

SETTING THE STANDARD

Roy Hill continues to break new ground

PROJECT





In recent years Africa has become an increasingly popular destination for resources investment, with major mining companies attracted by the continent's rich mineral reserves and affordable operating environment.

This growth presents Western Australia with an exciting opportunity to become a leading exporter in mining skills, technology and knowledge. Already, more than 160 Western Australian mining companies operate hundreds of projects across 33 African countries.

Early this year I travelled to South Africa to speak at the annual Investing in African Mining Indaba conference, and the central message I delivered to leaders from the many African nations in attendance was to ensure they receive a fair return for their country's minerals (story page 2).

I also signed a Memorandum of Understanding pledging to share mining knowledge and technology with the Common Market for Eastern and Southern Africa, a regional trading bloc representing 19 nations (story page 4).

Returning to Western Australia, the Department of Mines and Petroleum has been working closely with communities across the State to ensure the public gains a better understanding of the emerging shale and tight gas industry (story page 10).

Also in this edition, the State Government has reached a key milestone in its reform of the State's ports (story page 16), and local suppliers are reaping the benefits of the Roy Hill iron ore project (story page 6).

Colin Barnett
PREMIER OF WESTERN AUSTRALIA & MINISTER FOR STATE DEVELOPMENT

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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: Aerial view of the new accommodation units at the Roy Hill iron ore mine site which are setting a new standard for remote facilities in Australia.

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PREMIER MAKES IMPACT IN AFRICA



Premier Colin Barnett delivers his keynote address at the Investing in African Mining Indaba event.

Premier and State Development Minister Colin Barnett completed a busy and productive trip to Africa early this year, culminating in the delivery of a keynote address on sustainable mining models at the 20th annual Investing in African Mining Indaba conference.

Held in Cape Town in South Africa over three days, Indaba is the world's largest mining investment conference, drawing mining leaders, analysts, fund managers, investment specialists and government representatives from around the globe with the aim of attracting foreign investment into Africa's mining chain.

Building on relationships forged during the Africa Down Under conferences in Perth in recent years, Mr Barnett's address focused on the legislative and administrative processes the State Government has put in place to develop a mining industry that is not only well-regulated and transparent, but also able to evolve with changing environments.

Premier Barnett took the opportunity to reiterate the view that, depending on their

location, natural resources should belong to either State or National governments, and that host countries should be adequately compensated. His advice to developing African nations was clear.

"If there is one message I have for the governments of African nations, it is that not a single grain of mineral or a single molecule of gas or oil should leave Africa without being paid for," he said.

"It is a mistake to allow the extraction of a natural resource without a fair return to the host country. No matter what other benefits are on offer, there is no substitute to a direct revenue stream from the mineral or petroleum resource."

Mr Barnett also advocated for the implementation of mining laws and administration that could develop in step with industry and ultimately lead to increased autonomy.

"A robust mining industry requires a soundly based system of law and administration. Done well, this can also be

a safeguard against sovereign risk, vested interests and corrupt conduct," he said.

"As the mining industry develops, so does the regulatory regime. As the industry develops, so does the capacity for a greater degree of self-regulation."

In Western Australia, mining industry management systems were first introduced more than 100 years ago in response to a rapidly growing gold industry, with a need to protect the rights of the small prospector.

Accordingly, the *Mining Act 1904* was born. From the 1950s, discoveries in a range of commodities, such as bauxite, iron ore and nickel, necessitated the creation of the *Mining Act 1978*, a piece of legislation which, though continually updated, is still in force today.

State Agreements between proponents of major projects and the State Government have been in place since the 1960s to secure major resource projects, particularly those that require the development of railways and ports, and long-term titles and conditions.

Under such agreements, proponents take or share responsibility with the State for developing infrastructure specific to the project. At present, there are 64 State Agreements in operation in Western Australia.

The Premier's speech touched on the State Government's well-ordered approach in allocating leases; specifically, that they are apportioned on a first-come, first-served basis. He also made mention of the robust administrative measures in place.

"Currently, there are over 22,000 mining titles on issue in Western Australia, covering some 54 million hectares," Mr Barnett said.

"Accurate mapping is obviously essential, as is overall title management through an electronic database. All of this complexity is necessary for an efficient mining system with integrity."

Australian companies hold a strong and active position in the African mining industry, with 168 companies from Western Australia operating 807 projects across 33 of the 54 African countries.

However, the links between Western Australia and Africa extend beyond mining into areas such as migration and education. Just over one quarter of African-born people permanently migrating to Australia in 2012-13 settled in the State.

Western Australia also accounted for roughly the same percentage of Australia's international students from Africa in 2012.

The enduring message from the Premier's address focused on these links between Western Australia and Africa, and on the benefits that can come from a fruitful relationship.

"Western Australian engineering and geological surveying firms have brought to Africa their expertise in exploration and mine construction and operation," he said.

"While they are not alone, Australian companies have been true pioneers in the discovery and development of African mining deposits.

"From a government perspective, I support Australian mining companies and offer our assistance to African nations as their mining industry develops."

During his visit to Africa, Mr Barnett also took the time to visit Zambia's largest government hospital, the University Teaching Hospital, to see first-hand the work being done by the Western Australian-run charity, Health Hope Zambia.

Founded by 29-year-old Western Australian businessman Brendan Clark in September 2011, Health Hope Zambia

operates several health care initiatives, including mobile medical clinics from decommissioned St John ambulances, an advanced HIV program and a school meals project.

"The work that this charity – supported by scores of Western Australians – has done here in Zambia is extraordinary and quite inspiring," the Premier said.

Mr Barnett said Health Hope Zambia had stepped in and overseen the renovation of the children's malnutrition ward, completed in December, which included major structural and building works, 100 new cots, medical furniture and additional medical personnel and training.

"To see the huge difference that has been made by this dedicated group of people and the difference it has made to the facilities available to children in this hospital is extraordinary," he said.



Health Hope Zambia founder Brendan Clark and Premier Colin Barnett.

Photo: Department of Premier and Cabinet

Good policy the key to a strong resources industry

Looking at how Western Australia collaborates with African nations in regard to regulation of the resources industry was the focus of a week-long trip to Africa by Western Australian Premier Colin Barnett and Department of Mines and Petroleum (DMP) Director General Richard Sellers.

Mr Sellers said the trip in February had a particular focus on Western Australian policies surrounding issues such as royalties, titles and land access.

"This is with good reason. Western Australia has more than 120 years of developed policy that guides us," he said.

Mr Sellers said there was recognition of the importance of having a solid policy framework.

"Good policy ensures not only continued investment, but that the benefit of the resources industry flows through to the community," he said.

The trip also helped guide future collaboration between Western Australia and African countries and identified a number of training and development opportunities.

This was formalised by the Premier signing a Memorandum of Understanding (MoU) with the 19 African member nations of the Common Market for Eastern and Southern Africa (COMESA).

"The department will now work closely with the University of Western Australia, Murdoch, Curtin and other institutions as we look to develop this opportunity," Mr Sellers said.

"The experience from this trip will also help shape future collaboration between Western Australia and other resource jurisdictions, and has highlighted the importance of shared knowledge and expertise in a global economy."

WA-AFRICA COOPERATION A WIN-WIN FOR MINERS, GOVERNMENTS

The Western Australian Government has signed an historic agreement with 19 African nations to build a close and mutually beneficial relationship, centred on the sharing of mining knowledge and technology.

Premier Colin Barnett travelled to Zambia in early 2014 and attended a meeting of the Common Market for Eastern and Southern Africa, a regional trade bloc comprised of 19 member nations including Kenya, Uganda and Zambia.

There, he met with mining ministers from across the region as well as Zambian Vice President Dr Guy Scott, who officially opened the meeting and witnessed the signing of a Memorandum of Understanding (MoU).

Speaking from Africa, Mr Barnett said the agreement would allow COMESA's member states to benefit from Western Australia's extensive experience in developing a world class system of legislation and regulation governing the resources industry.

"Where the problem seems to be for many of the African nations is that they have a sense they're not getting enough return to their country for their mineral resources," Mr Barnett said.

"Under this MoU the Western Australian Government will assist these developing nations in building up their mining law, their system of administration such as the tenement systems, standards of work safety, environmental regulation and rehabilitation."

The MoU also aims to promote development and investment in vocational

training and capacity building across the resources and agriculture sectors.

The origins of the MoU were forged at Perth's own Africa Down Under conference in 2013, when the Premier met COMESA Secretary General Sindiso Ngwenya and offered the State's assistance.

Speaking at the signing of the MoU just six months later, Mr Ngwenya said he was delighted the agreement had come together so quickly.

"There is a lot that we, as African states, can learn from Western Australia in how to regulate these industries as well as ensure that the state receives a fair and equitable return from mining revenues," Mr Ngwenya said.

"With this assistance we expect to be able to develop our national mining laws, tenement systems, tax regimes and environmental and safety standards to levels similar to those across Australia."

Richard Sellers, the Director General of the Department of Mines and Petroleum (DMP), also attended the signing and was able to learn firsthand the priorities of COMESA's member states as the relationship goes forward.

Mr Barnett and Mr Ngwenya said they were confident the MoU would be mutually beneficial, with Western Australia's assistance also helping

to de-risk African investment for Australian companies

Mr Barnett said more than 160 Western Australian mining companies were currently operating projects in Africa and the region was an exciting new market for the State to promote its resources expertise.

"Over the next 20, 30, 50 years, a big part of the growth of the Australian mining industry will be mining and mining services into Africa. This is part of the future, and Australia is trusted and welcome in Africa."

Mr Ngwenya said he agreed with the Premier's belief that the growth in African mining was more an opportunity than a threat to Western Australia.

"It is in the interests of Australian companies for African countries they are already heavily invested in to have the capacity and resources to create and maintain a fair and equitable regulatory and administrative and financial environment within which all mining companies and operations can operate," Mr Ngwenya said.

The 19 members of COMESA are Burundi, Comoros, the Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Seychelles, Madagascar, Malawi, Mauritius, Rwanda, Sudan, Swaziland, Uganda, Zambia and Zimbabwe.



Mines and Money London 2013.

WA INVESTMENT OPPORTUNITIES PROMOTED TO THE WORLD

The Mines and Money London Conference and Exhibition held in London in December last year provided the Department of Mines and Petroleum (DMP) and the State Government's Europe Office a golden opportunity to promote Western Australia investment opportunities.

Mines and Money London is Europe's leading mining investment and capital raising conference and exhibition, annually bringing together more than 5,000 investors, financiers, brokers and mining developers, for up to five days of business matching, knowledge sharing and dealmaking.

The conference, themed 'Where quality mining projects secure investment capital', attracted a record number of investors from China, Japan, the Middle East, Canada, Latin America and Australia, and highlighted London's enduring position as a key global centre for mining finance.

Conference organisers said this year's event demonstrated a sense of positivity coming back into the market by the sheer volume of participants and noticeable increase in investors present.

On display were more than 260 exhibitors right across the mining commodities spectrum as well as exploration, production, operation and maintenance expertise.

The Australian stand featured Western Australia, South Australia and Queensland and demonstrated how the various State Government offices in Europe leverage access into the most prospective, emerging mining markets and are able to assist global companies to trade and invest in Australia.

The display highlighted that in 2012 there were 699 operating projects, mining 50 commodities and providing a combined export of A\$140 billion across the three jurisdictions.

Within the conference agenda Stuart Russell, Senior Trade and Investment

Manager of Western Australian Government European Office presented a 'Country and Regional Update on Mining in WA' focusing on emerging opportunities and incentives for mining companies to invest.

"Between these three states we cover the full spectrum of mining technologies and mining skills, as well as the commodities," Mr Russell said.

"Being here together was important because it presented the collective Australia brand as well as providing a State focus where appropriate, and keeps us out there in front of both mining companies and the major global investors."

The next Mines and Money London event will be from 1-5 December 2014.

For further information visit
[www.minesandmoney.com/
London/2014](http://www.minesandmoney.com/London/2014)

NEW STANDARDS SET AT ROY HILL WHILE WA FIRMS BENEFIT



Minister Marmion at the Roy Hill mine-site in November 2013 inspecting core samples with Lorraine Stevens, Product Quality Specialist at Roy Hill.

As well as setting a new Australian standard for remote facilities, the State's Roy Hill iron ore mine has created a number of opportunities for local suppliers during its construction stage. *Prospect* looks at how the project is developing and some of the benefits its construction has brought to Western Australian companies.

Up until 30 June 2013, Roy Hill had spent or committed A\$1.55 billion for the construction of the mine and accompanying facilities, with 94 per cent going to WA firms.

"This is a much higher percentage than industry averages," said Darryl Hockey, General Manager External Affairs at Roy Hill.

He said the costs include professional services, all of which come from Western Australia, and the majority of goods and equipment used in developing this vast iron ore project.

Brookfield Multiplex have benefitted to the tune of A\$200 million constructing the mine accommodation village, while the Compass Group has constructed the South Hedland accommodation village.

Perkins, a WA family owned company from the regional south west centre of Bunbury, secured the A\$50 million contract to build the recently completed company headquarters and remote operating centre.

Other major companies that have benefitted included BGC, who have built the Ginbata airport and accompanying roads, Ausdrill (drilling), Ausco (kitchens and dining facilities) and Decmil (rail and port terminal buildings).

"The project has also provided good opportunities for local providers in the Newman and Port Hedland areas, including Hazeldine Plumbing, Day's Contracting, and BJ Young Earthmoving. Additional benefits have also seen opportunities for Indigenous employment

providers including MPL, ICRG and Guma," Mr Hockey said.

Roy Hill is progressing well, and at the time of publication a number of milestones had been completed, including the completion of the accommodation villages and flash butt welding facilities, and construction works accelerated to the point that almost 2,000 people were working across the project, with an additional 1,000 expected to be onsite by the end of the year.

The Ginbata airport, serviced by Qantas, now has seven flights per week to ensure staff are rotated through their various rosters.

Towards the end of 2013 Mines and Petroleum Minister Bill Marmion visited the Roy Hill iron ore project to inspect the considerable developments then underway.

"The visit was a great opportunity to have a look at the site first hand and become more familiar with some of the challenges being overcome to bring this project to fruition," Minister Marmion said.

He said early site works were rapidly progressing at the mine site, located 115km north of Newman, including extensive civil earthworks for the mine processing plant.

It is expected that mining will begin in 2015 with the first ore on ship scheduled for September 2015, and an output of 55 million tonnes per annum at full production for 17 years.

"The impressive 2,000 bed accommodation village is now complete, and is second to none, setting a new Australian standard for remote facilities," Mr Marmion said.

"Flying along the 344km rail alignment, I could see that works are well underway, with four completed 300 bed rail construction villages already in place, and early works already being conducted on the construction of 11 rail bridges by WA firm Centrals," he said.

At Port Hedland the Minister inspected the recently completed 1,200 room village at South Hedland, the flash butt rail yards, the relocation of water and gas utility lines, and the new berth construction road.

"I understand that once fully operational there will be 2,000 full time employees across the company, including Perth positions," Mr Marmion said.

"I am very much encouraged by the high level of participation by WA

firms, including the new corporate headquarters constructed at the Perth International Airport business precinct by WA regional firm Perkins.

"The dominance of the resources sector in the nation's economy is expected to continue given the number of projects which have been expanded or developed, such as the Roy Hill mine, and in particular iron ore and LNG projects."

As at September 2013, Western Australia had an estimated A\$146 billion worth of resource projects under construction or in the committed stage of development. A further A\$97 billion has been identified as planned or possible projects in coming years.

WA MINING AND PETROLEUM SECTOR BREAKS RECORDS

Western Australia's mineral and petroleum sector reached a new record value of A\$113.8 billion during 2013, breaking the previous record of A\$108 billion set in 2011.

Mines and Petroleum Minister Bill Marmion said the State's new record was an increase of more than A\$11 billion or 15 per cent compared to 2012.

"The depreciation of the Australian dollar in 2013 has been a key factor in boosting the value of WA's mineral and petroleum exports with the weaker Australian dollar helping to counter the fall in commodity prices during the year," Mr Marmion said.

"The value of sales was also assisted by increases in some of the volumes of commodities sold."

Iron ore continues to be the State's most valuable export, accounting for A\$68 billion (76 per cent) of the mineral sector's total sales, with continuing strong demand increasing the quantity sold in 2013 by 16 per cent to 556 million tonnes.

The Minister said gold was the second most valuable mineral commodity, with total sales of A\$8.7 billion, representing 10 per cent of total mineral sales.

"Together, iron ore and gold accounted for more than A\$76 billion (or 86 per cent) of all mineral sales in 2013," he said.

"Strong demand from China meant the iron ore sector achieved a record 556 million tonnes in exports, an increase of 16 per cent over the previous calendar year.

"However, despite increased output of almost three per cent, the average gold price was down by 16 per cent which contributed to a decrease of seven per cent in the sales value on the previous year."

Alumina and nickel maintained long-held positions as WA's third and fourth most valuable sectors respectively with total nickel sales valued at A\$3.4 billion, representing a 10 per cent decrease. In contrast the total value of alumina increased by nearly 13 per cent to A\$4.1 billion.

Valued at a record A\$24.7 billion in 2013, WA's petroleum sector is the State's second most valuable after iron ore.

"Petroleum, which includes crude oil, condensate, LNG, natural gas and LPG (butane and propane), represented only a slight sales value increase of one per cent compared on the previous year, which was due to Pluto LNG coming on stream and countering falls in the sales volumes and total values of crude oil and LPG," Mr Marmion said.

The overall value of base metals (copper, lead and zinc) increased by 16 per cent to A\$1.7 billion in 2013 and the other category of vanadium, rare earths, manganese and industrial minerals, reached a total sales value of A\$1 billion for the period.

The Minister said this was further evidence that the resources sector was the backbone of the Western Australian economy and was good indication of how strongly the industry was going.

Statistics on the value of Western Australia's mineral and petroleum sales are prepared biannually by the Department of Mines and Petroleum.

Fact File

- Mineral and petroleum sector reached a new record value of A\$113.8 billion
- Iron ore continued as the State's most valuable export with sales of A\$68 billion
- Gold was the second-most valuable commodity
- More 2013 statistics are available on the department's website under latest statistics release www.dmp.wa.gov.au/lateststatisticsrelease

SINO IRON ORE SHIPMENTS UNDERWAY

Chinese steelmaker CITIC Pacific has celebrated the first shipment of iron ore from its Sino Iron project 100km south west of Karratha as Western Australia's growing magnetite iron ore industry gathers pace.

The project is the largest magnetite mining and processing operation in Australia and employed more than 4,000 people at peak construction. With a permanent workforce of around 1,000 people and an expected lifespan of 30 years, the Sino Iron project is expected to enjoy a productive future.

Premier and State Development Minister Colin Barnett was on hand to launch the first shipment of magnetite concentrate with CITIC Group Chairman Mr Chang Zhenming.

"This is the biggest magnetite mining and processing operation under construction in Australia and is a further sign of the

potential of the industry to stimulate new investment and construction activity throughout the State," Mr Barnett said.

"Western Australia has significant magnetite resources and this type of premium, value-added ore is preferred by many Chinese steel mills."

Mr Barnett said the integrated Sino Iron project, comprising a mine, concentrator, desalination plant, power plant and port, would produce numerous benefits for local communities, the region and the State over the decades to come.

To the end of 2013, just over 70 per cent of total expenditure on goods and services had been in Australia, with almost 60 per cent of this spend taking place in Western Australia.

"Sino Iron is one of China's biggest investments in the Australian resources

sector and, at full capacity, will be the biggest single-stage magnetite project in the world," Mr Barnett said.

"It has also stimulated development of the region's gas industry by becoming the foundation customer for Apache's Devil Creek project."

CITIC Group Chairman Mr Chang Zhenming thanked workers and contractors for their hard work amid the challenges of building the project.

"We are very proud to be standing here today, to see the vision of Sino Iron becoming a reality," he said.

"Our team continues to overcome the challenges associated with a greenfield project of this scale and complexity.

"We now look forward to the regular shipment of our product."

WHAT IS MAGNETITE?

The first shipment from CITIC Pacific's Sino Iron project has thrust the spotlight on Western Australia's burgeoning magnetite iron ore industry, and *Prospect* has taken the opportunity to have a closer look at the commodity.

In contrast to traditional hematite iron ore projects, magnetite iron ore is of little value in its raw state and must go through a complex processing phase before its worth becomes apparent.

The result, however, is a concentrated form of magnetite that has a much higher iron content than haematite ore and is used in the production of premium, quality steel.

Hematite ore contains roughly 70 per cent iron and has been the dominant

iron ore mined in Australia since the 1960s. It accounts for the majority of Australia's iron ore exports and goes through a relatively simple crushing and screening process before being exported for use in steel making.

Magnetite ore has a much lower iron content than hematite, which means it has to go through several stages before it can be used to produce steel.

Like hematite ores, magnetite ores require initial crushing and screening



Photos: CITIC Pacific Mining

Top left: Premier Colin Barnett and CITIC Group Chairman Chang Zhenming signal the departure of the first shipment of magnetite. Top right: The Sino Iron project's desalination plant. Bottom: Magnetite being loaded, ready for shipment.

but then undergo a second stage of processing to extract the magnetite and produce a concentrate. Typically, it is very low in impurities.

As the most magnetic of all minerals on Earth, naturally-magnetised pieces of magnetite, called lodestone, attract small pieces of iron, which is how ancient people first noticed the property of magnetism.

There are currently 29 potential magnetite mines at different stages of planning and development in Western Australia, with 38 billion tonnes in estimated resources.

In 2011, it was estimated that a magnetite industry could add A\$4.5 billion and 4,000 jobs to Australia's economy, with most of those in Western Australia.



The distinctive banded iron formation of magnetite iron ore – an emerging industry in Western Australia.

OUTLINE FOR DMP'S REGULATORY VISION FOR SHALE AND TIGHT GAS INDUSTRY RELEASED

Western Australia's regulation of natural gas from shale and tight rock (shale and tight gas) resources has been outlined in an overview document released by the Department of Mines and Petroleum (DMP) last month.

The document, *Natural Gas from Shale and Tight Rocks – An overview of Western Australia's regulatory framework*, was developed for community members interested in gaining a better understanding of this emerging industry.

DMP Director General Richard Sellers said the overview included information on what shale and tight gas was, where it's located in WA and what exploration activities have already occurred to date.

"It also details what shale or tight gas activity looks like on the surface and the

potential footprint of a producing natural gas field," he said.

Mr Sellers said the potential development of a shale and tight gas industry for WA had attracted broad community interest in regard to the extraction using horizontal wells and hydraulic fracture stimulation (fracking).

"The overview addresses frequently asked community questions about the process of hydraulic fracturing, including water use and protection," Mr Sellers said.

"The State's legislative framework for the industry is also featured in the overview to provide an understanding of the robust, multi-agency assessment process in place for shale and tight gas proposals."

The department's work with communities indicates most community members

are seeking more information about these processes in order to develop an informed opinion.

The overview details the assessment process for a shale or tight gas activity, including international standards for well design, baseline and ongoing water monitoring and public disclosure of all chemicals used down a well.

To view the overview document go to http://www.dmp.wa.gov.au/documents/Natural_Gas_from_Shale_and_Tight_Rocks_-_An_overview_of_Western_Australia_regulatory_framework.pdf

For more information on WA's emerging shale and tight gas industry, please visit www.dmp.wa.gov.au/shaleandtightgas

DMP LEARNING FROM EXPERIENCES OVERSEAS

Towards the end of last year Department of Mines and Petroleum (DMP) Petroleum Executive Director, Jeff Haworth, attended the World Shale Oil and Gas Summit to gain a better understanding about international standards for natural gas from shale regulation.

Mr Haworth said the conference, held in the United States, included the latest information on best practice well design, environmental protection and water management.

"With Western Australia's natural gas from shale industry in its early exploration and evaluation stages, the State is taking every opportunity to learn from experiences in other countries to ensure our regulations have the highest environmental and social standards," he said.

"Experiences in countries such as the United States, which has been producing natural gas from shale for more than ten years, provide valuable insight into the opportunities and challenges which can arise during its development."

DMP PARTICIPATES IN BROOME FORUM

As part of its community engagement commitment, the Department of Mines and Petroleum (DMP) participated in a live radio panel discussion about hydraulic fracturing in the Kimberley.

Hosted by the Broome ABC, DMP was among a panel of six participating in the public forum at the end of January

Executive Director for Environment, Dr Phil Gorey, said the discussion, led by questions from listeners and audience members, allowed community members to gain a better understanding of hydraulic fracturing and how it's regulated in Western Australia.

"With WA's natural gas from shale and tight rocks industry in the early exploration and evaluation stages, it is important community members have confidence their concerns have been addressed and that the industry will be developed responsibly," Dr Gorey said.

"Many of the community's concerns around hydraulic fracturing focused on water protection and chemical use.

"There is also a strong desire within regional communities for this emerging industry to be developed in consultation with local people to ensure future projects

co-exist with a diverse range of land values and uses."

Dr Gorey said protecting the State's water resources is of the highest priority for the State Government.

"Assessment processes for water protection include international standards for well design, baseline and ongoing water monitoring and rules for mandatory referral of proposals to the Environmental Protection Authority (EPA)," he said.

"If an activity is approved, petroleum companies must also publicly disclose all chemicals used down a well – these are the strictest chemical disclosure laws in Australia."

DMP is engaging with local communities about how the State's natural gas from shale and tight rock industry is regulated through various forums with regional shires, community organisations and environmental interest groups.

"DMP is also engaging with the petroleum industry to encourage a culture of companies engaging early and often with local communities," Dr Gorey said.

"It is pleasing to see companies operating in WA are adopting this culture. In today's society, I think most companies are aware

that gaining a 'social licence to operate' is just as important as gaining the regulatory licenses required.

"Petroleum companies need to be open and transparent with communities about their proposed activities and, where appropriate, involve community members in their decision-making processes."

Panel members included:

- Dr Peter Stone, Deputy Director, CSIRO Sustainable Agriculture Flagship
- Dr Phil Gorey, Executive Director for Environment, Department of Mines and Petroleum
- Martin Pritchard, Director of Environs Kimberley
- Dr Damian Ogburn, Chief Scientist for Buru Energy
- Jon Ford, General Manager of Community Affairs with Buru Energy
- Dr Anne Poelina, Academic and Aboriginal leader

For more information about the State's emerging shale and tight gas industry, please visit www.dmp.wa.gov.au/shaleandtightgas

One of the most common themes discussed during the conference was the need to engage with local communities to ensure any natural gas from shale development has a social licence to operate.

"In WA, our known natural gas from shale resources are found in the Midwest, Kimberley and east Pilbara regions," Mr Haworth said.

"Community land use in these regions is diverse and includes urban development, agriculture, mining and tourism.

"The State Government is committed to ensuring WA's natural gas from shale activities operate in co-existence with these other land uses and activities which all play an important role in our society."

Key to this co-existence will be the responsible use and protection of water resources.

During the conference, the U.S Environmental Defence Fund led a discussion on the benefits of conducting baseline air and water monitoring near natural gas from shale activities.

"It was pleasing to take part in this discussion as DMP will soon be introducing new regulations which will require baseline monitoring to be conducted before, during and after natural gas from shale activity," Mr Haworth said.

"This means petroleum companies will have to monitor nearby air and water sources to ensure they are not being adversely impacted by their activities."

For more information on shale and tight gas, please visit www.dmp.wa.gov.au/shaleandtightgas

PROPOSED CHANGES TO CLARIFY ENVIRONMENTAL RESPONSIBILITIES

An important part of the Department of Mines and Petroleum's (DMP) environmental reform program includes proposed changes to the *Mining Act 1978* designed to help clarify environmental responsibilities and further ensure the environmentally responsible development of Western Australia's resources industry. *Prospect* takes a look at the improvements the reforms will make.

A consultation paper outlining the proposed changes that will deliver environmental outcomes has been released by the department.

Executive Director for Environment Dr Phil Gorey said Western Australia was well-placed to regulate the impacts of mining into the future.

"At present, the *Mining Act 1978* limits our ability to introduce risk and outcomes-based environmental regulations," Dr Gorey said.

"This was highlighted by a Ministerial Advisory Panel that looked at environmental reforms for the mining sector in Western Australia.

"These amendments will clarify environmental obligations, increase transparency for industry and the community, and remove unnecessary duplication.

"It will also assist in proactively identifying and managing environmental impacts and risks, and clarify DMP's role in environmental regulation."

Dr Gorey said the act was functional and had been adequate up until now, but the proposal was about modernising environmental laws.

"While the main objective continues to ensure that the environment is protected, it will also ensure that business is not exposed to unnecessary costs," he said.

"Importantly, these changes will mean that there is greater time spent by departmental inspectors at mine sites monitoring the environmental performance of miners, and less time trawling through unnecessary paperwork."

The department will continue to consult with stakeholders on the detail of the amendments before they are implemented.

The consultation paper is available on the department's website and includes information for making a submission.

To access this information go to www.dmp.wa.gov.au/environment

Reforming Environmental Regulation program

In May 2012, the department launched the Reforming Environmental Regulation (RER) program.

The objective of the RER program is to implement the principles of best practice regulation of the resources sector to ensure environmental integrity is maintained.

By establishing a risk and outcome based regulatory framework, DMP will ensure its regulatory effort is targeted and proportionate and that regulatory effort protects environmental values in an effective, efficient and timely manner.

The department will undertake ongoing monitoring and evaluation of key performance indicators to complement a risk-based approach by ensuring resources have been appropriately allocated to minimise environmental risk.

It will administer a risk-based regulatory framework in accordance with the principles of best practice government administration – accountability; transparency; predictability; proportionate; and targeted.

For more information about the reforms go to www.dmp.wa.gov.au/RER

ENVIRONMENTAL BOND POLICY OPENS FOR COMMENT

New policy guidelines outlining the use of unconditional performance bonds have been developed to provide clarity and certainty for industry before the compulsory introduction of the Mining Rehabilitation Fund (MRF) on 1 July 2014.

Introduced by the Department of Mines and Petroleum (DMP), the new policy guidelines outline circumstances where a bond may still be needed.

Executive Director for Environment Dr Phil Gorey said that while the fund largely replaced the use of unconditional performance bonds, they were still needed in some circumstances.

"This includes projects that might have a high closure or rehabilitation risk, or

for companies that have a poor record of complying with environmental or rehabilitation obligations," he said.

Before the MRF was introduced, a mining operation could not start or expand its operations without an unconditional performance bond.

"These typically only covered 25 per cent of the cost of rehabilitation and any further costs were borne by taxpayers," Dr Gorey said.

"Another issue was the fact that the bonds could only be used to rehabilitate the specific site that it was collected for.

"The MRF is intended to be the principle form of mining security applied in WA,

although environmental bonds will be retained to protect the integrity of the fund."

The guidelines also look at cases and criteria where bonds may be reduced or retired by the Minister.

"These guidelines give clarity and certainty to industry as we shift to fully implementing the MRF on 1 July 2014," Dr Gorey said.

More information about the guidelines, including contact details for making feedback, can be found at www.dmp.wa.gov.au/19344.aspx

The comment period is open until 20 March 2014.

INDEPENDENT ADVICE FOR REHABILITATION FUNDING

An independent advisory panel that will provide advice about administration of the Mining Rehabilitation Fund (MRF), legacy sites and rehabilitation priorities was announced recently by Mines and Petroleum Minister Bill Marmion.

The Minister said the five-member panel had experience that covered a broad range of expertise.

"This includes industry experience in mine closure, planning, costing and operation, as well as financial management and legal experience," Mr Marmion said.

Inaugural members of the MRF Advisory Panel, Michael Slight, Julie Hill, Charmian Barton, John Gardner and Phil Scott, have been appointed for a two year period and will provide advice to the Director General of the Department of Mines and Petroleum (DMP), Richard Sellers.

"These five individuals bring a wealth of experience and will be well-suited to providing expert, independent advice to DMP," Mr Marmion said.

"The panel will help identify abandoned mines, prioritise sites for rehabilitation, determine expenditure and provide guidance in the administration of the fund."

The department received 30 expressions of interest when it advertised for panel members in August.

"Experts from across Australia were interested in playing a role in the MRF," Mr Marmion said.

"This was an opportunity to be involved in an innovative reform that is unlike any other mine rehabilitation system operating in the world."

The MRF largely replaces the previous bond system and will better cover rehabilitation costs, free up capital for companies and encourage early and ongoing rehabilitation of the State's mine sites.

Western Australia's MRF was developed after almost three years of research, consultation and policy development.

Fact File

- More than A\$220 million in bonds have been retired since the MRF was introduced on a voluntary basis.
- The Fund becomes compulsory from 1 July 2014.
- For more information on the MRF visit www.dmp.wa.gov.au/mrf



Work continues on the 2.1km LNG jetty, with all 56 jetty caissons now in position.

ADDITIONAL HECTARES FOR BARROW

Chevron is set to expand its operations on Barrow Island after Western Australia's Environmental Protection Authority (EPA) recommended conditional approval for a proposal to clear a further 32ha of land.

The class A nature reserve is being used as the base for the US\$54 billion Gorgon Project, Australia's largest single resources investment.

While the EPA said it was satisfied that the proposal to increase the area of clearing from 300ha to 332ha met their environmental objectives, it recommended a two-year extension to the threatened species translocation and reintroduction program to offset the significant residual impacts on the nature reserve.

Under the plan, threatened species will be taken from the island and re-established

on the mainland, and the EPA has proposed an increase in the program from 12 to 14 years.

It's estimated that Barrow Island is currently home to up to 60,000 golden bandicoots, 5,000 boodies, 10,000 spectacled hare wallabies and 10,000 possums.

Boasting a rich marine environment which is just as diverse, the continued survival of many species on the island is a direct result of the absence of introduced predators and competitors. One of the aims of the program is to re-establish populations no longer found on the mainland and provide ongoing management.

"The EPA concluded that the conditions set out in the original approval are effective in managing impacts and should be implemented for the

additional development," EPA Chairman Paul Vogel said.

The extra space will be used for additional construction laydown and operations support to the existing development.

Dr Vogel also said that a commitment was in place to rehabilitate land within the development when it was no longer required to support the construction and operation of the project.

Originally estimated to cost US\$37 billion, factors such as weather delays and the logistical challenges of building a gas plant on the island have seen the budget increase to US\$52 billion a year ago, and more recently to US\$54 billion.

The Gorgon Project, which will see the development of the Gorgon and Jansz-lo gas fields roughly 160km off the north-

REGIONAL VISITS REVEAL COMMUNITY IS SEEKING MORE INFORMATION

Key community stakeholders in the mid and north-west of the State recently participated in informative discussions about Western Australia's emerging natural gas from shale and tight rocks (shale and tight gas) industry and hydraulic fracturing (fracking).

Representatives from the Department of Mines and Petroleum (DMP) visited Geraldton, Broome, Derby and Kununurra to provide presentations about how the department regulates shale and tight gas activities for this developing industry.

Petroleum Executive Director Jeff Haworth said the visits were part of DMP's commitment to engage early and often with local communities.

"During this early stage of shale and tight gas exploration, it has been incredibly beneficial for DMP to be regularly going



Photo: Chevron Australia

west coast of Western Australia, is now approximately 75 per cent complete and first LNG production is scheduled for the middle of 2015.

More than 10,000 jobs have been created, either directly or indirectly, during construction, as well as in local workshops and specialist engineering firms throughout the Perth metropolitan area, the Pilbara, on Barrow Island itself and across Australia.

The project is on track to deliver A\$30 billion in Australian Industry Participation expenditure during construction, the highest ever for an Australian resource project.

Once operational, the focus will move to higher skilled long-term jobs in LNG and domestic gas plant operations, maintenance and logistics support, along with continuing exploration and appraisal to support the expansion of facilities.

For more information, visit the Department of State Development (DSD) website www.dsd.wa.gov.au or Chevron Australia www.chevrontaustralia.com

LNG tank put to the test

The Gorgon Project recently hydrotested the first of two LNG storage tanks on Barrow Island, a process which is used to assess structural integrity.

During the hydrotest, 118,000 cubic metres of seawater – a volume which is 25 per cent heavier than a full tank of LNG – is pumped into the tank using a temporary hydrotest pipeline and a tie-in to the permanent firewater line. This 24-hour fill process takes four days to complete.

Once the tank is filled, the water is stored for 24 hours before being drained. During drainage, a stringent cleaning program is undertaken involving four people in two rowing boats who are placed in the tank prior to the start of the hydrotest. Their role involves cleaning the salt residue from the tank by pressure washing it with potable water.

The removal of salt residue during the hydrotest draining process is extremely important for quality assurance and fault-free start-up of the LNG tanks. The whole process can take up to 10 days to complete safely and accurately.

The rowboat workers spend four or five days and nights cleaning the walls while the tank drains, and finish with the floor of the tank, which takes a similar length of time.

The completion of the first LNG tank hydrotest is a significant achievement for the Gorgon Project as it provides quality assurance that the LNG Tank 1 is ready for operations.



out to regional communities to gain an understanding of local views about the industry," Mr Haworth said.

"Ongoing consultation with community stakeholders plays an important role in guiding DMP's policy decisions and regulatory reform initiatives."

Meeting with community stakeholders has revealed most people are seeking more knowledge about shale and tight gas to better understand the implications and benefits.

"In response, DMP is working hard to make its regulatory processes more transparent and accessible to the public while also developing a suite of information sheets to address common community questions," Mr Haworth said.

A common question asked during regional meetings was how shale and tight gas differs from coal seam gas currently being developed in other jurisdictions.

"All are similar in that they are natural gas resources, however, where they are located, how they are extracted and the surface impacts are quite different," Mr Haworth said.

"For example, it is estimated one well pad would be required per 2.25km² to develop a shale gas field compared to a coal seam gas field which would require a well pad approximately every 0.25–1km².

"Coal seam gas resources are also found at much shallower depths than shale and

tight gas and are commonly associated with aquifers which require dewatering to release the natural gas held in the coal seams by hydraulic pressure."

During recent visits, DMP representatives met with the Shires of Wyndham/East Kimberley, Broome, Derby/West Kimberley and Irwin.

Several State Government regional agencies were also visited, including the Departments of Water, Aboriginal Affairs, Parks and Wildlife, Agriculture and Food, Lands and Main Roads.

The City of Greater Geraldton, Environs Kimberley, media outlets, KRED and the Nulungu Research Institute were other organisations that accepted invitations for briefings.

PORTS REFORM STEAMS AHEAD



Photo: Dampier Port Authority

LNG berths in Dampier.

The reform of Western Australia’s ports has reached a key milestone with the introduction of legislation to consolidate seven regional port authorities into four overarching authorities and the appointments of the chairs-elect who will oversee the amalgamations.

The Ports Legislation Amendment Bill 2013 introduced to State Parliament will see four new regional port authorities established – namely, Kimberley, Pilbara, Mid West and Southern. Fremantle will remain a standalone port authority.

The reforms will improve efficiency, reduce red tape and maximise the capacity of the ports, all of which would ultimately benefit consumers.

“The strong and rapidly growing demand for Western Australian commodities and export capacity at our ports means we must have a model to ensure our ports have the most effective governance framework for our future,” a government spokesperson said.

“The current governance model has served the State well, but times have changed and we need to reinvigorate how our ports operate.”

The amalgamation arose from a review of the governance of the State’s ports with a view to delivering better planning and coordination of port development across Western Australia, less bureaucracy, fewer boards and improved resourcing of smaller ports.

The new port authorities will assume overall responsibility for safe navigation and marine safety across all sites that come under their control, and the relevant port authority will need to appoint harbour masters and approve pilots that operate within their port waters.

They will also be expected to make sure that systems are in place to protect the environment of all port sites.

With Western Australia’s exports experiencing unprecedented growth, there came a need to conduct a review of the ports to ensure they could meet the increasing demand for port services and cope with current and future challenges.

Since 2000, the value of the State’s ports has quadrupled to A\$101 billion in 2012–13, almost doubling Western Australia’s contribution to the nation’s total value, from 26 per cent to 44 per cent. Of these, Port Hedland is the highest tonnage port in Australia and the largest bulk commodity export port in the world.

A second key step in advancing the reform was the recent appointment of chairs-elect for the new authorities. Once formally appointed, the chairs will have the responsibility of directing and managing the transition to the new entities.

The chairs-elect have two decades’ experience in running ports and will play a key role in steering the transition to more efficient regional ports.

The chairs-elect of the four new regional port authorities are:

- Southern Ports Authority – Neema Premji (current Chairwoman, Albany and Bunbury Port Authorities)
- Mid West Ports Authority – Ian King (current Chairman, Geraldton Port Authority)

- Pilbara Ports Authority – Kenneth Pettit (current Chairman, Port Hedland Port Authority)

- Kimberley Ports Authority – Laurie Shervington (current Chairman, Broome Port Authority)

The role of each chair-elect will be distinct from their positions as chair of an existing port authority. The new authorities are expected to be established by 1 July this year, at which point staged amalgamations are set to be implemented.

Current Chairwoman of the Albany and Bunbury Port Authorities, Ms Neema Premji, said the merging of the Albany, Bunbury and Esperance ports would have a number of benefits.

“The amalgamation of the southern ports will bring about optimised use of port infrastructure, improved investment decisions, enhanced governance processes, reduced administrative expenditure and will ensure better planning and coordination of port development,” she said.

“These achievements will assist in benefiting the wider business community by providing cohesive and efficient port operations, in turn providing the opportunity for increased trade and employment opportunities.”

The ports reform is being implemented in two phases, with the second phase involving the transfer of control of 13 non-port authority ports to the new regional port authorities.



Photo: Department of Transport.



Photo: Port Hedland Port Authority

Left: The Wyndham Port. Right: An aerial view of Port Hedland.

ICRG COMMITS \$200,000 TO ABORIGINAL EDUCATION

Civil maintenance and construction contractor Indigenous Construction Resource Group (ICRG) recently launched a A\$200,000 investment over three years in its Aboriginal Education Scholarship program in Port Hedland.

The Little Stars Scholarship program will fund education for 20 primary school aged Aboriginal children.

The program will provide mentoring and pastoral care to create a culturally diverse and inclusive educational environment.

ICRG Chairman Clinton Wolf said ICRG are strongly committed to not just helping develop resource projects in Australia, but to providing real opportunities to enhance the education opportunities for Aboriginal youth.

Fortescue Metals Group CEO Nev Power said Fortescue was committed to promoting employment, training and economic development for Aboriginal people in the Pilbara and was particularly proud of the work opportunities Aboriginal people have had at Fortescue sites through their involvement with ICRG.

“The Little Stars Scholarship program is an important contribution from ICRG as a leading Aboriginal contractor back to the community and to future generations of Aboriginal people,” Mr Power said.

St Cecilia’s Principal Peter Allen said the school was delighted to be involved in the Little Stars Scholarship program.

As part of the program ICRG and St Cecilia’s will work with local Aboriginal representatives to establish close ties with the families and communities of recipients.

Gaining direct knowledge and understanding of the recipients’ social, community, family and home contexts, as well as personal strengths and vulnerabilities, will assist in the delivery of effective education and pastoral care.

The Little Stars Scholarship program is intended for students entering kindergarten to year seven at St Cecilia’s and, subject to satisfactory performance, the students will hold the scholarship for up to three years during their primary schooling.



ICRG Chairman Clinton Wolf, recipient Charlie Stainton-Rea and FMG CEO Nev Power.

DESERT IRRIGATION PROJECT FOR REMOTE EAST PILBARA

A trial of irrigation systems in the State's north-west will use surplus mine water to grow food and biofuel under the Pilbara Hinterland Agricultural Development Initiative (PHADI).

The State Government has committed A\$12.5 million in Royalties for Regions funding to establish two pilot projects growing irrigated crops in the Pilbara.

Sorghum will be grown at Woodie Woodie on Warrawagine Station in the eastern Pilbara, which can be then used for biofuel in the mining industry, as well as cattle fodder. A second site in the central Pilbara is under consideration.

The Woodie Woodie mines, 120km east of Australia's official hottest town, Marble Bar, are licensed to discharge up to 60 gigalitres of groundwater a year.

The trial will start with a 150ha farm operation and could be expanded to several thousand hectares with private sector participation.

Agriculture and Food Minister Ken Baston said surplus water from mine dewatering offered a largely untapped resource.

"This is about teaming agriculture with mining to grow fodder for the pastoral industry and biofuel for the resource sector. The knowledge uncovered through these pilot projects will be vital to Western Australia being able to develop systems for world-leading irrigated agriculture," Mr Baston said.

The Woodie Woodie trial would measure sorghum fodder production potential as a means of drought-proofing and expanding Pilbara beef herds.

Former Regional Development Minister Brendon Grylls said the Pilbara economy was overwhelmingly reliant on the mining industry at present.

"Industrial diversification through irrigated agriculture is crucial in securing economic sustainability for the region's growing population," he said.

PHADI will be run by the Department of Agriculture and Food in partnership with the Pilbara Development Commission and Department of Regional Development.

The project is working with Rio Tinto, BHP Billiton and other miners in the central Pilbara to establish timely approvals processes to expand the use of agriculture as a means of managing mine water discharge.

The concept is already attracting global attention with the Belgium Government visiting Warrawagine Station on the edge of the Great Sandy Desert to assess the potential for a biofuel plant fed by sorghum or a similar crop.

The State Government has signed a Memorandum of Understanding with China on live cattle exports, which has the potential to create virtually unlimited demand for Western Australian cattle.

AGREEMENT TO REDUCE GREEN TAPE WELCOMED

Western Australia has confirmed its commitment to a one-stop shop for environmental approvals, after signing a Memorandum of Understanding (MoU) with the Commonwealth Government at a recent Council of Australian Governments (COAG) meeting.

The MoU sees WA join other states in agreeing to work towards a bilateral agreement with the Commonwealth Government over the next 12 months.

Premier and Minister for State Development Colin Barnett welcomed the development.

"The signing of the MoU is a major step forward in establishing a more

efficient process for approvals without compromising the stringent environmental assessments that are in place," Mr Barnett said.

Bilateral agreements will enable State and Territory Governments to undertake environmental assessments under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) in parallel with State based approvals processes.

"If we can achieve what we are working towards it will significantly reduce duplication between State and Federal environmental approvals processes," the Premier said.

It is expected that the establishment of bilateral agreements will result in improved efficiencies in the process, while maintaining the level of protection under the EPBC Act.

The policy is designed to deliver more streamlined and cost-efficient approvals by reducing overlap between the states and the Commonwealth on a project-by-project basis and enabling a focus on strategic outcomes for biodiversity.

"I look forward to making more progress on this and other productivity measures in the coming months," Mr Barnett said.

GREEN LIGHT FOR THE EAST KIMBERLEY



Photo: Rio Pinto

The \$4.5 million Shared Office Facility provides workspace for up to 30 members from the Gelganyem Trust and Miriuwung Garjerrong Corporation based in Kununurra.

The Ord Irrigation Expansion Project represents a successful partnership between the State, through key agencies such as the Departments of Regional Development and State Development and LandCorp, and the private company Leighton Contractors, to construct new infrastructure to facilitate private investment in the expansion of irrigated farm land in the Ord.

The Premier and State Development Minister Colin Barnett and former Regional Development and Lands Minister Brendon Grylls recently signed a Development Agreement with Kimberley Agricultural Investment Pty Ltd. (KAI), commencing a staged investment process worth an initial A\$200 million in development of Ord Agricultural Land.

During 2013, KAI made significant progress clearing about 2,000ha of land. Under the Development Agreement, KAI has the opportunity to secure a long-term lease over 7,400ha of land with a further option to develop 6,000ha, doubling

the current irrigated farmland area to approximately 28,000ha.

Into the future, KAI plans to invest up to A\$700 million to access additional agricultural land and develop manufacturing facilities in the Ord Valley, with the aim of establishing a sugar industry. This will include construction of a mill and further upgrades to Wyndham Port, creating approximately 300 new jobs in the region.

“The State’s own extensive investment and now that by KAI will support sustainable economic growth in the East Kimberley,” Mr Barnett said.

The KAI proposal is expected to deliver large-scale agricultural industry and downstream processing, representing exciting new opportunities for the East Kimberley community.

To support the expansion of the Ord farm land, the East Kimberley Development Package – a partnership agreement between the Commonwealth and State

Governments – has seen A\$195 million invested in the region in social and community infrastructure, creating further business opportunities, jobs and training.

The award-winning facilities and initiatives now being enjoyed by the East Kimberley community include 103 new homes; a successful transition to home ownership program; a new regional health centre and short stay patient facility in Kununurra; a new rehabilitation facility and a port upgrade in Wyndham; and upgrades to the Kununurra airport, TAFE, secondary school and primary school.

Other new services include a community library, after school care, early learning centres and community meeting rooms in Kalumburu, Dawul and Kununurra.

The delivery of the East Kimberley Development Package provides a good example of cooperation at a local, State and Federal level to identify priorities and deliver key infrastructure.



Left: The Health Service Provider Housing Project has provided seven new houses for health professionals in Kununurra. Right: The Kununurra Education Precinct. Middle: The Kununurra Out-of-School Care Facility was initiated to help address the shortage of after-hours care for school-aged children.



STATE-OF-THE-ART DRILLING RIG TO REDUCE ENVIRONMENTAL FOOTPRINT

Western Australia's vast 530,000 square kilometre Canning Basin in the Kimberly region has the potential to become the largest natural gas resource in Australia and while exploration continues, one company is moving towards a new standard in environmental management.

Buru Energy's interests in the basin are expected to result in improved environmental outcomes with a new type of drilling rig brought in specifically for the Whicher Range conventional gas program.

The company is using a LOC-400 drilling rig as part of its exploration program in the State's Kimberley region that will create a smaller surface footprint compared to traditional rigs.

This will not only create less disruption to the landscape, but its design features, which are intended for use in a closed loop sumpless environment, means no drilling fluids will be discarded in the process.

This new generation machinery, the Crusader 405 manufactured by Huisman, is operated by Advanced Energy Group (AEG) and has a number of environmental benefits.

Because a smaller location is required compared to a conventional drilling rig, less earthmoving is necessary to prepare the site.

All components can be containerised for easy transport resulting in less disruption to traffic as experienced by standard rigs with over size loads, and with far fewer loads it takes a lot less time to move.

Another advantage is the Crusader's ability to drill with casing, which not only reduces the time taken to drill a well, but also the cost.

The unit is also capable of horizontal directional drilling enabling multiple wells to be drilled from a single rig pad, resulting in less surface disturbance from clearing.

Compatible with closed-loop fluid management systems, the rig has a high yield recovery of drilling fluids through recycling, minimising waste.

The rig is provided with a containerised diesel storage vessel which is double-skinned and self-bundled, as well as a closed-loop diesel supply to generators, reducing the potential for spills to the environment.

The rig hydraulic system, together with dry break hose couplings, significantly reduce potential spill volumes during rig up and rig down operations.

In preparation for the proposed program, Buru Energy has conducted geological modelling and hydrogeological assessments and is collecting robust baseline data to support the rigorous environmental approval process.

If the project is successful, Buru Energy aims to provide a long term supply of natural gas for the WA domestic gas market.

The 2014 program is the first stage of a multi-stage exploration, appraisal and development program.

Buru Energy Managing Director Dr Keiran Wulff said: "This rig uses a lot less fuel than other rigs, and full automation means less risk to personnel as well as fewer personnel requirements."

"This all goes towards a reduced footprint for the overall operations which is a key focus for Buru Energy's activities in the Canning Basin."



Aircore drilling at Toro's Wiluna site.

WA'S URANIUM WAITING GAME

At 2.46pm on Friday, 11 March 2011, a magnitude 9.0 undersea earthquake rocked the north-east coast of Japan, unleashing a tsunami that wrecked the Fukushima Daiichi Nuclear Power Plant. The disaster shocked the world and cast a lingering shadow over uranium mining projects in Western Australia.

As the price of uranium dropped, so did the pace of development by the major players in WA's fledgling industry. Plans were put on hold, but not dumped because the industry leaders know it's now a waiting game.

In the first of a two-part series *Prospect* takes a look at how this emerging industry in Western Australia is progressing.

The companies closest to getting uranium ore out of the ground in Western Australia – Toro Energy Limited and Cameco Australia – both believe the long term fundamentals of the uranium market remain strong.

Toro Managing Director Dr Vanessa Guthrie expects to see a recovery as

growth in nuclear power continues, particularly in China.

She believes Toro's Wiluna mine in the Northern Goldfields is well placed to take advantage of a price upswing when the market starts to recover.

"Wiluna is scheduled to begin production early in the second half of this decade

– precisely the time when the current short term depressed uranium market conditions are expected to end," Dr Guthrie said.

"Underpinning this demand trend is the fact more Japanese power utilities are applying to restart their reactor fleet, and new-generation reactors being built in

China will continue to come on line from 2015 through to 2020 and beyond.”

She said these new reactors would need to secure long-term supply and this would be a key factor in stabilising the demand in the global uranium market, “making Wiluna even more attractive”.

Cameco Australia Managing Director Brian Reilly said his company was taking “prudent steps to prepare our projects (most notably the proposed mine at Kintyre in the East Pilbara) for improved market conditions”.

“We are seeing strong reactor growth around the world, as countries with rapidly developing economies seek alternative sources of clean energy and advance their plans to use nuclear power as part of their energy mix,” he said.

“With projects being put on the back burner and finite secondary sources diminishing, increased demand from new reactors will need to be met by increasing uranium supply.”

Energy and Minerals Australia (EMA) Chief Operating Officer Julian Tapp said EMA aimed to achieve a “final Investment decision” for the Mulga Rocks project by mid-2015.

Mulga Rocks, 250km east-northeast of Kalgoorlie, is EMA’s most advanced project and comprises four separate mineral deposits named Princess, Ambassador, Emperor and Shogun.

“We intend to produce around 1360 tonnes of uranium oxide concentrate per annum with production ramp-up starting before the end of 2016,” Mr Tapp said.

Managing Director/CEO of Paladin Energy Ltd John Borshoff is pragmatic about the future.

He believes the industry in WA has been in limbo since Fukushima and won’t move ahead until the price of uranium hits A\$70 a pound.

Mr Borshoff sees a dramatic gap between supply and demand in coming years because utilities are not committing now to long-term contracts.

“The industry can’t afford ad hoc buying,” he said.

However he believes that WA has a bright future because, like Canada, but unlike other less stable areas in the world, it will offer security of supply.

“If the price of uranium hits the magic A\$70 a pound in the very near future, we hope to achieve first production at Paladin’s Manyinee project in the Pilbara during 2017,” he said.

Regulation and responsibilities

WA’s resurgence in uranium projects began in earnest in 2008 when the newly-elected Coalition State Government lifted the ban on uranium mining.

Since then, the Department of Mines and Petroleum (DMP) has granted leases to about 46 companies focusing on uranium.

As of February 2013, WA has known resources of 234,000 tonnes of uranium in about 30 separate deposits.

In preparation for the first uranium mine in the State becoming operational, DMP is taking steps to ensure that stakeholders are engaged and provided with a wide range of information in appropriate formats regarding the uranium industry, the government’s activities in regulating the industry and the projects operating in WA.

The department is keen to help foster the responsible growth of a uranium industry in the State and is focused on its regulatory duties in the key areas of protecting workers, public health and the environment.

“DMP has regulatory processes in place for when the demand for uranium

improves,” DMP Deputy Director General Dr Tim Griffin said.

“This will ensure that Western Australia can play a significant part in the supply of uranium, as countries increase their utilisation of nuclear power to reduce reliance on fossil fuels.

“As uranium projects develop, DMP is encouraged by the work the industry continues to do with the local community, especially around Indigenous engagement,” he said.

Getting the go-ahead for a uranium project in WA is no simple task.

Companies must seek at least 38 separate approvals involving 11 State and Commonwealth agencies governed by 12 different pieces of legislation before construction can begin.

DMP’s regulatory requirements are rigorous and focus strongly on radiation safety.

In January 2013, the department and the Radiological Council in Western Australia signed a Memorandum of Understanding (MoU) on Radiation Safety for Mining Operations Working Arrangements.



Top left: *Toro Energy Managing Director Vanessa Guthrie. Top right: *Cameco Australia Managing Director Brian Reilly. Above: *Paladin Energy CEO John Borshoff .***

The MoU formalises a partnership responsible for regulation at the highest international levels to ensure that risk from uranium mining to workers, communities and the environment is minimised.

DMP's established measures to ensure radiation safety for workers and communities living near mine sites and transport routes include approval of a Radiation Management Plan before any operation involving the mine, processing plant and transport arrangements.

Uranium exploration and mine workers are subject to a broad range of safety regulations, protocols and practices, and a more extensive health monitoring regime than most other mine workers.

In the next edition of *Prospect* we take a look at how the projects of the key players – Toro, Cameco, EMA and Paladin are progressing.



Samples being taken at Toro's Wiluna mine in the Northern Goldfields.

WA RANKS AS WORLD'S NO.1 INVESTMENT DESTINATION

Western Australia's resources sector has been identified in the Fraser Institute Survey of Mining Companies 2013 as the world's top-rated jurisdiction for investment attractiveness.

With a score of 85.3 out of a possible 100 in the survey's Investment Attractiveness Index, WA ranked number one in the world over Nevada (84.2) and Newfoundland and Labrador (81.3).

The State also received number one rankings for the Current Practices Mineral Potential Index, which determines whether under the current policy environment exploration is encouraged or not, as well as the Uncertainty Concerning Existing Regulations Index.

WA ranked second in the world in the Best Practices Mineral Potential Index and sixth in the Policy Perception Index (PPI). These two categories combined create the overall Investment Attractiveness Index category.

The Best Practices Mineral Potential Index ranks a region's mineral potential with exploration investment potential, independent of policy restrictions. In this category WA and Nevada (0.82) were equal second to Alaska (0.83).

Other closest ranked Australian jurisdictions in this category included Queensland, 18th in the world (0.73) and Northern Territory, 24th (0.70).

In the Policy Perception Index, which the Fraser Institute says provides a 'report card' to governments on the attractiveness of their mining policies, Western Australia was ranked sixth in the world. This was up from 15th in 2012-13.

In the same category South Australia ranked 11th (82.9) and the Northern Territory was 13th (81.8), while in the Investment Attractiveness Index, the Northern Territory was ranked 17th with 74.7 out of a possible 100, followed

by South Australia, 20 (73.8) and Queensland, 21 (73.5).

Western Australia also received encouraging comments in regard to managing Native Title approvals.

Other achievements include Legal System (4th), Regulatory Duplication and Inconsistencies (7th), Political stability (8th), Quality of the geological database (11th), Socioeconomic agreements/community development conditions (13th) and top 20 rankings for Uncertainty concerning disputed land claims, Community Development Conditions and Certainty regarding environmental regulation.

The Fraser Institute annual Survey of Mining Companies 2013 is available at <http://www.fraserinstitute.org/uploadedFiles/fraser-ca/Content/research-news/research/publications/mining-survey-2013.pdf>

PUBLIC COMMENT OPEN FOR OIL AND GAS REGULATIONS

Revised oil and gas well management regulations have been released for public comment by the Department of Mines and Petroleum (DMP).

The draft Petroleum and Geothermal Energy Resources (Resource Management and Administration) Regulations 2014 address a range of matters, including well design, baseline water monitoring, field development and data administration.

DMP Executive Director for Petroleum, Jeff Haworth, said the draft well management regulations adopt a risk-based approach and were developed in response to recommendations received from an independent review the department commissioned in 2011.

"The review recommended greater regulatory transparency and enforceability, particularly in response to heightened public interest in Western Australia's emerging shale and tight gas industry and hydraulic fracturing," he said.

"These regulations are a key part of the State Government's integrated regulatory framework for oil and gas activities that provides protection for communities, the environment and water resources. Various government agencies are involved, including the Departments of

Environment Regulation, Water, Health and the Environmental Protection Authority."

With more than one million shale gas wells hydraulically fractured around the world, DMP has drawn on experiences in other jurisdictions to ensure these new regulations reflect the latest scientific and technological advancements in the oil and gas sector.

"A key lesson we have learnt from other jurisdictions is the need for greater transparency and accountability in regards to the protection of groundwater resources near onshore oil and gas activities," Mr Haworth said.

"The new regulations will introduce requirements for petroleum companies to have baseline water monitoring for their groundwater management strategies for field development.

"DMP will soon be releasing guidelines which will assist petroleum companies to identify the extent of baseline groundwater monitoring and what they need to consider to ensure monitoring is carried out effectively."

The draft regulations will also adopt a new 'whole-of-life' approach to well construction and management to further strengthen obligations on companies to ensure wells are fit for purpose.

"These strengthened requirements, together with new water monitoring requirements and the State's existing petroleum environment and safety regulations, will ensure the State's water resources are protected from oil and gas activities," Mr Haworth said.

The new regulations are part of a broader initiative to reform the State's petroleum legislative framework, with new environment and safety regulations released in 2012 and 2010 respectively.

The new regulations will transition WA's petroleum industry regulation from a prescriptive regime to a risk-based approach which will align onshore activities with offshore Commonwealth regulated activities.

"This will provide a consistent, best practice approach for petroleum companies operating in Western Australia," Mr Haworth said.

The public comment period closes 5:00pm WST, 30 May 2014 and the finalised regulations will be gazetted later this year.

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

DMP ASSISTS HYDRAULIC FRACTURING INQUIRY

In August 2013, Western Australia's Legislative Council commenced an inquiry into the implications for Western Australia of hydraulic fracturing for unconventional gas (shale and tight gas).

This inquiry is the first of its kind in Australia and represents an important opportunity for public policy discussion on this emerging industry, which has generated widespread interest in Australia and internationally.

In December last year, the inquiry received 114 written public submissions which were publicly released.

The first round of hearings before the committee were held in February this year.

Lead regulator, the Department of Mines and Petroleum (DMP), along with other State Government agencies including the Departments of Water and Health,

presented to the committee and are assisting the inquiry, which is expected to continue through to next year.

For more information visit www.parliament.wa.gov.au

STAKEHOLDER ENGAGEMENT PART OF DMP CULTURE

Since establishing a specialised Reform Group four years ago the Department of Mines and Petroleum (DMP) has had many achievements.

Under the directive of the then recently appointed Director General Richard Sellers, the Reform Group had a clear mandate to embed stakeholder engagement into the department's culture and its core business.

The success of DMP's reforms was highlighted in the Public Sector Commission's State of the Sector Report 2013 in the Governance and Innovation section, and has set a new benchmark for how government agencies consult with stakeholders.

The creation of a Reform Group was sparked by a State Government decision in 2009 to create a framework of best practice safety regulation for Western Australia's resources sector, following a spate of mining fatalities.

That was the daunting task facing Reform Project Director Simon Skevington when he accepted the challenge to get the Mine Safety and Inspection Levy and the Safety Reform program stakeholder engagement completed in 2010.

The group's brief was to project manage the development and implementation of a risk-based approach to safety reform, working with the agency's Resources Safety Division and external stakeholders and included the introduction of the Mine Safety and Inspection Levy.

A critical role for the Reform Group during this period was managing a Ministerial Advisory Panel (MAP) involving representatives from industry, unions and the regulator, and the four working groups it established.

As part of the formal stakeholder engagement process, briefings on the

reforms were also held across the State, including some held jointly with industry peak bodies.

Mr Skevington said the briefings provided an opportunity for regional communities to learn early on in the process what changes were being considered.

He said it also gave them the chance to give the department first hand advice on issues that might arise.

Two years later, the group had to shift its focus to concentrate on environmental regulation, and in particular, the Mining Rehabilitation Fund (MRF).

This involved extensive consultation with stakeholders to develop a new model of environmental regulation and the drafting of legislation for the MRF within six months.

As with safety reform, the department had the challenge of working with a MAP representing the key stakeholders.

By the end of the six months the panel had a report for the Minister with recommendations for clear environmental objectives, efficient regulation, improved transparency and communications and an effective compliance framework.

Mr Skevington said the key to implementing the MRF legislation on schedule was managing stakeholder expectations so that the department could get the system in place quickly, while ensuring there was time to establish processes and procedures.

The successful strategy saw the introduction of a voluntary 12-month period for miners to choose whether to opt in early.

The department's Environment Division has now taken up the challenge of getting the systems and processes in place and has established a Reforming

Environmental Regulation Advisory Panel to ensure there is continued stakeholder engagement in the development and implementation of the MAP recommendations.

Due to its success, other parts of the organisation are now adopting this approach. As part of the continued consultative process a new MAP has been established at Resources Safety to develop and implement major safety legislation amendments.

The Environment Division has continued the regional briefings and Resources Safety has continued with its State-wide roadshow. Talking to people face-to-face has become the norm for the department.

DMP's Community Engagement Manager, Silvana Traini, is now working to build capacity for early engagement across the various business units.

She said heightened community interest in the emerging shale and tight gas sector has resulted in a strong commitment by the department to engage with affected communities early and often.

"The community is seeking more knowledge about this industry to better understand the implications and benefits," Ms Traini said.

"Since 2011, DMP officers have met with a range of stakeholders across the State. A strong focus of the department's community engagement efforts has been in the Mid West and Kimberley regions, where some shale and tight gas exploration activities are already occurring."

She said the ongoing consultation with a wide range of stakeholders, including local governments, land holders, and environmental and regional community groups and organisations, is shaping the regulatory framework for this emerging industry.

NEW EXECUTIVE DIRECTOR FOR DMP'S PETROLEUM DIVISION

Jeff Haworth knew he had some pretty big shoes to fill when he stepped in to Bill Tinapple's former role as Executive Director Petroleum Division at the Department of Mines and Petroleum (DMP) late last year.

But as Director General Richard Sellers has observed, Jeff's 38 years of experience in the resources industry – 22 of them in the department – have given him the strongest of foundations.

Mr Sellers said that Jeff had been a pivotal force, helping drive and administer important tasks for the department.

"I am confident Jeff will continue to hold the department to account, applying the highest standards across the Petroleum Division in years to come," Mr Sellers said when Jeff was appointed in November last year.

Jeff started his career in nickel mining near Norseman before moving to diamond exploration in the Kimberley during the diamond rush of the 70s.

In 1979, he 'saw the light' and moved into oil and gas exploration, working in Australia on the North West shelf and Browse projects, Barrow Island, and in the Northern Territory, Queensland and Victoria.

Jeff has worked overseas in the Norwegian sector of the North Sea, the Arctic Ocean, New Zealand and the United States.

He has vivid memories of his time working for Norsk Hydro as a contract well site geologist in the North Sea and Arctic Ocean.

"I particularly remember it being so cold I snapped a door handle off," Jeff said.

"But I will never forget when I first arrived in the Arctic, watching men sunbathe on the helideck by the light of the midnight sun."

In the US, Jeff was involved in gas analysis research that resulted in the publication of several papers on improved interpretation techniques.



Newly appointed Executive Director Petroleum at DMP Jeff Haworth, left, is welcomed to the role by his predecessor Bill Tinapple.

This research is currently being used as an evaluation tool by Buru Energy in the Canning Basin as part of its determination of their basin-centred tight gas resources.

Since joining DMP in 1991, Jeff has been involved in the development of the Western Australia Petroleum Information Management System (WAPIMS) database, which was ranked number one in the world by the Fraser Institute.

His knowledge and experience in petroleum data has led to him providing advice to other countries in developing their systems.

This experience in data management played a key role last decade in developing Commonwealth regulations around data administration for the offshore sector.

Jeff is a member of the Society of Petroleum Engineers (SPE), the American Association of Petroleum Geologists (AAPG) and the Petroleum Exploration Society of Australia (PESA).

During his time with DMP Jeff has held the positions of Petroleum Geology Manager and Director of Technology, Petroleum and Geothermal.

In his new role, he is concentrating on the provision of consistent and transparent approvals processes for the Western Australian petroleum industry.

"My focus is to maintain and build upon the Petroleum Division's role in approvals and compliance monitoring of the industry and maintain world's leading practice in resource management and regulation," he said.

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 to deliver economic and Indigenous participation opportunities and much-needed infrastructure to a regional community 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. To achieve a diverse agricultural mix for the region and to support local enterprise, an additional 1,700ha of newly developed land in the Ord West Bank will be available for the development of up to 25 new farms. The Commonwealth Government has 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). The Yawoorroong Miriung Gajerrong Yirrgab Noong Dawang Aboriginal Corporation (MG Corporation) building and the Department of Housing transitional housing projects have been successful nominations for the Australian Institute of Architects 2013 Western Australian Architectural Awards. The transitional housing project has also achieved a 2013 Premier's Award for Improving Indigenous Outcomes.

Expenditure: \$517m.

Employment: Construction: 761

GOLD

Boddington – Gold Mine

NEWMONT BODDINGTON GOLD PTY LTD

Newmont Boddington Gold (NBG), a major gold and copper mine in the south east of Western Australia, 120km from Perth, commenced operations in 2009 after a \$3b expansion of the original Boddington Gold Mine, a joint venture which had been in care and maintenance for several years. NBG is now 100 per cent owned and operated by United States global miner Newmont Mining Corporation. First gold was poured in September 2009 and 18 months later the operation achieved its first one-million-ounce milestone. An estimated 700,000-750,000 ounces of gold per annum is expected to be produced for the life of the mine, which is officially more than 24 years, however it is possible the mine life could be further extended with a decision likely by the end of 2014. NBG also produced 67Mlbs of copper in 2013 and a similar amount is expected to be produced in 2014.

Employment: Operation: 650

Kalgoorlie – Tropicana Gold

ANGLOGOLD ASHANTI/INDEPENDENCE GROUP JOINT VENTURE

AngloGold Ashanti, as Joint Venture Manager, began production of the Tropicana Joint Venture gold mine in September 2013, ahead of schedule. The mine is 330km north east of Kalgoorlie and in an area previously devoid of infrastructure. Following State and Commonwealth Environmental approvals in the second half of 2010, key State and local government approvals were obtained for construction of a 225km road, bore field, pipelines, airstrip, accommodation village, power station and mine plant.

Expenditure: \$700m.

Employment: Construction: 700; Operation: 400

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 support industry area and 5,231ha 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 – Jimblebar Iron Ore Mine Expansion

BHP BILLITON IRON ORE PTY LTD

During the September 2013 quarter first production was delivered from the Jimblebar Mine Expansion, six months ahead of its original schedule. The ramp up of phase one capacity to 35Mtpa is expected to be completed by the end of 2015 financial year. Together with the recent installation of four mobile crushers, this will increase total iron ore supply chain capacity to in excess of 220Mtpa. Longer term, a low cost option to expand Jimblebar to 55Mtpa and the broader debottlenecking of the supply chain is expected to underpin capital efficient growth in capacity to approximately 260 to 270Mtpa.

Expenditure: \$4b.

Pilbara – Port Hedland – Atlas Iron Ore

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. Atlas' second mine, Wodgina, commenced operations in 2010. Atlas' third mine, Mt Dove, was opened in December 2012, followed by its Abydos mine in 2013. The first phase of the Mt Webber Mine has commenced, with haulage expected to begin in June 2014. Atlas aims to export between 9.8Mt and 10.3Mt in the 2014 financial year. Atlas plans to progressively expand its exports, targeting 15Mtpa by 2015 and 46Mtpa during the 2017 calendar 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: 700

OIL & GAS DEVELOPMENTS

Carnarvon Offshore Basin – North Rankin – North Rankin Redevelopment

WOODSIDE ENERGY

In October 2013, Woodside as operator of the North West Shelf Project announced that the North Rankin Redevelopment Project achieved start-up and has exported gas to the Karratha Gas Plant. The \$5b North Rankin Redevelopment Project involved the construction and installation of a second platform, North Rankin B, and modification and refurbishment of the existing North Rankin A platform. Located approximately 135km offshore of Karratha, the North Rankin B platform will enable the recovery of approximately 5 trillion cubic feet (100% project) of discovered, low pressure reserves from the North Rankin and Perseus fields.

Expenditure: \$5b.

Pilbara – Macedon Domestic Gas Project

BHP BILLITON PETROLEUM (AUSTRALIA) PTY LIMITED

BHP Billiton Petroleum (Australia) Pty Ltd and Apache Energy Limited have commissioned a domestic gas plant for Western Australia at the Ashburton North Strategic Industrial Area near Onslow. The development involves a number of sub-sea gas wells connected to the gas field, offshore and onshore wet gas pipelines, 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 is in the order of 200TJ.

Expenditure: \$1.5b.

Employment: Construction: 700; Operation: 14

AMMONIUM NITRATE

Kwinana – Ammonium Nitrate Facility Expansion

CSBP LIMITED

CSBP is currently expanding its ammonium nitrate production facility at Kwinana from its current capacity of 520,000tpa to 780,000tpa. The expansion involves 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. Construction is well advanced with all major modules delivered to site and in place. The expansion is on track to be operational in the first half of 2014.

Expenditure: \$550m.

Employment: Construction: 300; Operation: 10

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 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: \$600m.

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 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. Site construction is expected to commence in the second quarter of 2014, with first production scheduled in 2015. The project is expected to produce 62,200tpa of leucoxene products and 28,700tpa of zircon concentrate, both of which will be exported from the Bunbury Port.

Expenditure: \$64m.

Employment: Construction: 35; Operation: 30

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 Dampier Port 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, producing in the order of 200TJ per day.

IRON ORE

Pilbara – BHPB – Port Blending and Rail Yard Facilities

BHP BILLITON IRON ORE PTY LTD

BHP Billiton WA Iron Ore's Port Blending and Rail Yard Facilities project has enhanced the efficiency of its supply chain. The project handled first ore in the December 2013 quarter, as planned. The project is now 98 per cent complete.

Expenditure: \$1.25b.

Employment: Construction: 2100; Operation: 720

Pilbara – 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 BHP's 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: \$400m.

Employment: Construction: 500

Pilbara – Solomon – Chichester expansion and Solomon Mine Project

FORTESCUE METALS GROUP LTD

Fortescue has recently completed the expansion of its existing mines at Cloudbreak and Christmas Creek to 95Mtpa (including 5Mtpa from BC Iron). The existing rail and port facilities have been expanded by the duplication of 120km of railway south of Port Hedland, installation of two new train unloaders, and construction of two additional berths and associated infrastructure resulting in a rail and port capacity of 155Mtpa. Construction of infrastructure in support of the Solomon Hub, which includes the new 20Mtpa Firetail iron ore mine at Solomon and the 127km railway spur to Fortescue's existing Christmas Creek to Port Hedland rail line, has been recently completed. The Solomon Hub is planned to involve at least two mining areas and two processing plants.

Expenditure: \$9b.

Employment: Construction: 7000; Operation: 6000

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, 6Mtpa pellet plant, 25km slurry pipeline, combined cycle 450MW power station, new port and trans-shipment facilities, and a 51GL desalination plant. At full production 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. Engineering, procurement and fabrication activities are progressing to plan. The project remains on budget and on schedule for start-up 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 A\$61b (US\$54) 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: \$61b.

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 developing 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 Western Australian and Commonwealth governments. Construction is expected to commence in the second quarter of 2014, with the first shipment of urea planned for the fourth quarter of 2017.

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 (SIA) at Anketell, located 30km east of Karratha on the Pilbara coast. The port and associated infrastructure will be a proponent-funded but State owned 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.

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



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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 has key international investment partners with strategic steel-making interests. They are 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 late 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, the rail construction, mine and port accommodation villages are completed. In addition, the new Corporate HQ and Remote Operations Centre at the Perth International Airport business precinct are now completed. Considerable works are already underway on port, rail and mine construction.

Expenditure: \$9.9b.

Employment: Construction: 3600; Operation: 2000

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 5 years. Mining of the Deception Deposit has environmental approval with first production expected in first half of 2017.

Expenditure: \$35m.

NICKEL

Mt Windarra – Windarra Nickel **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**

The Canning Basin is home to what is potentially the largest onshore resource of unconventional gas in Australia. Buru Energy Limited and Mitsubishi Corporation are currently investigating the potential of the basin's tight gas resource contained in the Laurel Formation, located 2-3km below the surface. The proposed 2014 program will involve testing the Laurel Formation at two locations in this basin – at Yulleroo, which is 80km east of Broome, and at Valhalla/Asgard, which is 320km east of Broome. Testing for this potentially large tight gas resource will involve stimulation of the Laurel Formation using hydraulic fracturing and flowback of two existing Buru Energy exploration wells at Yulleroo and a further two wells at Valhalla/Asgard. These wells were drilled between 2010 and 2013. In preparation for the proposed 2014 program, Buru Energy has undertaken geological modelling, building capacity and accessing experienced companies to support Buru Energy's programs. The company has undertaken hydrogeological assessments and is collecting robust baseline datasets to support the rigorous environmental approvals process currently underway. Buru Energy is also currently undertaking an extensive program of engagement with Traditional Owners, pastoralists and the general Kimberley community, ensuring they have access to comprehensive information about the proposed activities, including the fracturing process and environmental safeguards, as well as independent, up-to-date advice regarding the proposed program. The results of the 2014 exploration program will assist Buru Energy's understanding of the commercial potential of the Laurel Formation as a significant and strategic tight gas resource to Western Australia. Canning Basin gas is destined for the domestic market. The development of the gas is under the *Natural Gas (Canning Basin Joint Venture) Agreement Act 2013*, which targets the delivery of at least 1,500PJ of gas into the Western Australian domestic gas market over a 25-year period.

