

# Shining star

Galaxy Resources' Mt Cattlin mine shines

# PROS PECT





Western Australia continues to cement its reputation as a global player in the minerals and energy sectors.

Growing numbers of energy, mining and related service companies are locating in Perth, with two more global giants landing in Western Australia recently.

The world's second largest company, General Electric has announced plans for an A\$80 million technology and education centre based in Perth to help deliver the next generation of skilled workers in the oil, gas, energy, mining, transportation and water industries.

GL Noble Denton has also arrived in Western Australia, opening an office in Perth to service the multi-billion dollar oil and gas projects scheduled for Australia.

Currently, the value of major resources and industrial projects, committed or under active consideration in Western Australia, is more than A\$170billion.

In April, Cimtec Construction & Engineering Pty Ltd opened a massive, new heavy engineering and fabrication workshop in Henderson, south of Perth.

The A\$30 million facility, located on the waterfront at the Australian Marine Complex, will help boost Western Australian industry's capacity to compete for resources sector projects.

The Cimtec facility will ensure that the state is positioned to win significant work generated by unprecedented levels of resources investment in Western Australia.

Western Australia can, and will, see enormous benefits from resources development and the growth of new industries in this state.

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**Norman Moore**  
**MINISTER FOR MINES AND PETROLEUM**

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Cover photo: Emerging lithium producer Galaxy Resources' Mt Cattlin mine. Story page 2.

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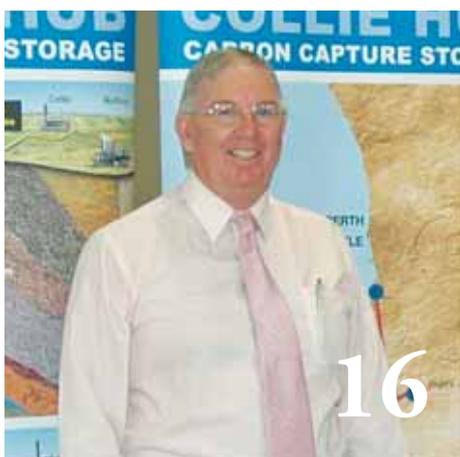
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# GALAXY RESOURCES RACKS UP MILESTONES AT MT CATTLIN

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March was a momentous month for emerging lithium producer Galaxy Resources and its Mt Cattlin mine, which shipped its first spodumene to China and sold its first tantalum concentrate.

The 6500 tonne spodumene shipment left from Bunbury Port on 28 March bound for Zhangjiagang Port in China.

The 28 tonnes of tantalum concentrate was sold to Western Australian company Global Advanced Metals under a five-year sales agreement.

The company also announced it had lifted the total contained lithium oxide resource at Mt Cattlin by 14 per cent to 197,000 tonnes in March.

Galaxy Resources Managing Director Iggy Tan said these were important milestones for the company.

“The Mt Cattlin project was constructed, commissioned and started up in less than 11 months,” he said.

“The project was on schedule and on budget.

“The first shipment of spodumene was slightly delayed but still in line with guidance, due to slower than expected ramp up.”

Galaxy has committed to a residential workforce in the towns of Ravensthorpe and Hopetoun, which were impacted by the closure of BHP Billiton’s Ravensthorpe Nickel project in 2008.

The company is also in negotiations with Esperance Port to export from the port in the longer term.

Mr Tan said Galaxy was bullish about the global outlook for lithium.

“The long-term prospect for the mine looks good, with the demand for lithium primarily coming from the lithium ion battery industry—this industry is about to significantly grow due to the electric vehicle revolution,” he said.

“The project ramp up is still proceeding with recent campaigns achieving 80 per cent of design output.”

The second shipment from Mt Cattlin is expected to occur in June this year.

Galaxy is also looking at building a downstream project involving lithium ion battery production in China in line with its plans to become a vertically integrated lithium company. ■



*Galaxy Resources made its first shipments of spodumene and tantalum concentrate during March this year.*



An artist's impression of the Wheatstone LNG project. Image courtesy of Chevron.

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# New gas giant looms

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With a Final Investment Decision imminent for the massive Chevron Corporation led Wheatstone LNG project, Western Australia could soon benefit from a fourth major gas export facility on its Pilbara coast.

Drawing on resources in the energy rich Carnarvon Basin, Wheatstone is planned initially to produce about 9 million tonnes of liquefied natural gas per annum (Mtpa) for export and associated natural gas for domestic use.

Liquefied natural gas (LNG) production from its initial two processing units is expected to commence in 2016, and the project has the potential to expand to up to 25Mtpa of LNG.

Chevron Australia Managing Director, Roy Krzywosinski, said the Wheatstone Project would boost Australia's position as a major LNG player on the world stage.

"The Wheatstone project will be Australia's first-ever LNG hub to accept gas from third party suppliers. This concept takes a long-term approach to keeping the country's LNG sector producing for generations to come, while minimising the environmental footprint that would be needed for new projects," Mr Krzywosinski said.

This will represent a significant expansion of Western Australia's LNG export capacity, which is currently 16.3Mtpa, but construction of an additional 19.3Mtpa is underway and expected to be in operation by 2016.

The project will have a sustained positive impact on Western Australia's economy, through direct employment and substantial Australian industry participation. It will also contribute billions of dollars to Australia's national revenue.

Chevron estimates that over its life, the Wheatstone project could generate services and supply contracts worth more than A\$15billion for Australian business. The company is currently working with a State Government led Local Content Steering Committee and industry organisations to identify opportunities for Australian participation in the project.

Market analysts say the value of Wheatstone's production over 20 years is estimated at more than A\$100billion and the project has a potential life of 40-50 years.

The impact will be especially dramatic for the small coastal hamlet of Onslow, 1400 kilometres north of Perth and 300 kilometres south of Karratha, which is likely to see its resident population treble from 700 to 2,200 as a result of the project.



However, before the project ships its first LNG to customers in Japan, Korea and China, Chevron will undertake an enormous construction task to complement the design, engineering, approval and marketing efforts that will underpin the Wheatstone project.

The project includes developing gas fields 225 kilometres offshore and in water up to 260 metres deep, building a subsea pipeline and construction of a port and LNG production facilities at the Western Australian Government's Ashburton North Strategic Industrial Area, 12 kilometres from Onslow.

Since Chevron announced its intention to develop the onshore facility in March 2008, based on its Wheatstone gas fields, the project team's achievements have been considerable.

Wheatstone Project General Manager, Brian Smith, said the project had been moving at a very fast pace.

"We have conducted the largest geotechnical site investigation in Australia, welcomed new joint venture participants, signed agreements with premier LNG buyers and made significant progress on environmental approvals," Mr Smith said.

"Front end engineering and design work is complete and we expect to reach a final investment in the second half of 2011 once environmental approvals and other associated agreements are finalised with government."

The three joint venture participants are Apache Corp, Kufpec (Kuwait Foreign Petroleum Exploration Co) and Shell Development, with the former two also providing additional gas from offshore fields.

Heads of Agreements that could account for sales of 80 per cent of initial production and further spread equity in the project, have been negotiated with Tokyo Electric Power Company (TEPCO), Kyushu Electric Power Company, and Korea Gas Corporation (KOGAS).

The Wheatstone project team has made significant progress through the statutory approvals requirements of the Australian and Western Australian Governments.

In July 2010, a Native Title Heads of Agreement was signed with the local traditional land owners, the Thalanyji people, that will provide significant benefits in terms of education, training, employment, business development and financial support.

Chevron has also completed a review of potential environmental and social risks and impacts and developed a management plan. These are being jointly assessed by the State and Federal Governments.

In June 2011, the State's Environmental Protection Authority recommended conditional environmental approval of Chevron's proposal for an LNG plant and associated facilities.

Onshore, the site will need to be raised by eight metres to build a raised pad for LNG, condensate and natural gas processing and storage facilities, power generation, and a water supply and waste water disposal system.

The project includes constructing a 12 kilometre road to provide access from the Onslow road and an approximate 70 kilometre pipeline connecting the domestic gas facility to the Dampier to Bunbury Natural Gas Pipeline.

During peak construction, Wheatstone will generate about 6,500 direct and indirect jobs in Australia—the majority in Western Australia.

Once operational, Wheatstone will employ hundreds of on-site workers who are expected to be accommodated in Onslow, either as residents or on a fly in fly out basis.

Port construction will include approximately 12 kilometres of shipping channel and a turning basin, a product loading facility and a materials offloading facility.

The Wheatstone facility will join BHP Billiton's Macedon natural gas processing plant, which is under construction, on the State Government's planned 8,000 hectare Ashburton North Strategic Industrial Area, which is being developed specifically to accommodate hydrocarbon-based industry.

Chevron is negotiating an agreement with the Western Australian Government that will cover the rights and obligations of both parties, and the terms and conditions for development of the project. Issues covered by such agreements include, security of land and water access, for the life of the project, provision for multi-user access to appropriate port infrastructure and land corridors.

Chevron is also working with the Western Australian Government and the Shire of Ashburton to ensure that Onslow is prepared for the project.

Residential commercial and industrial land will be developed, and energy and water supplies expanded, to accommodate rapid population growth and increased business activity. Education, health and recreation services and facilities will be similarly upgraded.

With up to 300 truck movements a day at peak expected along the 80 kilometre road linking Onslow with the North West Coastal highway, significant road improvements will also be required.

"We have been working closely with the Onslow community to learn about their aspirations and expectations surrounding the Wheatstone Project," Mr Smith said.

"This ongoing consultation has allowed us to develop some valuable partnerships and programs that will have a direct impact on the community, including education, training and health initiatives."

The Department of State Development, as the Western Australian Government's lead agency for the Wheatstone project, is responsible for co-ordinating and managing Government interactions and statutory approvals processes and leading negotiations with Chevron. ■

# STRONG PARTNERSHIPS

## WA working with Japan & Korea



Premier Colin Barnett met with the Governor of Hyogo Prefecture, Toshizo Ido, in Japan.

Ranked second and third for Western Australian exports, Japan and South Korea are two of Western Australia's most important economic partners with WA exports to the two countries totalling almost A\$30billion in the past year.

In March, Western Australian Premier and Minister for State Development, Colin Barnett travelled to Japan and South Korea for an official eight-day visit, meeting with industry and government decision makers.

Announcing his visit, Mr Barnett said that as well as reinforcing existing trade and investment relationships, he would encourage even greater involvement in the development of Western Australian resources and infrastructure.

"Japan is the second largest market for Western Australia's exports and Korea the third, so industry in both countries has a lot to gain from the continued expansion of our minerals and energy sectors and development of new export infrastructure," he said.

"Last year, the combined value of the State's exports to these markets was almost A\$30billion and companies from both countries are involved in new resources and industrial projects in Western Australia.

"Japanese and Korean investment is welcome in Western Australia and I'll be encouraging companies to take a broad view of the opportunities to secure resources for the future.

"These opportunities could also include developing more advanced processing and materials manufacture in Western Australia."

While in Japan, Mr Barnett discussed future investment plans and opportunities with senior executives of companies with interests in Western Australia, including:

- Mitsubishi Corporation – a diverse industrial company and a partner in the Oakajee project
- Japan Steel Mills – representing Japan's five largest steel producers; all important buyers of WA iron ore
- Mitsui & Co. – an investor in, and customer for, Australian minerals, energy, forestry, agriculture, food and infrastructure sectors
- Inpex – a global petroleum explorer and producer

- Nisshin Flour Milling Association – a customer for WA grains.

The Premier met with senior Japanese Government officials including Mr Banno, Japanese State Secretary for Foreign Affairs and addressed an investment luncheon organised by the Australian Ambassador to Japan.

Mr Barnett also attended a function hosted by the Governor of Hyogo Prefecture, Mr Toshizo Ido, to mark the 30th Anniversary of the Prefecture’s Sister State relationship with Western Australia.

Tragically, later in March, Japan experienced the tsunami and earthquake disasters in coastal areas of Sendai, the capital city of Miyagi Prefecture.

The magnitude 9 offshore earthquake triggered the destructive tsunami, causing catastrophic damage.

Along with others around the world, Western Australia reached out to Japan to offer our condolences and assistance to the people of Sendai.

Japan is undergoing a recovery process and, although Western Australian exports to the country slowed following the natural disasters, our iron ore and LNG exports to the country will help Japan to rebuild, providing critical infrastructure and energy supplies.

Following his visit to Japan, the Premier travelled to Korea for his first official visit to the country. His Korea visit also had a strong trade and investment focus.

As well as meeting with Korean Government officials and the Australian Ambassador to Korea, Mr Barnett met with senior executives of major resources, engineering and trading companies including:

- KOGAS – the world’s biggest LNG importer
- POSCO – the world’s third largest steel producer
- Hyundai and KIA Motor Group – a large conglomerate that includes Hyundai Steel
- STX – a global shipping operator and resources trader

- GS Construction – a global engineering and construction company, and the prime contractor for building the Perdaman Collie coal to urea project.

The Premier was invited to meet with the Korean Prime Minister Kim Hwang-sik where they discussed Korea’s heightened interest in Western Australia both in buying iron ore and as a significant investor and buyer in liquefied natural gas.

In recent years, major Korean engineering companies have located offices in Western Australia to participate in major projects, including GS Construction.

Korea is ranked as Western Australia’s largest market for crude oil exports and our third-largest market for iron ore, beef and wheat exports.

This year marks the 50th anniversary of diplomatic relations between Australia and the Republic of Korea, with 2011 designated as the Australia-Korea Year of Friendship. ■



Premier Colin Barnett with South Korean Prime Minister Kim Hwang-sik.



# Global giants land in WA

## Global companies seek out Perth to service petroleum industry

Western Australia is continuing to cement its reputation as a petroleum industry services hub, with two big name companies recently establishing themselves in Perth.

In March, General Electric (GE) chairman, and world-renowned business leader, Jeffrey Immelt was in Perth for the official launch of the company's new Jandakot facility.

Mr Immelt has chaired GE since 2001. In 2009, he was appointed to the United States President's Economic Recovery Advisory Board and, earlier this year, was appointed as President Obama's chair of his outside panel of economic advisers.

With Forbes rating GE the world's second largest company in 2010, Mr Immelt's visit to Perth marked the growing importance of Western Australia's status in the global petroleum industry.

GE is collaborating with Western Australian tertiary and training institutions to establish an Australasian hub for regional training, including leadership expertise currently run out of New York.

A new A\$80 million technology and education centre will be located at Perth's Jandakot airport and will help deliver the next generation of skilled workers in the oil, gas, energy, mining, transportation and water industries.

Steve Sargent, President and CEO, GE Australia and New Zealand said the company had a tradition of investing in people and top quality training and would work with government to help create a highly skilled labour force.

"Developing the right skills is essential to fuelling Australia's economic growth and ensuring that the maximum value is created from projects like Gorgon both locally and nationally," he said.

"Working with the Australian Government to invest in a highly skilled labour force is going to create tremendous value for both the industries that are thriving here, and the local economy.

*"It's about business aligning with government plans to invest in the critical skills needed to support growth."*

The Department of State Development, through its Industry and Investment branch, has been working with GE over 18 months on the proposed Jandakot facility.

Initially planned to consolidate several GE groups in Western Australia, the fast-tracked A\$80 million investment will create an oil and gas training, technology and repair centre that will employ about 400 people.



An artist's impression of the new A\$80m centre General Electric will build at Jandakot.

The centre will also service and maintain a range of sophisticated equipment, including sub surface equipment that is currently sent as far away as Norway and Houston, as well as develop in-house research and development capabilities.

GE's Australian profile has been constantly expanding and has reached 200 people—a large step up from 75 employees in 2009.

GE Oil and Gas has been awarded over A\$1billion in contracts from the Gorgon project, including the supply of three refrigerant compression trains, six compression trains and five turbines of 130 megawatts each.

Another industry giant to land in Perth recently was GL Nobel Denton, which opened an office to service the local oil and gas industry. Richard Palmer will head the Perth Office.

Mr Palmer said GL Nobel Denton saw the opening of the Perth office as the best way for the company to service the multi-billion dollar oil and gas projects scheduled for Australia.

“With a significant number of large projects in the Australian North-West Shelf region and Queensland, amounting to more than US\$170billion of capital expenditure for projects that are at front-end engineering stages and all aiming to start production in the next four or five years, GL Noble Denton are opening the Perth office to be best placed to add value to these projects,” he said.

*“A number of the development concepts are new to the operators and they are looking for the complete range of GL Noble Denton’s independent offerings from assurance, to advanced engineering and consulting, to marine operations and execution to help make these projects a reality both on – and offshore.”*

Providing technical services to the oil and gas industry, GL Nobel Denton was founded in 2010, formed through a British-German company merger.

It currently has 10 Perth based employees, with plans to triple staff numbers.

Globally, the company employs more than 3,000 engineers in 80 countries, offering marine assurance; warranty and casualty investigation; rig moving; naval architectural services; design verification; risk and safety, transportation and installation consulting; due diligence; and dynamic positioning.

The Department of State Development’s Industry and Investment branch worked closely with Austrade in Singapore and the Agent General’s Office in London to provide investor presentations and a customised itinerary for Mr Palmer.

The Industry and Investment branch is available to assist companies interested in better understanding the diverse opportunities available in Western Australia. Contact David McCulloch, General Manager, Industry and Investment, Department of State Development +61 8 9222 0496. ■

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# State of opportunity

## Local participation in resources sector

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Their skills and expertise have been forged in building a world class mining and petroleum economy, but Western Australian businesses are now facing new challenges to their dominant role in servicing and supplying the State's resources projects.

A Local Content Report prepared by the Western Australian Departments of State Development and Commerce and adopted by the State Government, documents significant changes underway in the resource project development market.

It also looks at responses by industry and the Western Australian Government to maintain high levels of local participation in the State's major economic sector.

The report shows that annual business investment in Western Australia more than doubled (122%) to A\$45 billion in real terms between 2004-05 and 2009-10.

The State's resources sector, which grew its output from A\$33b to A\$71b in the same five-year period, and in 2010 earned A\$91b, is the undisputed driver of investment growth.

Annual investment is forecast to rise to A\$62b in 2013-14, with mineral and petroleum projects worth more than A\$170b currently committed, or under consideration.

While Western Australia doesn't mandate local content in major resources projects, the Western Australian Government does require that local industry has a full, fair and reasonable opportunity to compete for contracts.

Companies developing and operating major projects under formal State Agreements with the Western Australian Government are required to report on their contract expenditure identifying their value, nature and percentage of State, Australian and overseas content.

A wide range of Western Australian businesses have developed in response to opportunities created by the State's diverse, export focussed resources industries.

Western Australia's relative isolation gave local businesses competitive advantages in competing for contracts from design and engineering, to construction, fabrication of major components and ongoing supply and maintenance.

These advantages also attracted leading global companies to locate operations, or establish partnerships in Western Australia.

At the same time, the rigorous requirements of global mining companies have ensured that contractors providing locally sourced services and products met high standards of quality and competitiveness.

As a result, a dynamic and diverse Western Australian mining technology and services sector has developed. A study by the Australian Bureau of Agricultural and Resources Economics and Science identified 320 such companies in Western Australia, almost a third of the national total.

These include companies providing a vast range of project management, engineering scientific and IT services, subsea technologies, specialist manufacturing, fabrication, construction and operational services, logistics and equipment suppliers.

However, while investment in the State's mineral and petroleum resources industries is ensuring a buoyant Western Australian economy, some sectors, particularly steel fabrication and engineering and design, are finding that their share of resources based contracts is declining.

The Local Content Report documents reasons for this, many of which relate to the massive scale of current projects, including the A\$43b dollar Gorgon LNG and gas project, the A\$14b Pluto LNG project, the A\$5b Sino Iron project, and multibillion dollar expenditure by major iron ore producers on expanding their production and export capacities.

Opportunities on the scale of those available in Western Australia are attracting growing interest from overseas providers and manufacturers, especially when economic growth remains subdued in many of their usual markets.

At the same time, advances in transport, communications and construction technologies, have eroded some of the "natural" advantages of locally based companies.

Additionally, the size of individual contracts issued for major new projects may exceed the capacity of local suppliers.

Also, the emergence of China as a major exporter of relatively low cost steel and steel products has dramatically changed a market in which the volume of steel used is rising rapidly.

This is especially so for gas processing projects either located offshore, or on the coastline, with massive specialist yards in Asia able to offer significant economies of scale in constructing modular components.

Local industry participation fell from a peak of 72 per cent for train 4 of Woodside's North West Shelf project, commissioned in 2004, to an estimated 45-55 per cent for the Pluto and Gorgon projects.

The report also identifies the procurement practices of major project proponents as another significant change for Western Australian companies accustomed to competing for contracts through locally managed tendering processes.

Current procurement practises include the use of engineering, procurement and construction management (EPCM) contractors based offshore, a variety of supplier selection arrangements, and reliance on established global supply chains.

Smaller and medium local firms may not have the profile with EPCM contractors, links to supply chains, or familiarity with procurement processes that would enable their participation.

Current factors such as the historically high value of the \$A, and high employment levels affecting relative labour costs add to these competitive challenges.

The increasing involvement of international companies linked to suppliers of construction materials and services, as equity partners in major resources projects will present new challenges in the future.

Despite this, the report documents the continuing success of Western Australian industry.

Based on reports from 21 projects operating under State Agreements in 2010, 86 per cent of total operational expenditure of A\$4.6b, and 53 per cent (A\$6.8b) of total new construction spending of A\$12.8b was awarded locally. Similar figures were achieved over 35 projects in 2009.

Local industry retains significant competitiveness in supporting mining projects including iron ore, gold and other metals, where it can offer well-established track records in providing a diverse range of services, for every phase of development.

The report also shows that a large and diverse range of Western Australian companies is successfully competing for contracts in the offshore petroleum and gas processing sectors.

Western Australian companies are employing strategies including investing in expanded capacity, new equipment and technology to increase their competitiveness.

Established local engineering company Civmec (see story p12) has built Australia's largest, most advanced fabrication workshop to enable it to compete for larger scale contracts.

Civmec and many other companies are actively building stronger links with project proponents and EPCM providers to increase their opportunities and emphasise the advantages their

proximity offers in being able to provide highly responsive life-of-project services.

Some have shifted their focus to establishing a niche in global supply chains. Matrix Composites & Engineering Limited (*Prospect* Dec 2010) has transformed from a heavy engineering company, to a successful exporter of advanced material components to major suppliers to the global oil and gas industry.

Others have built on their success in the local resources sector to expand their operations into national and international markets, supplying specialised services and equipment to projects across the globe.

Lycopodium Limited (story p12), a Perth based, globally successful EPCM provider for the mining sector, aims to maintain a portfolio of projects roughly 50 per cent of which are located overseas.

Inevitably too, the sheer magnitude of projects underway and planned is attracting international companies to locate operations in Western Australia, creating significant new opportunities for linkages.

Global giant General Electric Corporation (story p8) is currently establishing a A\$80 million technology and training centre in the metropolitan area that includes a regional skills and development centre, and a workshop to service and commission its products and technology that will support its operations in Western Australia's LNG sector.

### **Government response**

The Local Content Report also outlines government policy options to support the objective of full, fair and reasonable opportunities for local participation in major resources and infrastructure projects.

This principle is supported by both the Western Australian and the Australian Government through policies that are consistent with national and international obligations to ensure that local, or national and international goods and services are treated equally.

Policy instruments currently used include commitments incorporated in State Agreements and Industry Participation Plans negotiated with major project proponents.

Industry Participation Plans document the actions and activities that will give capable and competitive local suppliers full, fair and reasonable opportunities to participate in their projects.

The Western Australian Government's Local Content Unit in the Department of Commerce manages the local content provisions of Agreement Acts, develops Industry Participation Plans and works with local suppliers to identify opportunities and resolve contentious issues.

Also, through the State's peak business body, the Chamber of Commerce and Industry (WA) Inc, the Government funds an Industry Capability Network (ICNWA) referral and advisory service for proponents and suppliers, and a Project Connect Web service, which provide advance market intelligence for local industry, details of local supplier capacity and capabilities, and contract opportunities on current projects.

The Western Australian Government is increasingly taking a more direct role in engaging major resource proponents in dialogue about procurement practices and trends and opportunities for local suppliers.

Other initiatives underway include a wider use of more detailed Industry Participation Plans, better information sharing between State and Commonwealth agencies, and a review and revamping of ICNWA and Project connect services. ■

## **Mining Employee Count Critical to 2011 Census**

The 2011 Census will be held on Tuesday, 9 August and one of the biggest challenges will be to achieve an accurate count of mining and resource employees – especially FIFO.

WA's mining regions and the State need everyone in the regions on Census night to complete a Census form AND workers need to record their usual place of residence as their mining camp - if they spend at least half their time there (six months or more of the year).

Workers off shift at home on Census night also need to record their camp as their usual place of residence.

**Contact [marie-louise.hunt@abs.gov.au](mailto:marie-louise.hunt@abs.gov.au) for brochures/posters for your camps or for more information.**

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# Tale of two local companies

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The processing plant at Barrick Gold's Buzwagi project in Tanzania is one of Lycopodium's international projects. Image courtesy of Lycopodium.

Two successful, but very different, Western Australian businesses illustrate the diversity of opportunities that Western Australia's powerful resources sector generates for local industry.

Both Lycopodium Limited and Civmec Construction & Engineering Pty Ltd (Civmec) have developed their businesses through 20 years of changing economic conditions and both are looking forward with optimism.

Lycopodium is an engineering and project management company that through five subsidiaries provides a wide range of services for mining and mineral processing projects, and for process industries, infrastructure, renewable energy and asset management.

Managing Director Rod Leonard said the company was founded in 1992 by five partners and with a total staff of twelve.

"Initially we worked in the gold processing sector, predominantly on brownfield projects in Western Australia and then the Northern Territory," Mr Leonard said.

"Then in the mid 1990s, one of our Australian clients took us with them to manage the development of a gold project in Africa.

Since then we have worked on studies and projects in more than 50 countries and currently have projects in about a dozen African countries, in South East Asia and in North America.

"We have offices in four Australian states and in Canada, Ghana and the Phillipines."

"Now gold projects account for about 35 per cent of our work, and we also have experience with iron ore, nickel, copper manganese and other minerals.

"Our real forte is the delivery of the process plant, but we provide a full range of process, engineering project and construction management services (EPCM) and subsequent asset management for the above ground operations of a mining project.

"Increasingly also, establishing a mining operation is an infrastructure project, so we have to have expertise in building roads, power and water supplies, setting up workforce accommodation."

Mr Leonard said Lycopodium currently employs about 750 staff, the majority located in Western Australia.

He said Western Australia offered real advantages as the company's base.

"Western Australia is one of a very few minerals engineering hubs in the world," he said.

*"Perth is a one stop centre for evaluating, design and managing the development of mining projects."*

"Clients come to Western Australia from as far away as North America and Africa because they know they can get the full range of high quality expertise from Australian engineers."

He said the company's target now is to have about 50 per cent of its work in Western Australian projects and 50 per cent in projects interstate or overseas.

"We are internationally recognised for our ability to deliver and our strong focus remains the quality of the service we provide," he said.

"Lycopodium's growth is the product of this approach, rather than the driver."

## **Civmec**

Civmec provides civil construction and structural/mechanical and process piping (SMP) services to the mining, oil & gas, infrastructure and utilities sectors and for EPCM contractors across Australia.



The new Civmec workshop facility officially opened in April at the Australian Marine Complex, located south of Perth.

Recent work has included building steel and concrete structures for gold and iron ore projects, two 420 tonne seawater intake structures for a desalination plant and 11 precast 450 tonne concrete caissons for a wharf on Barrow Island for the Gorgon Project.

The company has set its sights on winning contracts in major Western Australian mining and petroleum projects, and in 2009 commenced construction of Australia's largest, most advanced fabrication hall.

Civmec Business Development Manager Joe Macri said the A\$30 million 29,200 square metre facility is specifically designed to handle very large modular assembly projects.

"Our facilities have been designed to accommodate a whole range of modern specialist, technically advanced fabrication equipment and will enable us to employ our own diverse capabilities, technology and resources, with minimal external interfaces.

"The workshop's large undercover bays range in size from 25 to 30 metres in width, it has 22 overhead cranes with 12 to 20 metres of clearance underneath the hooks, and lifting capacities ranging from 20 to 50 tonnes," Mr Macri said.

*"Not only can we fabricate general steel work and piping, we can also fabricate and assemble and commission large offshore or onshore structures and large reinforced precast concrete structures.*

"Currently, we are constructing large precast concrete foundations for Gorgon's major onshore civil works contractor, all inside our workshop. In the past, these jobs were generally done outside and exposed to extreme weather conditions, making them very costly.

"The workshop is strategically located on 70,000 square metres of land at the Australian Marine Complex, just 500 metres from the common user heavy 15,000 tonne load out wharf and floating dock, making waterfront access an additional advantage.

"We can use the complex's self propelled modular transporters to carry loads of up to 4,600 tonnes."

Mr Macri said Civmec's new workshop had attracted interest from representatives of major resources companies, and their EPCM contractors, who recently visited the facility.

"Our facilities are also attracting interest from overseas supplier companies, which we hope will encourage them to look to Civmec for assistance with offshore opportunities, especially in specialist markets such as subsea fabrication."

Mr Macri said Civmec's investment represented a significant step towards enhancing Western Australian capability in general and increasing Australian and local participation in resources projects.

He said the state of the art facilities and the working environment they offered would help attract the best trades and supervisory personnel to work on Civmec's projects.

The facility has the capacity to employ up to 600 trades employees and 100 management and administrative staff in a single shift. ■

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# SHARED RAIL SEES NULLAGINE RAPID DEVELOPMENT

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Western Australia's latest iron ore mine officially opened on April 18, only four years after the first holes were drilled into the deposit.

The Nullagine iron ore mine, located 140 kilometres north of Newman, is a joint venture between BC Iron and Fortescue Metals Group (FMG).

The opening of the mine was a significant milestone. It was the first time a junior iron ore miner had been able to use third party rail infrastructure to transport iron ore in the Pilbara.

Member of the Legislative Council, the Honourable Ken Baston, officially opened the mine on behalf of the Western Australian Government.

"Access to rail and port can be significant barriers for new producers," Mr Baston said.

*"Fortunately, FMG have also long believed in the principle of shared infrastructure in the Pilbara."*

"This preparedness to share infrastructure has allowed this mine to be brought into production quickly and at a time of historically high iron ore prices."

The Nullagine project is being operated as a 50/50 joint venture between BC Iron and FMG.

Mr Baston said the mine had been developed at a rapid pace.

"It has only been four years since the first drill hole into the deposit, three years since the maiden resource estimate and a little over one year since the board of BC Iron approved development of the project," he said.

"This is an amazing achievement and one in which BC Iron and FMG should feel extremely proud."

BC Iron saw the joint venture as a way of unlocking the value of the Nullagine iron ore asset, which would have otherwise been stranded.

The non-binding Memorandum of Understanding between FMG and BC Iron was announced on 5 July, 2007 and the deal was finalised in June–July 2009.

The first drill-hole into the deposit was on 10 April, 2007.

The maiden resource estimate for the Nullagine mineralisation was released in March 2008. By January 2009 the resource estimate had nearly doubled.

The Board of BC Iron approved commencement of the feasibility study of the project in July 2009 and trial mining commenced a few months later in September.

By December that year, the board had approved development of the project and by mid-2010, mining approvals had been received and construction of mining infrastructure started.

The first ore from the Nullagine project was railed from FMG's new Christmas Creek facility on 31 January, 2011 and loaded onto a ship at Port Hedland on 24 February.

About 20,000 tonnes of Nullagine joint venture ore was loaded and exported to inaugural customer the Henghou Group, a major Chinese trading company. ■



*BC Iron chairman Tony Kiernan and BC Iron Managing Director Mike Young at the Nullagine iron ore mine opening.*



*Western Australia's latest iron ore mine, BC Iron and FMG's Nullagine mine, was officially opened on April 18, only four years after the first holes were drilled into the deposit.*

# WA EXPERTS IN CARBON CAPTURE



*Dominique Van Gent.*

Western Australian expertise in carbon capture and storage was officially recognised with the recent appointment of the Department of Mines and Petroleum's Coordinator, Carbon Strategy, Dominique Van Gent to the Australian Government's National Carbon Capture and Storage Council (NCCS).

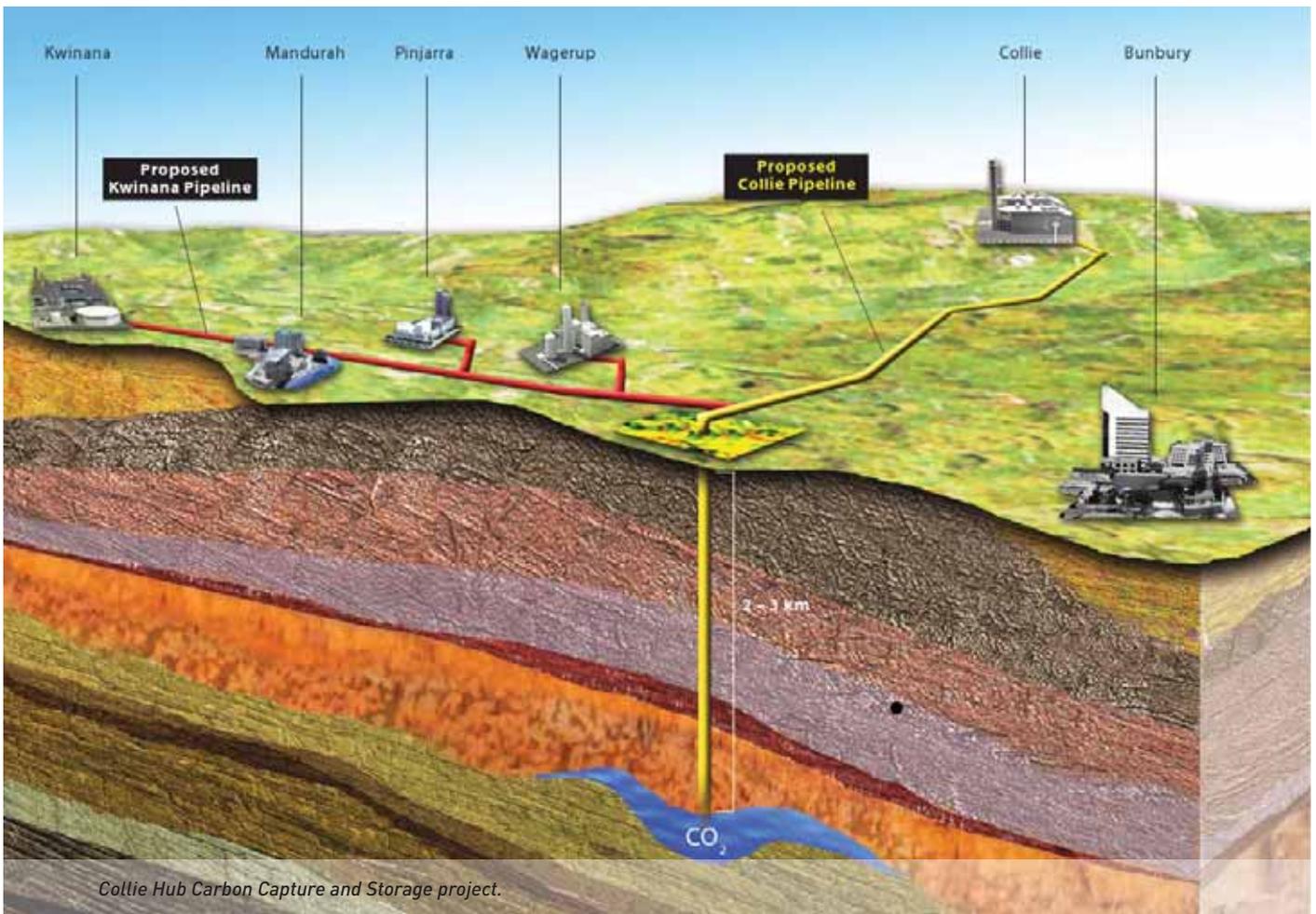
Mr Van Gent was nominated to the NCCS, which supersedes the National Low Emissions Coal (NLEC) Council, by Minister for Mines Norman Moore.

The NCCS was formed in recognition of the need to broaden the focus of the NLEC Council beyond coal-fired power stations and assist the Federal Government to chart Australia's development and uptake of carbon capture and storage (CCS).

The council will bring together key stakeholders to advise the Federal Government on the accelerated development and deployment of CCS in Australia, including a portfolio of industrial-scale demonstration projects in 2012-2020 and commercial deployment from 2020.

The council will also oversee the implementation of the National Low Emissions Coal Strategy and the National Carbon Mapping and Infrastructure Plan.

Mr Van Gent contributed to the development of the National Low Emissions Coal Strategy launched in November last year, together with the National Carbon Mapping and Infrastructure Plan prepared by the Carbon Storage Taskforce.



*Collie Hub Carbon Capture and Storage project.*

Geological Survey of Western Australia (GSWA) Assistant Director Jeff Haworth was another DMP member who contributed significantly as a member of the Carbon Storage Taskforce.

Mr Van Gent has also been busy coordinating the Collie South West CO<sub>2</sub> Geosequestration Hub, which has been nominated as one of four national CCS flagship projects.

Western Australia is rapidly developing as Australia's key state in the sequestration field of CCS with critically important oil and gas expertise located in this state.

The Australian Resources Research Centre in Bentley is also emerging as a significant research centre with the Western Australian Energy Research Alliance being able to harness the

sub-surface expertise located within the University of Western Australia, Curtin University and the CSIRO.

The Gorgon project, currently under construction, will sequester 3.4 million tonnes of CO<sub>2</sub> per annum two kilometres below the surface of Barrow Island, in the state's north west.

The project is one of the largest CCS projects in the execute stage in the world and, in order to receive approvals, it satisfied some of the world's most stringent environmental impact assessment conditions.

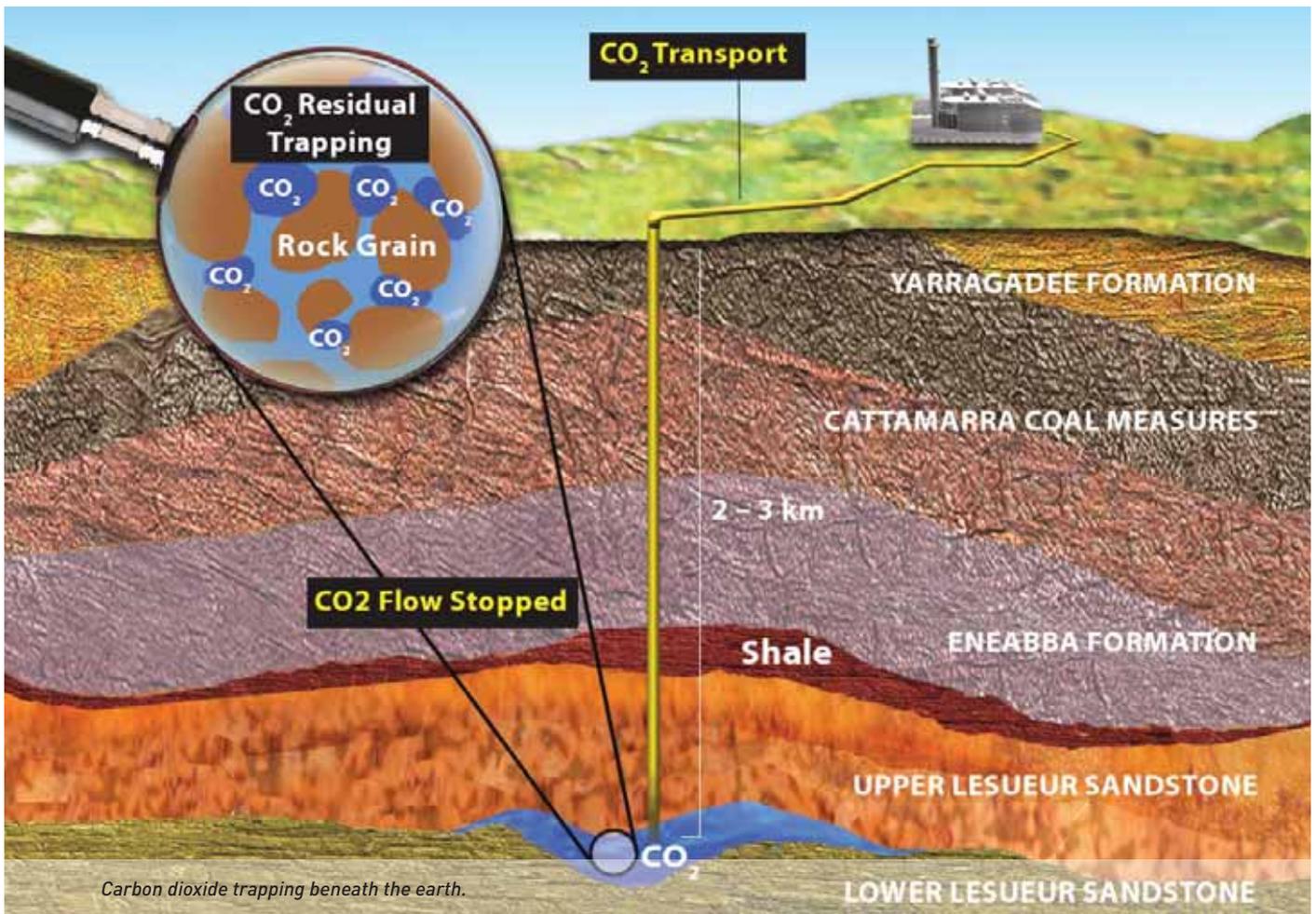
The project also includes integrated monitoring, reservoir management and risk minimisation strategies.

The Collie Hub project, located onshore in the south west of the state is one

of the world's largest integrated CCS proposals, taking CO<sub>2</sub> from gas and coal fired, utilising CO<sub>2</sub> for industrial purposes and testing the viability of sequestration two to three kilometres underground in the Lesueur formation.

Mr Van Gent said his appointment to the NCCS Council, and that of other WA industry and research representatives, recognised the strengths and expertise that Western Australian can bring to the national table.

Federal Resources Minister Martin Ferguson officially appointed Mr Van Gent to the council and thanked him for his previous contribution as a member of the NLEC Council, which was instrumental in the creation of the Australian National Low Emissions Coal Research and Development Ltd. ■





# Spotlight on WA in Canada

*Department of Mines and Petroleum Minister Norman Moore spoke of emerging investment opportunities at the Prospectors and Developers Association of Canada (PDAC) convention in Toronto.*

Western Australian investment opportunities were squarely in the spotlight when Mines and Petroleum Minister Norman Moore visited Canada on a speaking tour in March.

Mr Moore spoke at the Prospectors and Developers Association of Canada (PDAC) convention in Toronto, as well as lead-up events in Vancouver.

PDAC is one of the largest mining trade shows in the world and attracted close to 28,000 participants this year, with Australia providing the third largest number of delegates after Canada and the United States.

Mr Moore represented Western Australia but also spoke on behalf of Australia as a whole at several events.

Speaking at PDAC's Growth Opportunities in Western Australia seminar, Mr Moore outlined recent exploration successes in the State such as the Tropicana gold deposit, Cyclone mineral sands deposit and Doolgunna copper-gold deposit.

"There have of course been ongoing discoveries of iron ore during the same time, and not only in the renowned Hamersley Basin," he said.

"Western Australia's mineral diversity was also on show with the recent discovery of a new supply of rare earths at Mount Weld, which is an uncommon event outside China."

Mr Moore outlined the State Government's commitments to the resources industry including approvals reform, the Exploration Incentive Scheme, infrastructure developments and allowing the mining of uranium.

He also distanced the State from the Federal Government's proposed Resources Rent Tax.

"Australia has a wealth of investment opportunities but there is perhaps no better place to be than Western Australia," the Minister said.

"The high level of exploration activity and success highlights the State's immense potential and is a very good reason

why you should be involved in your own right or by joint venture with companies already active in the State."

Mr Moore said the trip had been very successful.

*"I spoke to a large number of potential investors in the State and informed them of the huge range of opportunities that exist here and the support that the Government is willing to offer," he said.*

"The response was very positive and I expect there will be some follow-up inquiries to the Department of Mines and Petroleum as a result of my visit."

Mr Moore was accompanied by Rick Rogerson, Executive Director of the Geological Survey of Western Australia, and Gaomai Trench, Manager of Mineral Promotion. ■

# CHANGE OF LEADER FOR STATE DEVELOPMENT

The Department of State Development has undergone a change at the top but with Western Australia's resources sector powering forward, the focus for the department remains on leading responsible development of the state.

In April, the department farewelled Director General Anne Nolan.

Ms Nolan headed up the department since it was established in January 2009, following on from her initial appointment in July 2008 as Director General of the then Department of Industry and Resources.

With extensive experience in leading and developing public sector agencies, she was instrumental in establishing the new Department of State Development as a lead agency in the public sector and positioning the department as the Western Australian Government's lead agency for the development of the state.

During her tenure, she facilitated the state's role in some of Australia's biggest resource projects, including the Gorgon and Browse gas developments, the opening up and expansion of capacity of iron ore projects in Western Australia, and oversaw infrastructure development for the resources sector throughout the state.

Ms Nolan's direction of the Department of State Development coincided with a period of significant growth in Western Australia's resources sector.

"Western Australia is experiencing a period of substantial growth underpinned by several major projects of unprecedented scale and complexity," she said.

"The focus for the department is on the successful delivery of key resources and industry infrastructure projects in which the Western Australian Government is in partnership with the private sector.



*Previous Director General  
Anne Nolan.*



*Department of State Development  
Director General Steve Wood.*

"These projects include those in the Kimberley, Pilbara and the Mid West, which will stimulate major growth opportunities for those regions and for the state.

"Responsible growth requires balancing economic, social and environmental interests, and addressing long-term as well as short-term considerations—this has been my key focus during my time as Director General."

Ms Nolan also steered the department's focus towards encouraging global trade and investment in the state.

She played a key role in securing Perth as the host for the 18th International Conference and Exhibition on Liquefied Natural Gas (LNG18), to be held in 2016.

LNG18 is one of the most significant conferences for the energy sector and Perth hosting the event is a clear indication of Western Australia's growing status in the world LNG industry.

"As a relatively new department, we've already achieved a lot," Ms Nolan said.

"I strongly believe the department is well positioned to ensure the success of complex major projects and contribute to responsible development for the benefit of the whole Western Australian community."

Ms Nolan will head-up the Western Australian Government's newly established Department of Finance, as Director General.

Steve Wood is the new Acting Director General for the Department of State Development, having taken over from Ms Nolan in early May.

Mr Wood joins the department with extensive experience both in the Federal and State public sectors—primarily in workplace relations, but with substantial policy roles in the Department of the Premier and Cabinet as Chief Executive of the Policy Office (1995-6) and Deputy Director General (1997-99 and from late 2009 until present). He was a Commissioner in the Western Australian Industrial Relations Commission from 2000 to 2009.

In his most recent role at DPC, Mr Wood worked closely with State Development staff on several of our biggest projects, including enabling better integration of BHP Billiton-Rio Tinto iron ore infrastructure and operations.

Mr Wood said he will be working with industry stakeholders and project proponents, and across government to achieve beneficial outcomes on behalf of the state.

"Western Australia will experience significant growth in the resources sector for the foreseeable future, with big projects in the pipeline," he said.

Mr Wood said he looked forward to the challenges facing State Development and the state. ■



# New guidelines governing mine closure and rehabilitation released by Minister

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Following extensive public consultation the Department of Mines and Petroleum has released new guidelines to ensure mining companies have adequate plans to rehabilitate mines on closure or relinquishment.

Mines and Petroleum Minister Norman Moore said the Guidelines for Preparing Mine Closure Plans were jointly developed by DMP and the Environmental Protection Authority (EPA) to help mining companies prepare mine closure plans.

“Starting in October last year, extensive public comment periods in developing these guidelines gave DMP and the EPA an insight into the expectations of industry and the community regarding mine site closure,” Mr Moore said.

*“The objective of the guidelines is to ensure effective planning throughout the life of mines and to ensure they are closed in an environmentally sustainable manner with minimum liability to the State.”*

The guidelines were developed to support amendments to the *Mining Act 1978* following the assent of the Approval and Related Reforms (Mining) (No. 2) Bill 2009 on 3 June, 2010.

Mine closure plans are an essential management tool for industry to ensure all stakeholders have their interests considered during the mine closure process, and that early risks are identified.

The release of the joint guidelines will assist in further streamlining mine closure requirements in Western Australia.

DMP and the EPA, in consultation with industry and other stakeholders, are currently developing an accompanying Mine Closure Plan Administration Information Package.

Following its release on 1 July 2011, the package will further streamline the administration of mine closure plans including the processes for assessing the plans. ■

The guidelines can be downloaded from [www.dmp.wa.gov.au/mineclosure](http://www.dmp.wa.gov.au/mineclosure)



DMP Director General Richard Sellers (left) and Petroleum Director Bill Tinapple watch as CSIRO's Bruce Maney showcases the features of the Rock Mechanics Laboratory.

# DMP builds on CSIRO links

A partnership between the Department of Mines and Petroleum (DMP) and CSIRO will help foster improved research results for the resources industry.

The department's Director General Richard Sellers and other staff recently toured the Australian Resources Research Centre (ARRC) at the invitation of CSIRO, which operates the centre with support from Curtin University and the Western Australian Government.

ARRC is home to a network of research centres and alliances focused on the resources industry and houses organisations including the Western Australian Energy Research Alliance (WA:ERA) and iVEC, which manages the A\$80 million Pawsey Centre Project.

Topics discussed focused on the petroleum sector and included ways of increasing onshore petroleum exploration and engaging industry in innovative research; the importance of gas-to-liquids technology; opportunities for shale and tight gas developments; and updates on carbon dioxide storage and geothermal energy research.

Mr Sellers was escorted on a tour of ARRC's state of the art facilities and technologies including a demonstration of rock fracturing in CSIRO's Rock Mechanics Laboratory and witnessing

CSIRO's Hydrates Flow Loop, where flow assurance was discussed.

"A key area of discussion was the development of strategic means of communicating the outcomes of research with industry and the community," Mr Sellers said.

*"A possible model put forward was CSIRO's Energymark program, which brings people together in small groups to learn about energy and climate change issues."*

DMP, CSIRO and industry members already work together in a number of fields, including tight gas and geosequestration research and development.

CSIRO's Director for Petroleum and Geothermal Research, Dr Edson Nakagawa said the organisation had a proud record of partnerships with industry and government, and looked forward to working with DMP to explore further means of providing benefits to local industry and the wider community.

"CSIRO has a proven track record in providing tools and technologies that deliver significant impact," he said.

Mr Sellers said collaboration delivered important results.

"The multipliers for the Western Australian community in terms of economic growth and employment opportunities are immense," he said.

"The WA:ERA concept has proven a very successful one in the petroleum sector and it is one that DMP and the Chamber of Minerals and Energy would like to see in the minerals sector if we can get industry members to come onboard."

Several members of DMP's Petroleum Branch also visited ARRC with Mr Sellers.

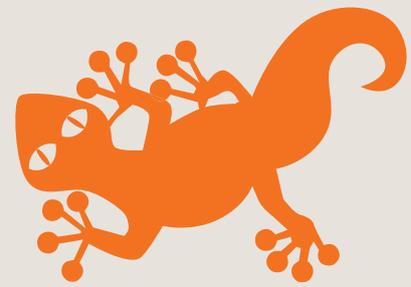
CSIRO representatives present at the meeting included Energy Group Executive Beverley Ronalds, WA:ERA Chief Executive Mark Stickells, Petroleum and Geothermal Research Director Edson Nakagawa, Gas and Geothermal Research Team Leader Jim Underschultz, and Business Development Manager Konrad Drogemuller. ■

# 20

## YEARS

## GOLDEN GECKO

Awards for Environmental Excellence



# Golden Geckos reaches milestone year

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The Department of Mines and Petroleum's Golden Gecko Awards celebrate their 20th anniversary this year and have attracted a typically large field, with 11 nominations.

DMP instigated the awards in 1992 in the hopes of raising industry standards of sustainable development and instilling community confidence in the resources industry.

Entries for this year's awards closed in April and their eligibility has been assessed.

An assessment panel, through an inspection of each operation, will review the submissions and prepare a report for the selection committee, which will select the recipients.

The recipients will be announced at a ceremony in early September at the Pan Pacific Hotel in Perth.

Mines and Petroleum Minister Norman Moore said it was exciting to see the State's resources sector displaying

contributions to environmental protection and management and the innovative solutions that are becoming available to enhance rehabilitation.

*"This year is a particularly special year as we celebrate two decades of the advancement of environmental management in our resources sector."*

"In the past 19 years, we have seen the achievements of winning entries become standard industry practice, raising the sector's environmental performance across the board," Mr Moore said.

Last year, Golden Geckos were awarded to Crosslands Resources and Pluton Resources, while Certificates of Merit went to Cliffs Asia Pacific Iron Ore and Rio Tinto Iron Ore.



Pluton Resources staff members with their 2010 Golden Gecko Award.



Crosslands Resources staff members with their 2010 Golden Gecko Award.

Crosslands was recognised for its research and innovative sampling technique for the endangered Schedule 1 Shield-back Trapdoor spider.

Results provided a new low impact technique for fauna surveys and reduced the buffer zone required around the spiders.

Pluton Resources was recognised for its limited impact exploration project on environmentally sensitive Irvine Island.

Pluton reduced ground disturbance from 30 square metres to just five square metres for its drilling platforms, which also contains mud and hydrocarbons in a closed system.

Since the awards began, the department has recognised 52 Award and 42 Certificate of Merit recipients.

Entries are judged against strict criteria and not against other applicants, making it possible for multiple Golden Gecko Awards to be won each year. ■

More information is available at [www.dmp.wa.gov.au/goldengecko/](http://www.dmp.wa.gov.au/goldengecko/)

# The 2011 Golden Gecko Awards nominations

## Apache

Use of horizontal direction drilling with delayed breakout for shoreline crossing of a new gas pipeline at Devil Creek Development Project.

## Argyle Diamond Mine (Biodiversity)

Development of Biodiversity Action Plan (BAP) in line with Rio Tinto's requirement for BAPs on all operations ranked as high biodiversity value.

## Argyle Diamond Mine (Water)

Focus on improved water management as a key environmental focus, with the end goal of self-sufficiency.

## BHP Billiton Iron Ore

Long-term study at Goldsworthy to increase understanding of Pilbara leaf-nosed bat activity, with implications for bat conservation globally.

## Cliffs Asia Pacific Iron Ore

Improving knowledge base and on-ground capacity for environmental management around northern Yilgarn operations.

## Compass Group

Centralised bulk production in Origin Foods program reduces onsite peeling, trimming and cutting in catering, cutting landfill and transport emissions.

## Golder Associates

Implementation of integrated approach to Wheatstone Phase Three Geotechnical Investigation to minimise environmental disturbance.

## Searcher Seismic

Vampire Two Dimensional Non Exclusive Seismic Survey within Browse Basin off Kimberley coast.

## WA Gas Networks

Mandurah Gas Lateral Project executed with high level of environmental management, including 20 per cent less native vegetation clearing than approved.

## Western Areas NL and ATMOS

Assisting Western Areas to avoid or minimise adverse dust impacts at an environmentally sensitive receptor near Spotted Quoll Pit.

## WorleyParsons and Port Hedland Port Authority

Environmental Impact Assessment and conformance monitoring of port infrastructure expansion at South West Creek.

# Managing risk – working with industry



*Delegates visited BHP Billiton's Mount Whaleback iron ore mine to gain an understanding of the company's risk management measures.*

The Department of Mines and Petroleum is currently working with industry to support the implementation of a risk management approach in the mining industry.

A delegation, including members of the Ministerial Advisory Panel on Best Practice Safety Regulation, its Best Practice Working Group, DMP's Safety Reform Project Team and Director General Richard Sellers, recently visited BHP Billiton's Mount Whaleback iron ore mine in Newman to gain a better understanding of the company's risk management measures.

The visit, at the invitation of BHP Billiton Iron Ore President Ian Ashby, coincided with the company's Mine Safety Week and the delegates were able to discuss with site workers the improved safety measures that the company is adopting.

BHP Billiton staff have been involved in the continual development of the company's safety strategy, and they acknowledged the importance of cultural change in reducing the number of incidents on mine sites.

The visit began with a detailed presentation outlining the company's Catastrophic Risk Management (CRM) process.

The process involves identifying the risks at a mining operation, assessing critical controls and reducing risk.

BHP Billiton Iron Ore is aiming to embed CRM in the way they do business.

The group toured the mine's iron ore pit and processing facilities to view critical controls and risk reduction measures in the field.

Outcomes from the site visit will be used to assist the Principal Hazard Management Plans Working Group, led by Safety Reform Consultant and General Manager for Health and Safety – Iron Ore at Rio Tinto, Bob Hirte, who is currently on a 12 month secondment with DMP's Resources Safety Division.

## **Best practice framework**

In September 2009, Mines and Petroleum Minister Norman Moore announced the State Government's intention to introduce a framework of "best practice, risk management"

safety regulation for Western Australia's resources sector, covering mining, petroleum and dangerous goods.

The Minister established a Ministerial Advisory Panel to provide advice on the implementation of best practice safety regulation.

The panel later created a Best Practice Safety Strategies Working Group to develop an agreed set of strategies and tools to increase the safety capabilities of both industry and the regulator.

The working group identified Principal Hazard Management Plans (PHMPs) as the most appropriate risk management approach. PHMPs are used to identify principal hazards, associated controls and the adequacy of controls on a mine site.

The working group recommended that PHMPs should apply to all mining operations in Western Australia and that all mining companies should be required to develop PHMPs at a single fatality level and submit them to Resources Safety—not for approval, but for review.



Mount Whaleback iron ore mine in Newman.



BHP Billiton has implemented risk reduction measures in the field.

This also aligned with the proposed national harmonised mines safety legislation, and the working group provided recommendations to the committees coordinating the national legislation.

The working group will next examine whether the proposed national legislation will deliver the required safety outcomes.

Risk management processes are in use with many of the major mining companies in Western Australia, however, the intent is to ensure that smaller mining companies also have risk management processes in place.

The Safety Reform Project Team is currently gathering and reviewing risk management plans from several mining companies to gather industry-specific experience on the risk management process.

The implementation of PHMPs is expected by 1 January 2012, in line with a national deadline. Guidance material will be developed to assist in the transition. ■

# Catastrophic risk management at BHP Billiton

Following significant safety incidents at BHP Billiton's Western Australian Iron Ore operations in financial year 2009, the company implemented a new safety program, Catastrophic Risk Management.

BHP Billiton Head of Health & Safety – WA Iron Ore, Mark Filtness described Catastrophic Risk Management as a site-specific program to identify and control all fatality risks.

"This has been achieved through identification of 'critical controls', which are essential to prevent fatal accidents," he said.

Mr Filtness said critical controls were now regularly monitored to assess how well they were implemented and how effective they were.

"These controls are also continually improved through the implementation of Risk Reduction Measures to move them up the hierarchy of control," he said.

Extensive communication and consultation has been a key to the success of Catastrophic Risk Management.

"Dedicated teams of shop floor personnel have been the foundation of the program—after all, they are the true experts who live and breathe the risk every day," Mr Filtness said.

To date, Catastrophic Risk Management has been highly successful, reducing the number of significant incidents from over 30 per month, to less than four.

Despite this success, BHP Billiton Iron Ore continues its work to ensure all employees at all levels know and understand:

- what can kill them
- what are the critical controls to keep them safe
- whether the critical controls are working.

"BHP Billiton takes the health and safety of its employees and contractors very seriously," Mr Filtness said.



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# Mining securities system review

The Department of Mines and Petroleum is conducting a major review of Western Australia's mining securities system.

The existing system is considered dated and unable to provide the Government with sufficient financial security in the event of companies not being able to fulfil their rehabilitation and closure obligations.

The department is committed to determining whether there is a suitable alternative model that could be used to replace the current system, which is estimated to provide security for only about 25 per cent of the environmental liability of mine sites.

To bring the system into line with other Australian jurisdictions would result in a securities system based on bank-guaranteed unconditional performance bonds being required for the full cost of rehabilitation and mine closure.

While such a system would provide the Government with an adequate level of financial security, it is recognised that it would have significant financial

implications for industry, particularly many junior and mid level miners.

Efforts in developing an alternative model have focussed on the possibility of substantially replacing the environmental bond system with a fidelity fund arrangement administered by the Government (the "Mining Rehabilitation Fund"), conducted through a comprehensive consultation process with industry associations and other key stakeholders.

Details of the proposed model are provided in a preferred option paper released by the department in March. The paper and associated documents are available at [www.dmp.wa.au/preferredoptionpaper](http://www.dmp.wa.au/preferredoptionpaper)

The fund model would see operators provide annual contributions to a fund set-up specifically for mine rehabilitation, with individual company contribution rates based on their current environmental liability.

It is important to note that contributing to the fund would not absolve companies from being required to pay for the rehabilitation and closure of their sites, and strict compliance measures would be put in place to ensure that this occurs.

"The department considers that such a fund has the potential to address the State's financial risk while providing a cost effective alternative for industry," DMP's Executive Director Environment Dr Phil Gorey said.

*"It is important that the community can be assured that it will not have to bear the cost of rehabilitation and mine closure."*

It is expected that the Government will make a decision on the State's future mining securities system by mid 2011. ■

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# Minerals titles e-lodgement boosts reform

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New electronic lodgement systems for minerals titles at the Department of Mines and Petroleum have made transacting business more efficient and convenient for resource companies operating in Western Australia.

Mines and Petroleum Minister Norman Moore said feedback from industry about the changes was positive.

“Prior to these changes, companies were required to lodge their forms at the office of the Mining Registrar responsible for the mining district,” Mr Moore said.

“For example, an application for a new exploration licence in the east Pilbara had to be submitted, either hand delivered or by courier/mail, to DMP’s office in Marble Bar.

“These changes mean forms can now be submitted to any of DMP’s 10 minerals titles offices across the State.”

The Minister said e-lodgement for a selection of tenement forms was also available.

Included in Stage 1 are:

- Operations Report - Expenditure on a Mining Tenement (Form 5)
- Objection (Form 16)

- Application for Exemption (Form 18)
- Application for Mining Tenement (Form 21).

“This is the first stage of introducing the new system which will eventually include all mineral titles forms associated with the Mining Act,” Mr Moore said.

“The ability for companies to use this system will provide clear benefits for industry and the department.”

Electronic lodgement can be done at any time, from any computer. The system also features data validation to ensure accuracy of required information prior to submission.

“Online submissions require a defined quality standard and higher quality submissions result in significantly less approval timelines,” Mr Moore said.

“WA resources industry activity occurs mostly in regional and remote areas - so making lodgement processes more accessible to those areas has obviously made a big difference to mining companies.”

The latest data shows tenement applications jumped from seven per cent to 26 per cent using online lodgement.

*“This is a significant step in the approvals reform process and is another example of the State Government’s ongoing efforts to make WA one of the world’s most attractive destinations for investment in the resources sector,” the Minister said.*

Funding for the project came through the highly successful Exploration Incentive Scheme (EIS), which is part of the State Government’s Royalties for Regions program.

“Approvals reform is an important component of the EIS program and will help ensure the continued investment in regional WA,” Mr Moore said. ■

## 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 8,000 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

## 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 45Mtpa and is investigating increasing its production to 95Mtpa 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 processing 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

## BAUXITE

**Worsley/Boddington – Alumina Refinery – E & G Project Expansion to 4.7Mtpa**

## BHP BILLITON WORSLEY ALUMINA PTY LTD

BHP Billiton announced in May 2008 the go-ahead for the A\$2.5 billion Efficiency and Growth (E&G) expansion project at its Worsley alumina refinery. The expansion project will lift capacity of the refinery from 3.5Mtpa to 4.7Mtpa through expanded mining operations, additional refining capacity and upgraded port facilities. Construction has commenced and production capacity is expected to be expanded by 2012. An additional A\$500 million will be spent on a new multi-fuel cogeneration power plant to be built at the refinery.

Expenditure: \$2.5b.

Employment: Construction: 1500; Operation: 200

## 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, is currently under construction and first production is planned to commence in the second half of 2011. The project involves 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 will be 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 leucosene) will be further processed at Narngulu, near Geraldton.

Expenditure: \$30m.

Employment: Construction: 130; Operation: 30

## 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 of the project has commenced with first shipments expected to be in June 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 before the end of 2011, 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 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 Australia iron ore operations to 200Mtpa. The Project is currently in schedule (overall Project is 95% complete) and budget based on original scope.

Expenditure: US\$4.8b.

Employment: Figures not currently available.

**Pilbara – BHPB Jimblebar Mine Expansion**

## BHP BILLITON IRON ORE PTY LTD

In March 2011 BHP Billiton announced approval of US\$7.4 billion (BHP Billiton share US\$6.6 billion) of capital investment to continue production growth in the company's Western Australia Iron Ore operations. It will deliver an integrated operation with capacity in excess of 220 million tonnes per annum. The investment includes US\$3.3 billion (BHP Billiton share) to increase installed mining and processing capacity at Jimblebar mine to 35Mtpa with incremental debottlenecking opportunities to 240Mtpa. The announcement is further to that made in November 2010, of US\$570 million\* (BHP Billiton share) and an earlier pre-commitment of US\$1.73 billion\* (BHP Billiton share) announced in January 2010.

Expenditure: US\$3.3 billion\*

Employment: Figures not currently available

**Pilbara – Port Hedland Inner Harbour Expansion**

## BHP BILLITON IRON ORE PTY LTD

In March 2011 BHP Billiton announced approval of US\$7.4 billion (BHP Billiton share US\$6.6 billion) of capital investment to continue production growth in the company's Western Australia Iron Ore operations. It will deliver an integrated operation with capacity in excess of 220 million tonnes per annum. The investment includes US\$1.9 billion (BHP Billiton share) to increase total inner harbour installed capacity to 220Mtpa with debottlenecking opportunities to 240Mtpa. The announcement is further to that made in November 2010, of US\$570 million\* (BHP Billiton share) and an earlier pre-commitment of US\$1.73 billion\* (BHP Billiton share) announced in January 2010.

Expenditure: US\$1.9 billion\*

Employment: Figures not currently available

**Pilbara – Port Blending and Rail Yard Facilities**

## BHP BILLITON IRON ORE PTY LTD

In March 2011 BHP Billiton announced approval of US\$7.4 billion (BHP Billiton share US\$6.6 billion) of capital investment to continue production growth in the company's Western Australia Iron Ore operations. It will deliver an integrated operation with capacity in excess of 220 million tonnes per annum. The investment includes US\$1.4 billion (BHP Billiton share) to optimise resource and enhance efficiency across the BHP Billiton WA Iron ore operation supply chain. The announcement is further to that made in November 2010, of US\$570 million\* (BHP Billiton share) and an earlier pre-commitment of US\$1.73 billion\* (BHP Billiton share) announced in January 2010.

Expenditure: US\$1.4 billion\*

Employment: Figures not currently available

**Pilbara – Solomon Hub Stage 1**

## FORTESCUE METALS GROUP LTD

Fortescue is progressing with approvals for its proposed 60 million tonne per annum iron ore mine at Solomon and supporting infrastructure. The Solomon Hub is planned to initially involve at least two mining areas, two processing plants and a 130 kilometre rail link to Fortescue's existing Christmas Creek to Port Hedland rail line. The proposed mining areas and rail corridor for the Solomon Hub are within Unallocated Crown Land and active pastoral leases and approximately 70 kilometres north of Tom Price in the Hamersley Ranges. Subject to Government approvals and final sign off by the Fortescue Board, a two year construction period will begin in 2011 with first production planned for mid 2012.

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 improvements are expected to consist of enhancements to the existing Kalgoorlie-Esperance rail infrastructure, an increase in rolling stock and upgrades to various other existing operational constraints. 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.

# Committed Projects

## 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 second half of 2011.

Expenditure: \$5.2b.

Employment: Construction: 4000; Operation: 500

## NICKEL

### Ravensthorpe – Ravensthorpe Nickel Operation FIRST QUANTUM MINERALS AUSTRALIA NICKEL PTY LTD

First Quantum Minerals (FQM) acquired the Ravensthorpe Nickel Operation (RNO) from BHP Billiton in February 2010. FQM 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. FQM 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 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. Pluto LNG Foundation Project has transitioned to an 'operating' site with the introduction of natural gas into the plant in early March. Start-up is targeted for August 2011 and LNG one month later. The Pluto LNG Project is on track to become the world's fastest developed LNG project from discovery of the gas field in 2005 to first LNG in Q3 2011.

Expenditure: \$14b.

Employment: Construction: 4000; Operation: 300

### Carnarvon Offshore Basin – Barrow Island – Gorgon Project GORGON JOINT VENTURE

The Gorgon Joint Venture (GJV) made a final investment decision on the \$43 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.

Expenditure: \$43b.

Employment: Construction: 3500; 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 owned by Single Buoy Moorings 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 Redevelopment WOODSIDE ENERGY

In March 2008 the North West Shelf Venture participants approved funding of the \$5 billion North Rankin Redevelopment Project 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 a 100m bridge 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 Venture's onshore gas requirements to supply future customer commitments.

Expenditure: \$5b.

### Pilbara – Devil Creek Development Project APACHE ENERGY LIMITED

Apache Northwest and Santos Offshore are continuing construction works for the Devil Creek Development Project, a greenfield gas project comprised of an unmanned offshore gas production platform over the Reindeer gas field located about 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. The development site is located near Devil Creek, 65km south west of Karratha where the construction workforce is being accommodated within a purpose built facility. The project is designed to provide up to 200 terajoules per day of dry natural gas and between 80kl to 160kl per day of gas condensate. All gas will service the domestic market in Western Australia. Gas plant site civil works are now complete, thus facilitating the installation of pipe rack and gas processing modules. Module pipework and electrical interconnection work is now proceeding. Construction of the onshore gas supply pipeline and the pipeline shore crossing is now complete and the offshore installation works has commenced, with first gas to be delivered in the second half 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 mine development includes an open pit mine and concentration plant at Mt Weld, which was completed in March 2011. The concentrate will be bagged and containerised on site, and trucked to the Port of Fremantle for export. The ore 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 in Q3 2011, expanding to 22,000tpa by 2013.

Expenditure: \$135m.

Employment: Construction: 135; Operation: 90

## SILICON METAL

### 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

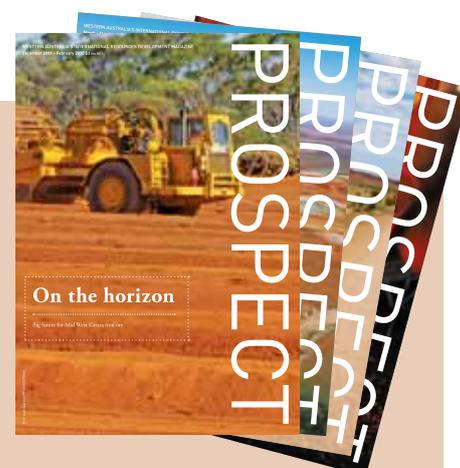
## VANADIUM

### Windimurra – Windimurra Vanadium Project ATLANTIC LIMITED

Atlantic has recently increased the global resource inventory at its developing Windimurra vanadium project by 19% to nearly 210 million tonnes following positive results from resource defining drilling. The increase in global mineral resources at its northern start-up area will allow the operation to continue to benefit from short distance haulages to the plant for several years more than in the current life of mine plan. The construction of the Windimurra Vanadium Project is fully funded and its completion is well underway. Plant commissioning and first production are expected to start in Q3 of 2011.

Expenditure: \$500m.

Employment: Construction: 350; Operation: 120



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## 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 "best in class" 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

### 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

## GOLD

### Kalgoorlie (330kms North East) – Tropicana Gold ANGLOGOLD 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 5 million 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 start is planned for mid-2011. 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.

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 leucoxene 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 leucoxene. 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 State Government is developing a Liquefied Natural Gas (LNG) Precinct on the Dampier Peninsula, 60km north of Broome, to enable processing of natural gas from the offshore Browse Basin. The LNG Precinct will be capable of accommodating LNG processing and shipping facilities for at least two proponents. By focussing development at a location where environmental impacts are considered to be most manageable, the Precinct will minimise the environmental footprint of gas processing in the region while maximising opportunities for the local area to benefit from employment and business opportunities. 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.

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 – 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 managed by 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. It is planned that the port construction period commence in early 2012 to enable operations to commence 2014.

## 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. Grange Resources Ltd is targeting a 2014 start-up with production of 10Mtpa of magnetite concentrate. The slurry concentrate will be transported via a 100km underground pipeline from the mine to the Port of Albany for export and pelletising. The Albany Port Authority received environmental Ministerial approval in November 2010 to expand the Port to allow access by Cape size vessels and to increase berth, storage and loading facilities. Environmental approvals for a 6.6Mtpa mine and pipeline are in place and an increase for the mine to produce 10Mtpa is currently being processed. Assuming the current prefeasibility study has positive results, a definitive feasibility study is expected by late 2011.

Expenditure: \$1.7b.

Employment: Construction: 2000; Operation: 600

# Projects Under Consideration

## 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.

Expenditure: \$2b.

Employment: Construction: 1000; Operation: 350

## Mid West Region – Jack Hills Expansion CROSSLANDS RESOURCES

Crosslands commenced trucking 1.5Mtpa hematite from its Jack Hills operations to the port of Geraldton in December 2006. Jack Hills Stage 2 would involve an increase to 25-35Mtpa of hematite and beneficiation feed ore. The ore would be transported by a new railway to a new deepwater port at Oakajee. A bankable feasibility study and exploration drilling program on the Stage 2 project is progressing.

Expenditure: \$2b.

Employment: Construction: 450; Operation: 350

## Mid West Region – Weld Range Iron Ore Mine SINOSTEEL MIDWEST CORPORATION LIMITED

Sinosteel Midwest Corporation proposes to develop a 15Mtpa iron ore mine at Weld Range 65km southwest of Meekatharra, producing a mix of hematite lump and fines. The project is expected to utilise a new rail line and a new deepwater port facility at Oakajee. The company finalised a bankable feasibility study in July 2010.

Expenditure: \$1b.

Employment: Construction: 1000; Operation: 500

## 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 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 would 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 people in March 2010. An environmental scoping document has been submitted to the EPA.

Expenditure: \$3.7b.

Employment: Construction: 3000; Operation: 1000

## 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 2014, 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 released its Public Environmental Review (PER)/Draft Environmental Impact Statement (Draft EIS) on 18 April 2011 to seek State and Federal Government approvals for the proposed development of an Outer Harbour facility in Port Hedland. The PER/Draft EIS will be available for public comment for a period of eight weeks. BHP Billiton Iron Ore's investment in the development of the proposed Outer Harbour project remains subject to a number of external factors which are outside BHP Billiton Iron Ore's control, such as market conditions.

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, a 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.

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

Pluto expansion is being progressing as a priority in 2011. The Pluto LNG Park provides the opportunity to consider both equity gas development and other resource owner gas supply at the five train 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 workforce to construct compared to a greenfield development. Woodside has completed front-end engineering and design (FEED) for the next two onshore trains. Woodside plans to order long-lead items (LLIs) in 2011 to maintain an earliest ready for start up for an expansion train by end 2014. 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 is expected to start in early 2011, and 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 planned for mid 2011. Gas to market is scheduled for 2016. The project will initially have two LNG trains with a 10Mtpa 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 ESL®/ Engineered Strand Board ESB® 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 the first quarter of 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 formal environmental impact assessment process was initiated in 2009 and the project Environmental Scoping Document was approved in May 2010. The Company is reviewing the project as part of its Selection Phase Study prior to submission of a draft ERMP. The uranium oxide will be transported to South Australia by road for export to overseas markets.

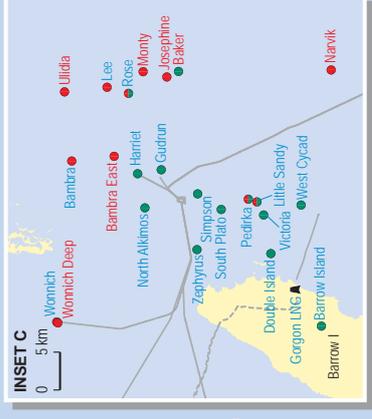
Employment: Construction: 700; Operation: 300



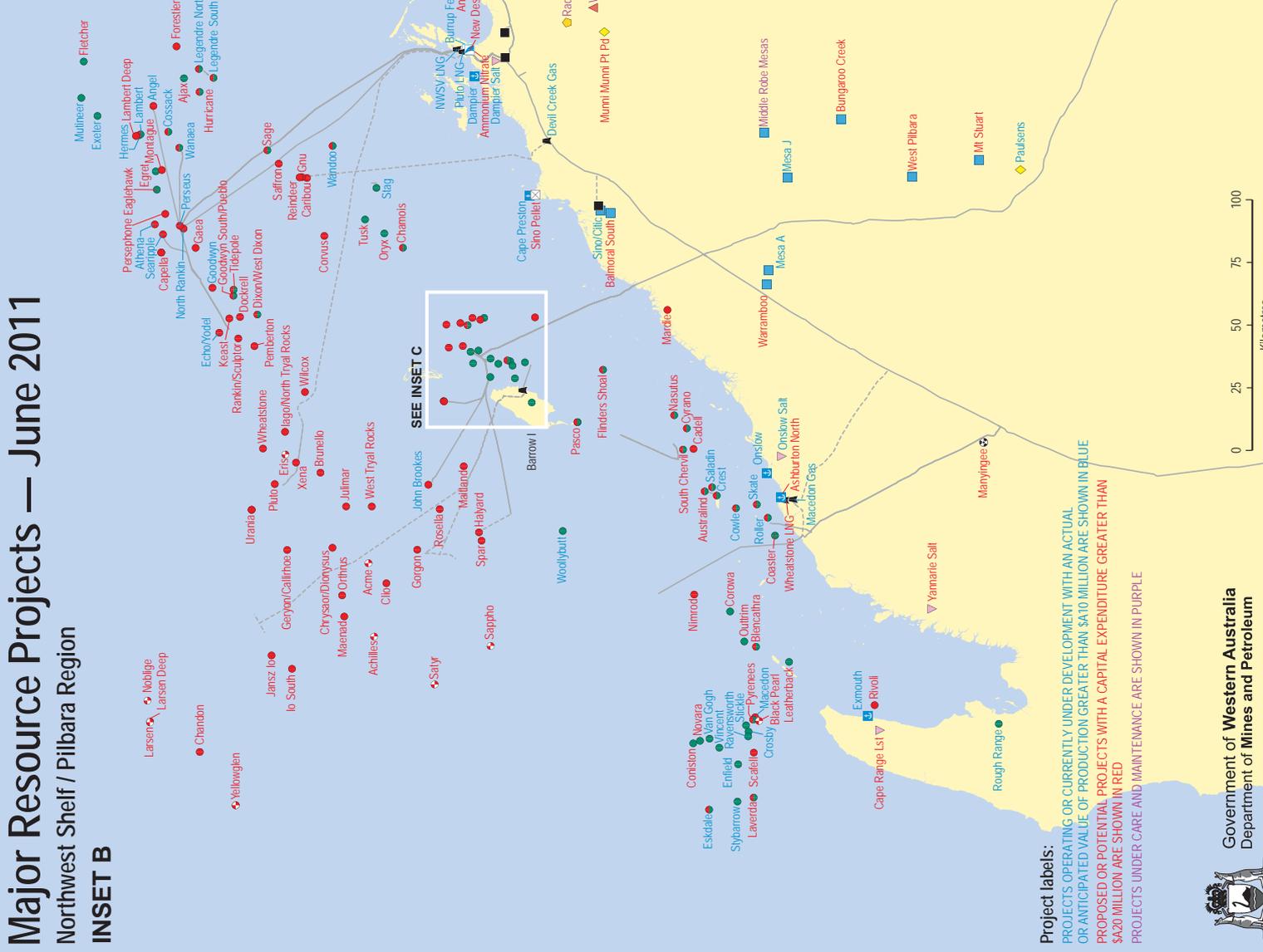
# Major Resource Projects — June 2011

## Northwest Shelf / Pilbara Region

### INSET B

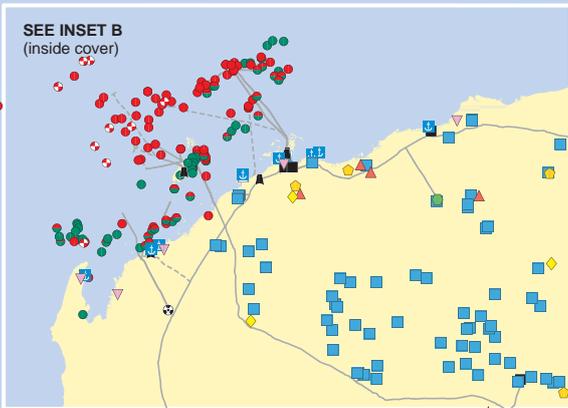
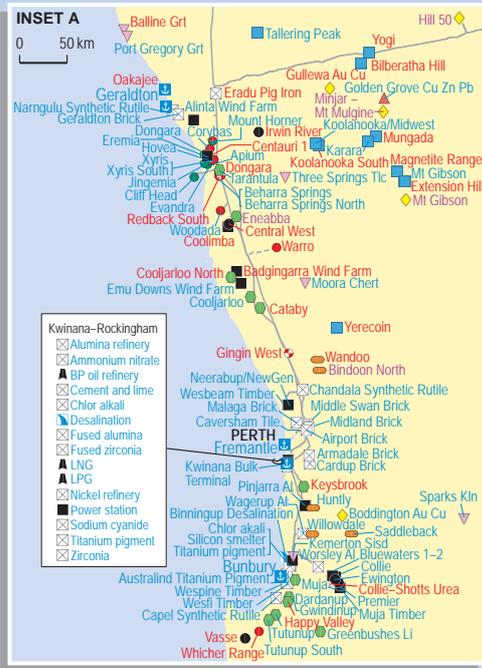


- MINERAL SYMBOLS**
- Precious metal (Au, Ag, Pt, Pd, Ni, Cu, Zn, Co, Ni, Cr, Mo, W, U, V, Nb, Ta, Ti, Zr, Hf, Y, Sc, In, Sn, Pb, Bi, Te, Se, Ge, Si, Ga, In, Sn, Pb, Bi, Te, Se, Ge, Si, Ga)
  - Steel alloy metal (Mn, Ni, Cr, Mo, W, U, V, Nb, Ta, Ti, Zr, Hf, Y, Sc, In, Sn, Pb, Bi, Te, Se, Ge, Si, Ga)
  - Specialty metal (Ni, Ti, Zr, Hf, Y, Sc, In, Sn, Pb, Bi, Te, Se, Ge, Si, Ga)
  - Base metal (Cu, Zn, Co, Ni, Cr, Mo, W, U, V, Nb, Ta, Ti, Zr, Hf, Y, Sc, In, Sn, Pb, Bi, Te, Se, Ge, Si, Ga)
  - Industrial mineral (U, V, Nb, Ta, Ti, Zr, Hf, Y, Sc, In, Sn, Pb, Bi, Te, Se, Ge, Si, Ga)
- 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
  - Processing plant
  - Irrigation / water / desalination
  - Port
- COMMODITIES**
- Au: Gold
  - Cr: Chromium
  - Cu: Copper
  - Fe: Iron
  - LNG: Liquefied natural gas
  - Li: Limestone
  - Mo: Molybdenum
  - Ni: Nickel
  - Pb: Lead
  - Pd: Palladium
  - Pl: Platinum
  - Ta: Tantalum
  - Ti: Titanium
  - V: Vanadium
  - Zn: Zinc
  - Zr: Zirconium



**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

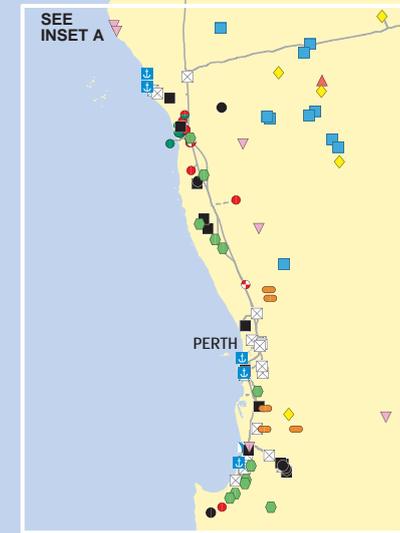
# Major Resource Projects — June 2011



- MINERAL SYMBOLS**
- Precious mineral Dmd
  - Precious metal Au (or as shown)
  - Steel alloy metal Ni (or as shown)
  - Specialty 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
  - Kln..... Kaolin
  - Li..... Lithium
  - LNG..... Liquefied natural gas
  - LPG..... Liquefied petroleum gas
  - Lst..... Limestone
  - MgCO<sub>3</sub>..... Magnesite
  - Mn..... Manganese
  - Ni..... Nickel
  - Pb..... Lead
  - Pd..... Palladium
  - Phos..... Phosphate
  - Pl..... Platinum
  - REE..... Rare earth elements
  - Sid..... Silica sand
  - Ta..... Tantalum
  - Ti..... Titanium
  - Tlc..... Talc
  - V..... Vanadium
  - W..... Tungsten
  - Zn..... Zinc
  - Zr..... Zirconium



**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  
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