

THE TIES THAT BIND

Examining WA and Singapore's prosperous relationship



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Western Australia and Singapore have a long and close trading relationship, built chiefly on the importing and exporting of commodities such as gold and petroleum. In fact, in total trade, Singapore ranks as the State's fourth-largest trading partner.

Now, as it seeks to set itself as a leading trading hub in Asia, Singapore is fast gaining a reputation for its ability to store liquefied natural gas (story page 3).

With substantial LNG facilities already located to the south-west of the country on Jurong Island, the country is expected to add to its considerable storage capacity in the future. As a result of this expansion, there is the potential for exciting new opportunities for Western Australian businesses in related fields and I encourage them to be explored.

Recently, Singaporean businesses have invested heavily in the State's property and hospitality markets (story page 2), and I was honoured to unveil Far East Hospitality's striking refurbishment of the Rendezvous Hotel in Scarborough. This revamp is symptomatic of the major developments that are underway in Perth's hotel industry.

The annual Africa Down Under Conference took place this month and provided the perfect opportunity to consolidate the Memorandum of Understanding signed earlier this year between Western Australia and the Common Market for Eastern and Southern Africa (COMESA) (story page 6). It is pleasing to see how positively this relationship has developed in such a short space of time.

Mines and Petroleum Minister Bill Marmion and I were honoured to attend an official State breakfast with the Secretary General of COMESA, His Excellency Sindiso Ngwenya, COMESA Ministers and officials and other Government representatives, where we reaffirmed our desire to share the knowledge and technology that have made the State's resources and agricultural sectors so successful.

Lastly, I'd like to take this opportunity to congratulate the Department of Mines and Petroleum's Director General, Richard Sellers, on being awarded the Patrons Award from the Institute of Public Administration Australia (WA) (story page 21). This is the highest accolade in public administration in the State, and is just reward for Mr Sellers' outstanding leadership during the busiest growth period in Western Australia's resources history.

Colin Barnett
PREMIER OF WESTERN AUSTRALIA & MINISTER FOR STATE DEVELOPMENT

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MINISTER FOR MINES AND PETROLEUM

ISSN 1037-4590

Prospect

Western Australian Prospect magazine is published quarterly by the Western Australian Government's Department of Mines and Petroleum (DMP) and Department of State Development (DSD).

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Cover photo: The LNG Terminal on Jurong Island. © Singapore LNG Corporation

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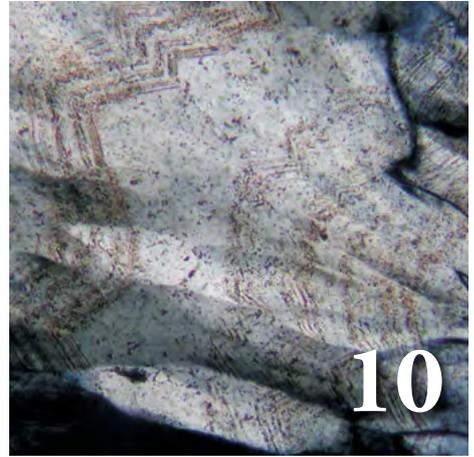
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The Elizabeth Quay development will provide much-needed hotel accommodation. Photo: Metropolitan Redevelopment Authority

GETTING IN ON THE GROUND FLOOR

Few would argue about Western Australia's attraction as a business and tourist destination – the State has Australia's fastest growing economy, it has strong ties with Asia, and it is blessed with spectacular weather and scenery.

This appeal, however, has been offset by a chronic shortage in the availability of hotel rooms. Thankfully, all that is about to change.

The Western Australian Government, through Tourism WA and the Metropolitan Redevelopment Authority, has actively sought to attract hotel investors after identifying that 1,900 additional rooms were required for Perth to keep pace with corporate and leisure demand.

As a result of this concerted and combined effort the construction of several new hotels is now on the horizon, with Perth and the southern port city of Fremantle set for a surge in room numbers over the next five years.

Major players in the hotel market, such as Ritz-Carlton, Westin, Hilton and Accor have made recent commitments to Perth with projects due for completion between 2015 and 2018, and as Tourism WA CEO Stephanie Buckland explains, it's easy to see why.

"Perth is Australia's most globally connected city, with particularly strong ties to our Asian neighbours," she said.

"With 24 major airlines servicing Western Australia, we welcome more than a million international and domestic passengers a month through Perth Airport. In the 12 months to March 2014, there were 7.7 million overnight visitors to Western

Australia, staying more than 57 million nights and spending A\$7.7 billion.

"In addition to the city centre and Fremantle, Scarborough, the Swan Valley and Rottnest Island are also ready for investment partners. In regional Western Australia, projects such as the airport construction at Busselton will mean direct flights for visitors to the Margaret River region and further investment opportunities.

"Tourism WA's Infrastructure and Investment Division is able to help with identifying sites of interest, through to liaising with planning authorities and other government departments."

Singaporean businesses have been quick to capitalise on the opportunities, with the Far East Organization recently making considerable property purchases in Perth. In May this year, Far East Organization's hospitality arm, Far East Hospitality, officially unveiled a A\$60 million refurbishment of the Rendezvous Hotel in Scarborough at a ceremony attended by Premier and State Development Minister Colin Barnett.

Perth boasts the largest number of Singaporeans outside Singapore, as well as significant Malaysian and Indonesian

populations. These groups comprise the core of the company's customers and Perth, with its shared time zone and close proximity to Southeast Asia, provided ideal investment conditions.

Another Singaporean business to make inroads into the Australian market is investment firm Crest Capital, which has steadily added Western Australia to its investing footprint. Managing Partner Peter Chan said the private equity firm was initially drawn in by the diverse opportunities in Western Australia's resources sector.

"Back then, we were first attracted by the level of mining activity, supporting services, technology and infrastructure in Western Australia. This interest spilled over into various accommodation related facilities and businesses. Since our initial interest we have funded over A\$150 million across sectors including retirement housing, affordable housing and medical facilities, amongst others," he said.

"Compared to other Australian cities, Perth's proximity to Singapore was also a logistical benefit. We have now used our establishment in Western Australia as a platform for further expansion in Australia."



The refurbished Rendezvous Hotel Perth in Scarborough. Photo: Toga Far East Hotels



The LNG Terminal on Jurong Island. Photo: Singapore LNG Corporation

OPPORTUNITIES ABOUND IN LNG HUB

As Singapore positions itself to become a leading LNG trading hub in Asia, Western Australia is ideally located to capitalise on the resultant business opportunities in its role as a major supplier of LNG.

With strong service and manufacturing sectors, Singapore is already a major trading centre in Southeast Asia. Its key industries include electronics, financial services, oil drilling equipment, petroleum refining, pharmaceutical manufacturing, and ship repair. It is now quickly becoming known for its capacity to store LNG.

Singapore's LNG terminal currently has a throughput capacity of 6Mtpa, with a further 3Mtpa expected to be added. Commercial operations began on Jurong Island, located on the south-west of Singapore, in May 2013. A second LNG terminal, possibly on the eastern side of Singapore, is planned for future development.

John Osborn, Regional Director of the Department of State Development's International Trade and Investment Office in Singapore, was optimistic about the flow on effects to Western Australian businesses from the increasing LNG trade activity in the area.

"According to the Singapore LNG Corporation, additional facilities at the terminal may be installed to enable new services to be introduced," he said.

"These new business opportunities could involve cold energy utilisation services, the installation of a liquefied petroleum gas terminal, and the trucking of LNG to various parts of Singapore that may be constrained by the Singapore gas network."

A spokesperson from Singapore's Energy Market Authority, a statutory board under the Minister of Trade and Industry, concurred with Mr Osborn's upbeat outlook.

"Singapore is planning to build a second LNG terminal to further enhance our energy security, and to support new industrial users and power generation companies in the eastern part of the country," they said.

Energy giant Chevron moved its Asia-Pacific headquarters to the region in 2013, and as explained by Melody Meyer, President of Chevron Asia Pacific Exploration and Production Company, it was a logical move.

"Chevron has a long history in Asia – we have had an operating presence in the region for close to 90 years," she said.

"Locating the regional operating company in Singapore to manage our upstream interests made sense given its position as a strategic hub, and also reflects Asia's increasing strategic importance to Chevron as a growth engine for the company's future production."

SERVICE COMPANIES BENEFIT FROM CHAIN REACTION

With a large concentration of LNG projects, a favourable business environment and close proximity to Asia, Western Australia has firmly established itself as an attractive business destination for oil and gas services companies.

Among those that have made significant investments in the State's oil and gas sector are the Singaporean company Ezion Holdings and its Perth-based subsidiary Teras Australia.

An indication of the developing business relationship between Singapore and Western Australia was given in March 2012, when the Western Australian Government opened a trade and investment office in Singapore to serve as a facilitator for Singaporean investment into the State.

Regional Director John Osborn, who heads the Singapore office, and his staff maintain links with key commercial entities in Singapore, such as sovereign wealth funds, government agencies, business chambers, private investment firms, and the Singapore Exchange (SGX). Since the Singapore office was opened, it has forged ties with organisations such as the Association of Singapore Marine Industries (ASMI), which represents a wide cross-section of the ship repair, shipbuilding and rig building industry in Singapore. The Singapore office has facilitated meetings between ASMI members and prospective joint venture partners in Western Australia.

Through its involvement with the above-mentioned business associations, the Singapore office has access to a significant portion of the Singapore business community, and is able to draw upon these ties to facilitate introductions between Singapore investors and Western Australian entrepreneurs.

Ezion Holdings is a globally operating oil and gas services company with a large fleet of service vessels and a market capitalisation of SGD\$2.8 billion. In 2009 it won a contract for the Gorgon Project



*Teras Bandicoot arrived in Australian waters servicing the Australian Defence Force.
Photo: Teras Australia*

to charter a fleet of ten marine logistics vessels from May 2009. That contract was worth A\$350 million.

The company also formed the wholly owned, Perth-based subsidiary Teras Australia in 2011 to expand Ezion's footprint in Australia in support of the offshore oil and gas industry.

The CEO of Teras Australia, Captain Larry Johnson, said the decision to establish in Western Australia as the starting point of the company's Australian operations was obvious.

"We came into the Australian market when we won the bid for Chevron's Gorgon Project in 2009. In the same year we gained work at the Australian Marine Complex (AMC) in Henderson and established the largest stevedoring operation in Western Australia," he said.

Ezion has since secured major contracts for Queensland LNG projects and a marine supply base and a gazetted port in the Northern Territory. It now maintains offices in Perth, Darwin and Gladstone and has created about 600 jobs in Australia since its initial operations began in 2009 in Western Australia.

In addition to Teras Australia's focus on terminals and ocean towing, the company also has a strong commitment to training Aboriginal people to undertake maritime work.

"During our work for the Gorgon Project a few years ago, we became the largest Aboriginal maritime training and employment program in the nation. Last year, we entered into agreement with Aboriginal Maritime Pty Ltd, a services company that provides maritime training and employment to Indigenous workers. This venture provides training to Aboriginal workers at Henderson so that they are skilled for our vessel operations," Captain Johnson said.

Teras Australia is also seizing opportunities in the defence sector, with contracts with the US military and, after winning a tender in August, with the Australian Navy. For Teras Australia, contracts with the resources industry, training programs and defence comes down to striking a balance between short and long-term projects.

"The types of services we offer to both the resources and defence sectors are similar, so it provides a good mix for sustainable business. We differentiate ourselves as a company by providing a high quality service at a reasonable price, and by identifying service gaps. It's about providing clients with options that create efficiencies that were not previously available to them."



The Singapore Trade and Investment Office is Western Australia's most recently opened overseas office. What strategic reasons drove the decision to launch the office in 2012? Has the strategic focus changed in any way since then?

The WATIO Singapore office was opened to tap into the breadth and depth of Singapore's financial and managerial capabilities. For instance, in the global supply chain of the oil and gas sector, Singapore is a leading player in the market for oil and gas drilling units and offshore support vessels.

Singapore's undoubted success in value creation, enhancement and accretion – in attracting FDI and transforming its economy – holds significant lessons for Western Australia.

Can you describe your role? What does an average day entail for you?

The Western Australian Trade and Investment Office in Singapore facilitates relationships between Singaporean business interests and Western Australian enterprises. As such, my staff and I generate and maintain person-to-person links with key commercial entities in Singapore, such as sovereign wealth funds, government agencies, business chambers, private investment firms, and the Singapore Exchange.

WATIO Singapore participates in and represents the interests of the Western Australian Government in international forums and conferences. The office also assists in organising official visits to Singapore by key officials and executives from Western Australia, and is involved in assisting sport and cultural exchanges between Singapore and Western Australia.

Q&A WITH JOHN OSBORN – REGIONAL DIRECTOR

Singapore is known as a financial and trade hub in Southeast Asia. What do you think are the key opportunities it presents for WA businesses and the State?

Singapore has traditionally been a transshipment point for much of Southeast Asia, and it is the world's second-busiest port, after Shanghai, in terms of container volume handled. Entrepreneurs in Western Australia would do well to keep in mind that Singapore, although a significant market in its own right, serves as a transit point for both goods and services into ASEAN and beyond.

Western Australian firms would also benefit from tapping into Singapore's accumulation of scientific talent, as many other companies from other parts of the world have done.

And similarly, what is Singapore seeking from WA?

Singapore investors are looking for access to a first-world economy in close proximity to the city-state, as well as regulatory stability for joint ventures and industrial investments. The ability to build scale and increase presence in a wider geographical milieu, and to source high-quality food items, such as dairy, meat, fruit and vegetables, is also important.

What are some of the key investments Singapore has made into WA in recent years?

Far East Orchard and Straits Trading Company, hospitality operators in Singapore, signed a joint venture agreement in April 2013 to pursue and conduct hospitality management and hospitality-related businesses. Under the terms of the agreement, Straits Trading will contribute its three hotel properties – Rendezvous Grand Hotel Melbourne, Rendezvous Hotel Perth and Rendezvous Studio Hotel Perth Central – and several hotel management contracts to the joint venture. Far East Orchard Ltd is a member of Far East Organization, Singapore's largest private property developer.

The Singapore-based Franklin Offshore Group is an integrated provider of quality rigging and mooring equipment and

services, serving primarily the offshore oil and gas industry. Founded in 1985, Franklin today is one of the largest offshore and marine-related service providers in Southeast Asia, and has a significant presence in Western Australia via Franklin Offshore Australia Pty. Ltd.

Centurion Corporation, an SGX-listed provider of workers' accommodation, acquired a 4,434 square metre freehold site in Port Hedland in September 2012, to be developed as short-stay accommodation facilities for workers, business executives and visitors. The site, composed of four adjacent plots, was acquired for A\$4.8 million.

Singapore is striving to become a major LNG trading hub in Asia and is investing heavily in LNG at home and abroad. What opportunities do you see in this for WA?

Singapore's emergence as a regional trading hub for LNG may support a shift towards an enhanced liquid spot market for LNG. Given the rise in the number of LNG exporters, such as Africa, Papua New Guinea and North America, and the concurrent increase in the number of LNG-importing countries, sellers of Western Australian LNG may benefit from this enhanced method of LNG trade facilitated in Singapore.

What advice would you give WA companies looking to expand into Singapore? What is the key to success in the Singapore market?

Companies need to find a good partner to leverage on Singapore's capabilities, move up the value chain and explore new markets outside of Singapore, effectively using Singapore as a springboard. The market here is crowded and sophisticated, so marketing and branding your exports is critical to success. I'd also advise companies to conduct research on the supply chain gaps in the oil and gas/LNG and agribusiness sectors, and diversify if necessary in order to satisfy opportunities identified. Engagement with WATIO Singapore can also lead to introductions to potential joint venture partners.

GOVERNMENT FORGES TIES WITH AFRICA

The Departments of Mines and Petroleum (DMP) and State Development have strengthened their bonds with the Common Market for Eastern and Southern Africa (COMESA) through a series of meetings in August and September.

Department executives and staff took part in the meetings and a range of associated events in the lead up to, and during, the three-day Africa Down Under Conference in Perth.

The highlight was the first face-to-face meeting of the Joint Working Group (JWG) established after Premier Colin Barnett signed a Memorandum of Understanding (MoU) between Western Australia and COMESA in January this year during his visit to Zambia.

The meeting followed an official State breakfast attended by the Premier, Mines and Petroleum Minister Bill Marmion, COMESA Secretary General Sindiso Ngwenya, COMESA Ministers and officials, and representatives of DMP, the Department of State Development (DSD) and the Department of Agriculture and Food.

The high-profile meeting of the Joint Working Group cemented ties created at the inaugural meeting held by teleconference in May that set up parameters for the MoU's governance arrangements and a 12-month work program.

The primary aim of the MoU is to tap Western Australia's expertise to help African nations to develop their mining laws, tenement systems, and environmental and safety standards to levels similar to those in Australia.

Involvement with COMESA has been identified by DSD as a highly effective way to have Western Australia recognised throughout the trading bloc's 19 member states, including Kenya, Uganda, Zambia, Egypt and Libya.

COMESA's states have a combined population of 389 million, annual imports of about US\$32 billion and exports of US\$82 billion.

DMP had a busy schedule of meetings and events involving COMESA and Africa Down Under delegates before the conference.

Department representatives also delivered briefings to delegates on tenement management, royalty and taxation policies, environmental approvals, geoscience information, and key policy issues for developing a successful resources sector.

The department, in association with DSD, hosted a meet-and-greet session for COMESA delegates on Monday 1 September.

On Tuesday, DMP Executive Director Environment Dr Phil Gorey took part in a panel discussion on challenges and innovation in environmental stewardship.

Dr Gorey will visit South Africa early this month to attend the Mine Closure 2014 Conference and will run an environmental best practice workshop in Kampala, Uganda as part of his itinerary.

The Africa Down Under Conference was attended by government Ministers from several African countries, and business leaders and executives from the mining services industries.



Right: Western Australian Trade Office Commercial Manager Africa Filippo Raggi, DSD Regional Manager Europe, Middle East, Africa John Shute, COMESA Public Relations Manager Mwangi Gakunga and Premier Colin Barnett.



WA'S WORLD CLASS ROYALTY SYSTEM

Recently released figures show that the total value of royalties from the resources sector increased by 33 per cent from the 2012-13 financial year to reach a record A\$6.98 billion during 2013-14.

Western Australia's royalty system has been in place since the early 1980s, and is highly regarded around the world.

The royalty system is based on the fundamental principle that the State's petroleum and mineral resources are owned by the Crown, and the right to extract these resources comes with an obligation to pay royalties to the State.

DMP's Director General Mr Richard Sellers said it was important companies continued to respect their obligation to pay the appropriate royalty.

"A royalty is not a tax," he said. "It is a purchase price paid by a company to the community."

"The State's royalty system has been benefiting all Western Australians for decades. It enables the Government to fund infrastructure programs, schools and hospitals."

The system is designed to balance equity, efficiency, stability, predictability, transparency and simplicity.

Royalty rates are generally applied to the value of the resource in the final product, with the rates reduced according to the level of processing that has occurred.

For example, bulk material attracts a royalty rate of 7.5 per cent, concentrates attract a royalty rate of 5 per cent and metals attract a royalty rate of 2.5 per cent.

DMP's new on-line system allows companies to view, pay and monitor their royalty obligations.

In the 2012 State Budget, the Western Australian Government announced a Mineral Royalty Rate Analysis to review Western Australia's royalty arrangements. The analysis is being conducted by DMP and the Department of State Development, and is on track to report to the Government by the end of 2014.



STRONG TURNOUT AT DMP PETROLEUM AND GEOTHERMAL OPEN DAY



Chief Geoscientist Roger Hocking spoke on opportunities in the Officer Basin.

More than 250 people attended a highlight on the calendar for Western Australia's oil and gas industry when the Department of Mines and Petroleum (DMP) held its Petroleum and Geothermal Open Day on September 11 at the Esplanade Hotel in Fremantle.

Mines and Petroleum Minister Bill Marmion delivered the opening address for this annual information day for industry.

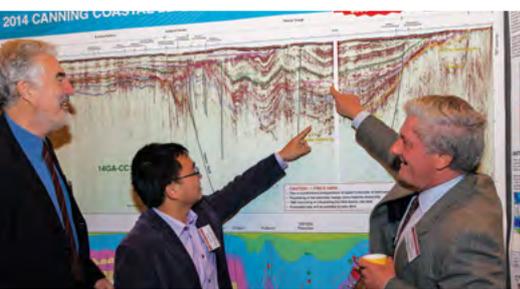
The theme this year was industry's social licence to operate – an area that is fast becoming as important to industry as getting the required licences and regulatory approvals.

Guest speaker Queensland GasFields Commission Chairman John Cotter took part in a panel discussion on the social licence concept after delivering a presentation on onshore gas projects and their effect on communities in his State.

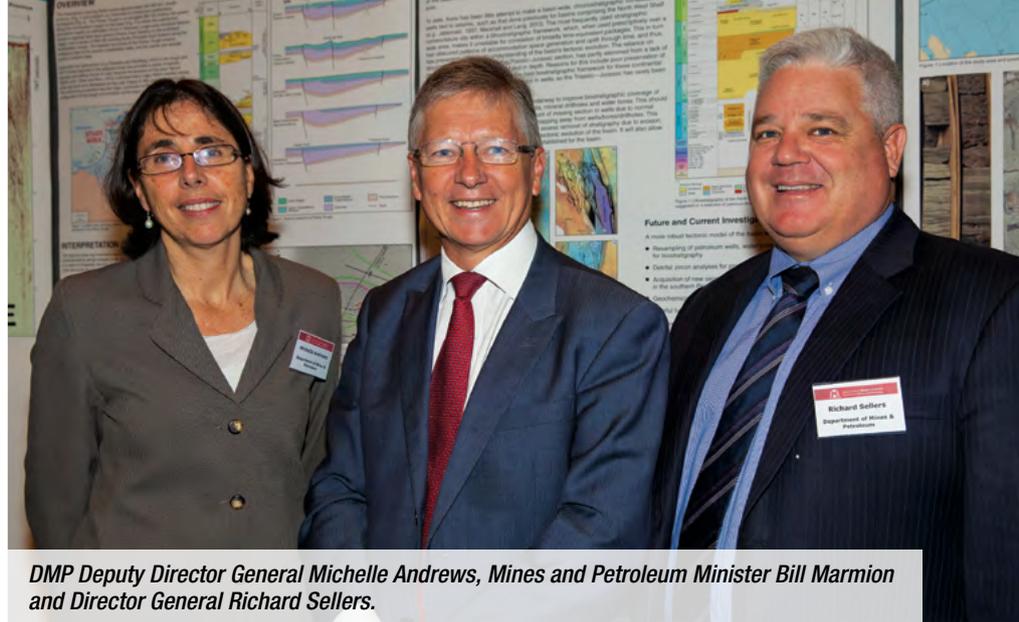
DMP Director General Richard Sellers spoke on responsible development of the resources sector and Petroleum Division Executive Director Jeff Haworth delivered a presentation on 'CCTV' (Compliance, Consistency, Transparency, Vision).

Transerv Energy Executive Director Stephen Keenihan spoke on land access guidelines and the importance of continuing community engagement.

Other presentations included acreage releases in the Canning, Southern Carnarvon and Officer basins, resource management regulations, well integrity, and an update on Carbon Capture and Storage at the South West Hub.



Buru Energy Managing Director Eric Streitberg, Senior Geophysicist Alex Zhan and Resources Assistant Director Don Flint.



DMP Deputy Director General Michelle Andrews, Mines and Petroleum Minister Bill Marmion and Director General Richard Sellers.



Petroleum Division Executive Director Jeff Haworth.

Speaking after the event, Mr Sellers congratulated DMP staff on their efforts in presenting the popular annual open days.

“Every time I go to one of these events, I know that people from my department have laboured into the night to make sure everything is just right for the big day,” he said.

“And they do such a wonderful job on the day itself, making sure that everything runs smoothly, and being available at the many displays to talk to people.”

“I’m pleased that our Petroleum and Geothermal Open Day is a drawcard for industry.

“The informal atmosphere and well-spaced itinerary allow plenty of scope for networking during breaks and during the debriefing that follows.”



DMP Mineral Titles Executive Director Dr Ivor Roberts.

ONLINE COURSES TEACH DEPARTMENT OF LANDS STAFF HOW TO USE TENGRAPH

The Department of Mines and Petroleum’s (DMP) venerable Tengraph Online mapping system is still going strong after 20 years and is now supplying information for the Department of Lands (DoL).

About 60 DoL staff recently took part in a successful series of training courses presented by a DMP team from Mineral Titles.

Mineral Titles Business Spatial Analyst Richard Morris was the facilitator, Senior Geospatial Information Analyst Sean Doherty provided expertise with his extensive knowledge of land layers, and Graduate Officer Matt Aravidis helped users navigate around the screen.

Tengraph is a mapping system that displays the position of Western Australian mining tenements and petroleum titles in relation to other land information.

It gives a current and accurate picture of land under mining activity and is used to determine ground that is available for mineral exploration.

“Tengraph was a world leading system introduced about 20 years ago after being developed in collaboration with IBM,” Mineral Titles Executive Director Ivor Roberts said.

“The fact that it’s still operational is testament to the innovation of those who developed it back then.”

Dr Roberts said Tengraph was believed to be the first mapping system in the world to go from paper to digital.

“It was a significant investment at the time but it’s paid for itself many times over,” he said.

BASE METALS IN WESTERN AUSTRALIA — AN OVERVIEW

Western Australia's base metals industry is a quiet achiever of the State's resources sector.

Moody's Investor Services predicted in its December 2013 global outlook that activity in the base metals sector would stabilise in the wake of the global financial crisis.

That outlook has generally been reflected in Western Australia, but recent discoveries such as Degruessa–Doolgunna and Nova–Bollinger are a light on the horizon, significantly upgrading the perceived prospectivity for base metals.

There are more than 200 base metal (copper, lead and zinc) projects in Western Australia.

Of these, more than 60 projects have known copper resources, 25 projects have lead resources and 30 projects have zinc resources.

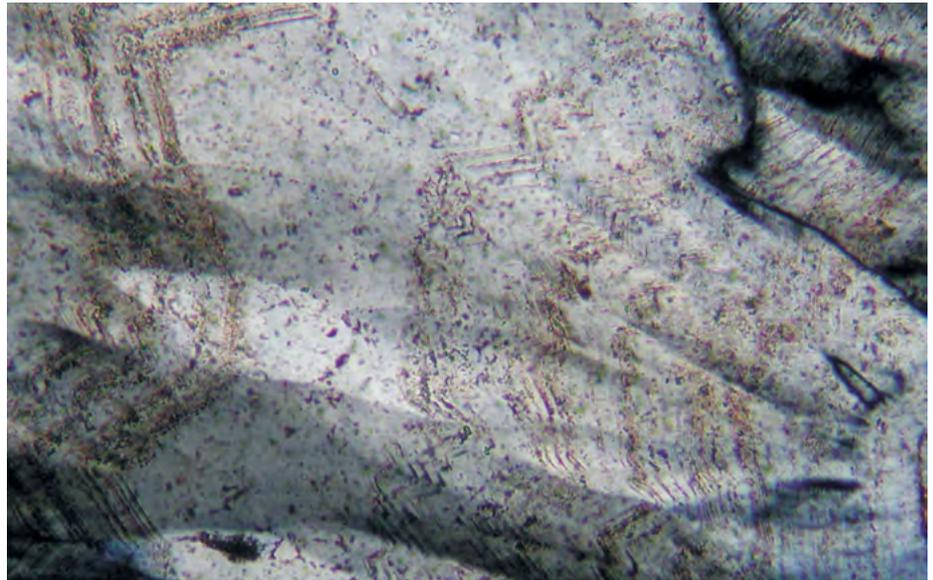
Copper is produced from 15 projects and lead and zinc from two projects each.

Resources

Copper

Western Australia has total resources of 8.8 Mt of contained copper (in measured, indicated and inferred categories). This compares with Australian resources of about 87 million tonnes and world resources of about 690 million tonnes. The following seven projects in Western Australia each have more than 500,000 tonnes of contained copper in total current resources — West Musgrave (1.56 Mt), Nifty (0.86 Mt), Spinifex Ridge (0.80 Mt), Telfer (0.78 Mt), Boddington (0.66 Mt), Golden Grove (0.64 Mt), and Degruessa–Doolgunna (0.58 Mt). Four of these are actually targeted primarily for commodities other than copper.

The DeGrussa polymetallic copper–gold–silver–zinc–lead mine discovered by Sandfire Resources NL in mid-2009 has a resource of 582,000 tonnes of contained copper and is currently the largest producer of copper in the State.



Cerussite, a lead ore.

The Nifty copper mine, owned by Aditya Birla Minerals Ltd, has an estimated resource of 866,000 tonnes of contained copper and is the second largest producing mine of copper in the State.

The Golden Grove polymetallic copper–zinc–lead–gold–silver mine owned by Minerals and Metals Group is the third largest copper producing mine and has a resource of 643,000 tonnes of contained copper.

The Boddington gold–copper mine owned by Newmont Australia is the fourth largest copper producing mine and has a resource of 665,000 tonnes of copper.

The Telfer gold–copper mine owned by Newcrest Mining Ltd, has a resource of 784,000 tonnes of contained copper.

The biggest resource of copper in Western Australia is the large, low-grade Nebo–Babel nickel–copper deposits (1.6 Mt of contained copper) in the West Musgrave region. The deposit was discovered by BHP in the early 2000s, but is currently owned by Cassini Resources Ltd.

The Spinifex Ridge copper–molybdenum–silver deposit in the Marble Bar area, owned by Moly Mines Ltd, is also a low-grade copper deposit and has a resource of 798,000 tonnes of contained copper.

Lead

Western Australia has total resources of 10.9 Mt of contained lead (in measured, indicated and inferred categories). This compares with Australian resources of about 36 million tonnes and world resources of about 89 million tonnes.

The largest lead projects in Western Australia (ordered by quantity of lead contained in total current resources) are Abra (3.74 Mt), Admiral Bay (2.80 Mt), Paroo Station (2.28 Mt), Sorby Hills (0.76 Mt), and Lennard Shelf (0.64 Mt).

Zinc

Western Australia has total resources of 7.2 Mt of contained zinc (in measured, indicated and inferred categories). This compares with Australian resources of about 64 million tonnes and world resources of about 250 million tonnes.

The largest zinc projects in Western Australia (ordered by quantity of zinc contained in total current resources) are Admiral Bay (2.32 Mt), Golden Grove (1.01 Mt), Lennard Shelf (0.70 Mt), and Panorama – Sulphur Springs (0.52 Mt).

Production

Copper

In 2013, Western Australia produced 201,525 tonnes of copper valued at A\$1.5 billion. This is an increase of 12 per cent compared to the 2012 production of 179,308 tonnes, which was valued at A\$1.3 billion.

Western Australian copper production in 2013 was about 20 per cent of the Australian production, which amounted to about 990,000 tonnes. The global production of copper in 2013 was about 17.9 million tonnes.

The major producers of copper, in 2013, in Western Australia were:

- Sandfire Resources NL from the DeGrussa mine in the Peak Hill region (nearly 60,000 tonnes).
- Aditya Birla Minerals Ltd from the Nifty mine in the Telfer region (about 47,400 tonnes).
- Minerals and Metals Group Ltd from the Golden Grove mine in the Yalgoo region (about 33,700 tonnes).
- Newmont Australia Pty Ltd from the Boddington mine in the Southwest (about 30,000 tonnes).
- Newcrest Mining Ltd from the Telfer mine (around 24,700 tonnes).

Lead

In 2013, Western Australia produced 52,706 tonnes of lead valued at A\$118 million. This compares with 2012 production of 8,135 tonnes, which was valued at A\$16.5 million. The low figure in 2012 was due to the stoppage of production at the Paroo Station mine near Wiluna, which is owned by Ivernia Inc. The mine was restarted in 2013. The only production of lead in 2012 was from Western Australia's only other lead mine, Golden Grove.

Western Australian lead production in 2013 was about eight per cent of the Australian production, which amounted to about 690,000 tonnes. The global production of lead in 2013 was about 5.4 million tonnes.

The major producer in Western Australia in 2013 was Ivernia Inc from the Paroo Station mine and the only other producer was Minerals and Metals Group Ltd from the Golden Grove mine in the Yalgoo region.

Zinc

In 2013, Western Australia produced 47,858 tonnes of zinc valued at A\$91 million. This is compared with the 2012 production of 57,113 tonnes, which was valued at A\$107 million.

Western Australian zinc production in 2013 was about three per cent of the Australian production, which amounted to about 1.4 million tonnes. The global production of zinc in 2013 was about 13.5 million tonnes.

The two producing mines in Western Australia were the Jaguar mine in the Leonora region owned by Independence Group NL and from the Golden Grove mine in the Yalgoo region owned by Minerals and Metals Group Ltd.

Exploration

In 2013 exploration expenditure for base metals in Western Australia decreased by 24 per cent to A\$88 million compared with 2012. The currently available 2013–14 quarterly data from the Australian Bureau of Statistics indicate decreasing base metal exploration expenditure in 2014.

However, these discoveries in recent years demonstrate significant interest in the base metal sector in Western Australia and with the Nova–Bollinger discoveries capturing world attention.

- Sirius Resources NL: Nova and Bollinger polymetallic (nickel–copper–cobalt) deposits in the Balladonia region in the Fraser Range.
- Encounter Resources Ltd: BM1, BM7 and other copper prospects of the Yeneena project in the Telfer region.
- Caravel Minerals Ltd: Bindi West and Kurrali copper prospects of the Calingiri project in the Wongan Hills area in the south-west.
- Resource and Investment NL: Forrest Gimp copper prospect in the Peak Hill region.
- Thundelarra Ltd: Azura copper prospect of the Frank Hill project in the Halls Creek region.

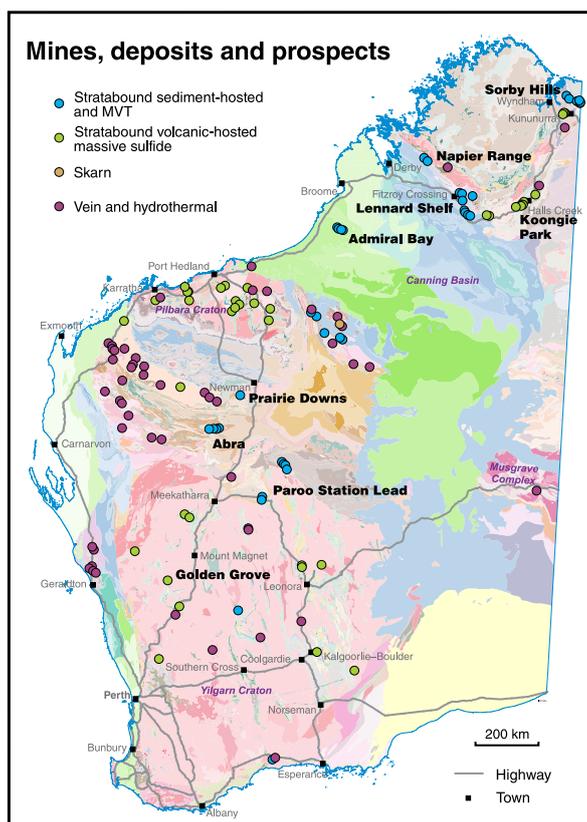
- Classic Minerals Ltd: Mammoth polymetallic (nickel–copper) prospect of the Fraser Range project in the Balladonia region in the Fraser Range.
- Matsa Resources Ltd and Cullen Resources Ltd joint venture: HW Gossan and KC50 polymetallic (zinc–copper–lead) prospects of the Killaloe project in the Norseman region.

Prices and market

The price of copper fell during 2013 (dropping 1.3 per cent from an average of A\$7680 per tonne in 2012 to an average of A\$7581 per tonne in 2013) and has continued to fall during 2014, with a recent price of about A\$7000 per tonne. AME Group (www.amegroup.com) has reported a metal shortage in the spot market, with London Metal Exchange (LME) opening stocks reaching a five-year low of less than 160,000 tonnes.

In 2013, the price of lead increased by 11 per cent to A\$2219 per tonne compared to the 2012 average price of A\$1992 per tonne. The current price is about A\$2200 per tonne.

The average price of zinc increased by five per cent in 2013 to A\$1979 per tonne compared to the 2012 price of A\$1882 per tonne. The current price has increased to about A\$2350 per tonne. According to AME, the zinc market is already in a 200,000-tonne deficit from the first half of 2014, and faces a further deficit of almost 300,000 tonnes in the full year 2014.





At the Pilbara Power signing were (seated L-R) Fortescue Metals Group Chief Executive Nev Power, Energy Minister and Treasurer Mike Nahan, Managing Director Horizon Power Frank Tudor, (standing L-R) Department of State Development Director General Steve Wood, General Manager TransAlta Australia Aron Willis, and Department of Finance Director General Anne Nolan. Photo: Horizon Power.



Premier and State Development Minister Colin Barnett

NEW POWER FOR PILBARA



Canadian-based energy company TransAlta Corporation (Australia) will fund, design, build and operate a 150 megawatt power station at South Hedland to meet future Pilbara electricity demand.

The Western Australian Government has approved the commercial agreements negotiated between TransAlta and Horizon Power, giving the green light for this major project to go ahead.

Fortescue Metals Group and Horizon Power are foundation customers of the new A\$570 million power station, to be built in South Hedland's Boodarie Industrial Estate.

Premier and State Development Minister Colin Barnett said the new power station would help to ensure long-term energy security for residents and businesses in the growing Pilbara region, with TransAlta's presence also introducing much-needed competition into the market.

"This state-of-the-art energy infrastructure will be built using private rather than State funds, demonstrating there are still innovative ways to deliver important infrastructure in times of financial constraint," Mr Barnett said.

The Premier thanked Fortescue Metals Group for their commitment to the project, adding it was a great example of a public-private partnership working together to deliver the right outcomes for the resources sector and regional communities.

The station is expected to create up to 250 jobs during construction, which will start in early 2015. First power is expected to be delivered in 2016 with full commissioning expected in 2017. At a later date, the plant may also be expanded to supply power to other customers and commercial users.

Energy Minister Mike Nahan said the agreement negotiated by Horizon Power

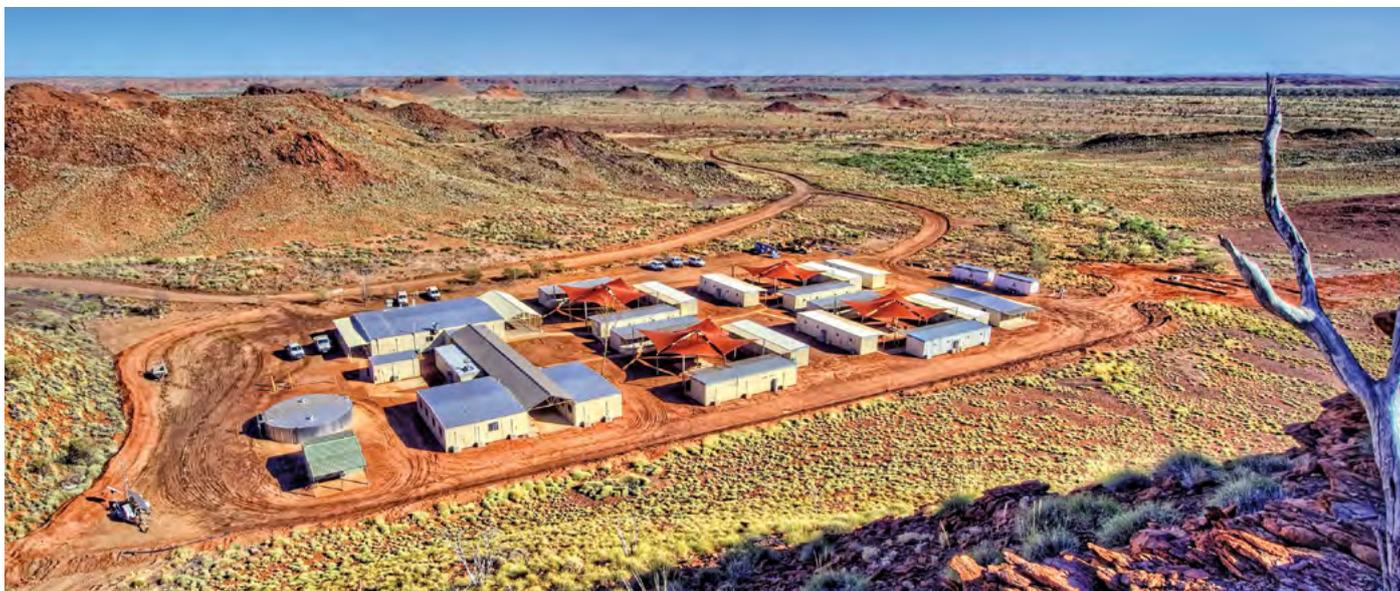
was just the beginning of improved coordination and integration of energy infrastructure in the North-West Interconnected System.

"Horizon Power should be proud of this outcome of several years of work which is part of a bigger vision to have a fully integrated and coordinated electricity network in the Pilbara," Dr Nahan said.

"This will ensure precious resources are not wasted and that customers are buying power from the most cost effective system possible."

The combined cycle gas power plant will be one of the most efficient and reliable power stations in the region. This plant features both natural gas and steam turbines, with the steam turbine using waste heat from the gas turbine to generate additional electricity.

WA MINERS URGED TO TAKE LEAD IN GLOBAL URANIUM PUSH



Cameco Australia's Kintyre Mine in the East Pilbara.

Mines and Petroleum Minister Bill Marmion says Western Australia should build on its world-leading resources technology to take a major role in the global uranium industry.

“We have seen competitor nations expand their energy mining sectors and now, with Australia home to one-third of the world’s known reserves, it’s time we embraced a leadership role as well,” Mr Marmion said.

Addressing the 10th annual Australian Uranium and Rare Earths Conference in Perth in July, the Minister said Australia was well-placed to supply new and expanding markets.

“An increasing number of rational people across the world are seeing nuclear energy, with its low carbon emissions and base-load power capacity, as a fundamental part of the response to climate change,” he said.

“Our biggest trading partner, China, is set to lead the charge for a cleaner, lower-carbon emission future – and we are in the box seat to ride the rising market for uranium.”

China already has 20 reactors on line, with 29 more under construction, and plans to triple its nuclear power generation by 2020, then triple it again by 2030.

Australia recently signed a supply agreement with the United Arab Emirates and negotiations continue with India, which has 21 reactors in operation, six under construction and 35 planned.

Mr Marmion acknowledged recent challenges faced by the industry but urged conference participants to take advantage of opportunities.

“Now is the time for consolidation,” he said.

“Over the next 18 months get all of your Commonwealth and State approvals in place so that you are best placed to capitalise on the next phase of market expansion.

“No State dominates gas energy exports like WA, and our Government certainly shares the vision for a dominant role in uranium, too.”



Mines and Petroleum Minister Bill Marmion addresses the 10th annual Australian Uranium and Rare Earths Conference.



SUCCESS AT THE END OF A LONG AND WINDING ROAD

DMP Environment Executive Director Dr Phil Gorey.

After years of consultation and a one-year voluntary opt-in period, the Department of Mines and Petroleum's Mining Rehabilitation Fund (MRF) is now firmly in place.

DMP Environment Executive Director Phil Gorey said the MRF team had completed a huge task, particularly given Western Australia has more than 22,000 Mining Act tenements.

"We have received very positive feedback from industry stakeholders on the management and implementation of the MRF being described as 'first class' and 'going above and beyond' to ensure tenement holders were registered," Dr Gorey said.

"We believe the fund is making history in terms of its progressive forward thinking and ability to provide better outcomes for the environment, mining industry and community."

The fund will generally remove the onus on Mining Act tenement holders having to submit Unconditional Performance Bonds (UPBs) as security for mine rehabilitation.

Tenement holders will be required to make annual contributions to the fund calculated on the amount and type of ground disturbed as a result of exploration and mining activities.

"The less ground disturbed by an activity, the less the tenement holder has to contribute to the fund, so it acts as an incentive for companies to conduct ongoing rehabilitation as a project progresses, rather than leaving all the rehabilitation until the end," Dr Gorey said.

"The fund will also free up cash previously held under UPBs, which most tenement holders will be able to use to invest in future projects and ongoing rehabilitation.

"In time, interest earned from the fund will be used to rehabilitate decommissioned and legacy mine sites across the State."

When the mandatory MRF started on 1 July, 96 per cent of tenement holders had registered, and most had submitted their disturbance data through the online system.

Dr Gorey said more than 13,000 individual tenements had submitted their disturbance data in one two-week period.

"It is particularly pleasing to see the high level of prospectors who have successfully registered for the fund," he said.

"With most prospectors living in regional areas and many not owning a computer, the MRF team held regional registration days to walk people through the online process."

About 1,800 individual tenement holders failed to either register or complete their reporting requirements by the 30 June 2014 deadline.

"Those tenement holders who have not registered or completed their submission will be fined A\$4000 per tenement under legislative requirements" Dr Gorey said.

"Tenement holders who have successfully registered will receive their annual invoice for their contribution to the MRF in the coming months, unless the rehabilitation estimate generated by the tenement is less than A\$50,000.

"Once invoices have been paid, DMP will review existing environmental bonds to see if tenement holders are eligible to have their bonds retired."

If the tenement holder has failed to lodge production reports, royalty returns and pay in full royalties owing to the department within the prescribed time and manner, the tenement holder will not be eligible to have bonds retired.

Regardless of whether a levy payment is required under the MRF, UPBs will still be imposed on tenement holders and activities where the DMP considers there is a high risk of rehabilitation liability reverting to the State.

Situations where UPBs may be imposed include when the tenement holder or controlling business is under administration or in liquidation, has failed to comply with environmental obligations under the Mining Act, or has breached reporting or payment obligations of the MRF.

The application or retention of a UPB will be managed on a case by case basis and will ensure a fair and transparent decision process.

For more information, please visit www.dmp.wa.gov.au/MRF

MINING REHABILITATION FUND SETS GLOBAL BENCHMARK

How do you promote the responsible development of Western Australia's resources sector while safeguarding the environment at the same time? Department of Mines and Petroleum Executive Director Dr Phil Gorey explains.

Behind the scenes of mighty machines, drilling and digging that characterise the industry, there is a quiet achiever, major policy reform called the Mining Rehabilitation Fund (MRF) that is doing just that.

It's a classic win-win situation that is the result of four years' intensive consultation and research by the Department of Mines and Petroleum (DMP).

Launched by the department on 1 July 2014, the MRF has been applauded in recent weeks at home and overseas.

Now the MRF is a global benchmark in mining reform, a model that no other Australian State or Territory is using.

But good news travels fast. Positive feedback from industry has sparked the interest of Queensland and New South Wales, who are reviewing adoption of the model.

The MRF is also the first fully online system designed for mining rehabilitation purposes in the world.

If you're wondering what that actually means, here's some background.

In the mining world, the MRF replaces the holding of Unconditional Performance Bonds (UPB), securities that operators were required to purchase under the *Mining Act 1978*.

The aim was to ensure miners met their environmental rehabilitation obligations while operating and after operations finished.

This protected the State Government and the people of Western Australia from undue exposure to these costs, while safeguarding the environment if operators neglected their responsibilities.

This approach worked well until recently, when it became apparent the bonds weren't keeping pace with inflation and the real costs of environmental rehabilitation and, consequently, not achieving their financial objectives.

In reality, the bonds covered less than 25 per cent of rehabilitation costs following mine closure.

This scenario left the State Government facing a massive potential contingent liability of about A\$5 billion.

Under the MRF model, that figure is now zero, and the framework for participants is more viable, equitable and simpler.

In a nutshell, operators now pay a non-refundable annual levy based on the amount and type of ground disturbance resulting from exploration and mining activities.

The mining operators are still required by law to meet all of their environmental obligations – the MRF is a safety net to protect the community and the State Government against having to pick up the tab for rehabilitation in cases where the operator is unable to fulfil obligations.

The scale of this reform is underlined by the fact that the State Government aims to retire more than A\$1 billion in bonds over the next 12 months, freeing up much-needed investment capital.

Naturally, stakeholders have embraced the cost savings which allow them to better use their funds, particularly to small-to-medium miners.

On the other hand, the benefit to the community and the environment is considerable because, as a perpetuating asset, all accruing interest within the MRF can be used to rehabilitate legacy mine sites.

If this sounds too good to be true, it wasn't all smooth sailing for DMP.

With about 23,000 tenements in the State, the department had to go into overdrive to achieve the 12-month transition phase to implementation.

DMP took an all-hands-on-deck approach to circumvent teething problems, communicating regularly with stakeholders through road shows, visits to regional centres, online information, reminder letters and phone and email support.

In the lead up to launch, the department encountered scepticism from some industry players concerned that the policy would incur higher expenses.

However, resoundingly positive feedback from industry, along with international attention and commendation, suggested otherwise.

Concerns were also voiced about the issue of infringement notices for late registration, which under legislation must be issued within 21 days of failure to lodge disturbance data.

But in the interest of a smooth transition DMP worked closely with tenement holders, achieving an amazing result of having 99 per cent of tenements now compliant.

The Fraser Institute's 2013 survey of mining companies described the MRF as 'exemplary policy' when it ranked Western Australia top jurisdiction for investment attractiveness for the first time in the history of the survey.

While contribution to the MRF is now mandatory, an additional safety net of new policy still enables the DMP to require a bond by tenement holders deemed a high risk of not completing their rehabilitation obligations.

At the end of the day, the MRF is still in its infancy but if current levels of recognition and praise are anything to go by, it appears to be a winner – a success story that deserves to be told.



Crude oil oozes over the top of the drill-pipe as drillers strike oil for the first time at Rough Range in 1953. This picture was taken by one of the men on site with a box camera on 21 November 1953, but the discovery was not announced until 4 December. Image courtesy West Australian Newspapers.

DMP TURNS 120 – A RETROSPECTIVE

Department of Mines and Petroleum Executive Director Petroleum Jeff Haworth looks back on 120 years of DMP's involvement with Western Australia's oil and gas industry

This year is the 120th anniversary of the creation of the Department of Mines and Petroleum, so I thought I would reminisce a little on the development of the petroleum industry in Western Australia and focus on the department's regulatory role during this time.

The first petroleum exploration wells, drilled in the Blackwood and Warren rivers area in 1902, were unsuccessful and other early exploration of the State was sporadic, also bringing little success.

The first concerted exploration drilling campaign began in the 1950s with West Australian Petroleum (WAPET) drilling the Rough Range 1 well near North West Cape and finding non-commercial oil in 1955.

WAPET continued a Statewide exploration campaign, drilling wells in the Canning, Perth and Carnarvon Basins, but it wasn't until 1964 that a commercially viable oilfield was discovered on Barrow Island.

The strategic value of oil and gas was recognised by the Commonwealth Government which created the *Petroleum Search Subsidy Act 1957* and provided incentives to industry for petroleum exploration throughout Australia. The discovery of oil at Barrow Island was a part of this program.

During this period, the Western Australian Government regulated the industry under the *Petroleum Act 1936*. In 1967, the *Petroleum Act 1967* (now the *Petroleum and Geothermal Energy Resources Act 1967* [PAGERA]) and the *Commonwealth Petroleum (Submerged Lands) Act 1967* were passed to regulate the industry.

Oil and gas was discovered in the Mid West in 1966 at the Dongara field, which came into production in 1971 when the Parmelia gas pipeline was constructed to deliver gas to the metropolitan area.

Several other gasfields were also discovered around Dongara, including Woodada, Warro, Yardarino and Gin Gin. Some proved to be commercial while others weren't.

Further discoveries were made in the 90s and 2000, including the Tubridgi and Beharra Springs gasfields, the Eremia, Jingemia and Hovea oilfields and the offshore Cliff Head oil and gas field.

"More than 3,200 wells have been drilled in Western Australia since 1903 – 1,772 onshore or on nearby islands and 1,476 offshore."

Woodside (then Burmah Oil Company of Australia) started exploring, along with others, off the coast in the North West

Shelf area in the 1970s. During this time, significant gas discoveries were made, such as North Rankin, Goodwyn, Gorgon, Scott Reef and Scarborough to name a few, however these were not commercially viable at the time.

DMP regulated this exploration in the onshore areas and on behalf of the Commonwealth in the offshore as the Designated Authority.

Regulation was conducted under a set of Schedules of Requirements for both areas and all activities conducted by companies required assessment and approval by DMP before commencement. All were subject to audit during operations by DMP inspectors.

In the 1980s, the State Government underwrote the construction of the Dampier to Bunbury Natural Gas Pipeline which provided domestic gas from the North West Shelf to customers in the South West. The North Rankin and Goodwyn fields started production in 1984 and 1995, respectively, with liquified natural gas (LNG) exports to Japan starting in 1989.

It was also in the 80s, on 6 July 1988 to be specific, that the Piper Alpha disaster in the North Sea occurred, killing 167 people.

The subsequent Cullen Inquiry into the disaster recommended that regulation should move from prescriptive to objective based regulation with a focus on risk identification and management.

The Commonwealth, the States and the Northern Territory agreed to adopt this style of legislation in 1994 and moved towards replacing the existing Schedules with a set of regulations.

The Commonwealth started this process first and Western Australia followed, with changes to its legislation starting in 2010. These included the Safety Regulations for the three State Acts, PAGERA, *Petroleum (Submerged Lands) Act 1982* and the *Petroleum Pipelines Act 1969*.

The Environment Regulations were introduced in 2012 and the final set of

regulations, the Resource Management and Administration Regulations, are due to be introduced later this year.

The real boom in the offshore occurred from the 1990s onwards with the introduction of floating technology, subsea manifolds, multi-lateral wells and horizontal drilling in the North West Shelf.

The introduction of Floating Production Storage and Offloading vessels (FPSOs) had a strong influence in bringing previously unviable oil fields into production.

Again, DMP was heavily involved in the regulation of these new technologies, including the construction and management of high-pressure, high-volume gas production wells in deep water, ensuring the legislation and regulatory framework dealt with the safe, environmentally responsible development of the industry.

During this offshore boom time, the onshore gas fields were reaching the end of their commercial life. In recent years, only one new commercial gas field has been brought into production, the Red Gully/Gingin West field.

Much has been said about the potential resources of natural gas in shale and tight rocks in Western Australia and this is seen as a potential replacement for the North West Shelf domestic gas supply that is due to decline in 2020.

This industry is in its infancy in WA with only a few exploration wells drilled specifically for this target and no commercially viable fields discovered as yet.

The US industry is harnessing technologies that have advanced from the days they were first used onshore, specifically horizontal drilling and hydraulic fracture stimulation.

As mentioned, DMP has been regulating horizontal drilling in offshore areas since the 1990s, and this type of hydraulic fracturing since early 2000.

As part of DMP's regulatory role, it reviews other jurisdictions' regulation of the industry,

both nationally and internationally, and compares this to our own.

The shale and tight rocks development has been around since the 1980s in the US and officers of the DMP have watched its development with keen interest and visited well sites in the US.

DMP had an independent review of its legislation in 2010, which concluded that the current regulation of the industry was robust, however, some changes were recommended to improve transparency. These recommendations have been implemented by DMP.

This department, along with other government agencies, treats the shale and tight rock industry with the same due diligence as the rest of the petroleum industry to ensure operations are conducted in a safe, environmentally responsible manner.

DMP manages this through a rigorous assessment and approvals system, followed up by compliance auditing of the operations.

The Departments of Agriculture and Food, Environment Regulation, Health, Parks and Wildlife, State Development and Water, and the Office of the Environmental Protection Authority (OEPA) are among those providing us with expert advice and exercising their own regulatory controls.

DMP works closely with these agencies and has developed Memoranda of Understanding with some of them, including the OEPA and Water, and has also established an interagency working group to ensure updated legislation, regulations and guidelines are robust and address community values and expectations.

It's a cohesive whole-of-government regulatory framework that underpins our department's regulation of the development of the onshore and offshore petroleum industry.

As in the past, now, and in the future, DMP ensures best practices are adhered to on behalf of the people of Western Australia.



Chevron's Gorgon Project: Things have come a long way since commercially viable oil was discovered at Barrow Island in 1964.



Executive Gas Training Program participants with (far left) Lily Li, LNG Fund Executive Assistant, and (centre) Duane McDonnell, Project Manager in the Department of State Development's Strategic Projects Division.

GAS PROGRAM CELEBRATES A DECADE

As the curtain falls on another successful occurrence of the Executive Gas Training Program, *Prospect* magazine is taking the opportunity to have a closer look at an initiative that is now celebrating its tenth year.

Implemented as part of the Australia-China Natural Gas Technology Partnership Fund, the program sees senior managers and officers from major Chinese oil and gas corporations, as well as the Chinese Government, spend three months in Australia developing their knowledge of the LNG industry.

Participants spend a significant amount of their time preparing group presentations at the Australian Training Centre, which is jointly operated by the University of Western Australia and Curtin University, and attending site visits. At the culmination of the program, the groups deliver their findings to representatives from the Western Australian Government and the LNG industry.

At the presentations, Qiao Yu, Commercial Department Manager at the China National Offshore Oil Corporation, took the opportunity to speak on behalf of the group and thanked those involved in the administration and organisation of the LNG Fund. He spoke fondly of the places the participants had visited during their stay in Australia and of how enriching the experience had been.

The topics covered in the presentations included such areas as China's low

carbon future; comparisons of natural gas regulations between Australia, the USA and China; and the costs and benefits of renewable power sources versus LNG.

The seeds for the program were sown in 2002 as part of an agreement for Western Australia to supply LNG to China for 25 years. The LNG Fund was formed to expand opportunities for training, research and technology transfer between Australia and China. To date, more than 200 trainees have participated in the program.

Part of the training involves an information session at the Department of State Development on the LNG industry in Western Australia. In June this year, the 12 participants of the program visited the department for the presentation and gained a deeper understanding of the industry. They also spoke of the benefits of the study they were undertaking.

"My major in college was engineering, so this is a good chance for me to learn more about natural gas," said Chen Shi, Director of Strategic Planning at ENN Group.

"The knowledge of the industry I do have is from reading books but I haven't had a formal education in this field, and in areas like the economy, so it's good for me to go back to school and develop a base understanding."

In addition to the formal aspects of the program, the group was also able to spend some time enjoying the sights of Perth, which left a favourable impression on Mr Chen.

"Perth is a very beautiful city, the people are friendly and the environment is very clean. I would definitely recommend this study to other people because it's a great opportunity, especially for young people in China."



Qiao Yu, Li Yue, Wang Changli, Feng Shiquan and Cheng Mingfeng at the Department of State Development.



LOCAL COMPANY'S ELECTRIC RIDE CONTINUES

HVLV's round-the-clock fabrication ability is not hampered by inclement weather. Photo: HVLV.

Established in early 2009 in the midst of the global financial crisis, local business HVLV is going from strength to strength as it capitalises on the significant opportunities being presented by the mining industry.

The company designs, manufactures and delivers transportable substations to the mining, utility and oil and gas sectors. With the value of its first contract totalling A\$2.5 million, HVLV quickly realised the enormous growth potential of the market and proceeded with the construction of a facility in Hazelmere, some 16 kilometres east of Perth.

Those first premises were opened by former Mines and Petroleum Minister Norman Moore on 29 September 2010, but on the back of robust orders in 2011 and 2012 HVLV was soon constructing its Stage 2 facility. Buoyed by the prospect of winning major work as part of the Wheatstone project, the company then decided to push ahead with the development of its Stage 3 facility, where it has been housed since March this year.

As it transpired, the confidence the company felt with respect to the Wheatstone project was not unfounded – in 2013 HVLV secured A\$40 million worth of work for the Chevron venture. It's an enormous job, but one that Anton Bekker, HVLV General Manager, explains is well within their capabilities.

"We have over 20 experienced designer draftspeople and project managers with experience specific to the transportable switchroom industry. This assists our client base during the design stage and

ensures a product which is tailored to their intended purpose," he said.

"Our undercover fabrication and construction facilities, which total some 7000m² complete with overhead cranes, and over 35,000m² hardstand provide the infrastructure required to deliver a high quality product.

"HVLV's role in the Wheatstone project is to design and manufacture all of the 13 transportable substations. Some of the buildings are in excess of 70m long and 35m wide, and the completed structures will be transported by barge to the site."

The size and technological capabilities of the workshop had a significant impact on Premier and State Development Minister Colin Barnett, who recently visited the company and came away impressed by HVLV's operation.

Further proof of HVLV's position as a leader in the manufacturing of portable switchrooms was provided earlier this year when it was successfully acquired by Viento, an ASX-listed company that specialises in mining services, land

subdivisions and civil contracting. This move has allowed HVLV to extend its portfolio to include the supply of full electrical services as well as the site civil works associated with transportable switchrooms.

Punctuated by the substantial order received as part of the Wheatstone project, HVLV relies almost solely on the Western Australian mining industry for work. As Bekker explains, it's an area to which the company is well-suited.

"Our entire business is set up and structured to support the mining industry. The product we deliver is engineered and designed to suit WA conditions. Supplying rooms to other areas of the country is not feasible due to transport costs, which result in us being commercially uncompetitive."

While HVLV is certainly capitalising on a rich period in WA mining, it has also made it a priority to assist the local community where it can – all its materials are locally sourced and all labour is derived from the Midland region. It also supports a number of apprenticeships.



Premier Colin Barnett, centre, with local government members and HVLV staff.



Former DMP Executive Director Petroleum Bill Tinapple.

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OIL AND GAS VETERAN WINS TOP INDUSTRY AWARD

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The Department of Mines and Petroleum's (DMP) former Petroleum Division Executive was recently awarded the prestigious John Duran Lifetime Achievement Award

Bill Tinapple, a 40-year veteran of the oil and gas industry, was presented with the annual award during the Resource Information Unit (RIU) Good Oil Conference 2014 in Fremantle this month.

Mines and Petroleum Minister Bill Marmion said while announcing the award that it was a fitting tribute to a titan of the industry.

"Bill Tinapple has worked in so many places around the world that most industry people over 30 seem to have worked with him at some time," Mr Marmion said.

"DMP has been very fortunate to have had the benefit of Mr Tinapple's experience and guidance during the 15 years he was with the department.

"Thanks to people of the calibre of Bill Tinapple, Western Australia is now the leading location in the world for liquefied natural gas."

The John Duran Award is an acknowledgement of a member of the oil and gas community who has dedicated his or her life to promoting the junior and midcap sector.

It is the first time a former government employee has been honoured with the award.

While heading DMP's Petroleum Division, Mr Tinapple played a leading role in a number of initiatives that improved customer service, increased investment in Western Australia, and sustained production.

Originally from Ohio in the US, he has qualifications in engineering and a Masters of Business Administration.

Mr Tinapple settled permanently in Australia in 1985 and has worked in the United States, the United Kingdom, Libya, Indonesia, the North Sea, Norway, Nigeria, Japan, Australia and Abu Dhabi.

Mr Tinapple has been intimately associated with development of the oil and gas industry in Australia.

Initially involved in engineering studies for the North West Shelf, he went on to play an important role in the development of the first floating production, storage and offloading unit.

Later he was also involved in gas pipeline development, including the Amadeus gas pipeline to Darwin.

The Australian petroleum industry has benefited ever since.

After migrating to Australia in 1985, Mr Tinapple went to Darwin to work in a regulatory role with the Northern Territory Government.

After 12 years in the top end, he accepted the position of Petroleum Director with the Western Australian Government, and started with DMP in 1998.

One of Mr Tinapple's early decisions was to establish the department's first Petroleum Open Day, so his division could communicate better with its stakeholders.

He was instrumental in facilitating and encouraging the huge multi-client offshore 3D survey in the 1990s.



Bill Tinapple receives his award from Minister Bill Marmion.

This greatly improved the rate of discovery of gasfields on the North West Shelf.

Mr Tinapple has also been a fervent promoter of onshore oil and gas.

It may seem at first glance that WA has enough offshore gas resources to last for many years.

But Mr Tinapple believed project lead times needed to be taken into account and that the State should encourage exploration and development of other sources of gas to meet future energy needs.

That was why he recognised the potential for shale and tight gas five years ago.

Mr Tinapple concentrated his efforts on advancing this area of the industry while also making sure the State regulatory framework was appropriately robust.

Initially, this was done through an independent review of the legislation which provided recommendations that are now being acted on.

In his role as a regulator, Mr Tinapple oversaw changes within the department resulting from amendments to the Commonwealth's offshore petroleum legislation which came into effect in 2012.

"Western Australia is now the leading location in the world for liquefied natural gas development and the largest user of domestic gas in Australia," Mr Marmion said.

"And that is due in no small part to the role Bill has played during an illustrious career that has spanned four decades."

Dr John Doran, who died seven years ago, was involved in discoveries in the Middle East, Africa and Europe before coming to Australia in 1980.

Dr Duran's career highlights included the discovery of the Thevenard Island fields and the creation of Roc Oil, which made several discoveries in the Perth Offshore Basin.

RICHARD SELLERS WINS PATRON'S AWARD

Department of Mines and Petroleum's Director General Richard Sellers was recognised with the highest Institute of Public Administration Australia (IPAA) award in the State.

The Patrons Award was awarded to Mr Sellers in June, accepted on his behalf by Acting Director General Dr Tim Griffin.

"This is a great honour for Richard, and it is an acknowledgement of the leadership he has brought to DMP," Dr Griffin told the audience.

Mr Sellers, who was away on annual leave, said he was deeply honoured to have been selected.

"We have achieved significant reforms and innovations during the past five years that will help ensure the continuing prosperity of Western Australia's resources industry," he said.

The Patron's Award is awarded annually to an individual who has made a significant contribution to the State.

Mr Sellers was described at the presentation as "a visionary who makes considered and complex decisions".

"His insistence on consultation and transparency in decision making, together with his willingness to implement innovative business methods have been key factors of his stewardship of DMP, during the busiest growth period of Western Australia's resources industry," the audience was told.

Appointed Director General of the department in June 2009, Mr Sellers has had a diverse career in the private and public sectors ranging from education, the fishing industry (commercial and government) and the resources sector.



Director General Richard Sellers

He holds a Bachelor of Applied Science Biology, a Graduate Diploma in Education and Master of Public Policy and Management.

Mr Sellers was reappointed last December for another five-year term at the helm of DMP.

The IPAA WA awards were presented during a lunch ceremony at the Hyatt Regency.



*New Dangerous Goods and Petroleum Safety branch
Director Ross Stidolph.*

SAFETY MERGER BRINGS NEW PERSPECTIVE

Towards the end of 2009, the Department of Mines and Petroleum launched the Reform and Development at Resources Safety strategy, also known as RADARS.

During the past four-and-a-half years, the strategy has been instrumental in strengthening the department's regulatory capacity.

While initially focusing on mines safety, more recently it has shifted to petroleum and dangerous goods safety.

Following a structural review of these two regulatory areas, it was recommended that these branches should be merged.

On 1 July this year, the Dangerous Goods and Petroleum Safety branch was officially launched and Ross Stidolph was announced as its inaugural director.

"The new branch brings together two regulatory groups that manage similar safety issues," Mr Stidolph said.

"This will help create a more consistent and robust regulatory approach to critical risk assessment."

Mr Stidolph is a 30-year veteran of the oil and gas industry and brings a wealth of experience to the role.

"I'm an engineer by trade and have spent a number of years at the BP refinery in Kwinana – one of the State's largest major hazard facilities," Mr Stidolph said.

Resources Safety Executive Director Simon Ridge said Mr Stidolph's experience would be invaluable.

"He has extensive experience with the department's safety regulations and brings a unique operator's perspective to safety performance and obligations," Mr Ridge said.

Mr Stidolph said his new role will initially focus on delivering dangerous goods regulatory reforms and completing a statutory review of the Dangerous Goods Safety Act.

"I am passionate about working to provide better safety outcomes and processes for industry," he said.

"One of the major achievements in my career to date has been the significant improvement in safety performance that occurred during my time at Verve Energy (now Synergy) as Chief Operating Officer."

Mr Stidolph said another highlight was working in Scotland for four years at Grangemouth's major petrochemical complex where the North Sea's oil and gas pipeline terminates.

"Living and working in the United Kingdom at a major hazards facility was a huge experience for me and my then young family," he said.

"Growing up in South Australia near a rocket range and test firing facility, I had a unique introduction to the dangerous goods industry at a very young age.

"Although I didn't realise it at the time, dangerous goods safety would go on to play a major part of my career and become something I am very passionate about."



Andrew Chaplyn, with Mines and Petroleum Minister Bill Marmion and former State Mining Engineer Simon Ridge.

NEW STATE MINING ENGINEER APPOINTED

Meet Andrew Chaplyn, Western Australia's 11th State Mining Engineer.

Mr Chaplyn, who is also Mines Safety Director at the Department of Mines and Petroleum (DMP), has taken over the role from DMP Resources Safety Executive Director Simon Ridge.

Mr Ridge said Mr Chaplyn had been a key member of the department's safety management team since 2009 and was highly suited to take over the role.

"Andrew has spent more than 30 years working in the mining industry, from a graduate mining engineer through to senior leadership roles in both private industry and government," Mr Ridge said.

Announcing the appointment, Mines and Petroleum Minister Bill Marmion said Mr Chaplyn would be responsible for administering the provisions under the *Mines Safety and Inspection Act 1994*.

"These responsibilities include managing the State's mine safety inspectorate, approving key mining submissions and chairing the

Board of Examiners and the Mines Survey Board," he said.

"Mr Chaplyn's appointment will complement his current role as Mines Safety Director at DMP, a position he has held since 2012.

"Before this, he held the positions of Regional Inspector and District Inspector.

"He also has a Bachelor of Engineering in Mining from the Western Australian School of Mines."

Mr Ridge said the appointment of an officer of Mr Chaplyn's calibre reinforced DMP's role as a proactive safety regulator working with the resources industry to create an environment in which resilient safety cultures were the norm.

"Companies, workers and the wider community need to be confident that the resources industry is operating as safely as possible," he said.

"We're continually looking at ways to improve upon our high safety regulation standards but, I have to say, regulation is already extremely strong here in WA.

"We have made a lot of progress in establishing a resilient safety culture in our industry."

Mr Ridge said it was particularly gratifying to see the willingness of industry to take part in the development of new codes of practice and guidance material.

"We all know that mining is a risky business and that complacency is one of our biggest enemies.

"It's why we need people like Mr Chaplyn who are not only dedicated, but passionate about safety, to ram home the messages about hazard recognition and risk management, and encourage a mindset that continually questions the status quo of work environments."



State Mining Engineer Andrew Chaplyn and Mines Inspector Peter O'Loughlin.

SAFETY FIRST

“Safety is everything.”

It's a simple statement, but for recently appointed State Mining Engineer Andrew Chaplyn, it's more than words.

It's a statement backed up by the kind of deep-rooted experience that comes from a 30-year career in the mining industry.

“Compared to when I first started in the industry, there's no doubt that there have been considerable improvements in safety,” Mr Chaplyn said.

The statistics back up recollections of his early days in the industry.

Between 1984 and 1993 there were a total of 86 fatalities in Western Australia's mining industry.

This included the worst single mining disaster in the State's history when six men drowned 25 years ago on 13 June 1989 at the Emu Gold Mine near Leonora.

It is an incident that has been burned into the memory of anyone who worked in the industry at the time.

“It was one of those moments where you remember where you were and what you were doing when you were told,” Mr Chaplyn said.

“It was the kind of incident that really brought safety to the forefront of your mind.”

In the past 10 years there has been a total of 36 fatalities – less than half the number of deaths in the first decade of Mr Chaplyn's career.

This included a 23-month stretch in which there were no fatalities – the longest fatality-free period since records started more than 100 years ago.

At the same time as the number of fatalities has dropped, the number of people working in the industry has more than doubled.

“I think this is evidence of the improvements that have been made to safety in the industry,” Mr Chaplyn said.

“There is a greater awareness around safety issues and the old, risk-taking attitudes of the past are just not tolerated today.

“However, this doesn't mean the risks have been removed and, arguably, one of the biggest dangers we now face is complacency.”

Safety experts say that one of the ways to combat complacency is to maintain a sense of vulnerability.

“In an industry like mining you are working with plant and equipment that can kill in an instant, no matter how strong or quick you think you are,” Mr Chaplyn said.

“It is important to always remember what you are dealing with, because the consequences of forgetting that fact can be tragic.”

Tempering complacency has been an important focus for Mr Chaplyn and the mines safety team.

“Our safety reforms call for continuous improvement and this cannot be achieved if people or organisations become complacent,” he said.

“This goes for us as regulators just as much as for industry.

“We all need to look at what we are doing, and how we can do it better.”

Since 2009, the department has held the biennial Mines Inspectors’ Forum, bringing together inspectors from across the State.

“The forums really give us the opportunity to come together as an inspectorate and look at how we are doing our jobs,” Mr Chaplyn said.

“We can identify what’s working and what areas we really need to focus on for improvement.

“It also helps to ensure that, as an inspectorate, we give clear and consistent advice and direction to industry – that our inspectors in the Goldfields are on the same page as our inspectors in the South West or in the Pilbara.”

Another focus of the reforms has been to ensure there is a collaborative approach to safety in the industry.

“The department has really focused on working with industry groups, unions and other government agencies,” Mr Chaplyn said.

“This helps to identify safety issues from a range of perspectives and ensures we respond to these issues in a collaborative way.”

Mr Chaplyn said the approach has been instrumental in establishing the department’s safety reforms and would continue to inform priorities in the future.

“I think it also recognises the fact that safety is the responsibility of everyone involved in the industry – from companies and workers, to regulators and the government,” Mr Chaplyn said.

“Only by continuing to work together can we make real, significant and sustained improvements to safety in our resources industry.”

\$70 MILLION RAIL FLEET TO SET YILGARN IRON ORE PRODUCTION RECORDS



Minister Marmion and Mineral Resources Chairman Peter Wade at the launch of the company's rail fleet.

A new fleet of trains to service the Yilgarn’s Carina mine will help lift exports by almost 25 per cent this year and augers well for the future of Western Australia’s southern iron ore industry.

Launching the A\$70 million rail expansion in July, Mines and Petroleum Minister Bill Marmion praised the company behind the project, Mineral Resources Limited, for its commitment to the State’s resources industry.

“By investing in its own fleet of five locomotives and 382 rail wagons, Mineral Resources will be able to build further on its already considerable success,” Mr Marmion said.

The Carina iron ore project is about 100 kilometres north-east of Southern Cross.

The new trains will service the Carina iron ore mine and the company’s future mine developments in the region and will allow it to boost production to 5.4 million tonnes next year, up from this year’s record of 4.6 million tonnes.

The Minister said the success of the project stemmed from more than 20 years of hard work by everyone involved in the company.

“This investment promises to improve the output and efficiency of your current operations,” Mr Marmion said.

“Even more importantly, these trains represent an investment in the future of Western Australia’s resources industry.”

The names of the five locomotives pay tribute to the region and the project: Southern Cross, Spirit of Yilgarn, Carina Flyer, MinRes Express and Polaris Express.

Since starting operations in July 2011, the Carina mine has exported more than 7.7 million tonnes of iron ore.

Mineral Resources has expressed an interest in exporting through the Esperance Port Multi User Iron Ore Facility when it begins operations.



ESS Support Services and AshOil receive the 2013 Golden Gecko Award.



Franmarine Underwater Services Pty Ltd and the Department of Fisheries won the Certificate of Merit last year.



2014 GOLDEN GECKO Awards for Environmental Excellence

NOMINEES ANNOUNCED FOR 2014 GOLDEN GECKO AWARDS

Rapid monitoring of coastal marine habitats, maximising renewable energy on a mine site and underwater bio-fouling of marine vessels are just some of the innovative projects competing for the prestigious Golden Gecko Awards 2014.

The awards will be presented by Mines and Petroleum Minister Bill Marmion at a gala event at the Duxton Hotel in Perth on 9 October.

The evening will showcase companies leading the industry in environmental practices and demonstrating strong leadership in environmental excellence across the State.

Department of Mines and Petroleum Environment Division Executive Director Dr Phil Gorey said entries were assessed against specific criteria by a panel of environmental officers from various government agencies.

“To receive a Golden Gecko award, nominees must excel across four criteria,” Dr Gorey said.

“These are a commitment to environmental excellence, achieving excellent environmental outcomes, community engagement and what makes the project special.

“Regardless of who receives an award, all six companies selected as finalists have shown a commitment to Western Australia’s unique environment.”

For the first time since the awards were launched in 1992, this year’s gala night will be open to all of the resources industry, not just finalists.

The ticketed event will be staged in two parts, a brief seminar during which finalists will present their submissions, followed by a cocktail networking event where the winner will be announced.

The finalists for the 2014 Golden Gecko Awards are:

1. Newcrest Mining Limited –Telfer Gold Mine *Copper Concentrate Storage Facility*

Newcrest Mining Limited’s submission relates to the construction of a Copper Concentrate Storage Facility at Telfer that prevents the migration of copper concentrate from the existing facility. This was achieved through detailed dust modelling, and the significant re-engineering of conventional storage structures for application in the Pilbara desert.

2. Geo Oceans Pty Ltd – Perth

Go Visions Marine Habitat Mapping and Monitoring Technology

Geo Oceans delivered the GO Visions system technology R&D project that rapidly assesses and monitors large areas of coastal marine habitats which may be impacted by an oil spill event. The GO Visions technology makes collecting marine habitat data more efficient, safe and accurate. The system comprises image analysis software, cameras, accurate spatial positioning systems and other sensors that are mounted on towed cameras and remotely operated vehicles.

3. Argyle Diamonds Limited – Argyle Diamond Mine

Maximising the use of renewable energy at Argyle Diamonds

Argyle Diamonds has reduced greenhouse gas emissions by 23,300tCO₂-e per year at the Argyle Diamond Mine. This was achieved through optimising the efficiency of hydro power usage during normal mining operations and the seasonal dewatering process. This has resulted in a 30 per cent reduction of hydro power usage and a 21 per cent decrease in onsite diesel consumption.

4. Environmental Rehabilitation WA (ERWA) – Mt Ida

Mt Ida Magnetite Rehabilitation Project - Beyond Best Practice Exploration Rehabilitation

ERWA undertook a rehabilitation strategy for the Mt Ida Magnetite Exploration Project and returned the natural landforms of Mt Ida back to their pre-disturbed form. The rehabilitation will also reduce the chances of erosion of rehabilitated sites and re-established nearby creeks, gullies and drainage lines.

5. Franmarine Underwater Services and Department of Fisheries – Henderson

In-Water Hull Cleaning System

Franmarine Underwater Services developed a system that can vastly reduce biosecurity risks and the carbon footprint

associated with large marine vessels. The project eradicates marine biofouling of large marine vessels using an in-water treatment, vessel encapsulation and cleaning technologies. This eliminates biological risk to the environment and any damage to the anti-fouling coat.

6. Evolution Mining Edna May Operations

Eremophila resinosa Translocation Program

Evolution Mining, in conjunction with the Kings Park Botanic Gardens and Parks Authority, has developed an Environmental Management Plan for *Eremophila resinosa* to protect the species and mitigate any disturbance during mine expansion. The project, involving several separate translocations, is based on leading and evolving scientific discoveries and innovative horticultural practices which

have improved the knowledge of the biology of the species and its cultural requirements. This is the first time that *E. resinosa* has successfully been propagated and translocated outside of a controlled environment.



\$110 MILLION PROJECT BRINGS MINING JOBS BOOST

La Mancha Resources Australia's June opening of its Mungari treatment plant near Kalgoorlie marked the first new gold mill built in Western Australia in more than 20 years.

The A\$110 million mill project, opened by Mines and Petroleum Minister Bill Marmion, promises employment for hundreds of Goldfields residents.

"What we see here is the sort of excellence that builds on Western Australia's rating as the world's number one mining investment destination," Mr Marmion said.

"And with the challenges that have faced the gold industry, this investment could not have come at a better time."

The production efficiency of the new plant means La Mancha can also reactivate its White Foil open pit mine, from which lower-grade ores were previously unviable.

"Re-opening White Foil will employ 30 extra La Mancha staff, plus another 50 drill and blast contractors, taking the total workforce to 280 on top of the 40 positions filled at the new mill," the Minister said.

"It's good news for the Goldfields, too, that all staff will be living locally. I'm also pleased to see the high level of specialised training being offered to workers."

When mining and mill processing is at full capacity later this year, La Mancha's gold production is expected to increase to 160,000 ounces a year.

The heart of the Mungari mill was machined in Perth but major components came from as far afield as Poland and Belgium.

"Western Australians engineered it, powered it and, finally, positioned it with laser precision," Mr Marmion said.

"This is the sort of WA resources industry opportunity I'm proud to support and encourage."

The Minister congratulated the company for its visionary approach.

The last gold mill built in Kalgoorlie was at Kanowna Belle in 1993.



Mines and Petroleum Minister Bill Marmion with a freshly poured bar of gold at the Mungari mill. Looking on is Dr Abu Fatima, General Manager of the La Mancha's giant Hassai mine in Sudan.

AGRICULTURE

East Kimberley – Ord – Ord/East Kimberley Expansion Project

WA STATE GOVERNMENT

The Ord East Kimberley Expansion Project is a good example of the Commonwealth and State Government working closely together with the local community to deliver economic and Indigenous participation opportunities and much-needed infrastructure to the East Kimberley region of Western Australia. The State Government committed \$322m to increase the existing amount of irrigated land in the Kununurra region by releasing approximately 15,000ha of additional Ord farm lands. This funding has enabled 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 State Government has signed a Development Agreement with Kimberley Agricultural Investment (KAI) for the lease and development of 13,400ha of irrigation land in the Goomig and Knox Plain areas. KAI, a subsidiary of China's Shanghai Zhongfu Group, proposes to establish a sugar industry in the Kununurra region. The State is currently working towards the release of approximately 5,000ha of Ord West Bank and Mantinea lands via a Request for Proposal process. The Commonwealth Government invested \$195m for construction of social and common use infrastructure in the East Kimberley region through the East Kimberley Development Package (EKDP) National Partnership Agreement (NPA). Twenty nine infrastructure projects were delivered over a three year period in health, housing, transport, education and community services. The Yawoorroong Miriung Gajerrong Yirrgab Noong Dawang Aboriginal Corporation (MG Corporation) building and the Department of Housing transitional housing projects were successful nominations for the Australian Institute of Architects 2013 Western Australian Architectural Awards. The transitional housing project was also awarded a 2013 Premier's Award for Improving Indigenous Outcomes.

Expenditure: \$517m.

AMMONIUM NITRATE

Kwinana - Ammonium Nitrate Facility

CSBP LIMITED

CSBP has completed the expansion of its ammonium nitrate production facility at Kwinana from a capacity of 520,000tpa to 780,000tpa. The expansion became fully operational in May 2014 and involved the construction of an additional nitric acid plant and ammonium nitrate plant, together with an upgrade of the existing prilling plant and other infrastructure work.

Expenditure: \$550m.

Employment: Construction: 500; Operation: 12

INFRASTRUCTURE

South West Region – Kemerton (HUILS – Heavy Use Industrial Land Strategy)

WA STATE GOVERNMENT

Kemerton Industrial Park (KIP), located 17km north of Bunbury, is the main strategic industrial area in the South West region and the nearest regional heavy industrial site to Perth. It is designed to supplement the Kwinana Industrial Area, only 90 minutes away by road. The estate comprises 7,543ha of land, including 2,019ha of industrial core, 293ha of support industry area and 5,231ha of buffer areas. It is accessible to the Port of Bunbury by road and a rail link is being planned. The estate is serviced by major road links to the metropolitan area. The KIP currently includes a silicon smelter, a titanium dioxide plant, a chlor-alkali plant, two peak load power stations and a wastewater treatment plant. Under the Heavy Use Industrial Land Strategy, the Government is progressing Kemerton towards project ready status by undertaking environmental, heritage and planning approvals for the estate. Work towards progressing approvals commenced in 2009 and is anticipated to be completed in 2014/15, by which time the structure plan and zoning adjustments will also have been completed.

IRON ORE

Pilbara - Chichester expansion and Solomon Mine Project

FORTESCUE METALS GROUP LTD

Fortescue Metals Group operates four iron ore mines across its two mining hubs, Chichester and Solomon, in the Pilbara. In March 2014, Fortescue officially celebrated the completion of its A\$9b expansion, which lifted production capacity to 155Mtpa. The expansion included the construction of the greenfields Solomon Hub in the Hamersley Ranges, comprising Kings Valley and the nearby 20Mtpa Firetail mine; an expansion of the Christmas Creek mine to 50Mtpa; and major extensions of Fortescue's world-class port and rail facilities. Eighty-six per cent of the money spent on the Kings Valley project was spent with Australian suppliers.

Expenditure: \$9b.

Employment: Construction: 7000; Operation: 6000

Pilbara - Port Hedland - Atlas Iron

ATLAS IRON LTD

Atlas Iron Ltd is an iron ore explorer and miner focused on developing a number of projects in the Pilbara region of Western Australia. Atlas commenced exporting in December 2008 from its Pardoo mine, east of Port Hedland. Since then, Atlas has commenced four other mines – at Wodgina in 2010, Mt Dove in 2012, Abydos in 2013 and the first stage of Mt Webber in 2014. Atlas exported 10.9Mt in the 2014 financial year and is forecasting exports of 12.2-12.8Mt (wet metric tonnes) in the 2014-15 financial year. Atlas operates its current mines on the basis of road haulage to Port Hedland. For the longer-term developments and production beyond 15Mtpa, rail haulage will be preferable due to the scale and distance to port. Atlas is engaging with a number of infrastructure owners and developers with the intent of unlocking the value of Atlas' Horizon 2 assets.

Expenditure: \$950m.

Employment: Operation: 1000

OIL & GAS DEVELOPMENTS

Pilbara – Macedon Domestic Gas Project

BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED

On 20 September 2013 BHP Billiton Petroleum (Australia) Pty Ltd and Apache Energy Limited commissioned a domestic gas plant for Western Australia at the Ashburton North Strategic Industrial Area near Onslow. The development involves four sub-sea gas wells, a wet gas pipeline, an onshore gas processing plant 11km south-west of Onslow and a sales gas pipeline connected to the Dampier-to-Bunbury Natural Gas Pipeline. Daily gas production capacity is 200TJ.

Expenditure: \$1.5b.

Employment: Construction: 700; Operation: 25

AMMONIUM NITRATE

Pilbara - Burrup Industrial Estate Site D - Yara Pilbara Nitrates

YARA INTERNATIONAL ASA

Yara, Orica and Apache have formed a joint venture – Yara Pilbara Nitrates Pty Ltd (YPNPL). YPNPL has executed an Engineering, Procurement and Construction (EPC) contract for the construction of a circa 350,000tpa Technical Ammonium Nitrate (TAN) plant to be located on the Burrup Peninsula. Ammonia feedstock will be supplied from Yara Pilbara Fertilisers Pty Ltd (YPFPL), which operates its facility directly adjacent to the proposed location for the new TAN plant. YPNPL will be the operator of the TAN plant and Orica will manage the product sales and distribution. Yara and Orica each have a 45 per cent interest in the joint venture and Apache the remaining 10 per cent. It is expected that all manufactured product will be sold into the Pilbara region. Work on the project has commenced and it is expected that the new plant will be commissioned during the third quarter of 2015.

Expenditure: \$800m.

Employment: Construction: 600; Operation: 65

HEAVY MINERAL SANDS

Keysbrook – Heavy Mineral Sands Mine

MZI RESOURCES LTD

MZI is proceeding to develop a mineral sands mine located near the township of Keysbrook, approximately 70km south of Perth. The project has received environmental approval from the Minister for Environment, as well as development approvals and extractive industry licences from the Shires of Murray and Serpentine-Jarrahdale. Keysbrook has a mineral resource of 78.9Mt at an average grade of 2.5 per cent total heavy mineral (THM) and an ore reserve of 670,000t of THM, which underpins the first five-and-a-half years of operations. Based on the total mineral resource estimate, the potential mine life could be more than 15 years. Approximately 110,000tpa of heavy mineral concentrate from Keysbrook will be trucked 120km south to Doral's mineral separation plant in Picton, near Bunbury, where it will be toll treated under a processing agreement. MZI plans to commence construction in the third quarter of 2014, with first production scheduled for the third quarter of 2015. The project is expected to produce 67,500tpa of leucoxene products and 28,700tpa of zircon concentrate, which will be exported from the Bunbury Port.

Expenditure: \$70m.

Employment: Construction: 100; Operation: 50

INFRASTRUCTURE

Pilbara – Ashburton North Strategic Industrial Area

WA STATE GOVERNMENT

The State Government is developing the Ashburton North Strategic Industrial Area (ANSIA) as a hydrocarbon precinct in the Shire of Ashburton, 11km south-west of Onslow, to enable the development of natural gas projects and associated industries to exploit the gas reserves in the Carnarvon Basin and Exmouth Gulf. The ANSIA includes three larger sites for major gas processing proponents, secondary processing sites, areas for general support industries and supply base operations, a port with common user facilities to be managed by the Pilbara Ports Authority and common user access and infrastructure corridors. Two foundation proponents, BHP Billiton Petroleum and Chevron Australia, have taken up land allocations within the ANSIA. Chevron Australia commenced construction in late 2011 with first LNG exports scheduled for late 2016. BHP Billiton Petroleum has commissioned a domestic gas plant, with production capacity of 200TJ per day.

IRON ORE

Pilbara – BHP Billiton Iron Ore – Shiploaders 1 and 2

BHP BILLITON IRON ORE PTY LTD

During the December 2013 quarter, BHP Billiton approved an investment of US\$301 million (BHP Billiton share) to replace shiploaders 1 and 2 at the company's Nelson Point operations in Port Hedland. The two new shiploaders will increase the reliability of its inner harbour port facilities and create additional port capacity that will be utilised as a series of debottlenecking initiatives to increase the capacity of the supply chain to approximately 260Mtpa to 270Mtpa (100% basis), at a low capital cost. Commissioning of the two replacement shiploaders is scheduled for the second half of the 2014 calendar year.

Expenditure: \$380m.

Employment: Construction: 500

Pilbara – Roy Hill Iron Ore Mine & Infrastructure ROY HILL HOLDINGS PTY LTD

Roy Hill Holdings is a private company which is majority-owned by Hancock Prospecting Pty Ltd, and also has key international investment partners with strategic steel-making interests. It is developing the Roy Hill iron ore project located 115km north of Newman. This project is expected to come into production in 2015 and will produce 55Mtpa of iron ore for 20 years following ramp-up. The project includes mine development, mine processing infrastructure, a new heavy-haul railway, and significant new port facilities at Port Hedland's inner harbour. Environmental approval for Roy Hill mine Stage 1 was received in December 2009 and environmental approval for Stage 2 was received in March 2010. In July 2011, Roy Hill Infrastructure was granted a Special Railway Licence to develop a 344km railway from its mine in the eastern Pilbara to Port Hedland. All primary approvals have been secured and major project works commenced in 2012. Dredging of the new berth areas at South West Creek was finished ahead of schedule, the airstrip and internal mine roads have been completed, and the rail construction, mine and port accommodation villages are completed and being utilised. As of August 2014, over 3800 construction workers were engaged across the project. In addition, the new Corporate HQ and Remote Operations Centre at the Perth International Airport business precinct are now completed and operational. Considerable works are already underway on port, rail and mine construction with the 50 per cent completion milestone being reached in late July 2014. Roy Hill secured the world's largest ever debt financing package for a mining project of US\$7.2b in March 2014.

Expenditure: \$10b.

Employment: Construction: 3800; Operation: 2000

IRON ORE PROCESSING

Pilbara – Cape Preston – Sino Iron

CITIC PACIFIC

The Sino Iron project is located at Cape Preston, 100km south-west of Karratha. Construction of the largest magnetite mining and processing project in Australia is at an advanced stage, with limited production from the first and second of six lines commencing in 2013. On completion, the project will comprise of in-pit crushers, six autogenous and six ball mills, concentrators, a 6Mtpa pellet plant, 25km of slurry pipeline, a combined cycle 450MW power station, a new port and transshipment facilities, and a 51GL desalination plant. At full production the project will export up to 21.6Mtpa of magnetite concentrate and 6Mtpa of high grade pellets. The first shipment of ore occurred on 2 December 2013.

Expenditure: \$5.2b.

Employment: Construction: 4000; Operation: 500

OIL & GAS DEVELOPMENTS**Carnarvon Basin – Greater Western Flank Phase 1****WOODSIDE ENERGY**

The Greater Western Flank Phase 1 Project will develop the Goodwyn GH and Tidepole fields, via a subsea tie-back to the existing Goodwyn A Platform. The project remains on schedule for start-up expected in early 2016.

Expenditure: \$2.5b.

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

The Gorgon Joint Venture (GJV) made its final investment decision on the Gorgon Project in mid-September 2009. The Foundation Project on Barrow Island is a three train LNG development with a nameplate capacity of 15.6Mtpa and includes a domestic gas plant capable of delivering at least 300TJ/d of gas to the mainland. Cost estimates for the project construction have been reassessed at \$57.9b (US\$54b) following a cost and schedule review conducted by Chevron in December 2013. The project involves the processing of gas from both the Gorgon and Jansz-lo gas fields and includes potentially the largest commercial CO₂ geosequestration project in the world. The project obtained State and Commonwealth environmental approvals in August 2009. On-island activity started in late 2009 and the major construction work for the processing plant commenced in 2011. Plant start-up and first gas is planned for mid-2015, with the provision of domestic gas by 31 December 2015.

Expenditure: \$57.9b.

Employment: Construction: 6250; Operation: 300

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

Chevron Australia Pty Ltd is currently constructing an LNG plant, domestic gas plant and port facilities at the Ashburton North Strategic Industrial Area near Onslow for its Wheatstone project. The project will initially have two LNG trains with a combined capacity of 8.9Mtpa, expandable to five or six trains with a total capacity of 25Mtpa, and a 250Mcf per day domestic gas plant connected to the Dampier-to-Bunbury Natural Gas Pipeline. The first export of LNG is scheduled for late 2016.

Expenditure: \$29b.

Employment: Construction: 6500; Operation: 400

AMMONIA/UREA**Shotts Industrial Park – Collie Coal to Urea PERDAMAN CHEMICALS AND FERTILISERS PTY LTD**

Perdaman Chemical and Fertilisers Pty Ltd is proposing to develop a \$3.5b coal to urea plant at the new Shotts Industrial Park, near Collie. The plant will use proven coal gasification and fertiliser production technologies. Around 2.7Mtpa of coal will be used to produce approximately 2Mtpa of urea, primarily for export. The urea will be transported to Bunbury Port by rail. A 20-year off take agreement has been signed with Incitec Pivot. The coal supply contract is yet to be finalised. The company has received all its environmental and all other approvals from both the State and Commonwealth governments. Construction is on hold as the company is still seeking to finalise a suitable domestic coal supply arrangement to achieve its financial investment decision.

Expenditure: \$3.5b.

Employment: Construction: 2000; Operation: 200

HEAVY MINERAL SANDS**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 per cent heavy minerals, all of which lie within the portion of the project area that has received government environmental approvals for mining. At a mining rate of 23.4Mtpa, the project is expected to produce 49,500tpa of zircon, 109,000tpa of chloride ilmenite and 23,500tpa of a mixed rutile-leucoxene over its 19 year mine life.

Expenditure: \$202m.

Employment: Construction: 170; Operation: 110

INFRASTRUCTURE**Dampier Peninsula – Browse LNG Precinct WA STATE GOVERNMENT**

The State Government is developing the Browse Liquefied Natural Gas (LNG) Precinct approximately 60km north of Broome. By focussing development at a suitable location, the Precinct will minimise the environmental footprint of gas processing and any social impacts in the region while maximising opportunities for the local community to benefit from development of the Browse Basin gas fields. The Precinct will have the capacity to accommodate at least two LNG processing operations, with a combined capacity of up to 50Mtpa. The State Government has acquired the land for the Precinct and will secure all relevant approvals to ensure the Precinct is 'project ready.'

Pilbara – Anketell – Anketell Port and SIA (Strategic Industrial Area)**WA STATE GOVERNMENT**

The Anketell project involves the establishment of a multi-user, multi-commodity deep water port and associated strategic industrial area at Anketell, located 30km east of Karratha on the Pilbara coast. The port and associated infrastructure will be a proponent-funded but State-controlled port which will be managed and operated under the Port Authorities Act 1999. The strategic industrial land will fall under the jurisdiction of the Western Australian Land Authority (LandCorp). During its initial phase, it is expected that Anketell will be an iron ore export facility and that, at its peak capacity, not less than 350Mtpa will be exported to customers, mainly in Asia. A number of iron ore producers with mining assets in the Pilbara have expressed interest in using the planned facilities at Anketell. It is likely that the Port will be developed in stages to accord with the development of the various mining operations which are located throughout the Pilbara. The Anketell Port Master Plan was released in June 2014 and a downloadable copy can be obtained from the department's website.

IRON ORE

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 and undertaking an implementation study for the project.

Expenditure: \$2b.

Employment: Construction: 1000; Operation: 350

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 deposits located 35-80km south-west of Pannawonica. The ore will be transported by a new heavy haul railway for export via the proposed 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 construction to commence following a decision to proceed by the joint venturers and completion of funding arrangements. Primary State and Federal environmental approvals for the mine and rail elements of the project were received in December 2011, and for the first stage of Anketell Port in the first half of 2013.

Expenditure: \$7b.

Employment: Construction: 3500; Operation: 1000

Yilgarn – Deception Iron Ore Deposit

CLIFFS ASIA PACIFIC IRON ORE PTY LTD

Cliffs proposes to expand its Koolyanobbing Operation to include an additional iron ore mining area at the Deception Deposit, located approximately 150km north of Southern Cross. The Deception Deposit contains an estimated 7.1Mt of iron ore and is expected to have a mine life of around five years. Mining of the Deception Deposit has environmental approval with first production expected in the first half of 2017.

Expenditure: \$35m.

NICKEL

Mt Windarra – Windarra

POSEIDON NICKEL NL

Poseidon Nickel Ltd has submitted a project development proposal for the redevelopment of the Mt Windarra underground nickel mine, the development of the new Cerberus underground nickel mine, the construction and commissioning of a nickel sulphide concentrator, a gold tailings re-treatment plant and associated project infrastructure at Mt Windarra. Subject to obtaining all relevant approvals and project finance, Poseidon is forecast to commence construction in 2014.

Expenditure: \$250m.

Employment: Construction: 80; Operation: 180

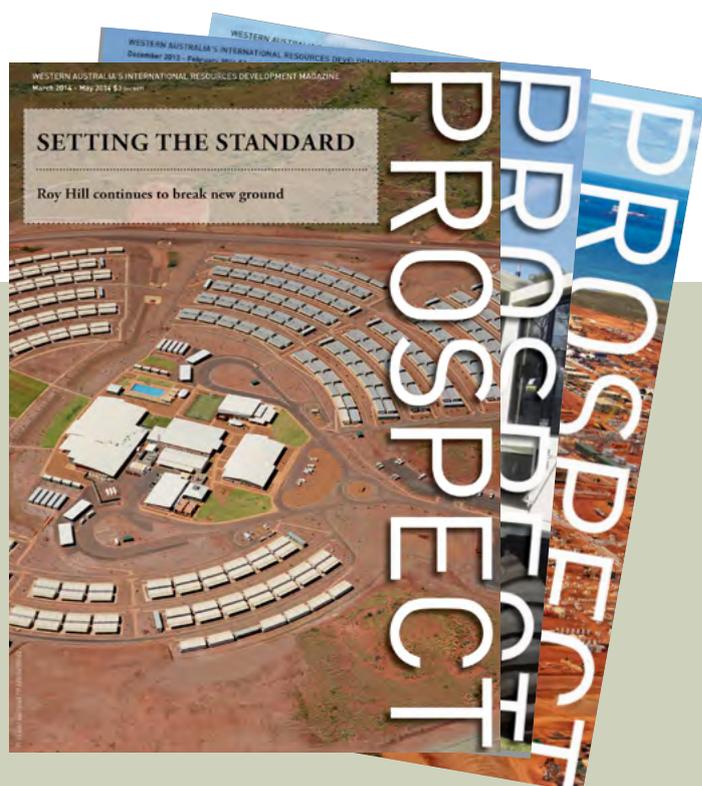
OIL & GAS DEVELOPMENTS

Canning Basin – Buru Canning Basin Tight Gas BURU ENERGY

Buru Energy, in partnership with Mitsubishi Australia, is at an early exploratory stage of evaluation of a large onshore natural gas resource in the Kimberley's Canning Basin that potentially offers employment and socio-economic opportunities for people and businesses in the local and regional community. The particular area of interest for Buru Energy is a potential tight gas resource located in a geological formation known as the Laurel Formation, which occurs at depths of about 2,000m to 5,000m below the surface. The next stage of Buru Energy's onshore natural gas exploration program in the Canning Basin is officially known as the Laurel Formation Tight Gas Pilot Exploration Program, with the operation having been approved by Department of Mines and Petroleum on 20 June 2014, including approval of Environment, Operational and Safety Plans, which completed the regulatory approval process required for this exploration program. A phased approach to the program has been adopted which ensures optimum operational and environmentally safe execution of the program. Diagnostic testing using mini-fracs is planned to be undertaken later in 2014 and the next phase of the fracking program will be undertaken early in the 2015 Kimberley dry season. In preparation for the 2014–2015 program, Buru Energy conducted geological mapping and hydrogeological assessments, and also collected robust baseline groundwater data. Buru Energy has also undertaken an extensive community engagement program throughout the Kimberley. The Company will continue to engage with Traditional Owners and the general Kimberley community as the natural gas evaluation program is progressed. If, in the long term, the resource proves to be commercially viable, gas from the Canning Basin would supply Western Australian domestic and industrial markets. Under a State Agreement the company, upon proving up sufficient reserves, is obligated to supply into the Western Australian domestic market at least 1,500 petajoules of gas.

Expenditure: \$40m.

Employment: Operation: 30

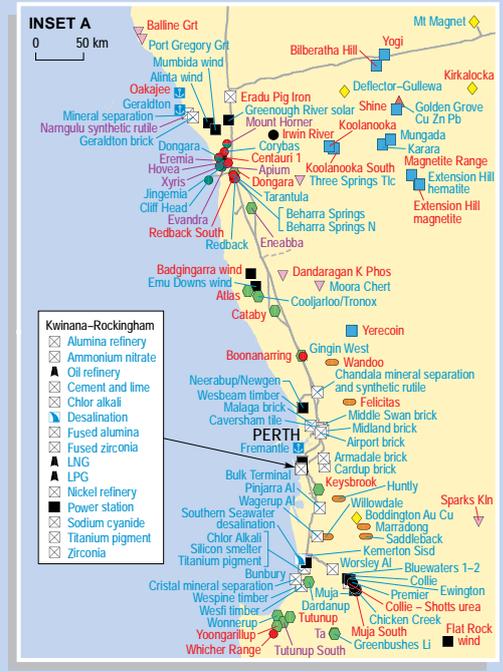


Prospect Magazine
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to view online.

Visit

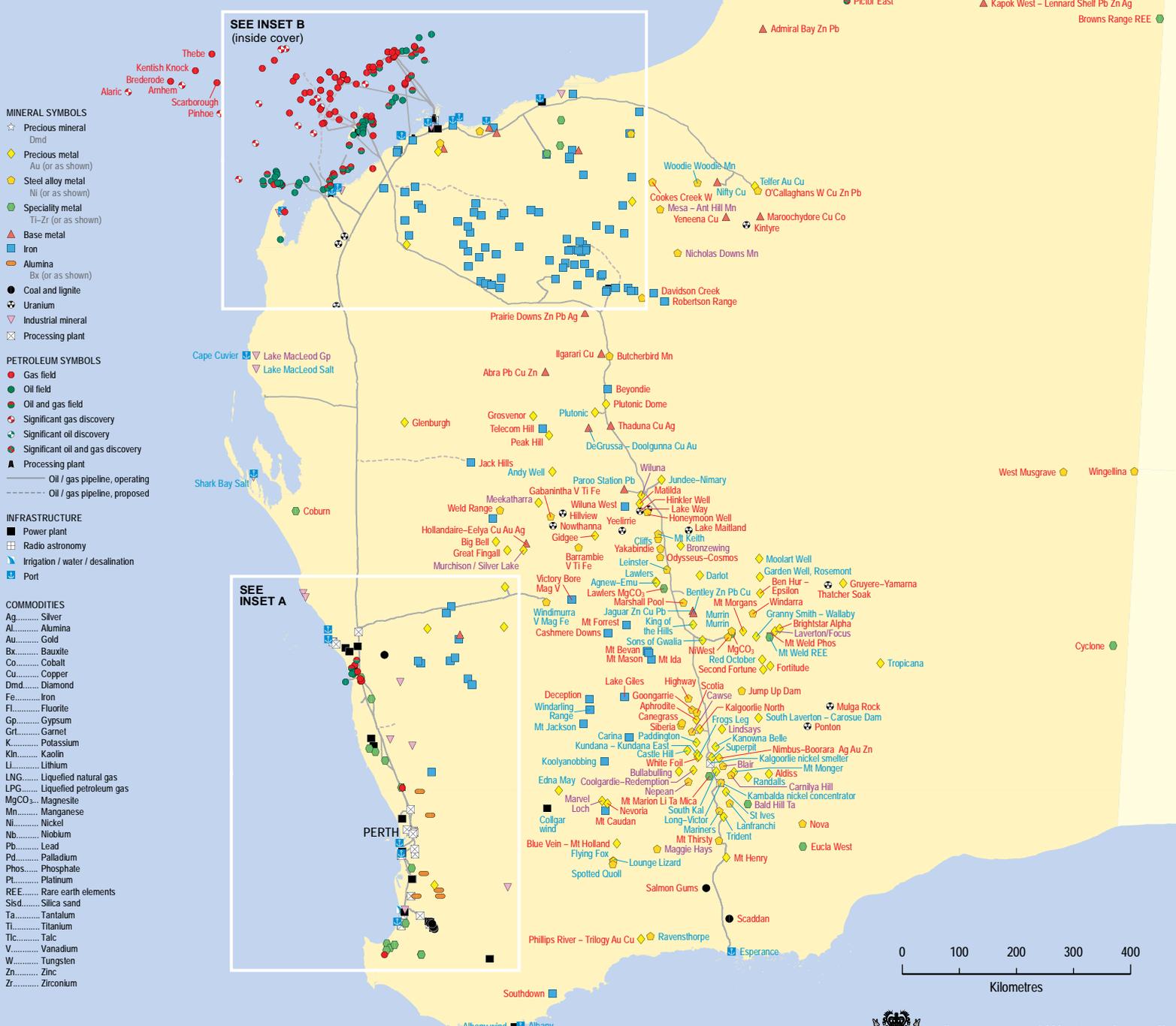
www.dsd.wa.gov.au/Prospect

Major Resource Projects — September 2014



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

Data for offshore Commonwealth-controlled waters is up-to-date as of December 2013. Enquiries for latest information for Commonwealth-controlled waters is available from National Offshore Petroleum Titles Administrator (NOPTA) at <info@nopta.gov.au>



- MINERAL SYMBOLS**
- ☆ Precious mineral
 - Dmd
 - ◆ Precious metal
 - Au (or as shown)
 - Steel alloy metal
 - Ni (or as shown)
 - Speciality metal
 - Ti-Zr (or as shown)
 - ▲ Base metal
 - Iron
 - Alumina
 - Bx (or as shown)
 - Coal and lignite
 - Uranium
 - ▽ Industrial mineral
 - ⊠ Processing plant
- PETROLEUM SYMBOLS**
- Gas field
 - Oil field
 - Oil and gas field
 - Significant gas discovery
 - Significant oil discovery
 - Significant oil and 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
 - Co..... Cobalt
 - Cu..... Copper
 - Dmd..... Diamond
 - Fe..... Iron
 - Fl..... Fluorite
 - Gp..... Gypsum
 - Gt..... Garnet
 - K..... Potassium
 - Kln..... Kaolin
 - Li..... Lithium
 - LNG..... Liquefied natural gas
 - LPG..... Liquefied petroleum gas
 - MgCO₃..... Magnesia
 - Mn..... Manganese
 - Ni..... Nickel
 - Nb..... Niobium
 - Pb..... Lead
 - Pd..... Palladium
 - Phos..... Phosphate
 - Pt..... Platinum
 - REE..... Rare earth elements
 - Ssd..... Silica sand
 - Ta..... Tantalum
 - Ti..... Titanium
 - Tlc..... Talc
 - V..... Vanadium
 - W..... Tungsten
 - Zn..... Zinc
 - Zr..... Zirconium

