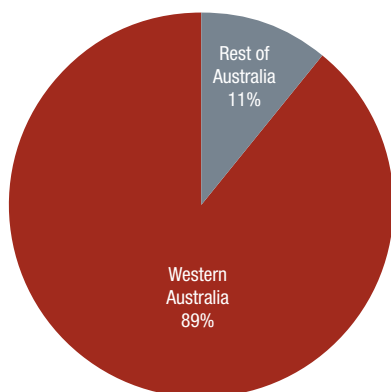


Figure 51. **Crude Oil and Condensate Production 2010** Source: DRET and DMP

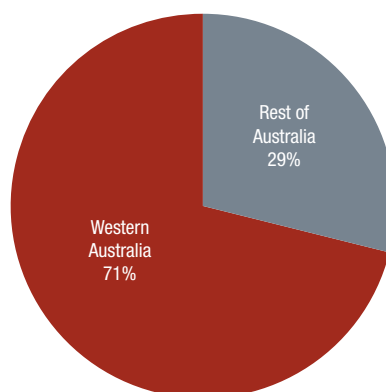


Figure 52. **Natural Gas Production 2010** Source: DRET AND DMP (Data includes LNG feedstock)

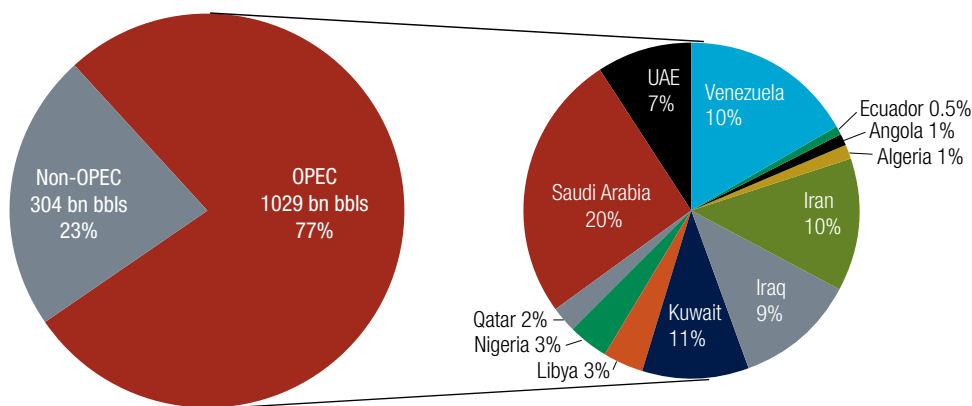


Figure 53. **OPEC Share of World Crude Oil Reserves (2009)** Source: BP World Energy Statistics 2010
 Note: Indonesia suspended OPEC membership in 2008 when it became a net importer of oil

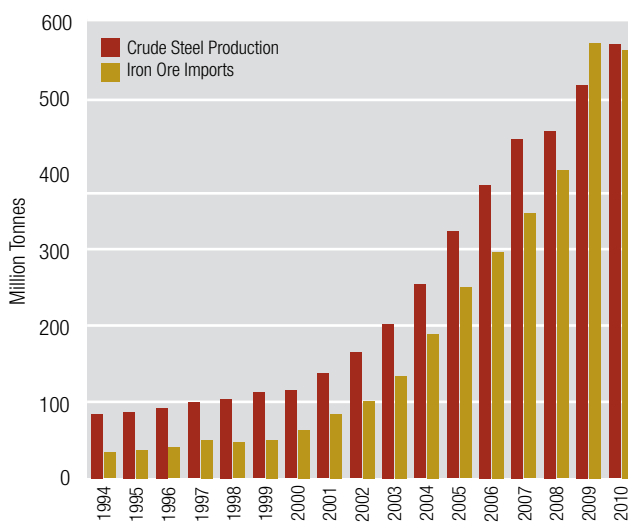


Figure 54. **China's Crude Steel Production and Iron Ore Imports** Source: TEX Report and Interfax China Ltd

TABLE 1. TENEMENTS IN FORCE 1978 ACT

	1999-00		2000-01		2001-02		2002-03		2003-04		2004-05		2005-06		2006-07		2007-08		2008-09		2009-10	
	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha	Number	000 ha
Prospecting Licences	5,827	745	5,512	711	4,964	634	4,566	575	4,561	568	4,665	586	5,056	638	5,376	682	6,260	800	7,110	913	7,032	890
Exploration Licences	3,394	20,687	3,162	18,152	2,899	18,556	2,855	21,123	2,917	20,896	3,066	22,215	3,966	30,822	4,766	40,031	5,427	51,790	4,959	42,367	5,297	44,123
Mining Leases	4,865	1,829	4,841	1,803	4,820	1,774	4,770	1,762	4,713	1,716	5,172	1,805	5,118	1,806	5,090	1,824	5,475	2,036	5,618	2,065	5,764	2,125
Other	2,001	468	3,625	2,840	3,618	3,002	3,629	3,299	3,590	3,115	3,258	2,982	3,432	3,037	3,629	3,248	3,678	4,119	2,512	3,477	2,884	4,541
Mineral Claims & Other 1904 Act	194	22	186	21	186	22	186	22	186	22	186	22	186	21	186	21	186	21	186	21	186	21
Total	16,280	23,751	17,326	23,829	16,487	23,988	16,006	26,781	15,967	26,317	16,347	27,610	17,758	36,324	19,047	45,806	21,026	58,766	20,385	48,843	21,163	51,700

Source: DMP

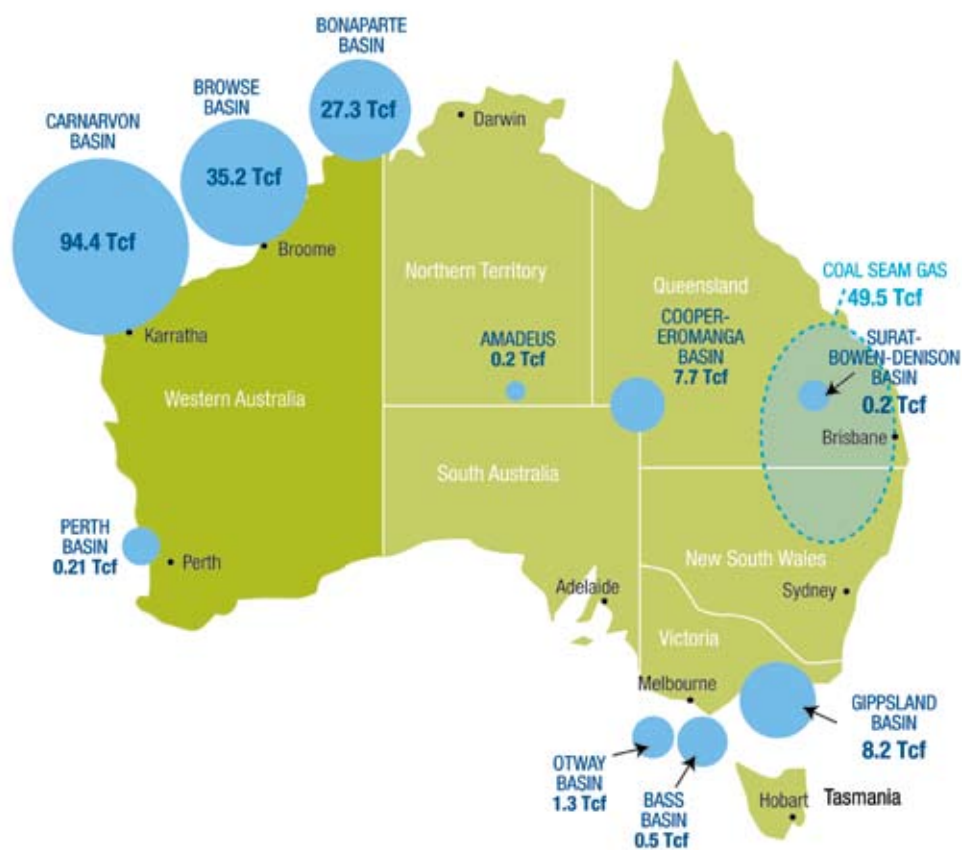


Figure 55. **Australian Natural Gas Resources** Source: DMP Current as at end 2009

TABLE 2. QUANTITY AND VALUE OF MINERALS AND PETROLEUM

COMMODITY	UNIT	CALENDAR YEAR 2009		CALENDAR YEAR 2010	
		QUANTITY	VALUE	QUANTITY	VALUE
ALUMINA	t	12,421,970	3,593,456,264	12,563,285	3,984,503,900
BASE METALS					
Copper Metal	t	149,043 (r)	992,506,173 (r)	156,587	1,232,800,905
Lead Metal	t	22,755 (r)	46,316,484 (r)	52,870	116,824,375
Zinc Metal	t	101,651 (r)	213,802,198 (r)	80,811	189,067,691
TOTAL BASE METALS			1,252,624,855 (r)		1,538,692,971
CHROMITE	t	72,813 (r)	n/a	73,618	n/a
CLAYS		57,846	1,089,071	67,834	1,255,153
COAL	t	6,558,857 (r)	308,156,873	6,998,501	330,062,126
CONSTRUCTION MATERIALS					
Aggregate	t	3,067,022 (r)	82,023,027 (r)	2,363,802	57,338,407
Gravel	t	188,800 (r)	1,612,636 (r)	117,466	924,502
Rock	t	1,136,844 (r)	16,099,075 (r)	448,670	7,654,322
Sand	t	3,872,160 (r)	29,499,489 (r)	3,738,262	29,047,183
TOTAL CONSTRUCTION MATERIALS			129,234,227 (r)		94,964,415
DIAMONDS	ct	11,899,326	231,796,288 (r)	14,416,656	345,042,536
DIMENSION STONE		5,980	333,130	5,162	728,675
GEM & SEMI-PRECIOUS STONES	kg	387,998 (r)	317,449 (r)	508,974	363,991
GOLD	kg	146,431 (r)	5,814,751,168 (r)	182,454	7,828,281,735
GYPSUM	t	784,374	17,122,104	891,299	16,815,737
HEAVY MINERAL SANDS					
Garnet	t	275,560 (r)	n/a	196,839	n/a
Ilmenite	t	463,742 (r)	63,498,346 (r)	492,715	66,062,412
Leucoxene	t	76,709 (r)	24,463,466 (r)	30,737	13,968,569
Zircon	t	253,500 (r)	214,485,748 (r)	309,932	217,102,339
Other	t		369,919,833 (r)		214,131,791
TOTAL HEAVY MINERAL SANDS			672,367,393 (r)		511,265,111
IRON ORE	t	356,069,972 (r)	28,149,032,553 (r)	390,772,762	48,542,262,147
LIMESAND-LIMESTONE-DOLOMITE	t	3,921,432 (r)	20,451,347 (r)	3,852,166	21,250,403

COMMODITY	UNIT	CALENDAR YEAR 2009		CALENDAR YEAR 2010	
		QUANTITY	VALUE	QUANTITY	VALUE
MANGANESE ORE	t	630,321 (r)	217,734,443 (r)	691,323	395,096,172
NICKEL INDUSTRY					
Cobalt	t	4,345 (r)	182,755,444 (r)	3,850	168,921,800
Nickel	t	171,179 (r)	3,373,727,562 (r)	187,581	4,280,763,471
Palladium and Platinum By-Product	kg	1,034 (r)	10,001,145 (r)	781	8,225,481
TOTAL NICKEL INDUSTRY			3,566,484,151 (r)		4,457,910,752
PETROLEUM					
Condensate	kl	7,492,544	3,232,733,058	7,215,589	3,705,433,478
Crude Oil	kl	11,246,917	5,505,448,018	14,726,104	8,247,309,631
LNG	t	15,252,516	6,320,744,991 (r)	16,527,193	8,754,682,474
LPG - Butane and Propane	t	950,524	612,776,966	988,724	763,328,435
Natural Gas	'000m ³	9,312,415	1,156,235,342	9,226,158	1,391,169,679
TOTAL PETROLEUM			16,827,938,375 (r)		22,861,923,696
SALT	t	10,061,953 (r)	447,592,200 (r)	11,590,225	388,322,816
SILICA-SILICA SAND	t	462,314	10,006,288	311,189	9,179,116
SILVER	kg	124,459 (r)	73,764,250 (r)	112,718	76,239,074
TIN-TANTALUM-LITHIUM	t	224,374	92,741,498	326,969	93,312,253
OTHER (Includes Feldspar, Red Oxide, Spongolite and Talc)	t		324,734,901 (r)		63,334,283
TOTAL VALUE			61,533,994,385 (r)		91,560,807,062

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.

(r) Revised from previous edition

n/a Breakdown of chromite, feldspar, garnet, red oxide, talc, spodumene and tantalite not available.

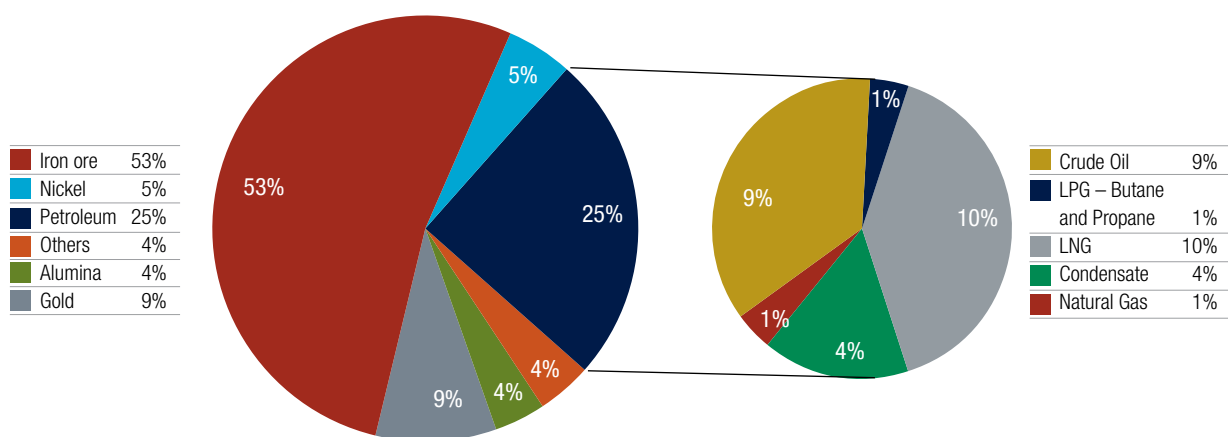


Figure 56. Sales by Commodity 2010 Source: DMP

TABLE 3. QUANTITY AND VALUE OF SELECTED MAJOR COMMODITIES

		2001		2002		2003		2004	
	Unit	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
ALUMINA	Mt	10.75	3,766.55	11.00	3,339.25	11.23	3,140.48	10.99	3,178.95
BASE METALS									
Copper Metal	kt	50.24	120.71	64.29	145.49	58.78	145.09	42.68	160.94
Lead Metal	kt	91.38	44.90	70.40	32.69	56.49	24.32	1.17	0.31
Zinc Metal	kt	210.84	208.72	218.80	173.06	174.55	139.73	51.78	57.78
TOTAL BASE METALS			374.33		351.24		309.15		219.03
COAL	Mt	6.20	258.21	6.26	266.40	6.03	266.41	6.31	281.91
COBALT	kt	4.26	146.27	4.70	118.95	5.17	145.04	4.55	262.18
DIAMONDS	M ct	21.68	499.53	34.37	650.34	35.48	661.86	24.23	414.81
GOLD	t	192.20	3,236.20	188.86	3,460.87	187.50	3,364.96	164.42	2,940.98
HEAVY MINERAL SANDS									
Ilmenite	Mt	0.83	137.32	0.85	131.26	0.86	110.46	0.76	87.94
Rutile	kt	112.93	99.01	125.41	102.66	123.63	80.28	112.93	69.02
Zircon	kt	353.17	230.00	369.92	246.74	420.55	242.10	414.07	265.07
Other HMS			24.23		21.54		17.60		327.05
TOTAL HEAVY MINERAL SANDS			909.22		855.87		760.75		749.08
IRON ORE	Mt	162.25	5,245.93	171.77	5,064.62	194.75	5,061.06	215.85	6,173.16
MANGANESE ORE ***	kt	498.60	76.09	578.39	75.63	587.84	65.18	593.68	106.48
NICKEL METAL	kt	181.17	2,074.48	183.00	2,242.55	190.21	2,680.24	174.70	3,261.21
PETROLEUM									
Condensate	Gl	6.02	1,787.91	6.88	1,928.58	6.39	1,765.46	5.94	2,011.14
Crude oil	Gl	14.06	4,246.65	15.29	4,502.72	14.12	4,034.63	12.25	4,211.56
LNG *	Btu 10 ¹²	389.57	3,482.87	394.11	2,791.22	408.27	2,874.61	454.12	3,150.81
LPG - Butane **	kt	475.25	217.54	458.15	197.56	425.20	182.83	398.84	189.28
LPG - Propane	kt	385.83	185.08	357.41	165.88	319.97	142.72	322.85	151.13
Natural Gas	Gm ³	7.67	642.08	7.75	650.20	8.11	690.45	7.71	655.46
TOTAL PETROLEUM			10,562.13		10,236.16		9,690.71		10,369.39
SALT	Mt	8.58	249.24	9.17	250.53	9.75	197.01	10.40	185.08
OTHER			379.55		389.16		343.08		353.17
TOTAL			27,777.73		27,301.57		26,685.93		28,495.43

2005		2006		2007		2008		2009		2010	
Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M	Quantity	Value \$M
11.35	3,655.84	11.87	4,767.05	12.17	4,704.33	12.25	4,901.12	12.42	3,593.46	12.56	3,984.50
83.88	434.71	99.96	917.78	119.41	1,018.75	129.53	1,041.60	149.04	992.51	156.59	1,232.80
30.27	41.17	74.85	130.61	42.02	115.57	13.78	32.61	22.76	46.32	52.87	116.82
63.61	118.91	138.84	607.12	180.73	685.54	156.01	329.13	101.65	213.80	80.81	189.07
	594.79		1,655.50		1,819.86		1,403.34		1,252.62		1,538.69
6.41	283.26	7.25	317.90	5.81	265.15	6.73	305.50	6.56	308.16	7.00	330.06
4.59	166.95	5.13	220.43	4.73	343.08	4.78	378.71	4.34	182.76	3.85	168.92
34.31	740.1	17.07	446.9	23.54	555.0	21.24	490.71	11.90	231.80	14.42	345.0
169.83	3,146.54	163.84	4,234.61	152.69	4,073.29	131.82	4,391.32	146.43	5,814.75	182.45	7,828.28
0.67	74.00	0.74	84.44	0.73	79.80	0.60	76.95	0.46	63.50	0.49	66.06
100.45	63.79	102.21	64.39	92.92	56.30	n/a	n/a	n/a	n/a	n/a	n/a
416.92	329.80	370.18	358.82	289.88	263.93	356.39	309.50	253.50	214.49	309.93	217.10
	412.78		376.01		412.97		390.58		369.92		214.13
	880.37		883.67		780.28		797.89		672.37		511.27
244.64	11,308.57	250.40	14,751.69	264.45	16,165.25	305.72	31,896.03	356.07	28,149.03	390.77	48,542.26
785.01	184.39	906.68	195.25	430.45	185.71	270.71	n/a	630.32	282.39	691.32	395.10
191.71	3,484.39	175.18	5,844.17	161.01	6,958.08	187.79	4,059.16	171.18	3,373.73	187.58	4,280.76
5.88	2,576.86	5.61	2,940.19	5.86	3,236.76	5.73	3,512.42	7.49	3,232.73	7.22	3,705.43
13.18	6,168.82	11.95	6,602.75	13.20	7,384.29	13.32	9,737.62	11.25	5,505.45	14.73	8,247.31
11.03	4,320.27	11.96	4,550.76	12.38	4,448.58	12.38	8,157.48	15.25	6,320.74	16.53	8,754.68
870.73	544.22	862.23	613.83	893.91	686.64	764.67	731.50	950.52	612.78	988.72	763.33
7.41	661.61	8.36	816.67	9.17	1,002.47	8.50	1,191.44	9.31	1,156.24	9.23	1,391.17
	14,397.85		15,524.20		16,758.73		23,330.46		16,827.94		22,861.92
11.48	213.78	10.72	241.64	10.39	229.60	11.49	276.72	10.06	447.59	11.59	388.32
	579.55		605.10		638.27		833.74		397.41		780.76
	39,452.04		49,492.86		53,290.94		73,064.70		61,533.99		91,560.81

TABLE 4. VALUE OF MINERALS AND PETROLEUM BY REGION BY LGA

Pilbara Region	2010 Value
East Pilbara	31,422,860,515
Ashburton	17,092,127,511
Port Hedland and Marble Bar	256,522,603
Roebourne and Karratha	156,649,902
Total	48,928,160,531

Offshore Petroleum	22,820,932,972
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Goldfields–Esperance Region	
Leonora	2,683,022,260
Coolgardie	2,466,872,017
Kalgoorlie–Boulder	1,960,795,765
Laverton	1,137,878,484
Menzies	131,631,238
Dundas	71,466,529
Esperance	431,657
Total	8,452,097,950

Peel Region	
Waroona	2,851,982,827
Boddington	2,194,410,588
Total	5,046,393,415

Mid West Region	
Wiluna and Three Springs	1,108,434,331
Yalgoo and Cue	455,126,150
Mullewa and Mt Magnet	338,774,716
Meekatharra and Morawa	271,607,581
Irwin and Murchison	240,457,466
Carnamah and Coorow	165,221,428
Northampton, Perenjori and Sandstone	65,882,317
Total	2,645,503,989

Wheatbelt Region	
Yilgarn	1,252,826,288
Dalwallinu and Kondinin	441,565,387
Dandaragan	199,654,584
Lake Grace and Westonia	52,569,691
Corrigin and Moora	1,831,866
Gingin, Koorda and Wyalkatchem	1,208,216
Mukinbudin, Northam and Nungarin	407,626
Total	1,950,063,658

Kimberley Region	2010 Value
Derby–West Kimberley	474,552,082
Wyndham–East Kimberley	263,135,898
Halls Creek	262,726,536
Broome	5,840,872
Total	1,006,255,388

South West Region	
Bunbury, Dardanup and Manjimup	93,600,302
Bridgetown–Greenbushes, Capel and Collie	440,353,938
Total	533,954,240

Gascoyne Region	
Carnarvon	94,629,194
Exmouth, Shark Bay and Upper Gascoyne	46,258,478
Total	140,887,672

Perth Metropolitan Region	
Kalamunda, Swan and Wanneroo	20,535,690
Cockburn, Kwinana and Rockingham	12,143,454
Total	32,679,144

Great Southern Region	
Albany, Denmark and Plantagenet	3,878,104

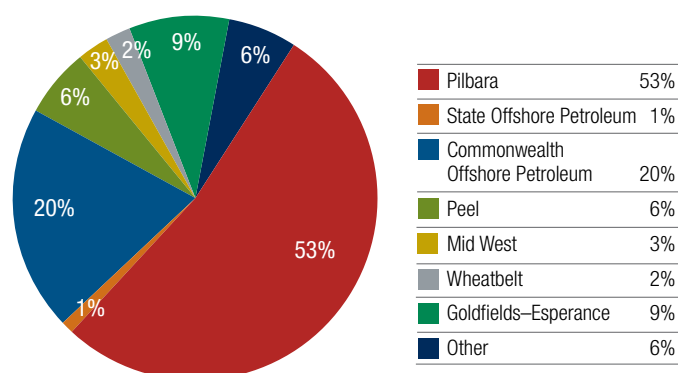


Figure 57. Value of Minerals and Petroleum by Region 2010
Total \$91.6 billion Source: DMP

TABLE 5. VALUE OF MINERALS AND PETROLEUM BY REGION BY COMMODITY

Pilbara Region	2010 Value
Iron Ore	46,497,399,644
Gold and Silver	1,016,593,282
Copper	701,906,790
Manganese and Salt	644,250,608
Other	68,010,207
Total	48,928,160,531

Offshore Petroleum	
Crude Oil and Condensate	11,925,744,007
Liquefied Natural Gas	8,754,682,474
Natural Gas	1,377,178,057
LPG Butane and Propane	763,328,435
Total	22,820,932,972

Goldfields–Esperance Region	
Nickel, Platinum and Palladium	3,263,287,984
Gold	4,871,043,536
Cobalt	152,945,601
Copper and Zinc	131,148,591
Silver	25,383,560
Construction Materials	5,215,797
Gypsum and Limesand	2,605,141
Other	467,740
Total	8,452,097,950

Peel Region	
Alumina, gold and copper	5,046,393,415

Mid West Region	
Gold	793,441,125
Cobalt, Nickel and Talc	444,802,830
Copper, Lead and Zinc	499,038,414
Iron ore	581,392,910
Heavy Mineral Sands, Chromite	204,336,564
Crude Oil and Condensate	25,101,159
Silver	31,380,034
Natural Gas	13,991,622
Other	52,019,331
Total	2,645,503,989

Wheatbelt Region	
Iron Ore, Gold and Silver	1,296,788,193
Nickel, Copper and Salt	447,102,121
Gypsum and Heavy Mineral Sands	202,420,029
Other	3,753,315
Total	1,950,063,658

Kimberley Region	
Iron Ore, Nickel and Cobalt	565,068,080
Diamonds and Crude Oil	346,940,479
Copper, Silver and Gold	86,042,631
Other	8,204,198
Total	1,006,255,388

South West Region	
Coal	330,062,126
Heavy Mineral Sands	110,229,096
Tin and Spodumene	93,312,253
Other	350,765
Total	533,954,240

Gascoyne Region	
Salt and Gems	129,798,670
Gypsum and Limesand-Limestone	11,061,897
Other	27,105
Total	140,887,672

Perth Metropolitan Region	
Construction Materials, Silica Sand, Limesand-Limestone	32,679,144

Great Southern Region	
Spongolite, Silica Sand and Limesand	3,878,104

TABLE 6. ROYALTY RECEIPTS 2009 AND 2010

COMMODITY	2009	2010	2010 Growth	
	Total A\$	Total A\$	A\$	%
Alumina	66,627,260	64,564,846	-2,062,414	(3)
Diamonds	18,332,883	15,818,955	-2,513,928	(14)
Gold	139,588,820	175,689,113	36,100,293	26
Heavy Mineral Sands	21,462,494	24,355,874	2,893,380	13
Iron Ore	1,701,603,049	2,394,704,119	693,101,070	41
Nickel	67,742,963	100,736,613	32,993,650	49
Petroleum	691,695,214	985,080,488	293,385,274	42
Other	85,733,527	106,028,016	20,294,489	24
Total Revenue	2,792,786,210	3,866,978,023	1,074,191,813	38

Note: All Royalty Receipts above are only those paid into the State's Consolidated Revenue Fund during the period. It does not include royalty receipts collected on behalf of the Commonwealth.

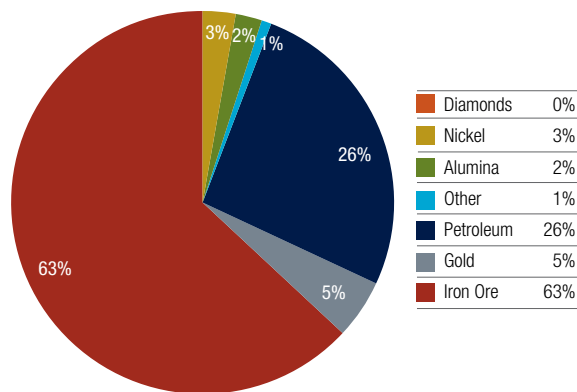


Figure 58. **Royalty Receipts 2010** Source: DMP

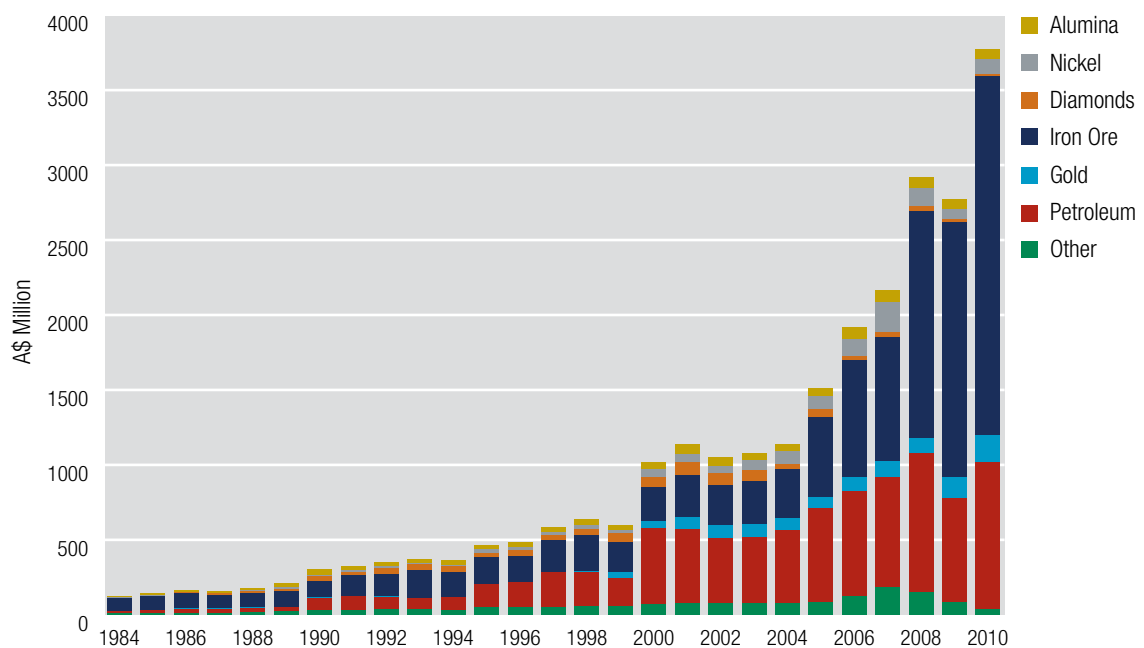


Figure 59. **Royalty Receipts by Commodity** Source: DMP

TABLE 7. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES

Mining employment data sources

The Department of Mines and Petroleum (DMP) collects mining employment data from monthly accident reports which are required to be submitted by all operating mines and companies carrying out exploration on mineral and mining leases under the *Mines Safety and Inspection Act 1994*. The Resources Safety Division's AXTAT reporting system identifies the number of direct employees and contractors (including exploration personnel) working on operating mining leases. In March 2008 legislation was introduced to capture exploration personnel working on greenfield sites.

DMP collects petroleum employment data by contacting each operating company who provide both direct and contract personnel data.

Employment data collected and published by the Australian Bureau of Statistics (ABS) is classified using reference to the Australian and New Zealand Standard Industrial Classification (ANZSIC). This data is therefore not directly comparable with that collected by DMP.

Under ANZSIC guidelines not all mining employment is reflected in ABS's Mining industry classification. For example:

- Catering personnel working on mine sites are reflected in the Accommodation and Food Services classification and transport personnel (truck and train drivers) working on mine sites are reflected in the Postal and Warehousing industries.
- Contractors employed in site preparation and removing overburden at a mine site on a contract or fee basis are listed under Site Preparation Services.
- Employees engaged in liquefying natural gas, production of pig iron, hot briquetted iron, alumina, the smelting and refining of metals are included in Manufacturing.
- Employees providing geophysical surveying services on a contract or fee basis are included in Surveying and Mapping Services.

MINERAL/Company	Operating Site	2009	2010
BAUXITE – ALUMINA			
Australian Fused Materials Pty Ltd	Rockingham Fused Alumina Plant	69	96
Alcoa World Alumina Australia	Huntly	688	841
	Kwinana Alumina Refinery	1,410	1,331
	Pinjarra Refinery	1,633	1,561
	Wagerup Alumina Refinery	1,015	1,059
	Wagerup Co-Generation Plant	0	
	Willowdale	313	402
Bauxite Resources Limited	Bindoon Bauxite Quarry	9	12
Worsley Alumina Pty Ltd	Boddington Bauxite	370	467
	Worsley Refinery	2,705	3,977
TOTAL BAUXITE – ALUMINA		8,212	9,746
BASE METALS			
Birla (Nifty) Pty Ltd	Nifty	541	692
Jabiru Metals Ltd	Jaguar	163	296
Lennard Shelf Pty Ltd	Pillara	8	39
Magellan Metals Pty Ltd	Magellan	24	249
Minerals and Metals Group	Golden Grove	655	903
Straits (Whim Creek) Pty Ltd	Whim Creek	65	20
TOTAL BASE METALS		1,456	2,199
COAL			
Griffin Coal Mining Co. Pty Ltd	Muja Open Cut	436	476
Wesfarmers Premier Coal Ltd	Premier	289	544
TOTAL COAL		725	1,020

TABLE 7. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	2009	2010
DIAMONDS			
Argyle Diamond Mines Pty Ltd	Argyle Diamond Mine	1,247	1,183
Kimberley Diamond Company Ltd	Ellendale/Kimberley Diamonds	353	316
North Australian Diamonds Limited	Wangarra Laboratory	2	4
TOTAL DIAMONDS		1,602	1,503
GOLD			
A1 Minerals Ltd	Brightstar Beta-Midado	15	45
Agnew Gold Mining Company Pty Limited	Agnew-Emu	454	408
AngloGold Ashanti Australia Ltd	Sunrise Dam	837	988
Apex Gold Pty Ltd	Wiluna Group	409	392
ATW Gold Corp Australia Pty Ltd	Burnakura	91	1
	Gullewa	9	1
Auzex Resources Limited	Bullabulling	6	5
Avoka Resources Ltd	Higginsville Gold Project	463	577
Barra Resources Ltd	Burbanks Group	1	4
Barrick Gold of Australia Limited	Darlot	299	455
	Granny Smith	423	655
	Kalgoorlie West Group	836	743
	Lawlers	324	386
	Plutonic	529	444
Catalpa Resources Limited	Edna May Gold Project	94	136
Central Norseman Gold Corporation	Central Norseman Group	262	286
Crescent Gold Limited	Laverton Gold Project	116	207
Diora - HBJ Minerals Pty Ltd	South Kal Operations	159	200
Focus Minerals Ltd	Coolgardie Group	169	102
	The Mount	3	6
	Three Mile Hill	0	90
	Tindalls	0	57
Golden Stallion Resources Pty Ltd	Minjar Gold Project	0	23
Haoma Pty Ltd	Bamboo Creek	11	6
Higginsville Mining Pty Ltd	Greenfields-Higginsville Plant	54	79
Integra Mining Ltd	Randals	0	214
Intrepid Mines Limited	Paulsens	182	86
Kalgoorlie Consolidated Gold Mines Pty Ltd	Golden Mile - Super Pit	1,408	1,578
La Mancha Resources Australia Pty Ltd	Frogs Legs Group	193	245
	White Foil	0	14
Mercator Gold Australia Pty Ltd	Meekatharra Gold Operations	10	2
Minjar Gold Pty Ltd	Minjar Gold Project	29	21
Mount Magnet Gold NL	Mt Magnet	18	18
Navigator (Bronzewing) Pty Ltd	Bronzewing	2	152
	Leonora	0	11
Newcrest Mining Ltd	Telfer	1,605	1,778
Newmont Boddington Gold Pty Ltd	Boddington	3,815	2,385
Newmont Mining Corporation	Jundee	745	570
Norilsk Nickel Australia Pty Ltd	Bannockburn Gold Mine	5	7
Northern Star Resources Ltd	Paulsens	0	73

MINERAL/Company	Operating Site	2009	2010
Paddington Gold Mine Pty Ltd	Paddington Gold	325	500
	Binduli	26	115
Ramelius Milling Services Pty Ltd	Burbanks Treatment Plant	22	18
Ramelius Resources Ltd	Wattle Dam	65	72
	Hill 50 - Mt Magnet Group	0	8
Range River Gold Ltd	Indee Group	5	7
	Mt Morgans	0	86
Reed Resources Ltd	Sand Queen	23	15
	Nimbus	0	6
Regis Resources Limited	Duketon	0	127
Silver Lake Resources Limited	Christmas Flat	8	6
	Daisy-Milano	95	130
	Lakewood - Fimtails Plant	32	50
Saracen Gold Mines Pty Limited	Carosue Dam	66	296
St Barbara Mines Ltd	Southern Cross - Marvel Loch and Hercules mines	443	412
	Leonora Operations - Sons of Gwalia	380	515
	King of the Hills Underground	0	17
St Ives Gold Mining Company Pty Limited	Kambalda/St Ives	1,242	1,613
Swan Gold Mining Ltd	Davyhurst	3	7
	Mt Ida Group	6	4
Tanami Gold NL	Coyote Group	157	195
The Perth Mint	Perth Mint	103	96
Troy Resources Ltd	Sandstone Group	98	36
Other	Various	11	22
TOTAL GOLD		16,686	17,803
HEAVY MINERAL SANDS			
BHP Titanium Minerals Pty Ltd	Beenup	2	3
Bemax Resources Limited	Bunbury	224	171
Doral Mineral Sands Pty Ltd	Dardanup	132	261
Mintech Chemical Industries Pty Ltd	Rockingham Fused Materials	11	25
GMA Garnet Pty Ltd	Narngulu Garnet Plant	34	30
	Port Gregory	30	31
Iluka Resources Limited	Capel	294	255
	Eneabba	326	103
	Narngulu Synthetic Rutile Plants	201	280
	Gingin/Iluka	54	3
TiWest Pty Ltd	Chandala-Muchea	226	393
	Cooljarloo	398	198
	Bunbury Port	2	14
TOTAL HEAVY MINERAL SANDS		1,934	1,767
IRON ORE			
Atlas Iron Ltd	Pardoo RSD Group	147	101
	Wodgina	10	46
Ngarda Civil and Mining Pty Ltd.	Yarrie Nimingarra	262	388
BC Iron Limited	Nullagine	0	59
BHP Iron OreLtd	RGP4/5 Port Hedland Pace Project	1,022	126
	Boodarie HBI Plant	29	55

TABLE 7. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	2009	2010
	Mining Area C	1,363	1,507
	Mt Newman Railway	1,050	1,097
	Mt Whaleback	2,018	1,702
	Nelson Point	1,244	1,432
	Newman Joint Venture Hub	1,370	0
Calibre Engenium Joint Venture Pty Ltd	Mesa A Rail Construction	418	24
Citic Pacific Mining Management Pty Ltd	Cape Preston Group	631	531
Cliffs Natural Resources Pty Ltd	Koolyanobbing	792	754
Crosslands Resources Ltd	Cuddingwarra	103	55
	Geraldton Port Storage Facility	0	54
	Jack Hills	245	123
Fast (Fluor & SKM Team)	Yandi	213	0
	Newman Switchyard	0	5
Ferro Metals Australia Pty Ltd	Balla Balla Group	4	3
Fortescue Metals Group Ltd	Anderson Point Port Facility	158	299
	Christmas Creek	281	696
	Cloudbreak	2,326	3,100
	Cloudbreak Team 45	27	0
	Rail Ballast Quarry	0	8
Hamersley HMS Pty Ltd	Hope Downs	867	1,238
Hamersley Iron Pty Ltd	Brockman	539	599
	Dampier Port Operations and Power Plant	1,290	1,820
	Hismelt Kwinana	86	93
	Marandoo	355	382
	Paraburdoo/Channar/Eastern Range	1,081	1,357
	Paraburdoo Power Plant	1	0
	Tom Price	1,515	1,910
	Yandicoogina	953	1,040
Henry Walker Eltin Cockatoo Pty Ltd	Cockatoo Island	127	143
Henry Walker Eltin Contracting Pty Ltd	Orebody 23/25	308	445
	Yandi	1,049	1,031
Henry Walker Eltin Mining Pty Ltd	Mesa A	45	0
Karara Mining Limited	Karara	0	29
MacMahon Holdings Pty Ltd	Orebody 18 - Wheelarra	473	460
Mount Gibson Mining Limited	Extension Hill	0	82
	Geraldton Port Storage Facility	18	22
	Koolan Island	518	521
	Ruvidini Rail Terminal	56	83
	Tallering Peak	278	299
Process Minerals International	Boodarie RSI	6	30
Rio Tinto Iron Ore Pty Ltd	Brockman 4 Operations	0	553
	Cape Lambert Power Station	0	58
	Cape Lambert Expansion	0	99
Robe River Mining Co. Pty Ltd	Cape Lambert Port Operations and Power Plant	1,151	1,220
	Pannawonica	627	631
	West Angelas	989	1,173
Sinosteel Midwest Corporation Limited	Koolanooka	0	54
TOTAL IRON ORE		26,045	27,537

MINERAL/Company	Operating Site	2009	2010
MANGANESE			
Auvex Resources Limited	Ant and Sunday Hill	0	2
Pilbara Manganese Pty Ltd	Woodie Woodie	600	762
Process Minerals International	Peak Hill	21	46
	Nicholas Downs	0	20
	Woodie Woodie Tailings Treatment Plant	37	30
TOTAL MANGANESE		658	860
NICKEL			
BHP Billiton Minerals Pty Ltd	Ravensthorpe	221	3
BHP Billiton (Nickel West)	Cliffs	207	255
	Kalgoorlie Nickel Smelter	638	603
	Kambalda	136	204
	Kwinana Refinery	436	457
	Leinster	1,163	1,111
	Mt Keith	968	1,300
	Beta-Hunt Nickel Group		10
Consolidated Nickel Pty Ltd	Beta-Hunt Nickel Group	10	5
First Quantum Minerals (Australia) Pty Limited	Ravensthorpe	0	235
Focus Minerals Ltd	Nepean	1	1
Fox Resources Pty Ltd	Radio Hill	26	27
Lake Johnston Ltd	Emily Ann	55	24
Lightning Nickel Pty Ltd	Long Nickel	169	198
Mincor Resources NL	Miitel, Wannaway, Redross, Mariners	176	0
	Carnilya Hill	57	50
	Mincor Operations	176	230
	Otter Juan	162	145
Norilsk Nickel Avalon Pty Ltd	Avalon-Bulong Plant	6	11
	Black Swan	64	27
	Cawse	11	15
	Waterloo	10	8
Murrin Murrin Operations Pty Ltd	Murrin Murrin	1,292	1,746
Panoramic Resources Limited	Lanfranchi	242	267
	Savannah Group	246	327
Poseidon Nickel Ltd	Windarra Group	2	6
Xstrata Nickel Australasia Operations Pty Ltd	Cosmos	630	275
	Sinclair	166	72
Southern Cross Energy	Southern Cross Energy Power Group	0	82
Western Areas Limited	Forrestania	291	485
TOTAL NICKEL		7,561	8,169
PETROLEUM PRODUCTS			
Apache Energy Ltd	Harriet, John Brookes, Stag, Legendre	463	550
AWE Energy Ltd	Dongara, Hovea-Eremia, Mt Horner, Woodada, Xyris	44	202
BHP Billiton Petroleum (North West Shelf) Pty Ltd	Stybarrow, Pyrennes, Van Gogh	140	198
Buru Energy Limited	Blina	3	26
Chevron (Australia) Pty Ltd	Barrow Island, Crest, Roller-Skate, Saladin,		
	Yammaderry Wheatstone and Gorgon	1,630	2,131
ENI Australia	Woollybutt	200	198
Origin Energy Resources Ltd	Beharra Springs, Tarantula, Jingemia	33	39
Roc Oil (WA) Pty Ltd	Cliff Head	31	36

TABLE 7. AVERAGE NUMBER OF PERSONS EMPLOYED IN THE WA MINERALS AND PETROLEUM INDUSTRIES

MINERAL/Company	Operating Site	2009	2010
Santos Limited	Mutineer-Exeter	78	80
Vermillion Oil and Gas Australia Pty Ltd	Wandoo	26	35
Woodside Energy Ltd	Athena, Cossack, Echo-Yodel, Goodwyn, Hermes, Laminaria East, North Rankin, Wanaea, Angel, Vincent, Enfield	2,904	3,650
TOTAL PETROLEUM PRODUCTS		5,552	7,145
SALT			
Dampier Salt Ltd	Dampier	162	677
	Lake MacLeod	163	205
	Port Hedland	154	167
WA Salt Supply Koolyanobbing Pty Ltd	Lake Deborah	7	13
Onslow Solar Salt Pty Ltd	Onslow	143	100
Shark Bay Salt JV	Useless Loop	145	127
Western Salt Refinery Pty Ltd	Pink Lake	4	4
TOTAL SALT		778	1,293
TIN, TANTALUM AND LITHIUM			
Galaxy Resources Ltd	Mt Catlin (Spodumene)	5	163
Global Advanced Metals Greenbushes Pty Ltd	Greenbushes	0	4
	Wodgina	0	12
Haddington Resources Limited	Bald Hill West	1	1
Nagrom and Co.	Kelmscott	28	61
Talison Minerals Pty Ltd	Greenbushes	188	180
	Wodgina	54	42
TOTAL TIN, TANTALUM AND LITHIUM		276	463
TOTAL CHROMITE		40	88
TOTAL CLAYS		86	101
TOTAL CONSTRUCTION MATERIALS		580	661
TOTAL DIMENSION STONE		107	134
TOTAL INDUSTRIAL PEGMATITE MINERALS		13	34
TOTAL LIMESTONE - LIMESAND		121	165
TOTAL MINERAL EXPLORATION		2,254	3,198
TOTAL PHOSPHATE		125	144
TOTAL RARE EARTHS		12	65
TOTAL SILICA - SILICA SAND		186	285
TOTAL SILVER		2	0
TOTAL TALC		32	77
TOTAL TUNGSTEN AND MOLYBDENUM		9	51
TOTAL VANADIUM		128	19
TOTAL VARIOUS PORTS		416	613
ALL OTHER MATERIALS		13	23
TOTAL		75,609	85,163

SOURCE: AXTAT Reporting System, Resources Safety Division, Department of Mines and Petroleum, for minerals data and petroleum producing companies for petroleum data. Figures are as provided by the various operating companies and include employees as well as contractors.

* Does not include third party contractors

** Includes operational personnel as well as Gorgon and Wheatstone development personnel (both site and Perth based, direct and contract) .

(e) estimated by DMP

TABLE 8. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS EFFECTIVE JULY 2010**BASE METALS****COPPER–LEAD–ZINC**

Aditya Birla Minerals Ltd,
Level 3, 256 Adelaide Terrace,
Perth WA 6000,
(08) 9366 8800,
Nifty.
www.adityabirlaminerals.com.au

BHP Billiton (Nickel West),
191 Great Eastern Highway,
Belmont WA 6104,
(08) 6272 3000,
Kambalda.
www.bhpbilliton.com

China Minmetals Corporation,
Level 8, 564 St Kilda Road,
Melbourne Vic 3004,
(03) 9520 6800,
Golden Grove.
www.minmetals.com/index.jsp

Jabiru Metals Limited,
Ground Floor, 1205 Hay Street,
West Perth WA 6005,
(08) 9426 8300,
Jaguar.
www.jabirumetals.com.au

Magellan Metals Pty Ltd,
96 Welshpool Road,
Welshpool WA 6106,
(08) 9267 7000,
Magellan.
www.magellanmetals.com.au

Newcrest Mining Ltd,
193 Great Eastern Highway,
Belmont WA 6104,
(08) 9270 7070,
Telfer.
www.newcrest.com.au

BAUXITE–ALUMINA**ALUMINA**

Alcoa of Australia Limited,
181–205 Davy Street,
Booragoon WA 6154,
(08) 9316 5111,
Del Park, Willowdale, Huntly.
www.alcoa.com.au

Worsley Alumina Pty Ltd,
PO Box 344,
Collie WA 6225,
(08) 9734 8311,
Boddington.
www.wapl.com.au

CLAY**ATTAPULGITE**

Hudson Resources Ltd,
2 Kemp Street, Narngulu,
Geraldton WA 6530,
(08) 9923 3604,
Lake Nerramayne.
www.hudsonresources.com

CLAY SHALE

The Griffin Coal Mining
Company Pty Limited,
Level 15, 28 The Esplanade,
Perth WA 6000,
(08) 9261 2800,
Collie.
www.griffincoal.com.au

SAPONITE

Watheroo Minerals Pty Ltd,
PO Box 353,
Dunsborough WA 6281,
(08) 9756 6121,
Watheroo Clays.
www.bentoniteproductswa.com.au

COAL

The Griffin Coal Mining Company Pty Limited,
Level 15, 28 The Esplanade,
Perth WA 6000,
(08) 9261 2800,
Collie.
www.griffincoal.com.au

Wesfarmers Premier Coal Ltd,
Premier Road,
Collie WA 6225,
(08) 9780 2222,
Collie.
www.wesfarmers.com.au

CONSTRUCTION MATERIALS**AGGREGATE**

Holcim (Australia) Pty Ltd,
Technology Park,
18–20 Brodie–Hall Drive,
Bentley WA 6102,
(08) 9212 2000,
Burrup–Dampier, Newman, Turner River.
www.holcim.com.au

GRAVEL

WA Limestone Co.,
41 Spearwood Avenue,
Bibra Lake WA 6163,
(08) 9434 2299,
Pickering Brook.
www.walimestone.com

SAND

Boral Resources (WA) Ltd,
63–69 Abernethy Road,
Belmont WA 6104,
(08) 9333 3400,
Gnangara, Grosmont.
www.boral.com.au

Rocla Quarry Products,
130 Fauntleroy Avenue,
Redcliffe WA 6104,
(08) 9475 2500,
Gnangara, Banjup, Gingin, Lexia, Baldivis.
www.rocla.com.au

Holcim (Australia) Pty Ltd,
Technology Park,
18–20 Brodie–Hall Drive,
Bentley WA 6102,
(08) 9212 2000,
Various sites.
www.holcim.com.au

Tuma Holdings Pty Ltd,
T/as Action Sand Supplies
42 Noel Road,
Gooseberry Hill WA 6076,
(08) 9275 1100,
Mobile: 0408 923 801,
Chidlow.

DIAMONDS

Argyle Diamonds Australia
2 Kings Park Road,
West Perth WA 6005,
(08) 9482 1166,
Argyle.
www.argylediamonds.com.au

TABLE 8. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS

Kimberley Diamond Company,
Level 3, 52 Kings Park Road,
West Perth WA 6005,
(08) 9426 9888,
Ellendale.
www.gemdiamonds.com

DIMENSION STONE GRANITE

Fraser Range Granite NL,
Eyre Highway,
Norseman WA 6443,
(08) 9039 3442,
Fraser Range Granite.

FELDSPAR

Unimin Australia Ltd,
26–28 Tomlinson Road,
Welshpool WA 6106,
(08) 9362 1655,
Mukinbudin.
www.unimin.com.au

GOLD

Agnew Gold Mining Co Pty Ltd,
PMB 10,
Leinster WA 6437,
(08) 9088 3822,
Agnew.
www.goldfields.co.za

AngloGold Australia Ltd,
Level 13, St Martins Tower,
44 St Georges Terrace,
Perth WA 6000,
(08) 9425 4600,
Sunrise Dam.
www.anglogoldashanti.com

Apex Minerals NL,
Level 1, 10 Ord Street,
West Perth WA 6005,
(08) 6311 5555,
Wiluna.
www.apexminerals.com.au

Avoca Resources Limited,
Level 1, 31 Ventnor Avenue,
West Perth WA 6005,
(08) 9226 0625,
Higginsville.
www.avocaresources.com.au

Barrick Gold of Australia Limited,
Level 10, 2 Mill Street,
Perth WA 6000,
(08) 9212 5777,
Darlot, Lawlers, Plutonic, Granny Smith,
Kanowna Belle, East Kundana, Kalgoorlie.
www.barrick.com

Dioro Exploration NL,
Level 2, 45 Stirling Highway,
Nedlands WA 6009,
(08) 9389 8799,
South Kal Mines, Frogs Leg.
www.dioro.com.au

Focus Minerals Limited,
Level 10, Exchange House,
68 St Georges Terrace,
Perth WA 6000,
(08) 9215 7888,
Coolgardie–Redemption.
www.focusminerals.com.au

Kalgoorlie Consolidated Gold Mines Pty Ltd,
Private Mail Bag 27,
Kalgoorlie WA 6433,
(08) 9022 1100,
Golden Mile Fimiston Super Pit.
www.superpit.com.au

Intrepid Mines Limited,
Level 1, WBM Building,
490 Upper Edward Street,
Spring Hill Qld 4004,
(07) 3007 8000,
Paulsens.
www.intrepidmines.com

La Mancha Resources Inc.,
Level 1, 12 St Georges Terrace,
Perth WA 6000,
(08) 9268 4000,
Mungari East.
www.lamancha.ca

Newcrest Mining Ltd,
193 Great Eastern Highway,
Belmont WA 6104,
(08) 9270 7070,
Telfer.
www.newcrest.com.au

Newmont Mining Corporation,
Level 1, 388 Hay Street,
Subiaco WA 6008,
(08) 9423 6100,
Boddington, Jundee, Kalgoorlie.
www.newmont.com

Norseman Gold Plc,
Suite 1D, 21 Teddington Road,
Burswood WA 6100,
(08) 9473 2222,
Norseman.
www.norsemangoldplc.com

Paddington Gold Pty Ltd,
Menzies Highway,
PO Box 1653,
Kalgoorlie WA 6430,
(08) 9080 6800,
Paddington.
www.nortongoldfields.com.au

Ramelius Resources Limited,
Level 1, 130 Royal Street,
East Perth WA 6004,
(08) 9202 1127,
Wattle Dam.
www.rameliusresources.com.au

Silver Lake Resources Limited,
31 Malcolm Street,
West Perth WA 6005,
(08) 6313 3800,
Mt Monger–Silver Lake.
www.silverlakeresources.com.au

St Barbara Limited,
1205 Hay Street,
West Perth WA 6005,
(08) 9476 5555,
Marvel Loch–Southern Cross,
Sons of Gwalia.
www.stbarbara.com.au

St Ives Gold Mining Co Pty Ltd,
PO Box 359,
Kambalda WA 6442,
(08) 9088 1111,
Kambalda–St Ives.
www.goldfields.co.za

Tanami Gold NL,
Level 4, 50 Colin Street,
West Perth WA 6005,
(08) 9212 5999,
Coyote.
www.tanami.com.au

Troy Resources NL,
44 Ord Street,
West Perth WA 6005,
(08) 9481 1277,
Sandstone.
www.troy.com.au

TABLE 8. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS

GYPSUM

Cockburn Cement Ltd,
Lot 242 Russell Road,
Munster WA 6163,
(08) 9411 1000,
Lake Hillman.
www.cockburncement.com.au

Dampier Salt Pty Ltd,
37 Belmont Avenue,
Belmont WA 6104,
(08) 9270 9270,
Lake MacLeod.
www.dampiersalt.com.au

Gypsum Industries,
Suite 1, 110 Robinson Avenue,
Belmont WA 6104,
1800 644 951,
Lake Cowcowing.
www.aglimestone.com.au

Lake Hillman Mining Pty Ltd,
PO Box 1,
Kalannie WA 6468,
(08) 9666 2045,
Lake Hillman.

HEAVY MINERAL SANDS

GARNET SAND

GMA Garnet Pty Ltd,
Level 18 Exchange Plaza,
2 The Esplanade
Perth WA 6000,
(08) 9287 3200,
Port Gregory.
www.garnetsales.com

ILMENITE, LEUCOXENE, RUTILE AND ZIRCON

Cable Sands (WA) Pty Ltd,
Koombana Drive, North Shore,
Bunbury WA 6230,
(08) 9721 0200,
Ludlow, Gwindinup Mine.
www.cablesands.com.au

Doral Mineral Sands Pty Ltd,
Lot 7 Harris Road,
Picton WA 6229,
(08) 9725 5444,
Dardanup.
www.doral.com.au

Iluka Resources Ltd,
Level 23, 140 St Georges Terrace,
Perth WA 6000,
(08) 9360 4700.
Capel, Eneabba.
www.iluka.com

TiWest Pty Ltd,
Technology Park,
1 Brodie–Hall Drive,
Bentley WA 6102,
(08) 9365 1333,
Cooljarloo.
www.tiwest.com.au

IRON ORE

Atlas Iron Ltd,
Ground Floor, 10 Richardson Street,
West Perth WA 6005,
(08) 9476 7900,
Pardoo.
www.atlasiron.com.au

BHP Billiton Iron Ore (Goldsworthy) Ltd,
225 St Georges Terrace,
Perth WA 6000,
(08) 6224 4444,
Mining Area C.
www.bhpbilliton.com

BHP Billiton Iron Ore Ltd,
225 St Georges Terrace,
Perth WA 6000,
(08) 6224 4444,
Jimblebar, Newman, Yandicoogina.
www.bhpbilliton.com

Channar Mining Pty Ltd,
152 St Georges Terrace,
Perth WA 6000,
(08) 9327 2327,
Channar.

Cliffs Natural Resources Pty Ltd,
Level 12, 1 William Street,
Perth WA 6000,
(08) 9426 3333,
Cockatoo Island, Koolyanobbing.
www.cliffsnaturalresources.com

Fortescue Metals Limited,
Level 2, 87 Adelaide Terrace,
East Perth WA 6004,
(08) 6218 8888,
Cloud Break.
www.fmgl.com.au

Hamersley Iron Pty Ltd,
152 St Georges Terrace,
Perth WA 6000,
(08) 9327 2327,
Brockman, Namuldi, Mesa J, Channar,
Eastern Range, Hope Downs, Marandoo,
Paraburdoo, Tom Price, West Angelas,
Yandicoogina.
www.hamersleyiron.com

Hope Downs Management Services Pty Ltd,
152 St Georges Terrace,
Perth WA 6000,
(08) 9327 7000,
Hope Downs.

Sinosteel Midwest Corporation Limited,
7 Rheola Street,
West Perth WA 6005,
(08) 9429 4888,
Koolanooka.
www.midwestcorp.com.au

Mt Gibson Iron Limited,
1st Floor,
7 Havelock Street,
West Perth WA 6005,
(08) 9426 7500,
Talling Peak, Koolan Island.
www.mtgibsoniron.com.au

Murchison Metals Ltd,
Level 1, 5 Ord Street,
West Perth WA 6005,
(08) 9492 2600,
Jack Hills.
www.mml.net.au

Robe River Iron Associates,
Level 22, Central Park,
152–158 St Georges Terrace,
Perth WA 6000,
(08) 9327 2000,
Pannawonica, West Angelas.
www.riotinto.com

LIMESAND–LIMESTONE

Cockburn Cement Ltd,
Lot 242, Russell Road,
Munster WA 6163,
(08) 9411 1000,
Cockburn, Denison, Wanneroo.
www.cockburncement.com.au

TABLE 8. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS

Gypsum Industries of Australia,
Suite 1, 110 Robinson Avenue,
Belmont WA 6104,
1800 644 951,
Cervantes, Lancelin, Jurien.
www.aglime.com.au

Limestone Resources Australia Pty Ltd,
25-29 Frobisher Street,
Osborne Park WA 6017,
(08) 9340 0022,
Wanneroo, Moore River, Carabooda.
www.limestone-resources.com.au

WA Limestone Co.,
41 Spearwood Avenue,
Bibra Lake WA 6163,
(08) 9434 2299,
Various sites throughout State.
www.walimestone.com

MANGANESE

Pilbara Manganese Pty Ltd,
Lot 2524 North West Coastal Highway,
South Hedland WA 6722,
(08) 9172 0900,
Woodie Woodie.
www.consminerals.com.au

NICKEL

BHP Billiton (Nickel West),
191 Great Eastern Highway,
Belmont WA 6104,
(08) 6272 3000,
Kambalda, Leinster, Mt Keith, Kalgoorlie,
Kwinana.
www.bhpbilliton.com

Glenmurrin Pty Ltd
Level 4, 30 The Esplanade,
Perth WA 6805,
(08) 9226 1099,
Murrin Murrin.
www.glencore.com

Independence Group NL,
Suite 1, 183 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 1777,
Long Nickel.
www.independencgroup.com.au

Minara Resources Ltd,
Level 4, 30 The Esplanade,
Perth WA 6000,
(08) 9212 8400,
Murrin Murrin.
www.minara.com.au

Mincor Resources NL,
Level 1, 56 Ord Street,
West Perth WA 6005,
(08) 9476 7200,
Carnilya Hill, Mariners, Miitel,
Redross, Wannaway.
www.mincor.com.au

Panoramic Resources Ltd,
Level 9, 553 Hay Street,
Perth WA 6000,
(08) 9225 0999,
Savannah, Lanfranchi Tramways.
www.panoramicresources.com

Western Areas NL,
Level 1, 11 Ventnor Avenue,
West Perth WA 6005,
(08) 9334 7777,
Flying Fox.
www.westernareas.com.au

Xstrata Nickel Australasia,
Level 3, 24 Outram Street,
West Perth WA 6005,
(08) 9213 1588,
Cosmos.
www.xstrata.com

PALLADIUM

BHP Billiton (Nickel West),
191 Great Eastern Highway,
Belmont WA 6104,
(08) 9479 0500,
Kambalda.
www.bhpbilliton.com

PETROLEUM

Apache Energy Ltd,
Level 9, 100 St Georges Terrace,
Perth WA 6000,
(08) 6218 7100,
Agincourt, Albert, Artreus, Bamba,
Double Island, East Spar, Endymion,
Gipsy, Gudrun, Harriet, Hoover, Legendre,
John Brookes, Linda, Little Sandy, Mohave,
Monet, North Alkimos, North Pedirka, Pedirka,
Rose, Simpson, Sinbad, South Plato,
Stag, Tanami, Van Gogh, Victoria, Wonnich.
www.apachecorp.com

AWE Ltd,
Level 16, 40 Mount Street,
North Sydney NSW 2060,
(02) 8912 8000,
Corbyas, Hovea–Eremia, Mt Horner,
Dongara, Woodada, Xyris.
www.awexp.com.au/irm/content/project/australia.html

Buru Energy Limited,
Level 1, 418 Murray Street,
Perth WA 6000,
Freecall: 1800 337 330,
Blina.
www.buruenergy.com.au

**BHP Billiton Petroleum
(North West Shelf) Pty Ltd,**
Level 42, Central Park,
152–158 St Georges Terrace,
Perth WA 6000,
(08) 9338 4888,
Chinook–Scindian, Griffin, Pyranees, Stybarrow.
www.bhpbilliton.com

Chevron Australia Pty Ltd,
Level 24, QV1 Building,
250 St Georges Terrace,
Perth WA 6000,
(08) 9216 4000,
Barrow Island, Crest,
Roller–Skate, Saladin, Yammaderry.
www.chevron.com

ENI Australia Limited,
Level 3, 40 Kings Park Road,
West Perth WA 6005,
(08) 9320 1111,
Woollybutt.

Origin Energy Resources Ltd,
34 Colin Street,
West Perth WA 6005,
(08) 9324 6111,
Beharra Springs, Jingemlia.
www.originenergy.com.au

Roc Oil Company Limited,
Level 2, 201 Adelaide Tce,
East Perth WA 6004,
(08) 9219 7111,
Cliff Head.
www.rocoil.com.au

TABLE 8. PRINCIPAL MINERAL AND PETROLEUM PRODUCERS

Santos Limited,
Level 1, 40 The Esplanade,
Perth WA 6000,
(08) 9333 9500,
Mutineer–Exeter.
www.santos.com.au

Vermilion Oil and Gas Australia Pty Ltd,
Level 5, 30 The Esplanade,
Perth WA 6000,
(08) 9215 0300,
Wandoo.
www.vermilionenergy.com

Woodside Energy Ltd,
240 St Georges Terrace,
Perth WA 6000,
(08) 9348 4000,
Angel, Athena, Cossack, Echo–Yodel,
Goodwyn, Hermes, Laminaria East,
North Rankin, Wanaea, Vincent, Enfield.
www.woodside.com.au

PLATINUM

BHP Billiton (Nickel West)
191 Great Eastern Highway,
Belmont WA 6104,
(08) 6272 3000,
Kambalda.
www.bhpbilliton.com

SALT

Dampier Salt Pty Ltd,
37 Belmont Avenue,
Belmont WA 6104,
(08) 9270 9270,
Dampier, Lake MacLeod, Port Hedland.
www.dampiersalt.com.au

Onslow Salt Pty Ltd,
Level 16, 2 The Esplanade,
Perth WA 6000,
(08) 9265 8000,
Onslow Salt.

Shark Bay Salt Joint Venture,
Level 16, 2 The Esplanade,
Perth WA 6000,
(08) 9265 8000,
Useless Loop.

WA Salt Supply Ltd,
Cockburn Road,
Hamilton Hill WA 6163,
(08) 9431 9431,
Lake Deborah East, Pink Lake.
www.wasalt.com.au

SILICA – SILICA SAND

SILICA

Simcoa Operations Pty Ltd,
973 Marriott Road,
Wellesley WA 6233
(08) 9780 6744,
Dalaroo, Kemerton.
www.simcoa.com.au

SILICA SAND

Austsand Pty Ltd,
570 Mindijup Road,
Manypeaks WA 6328,
(08) 9846 1222,
Mindijup.

Kemerton Silica Sand Pty Ltd,
Suite 5, 363–367 Albany Highway
Victoria Park WA 6100,
(08) 9355 0266,
www.ksspl.com.au

Rocla Quarry Products,
3 Casella Place,
Kewdale WA 6105,
(08) 9353 9800,
Gnangara.
www.rocla.com.au

SPONGOLITE

Opalbase Nominees Pty Ltd,
Red Gum Pass,
Kendenup WA 6323,
(08) 9841 7549,
Red Gum Spongolite.

TALC

Luzenac Australia Pty Ltd,
Perenjori Road,
Three Springs WA 6519,
(08) 9954 3000,
Three Springs.
www.luzenac.com

Unimin Australia Ltd,
26 Tomlinson Road,
Welshpool WA 6106,
(08) 9362 1411,
Mt Seabrook.
www.unimin.com.au

TIN–TANTALUM–LITHIUM

SPODUMENE

Talison Minerals Ltd,
Level 4, 37 St Georges Terrace,
Perth WA 6000,
(08) 9263 5555,
Greenbushes.
www.talison.com.au

Tantalite–Tin

Talison Minerals Ltd,
Level 4, 37 St Georges Terrace,
Perth WA 6000,
(08) 9263 5555,
Greenbushes.
www.talison.com.au

ABBREVIATIONS

A\$	Australian dollar	kt	thousand tonnes
ABARE	Australian Bureau of Agricultural and Resource Economics	LME	London Metal Exchange
ABS	Australian Bureau of Statistics	Mboe	Millions of barrels of oil equivalent
bbl	barrels of oil	Mtoe	Million tonnes of oil equivalent
Bcm	billion cubic metres	Mct	million carats
Btu	British Thermal Units	Moz	million ounces
ct	carat	Mt	million tonnes
GDP	Gross Domestic Product	oz	ounce
Gm ³	billion cubic metres	OPEC	Organisation of Petroleum Exporting Countries
ha	hectares	RBA	Reserve Bank of Australia
km	kilometres	t/a	tonnes per annum
km ²	square kilometres	Tcf	trillion cubic feet
		US\$	United States dollar

WEIGHTS AND MEASURES

Kilo	1000 ¹	10 ³	1,000
Mega	1000 ²	10 ⁶	1,000,000
Giga	1000 ³	10 ⁹	1,000,000,000
Tera	1000 ⁴	10 ¹²	1,000,000,000,000
Peta	1000 ⁵	10 ¹⁵	1,000,000,000,000,000
Exa	1000 ⁶	10 ¹⁸	1,000,000,000,000,000,000
Zetta	1000 ⁷	10 ²¹	1,000,000,000,000,000,000,000
Yotta	1000 ⁸	10 ²⁴	1,000,000,000,000,000,000,000,000

UNITS AND CONVERSION FACTORS

	Metric Unit	Symbol	Imperial Unit
Mass	1 gram	g	= 0.032151 troy (fine) ounce (oz)
	1 kilogram	kg	= 2.204624 pounds (lb)
	1 tonne	t	= 1.10231 United States short ton [1 US short ton = 2,000 lb]
	1 tonne	t	= 0.98421 United Kingdom long ton [1 UK long ton = 2,240 lb]
	1 tonne LNG	t	= 52,000,000 British Thermal Units (Btu)
Volume	1 kilolitre	kl	= 6.28981 barrels (bbl)
	1 cubic metre	m ³	= 35.3147 cubic feet (ft ³) [1 kilolitre (kl) = 1 cubic metre (m ³)]
Energy	1 kilojoule	kj	= 0.94781 British Thermal Units (Btu)
Energy Content		Prefix	
Coal	19.7 GJ/t	kilo (k)	10 ³
Condensate	32.0 MJ/L	mega (M)	10 ⁶
Crude oil	37.0 MJ/L	giga (G)	10 ⁹
LNG	25.0 MJ/L	tera (T)	10 ¹²
Natural gas	38.2 MJ/m ³	peta (P)	10 ¹⁵
LPG-butane	28.7 MJ/L (1tonne LPG-butane = 1,720 litres)		
LPG-propane	25.4 MJ/L (1tonne LPG-propane = 1,960 litres)		

DATA SOURCES

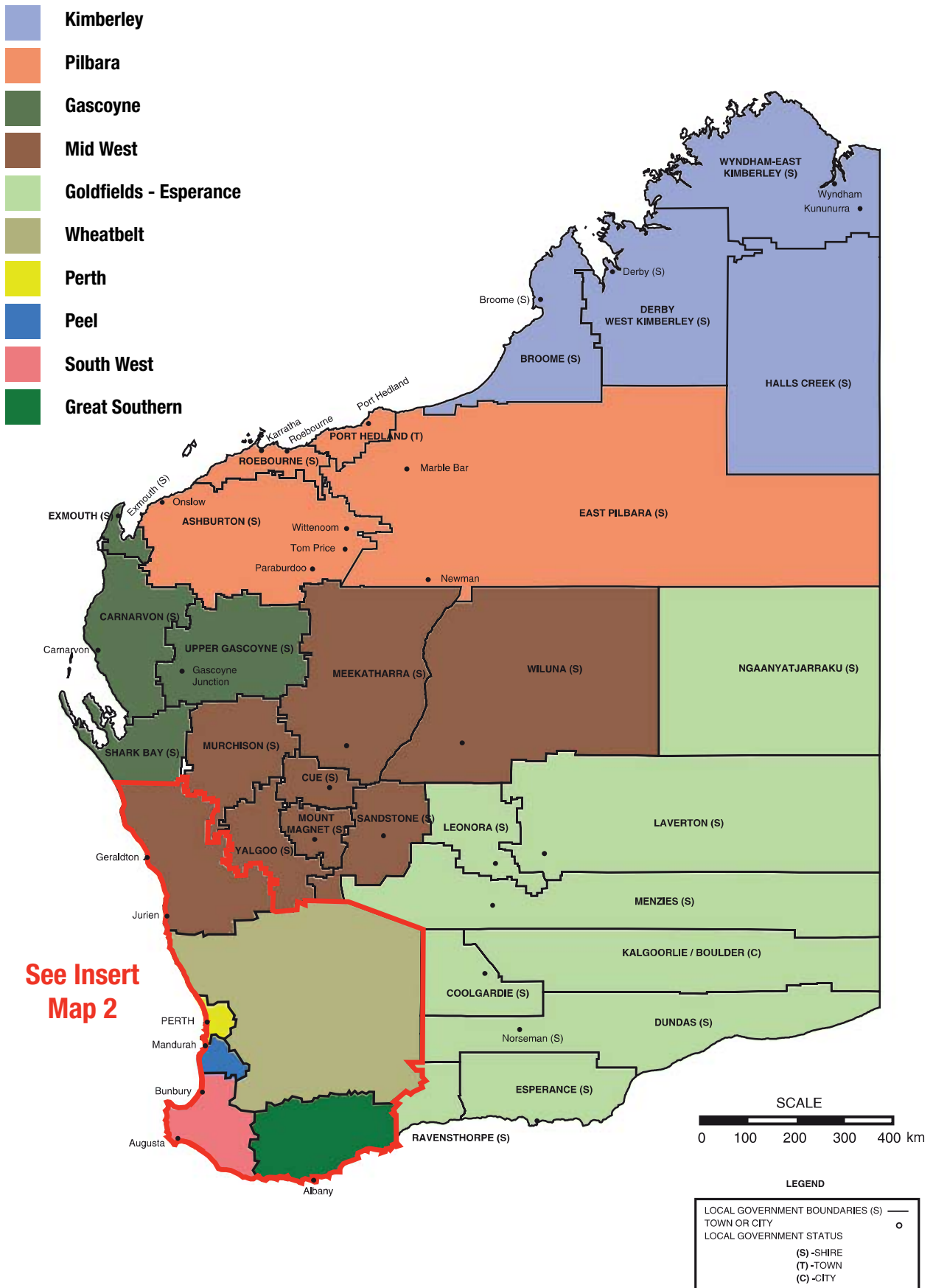
Quantities and values for minerals and petroleum in this publication are collected from a variety of sources including:

The Department's royalty returns, various company annual reports and quarterly Australian Stock Exchange reports, State port authority statistics, the ABS and ABARE.

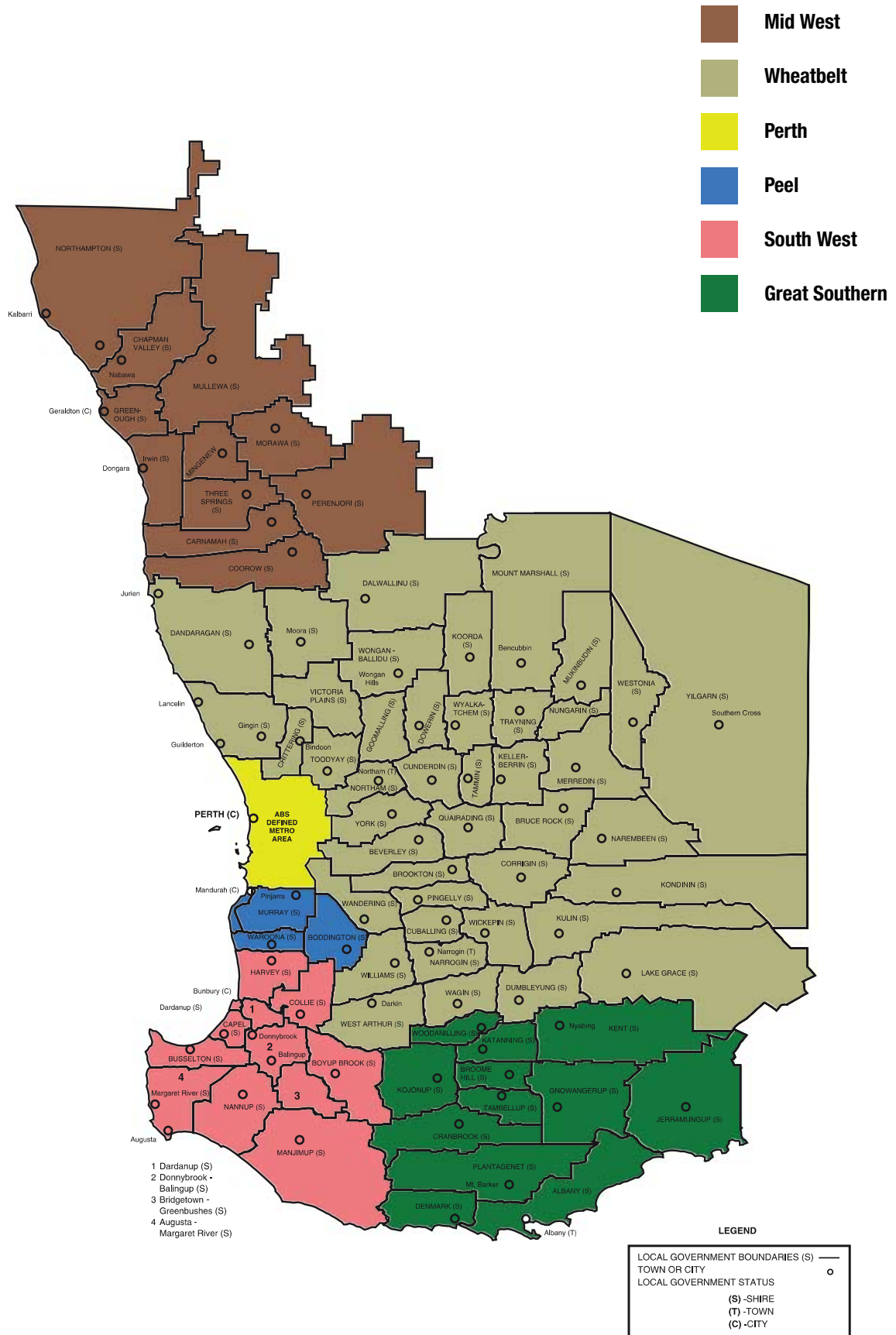
Quantities specified relate to either mine production or sales as listed below for each commodity.

Mine Production
Clays
Coal
Construction Materials
Dimension Stone
Gold
Gypsum
Limesand–Limestone–Dolomite
Silica – Silica Sand
Talc
Sales
Alumina
Base Metals (Copper, Lead and Zinc)
Chromite
Diamonds
Gem and Semi-Precious Stones
Heavy Mineral Sands
Industrial Pegmatite Minerals
Iron Ore
Manganese
Nickel Industry (Nickel, Cobalt, Platinum and Palladium)
Petroleum
Pigments
Salt
Silver
Spongolite
Tin–Tantalum–Lithium

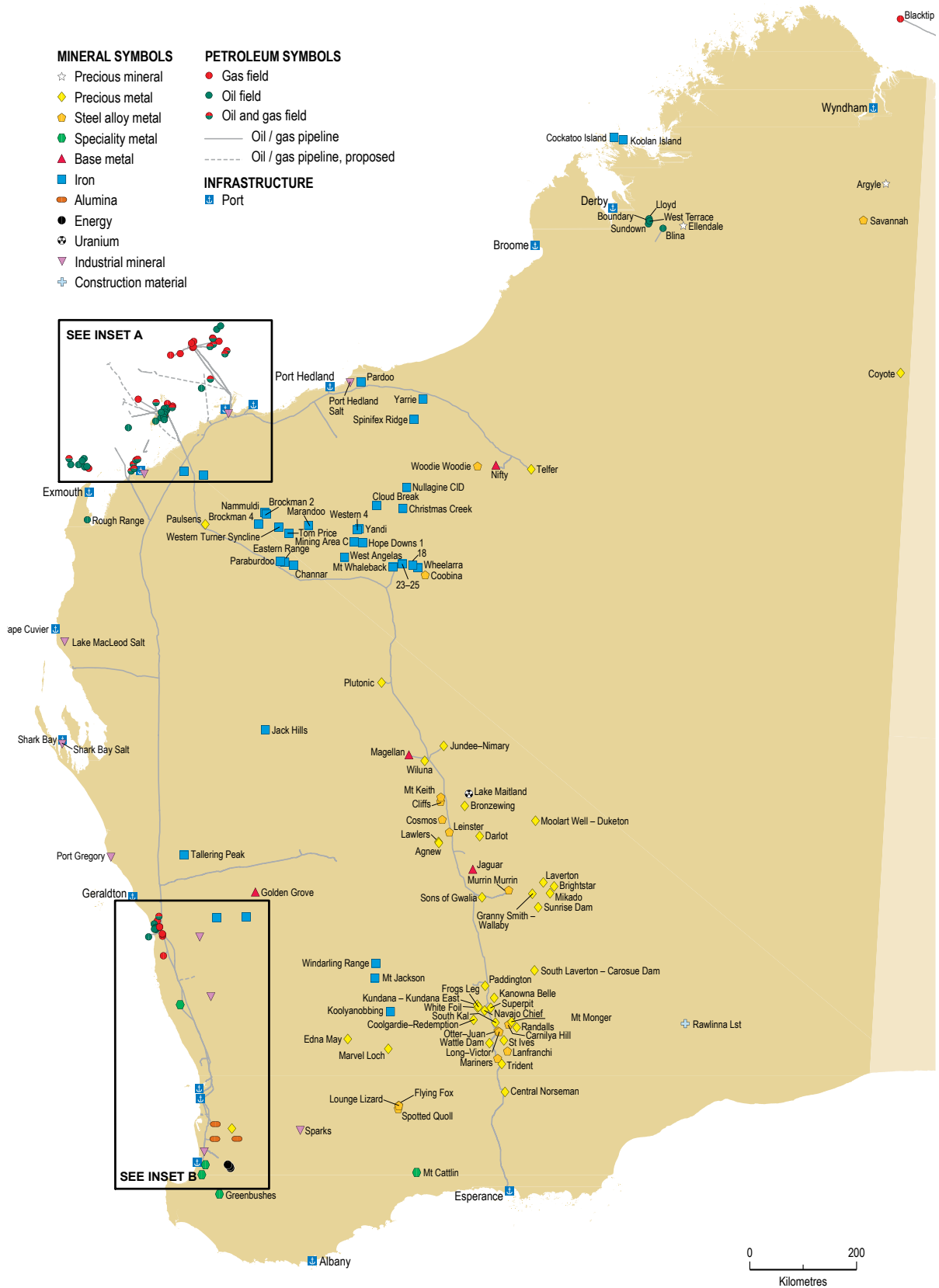
MAP 1. LOCAL GOVERNMENT BOUNDARIES



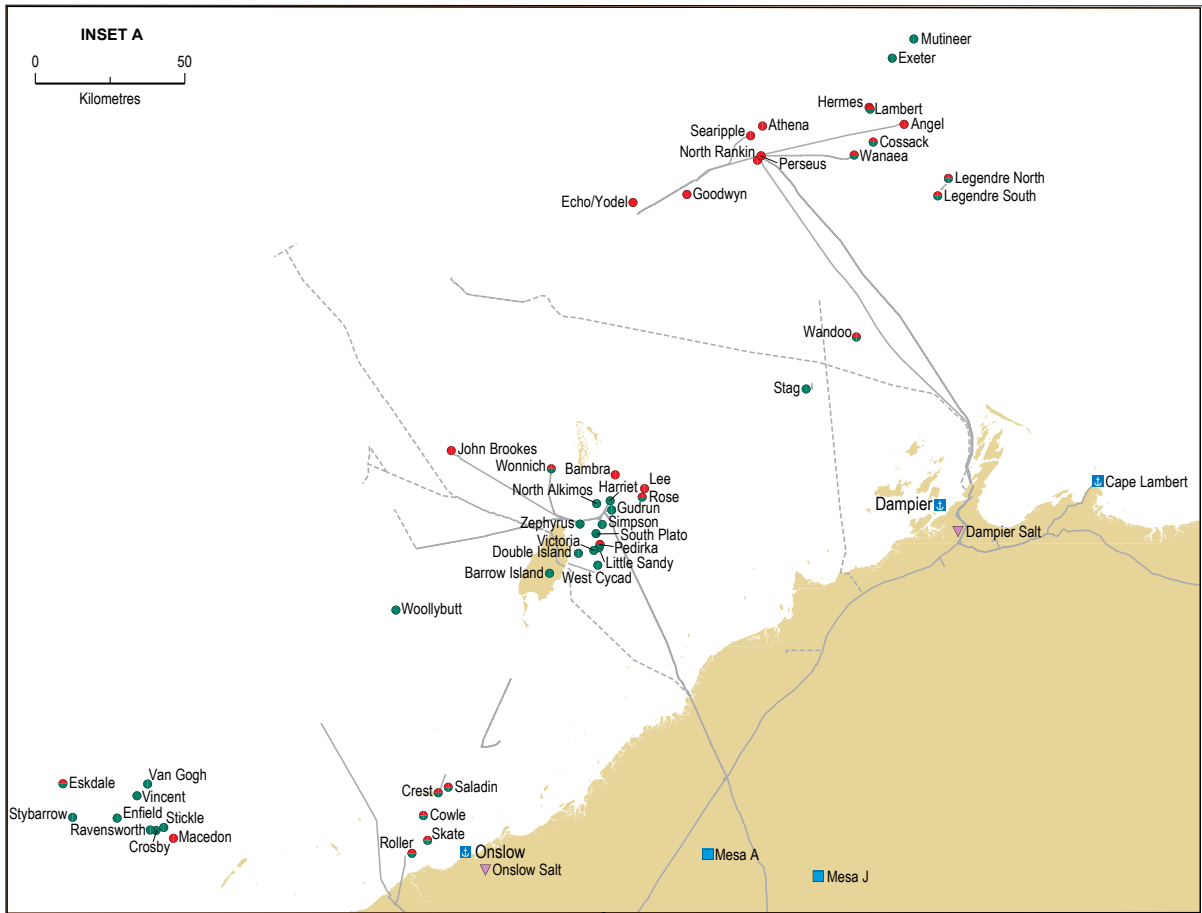
MAP 2. LOCAL GOVERNMENT BOUNDARIES



MAP 3. MAJOR MINERAL AND PETROLEUM PROJECTS IN WESTERN AUSTRALIA



MAP 4. MAJOR MINERAL AND PETROLEUM PROJECTS IN WESTERN AUSTRALIA – INSET A & B



MINERAL SYMBOLS

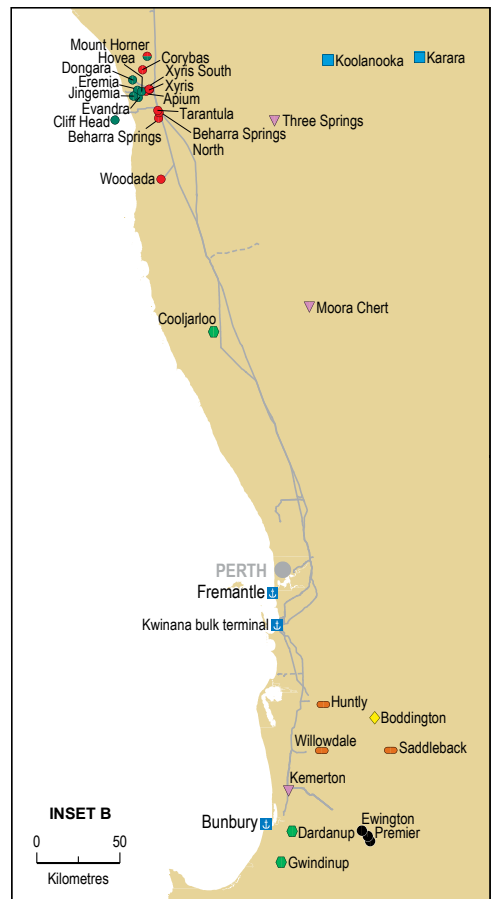
- ◆ Precious metal
- Speciality metal
- Iron
- Alumina
- Energy
- ▼ Industrial mineral

PETROLEUM SYMBOLS

- Gas field
- Oil field
- Oil and gas field
- Oil / gas pipeline
- - - Oil / gas pipeline, proposed

INFRASTRUCTURE

- Port



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Department of Mines and Petroleum
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