

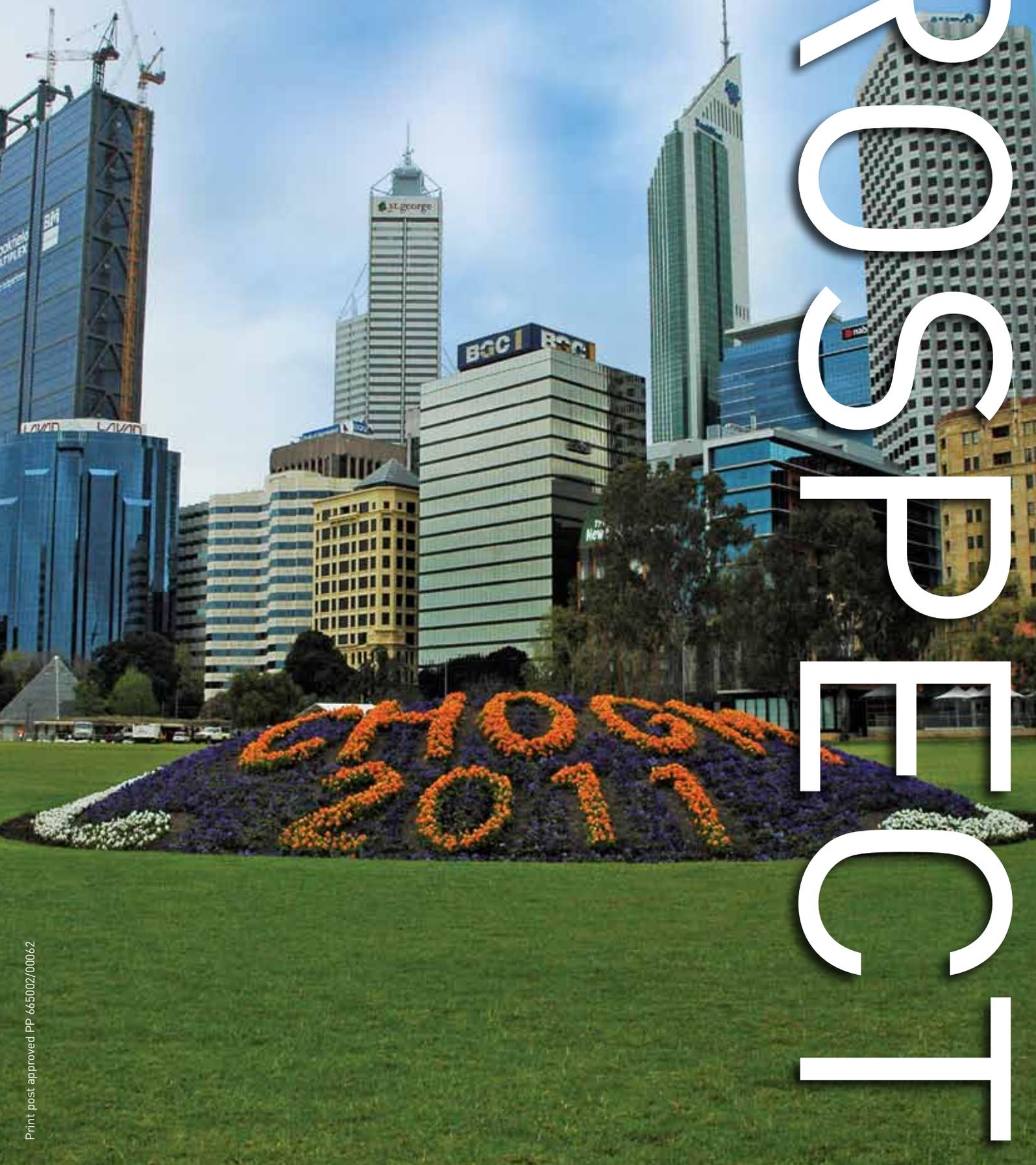
Going global

Western Australia hosts CHOGM and
the Commonwealth Business Forum 2011



CHOGM 2011
PERTH, AUSTRALIA

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Creating global partnerships

Western Australia will host international visitors from around the world in October for the Commonwealth Heads of Government Meeting (CHOGM) and associated events.

We take this opportunity to welcome delegates to Western Australia and our capital city of Perth, while recognising the significance CHOGM brings to our State.

A key feature of CHOGM will be the Commonwealth Business Forum (story page 2), a three-day event that will highlight global economic partnerships for trade and investment across the Commonwealth and beyond, with particular emphasis on the Indian Ocean and the Pacific Rim.

The forum provides a unique opportunity for industry and government to work together to enhance and create investment and trade relationships for our State, our region and globally.

Perth is a growing regional centre for the resources services industry, and we are connected to global supply chains with Western Australian resources critical to economies around the world.

Later this year, the Western Australian Government will open a trade and investment office in Singapore (story page 8), creating connections with one of the world's top five trading centres and providing Western Australian developers with ready access to global financial investors.

With Western Australia continuing its role as the powerhouse of the Australian economy, we are well positioned to build on our international relationships, while creating new partnerships and new opportunities for trade and investment in our State.

Colin Barnett PREMIER OF WESTERN AUSTRALIA & MINISTER FOR STATE DEVELOPMENT

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Editorial management: Rebecca Atkinson, DSD Communications and Marketing Division.
Tel: (08) 9222 0417 • Fax: (08) 9222 0505

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Cover photo: Perth plays host to international visitors for CHOGM 2011. Story page 2.

DEPARTMENT OF STATE DEVELOPMENT

International Trade and Investment

1 Adelaide Terrace
East Perth, Western Australia 6004
Tel: +61 8 9222 0566 • Fax: +61 8 9222 6151
Email: invest@dsd.wa.gov.au
www.dsd.wa.gov.au

INTERNATIONAL OFFICES

Europe

European Office • 5th floor, Australia Centre
Corner of Strand and Melbourne Place
London WC2B 4LG • UNITED KINGDOM
Tel: +44 20 7240 2881 • Fax: +44 20 7240 6637
Email: europe@wago.co.uk

India — Mumbai

Western Australian Trade Office
93 Jolly Maker Chambers No 2
9th floor, Nariman Point • Mumbai 400 021 • INDIA
Tel: +91 22 6630 3973 • Fax: +91 22 6630 3977
Email: middleeastindia@dsd.wa.gov.au

Indonesia — Jakarta

Western Australian Trade Office
Wisma Budi Building • floor 5 Suite 504
JI HR Rasuna Said Kav C-6
Kuningan, Jakarta 12940 • INDONESIA
Tel: +62 21 5290 2860 • Fax: +62 21 5296 2722
Email: southeastasia@dsd.wa.gov.au

Japan — Tokyo

Government of Western Australia, Tokyo Office
13th floor, Fukoku Seimei Building
2-2-2 Uchisaiwai-cho Chiyoda-ku
• TOKYO 100-0011 • JAPAN
Tel: +81 3 5157 8281 • Fax: +81 3 5157 8286
Email: wa.tokyo@wajapan.net

Japan — Kobe

Western Australian Government Office
6th floor, Golden Sun Building •
4-3-6 Nakayamate-dori
Chuo-Ku • Kobe 650-0004 • JAPAN
Tel: +81 78 242 7705 • Fax: +81 78 242 7707
Email: wa.kobe@wajapan.net

Malaysia — Kuala Lumpur

Western Australian Trade Office
4th floor, UBN Tower • 10 Jalan P Ramlee
KUALA LUMPUR 50250 • MALAYSIA
Tel: +60 3 2031 8175/6 • Fax: +60 3 2031 8177
Email: southeastasia@dsd.wa.gov.au

Middle East — Dubai

Western Australian Trade Office • Emarat Atrium
PO Box 58007 • Dubai • UNITED ARAB EMIRATES
Tel: +971 4 343 3226 • Fax: +971 4 343 3238
Email: middleeastindia@dsd.wa.gov.au

People's Republic of China — Shanghai

Western Australian Trade and Investment Promotion
Room 2208 • CITIC Square
1168 Nanjing Road West
SHANGHAI 20004 • PEOPLE'S REPUBLIC OF CHINA
Tel: +86 21 5292 5899 • Fax: +86 21 5292 5889
Email: china@dsd.wa.gov.au

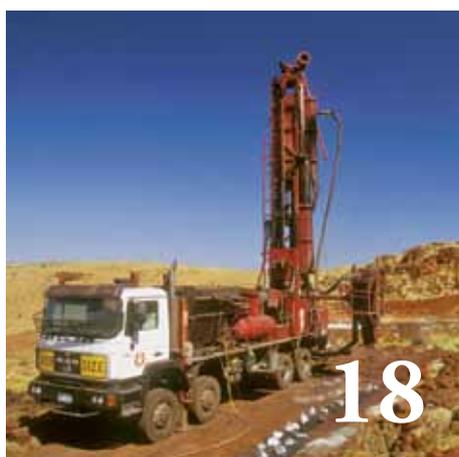
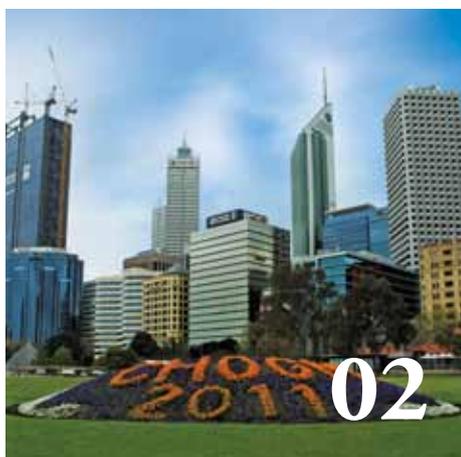
People's Republic of China — Hangzhou

Western Australian Trade and Investment Promotion
Hangzhou Representative Office
Room 1705 • World Trade Office Plaza
Zhejiang World Trade Centre
122 Shuguang Road • Hangzhou 310007
PEOPLE'S REPUBLIC OF CHINA
Tel: +86 571 8795 0296 • Fax: +86 571 8795 0295
Email: china@dsd.wa.gov.au

South Korea — Seoul

Western Australian Trade and Investment Office
Unit 702 • 7th Floor • Kwanghwamoon Building
211 Sejongno, Jongno-gu
Seoul • South Korea 110-730 • KOREA
Tel: +82 2 722 1217 • Fax: +82 2 722 1218
Email: japankorea@dsd.wa.gov.au

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Partnering for global growth

Commonwealth Business Forum 2011

Perth will host the Commonwealth Business Forum from 25-27 October, in conjunction with the Commonwealth Heads of Government Meeting (CHOGM).

CHOGM 2011 is gearing up as the biggest CHOGM in history, with more than 3,000 international delegates and media from more than 50 nations set to visit Western Australia for the event.

Held every two years in a different host nation, CHOGM provides an opportunity for Commonwealth leaders, representing more than two billion citizens around the world, to discuss global and Commonwealth issues.

A centrepiece of CHOGM is the Commonwealth Business Forum (CBF), which is co-organised by the Commonwealth Business Council and the State and Federal Governments, in conjunction with the private sector.

The forum provides an opportunity for business and government to network on global trade and investment policies, while building global economic partnerships.

The theme for the CBF 2011 is "Partnering for Global Growth: The Commonwealth, Indian Ocean and the Pacific Rim"—which is of particular importance to Western Australia given our location and rapidly expanding relationship with Asia and Indian Ocean Rim countries.

Premier Colin Barnett said the Commonwealth Business Forum 2011 would be an ideal opportunity to explore how other Commonwealth countries can link into the massive growth of north Asia and India.

"In international trade, Western Australia punches above its weight, producing more than one third of Australia's exports with just one tenth of the nation's population," he said.

"Western Australia is the source of 66 per cent of all Australian exports to China, 42 per cent of Australian exports to India and 33 per cent of Australian exports to Japan.

"Our State is blessed with extraordinary mineral and energy resources; food and fish production; and advanced and highly capable service industries for these sectors.

"Global resource and service companies have a major presence in Western Australia.

"The combination of natural resources, our relative proximity to Asian markets and the comfort of doing business in a first world nation with both political and legal stability make our State an attractive business centre."

Mr Barnett will join heads of government, including Prime Minister Julia Gillard, as well as Australian and international business leaders as guest speakers at the forum.

Western Australia's resources industry will be well represented at the event, with principal sponsors of the forum including Fortescue Metals Group, BP, Woodside, Rio Tinto and Perdaman Chemicals and Fertilisers, as well as gold sponsors BHP Billiton, AngloGold Ashanti and others.

Mr Barnett described the quality of sponsorship attracted by the Commonwealth Business Council for the CBF as outstanding.

"It augurs very well for a great conference which will not only develop business and trade relationships but also showcase our wonderful city, state and nation to the rest of the world," he said.

Over the three days, the CBF will feature a full program of events, with guest speaker, round table and investment sessions covering key topics, including:

- Opportunities In the Zone
- Natural resources: maximising value for growth and development
- Partnering for global growth
- Australia: business hub for the next century
- China and the Commonwealth
- Oil, gas and coal
- India: 21st century powerhouse
- Commonwealth partnerships for natural resource development
- Strengthening national economies through global business and trade

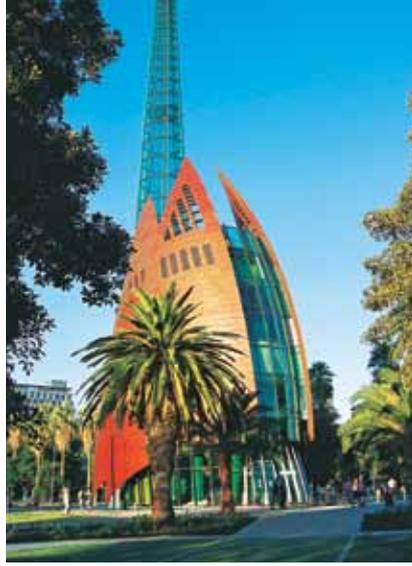
Mr Barnett said the CBF would be a key part of the broader CHOGM program.

"While CHOGM itself focuses on political leaders, the gathering of more than 1,000 global business leaders at the CBF will be significant," he said.

"Holding such a major global event here will showcase Perth and Western Australia to the world and allow us to expand our international trade and investment networks."

The Department of State Development is organising seminars for target international markets as part of the agency's role on the organising committee for the CBF, which includes the Chamber of Commerce and Industry, Austrade, sponsor organisations, the Commonwealth Business Council and the national and state CHOGM teams.

For more information on the Commonwealth Business Forum, visit www.cbf2011.com ■



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Western Australia welcomes CHOGM

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The Western Australian Government Departments of State Development and Mines and Petroleum welcome CHOGM delegates to Perth and to Western Australia—the powerhouse of the Australian economy.



Government of **Western Australia**
Department of **State Development**



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

The Department of State Development is the Western Australian Government’s lead agency for driving the responsible and sustainable development of Western Australia.

Working closely with industry, communities and government agencies we deliver significant State initiatives and facilitate major resource, industrial and infrastructure projects.

We also work to attract strategic investment to Western Australia, assist the development of export markets, and enable the development of strategic industrial land and infrastructure.

www.dsd.wa.gov.au

The Department of Mines and Petroleum is the State’s lead agency in attracting private investment in resources exploration and development through the provision of geoscientific information on minerals and energy resources, and management of an equitable and secure titles systems for the mining, petroleum and geothermal industries.

We also carry prime responsibility for regulating these extractive industries and dangerous goods in Western Australia, including the collection of royalties, and ensuring that safety, health and environmental standards are consistent with relevant State and Commonwealth legislation, regulations and policies.

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Western Australia: A leading resources economy

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Super pit at Kalgoorlie Consolidated Gold Mine

Western Australia's mineral resources industries have had a vital role in driving major phases in the State's economic and social development.

Three dramatic events—the 1890s gold rush, the 1960s mining boom and the current period of sustained growth that began early in the 21st century—each brought population increases, and major new foreign investment and infrastructure development. This helped create the world's leading resources economy.

Western Australia's colonial government actively encouraged the search for minerals and created a Government geologist, with Western Australia's Geological Survey tracing its establishment to the 1880s.

While various small clay, rock and base metal operations predated it, the rushes that followed the discovery of gold, initially at Halls Creek (1885) in the State's far north and most importantly at Kalgoorlie (1893), established the mining sector's critical importance to the State.

In the decade 1890 – 1900, when annual gold production grew from a few tonnes to almost 50, the State's population more than trebled from 48,502 to 179,967.

During this time Western Australia attracted significant foreign investment, especially from London.

As a result, new towns were founded and Perth, the State capital, grew significantly with major investment in private and public buildings.

Major new infrastructure commenced, including the construction of Fremantle's inner harbour and commencement of a 600 kilometre water pipeline to service the Eastern Goldfields.

The State's railway system more than doubled in length and a coal mining industry was established to fuel it.

The decade also saw a Department of Mines established to administer a framework of laws and regulations. These aimed to attract major investors by securing their titles; protect the rights of smaller prospectors and miners; ensure the safety of the mining workforce; and collect royalties.

While gold output slowly declined after the turn of the century, the boost to the State's population and its finances helped ensure continued growth and major agriculture expansion.

During the 1930s, revived gold prices and mining activity spared the State the worst ravages of the Great Depression.

Work continued to map and better understand the State's geology. In the 1950s, new mineral production including iron ore and mineral sands helped prepare Western Australia for the next great phase of resources-led expansion.

The State's capacity to manage major industrial development projects improved with the introduction of the State Agreement, a legislated instrument that specified the rights, obligations, terms and conditions for the development of projects. A framework was also established for ongoing relations and cooperation between the State and the project proponents.

The first State Agreement came in 1952, underpinning establishment of Australia's largest oil refinery and, in 1955, cement production. These Agreements became especially valuable when industrialisation in North Asia and the removal of national barriers to iron ore exports triggered the mining boom of the 1960s.

In the decade from 1961 – 1971, proven iron ore reserves grew from 400 million tonnes to 15 billion, and the Pilbara region was transformed with new towns, ports and railways.

Annual iron ore exports grew from 1 million to more than 46 million tonnes.

The decade also saw the development of oil production on offshore Barrow Island and the discovery of natural gas fields.

Other significant industrial mineral production commenced including nickel, bauxite and salt.

By the end of the decade, resources processing had increased to include alumina refining, titanium dioxide production and pig iron production (now discontinued), and a nickel refinery was under construction, as were two major new power stations.

In 10 years from 1961, the annual value of the State's exports almost trebled from A\$309 million to A\$862 million, and its annual royalty receipts grew from A\$198,297 to almost A\$19 million.

Western Australia's population grew from about 750,000 to more than 1 million and Perth was transformed with a firm linkage established between the State's economic prospects with those of Asia.

Over the next thirty years, mineral production and industrial development continued, though mostly at a less dramatic pace, with new discoveries and projects across a wide range of minerals, including world-scale diamond production.

In the 1980s, liquefied natural gas exports began, underwritten by the State Government's purchase of natural gas and construction of a 1500 kilometre pipeline.

The establishment of major new ports, a vast rail network and other key infrastructure, to support both land based and offshore resources industries, are among the lasting benefits of the expansion that began in the 1960s.

Along with these, Western Australia's capacities in resource related research, expertise, engineering, project management and support industries expanded across a wide range of resources sectors.

With the 21st century came the emergence of China as a major industrial power, triggering a new phase in Western Australia's development.

The demands of China's strongly growing economy are driving a massive expansion of iron ore production and new investment in a wide range of minerals, including those such as spodumene, tantalum and

rare earths. These minerals are essential for new information-based and renewable energy technologies, and for energy exports.

Growth in Western Australia's resources production is being accompanied with major expansions of rail and port infrastructure and significant new investment in regional cities and towns, to handle a strong population growth.

Between 2001– 2010 annual capital investment values in Western Australia almost trebled and over that decade totalled more than A\$400 billion. In the same period, Western Australia's economy (annual GSP) has grown from A\$122 billion to A\$188 billion (taking inflation into account).

Over that decade, the annual value of merchandise exports grew from A\$31 billion to more than A\$100 billion, with iron ore, gold, and oil and gas the primary drivers.

Perth is also growing strongly and is increasingly a regional hub both for resources companies and service companies.

Western Australian based companies are also playing an increasingly important role in the development of mining projects across the globe, including many in Commonwealth countries.

The Western Australian Government has responded to the accelerated demands of a strongly growing resources sector by increasing the efficiency and transparency of its licensing and approvals processes for exploration mining and processing activities.

It has introduced a lead agency framework, so that a specific government agency is allocated to work with the major project proponents – managing to all Government interactions and statutory approvals processes.

The State Government is also leading the development of new industrial land and infrastructure in partnership with the private sector to ensure that investment in new and expanded resources based export, processing and advanced manufacturing can be accommodated.

Western Australians understand and welcome the contribution the resources sector makes to their State's prosperity. ■



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Western Australia has an extraordinary natural endowment of mineral and petroleum resources and has developed a diverse and globally important resources sector. Drilling for oil and gas in the onshore Perth Basin



The Australian Marine Complex (AMC) in Henderson, Western Australia

WA oil and gas on international stage

Local Western Australian oil and gas services companies were recently showcased to the global market during a State Government led business mission to the United Kingdom and Europe.

The 12-day mission included travel to Aberdeen to participate in one of the world's largest oil and gas conferences—Offshore Europe 2011.

The itinerary also allowed the diverse range of participating Western Australian companies to explore both supply chain access opportunities and prospects for joint venture and strategic business alliances in London, The Hague, Rotterdam and Paris.

Commerce Minister, Simon O'Brien said the Western Australian Government was dedicated to continuing to build the State's profile in the international oil and gas arena, ensuring that Western Australia's potential economic growth was realised.

"The oil and gas industry is a global business with an international approach to engineering, fabrication, construction and supply," he said.

"In many instances, the engineering and procurement strategies for projects in Western Australia are initiated overseas.

"That is why, in this increasingly dynamic economic environment, local businesses need to take a more aggressive role in

promoting their capabilities to the global market place."

Western Australia dominates Australia's oil and gas production, and currently accounts for more than nine per cent of the world's liquefied natural gas (LNG).

In the next 10 years, Western Australia's LNG production is forecast to triple.

Mr O'Brien said that, currently, there were around A\$250 to A\$300 billion worth of resource projects either committed or planned in Western Australia.

"Growth and development in Western Australia's oil and gas sector will undoubtedly present many opportunities, albeit with significant challenges," he said.

“However, the State Government actively supports industry to adapt and overcome these challenges.

“For example, the Western Australian Oil and Gas Mission assisted the participating Western Australian companies to take advantage of the global interest in the local oil and gas industry.

“The mission gave the participating Western Australian companies the opportunity to expand their networks and form vital strategic alliances.”

The Department of Commerce led the mission with support from the Department of State Development, the Department of Training and Workforce Development and the Western Australian Government’s European Office in London.

Aberdeen, where this year’s Offshore Europe conference was held, is one of the world’s leading centres for upstream offshore oil and gas expertise.

As well as attending valuable briefings and seminars, the Western Australian delegates were able to meet one-on-one with important international oil and gas industry representatives and organisations and network with other Offshore Europe delegates.

In addition to Offshore Europe, the business mission also involved a tailored appointments program with potential industry partners and the global supply chain managers of Engineering Procurement Construction Management (EPCM) companies in the UK and Europe.

Mr O’Brien said the Western Australian Government Office in London played an integral role in connecting with local UK and European companies. He added, it facilitated relevant and beneficial business meetings for the Western Australian delegates.

“The Western Australian Government Office in London worked hard to open doors for the Western Australian delegates, who were then able to demonstrate our local industry’s capacity in the global oil and gas industry,” he said.

“The Western Australian Oil and Gas Business Mission was a successful, collaborative effort to support industry in Western Australia, particularly in the growing oil and gas sector.”

Other major State Government initiatives supporting Western Australian industry are the Local Industry Participation Framework and the world-class common use infrastructure at the Australian Marine Complex (AMC) in Henderson, just south of Perth.

Mr O’Brien said the AMC housed the world’s most technologically advanced floating dock, and has expansive undercover and open lay-down areas, which assist industry to keep project costs down.

“A subsea cluster is currently being developed at the AMC to answer the need for a locally-based subsea service and supply base that can provide industry-specific facilities for the South East Asian region,” he said.

“Additionally, the Pilbara region in Western Australia’s North-West has been identified as a possible location to develop a marine-based Common User Facility (CUF) to support the growth and development of the many industries, including oil and gas.”

Several companies taking part in the WA Oil and Gas Business Mission have offices at the AMC, including Matrix Composites and Engineering, Civmec Construction and Engineering, BAE Systems Australia, Oceaneering Australia, Westralian Engineering Services and AMC Management (WA) Pty Ltd.

Other companies involved in the mission included: Australian Project Management; Eilbeck Cranes Australia; Energy and Minerals Institute, the University of Western Australia; GMA Garnet; Hertel Modern; Industry Capability Network Western Australia; Open Door Migration; Peak Well Systems; Rig Inspection Services; UHY Haines Norton; Velocious; Vigil Antislip; and Western Australian Energy Research Alliance (WA:ERA).

For more information contact Paul Mercer, Manager Global Supply Chain Access, Department of Commerce on +61 8 9263 8018 or email paul.mercer@commerce.wa.gov.au ■



L-R: Commerce Minister Simon O'Brien and John Wood, BAE Systems Australia



Singapore city skyline

WA Singapore Office opens gateway to Asia

Western Australia is cementing its ties with Singapore, with a recent initiative set to build on trade and investment links between the two economies.

Following increased interest from Singaporean investors in Western Australian markets, particularly in the mining and oil and gas sectors, the State Government is opening a trade and investment office in Singapore.

Premier and Minister for State Development, Colin Barnett, travelled to Singapore late last year at the invitation of Singaporean Minister for Foreign Affairs, George Yeo.

During his visit, the Premier spoke about the many opportunities in Western Australia in infrastructure, resources, petroleum, food and agriculture, as well as tourism and education.

"I highlighted the natural economic complementarities between Western Australia and Singapore and shared updates on our development projects, the investment potential in our mining and gas sectors, the State's food production potential and the scope for further exchanges on education-related activities," Mr Barnett said.

"Our complementary economies, proximity and shared time zone mean that there are significant opportunities for closer economic and social ties."

While in Singapore, Mr Barnett met with the head of the Singapore stock exchange, Singapore Exchange (SGX), to outline commercial opportunities in Western Australia, particularly for the many banks and financial institutions investing out of Singapore.

Singapore is one of the top five most active foreign exchange trading centres in the world and is also a leading commodities trading hub, which is well suited to Western Australia's economy and industry sectors.

Its proximity to Perth provides Western Australian developers and the resources sector with ready access to global financial investors.

In March this year, a senior delegation from the SGX visited Perth, including Chief Executive Officer, Magnus Bocker, and 17 Singaporean companies.

Department of State Development Director of International Trade and Investment, Nathan Backhouse, said the company delegates were very interested in exploring opportunities in Western

Australia's mining and oil and gas sectors in particular.

"There is a strong desire among Singaporean companies to become more actively involved in the Western Australian market," Mr Backhouse said.

"Singapore companies, with support from the Singapore Government, have shown a strong desire to invest in Western Australia."

Mr Backhouse said Singapore, as a highly developed market economy, was projected to grow at 4.8 per cent per year from 2011-2015.

"Singapore is a key regional centre for multinationals, banks, financial institutions and commodities traders, with more than 600 financial institutions operating in the market ranging from the world's largest players to boutique firms," he said.

"It is also the largest source of foreign direct investment (FDI) in the Association of South East Asian Nations (ASEAN) region and is strategically located to the fast-growing markets of North and South East Asia."



Mr Backhouse said that Singapore's importance as a regional centre for finance and capital was expected to grow as markets in the ASEAN region continue to develop.

"While Singapore is not the largest ASEAN economy, it is the most significant in terms of foreign investment flows in ASEAN and in South East Asia generally," he said.

Singapore's largest FDI country destinations are China, the United Kingdom, Malaysia, Indonesia, Hong Kong, Thailand and India.

With Western Australia currently the nation's largest exporting State at A\$102 billion (2010), and the fourth largest state by Gross State Product at

A\$188b (2010) behind New South Wales, Victoria and Queensland, the opening of a WA trade and investment office in Singapore will provide a strategic link and important gateway for global investors.

"The Western Australian Government's overseas network has a focus predominantly on markets in the Asian region, consistent with the state's top ten export destinations," Mr Backhouse said.

"Taken as a regional group, ASEAN constitutes the fourth largest source of investment in Australia, behind the United States, the United Kingdom and Japan.

"While in close proximity to Perth, Singapore's importance as a key source of FDI for key sectors in Western Australia is currently underutilised."

Mr Backhouse added the Singapore office would provide support and information on trade and investment in Western Australia.

"It will also help open Singapore as a strategic location for Western Australian firms to launch their trade and investment opportunities in greater levels into ASEAN and the wider Asian region," he said.

"The WA office in Singapore will not only be well placed to assist companies across the Singapore market, but also the larger ASEAN market."

The Singapore office is due to open late 2011. ■

Top Ten Sources of Total Level of Foreign Investment in Australia

	2008	2009	2010	Share % in 2010	Rank in 2010
	\$m	\$m	\$m	%	-
United States of America	442,068	514,919	549,881	27.9	1
United Kingdom	442,712	498,991	472,649	24.0	2
Japan	89,262	102,538	117,633	6.0	3
Singapore	43,287	41,088	43,771	2.2	4
Netherlands	30,029	43,436	42,425	2.2	5
Hong Kong (SAR of China)	56,030	43,201	40,774	2.1	6
Germany	37,375	38,232	40,756	2.1	7
Switzerland	37,280	32,226	40,731	2.1	8
New Zealand	28,736	31,682	33,773	1.7	9
France	29,355	22,976	23,861	1.2	10
Other	525,441	537,264	561,552	28.5	-
Total all countries	1,761,575	1,906,553	1,967,806	100.0	

Source: ABS, International Investment Position, Australia: Supplementary Statistics, 2010/DSD



WA working with Africa

On location: Western Australian company Base Resources Ltd is developing a mineral sands resource in Kenya. Above: pilot plant test pit on central dune

Western Australia's mining sector is playing an important role in unleashing Africa's enormous mineral potential.

It is a partnership that Africa has welcomed, and that governments and business on both sides of the Indian Ocean are happy to see grow.

More than 130 Western Australian mining companies are active in 415 projects across 42 African countries—this represents more than 70 per cent of all Australian Stock Exchange listed companies involved in Africa's resources sector.

In addition, many of the estimated 150 Australian companies providing a wide range of mining related expertise, consulting, engineering and equipment supply services to African projects, are based or have operations in Western Australia.

Western Australian companies hold the lion's share of Australia's investment in Africa, estimated to be worth A\$20 billion, and accounting for 40 per cent of the mining sector's overseas activity.

Both Western Australia and African nations are benefiting from China's emergence as a major industrial power and a market for a wide range of mineral and energy resources.

The strength of Australian engagement in Africa is such that global business and financial consultant Deloitte has established a specialist team to service

clients operating, or considering investing in Africa's mining sectors.

"Western Australia has two mining industries, one focussed on Western Australian industry and another working towards Africa," Jacques Van Rhyn, Perth based leader of Deloitte's Australia Africa Services Group said.

"Our role is to help our clients manage the differences in doing business between Australia and Africa."

Mr Van Rhyn said African Governments and mining companies had positive attitudes towards Australian involvement.

"Australian companies have very high levels of expertise and standards, and are socially and environmentally responsible," he said.

"As well as strong exploration experience, especially in gold and iron ore and other minerals in high demand, Australia has an investor market that understands the sector and is willing to invest.

"In some African countries, companies may be required to include government, or local company joint venture participation in their projects as part of their licence conditions.

"Australian companies understand these requirements, and the need to generate local employment and benefits.

"The big effort the Australian Department of Foreign Affairs and Trade is making to

build good relations with African nations is also helping Australian companies."

Start up miner Base Resources Ltd is one such Western Australian company that has made a commitment to Africa, undertaking the development of a major new mineral sands resource, the Kwale Project in Kenya.

Managing Director Tim Carstens said the company, founded in 2008, was established as an iron ore explorer with a Western Australian focus, but found itself operating in a very crowded market place.

"After a 12 month review of our strategy we selected mineral sands as a commodity with strong prospects and, in early 2010, took on the Kwale Project, at that time held as a prospect by a Canadian firm," he said.

"A vigorous drilling program, using Western Australian contractor Wallis Drilling, saw the identified resource expand considerably and we are finalising financing arrangements for a US\$256 million project."

Mr Carstens said that with the Kwale Project, Base Resources had taken on an important responsibility.

"Kwale will be Kenya's first large scale mining project and the Kenyan Government is looking at it as a model for future mining investment," he said.

"We have a very good relationship with the Kenyan Government, which is looking to model its mining industry on Australia's.

"Opportunities for interchange between Australia and Kenya include Australia's valuable expertise in regulation of the industry, and also the behaviour of mining companies."

Mr Carstens, who has strong experience in the sector, both in Australia and overseas, said Australians did mining better than anyone, whether from a technical, social or environmental perspective.

He said environment and community were part of the company's business model and that these aspects were significant in the Kwale Project.

"So far, 383 families have been relocated from the mining lease and eventually another 100 families will also be moved from the flood zone of a dam we are building," he said.

"We have built schools and health facilities for their new settlements, but our focus is finding ways to maximise their opportunities to benefit from the project.

"It isn't only about providing employment opportunities, but building the community's capability to alleviate poverty and food shortages.

"It won't be enough if all we leave is a memory of how good it was when we were here."

Another Western Australian company Aviva Corporation is developing gold and base metal projects in Kenya's west.

Mr Van Rhyn said that Western Australian engagement with Africa's resources sector wasn't limited to mineral exploration, mining and processing companies, with businesses ranging from law firms to others supplying "yellow goods"—the bulldozers and equipment—building a presence.

He said there were many reasons why Western Australia had become a significant player in Africa's mining industry.

"If you are here and you look to the west, there is Africa, so there is an awareness and interest to start with," he said.

"The time difference from Perth is only six hours, so it is easy to connect with African operations.

"Also, within the Western Australian workforce there is a depth of African experience that employers can draw on.

"As well as Africans who have migrated here, there are many Australians who have worked in Africa and had experience on the ground, often in the resources sector."

Geologist Ian Glacken, a Principal of Perth based mining advisory firm Optiro, is among the Western Australian professionals who are finding Africa increasingly significant in their work.

In recent years, he estimates he has made the 10 hour air journey from Perth to Johannesburg more than 20 times, to access countries as diverse as Botswana, Ghana, Mali, Namibia, The DRC, Tanzania and Kenya. He took these trips to undertake consulting work on projects covering a diverse range of minerals.

He said companies with African projects were able to come to Perth and make use of all the required expertise in one place.

"Western Australia has the largest concentration of mining services companies in the world," he said.

"All the major mining consulting and contracting organisations have a presence here."

Underlining Western Australia's role in African mining, Perth's Africa Down Under Conference and Exhibition is the single largest Africa business forum held annually outside the African continent itself.

This year, the event attracted 2000 delegates, more than 170 exhibitors and a strong media contingent, representing both African and Australian media.

Among those attending were senior government officials, including 11 African resources Ministers, mining executives, investment advisors and industry analysts from across Africa and others from throughout Australia, Asia and beyond.

According to Mr Carstens, as well as giving companies an opportunity to promote their projects in front of investors, to see who is doing what and to exchange ideas, the annual event provides a great opportunity to meet with African government officials.

"The message from African governments is that they have a very clear vision of where they want to go in terms of mineral development," he said.

"They are showing really strong leadership and they want to have a partnership of equals.

"As Botswana's Minister for Trade and Industry, Dorcas Makgato-Malesu told a conference dinner: 'Africa is not emerging, it has emerged.'"

African governments attending the conference were interested in learning from Western Australia's experience in attracting and regulating large scale mining investment.



Nigeria's Mines and Steel Development Minister, Arc Musa Mohammed Sada explained that his country has always regarded itself as Africa's best destination for resources investment.

"We have the resources, we have the markets, both internally and through established trade links and we have the infrastructure," Minister Sada said.

"Recently however, smaller countries around us are opening their economies and competing successfully for mining investment.

"Nigeria wants to remain the best, and we've come to the best to see how we can improve our competitiveness."

It is a message that Trade and Investment Minister, Olusegun Aganga is happy to reinforce.

"Now that we have found what Western Australia has to offer, we want to build our relationship," he said.

Western Australia's Premier, Colin Barnett is keen to encourage this relationship.

Mr Barnett told conference delegates that Western Australia would be happy to share its successes, and the lessons it had learnt, in developing mining laws, managing large investment projects and setting environmental standards.

He said that the Western Australian Government could also provide expertise in areas such as the use of science and technology, and mining education and training. ■

The Perth Mint's golden touch



Situated in Perth, Western Australia, Gold Corporation is one of the world's leading precious metal refining, minting and value adding enterprises, providing high quality precious metal products and services to markets throughout the world.

Gold Corporation is the operator of The Perth Mint, the issuer of Australia's bullion coins and an extensive range of high quality commemorative coins. It offers many options for the ownership of gold, silver and platinum, including storage options in its depository. Still operating in its historic 112-year-old premises, The Perth Mint is also a premier tourist destination in Western Australia.

With increasing numbers of investors looking at gold as a solid investment option in recent years, Western Australia's reputation as the 'Golden State' is on the rise.

How it began

The British established the Perth Mint in Western Australia at the end of the 19th century. The incentive to open a branch of the Royal Mint in the isolated colony was the discovery of vast reserves of gold about 600 kilometres inland near what is now one of the State's key mining towns, Kalgoorlie.

The Mint's doors opened in 1899, a huge boon to the tens of thousands of prospectors who had trekked to the remote diggings from all over the world. They were no longer required to dispatch their golden finds to Melbourne or even further afield to London for assay.

At the Mint refinery, their rich pickings were processed for use in gold sovereigns, the international coins of choice at the height of British Imperial rule. A prodigious output was achieved - no less than 106 million coins were issued during the ensuing three decades.

Many sovereigns made in Perth were shipped overseas as coinage for the Empire, establishing the Mint as one of the first commercial ventures to generate wealth for Western Australia through the export of its natural resources.

A new boom

In 1931, however, Britain abandoned the Gold Standard and the production of sovereigns at The Perth Mint ceased. It would be about 55 years—during which the Mint struck mainly base metal coins—until its presses returned to their original purpose: the manufacture of internationally sought-after gold coins.

It was the 1980s and a new boom in the price of gold was beckoning. The Government of Western Australia, which had acquired ownership of the Mint in 1970, was looking for new ways to make use of its historic asset. With reluctance by some nations to import Krugerrands, it planned to step into the breach with an official gold bullion coin that would help market Australian gold around the world.

The Perth Mint officially entered the international bullion coin market with the launch on 23 April 1987 of the Australian Nugget, a legal tender coin series made from 99.99 per cent pure gold.

"The coins are essentially a gold investment product," a Perth Mint statement issued on their release announced. They were minted in a number of weights, "each a finite fraction of a unit of gold, making them easy to relate to the prevailing world gold price."

Today, this series is known in markets around the world as the Australian Kangaroo.

Each year, the coins feature a new interpretation of the world's most famous marsupial, making them fascinating collectables. However, the overriding reasons behind their success remain the same: reliable, convenient and cost-effective ways for investors to acquire pure gold in the trusted form of Australian legal tender.

Multi-faceted Perth Mint

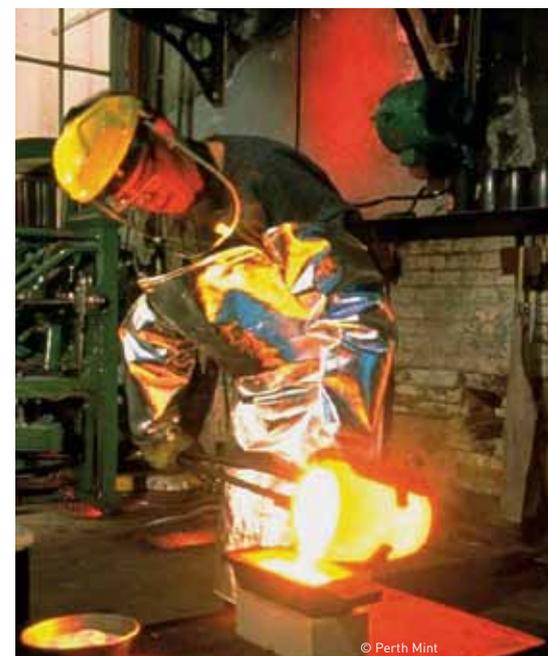
Australia is the world's second largest gold producer. The Perth Mint is the nation's leading precious metals refining and minting group—and thus the chief conduit of Australian value-added gold, silver and platinum to domestic and international markets.

Major divisions within the modern group include coin production; refining and cast bar manufacturing; and depository services.

Coin production is not solely responsible for Australian Kangaroo bullion coins. With the Australian Kookaburra, Australian Koala, Australian Platypus and Australian Lunar series, it offers significant choice for investors across three metals.

The coining division also makes Australian precious metal commemoratives—probably the largest program of its kind anywhere in the world.

The Perth Mint refinery processes the total annual production of gold in Australia.



Gold pouring at the Perth Mint

The quantity of gold refined in 2009-10 made the refinery one of the largest in the world. It shipped gold and silver ingots and bullion in other forms to markets around the world as well as supplying the Mint's own needs.

Accreditation with the London Bullion Market Association and other leading exchanges means its cast bars are internationally tradeable without the need for assay.

The depository is a specialist division for investors who would rather not deal with security, insurance and other issues associated with taking physical possession of precious metals.

It has developed three products to satisfy these requirements: the Perth Mint Depository Program; the Perth Mint Certificate Program; and the Australian Stock Exchange listed Perth Mint 'Gold' quoted product (ASX code: PMGOLD).

The Perth Mint during gold's 'bull run'

Gold prices began rising significantly in 2000 and the metal's 'bull run' is now in its 11th year.

Many analysts believe the current trend will carry on for some time yet. They argue investors will continue to be attracted to the 'safe haven' of gold and other precious metals, as long as uncertainty surrounding the world's economies and monetary systems continues.

This has been hugely beneficial to Australia's gold industry and as one of the key lynchpins in the sector, the Perth Mint is determined to stay at the forefront of international activity.

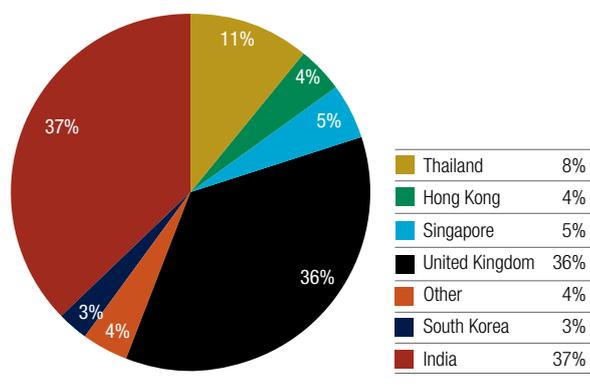
With multi-million dollar capital investments, development of critical distribution in new overseas markets, and many new sales and marketing

initiatives, it has met with significant success in recent years.

As shown in the table, the growth in sales of minted products has seen dramatic increases in the amounts of gold, silver and platinum to which The Perth Mint has added value—particularly since the Global Financial Crisis.

Interestingly, between 86 and 90 per cent of these sales revenues were generated by exports, underlining The Perth Mint's credentials as one of Western Australia's largest exporters.

Given downcast economic predictions in Europe and the US, the future for gold appears bright—and there's little doubt that the 112-year old Perth Mint will continue to retain its golden touch. ■



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.

Financial Year	Gold (Tonnes)	Silver (Tonnes)	Platinum (Kilograms)
2006-07	4.75	69.82	30
2007-08	4.99	140	13
2008-09	13.5	229	32
2009-10	10.13	218.5	9.86
2010-11	13.5*	333.69*	440*

* Estimates only.

A golden state

The value of Western Australia's mineral and petroleum industry reached a record A\$91.6 billion last year. While iron ore remained the State's most valuable resource (accounting for A\$48.5 billion or 53 per cent of all mineral and petroleum sales), strong results were also recorded for the petroleum and gold sectors.

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

Gold was ranked fourth in terms of overall value and accounts for nine per cent of all sales.

The value of the sector increased sharply in 2010 by 35 per cent to be worth a record A\$7.8 billion. This impressive result is 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.

The Australian Bureau of Statistics estimates that gold exports from Western Australia last year amounted to A\$14.25 billion. About 55 per cent or A\$7.83 billion of this was gold produced in Western Australia. The remaining 45 per cent (approximately A\$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.

Western Australia's Perth Mint refinery processes the total annual production of gold in Australia.

The quantity of gold refined in 2009-10 made the refinery one of the largest in the world.

The Perth Mint ships gold and silver ingots and bullion to markets around the world and accreditation with the London Bullion Market Association and other leading exchanges means its cast bars are internationally tradeable without the need for assay.



Premier Colin Barnett with Lynas Corporation Executive Chairman Nick Curtis

Mt Weld rare earths mine officially opens

The richest known rare earths deposit in the world, located in Western Australia, is at the centre of an important development in the State's resources sector—one that will strengthen economic ties with both Malaysia and Japan.

The Mt Weld rare earths deposit is located about 35 kilometres south of Laverton in the State's Goldfields region.

In August, Premier and Minister for State Development Colin Barnett officially opened Lynas Corporation's Mt Weld rare earths mine, a A\$100 million project that the company has been developing over the past 10 years.

The Mt Weld mine is the first significant rare earths mine to open outside of China, which is currently the world's major supplier of rare earths, supplying about 95-97 per cent of the 134,000 tonnes global rare earths market.

As China is now limiting supply of processed rare earths to the rest of the world, the Western Australian mine is a significant development for the State's resources sector.

The mine is expected to be in production for 20 years, with its first phase producing an estimated 33,000 tonnes per annum (tpa) of rare earth concentrates.

The ore will be concentrated at Mt Weld then exported to Lynas Corporation's purpose-built advanced materials processing plant in Kuantan, Malaysia, to be sold globally.

"The Mt Weld project brings an important new capacity to Western Australia's already diverse and globally important resources sector," Mr Barnett said.

"It will give WA a stake in some of the 21st century's most exciting technological developments, and strengthen our economic links with Malaysia."

'Rare earths' is the term used to classify 15 metallic elements which are further divided into 'heavy' and 'light' rare earths.

Rather than existing in the earth's crust as free metals, rare earths are instead found within a mixture of elements that need to be separated for their individual or combined commercial use.

The end products are used in computers, high definition televisions, mobile

phones and audio devices and are also important in advanced electricity generation, including hybrid car technologies.

The opening of Lynas Corporation's Mt Weld mine has particular significance for Japan, which, as one of the world's technology-heavy industries, is one of the biggest consumers of rare earths globally.

With a vision towards becoming a leading rare earths supplier, Lynas Corporation has already signed a long-term supply contract with a major Japanese buyer—an alliance that Executive Chairman Nick Curtis said would provide a stable and long-term source of supply for the Japanese market.

"Lynas Corporation's strategy is to create a reliable, fully integrated source of rare earths from mine through to market, and to become the benchmark for the security of supply and environmental standards in the global rare earths industry," Mr Curtis said.

"The foundation of our strategy is Mt Weld in Western Australia, the richest known deposit of rare earths in the world, together with the Lynas Advanced Materials Plant, a state-of-the-art rare earths processing plant currently under construction near Kuantan in Pahang, Malaysia.

"Rare earths underpin the new materials technology that is required to sustain the needs of today's society.

"There was much public discussion about the forecast imminent shortage of rare earths and the potential impact on industries that rely on rare earths.

"Lynas will provide the first new source of supply outside of China to industries globally."

Lynas intends to produce 11,000tpa from Phase 1 of the Mt Weld project, increasing to 22,000tpa from Phase 2.

Based on 2010 production, Lynas could be supplying about eight per cent of the world market when Phase 1 reaches full capacity in 2012 and about 14 per cent when Phase 2 commences in 2013. ■



Drilling in the Eucla. Photo courtesy of Gunson Resources

NEW DISCOVERIES

Exploration drilling co-funding

Exploration companies both large and small are benefiting from the Western Australian Government's subsidised drilling funding, which is delivering exciting new discoveries and reducing the risks of exploration in the state.

The Co-funded Exploration Drilling Program, coordinated by the Department of Mines and Petroleum (DMP), is the signature program in the five-year A\$80 million Exploration Incentive Scheme funded by the Royalties for Regions program.

Three competitive rounds of applications, where co-funding of over A\$12 million has been offered to support 150 projects, have already produced a number of projects that can be considered both commercially and scientifically successful.

Information and core from the drilling projects is submitted to DMP for public release via the WAMEX exploration database, as part of the conditions of the grants.

Projects that have previously obtained funding and that have been successful include:

- Beadell's Handpump gold project
- Encounter Resources' Yeneena copper project
- Alchemy Resources' Magnus gold project
- the Saturns Deep drilling at Mount Magnet gold mine
- Beadell's gold find in the Tropicana Belt

- Atlas Iron's drilling at the Hickman project
- Cazaly Resources' iron ore drilling in the Earaheedy Basin

The successful applicants from Round 3 (2011/12 drilling projects) were announced in June. Co-funding offers were made to 53 projects, nine of which were prospectors' drilling projects.

The major commodities being sought include gold, copper, nickel and iron with a smaller number of projects exploring for platinum-group elements, zinc lead, uranium and manganese.

One oil and gas project and one geothermal project were also among the successful applications, which share co-funding grants totalling A\$4.5 million.

In a break from previous financial year funding offers, DMP is now offering two rounds of applications and project grants per year—one covering a calendar year and one covering a financial year.

Each drilling round is "stand-alone" and projects must be completed in the 12 month period relating to the application. Grants will not be able to be 'rolled over' to the next application period.

The Department is offering more than A\$6 million funding for drilling projects to be undertaken in the next calendar year, 2012. This will be of particular interest to explorers whose fieldwork is undertaken during the winter months.

Applications are open to explorers in all commodities in Western Australia, with co-funding of up to 50 per cent of direct drilling costs capped at specific amounts. In the general category, the cap is

A\$200,000 for a single deep-hole program or A\$150,000 for a multi-hole program. In the prospectors' category, the cap is A\$30,000. Prospectors may apply within the general category, but the prospectors' category is only open to bona fide prospectors.

The program is highly competitive and successful applicants are determined in an evaluation of criteria, which are required to be addressed in the online application system.

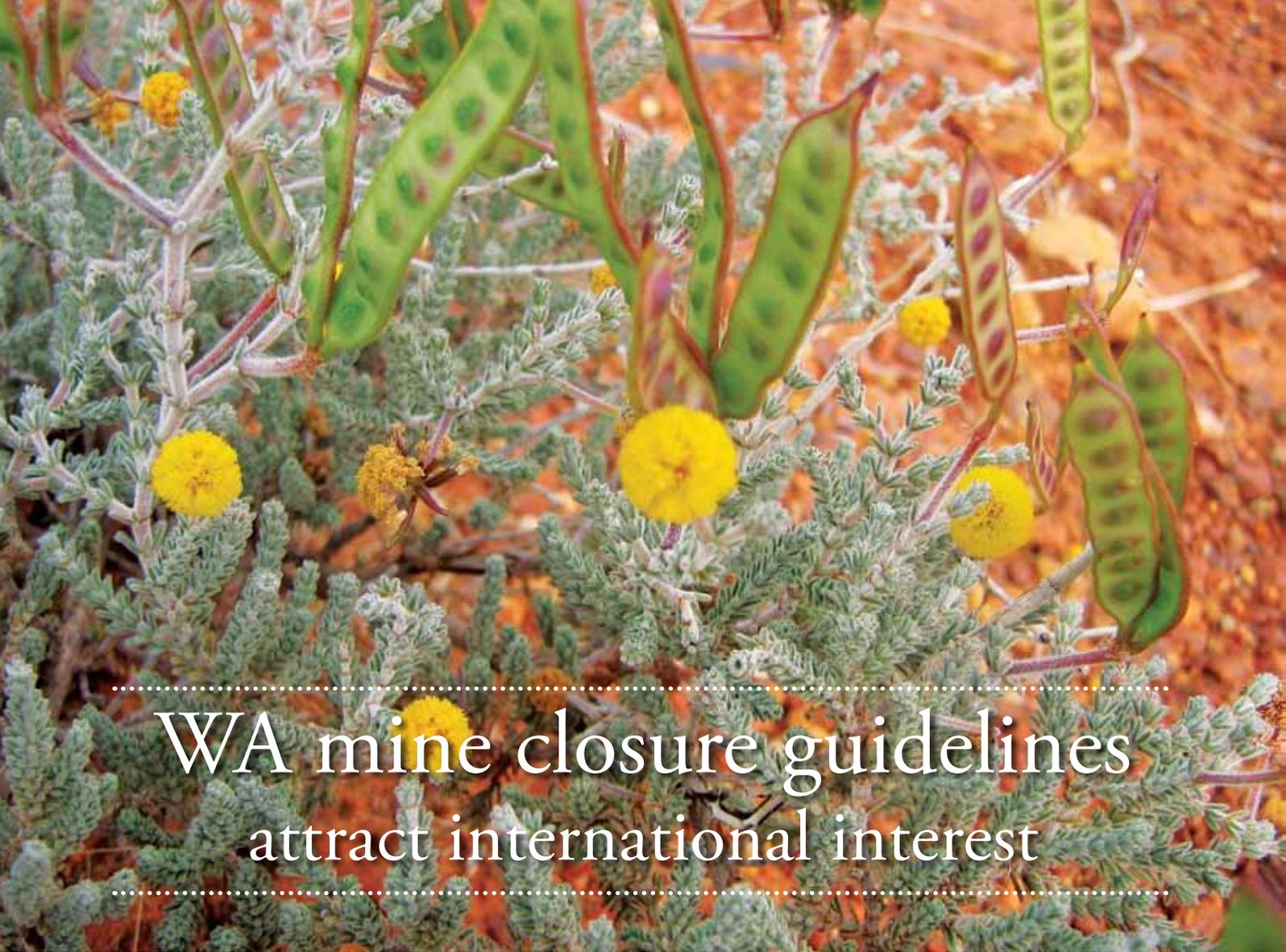
An independent panel of exploration geologists, who have significant industry experience in Western Australia, undertakes the evaluation.

Panel members are members of professional geoscience bodies and are required to abide by confidentiality and conflict-of-interest guidelines, to ensure the highest level of integrity in the handling and evaluation of applications.

The round five grants will be open for application from February to March 2012.

More detailed explanations of all the conditions governing the Exploration Incentive Scheme, Co-funded Drilling Program can be found at www.dmp.wa.gov.au/EISdrilling

For more information on all the programs and data releases from the Exploration Incentive Scheme, visit www.dmp.wa.gov.au/eis or contact the Exploration Incentive Scheme coordinator, Margaret Ellis, on +61 8 9222 3509 or email margaret.ellis@dmp.wa.gov.au ■



WA mine closure guidelines attract international interest

The Department of Mines and Petroleum's recently released Mine Closure Guidelines are gaining international interest.

Testament to this is the invitation that the Department's Senior Environment Advisor Xuan Nguyen recently received to speak at the 2011 Mine Closure Conference in Alberta, Canada.

The International Conference on Mine Closure, which attracts practitioners from around the world, is held every two years in a different country.

Ms Nguyen said her presentation would showcase the Western Australian Mine Closure Guidelines and seek feedback from the international audience.

"On the basis of feedback already received from interstate conferences on mine closure, the WA guidelines have received strong support and favourable comments from mine closure practitioners from around the country as a best practice framework," she said.

As part of her presentation, Ms Nguyen will discuss issues and lessons learned in transferring high level mine closure principles and approaches into the Western Australian regulatory framework.

The 'Guidelines for Preparing Mine Closure Plans' aim to improve mine closure management practices and outcomes through an integrated approach.

The guidelines focus on the application of national and international principles to mine closure planning and implementation. These include stakeholder consultation, risk-based approach, development of completion criteria and financial provision.

Ms Nguyen said planning for mine closure should commence at the feasibility phase of the project, with closure considerations integrated into operational planning and engineering processes, from exploration through to post closure.

The closure planning process is an evolutionary process through all stages of mining, with implementation detail, certainty and confidence increasing with time.

"While the national strategic framework on mine closure focuses on a process that gives certainty and confidence to the mine closure outcomes, it does not provide a detailed set of guidelines for mine closure—the WA guidelines are designed to bridge that gap," Ms Nguyen said.

She said experience in the State and in Australia indicated that the integration of mine rehabilitation works into day-to-day mine operations would reduce overall closure costs to industry.

“Without proper planning, the costs of mine closures have been estimated to be four to ten times those for planned closures, in order to achieve the same environmental outcome,” Ms Nguyen said.

In 2010, the *Western Australian Mining Act 1978* was amended to address issues identified with mine closure planning and made the following requirements mandatory:

- A mine closure plan must be submitted to DMP for approval as part of the mining proposal application
- The approved mine closure plan must then be reviewed and submitted for approval by DMP every three years after its approval, or at such other time as required in writing by DMP
- All mine closure plans must be prepared in accordance with approved guidelines

These requirements apply to new mining projects from 1 July 2011, with existing mining operations receiving up to three years to comply.

Specific guidelines for mine closure plans for the Western Australian mining industry were also developed to support the Act amendments.

Following extensive consultation with stakeholders, DMP and the State Environmental Protection Authority (EPA) jointly prepared the *Guidelines for Preparing Mine Closure Plans*.

“From a Government viewpoint, integrated mine closure plans make good business sense for DMP to minimise the State’s liability from unplanned closure and limit future abandoned mines,” Ms Nguyen said.

Changes to the Act provide additional powers for DMP to:

- Reject a mining proposal application if the accompanying mine closure plan does not meet the stated requirements in the guidelines
- Ensure that mine closure plans are regularly reviewed by companies and approved by DMP

- Take enforcement action for non-compliance with approved mine closure plans.

“Based on lessons learnt in the past five years in WA and similar experience from elsewhere, the specific provisions in the WA legislative framework for mine closure planning should go a long way to advance the principles of integrated mine closure planning,” Ms Nguyen said.

“These provisions, together with an improved system for mining securities will reduce the State’s liabilities associated with future abandoned mines in Western Australia.”

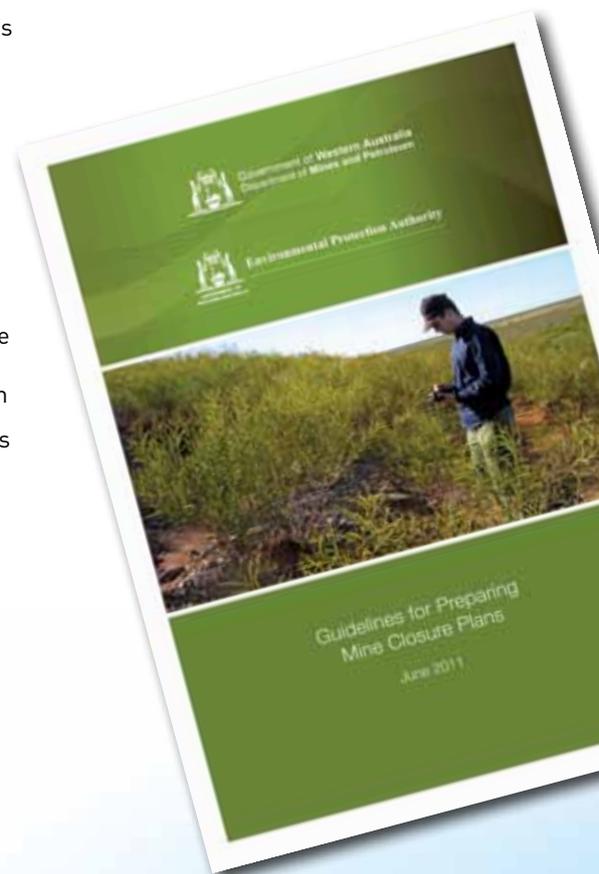
The six key aspects in the mine closure process and their objectives are:

- Stakeholder involvement – identification and consideration of all stakeholder interests (i.e. company, community and government)
- Planning – an orderly, cost effective and timely process through an integrated and risk based approach
- Financial provision – cost estimates and adequate inclusion of the cost of closure in company accounts
- Implementation – clear accountability and adequate resources
- Standards – establishment of acceptable and achievable outcomes, measurable completion criteria and an agreed set of indicators
- Relinquishment – acceptance by a Responsible Authority when the company has met agreed completion criteria

In conjunction with the mine closure plan requirements, DMP is currently conducting a major review of the State’s mining securities system.

The review aims to ensure sufficient funds are available for government to rehabilitate mine sites, in the event of an operator not fulfilling their mine closure obligations.

For more information or to download the guidelines, go to www.dmp.wa.gov.au/mineclosure ■



Exploration on the rise



Exploration expenditure in Western Australia is increasing

Mineral exploration in Western Australia this year is on the rise, according to the Australian Bureau of Statistics.

The amount spent on exploration in the State for the March quarter was more than A\$360 million, an increase of A\$100 million for the same period last year.

Gold, iron ore and uranium accounted for more than A\$250 million of exploration expenditure in Western Australia.

In total, the State accounted for more than half of all national expenditure on exploration.

The level of exploration in WA looks set to grow further, as the State Government continues to improve Western Australia's mining approvals processes.

These improvements have been reflected in an increasing number of online submissions of mining and exploration applications.

Figures from the Department of Mines and Petroleum (DMP) show the number of companies using online applications for mineral exploration during the last 12 months has increased from 16 per cent to 54 per cent.

Mines and Petroleum Minister, Norman Moore said online lodgement was a key component of the State Government's approvals reform.

"More than 50 per cent of mineral exploration applications (Programmes of Work) were submitted online this quarter, which shows industry is embracing this technology," Mr Moore said.

"The response is a credit to the department's continued work to expand the range of online services available for the mining and petroleum industry."

Figures released late last year showed the assessment time for online applications was up to one week faster than paper applications.

The Minister said industry had also been provided with regular feedback, which would help to improve the service delivery and efficiency of the department's online systems.

"The shift to online lodgement has corresponded with a record level of interest in WA's resources industry, during that time the department has also received a record number of applications for exploration and mining proposals," he said.

In the 2010-11 financial year, the department received 2,479 exploration Programmes of Work (PoWs) and 356 mining proposals, an overall increase of 18 per cent compared to the 2009-10 financial year.

The Department also finalised 1,317 exploration licences in the past six months, compared to 1,063 during the same period last financial year.

Mr Moore said the number of exploration applications had steadily increased in the last 18 months, driven by high levels of interest in gold and uranium and showed no signs of slowing down.

Quarterly approval performance reports for key mining and petroleum approval processes are published on the department's website - www.dmp.wa.gov.au ■



2011 Golden Gecko Award winners (L-R) WorleyParsons' Peter Mellor and Port Hedland Port Authority's Craig Wilson with Minister Moore

20 years celebrating environmental credentials



World-first technology in sedimentation scanning has taken out the Golden Gecko Award for Environmental Excellence in the twentieth year of the awards.

WorleyParsons and Port Hedland Port Authority were awarded the prestigious statue by Mines and Petroleum Minister, Norman Moore at a recent ceremony in Perth.

The technology allows for real time environmental monitoring of the impacts of dredging. Results to date have provided a new understanding of the process of sedimentation.

Mr Moore congratulated WorleyParsons and Port Hedland Port Authority for their leadership in developing the new technology.

The technology not only provides real time data, but also reduces field exposure to staff and the environment.

With the aim of having no indirect impacts on mangroves as a result of dredging activities associated with a new port facility in Port Hedland, a collaborative effort resulted in the

development of world-first technology in sedimentation scanning.

Previous technology allowed either a reactive approach to measurements of sedimentation or the use of turbidity as a proxy.

The new technology allows for the proactive management of mangroves.

Port Hedland Port Authority has established the first acute and chronic sedimentation stressors to measure dredging-related impacts.

These trigger values have been accepted by the Minister for Environment, and the sedimentation scanner is designed to send data to WorleyParsons four times per day.

If the data shows any significant changes, there is a process for an immediate mitigation response with the dredging, including stopping or relocating it.

Field exposure to staff and the environment is also reduced as the innovation automatically transmits the data back to the office. ■

Merit Certificates

Certificates of Merit were awarded to WA Gas Networks (supported by KD1) and Compass Groups (Australia).

WA Gas Networks and KD1 executed the laying of a new gas pipeline with a high level of environmental conservation and management, demonstrated through avoidance and minimisation of environmental impacts.

Each part of the route of the pipeline was assessed on the ground, resulting in 40 per cent less clearing and no loss of Black Cockatoo habitat trees.

Compass Groups' unique approach to remote site catering by utilising central production facilities in Perth was also a worthy certificate winner.

Compass Group uses facilities in Perth to minimise waste through composting, providing feed to livestock and minimising energy and greenhouse emissions by preparing food in bulk.

The merit winners demonstrated how commitment to the environment and sustainability could produce positive benefits for companies.

"All of this year's submissions have shown that the resources industry is committed to protecting the environment," Minister Moore said.

"The twentieth year exemplifies the sector's commitment to making Western Australia the place for responsible resource development."



2011 Golden Gecko Merit Certificate recipient, Compass Groups (Australia)



2011 Golden Gecko Merit Certificate recipient, WA Gas Networks (supported by KD1)



Federal Resources and Energy Minister Martin Ferguson and Mines and Petroleum Minister Norman Moore at the Australian Resources Research Centre in Perth

World leading research in carbon capture and storage

Western Australia is at the forefront of international research into carbon capture and storage (CCS) opportunities, through work carried out in the south west of the State, with the support of the Department of Mines and Petroleum.

The Collie South West CO₂ Geosequestration Hub, known as the Collie Hub Project, was the first project in Australia to secure funding from the Federal CCS Flagships Program.

In June, the Collie Hub Project was awarded A\$52 million from the Commonwealth Government to continue its research into the first onshore CCS plant.

The project is part of a global initiative to have 20 commercial-scale projects active by 2020 and will play a vital role in helping Australia meet its target of a 60 per cent cut in green house gas emissions (on 2000 levels) by 2050.

The Collie Hub Project is investigating the capture of industrially generated carbon dioxide emissions and the ground-breaking concept of geosequestration of liquefied CO₂.

The liquefied carbon dioxide will be pumped deep underground into a saline body of sandstone for long-term storage.

The Collie Hub is an alliance lead by the Department of Mines and Petroleum (DMP) together with foundation partners and leading south west organisations Alcoa of Australia, BHP Billiton Worsley Alumina, Griffin Energy, Perdaman Chemicals and Fertilisers, Verve Energy and Wesfarmers Premier Coal.

The partners operate in the area stretching from Kwinana to Collie, which forms one of the nation's most important industrial regions, generating billions of dollars in domestic and export revenue and over 10,000 jobs.

The focus of the Collie Hub alliance is to support the research, demonstration

and development of low CO₂ emission technologies through CCS, to boost the sustainability of the major industries who underpin the south west region's economy.

However, more development work is required into the large-scale capture of CO₂ from south west industries.

The Lesueur formation is a body of sandstone lying two to three kilometres under parts of the South West region, which has been identified as a possible site for long term on shore CO₂ storage.

The Collie Hub has been concentrating its research and development on this formation, in an area north of the Kemerton Industrial Park, near Bunbury.

The formation's suitability for CO₂ geosequestration will be determined through a detailed four-year data collection and study program.

The program started in early 2011 and initially involved a seismic acquisition program with the drilling of data.

DMP's Coordinator of Carbon Strategy, Dominique Van Gent, has been working on CO₂ capture and storage for several years and has responsibility for coordinating the Collie Hub Project.

The Minister for Mines, Norman Moore, recently nominated Mr Van Gent to sit on the Commonwealth Government's National Carbon Capture and Storage Council, which oversees the National Low Emissions Coal Strategy.

"The Lesueur sandstone formation looks promising as a geosequestration site for industrially generated carbon," Mr Van Gent said.

"The Collie Hub Project partners are committed to additional data acquisition and feasibility studies to progress the project."

Some of the biggest sequestration projects to date worldwide, namely Sleipner, In Salah, and the upcoming Gorgon natural gas project in northwest Western Australia, all use CO₂ streams from gas processing.

"The Collie Hub is working closely with the Western Australian Energy Research Alliance based at the Australian Resources Research Centre in Perth—drawing on the expertise of the CSIRO in WA, the University of Western Australia and Curtin University," Mr Van Gent said.

"This will provide us with one of the leading CO₂ testing facilities in the world.

"At this stage of the project, dynamic simulation modelling provides an understanding of how injected CO₂ will behave after it is pumped underground and how uncertainty in various parameters affects storage performance such as injectivity, capacity and containment."

The Collie Hub is working from the base case of a 40-year injection program of a pure stream of liquefied CO₂, pumped through six injector wells.

The modelling suggests that injection rates of 6 million metric ton per year (MMt/y) for a six well injection scenario can be sustained for 40 years and will result in the storage of 200 to 260 million tonnes of CO₂.

"At this stage, we are anticipating the lifetime of a commercial capture and storage facility to have the same longevity as a newly constructed power station," Mr Van Gent said.

"This is important for confidence of future decision making and selection of generating and processing technologies.

"Our current modelling shows that at the end of 1250 years shut-in, the CO₂ remains within the structure, with the majority of CO₂ trapped in the sandstone formation."

Geological uncertainties remain and the Collie Hub is about to launch into the next phase of investigation into the Lesueur Formation.

DMP recently hosted a workshop to plan for the drilling of the first stratigraphic well, to collect data for the geosequestration project.

The 3000 metre deep well represents a significant investment in the Collie Hub project.

It was essential that experts from various organisations, including the Cooperative Research Centre for Greenhouse Gas Technologies, worked on the planning to ensure the best possible collection and evaluation of the information gathered.

"The participants reviewed the historical work program and the proposed drilling, coring and logging program for the hole as well as post-hole analyses of samples," Mr Van Gent said.

"Coupled with the results of a recent seismic survey, the data well will progress the understanding of the geology of the area and its suitability for CO₂ storage.

"The planned well, to be drilled later this year, represents a significant investment by the State and Federal Government to progress the Collie Hub Project." ■

Community consultation

The Collie Hub Project plans to ensure open and accurate communication with the local community through the new Lesueur Community Consultative Committee (LCCC) currently being established by the Western Australian Government.

The LCCC will report to the Minister for Mines and Petroleum, Norman Moore, and will be chaired by Simon Holthouse, who previously led the State Planning Commission and is a long-time Harvey resident.

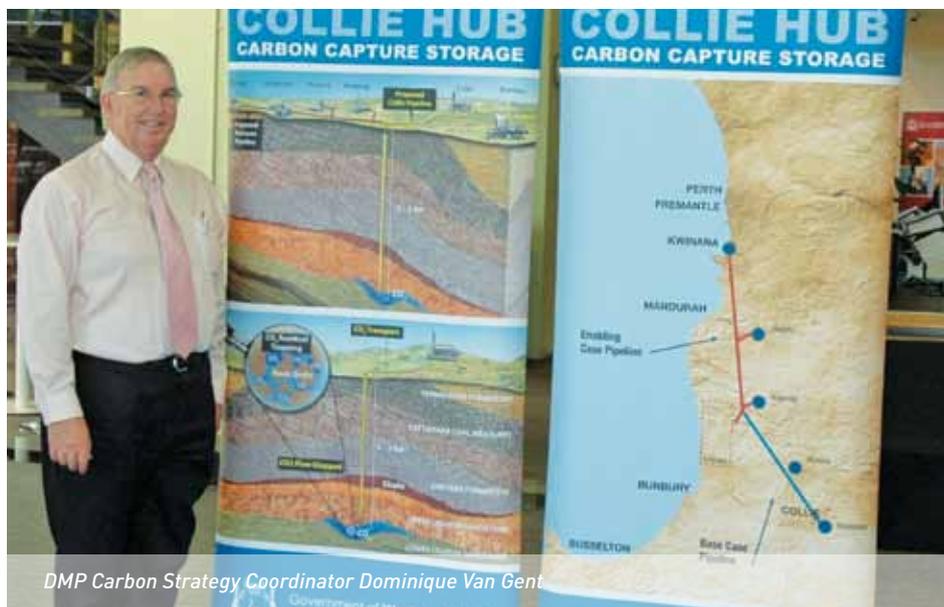
Remaining committee members have been sought from Local Government nominations and through advertising in local newspapers.

"It is envisaged that throughout the development of this project the local community will play a vital role in each phase of the Collie Hub," Department of Mines and Petroleum Coordinator of Carbon Strategy, Dominique Van Gent said.

"We hope that the committee will be involved in the design of the project assessment, identification of issues to be addressed, monitoring and review of the trials, along with project planning and development.

"This will guarantee the project has a thorough and transparent examination by the community before any commercial operations are considered."

Visit www.dmp.wa.gov.au/colliehub for more information on the project.





Mount Amy in Western Australia's Kimberley region

Geoscience surveys build Kimberley big picture

A three-year A\$3 million program of geochemical and geophysical surveys in the Kimberley Basin will help create a 'big picture' of the geological framework of the Kimberley.

The Western Australian Government has authorised the program, which will be carried out by the Department of Mines and Petroleum's Geological Survey of Western Australia (GSWA), as part of the Kimberley Science and Conservation Strategy.

These 'big-picture' baseline geoscience surveys will develop a greater understanding of the geological framework that created landscapes and soils of the Kimberley.

The survey program was developed in consultation with the Departments of Environment and Conservation, State Development and the Premier and Cabinet. GSWA will work with traditional owners through their representative bodies to obtain cultural heritage clearances.

The surveys being undertaken are aimed at revealing crustal structures and baseline geochemical information. This information will help other government agencies that are undertaking various programs under the strategy, including in conservation, biology, geography and geomorphology, hydrology, agriculture, anthropology and tourism.

Sound knowledge of the geological structure and composition of the Kimberley region will contribute to understanding the geological framework of the State, and of Australia as a whole.

The programs are aimed at understanding both the Kimberley region's role in the story of the Australian continental plate, and the 250 million year evolution of the Kimberley landscape—including the sandstone cliffs and islands of the Kimberley coastline, the sandstone karst beehives of Purnululu, and the exhumed 350 million year old Devonian barrier reef of the Napier Range.

The Kimberley region has a long and complex geological history dating back at least 1910 million years.

There is evidence that the formation of the Earth's crust below the Kimberley Basin probably took place 2700 million years ago.

A collision involving a continent that included the Kimberley Craton with the rest of northern Australia took place 1820 million years ago.

Knowledge of the structure of the deeper crust, and of the underlying sub continental mantle is important to understanding the plate tectonic setting and geological development of the region.

Understanding the crust underlying the Kimberley Basin, together with that of the adjacent King Leopold and Halls Creek Orogens, is the key to understanding the geological development of this part of northern Australia and its role in the tectonic development of the "Proterozoic Australia" protocontinent.

GSWA collects and publishes geoscientific information together with Geoscience Australia and has published geological mapping covering the Kimberley region.

Little is known about the Kimberley Basin's depositional history, volcanology, age, isotopic composition and geochemistry of the rocks forming the basin, or of the soils that blanket them.

The geochemical and geophysical surveys will:

- Map the distribution of major and trace elements in the soils overlying the Kimberley Basin to understand the distribution of the underlying rocks and the interaction of soil with flora and fauna
- Identify the processes that have created the landforms of the Kimberley region over the past 250 million years
- Determine the nature, controlling structures and character of basement for the Paleoproterozoic Kimberley Basin
- Link surface units and structures with their deep geophysical character, to better understand the geological evolution of the region
- Provide information about the processes driving the Proterozoic assembly of the Kimberley and North Australian Cratons, along with subsequent processes of repeated crustal reworking

All data will be presented in formats that can be viewed and interpreted by geographical information system and geophysical processing software.

Data and publications will be available free of charge (as shape files, PDF files, etc) for publishing or download from the DMP website: www.dmp.wa.gov.au/GSWA

The Kimberley Science and Conservation Strategy is available to view at www.dec.wa.gov.au/content/view/6558/2183/ ■

Conserving the Kimberley

The Western Australian Government has released a bold plan to conserve the Kimberley region's natural and cultural values.

The Kimberley Science and Conservation Strategy is funded with an A\$63 million budget over five years, demonstrating a commitment to recognise and protect one of the world's last great wilderness areas.

The strategy recognises that the Kimberley has the potential to become one of the world's greatest wilderness ecotourism destinations—a place where extraordinary natural and cultural values can be experienced.

Opportunities for Aboriginal involvement and employment in land management, and the promotion of nature and culture-based tourism are also set out in the strategy.

Awareness of the Kimberley's economic, cultural and biological values is rapidly increasing across Australia and around the world.

It is a region containing unique terrestrial and marine ecosystems, set in wild, rugged and remote landscapes, and central to the Kimberley's past, present and future is a rich and living Aboriginal culture.

Aboriginal people retain strong links to and responsibility for country, and they have a key role in protecting the Kimberley's cultural and natural heritage.

The Kimberley landscape is reflected in art, literature, poetry, music, film and in ancient and continuing Aboriginal songlines and culture.

The Kimberley is at a critical point, with increasing recognition of its development potential, including development of rich offshore petroleum resources, the expansion of the Ord Irrigation Scheme, an expanding international profile and increasing visitor numbers as well as a growing population.

A strategy that recognises this growth, and sets a path to conserve the region's natural and cultural values, is vital.

The State Government has met this challenge by developing a comprehensive strategy with ongoing funding for key initiatives, including marine park management and landscape-scale fire, feral animal and weed control.

This is a major investment in conserving the region's unique values and providing new opportunities for Aboriginal employment and for nature-based tourism.

This funding is also expected to create significant opportunities to leverage cash and in-kind funding from a wide array of sources, including the Commonwealth Government and major Kimberley resource development ventures.

The strategy is founded on the major themes raised through an extensive community consultation process, which was chaired and reported on by an independent facilitator, the Hon Chris Ellison.

The centrepiece of the Government's Kimberley strategy is the creation of the Kimberley Wilderness Parks, one of the most significant environmental initiatives in Western Australia's history.

The Kimberley Wilderness Parks will include the State's largest interconnected system of marine and terrestrial parks covering more than 3.5 million hectares.

Partnerships with local land managers, including traditional owners, pastoralists and conservation groups, are also central to this initiative.

These partnerships will deliver improved on-ground management of the key threats to the region's biodiversity across different land tenures, including parks, Aboriginal lands and pastoral leases.

The State Government has committed A\$21.5 million to these partnerships to 2015.

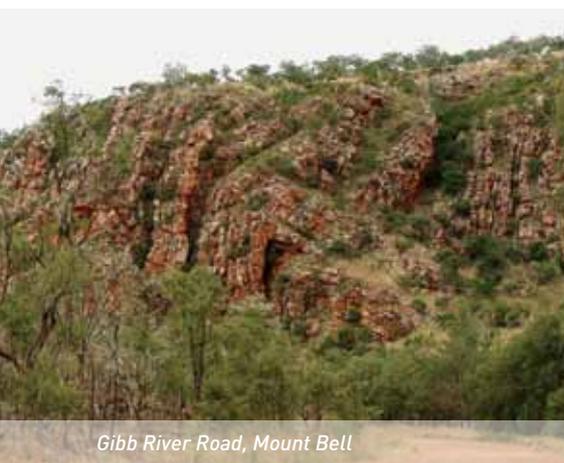
Under the Kimberley Science and Conservation Strategy, the State Government will invest an initial A\$9.6 million in nature-based tourism in the region.

The Western Australian Government is determined to see positive changes on the ground and has already begun implementing many of the new initiatives set out in the strategy. This includes working to establish new marine parks, creating Prince Regent National Park from the former nature reserve, exploring partnerships with traditional owners and other land managers, delivering the landscape conservation initiative and planning for new visitor facilities.

The strategy is a bold commitment by the State Government to recognise and conserve one of the world's last great wilderness areas.

It provides a vision for conservation in the region, which involves roles for many partners in the community, industry and in government and non-government organisations.

The strategy can be downloaded at www.dec.wa.gov.au ■



Gibb River Road, Mount Bell



View of the Rocklea Dome area in the Hamersley Basin of Western Australia

Mapping minerals transforming exploration

Western Australia is the focus for 3D mapping using new generation 'space age' technologies that will transform mineral exploration in the state.

The Western Australian Centre of Excellence in Three Dimensional Mineral Mapping (C3DMM) is working on generating 3D mineral maps of Western Australia. This is being done to understand the State's abundance of rock forming minerals and their composition, which is fundamental to the successful exploration and mining of the mineral deposits.

C3DMM, led by the CSIRO's Minerals Down Under Flagship at the Australian Resources Research Centre, was granted funds to develop underpinning methods and software.

The software is able to crosscheck and transform raw hyperspectral sensor signals into seamless, accurate maps of specific minerals.

Dr Thomas Cudahy, C3DMM Director, said raw data was being sourced

from an emerging array of drill core logging systems, including the CSIRO's HyLogger™; airborne systems such as the Australian HyMap; satellite systems, including ASTER; and, from 2014 onwards, hyperspectral-imaging sensors such as the German EnMap.

"We are developing 'hyperspectral sensing'—a non-contact and non-destructive technology that measures electromagnetic radiation across hundreds of wavelength channels and creates mineral maps," Dr Cudahy said.

"Hyperspectral systems are being used in the search for evidence of life on Mars, targeting specific minerals associated with water, such as clays."

While laboratory hyperspectral instruments have been available for decades, operational 'geoscience-tuned' satellite, airborne, and field and drill core logging systems are only now becoming available, enabling deposit to global-scale maps of mineralogy to be generated.

Dr Cudahy said maps of mineralogy bring many benefits to the resources industry.

"They reveal where remnants of fresh rocks persist to the surface through cover, where transported materials cover bedrock geology and where you are within an in situ weathered profile," he said.

"C3DMM's Rocklea Dome public case history, for example, demonstrates how kaolin crystallinity can be used to more accurately map the precise extent of a palaeo-channel system and its iron ore resource, compared with the published geological mapping, which did not use maps of mineralogy."



A current focus for C3DMM is the generation and public web-release of a suite of ASTER geoscience maps of Western Australia, which are being developed in collaboration with the Geological Survey of Western Australia (GSWA), with funding from the State's Exploration Incentive Scheme.

The maps are sourced from 12,000 images provided by NASA and other international agencies.

C3DMM is working towards establishing national standards for mineral information products with Australian, State and Territory geoscience surveys.

The centre is also working to provide public demonstrations of the mineral exploration value of the data for different commodities.

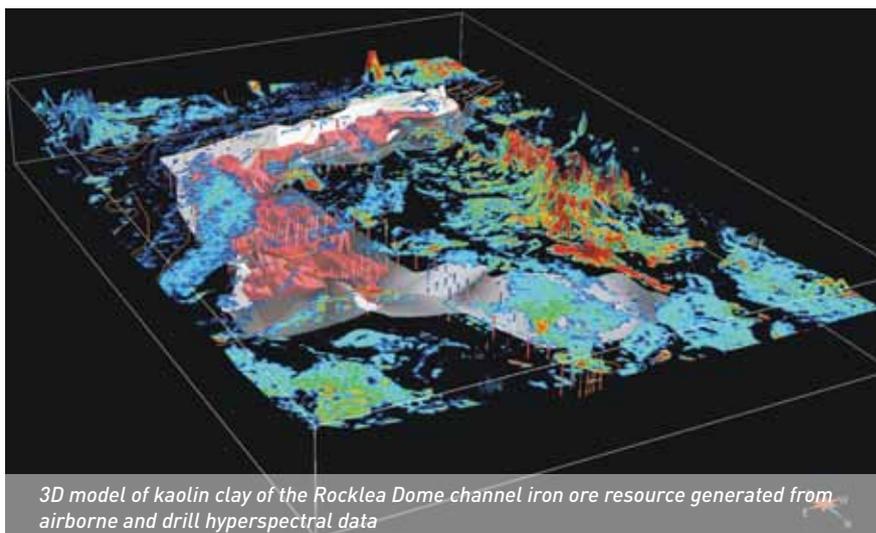
The ASTER Geoscience map of Western Australia is scheduled for release shortly, while the Australian ASTER geoscience map will be released at the 34th International Geological Congress in Brisbane next August.

Dr Cudahy said that C3DMM was aiming to release a public 'Google-zoom' map by the end of the year.

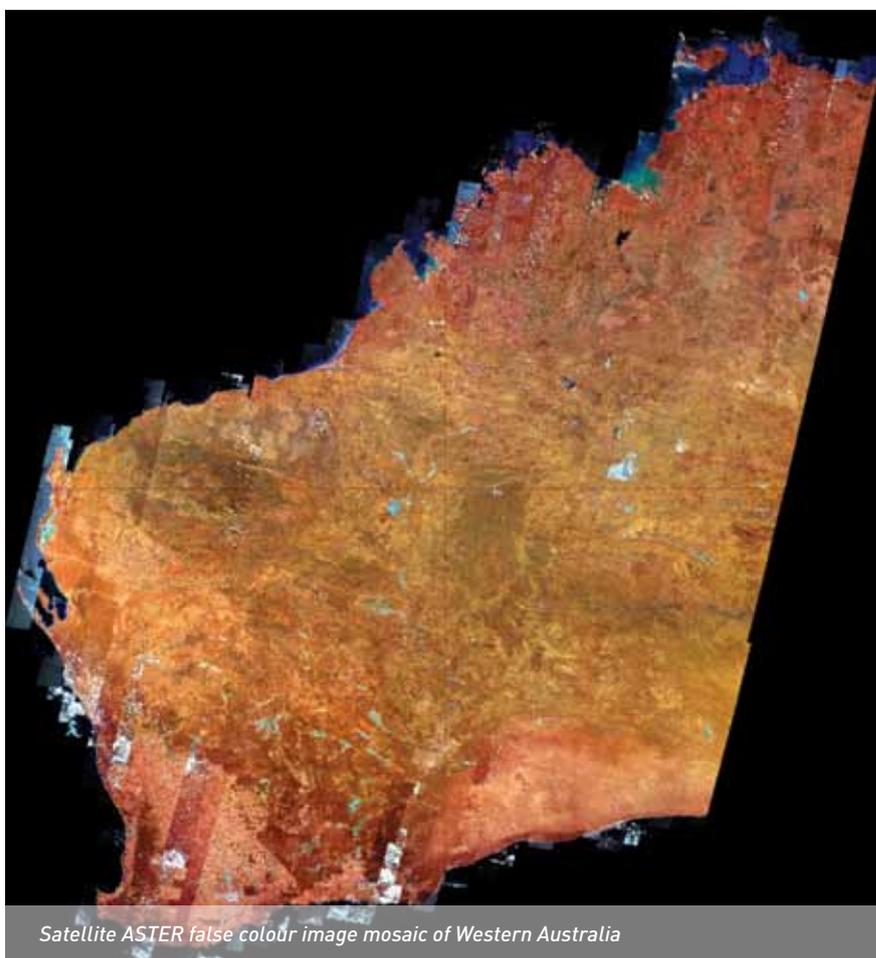
"C3DMM is planning to release a public Google-zoom demonstration that progressively reveals a mineral system starting from Western Australia using ASTER, down to the prospect-scale using airborne hyperspectral, draped over topography 2.5D, and down to the deposit-scale, seamlessly extending into the subsurface using airborne and drill core HyLogging™ hyperspectral data," he said.

"This demonstration will be compared with other geoscience data using ARRC's iVEC computer facility."

For more information, visit C3DMM's website: <http://c3dmm.csiro.au/> ■



3D model of kaolin clay of the Rocklea Dome channel iron ore resource generated from airborne and drill hyperspectral data



Satellite ASTER false colour image mosaic of Western Australia

MERIWA celebrates 30 years of research



MERIWA



Left to right: Zoja Vukmanovic; Kerryn Chia; Norman Moore, Minister for Mines and Petroleum; Amin Nabipour; Simon Assmann; Associate Professor Don Ibana, WASM (accepting David Grimsey's certificate on his behalf); Professor Martin Fey, UWA (accepting Talitha Santini's certificate) and Professor Odwyn Jones of MERIWA's Scholarship Committee

The Minerals and Energy Research Institute of Western Australia (MERIWA) recently celebrated the 30th anniversary of its inaugural combined Board and Advisory Council meeting.

Over that 30-year period, MERIWA and its predecessor the Western Australian Mining and Petroleum Research Institute, has published 289 research reports on topics significant to resources industries.

"Our continued relevance to the industry is underlined by the current suite of 18 projects under management," MERIWA Executive Officer, Ross Marshall said.

"These 18 projects, which commenced between 2006 and 2011, are sponsored by more than 80 separate companies contributing A\$7.5 million with MERIWA providing an additional A\$2.05 million."

The current projects cover a range of diverse topics from novel exploration techniques aimed at improving exploration success, through mine safety, to the rehabilitation of mine sites.

Since 1981, MERIWA-managed research funding has cumulatively exceeded A\$50 million, of which A\$30 million has come from industry sponsors and A\$20 million from the Western Australian Government.

MERIWA's success measured by dollar value has increased from zero in 1980 to an average of A\$3 million per year for research commenced over 2008/09 and 2009/10.

Over the same period, the Western Australian mineral and petroleum industry has burgeoned from a value of A\$2.26 billion in 1981 to A\$91.6 billion in 2010.

The research body focuses on minerals and hydrocarbon exploration, mineral processing, mining and engineering, and rehabilitation and environmental areas.

"Within these areas are projects of relevance to the long-term development of the minerals industry which enhance both the commercial viability and the intellectual and human resource base," Mr Marshall said.

Mr Marshall said funding of some suites of research projects to date has led to or sustained state-based specialist centres that are building the capacity for research excellence.

One example from the 1990s was the work of Professor David Groves, and his colleagues at the University of Western Australia (UWA), on gold deposits in the state.

This work involved 15 MERIWA projects, some 23 researchers, and over 38 industry sponsors at the Centre for Global Metallogeny based at UWA.

Similarly, MERIWA-assisted projects have helped to establish the Australian Centre for Geomechanics and the Centre for Exploration Targeting at UWA, the Centre for High Definition Geophysics on the Curtin University campus, and the WA Centre of Excellence for 3D Mineral Mapping at the CSIRO.

With bipartisan support over the past 30 years, MERIWA is confident of a sustained future.

Mr Marshall said under the *Minerals and Energy Research Act 1987* the function of the Institute is to encourage the development of the minerals and energy industries within Western Australia by fostering and promoting all aspects of minerals and energy research.

"The desired outcome is that the level of research undertaken will achieve the level of technological advancement required to meet the future challenges of these industries, ensuring their competitiveness and continued growth," he said. ■

World-class testing facility in Kalgoorlie

Two MERIWA research projects are addressing some of the challenges faced as miners follow ore bodies ever deeper, both in underground and open pit operations.

The projects have received funding of more than A\$710,000 to help protect massive industry investments and, importantly, the safety of workers.

This has been made possible with the development of a unique dynamic test facility able to simulate the performance of rock reinforcement and surface support systems in mine conditions.

The test facility has been developed over eight years in two sequential projects led by Professor Ernesto Villaescusa of the Western Australian School of Mines (WASM).

The WASM Dynamic Test Facility enables suppliers and users of a wide range of ground support technology, such as shotcrete and steel mesh, to test products and evaluate their use in specific conditions.

The key to the facility is the development by Professor Villaescusa of a loading concept, involving momentum transfer that simulates the stresses caused by mining activity and violent rock failures.

MERIWA Project M349 (2002-2005) included the design, construction and operation of the WASM Dynamic Test facility. This included related instrumentation and monitoring systems, and developing software to analyse test data and develop a preliminary database of test results.

Dr Alan Thompson and PhD student John Player carried out much of this work.

MERIWA Project M349A (2006-2010) included further modifications to the test facilities, software enhancement and 80 more tests.

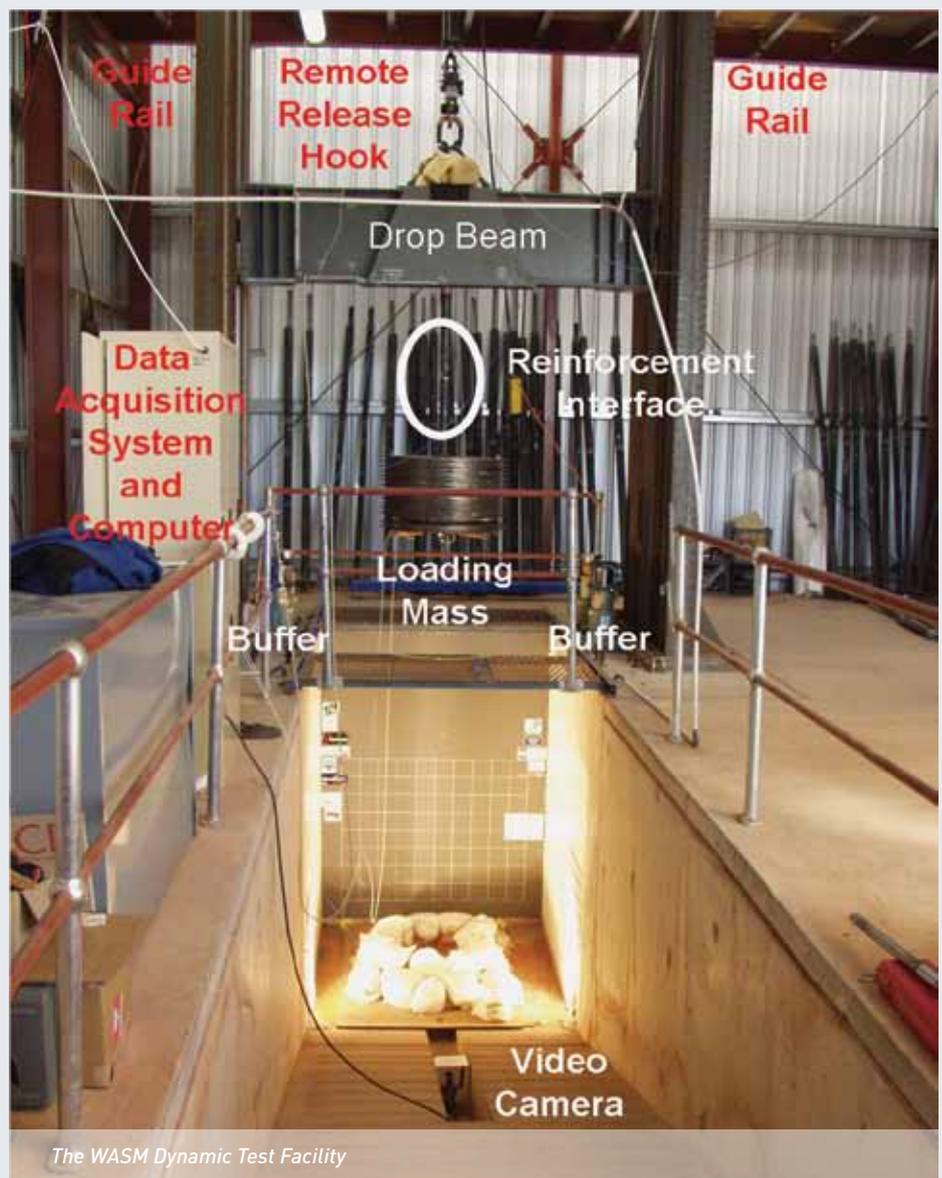
Reports on these two projects have been published by MERIWA and are available on CD at a nominal cost.

Refinement of the test facility and expansion of its applications have continued since the research projects were completed.

As a result of the MERIWA funding, industry and researchers now have access to a world class testing

facility and an extensive database of information to help in designing better systems, as well as more effective and reliable surface support and ground reinforcement systems, which are of obvious benefit to mine workers and mine operators.

For the wider community, safer mining has significant economic and social benefits. ■



The WASM Dynamic Test Facility

AGRICULTURE

East Kimberley – Ord – East Kimberley Expansion Project

WA STATE GOVERNMENT

The State Government has committed \$220 million to increase the existing amount of irrigated land in the Kununurra region by adding 7,700 hectares at Weaber Plains. This funding will provide the construction of irrigation channels, roads and off-farm infrastructure to service the future needs of the region's growing population and sustain economic growth. The Commonwealth Government has committed \$195 million of funding for social and common use infrastructure in the East Kimberley region. Construction has commenced and the package will be fully implemented by June 2013.

Expenditure: \$415m.

Employment: Construction: 483

HEAVY MINERAL SANDS

Tutunup South - Heavy Mineral Sands Mine

ILUKA RESOURCES LIMITED

The Tutunup South mineral sands mine, located approximately 15km south east of Busselton, was commissioned in June 2011. The development involved the construction of mine pits, screen plant, ore concentrator, solar drying dams and associated mine infrastructure. The mine is expected to produce over 1Mt of heavy mineral concentrate over its four to five year life, which is transported to Capel for further processing to produce ilmenite for upgrading in the synthetic rutile kiln. The small stream of non-magnetic material [zircon, rutile and leucoxene] is further processed at Narngulu, near Geraldton, when plant capacity allows.

Expenditure: \$30m.

Employment: Construction: 130; Operation: 30

INFRASTRUCTURE

South West Region - 17 kilometres north east of Bunbury - Kemerton

(HUILS - Heavy Use Industrial Land Strategy)

WA STATE GOVERNMENT

Kemerton Industrial Park, located 17km north of Bunbury, is the main strategic industrial area in the South West region and the nearest regional heavy industrial site to Perth. It is designed to supplement the Kwinana industrial area, only 90 minutes away by road. The estate comprises 7,543ha of land, including 2,019ha of industrial core, 293ha support industry area and 5,231ha buffer areas. It is accessible to the Port of Bunbury by road and planned rail link and is serviced by major road links to the metropolitan area. Under the Heavy Use Industrial Land Strategy, the Government proposes to progress Kemerton to project ready status by completing environmental, heritage and planning approvals for the estate. Work towards progressing approvals commenced in 2009 and is anticipated to be completed in 2012/13, by which time the structure plan and zoning adjustments will also have been completed.

IRON ORE

Pilbara - FMG Chichester - Iron Ore Mine, Rail and Port Development

FORTESCUE METALS GROUP LTD

FMG Chichester operates iron ore mines at Cloudbreak and Christmas Creek in the Chichester Ranges of the eastern Pilbara, serviced by a multi-user railway and port facilities at Port Hedland. FMG Chichester is currently ramping production up to 120Mtpa from the Chichester Ranges.

Employment: Construction: 2500; Operation: 3200

LITHIUM

Great Southern Region - Mount Cattlin Lithium Project, Ravensthorpe

GALAXY RESOURCES LIMITED

Galaxy Resources Limited commenced commissioning of the Mt Cattlin lithium concentrate processing plant in September 2010. The mine and the mineral plant will produce approx. 137,000tpa of spodumene concentrate. Galaxy commenced exporting its product to China in the first quarter of 2011. In China, Galaxy will produce 17,000tpa of battery grade lithium carbonate. A large proportion of this will make its way into the growing markets of China and Japan.

Expenditure: \$75m.

Employment: Construction: 100; Operation: 75

IRON ORE

Mid West Region - Extension Hill Hematite Mine

MOUNT GIBSON IRON LIMITED

Mount Gibson Iron has environmental approval for a 3Mtpa hematite mining operation at Extension Hill, 260km south east of Geraldton. The ore will be trucked to a rail head near Perenjori then railed to the port of Geraldton for export. Construction has commenced with first shipments expected to be in Q3 2011.

Expenditure: \$73m.

Employment: Construction: 150; Operation: 100

Mid West Region - Karara Iron Ore

KARARA MINING LTD (GINDALBIE METALS LTD / ANSTEEL JOINT VENTURE)

The Karara Iron Ore Project is Karara Mining's cornerstone production project in the Mid West region. Construction commenced in November 2009. Karara will deliver some 10Mtpa of iron products by Q2 2012 comprising 8Mtpa of high grade magnetite concentrate and blast furnace quality pellets and 2Mtpa of Direct Shipping Ore hematite. The Project is underpinned by a world-class JORC-Code compliant resource base comprising a 977 million tonne magnetite reserve, a 2.518 billion tonne magnetite resource, a 10.9Mt hematite reserve and a 16.2Mt hematite resource.

Expenditure: \$1.975b.

Employment: Construction: 1500; Operation: 500

Pilbara - BHPB - Inner Harbour Expansion - Port Hedland

BHP BILLITON IRON ORE PTY LTD

In March 2011, BHP Billiton announced approval of \$6.71 billion (BHP Billiton's share \$5.98 billion) of capital investment to continue production growth in the company's Western Australian iron ore operations. It will deliver an integrated operation with capacity in excess of 220Mtpa. The investment includes \$1.72 billion (BHP Billiton's share) to increase total inner harbour installed capacity to 220Mtpa with debottlenecking opportunities to 240Mtpa. The project is currently on schedule (overall project is 30 per cent complete) and on budget.

Expenditure: \$1.722b

Employment: Figures not currently available.

Pilbara - BHPB - Port Blending and Rail Yard Facilities

BHP BILLITON IRON ORE PTY LTD

In March 2011, BHP Billiton announced approval of \$6.71 billion (BHP Billiton's share \$5.98 billion) of capital investment to continue production growth in the company's Western Australian iron ore operations. It will deliver an integrated operation with capacity in excess of 220Mtpa. The investment includes \$1.26 billion (BHP Billiton's share) to optimise resource and enhance efficiency across the BHP Billiton WA iron ore operation supply chain. The project is currently on schedule (overall project is 9 per cent complete) and on budget.

Expenditure: \$1.26b.

Employment: Figures not currently available.

Pilbara - BHPB Rapid Growth Project 5

BHP BILLITON IRON ORE PTY LTD

BHP Billiton Iron Ore has obtained all relevant Government approvals to further increase its installed production capacity of its Western Australian Iron Ore operations. Scope review of the project has been completed and it will be integrated into subsequent expansion approvals that will increase capacity of BHP Billiton's Western Australian iron ore operations to 220Mtpa. First production was achieved on schedule and the overall project is 98 per cent complete.

Expenditure: \$4.35b.

Employment: Figures not currently available

Pilbara - Jumblebar Iron Mine Expansion

BHP BILLITON IRON ORE PTY LTD

In March 2011, BHP Billiton announced approval of \$6.71 billion (BHP Billiton's share \$5.98 billion) of capital investment to continue production growth in the company's Western Australian iron ore operations. It will deliver an integrated operation with capacity in excess of 220 million tonnes per annum. The investment includes \$2.99 billion (BHP Billiton's share) to increase installed mining and processing capacity at Jumblebar mine to 35Mtpa with incremental debottlenecking opportunities to 55Mtpa. The project is currently on schedule (overall project is 11 per cent complete) and on budget.

Expenditure: \$4b.

Employment: Construction: 1000; Operation: 3000

Yilgarn - Koolyanobbing Iron Ore Upgrade

CLIFFS ASIA PACIFIC IRON ORE PTY LTD

In September 2010, Cliffs approved an upgrade of its Koolyanobbing iron ore operations from 8.5Mtpa to around 11Mtpa. Koolyanobbing is located 50km north east of Southern Cross and also includes the Mt Jackson and Windarling mines. The upgrade is expected to consist of enhancements to the existing Kalgoorlie-Esperance rail infrastructure, an increase in rolling stock and decreasing constraints at various other existing operational areas. Cliffs anticipates these improvements to be fully implemented in the second half of 2012. The development of the Mt Jackson J1 deposit, which contains 30Mt of iron ore reserves, is currently underway and is expected to contribute to the increased production.

Expenditure: \$320m.

IRON ORE PROCESSING

Pilbara - Cape Preston - Sino Iron

CITIC PACIFIC

CITIC Pacific Mining is constructing the Sino Iron project at Cape Preston, 100 kilometres south west of Karratha. The magnetite iron ore project will include a concentrator, 6Mtpa pellet plant, 25km slurry pipeline, combined cycle 450MW power station, new port and trans-shipment facilities, and a 51GL desalination plant. At full production up to 27.6 million tonnes of magnetite concentrate and high grade pellets will be exported each year. First shipment of concentrate is expected in the first half of 2012.

Expenditure: \$5.2b.

Employment: Construction: 4000; Operation: 500

Ravensthorpe - Ravensthorpe Nickel Operation

FIRST QUANTUM MINERALS AUSTRALIA NICKEL PTY LTD

FQM Australia Nickel (FQMAN) acquired the Ravensthorpe Nickel Operation (RNO) from BHP Billiton in February 2010. FQMAN plans to return RNO to sustainable production by late 2011. RNO is an open cut mine and hydrometallurgical process plant that produces a mixed nickel cobalt hydroxide intermediate product. The modifications are within the plant's existing footprint in the materials handling area, including crushing, conveying and stockpiles. FQMAN aims to produce 39,000tpa nickel metal

for the first five years after recommencement and 28,000tpa nickel metal over the current anticipated mine life of 32 years.

Expenditure: \$190m.

Employment: Construction: 200; Operation: 500

OIL & GAS DEVELOPMENTS

Carnarvon Basin - Pluto LNG Project WOODSIDE ENERGY

Approved for development in July 2007, the project will process gas from the Pluto and Xena gas fields, located about 190km north-west of Karratha in Western Australia, into LNG and condensate. The Pluto and Xena gas fields are estimated to contain 4.8 trillion cubic feet (Tcf) of dry gas reserves and an additional 0.25Tcf of contingent resources. The initial phase of the Pluto LNG Project comprises five subsea wells on the Pluto gas field connected to an offshore processing platform in 85m of water. Gas will be piped about 180km to the onshore plant in a 36-inch pipeline. Onshore facilities at the Pluto LNG Park include a single LNG processing train with forecast production capacity of 4.3 million tonnes a year, in addition to storage facilities and an export jetty. First LNG cargo is estimated for March 2012.

Expenditure: \$14.9b.

Employment: Construction: 5000; Operation: 300

Carnarvon Offshore Basin - Barrow Island - Gorgon Project GORGON JOINT VENTURE

The Gorgon Joint Venture (GJV) made a final investment decision on the \$4.3 billion Gorgon Project on 14 September 2009. The GJV's foundation project on Barrow Island includes a three train LNG development capable of exporting 15Mtpa and a domestic gas project capable of delivering at least 300 terajoules per day of gas to the mainland. The development on Barrow Island also includes potentially the largest commercial geosequestration project in the world. The project obtained State and Commonwealth environmental approval in August 2009. The project is based on gas from both the offshore Gorgon and Jansz/lo gas fields. On-island activity commenced in late 2009 and the major construction work for the processing plant is scheduled to commence in 2011.

Expenditure: \$43b.

Employment: Construction: 5500; Operation: 300

Carnarvon Offshore Basin - Cossack/Wanaea - Cossack/Wanaea Redevelopment WOODSIDE ENERGY

In December 2008, the Cossack Wanaea Lambert and Hermes oil venture participants (CWLH joint venture) approved funding of the A\$1.8 billion CWLH Redevelopment Project to support ongoing safe and reliable production from the Cossack, Wanaea, Lambert and Hermes fields beyond 2020. The project scope of work includes the purchase and conversion of the Okha floating storage and offloading (FSO) facility into an FPSO facility to replace the Cossack Pioneer FPSO in 2011, and the replacement of associated subsea infrastructure.

Expenditure: \$1.8b.

Carnarvon Offshore Basin - North Rankin - North Rankin Redevelopment WOODSIDE ENERGY

In March 2008, the North West Shelf Project participants approved funding of the A\$5 billion North Rankin Redevelopment which will recover remaining low pressure gas from the North Rankin and Perseus gas fields, and extend the field life to around 2040. The project involves the installation of a new second platform - North Rankin B - with gas compression facilities, low pressure separators, utilities and accommodation. North Rankin B will be connected by two 100 metre bridges to the existing North Rankin A platform and on completion both platforms will be operated as a single integrated facility known as the North Rankin hub. The North

Rankin Redevelopment project also includes the necessary connections to North Rankin A and some refurbishment of the North Rankin A platform. North Rankin B is scheduled for start-up in 2013 and will support the North West Shelf Project's onshore gas requirements to supply future customer commitments.

Expenditure: \$5b.

Pilbara - Devil Creek Development Project APACHE ENERGY LIMITED

The Apache Northwest and Santos Offshore Devil Creek Development Project is a greenfield gas project comprising; an unmanned offshore gas production platform over the Reindeer gas field 80km northwest of Dampier; offshore and onshore gas pipelines; an onshore gas processing plant and a sales gas export pipeline connected to the Dampier to Bunbury Natural Gas Pipeline (DBNGP). The onshore facility is near Devil Creek, 65km south west of Karratha. The project can provide up to 200 terajoules per day natural gas and 80kl to 160kl per day of gas condensate to the domestic market. Installation of pipe rack and gas processing modules is now complete and module pipework hook-up is nearing completion. The sales gas pipeline was completed in Q2 2011. First gas is due to be delivered to the State's domestic gas market in Q4 2011.

Expenditure: \$800m.

Employment: Construction: 200; Operation: 20

RARE EARTHS

Mt Weld - Rare Earths Mine LYNAS CORPORATION LTD

The Mt Weld deposit is located about 35km south of Laverton and contains an estimated resource of 17.4Mt at 8.1% grade for 1.41Mt rare earth oxides (REO). The development includes an open pit mine and a concentration plant, located 1.5km from the open pit mine. The first feed of ore into the 33,000tpa concentration plant occurred in May 2011 and the plant was officially opened in August 2011. The concentrate will be bagged and containerised on site, and trucked to the Port of Fremantle for export. It will be shipped to a \$300 million processing plant in Malaysia, which will have an initial production capacity of 11,000tpa REO scheduled to commence by the end of 2011 subject to Malaysian government approvals. Phase 2 will involve the expansion of the Mt Weld concentration plant to produce around 66,000tpa of concentrate, which will be required to meet the Malaysian processing plant's expanded production of 22,000tpa REO. Lynas expects Phase 2 to be completed in 2013.

Expenditure: \$135m.

Employment: Construction: 135; Operation: 90

Kemerton - Silicon Metal Plant Expansion SIMCOA OPERATIONS PTY LTD

Simcoa announced in October 2009 its decision to expand the company's 32,000tpa capacity silicon metal plant at Kemerton. The first stage expansion, involving installation of a third furnace, will increase the plant capacity to 48,000tpa and commissioning is scheduled for Q3 2011. Providing world demand for silicon continues to increase strongly, a second stage expansion, involving installation of a fourth furnace could take place by late 2013 and increase plant capacity to 64,000tpa.

Expenditure: \$100m.

Employment: Construction: 120; Operation: 40

Windimurra - Windimurra Vanadium Project ATLANTIC LIMITED

Atlantic has recently announced a 30% increase in the JORC-compliant Ore Reserve estimate for its Windimurra vanadium project to 128 million tonnes. This prompted an upward revision to the potential mine life of Windimurra to 28 years. Atlantic has also recently lifted its vanadium output forecast by 11% to 6,300 tonnes of contained vanadium per annum. Construction costs to complete the

Windimurra vanadium mine and plant remain in line with budget, with the project on track for first production in September 2011. In the last quarter, Atlantic successfully shipped a trial cargo of existing Windimurra iron ore fines by-product to a Chinese customer and reached agreement to supply an extra 30,000 tonnes and undertake a further long term contract, subject to test results.

Expenditure: \$500m.

Employment: Construction: 350; Operation: 120

AMMONIA/UREA

Shotts Industrial Park - Collie Coal to Urea PERDAMAN CHEMICALS AND FERTILISERS PTY LTD

Perdaman Chemical and Fertilisers Pty Ltd is developing a \$3.5 billion coal to urea plant at the new (to be developed) Shotts Industrial Park, near Collie. The plant will use proven coal gasification and fertiliser production technologies. Around 2.7Mtpa of coal will be used to produce approximately 2Mtpa of urea, primarily for export. The urea will be transported to Bunbury Port by rail. The company has recently received environmental approval from the WA Minister for Environment in accordance with the Environmental Protection Act. A 20-year off take agreement has been signed with Incitec Pivot. Construction is expected to commence in 2011 with the first shipment of urea planned for 2014.

Expenditure: \$3.5b.

Employment: Construction: 1500; Operation: 200

AMMONIUM NITRATE

Kwinana - Ammonium Nitrate Facility Expansion CSBP LIMITED

CSBP is proposing to expand its Kwinana ammonium nitrate production facility from its current capacity of 520,000tpa to 780,000tpa. The proposed expansion will involve the construction of a new nitric acid plant and ammonium nitrate plant, and an upgrade of the existing prilling plant. In June 2011, CSBP announced that it had received Wesfarmers Board approval for \$45 million to fund long-lead equipment orders and continued detailed engineering work. This follows the completion of a \$15 million Front End Engineering and Design study. Final Wesfarmers Board approval for the project is expected to be sought later in 2011. Subject to obtaining regulatory approvals, the expansion could be completed in the first half of 2014.

Expenditure: \$550m.

Employment: Construction: 300; Operation: 10

Pilbara - Burrup Industrial Estate Site D - Burrup Nitrates BURRUP NITRATES PTY LTD

Burrup Nitrates Pty Ltd (BNPL), a joint venture between Burrup Holdings Ltd (BHL) of Australia and Yara International ASA of Norway, is conducting a feasibility study into the construction of a 350,000tpa Technical Ammonium Nitrate (TAN) plant to be located on the Burrup Peninsula. Ammonia feedstock will be supplied from BHL's subsidiary company Burrup Fertilisers Pty Ltd, which operates its facility directly adjacent to the proposed location for the new TAN plant. It is expected that all manufactured product will be sold into the Pilbara region. Regulatory approvals are in progress. The company is aiming for operations to commence by Q4 2013.

Expenditure: \$600m.

Employment: Construction: 600; Operation: 65

ELECTRICITY

Mid West Region - Centauri 1 Power ENEABBA GAS LIMITED (EGL)

Eneabba Gas Limited is planning to develop a 168MW Centauri 1 gas-fired turbine power station near Dongara. Generation capacity can be increased to 365MW. The project is focused on supplying additional volumes of energy for the developing Mid West iron ore industries.

Expenditure: \$200m.

Employment: Construction: 100; Operation: 4

Kalgoorlie (330kms North East) – Tropicana Gold ANGLGOLD ASHANTI/INDEPENDENCE GROUP JOINT VENTURE

AngloGold Ashanti, as Joint Venture Manager, has undertaken an intensive exploration and resource development program approximately 330kms north east of Kalgoorlie. Plans for the project are to develop an open-cut gold mine and nearby processing plant. So far, a resource estimate of 5million oz of gold has been identified with a mine life of at least 10 years. The feasibility study commenced in July 2009 and is ongoing. Environmental approvals were finalised in September 2010. Commonwealth environmental approval received on 13 December 2010. Construction has started and gold production is planned for 2013. Expenditure: \$700m.

Employment: Construction: 700; Operation: 400

HEAVY MINERAL SANDS

Happy Valley – Heavy Mineral Sands Mine BEMAX RESOURCES LTD

Located adjacent to the Bemax Gwindinup deposits south of Bunbury, the project will involve the mining of the Happy Valley North and South mineral sands deposits situated on private land and in State Forest. The two deposits contain over 750,000 tonnes of recoverable heavy mineral concentrate, with average production expected to be around 150,000tpa over a combined mine life of eight years. The concentrate will be trucked to Bemax's Bunbury Mineral Separation Plant for final processing. In February 2011, the EPA recommended that the Minister for Environment not approve the company's proposal to develop the Happy Valley mine. Bemax has lodged an appeal against the EPA's decision and the matter is currently with the Appeals Convenor.

Expenditure: \$35m.

Employment: Construction: 100; Operation: 30

Keysbrook – Heavy Mineral Sands Mine MATILDA ZIRCON LIMITED

Matilda Zircon proposes to develop a mineral sands mine located near the township of Keysbrook, approximately 70km south of Perth. It has ore reserves of 41Mt, containing 1.2Mt of heavy mineral concentrate. The project is expected to produce 40,000tpa of leucocoxene and 47,000tpa of ilmenite, high titanium ilmenite and zircon over its eight year mine life. Keysbrook received environmental approval in October 2009. Matilda's applications for development approvals have been refused by the Murray and Serpentine-Jarrahdale Shires, and have been referred to the State Administrative Tribunal. A determination from this process is expected in September 2011. Subject to obtaining development approvals and completion of the Definitive Feasibility Study, Matilda Zircon will be in a position to seek funding and start construction in 2012.

Expenditure: \$25m.

Employment: Construction: 35; Operation: 30

Shark Bay – Coburn Zircon Project GUNSON RESOURCES LIMITED

Gunson proposes to develop the Coburn zircon project, located south of Shark Bay and approximately 250km north of Geraldton. It contains total ore reserves of 308Mt at an average grade of 1.2% heavy minerals, all of which lie within the portion of the project area that has received government environmental approvals for mining. The project is expected to produce 40,000tpa of zircon, 90,000tpa of ilmenite, 9,000tpa of rutile and 7,000tpa of leucocoxene. At the proposed mining rate of 17.5Mtpa, the Coburn mine life is estimated to be 17.5 years which could be extended by six years if the northern area receives government approvals for mining. The Project Definitive Feasibility Study and Definitive Design Study have been completed. Gunson is continuing to advance discussions with potential strategic funding and offtake partners.

Expenditure: \$169m.

Employment: Construction: 170; Operation: 110

INFRASTRUCTURE

Kimberley – James Price Point – Browse LNG Precinct

WA STATE GOVERNMENT

The Department of State Development, on behalf of the State of Western Australia, proposes to develop the Browse Liquefied Natural Gas (LNG) Precinct as a common user facility to process natural gas from the Browse Basin gas fields, near James Price Point, approximately 60km north of Broome, on the West Kimberley coast of Western Australia. The Precinct could potentially accommodate two, or more, LNG processing operations, with a combined capacity of up to 50Mtpa. By focussing development at a suitable location, the Precinct will minimise the environmental footprint of gas processing while maximising business opportunities and economic and community development in the Kimberley. On 30 June 2011, agreements between the State Government, the Goolarabooloo Jabirri Jabirri native title claimant group and Woodside Energy Ltd were signed to secure land access near James Price Point for the establishment of an LNG Precinct. The agreements, which help ensure that Kimberley communities benefit from the development of the natural gas resources in the Browse Basin, were signed after years of intensive negotiations with traditional owners. Under the agreements, benefits to traditional owners will total more than \$1.5 billion over the 30 year life of the project and will be expanded when additional LNG proponents take up land in the precinct. They include State funding of \$256 million towards housing, education, economic development, promotion and protection of cultural heritage and a Kimberley enhancement scheme which will invest in indigenous social programs. The Woodside-led Browse Joint Venture is a potential foundation proponent for the Precinct. Joint Venture participants are expected to make a final investment decision in mid-2012. If the project proceeds, it is anticipated LNG processing will commence in 2016-17.

Expenditure: \$30b.

Employment: Construction: 6000; Operation: 400

Oakajee – Oakajee Midwest Development WA STATE GOVERNMENT

The Oakajee Port will include common user infrastructure (channel, breakwater, turning basin, navigational aids, provision for tug and pilot boat pens, port administration offices and roads and utilities) funded by the State and Commonwealth Governments and private use infrastructure (at least one Cape Class iron ore berth, as well as associated materials handling equipment and rail infrastructure) funded by Oakajee Port and Rail Pty Ltd. The Port will also include provision for a non iron ore berth in the future to provide import/export capability for value-adding industries in the Oakajee Industrial Estate. A northern railway will link the port to mines to the north-east of Geraldton and a southern railway will link to the mines in the south-east. The northern rail line will be operated by Oakajee Port and Rail though an open access regime. Oakajee Port and Rail has now identified three foundation customers with an expected initial throughput of 45Mtpa and delivered its draft bankable feasibility study to the State for consideration.

Expenditure: \$4b.

Employment: Construction: 2000; Operation: 300

Pilbara - Ashburton North Strategic Industrial Area

WA STATE GOVERNMENT

The State Government is developing the Ashburton North Strategic Industrial Area (ANSIA) as a hydrocarbon precinct in the Shire of Ashburton, 12km south west of Onslow, to enable the development of natural gas projects and associated industries to exploit the gas reserves in the Carnarvon Basin and Exmouth Gulf. In addition to the industrial area with proponent sites and general areas, the ANSIA includes a port with common user facilities, and common user infrastructure corridors. The ANSIA

estate is intended to cater for the development of hydrocarbon processing, storage and exportation, with the overall vision of creating an industrial estate that successfully and safely manages the varied land uses in the area. Three foundation proponents, BHP Billiton, Chevron, and ExxonMobil have been allocated land within the ANSIA. Chevron entered into Front End Engineering Design in July 2009 with a final investment decision expected in the second half of 2011. Gas to market is scheduled for 2016. In Q3 2011, BHP Billiton commenced construction for the Macedon project, with gas production to commence in early 2013.

Pilbara - Anketell - Anketell Port and SIA (Strategic Industrial Area)

WA STATE GOVERNMENT

The Anketell project includes establishment of a multi-user, multi-commodity deepwater port and associated strategic industrial area (SIA) at Anketell, located 30km east of Karratha. The port and corridor development will be proponent-funded but will ultimately be managed and owned by the Dampier Port Authority. The strategic industry land will be transferred freehold to LandCorp. Three companies have expressed interest in developing facilities at Anketell: Australia Premium Iron (API) for its 30-40Mtpa West Pilbara Iron project, MCC Australia Holding Pty Ltd (MCC) for its 15Mtpa Cape Lambert Iron Ore project, and Fortescue Metals Group (FMG) for its 100Mtpa Solomon project.

IRON ORE

Great Southern Region – Southdown Magnetite Mine

GRANGE RESOURCES LTD

The Southdown Magnetite deposit is situated 90km north east of Albany near Wellstead. The Southdown Project is a joint venture between Grange Resources Ltd (70%) and Sojitz Resources & Technology Pty Ltd (30%), SDJV. A Feasibility Study is being completed as part of the last tollgate prior to Project Approval by the Owners. On the 30 June 2011 the Minister approved the permit to increase mine production from 6.8 to 10Mtpa. Grange continues to work and collaborate with relevant government agencies to refine its mine, port and associated infrastructure approvals to coincide with the outcomes of its Definitive Feasibility Study due in the first quarter of 2012.

Expenditure: \$2.57b.

Employment: Construction: 2000; Operation: 600

Mid West Region – Extension Hill Magnetite Mine ASIA IRON

Asia Iron has primary environmental approval to produce up to 10Mtpa of magnetite concentrate, which will be transported by slurry pipeline to the port of Geraldton for export. The company is currently seeking secondary approvals. Asia iron is also undertaking an implementation study for the project and has appointed a project management contractor for project delivery.

Expenditure: \$2b.

Employment: Construction: 1000; Operation: 350

Mid West Region – Jack Hills Expansion

CROSSLANDS RESOURCES

Crosslands commenced trucking 1.5Mtpa haematite from its Jack Hills operations to the port of Geraldton in December 2006. Jack Hills Stage 2 will involve an increase to 25Mtpa of haematite and beneficiation feed ore. The ore will be transported by a new railway to a new deepwater port at Oakajee. A bankable feasibility study for the project was finalised in June 2011.

Expenditure: \$2b.

Employment: Construction: 450; Operation: 350

Pilbara – Cape Lambert Iron Ore Project

MCC AUSTRALIA HOLDING PTY LTD

MCC Australia Holding Pty Ltd is developing a 15Mtpa magnetite iron ore mine in the Pilbara and aims

Projects Under Consideration

to ship its first ore in 2015 via the new multi-user 350Mtpa port at Anketell. The Project comprises a proven JORC compliant 1.9bt iron ore resource. The Project will consist of a beneficiation plant, 300MW power plant, port facilities for exporting concentrate and other related infrastructure. MCC has completed feasibility studies for the port, power supply, water supply, accommodation and general site infrastructure. The mine and processing studies are progressing. The company commenced native title negotiations with the Ngarluma Aboriginal Corporation in March 2010 and a preliminary native title agreement was signed on 17 May 2011. An environmental scoping document has been submitted to the EPA.

Expenditure: \$3.7b.

Employment: Construction: 3000; Operation: 1000

Pilbara - Cape Lambert Port B Expansion **ROBE RIVER MINING CO PTY LTD**

Robe River is proposing to expand Cape Lambert Port B to supplement the Port's existing capacity by up to 130Mtpa. The Port B development includes: ore handling facilities (incorporating rail tracks, car dumpers, conveyors, stackers, stockpiles, reclaimers and screenhouses) - supporting operational infrastructure (including offices, warehouses and workshops) - marine facilities incorporating jetty, wharf, shiploaders and dredging.

Expenditure: \$3.7b.

Employment: Construction: 300; Operation: 300

Pilbara - FMG Central Pilbara Project (Solomon Stage 2 and Western Hub) **FORTESCUE METALS GROUP LTD**

FMG's Central Pilbara project is located in the Solomon Stage 2 area (about 70km north of Tom Price) and the Western Hub (west of Solomon) in the Pilbara. To date, Solomon Stage 2 has identified resources of 1.1 billion tonnes, with a target of 2 billion tonnes, comprising channel iron, bedded Brockman and detritals iron deposits. Start-up production from Solomon Stage 2 of 20Mtpa is scheduled for early 2015, with aspirations to expand to around 200Mtpa by 2017 (100Mtpa from Solomon Stage 2 and 100Mtpa from Western Hub). The project comprises mines, a new 250km railway linking Solomon Stage 2 mines to berths and shiploading facilities in the new 350Mtpa multi-user port at Anketell.

Expenditure: \$7b.

Employment: Construction: 4800; Operation: 2650

Pilbara - Outer Harbour Development, Port Hedland

BHP BILLITON IRON ORE PTY LTD

BHP Billiton Iron Ore (BHPBIO) has received comments from both public and regulatory agencies on its Public Environmental Review/Draft Environmental Impact Statement for the Proposed Outer Harbour Development. BHPBIO's investment in the proposed Outer Harbour Development remains subject to market conditions, the receipt of all required government approvals and BHP Billiton Board approval.

Expenditure: Not currently available.

Employment: Figures not currently available

Pilbara - Roy Hill Iron Ore Mine & Infrastructure **HANCOCK PROSPECTING PTY LTD**

Hancock Prospecting is developing the Roy Hill iron ore project located 105km north east of Newman. This project is expected to come into production in 2014 and will produce iron ore for over 20 years after ramp-up at 55Mtpa. The project includes the development of the mine, and new railway and port facilities at Port Hedland. Environmental approval for Roy Hill mine Stage 1 was received in December 2009 and environmental approval for Stage 2 was received in March 2010. The Railway (Roy Hill Infrastructure Pty Ltd) Agreement Bill 2010 was passed by both houses of Parliament in October 2010. On 5 July 2011, pursuant to the Railway (Roy Hill Infrastructure Pty

Ltd) Agreement Act 2010, Roy Hill Infrastructure Pty Ltd was granted with a Special Railway Licence to commence construction of its railway.

Expenditure: \$7b.

Employment: Construction: 1500; Operation: 750

Pilbara - West Pilbara Iron Ore Project **API MANAGEMENT PTY LTD**

The Australian Premium Iron Joint Venture is proposing to develop the West Pilbara Iron Ore Project. Stage 1 of the project is based on the production of 30Mtpa of direct shipping iron ore from its Red Hill and Mt Stuart mine sites located 35-80km south west of Pannawonica. The ore will be transported by a new heavy haul railway for export via the new multi-user 350Mtpa port at Anketell. Subject to the successful completion of feasibility and environmental studies, and receipt of government regulatory approvals, the company anticipates that the first shipment of ore will occur in 2014.

Expenditure: \$4b.

Employment: Construction: 2000; Operation: 700

OIL AND GAS DEVELOPMENTS

Carnarvon Basin - Pluto LNG Project Expansion - Trains 2 & 3 **WOODSIDE ENERGY**

The Pluto LNG Park provides the opportunity to consider both equity gas development and third party gas supply at the site. The foundation project investment in support infrastructure enables a significantly lower cost and de-risked expansion opportunity. As a brownfield development Pluto expansion will require a much smaller construction workforce compared to a greenfield development. Woodside has completed front-end engineering and design (FEED) for the next two onshore trains. Discussions continue with third parties regarding the potential to process Carnarvon Basin gas through additional trains at Pluto.

Carnarvon Offshore Basin - Macedon Domestic Gas Project

BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED

The Macedon gas field, about 90km west of Onslow, was discovered in 1992 during drilling of the West Muiron-3 well and is estimated to contain a gas resource of up to 600bcf. BHP Billiton Petroleum (Australia) Pty Ltd and Apache Energy Limited are currently progressing the necessary approvals for a domestic gas project for Western Australia. The development will involve a number of sub-sea gas wells connected to the gas field, offshore and onshore wet gas pipelines, an onshore gas processing plant 15km southwest of Onslow, and a sales gas pipeline connected to the Dampier-to-Bunbury Natural Gas Pipeline. Daily production is expected to be in the order of 200TJ. Construction has started in Q3 2011, with gas production to commence in early 2013.

Expenditure: \$1b.

Employment: Construction: 300

Pilbara - Wheatstone LNG Development **CHEVRON AUSTRALIA PTY LTD**

Chevron is investigating the feasibility of an LNG project based on its Wheatstone and Iago gas fields, to be located at Ashburton North, near Onslow. The project will also process gas from sub-economic third party fields in the Carnarvon Basin. Chevron entered FEED (Front End Engineering Design) in July 2009 with a Final Investment Decision expected in the second half of 2011. Gas to market is scheduled for 2016. The project will initially have two LNG trains with an 8.9Mtpa capacity, expandable to five, and a 250 million cubic feet per day domestic gas plant.

Expenditure: \$23b.

Employment: Construction: 5000; Operation: 400

TIMBER

Mirambeena Timber Processing Precinct - Engineered Strand Lumber

LIGNOR LTD

Lignor proposes to develop an Engineered Strand Lumber ES^L®/ Engineered Strand Board ES^B® plant located at Mirambeena, about 15km north west of Albany. The Commercial Plant will be preceded by the construction of a Demonstration Plant/Global R&D Centre. This Plant will produce a range of products for certification to the Australian Building Code and overseas equivalents. The Plants will source most of the timber from the extensive eucalypt plantations in the Albany region. Lignor is finalising its design of the Demonstration Plant and anticipates construction to commence by Q1 2012, with product coming into the market by mid 2013. Following successful results from the Demonstration Plant, construction of the Commercial Plant is expected to commence by mid 2016.

Expenditure: \$273m.

Employment: Construction: 380; Operation: 125

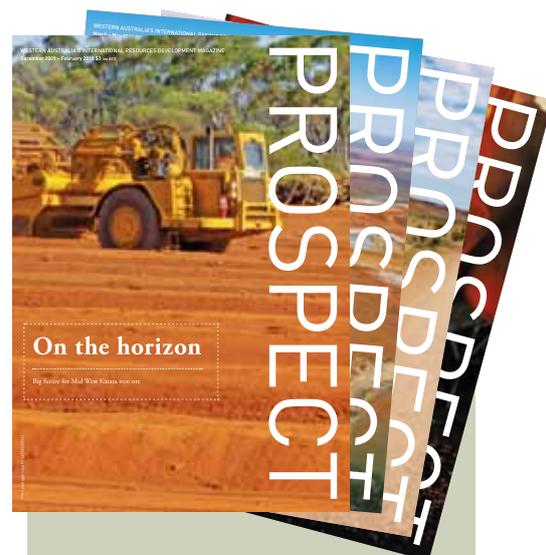
URANIUM

Northern Goldfields - Yeelirrie - Yeelirrie Uranium

BHP BILLITON YEELIRRIE DEVELOPMENT COMPANY PTY LTD

BHP Billiton proposes to develop the Yeelirrie Uranium Project in the North-eastern Goldfields, near Wiluna. The proposal entails open cut mining of shallow deposits of uranium ore, treatment in a plant to be established at the site, and development of associated infrastructure. The project would produce up to 3,500tpa uranium oxide concentrate over about 30 years. The uranium oxide will be transported to South Australia by road for export to overseas markets. The formal environmental impact assessment process was initiated in 2009 and the project Environmental Scoping Document was approved in June 2010. The Company is reviewing the project and has deferred submission of its ERMP at this time.

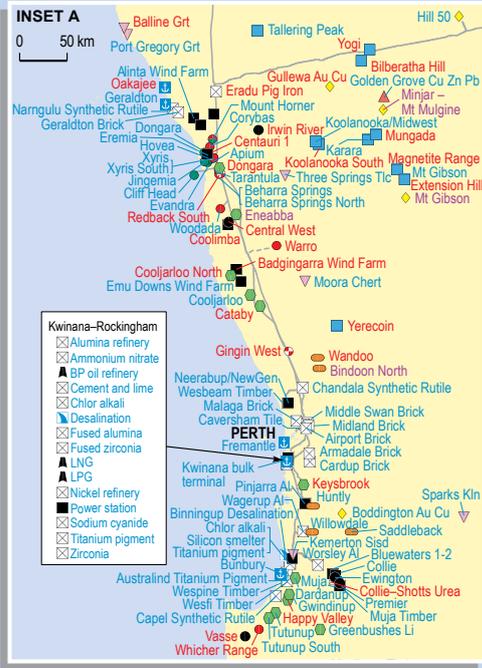
Employment: Construction: 700; Operation: 300



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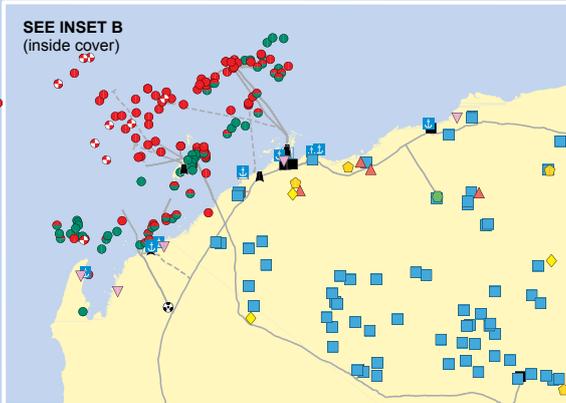
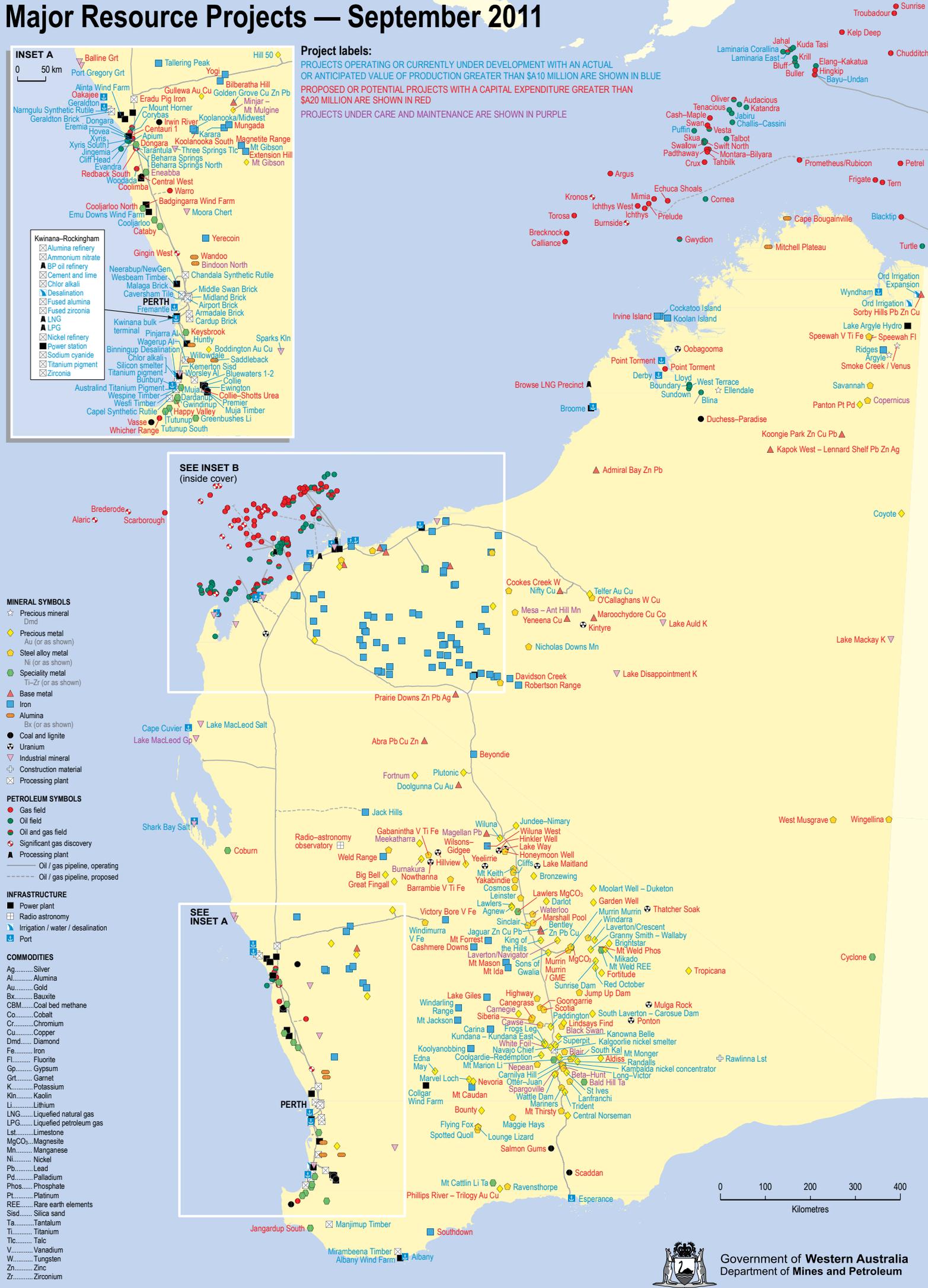


Project labels:

PROJECTS OPERATING OR CURRENTLY UNDER DEVELOPMENT WITH AN ACTUAL OR ANTICIPATED VALUE OF PRODUCTION GREATER THAN \$A10 MILLION ARE SHOWN IN BLUE

PROPOSED OR POTENTIAL PROJECTS WITH A CAPITAL EXPENDITURE GREATER THAN \$A20 MILLION ARE SHOWN IN RED

PROJECTS UNDER CARE AND MAINTENANCE ARE SHOWN IN PURPLE



- MINERAL SYMBOLS**
- Precious mineral Dmd
 - Precious metal Au (or as shown)
 - Steel alloy metal Ni (or as shown)
 - Speciality metal Ti-Zr (or as shown)
 - Base metal
 - Iron
 - Alumina Bx (or as shown)
 - Coal and lignite
 - Uranium
 - Industrial mineral
 - Construction material
 - Processing plant
- PETROLEUM SYMBOLS**
- Gas field
 - Oil field
 - Oil and gas field
 - Significant gas discovery
 - Processing plant
 - Oil / gas pipeline, operating
 - Oil / gas pipeline, proposed
- INFRASTRUCTURE**
- Power plant
 - Radio astronomy
 - Irrigation / water / desalination
 - Port
- COMMODITIES**
- Ag..... Silver
 - Al..... Alumina
 - Au..... Gold
 - Bx..... Bauxite
 - CBM..... Coal bed methane
 - Co..... Cobalt
 - Cr..... Chromium
 - Cu..... Copper
 - Dmd..... Diamond
 - Fe..... Iron
 - Fl..... Fluorite
 - Gp..... Gypsum
 - Grt..... Garnet
 - K..... Potassium
 - Kn..... Kaolin
 - Li..... Lithium
 - LNG..... Liquefied natural gas
 - LPG..... Liquefied petroleum gas
 - Lst..... Limestone
 - MgCO₃..... Magnesite
 - Mn..... Manganese
 - Ni..... Nickel
 - Pb..... Lead
 - Pd..... Palladium
 - Phos..... Phosphate
 - Pt..... Platinum
 - REE..... Rare earth elements
 - Sed..... Silica sand
 - Ta..... Tantalum
 - Ti..... Titanium
 - Tl..... Talc
 - V..... Vanadium
 - W..... Tungsten
 - Zn..... Zinc
 - Zr..... Zirconium

