

Queensland  
**EXPLORATION**  
**SCORECARD**

TRACKING QUEENSLAND'S PROGRESS TOWARDS  
BECOMING AN EXPLORATION LEADER BY 2020,  
WITH BRISBANE AT ITS HEART



AN INITIATIVE OF THE QUEENSLAND  
EXPLORATION COUNCIL

**2012**

# FOREWORD

## THE QUEENSLAND EXPLORATION COUNCIL (QEC) IS PLAYING AN INTEGRAL ROLE IN DRIVING RESOURCES EXPLORATION IN QUEENSLAND.

Led by senior industry, government, and academic representatives, the QEC is implementing a number of innovative strategies to achieve our objective of having Queensland recognised as a minerals and energy exploration leader by 2020.

Tracking our performance and ensuring that our policies and programs are responsive to changing global circumstances is essential. Since the launch of the inaugural QEC Exploration Scorecard in November 2011 by federal Resources and Energy Minister Martin Ferguson, the publication has been confirmed as a valuable tool for industry leaders and policy makers. Our first report demonstrated that our greenfields expenditure is low by comparison with similar jurisdictions and that explorers held deep concerns over regulation and policy. We are glad to report that the Newman state government, elected in March 2012, has moved to address some of these concerns.

Our 2011-12 results reveal data as at 30 June 2012 and make for interesting reading. Despite general moderation in commodity prices and capital flows, our exploration sector achieved some strong outcomes compared with 2010-11:

- equity capital raisings increased both in absolute terms and as a percentage of all Australian raisings
- exploration expenditure increased by 69 percent and 38 percent respectively for new deposits and existing deposits
- exploration expenditure as a percentage of sales increased from 1.6 to 2.4 percent
- internet vacancies for geoscientists continued to increase
- the number of hits and quantum of downloads from the state government's geoscientific databases increased sharply.

However, there are headwinds approaching in 2012-13. Slower global economic growth, tighter margins and reduced capital access are anticipated, which may curtail exploration expenditures. The value of good policy and regulation increases in times of downturn and we must continue the process of reform – working with all levels of government along the way.

In commending this report to you, we gratefully acknowledge the contributions of the QEC working group as well as those from industry and government who provided valuable data and information referenced throughout the document, especially the busy exploration companies who contributed to our survey.

Yours sincerely



**Michael Roche**  
Chief Executive  
Queensland Resources Council



**Geoff Dickie**  
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November 2012

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# PERFORMANCE SUMMARY

## THE QUEENSLAND EXPLORATION SECTOR 2012 (WITH 2011 COMPARISON)

LEAD INDICATORS – DRIVERS OF ACTIVITY AND PERFORMANCE	2012	2011
<p><b>Resources prospectivity and endowment (Section 2)</b></p> <ul style="list-style-type: none"> <li>Queensland enjoys high minerals and energy prospectivity with significant endowments of coal and coal-seam gas.</li> </ul>		
<p><b>Resource prices (Section 3)</b></p> <ul style="list-style-type: none"> <li>Exploration expenditure in coal increased despite moderation in coal prices. Exploration spend remained steady for oil and gas and gold assisted by buoyant Japanese Liquefied Natural Gas (LNG) prices and continued sharp increases in the gold price. Exploration expenditure in copper continued to increase despite moderating copper prices.</li> </ul>		
<p><b>State government geoscientific funding and activities (Section 4.1)</b></p> <ul style="list-style-type: none"> <li>Improved functionality of the Queensland Government's Interactive Resource and Tenure Maps (IRTM) saw a trebling in the volume of downloads and hits recorded.</li> <li>The volume of downloads registered on the Queensland Digital Exploration reports (QDEX) increased by 60 percent.</li> </ul>		
<p><b>Regulatory, legislative and policy stability (Section 4.2)</b></p> <ul style="list-style-type: none"> <li>Since 2009, the Queensland Government has undertaken streamlining of approval processes for resources tenure and their environmental authorities, including for exploration. The streamlining is aimed at providing flexibility for managing tenures and greater accessibility in making applications. Although many of these initiatives have been enacted, they will not be fully implemented until the end of June 2013.</li> </ul>		
<p><b>Operating and investment sentiment of exploration companies (Section 4.3)</b></p> <ul style="list-style-type: none"> <li>In comparison with other Australian jurisdictions, Queensland rates: <ul style="list-style-type: none"> <li>strongly in terms of pre-competitive geoscientific data, equipment availability, labour and skills availability, and environmental regulations, but</li> <li>relatively poorly in terms of government/departmental assistance, exploration permit processes, conduct/compensation agreements and policy uncertainty.</li> </ul> </li> </ul>		
<p><b>Access to land (Section 5.1)</b></p> <ul style="list-style-type: none"> <li>Exploration Permit Coal (EPC) and Exploration Permit Mineral (EPM) granted in 2011 took on average 21 and 26 months respectively, compared to 17 and 24 months in the previous year.</li> <li>In 2011 it took 183 calendar days to decide the successful petroleum tenders.</li> </ul>		
<p><b>Access to human and intellectual capital (Section 5.2)</b></p> <ul style="list-style-type: none"> <li>Internet job vacancies for geologists and geophysicists in Queensland continued to increase.</li> <li>The pool of potential geoscience graduates decreased nationally but increased slightly from Queensland Universities.</li> <li>Drilling commencements in Queensland increased by 44 percent over the past 12 months.</li> </ul>		

## LEGEND

Good

No significant impediment

Cause for concern

Significant problems



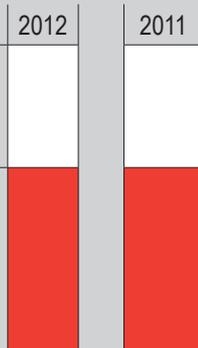
### LEAD INDICATORS – DRIVERS OF ACTIVITY AND PERFORMANCE

#### Livability of Queensland (city and regional hubs) (Section 5.2.2)

- Brisbane and Cairns were rated as the two most livable communities among cities and regions most commonly chosen by geoscience professionals to reside.

#### Access to equity capital (Section 5.3)

- Despite deteriorating global conditions, the amount of equity finance raised by exploration companies from domestic and global sources for exploration in Queensland increased slightly to \$265 million.
- As a percentage of all Australian capital raisings, Queensland increased its share from 16.5 to 30 percent.



### LAG INDICATORS – EXPLORATION SUCCESS

#### Exploration and development permits and areas granted (Section 6)

- Lodgements for coal, mineral and geothermal exploration permits fell, but increased for petroleum.
- The number of current exploration permits (and authorities to proceed) for coal, minerals, petroleum and geothermal increased.
- The amount of land granted for exploration increased for coal and minerals, but fell for petroleum and geothermal.

#### Mineral and petroleum exploration (Section 7)

- Expenditure on greenfields and brownfields increased by 69 percent and 38 percent respectively.
- Greenfield expenditure as a percentage of total exploration increased to 30 percent from 26 percent, bringing it into line with Western Australia, but lagging other jurisdictions.
- As a percentage of sales, exploration expenditure increased from 1.6 to 2.4 percent, surpassing Western Australia, but lagging other jurisdictions.

#### Drilling success and levels of reserves (Section 8)

- Reserve to production ratios for bauxite, coal and coal-seam gas remain in healthy ranges, but low for base and precious metals.

#### Minerals production and comparison with global demand (Section 9)

- Over the past 12 months production in particular for bauxite, zinc and coal (post flood impact) has picked up and the gap between the actual production and the trend global demand has narrowed.

#### Market capitalisation movements (Section 10)

- Market capitalisations of the Queensland junior exploration sector have fallen 42 percent over the past 12 months.



# 1.0 BACKGROUND

## 1.1 THE QUEENSLAND EXPLORATION COUNCIL

The vision of the QEC is to see Queensland acknowledged as a minerals and energy exploration leader by 2020 with Brisbane at its 'heart'. This vision is maximised by fostering investment in Queensland exploration using expertise and services sourced from Queensland.

The QEC was formed by the Queensland Resources Council (QRC) in December 2010 to drive the 2020 Exploration Vision. The QEC brings together senior representatives from established and emerging resource companies, government, the finance and broking community and academic leaders.

Under the chairmanship of geologist and former Queensland Deputy Coordinator-General Dr Geoff Dickie, the QEC is putting Queensland on the front foot in the global contest for new resource sector investment.

Key initiatives of the QEC include:

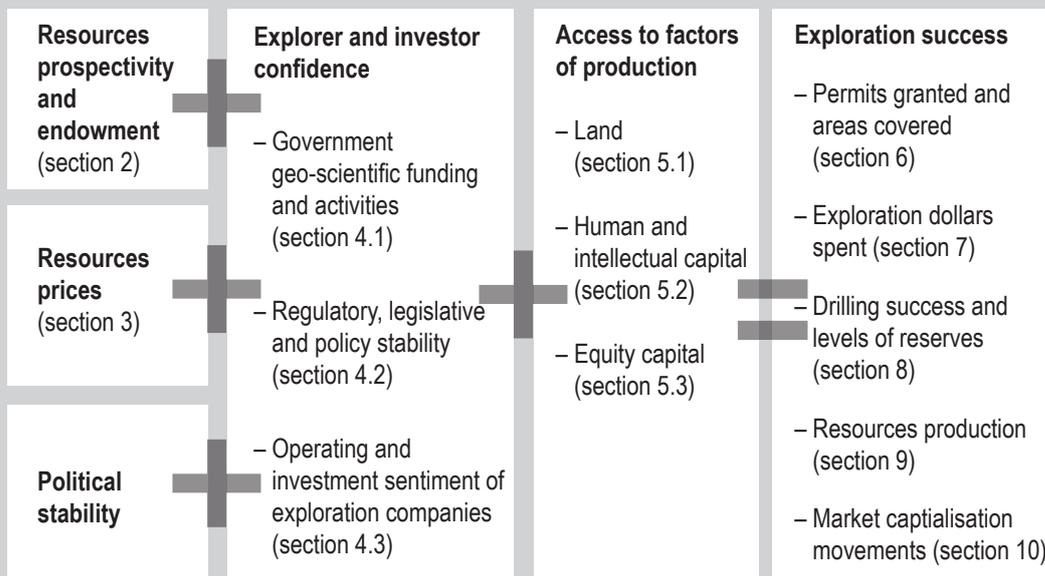
- publication of an annual scorecard
- exploration focused events
- monthly investor forums
- local and international promotion of Queensland as an attractive investment destination for explorers.

For more information, visit [www.queenslandexploration.com.au](http://www.queenslandexploration.com.au).

**CHART 1: SCORECARD STRUCTURE**

**LEAD INDICATORS – FACTORS THAT DRIVE EXPLORATION ACTIVITY AND PERFORMANCE**

**LAG INDICATORS – MEASURING ACTUAL SUCCESS**



Source: QRC

# 1.2 THE QUEENSLAND EXPLORATION SCORECARD

The QEC *Exploration Scorecard* is a valuable tool in tracking the progress of the 2020 Exploration Vision. This is the second edition following publication of the inaugural scorecard in 2011.

Government and industry data as well as survey information from companies actively exploring in Queensland are used to inform the results. To easily evaluate progress of the sector, the *Exploration Scorecard 2012* retains the layout of the first edition and continues its analysis of introduced indicators.

The scorecard is developed on the assumption that increasing exploration activity is broadly driven by:

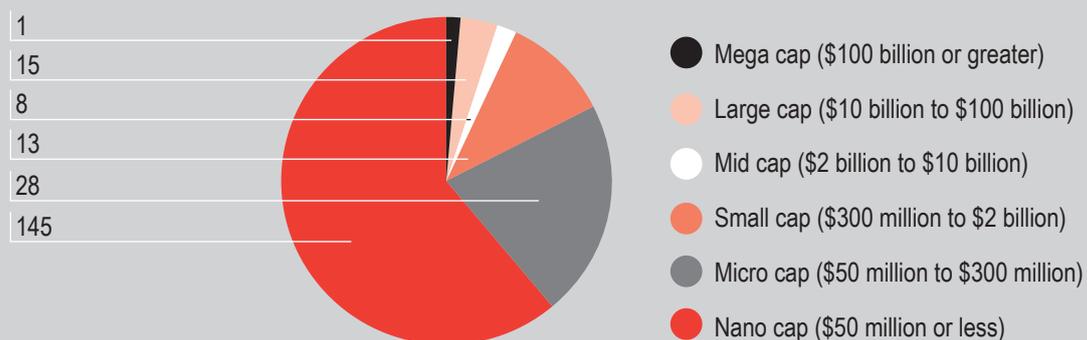
- resource prospectivity and endowment
- commodity prices
- explorer and investor confidence
- political stability
- access to the essential factors of production (capital, land, skills).

As commodity prices are driven by the market, the scorecard concentrates on those lead indicators that can be influenced, namely explorer and investor confidence and access to the essential factors of production. Outcomes or lag indicators that measure actual exploration success are also included (Chart 1).

# 1.3 THE EXPLORATION SECTOR IN QUEENSLAND

The QRC estimates that there were approximately 210 companies conducting exploration activities in Queensland as at 30 June 2012. This is a slight reduction on last year's 250 companies, reflecting the ebb and flow of exploration activity. These companies are diverse in their size (market capitalisation), business models, and exploration targets.

**CHART 2: QRC ESTIMATES OF THE NUMBER OF COMPANIES ACTIVELY EXPLORING IN QUEENSLAND AS AT 30 JUNE 2012**



Source: IntierraLive

TOTAL 210

# LEAD INDICATORS – DRIVERS OF ACTIVITY AND PERFORMANCE

## 2.0 RESOURCES PROSPECTIVITY AND ENDOWMENT

Prospectivity is a major driver of exploration activity. Queensland's high-level prospectivity for base metals, gold, and uranium resources is evident and recognised globally.

Its considerable endowment of coal and coal-seam gas is also confirmed in the following charts.

### KEY FINDINGS

- **Queensland base metal prospectivity (Chart 3)**

The world renowned Carpentaria Minerals Belt plays host to the Mount Isa style copper-silver-lead-zinc ore bodies in addition to other large sediment-hosted silver-lead-zinc deposits including Century, Cannington and Dugald River. The Ernest Henry iron-oxide-copper-gold deposit near the township of Cloncurry has been a major producer of copper and more recently produced Queensland's first iron ore product from its rich reserves of magnetite. Base metals deposits have been identified south of Cooktown, Townsville Hinterland and along the east coast from Mackay to west of Brisbane. There remain many lightly explored prospective areas for base metals in Queensland, and further exploration has the potential to identify new deposits.

- **Queensland gold prospectivity (Chart 4)**

Historically, gold exploration is centred on highly prospective areas across Queensland such as Charters Towers-Ravenswood, Coen-Chillagoe-Palmer-Hodgkinson, Clermont-Drummond-Cracow, Croydon-Georgetown, Gympie, and Warwick. Along the coastal region extending from Townsville to the south-east corner of the state a number of intrusion related gold deposits have been identified. In central Queensland, again in the Carpentaria Minerals Belt, copper-gold associated deposits and skarn-hosted deposits have been discovered in the Selwyn-Mount Dore area. More recently the discovery of the Merlin molybdenum-rhenium deposit has drawn exploration to this area looking for rare earth deposits.

- **Queensland uranium prospectivity (Chart 5)**

Queensland plays host to highly prospective uranium deposits. The Mount Isa Minerals Province has produced uranium oxide from the Mary Kathleen deposit. Other significant uranium deposits include Valhalla and Westmoreland in the North West and Ben Lomond, an area 50 kilometres from Townsville.

- **Queensland coal endowment (Chart 6)**

Queensland has about 9362 million tonnes of proven and probable coal reserves, a minor decrease from 10,552 million tonnes in 2010-11. However, measured and indicated as well as inferred resources increased significantly to 94,876 million tonnes in 2011-12 from 80,967 million tonnes in the previous 12-month period.

- **Queensland's coal-seam gas endowment (Chart 7)**

The extensive development in the coal-seam gas industry continues in Queensland with significant exploration and construction activities in the Clarence-Moreton, Galilee, Bowen and Surat Basins. Coal-seam gas 2P reserves (proved and probable) increased to 35,060 PJ as at 31 December 2011.

**CHART 3: QUEENSLAND BASE METAL PROSPECTIVITY**

Source: GeoScience Australia



**CHART 4: QUEENSLAND GOLD PROSPECTIVITY**

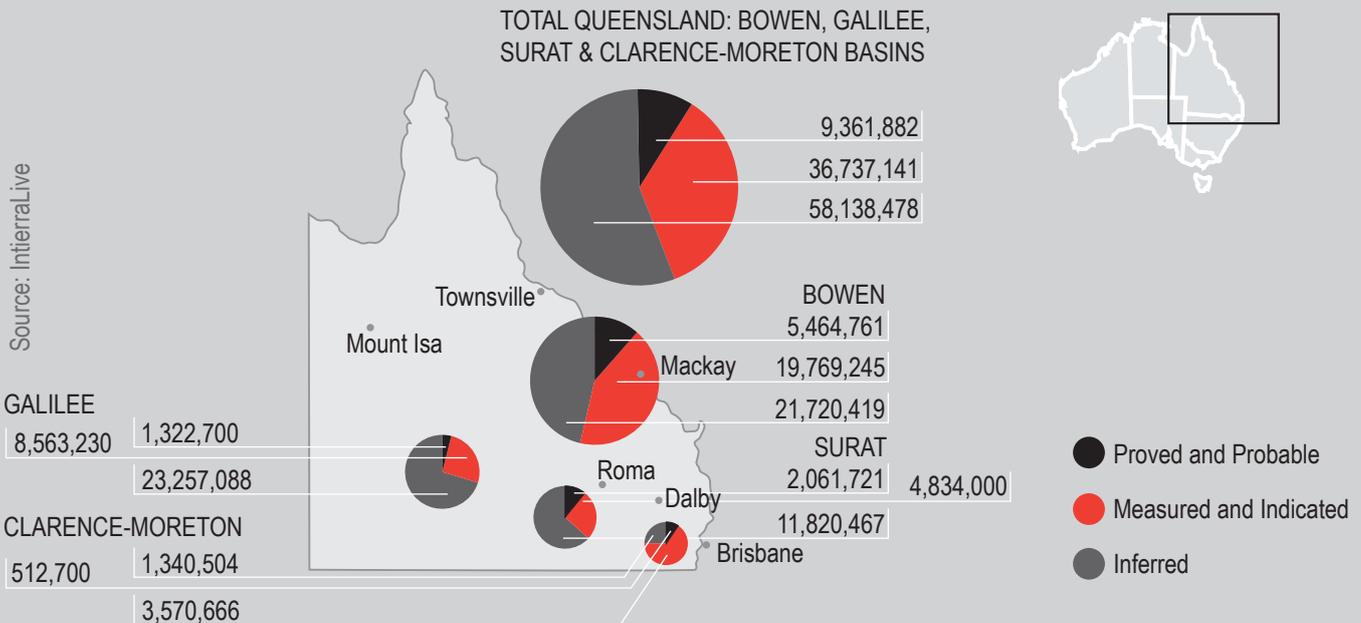


**CHART 5: QUEENSLAND URANIUM PROSPECTIVITY**



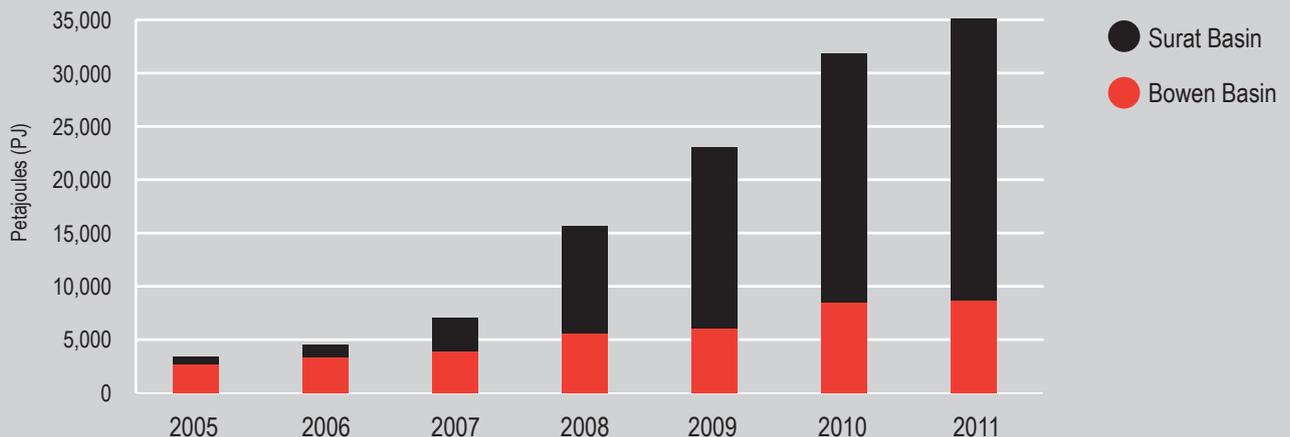
- Unknown/Non Permissive
- Low to Moderate
- Moderate
- Moderate to High
- High

**CHART 6: QUEENSLAND COAL ENDOWMENT (TONNES OF RESERVES AND RESOURCES AS AT 30 JUNE 2012)**



**CHART 7: QUEENSLAND COAL-SEAM GAS 2P RESERVES (PROVED AND PROBABLE)**

Source: Department of Natural Resources and Mines



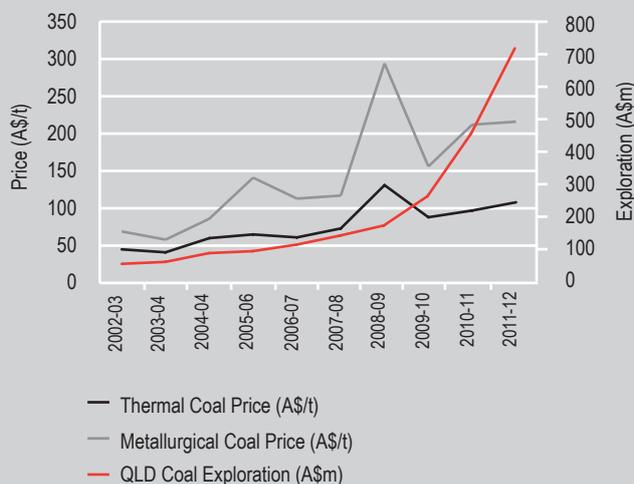
# 3.0 RESOURCE PRICES

Resource prices are a significant driver of exploration in Queensland. Charts 8-11 show the relationship between average global benchmark prices for coal, gold, copper, and LNG compared with Queensland exploration expenditure for each commodity.

## KEY FINDINGS

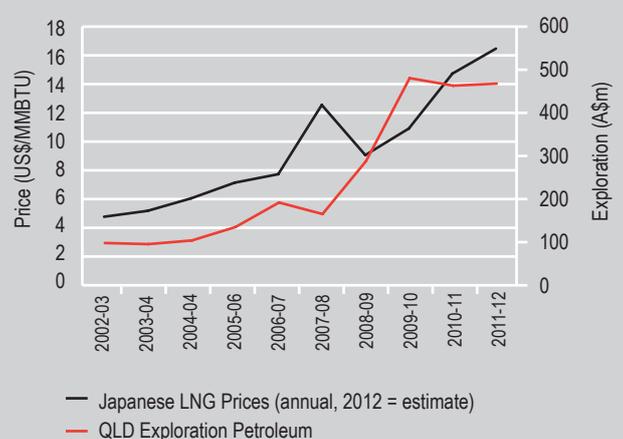
- Coal exploration in Queensland stayed strong despite a softening trend in global thermal and metallurgical coal prices (Chart 8).
- The Japanese LNG price continued to increase and Queensland petroleum exploration expenditures are still catching up after the state's record 2010-11 floods (Chart 9).
- While the average global gold price continued to increase, gold exploration expenditures stabilised (Chart 10).
- Copper showed a slight decrease in prices at record high and higher exploration expenditures (Chart 11).

**CHART 8: GLOBAL AVERAGE BENCHMARK COAL PRICES AND QUEENSLAND EXPLORATION SPEND, 2002-03 TO 2011-12**



Source: BREE, Resources and Energy Quarterly ABS 8412.0

**CHART 9: GLOBAL AVERAGE BENCHMARK LNG PRICES AND QUEENSLAND PETROLEUM EXPLORATION SPEND, 2002-03 TO 2011-12**



Source: BP Statistical Review of World Energy ABS 8412.0



**CHART 10: GLOBAL AVERAGE BENCHMARK GOLD PRICES AND QUEENSLAND EXPLORATION SPEND, 2002-03 TO 2011-12**



Source: BREE, Resources and Energy Quarterly  
ABS 8412.0

**CHART 11: GLOBAL AVERAGE BENCHMARK COPPER PRICES AND QUEENSLAND EXPLORATION SPEND, 2002-03 TO 2011-12**



Source: BREE, Resources and Energy Quarterly  
ABS 8412.0

# 4.0 EXPLORER AND INVESTOR CONFIDENCE

A key driver of exploration activity is explorer and investor confidence, influenced by perceptions of business risk and the likelihood of success.

Risk and success perceptions are in turn influenced by factors such as geoscientific funding and associated activities, legislative, regulatory and policy stability and operating and investment sentiment.

This section outlines a number of measures assessing each aspect.

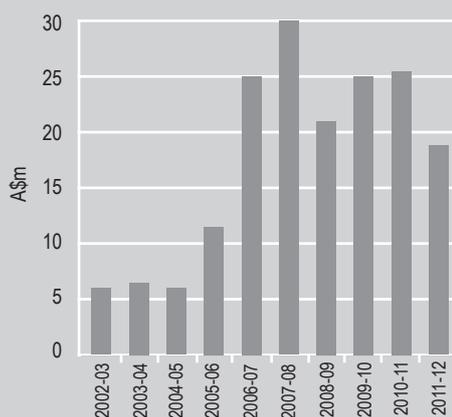
## 4.1 STATE GOVERNMENT GEOSCIENTIFIC FUNDING AND ACTIVITIES

State government geoscientific funding is shown in Chart 12. Chart 13 shows the breakdown of that funding across the various programs.

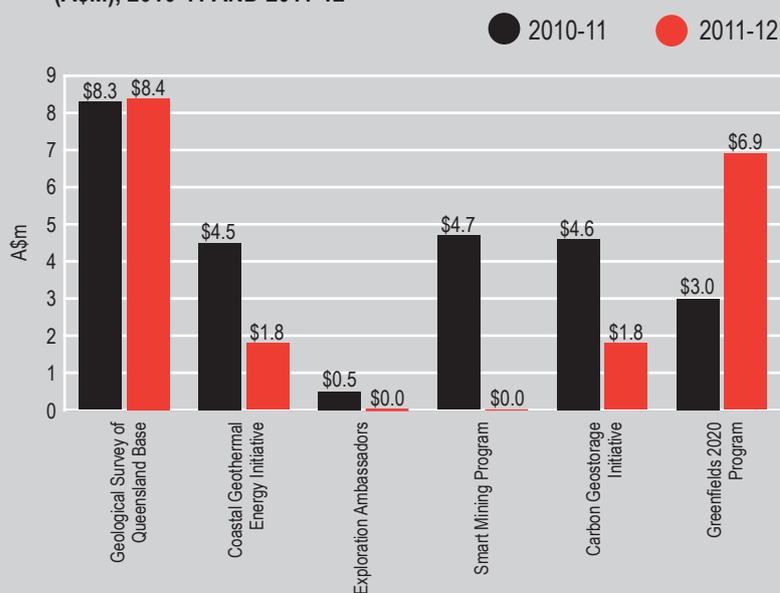


Source: Department of Natural Resources and Mines

**CHART 12: GEOLOGICAL SURVEY OF QUEENSLAND BUDGET ALLOCATIONS (A\$m) 2002-03 TO 2011-12**



**CHART 13: GEOLOGICAL SURVEY OF QUEENSLAND BUDGET ALLOCATION (BASE FUNDING AND LIMITED LIFE PROJECTS) (A\$m), 2010-11 AND 2011-12**



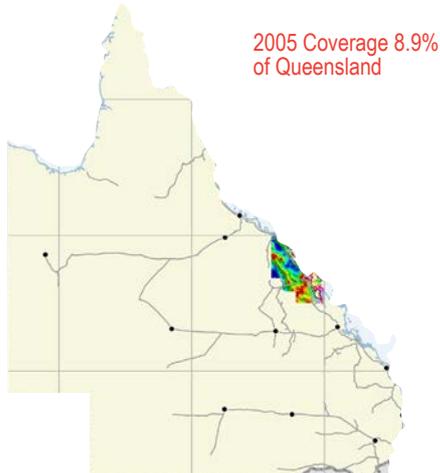
Source: Department of Natural Resources and Mines

The funding variations in Chart 13 relate to:

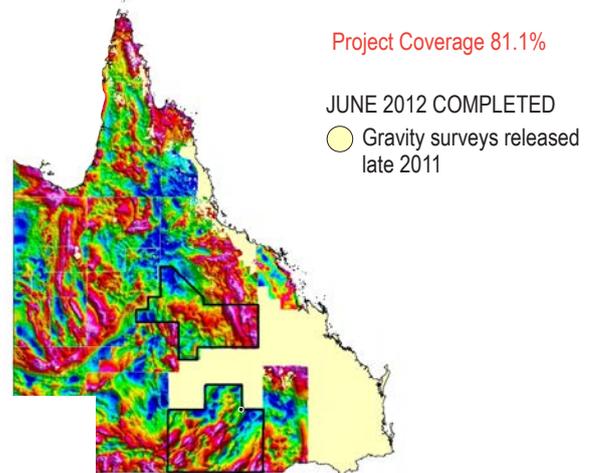
- Smart Mining Program limited life funding finished in early 2011 and was replaced with the Greenfields 2020 Program.
- Major variations in expenditure related to the Coastal Geothermal Energy Initiative and Greenfields 2020 Program are associated with timing of airborne geophysical surveys and drilling programs, which accounted for the bulk of expenditure.
- Low expenditure on Exploration Ambassadors reflects low demand on the services provided by Geological Survey of Queensland (GSQ) for this initiative.

The maps below show the significant increases in gravity and airborne magnetic surveys pre-2005 and post-2012 under the Smart Exploration, Smart Mining and Greenfields 2020 programs (charts 14 to 17).

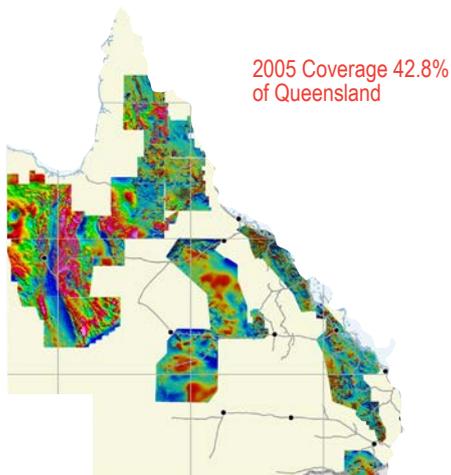
**CHART 14: GRAVITY SURVEYS PRE-SMART EXPLORATION AND SMART MINING 2005**



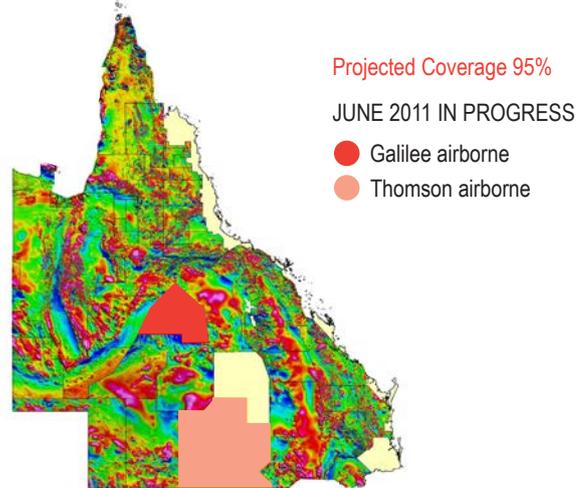
**CHART 15: GRAVITY SURVEYS POST-SMART EXPLORATION AND SMART MINING 2012**



**CHART 16: AIRBORNE MAGNETIC SURVEYS PRE-SMART EXPLORATION AND SMART MINING 2005**



**CHART 17: AIRBORNE MAGNETIC SURVEYS POST-SMART EXPLORATION AND SMART MINING 2012**



## MAJOR GSQ ACHIEVEMENTS INCLUDE:

- production of 17 major publications on aspects of the geology and mineral potential of Queensland
- nineteen major presentations at industry seminars and conferences and the publication of seven papers in international journals
- major contributor to the 34th International Geological Congress in Brisbane in August 2012 with 21 presentations and four field trip leaders
- sponsoring or convening three major events: Mining 2011, Digging Deeper 9 and the Investing in Australian Resources seminar in China
- Thomson Region and Galilee Basin gravity survey completed
- Thomson Region and Galilee Basin airborne magnetic and radiometric surveys completed
- completing drilling associated with the Coastal Geothermal Energy Initiative in early 2012
- releasing a revised edition of Queensland's Geological Mapping Digital Data in December 2011
- awarding of grants in Round 7 of the Collaborative Drilling Initiative completed in early 2012
- eight applications submitted for six areas in the Round 6 Mineral Land Release in March 2012
- seventy-five applications submitted for 19 areas of the Round 7 Call for Petroleum Tenders.

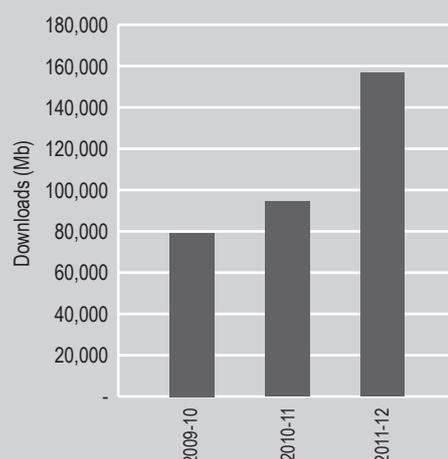
# 4.1.1 IRTM AND QDEX DOWNLOADS

The Interactive Resource and Tenure Maps system (IRTM) is an online spatial data viewer for maps and spatially referenced images. It has a download facility for many layers and also an interactive web map service that can be linked to an online GIS tool for live data feeds. IRTM also has spatial links to the Queensland Exploration reporting system (QDEX), which is an online document management system for lodgement, search and retrieval of statutory exploration and other reports as well as many departmental mining-related publication collections. The link allows spatial searches in IRTM for historical tenure exploration reports in QDEX and some other spatial layers also link to QDEX documents.

**CHART 18: INTERACTIVE RESOURCE AND TENURE MAP (IRTM) DOWNLOADS AND HITS, 2009-10, 2010-11 AND 2011-12**



**CHART 19: QUEENSLAND DIGITAL EXPLORATION REPORTS (QDEX) DOWNLOADS, 2009-10, 2010-11 AND 2011-12**



Source: Department of Natural Resources and Mines

Source: Department of Natural Resources and Mines

## KEY FINDINGS

- There was an increase in the use of the Queensland Government's Interactive Resource and Tenure Maps (IRTM) system. In 2011, IRTM's functionality was extended to include categories such as geological mapping and data for display, query and download, solar atlas in the renewable resources category, restricted lands category in urban areas and strategic cropping land. In 2011-12 the volume of downloads reached more than 153,000 Megabytes (Mb), which represents an almost threefold increase compared with 2010-11. The number of hits registered increased by more than 50 percent to approximately 27 million (Chart 18).
- The volume of downloads registered on the Queensland Digital Exploration Reports (QDEX) database increased by approximately 60 percent in 2011-12 to more than 156,000 Mb compared with approximately 94,000 Mb in 2010-11 (Chart 19).

## 4.2 REGULATORY, LEGISLATIVE AND POLICY STABILITY

In a globalised and increasingly competitive operating environment, governments need to provide a workable regulatory framework for exploration activity.

In January 2009, the Queensland Government partnered with industry to deliver the Streamlining Project to modernise mining and petroleum regulatory approvals systems. The Streamlining Project is introducing online service delivery functions, via the 'MyMinesOnline' solution to drive efficiencies into the resource approval processes. Streamlining initiatives will reduce tenure approval timeframes and duplication in regulation. Significant progress was made on the streamlining reform agenda through the passage of the *Mines Legislation (Streamlining) Amendment Act 2012* and the *Environmental Protection (Greentape Reduction) and Other Legislation Amendment Act 2012*.

On 24 March 2012, Queensland elected a new LNP government. Leading up to that election, work had stalled on some of the positive initiatives that are now due to be effective in 2012-13.

Table 1 provides a summary of movements in regulatory changes from 2010/11 to 2011/12 as they relate to exploration activities in Queensland.

**TABLE 1 : CHANGE IN REGULATORY CONTROLS ON QUEENSLAND EXPLORATION ACTIVITY**

Types of controls	2011	2012
<b>Foundation requirements - generally accepted processes that all holders of exploration permits must meet on application and continuously through the life of the tenure</b>		
• Cultural heritage (aboriginal and non-aboriginal)	✓	-
• Application for environmental authority	✓	-
• Application for exploration rights (coal now subject to tender process)	✗	↑
• Application for exploration rights (oil and gas rights subject to tender process)	✓	-
• Landowner compensation	✓	-
• Native title considerations	✓	-
• Remediation obligations	✓	-
• Renewal of exploration rights	✓	-
<b>Site-specific controls - regulations which are not applicable to all exploration permit holders, but which can prevent tenure (like a gateway process) or attach condition controls</b>		
• Declared Wild Rivers areas	✓	-
• Application of strategic cropping land policy (protection areas)	✗	↑
<b>Gateway controls - barriers to tenure from simplistic stop/go regulatory processes</b>		
• Land regulated as 'Restricted Area'	✓	↑
• Land otherwise off limits for environmental reasons (eg national park)	✓	-
• Land subject to other third party interests increased (eg other exploration rights such as coal v gas)	✓	-
<b>Conditioning controls - policies that impose attach additional conditions to tenures</b>		
• Application of strategic cropping land policy (management areas)	✗	↑
• Applications and approvals to disturb native vegetation	✓	-
• Applications and approvals to work in waterways	✓	-
• Transfer duty	✗	↑

## KEY

- ✓ regulatory control in place in year specified
- ✗ regulatory control not in place in year specified
- ↑ increased regulatory control (regulatory control imposed during the year)
- ↓ decreased regulatory control
- unchanged

## KEY FINDINGS

2011-12 saw the introduction of a number of new government policies that reduced the level of exploration activity in Queensland.

A summary of these key changes include:

- A new competitive bidding regime for awarding coal exploration permit applications was announced in early 2012. As a temporary measure until the new regime is introduced, a restricted area for coal exploration permits has been placed over the entire state. This means new applications for coal exploration permits will not be accepted, other than by tender process.
- A cash bidding component to the competitive tender process for all highly prospective coal, petroleum and gas exploration permits was also announced in early 2012.
- In early 2012, the strategic cropping land laws commenced in Queensland. These laws inhibit exploration activities, (especially coal), across lands that may be suitable for cropping. Strategic cropping land currently covers 4.34 percent of the state (protection and management areas), with 1.06 percent (protection areas) prohibiting all mining with exploration activity likely to be heavily conditioned.
- Since 2010-11 there has been a significant increase in restricted areas for exploration in Queensland. Apart from the restriction on exploration permits for coal, an interim urban exploration policy restricts new applications over and within 2km around towns with 1000 people or more. The restricted area represents 2.2 percent of the state.
- In early 2012 the government introduced a transfer duty on all exploration permits other than farm-in transactions.

## 4.3 OPERATING AND INVESTMENT SENTIMENT OF EXPLORATION COMPANIES

The QRC asked 330 companies with exploration interests in Queensland for their views on a range of factors that influences operational and investment confidence during 2011-12.

Operating sentiment indicates the degree the various factors were perceived to positively or negatively impact companies' commercial objectives. Investment sentiment indicates the degree the various macro factors were perceived to positively or negatively impact companies' decision to headquarter their exploration activities in Queensland.

The online survey received 62 responses, which represents a response rate of 20 percent. Respondents varied in terms of market capitalisation (Table 2) and exploration interests (Table 3). Not all participants answered every question.

**TABLE 2: SURVEY RESPONDENT DETAILS, BY MARKET CAPITALISATION, 2011-12**

2011-12		
Your company's market capitalisation	Response (percent)	Response count
Large cap (\$10 billion or greater)	12%	7
Mid cap (\$2 billion to \$10 billion)	2%	1
Small cap (\$300 million to \$2 billion)	12%	7
Micro cap (\$50 million to \$300 million)	19%	11
Nano cap (\$50 million or less)	56%	33
<b>TOTAL</b>		<b>59</b>

Skipped question = 3

**TABLE 3: SURVEY RESPONDENT DETAILS, BY MAIN EXPLORATION TARGET, 2011-12**

2011-12		
Your company's main exploration target	Response percent	Response count
Coal (all types)	31%	19
Oil	2%	1
Gas	7%	4
Base and/or precious metals	40%	25
Bauxite	3%	2
Phosphate	2%	1
Other	16%	10
<b>TOTAL</b>		<b>62</b>



The survey results are shown using overall factor index scores. For each factor influencing operating and investment sentiments, companies were asked to respond very positively, positively, not at all, negatively or very negatively. Weightings were assigned to each response based on the strength of its sentiment to calculate an overall index score for each factor. See the example provided in Table 4.

**TABLE 4: CALCULATION OF WEIGHTED SURVEY RESULTS (EXAMPLE)**

Resources prospectivity	Weights	Responses	Percentage of responses	Weighted responses
Very positively	1	5	9%	9%
Positively	0.5	18	34%	17%
Not at all	0	26	49%	0%
Negatively	-0.5	3	6%	-3%
Very negatively	-1	1	2%	-2%
		53	100%	22%

Note: For interpretation, the higher the positive score, the higher the positive sentiment and vice versa.

# 4.3.1 OPERATING SENTIMENT

Companies were asked to indicate to what degree 13 individual factors positively or negatively impacted upon their commercial objectives for their Queensland operations during 2011-12. The factors chosen were considered important in the day-to-day operations of a resources exploration company.

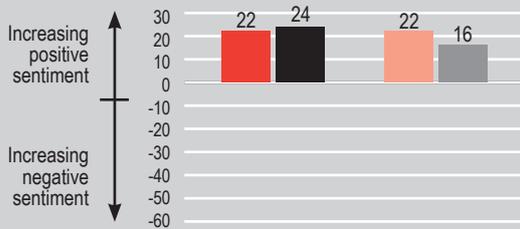
Companies were also asked to nominate which Australian jurisdiction they were most active in apart from Queensland. For that jurisdiction, they were asked to indicate to what degree the same factors positively or negatively impacted upon their commercial objectives in that jurisdiction during 2011-12. These results were aggregated to present a 'rest of Australia' comparison. For Queensland, the number of responses to this section of the survey was 52, and for other jurisdictions the number of responses was 30.

The 2011-12 survey results of the 13 factors (charts 20A to 20M) that influence operating sentiment are compared to the 2010-11 results and are presented in four clusters, which roughly align with groups of factors that drive exploration activity and performance:

- resource prospectivity
- availability of pre-competitive data and state government assistance
- regulatory, legislative and policy stability
- access to factors of production.

## SENTIMENT TOWARDS RESOURCE PROSPECTIVITY

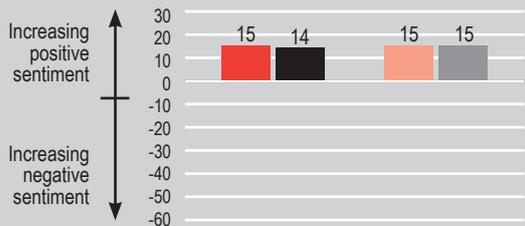
**CHART 20A:  
RESOURCE PROSPECTIVITY AND ENDOWMENT**



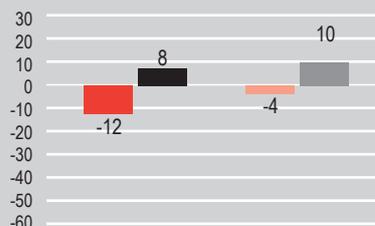
• Resource prospectivity and endowment are perceived to have positive impacts on exploration activities. The positive sentiment did not change from 2011 to 2012.

## SENTIMENT TOWARDS AVAILABILITY OF PRE-COMPETITIVE DATA AND STATE GOVERNMENT ASSISTANCE

**CHART 20B:  
PRE-COMPETITIVE GEOSCIENTIFIC DATA**



**CHART 20C:  
GOVERNMENT AND DEPARTMENTAL ASSISTANCE**

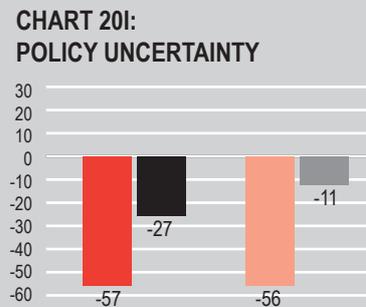
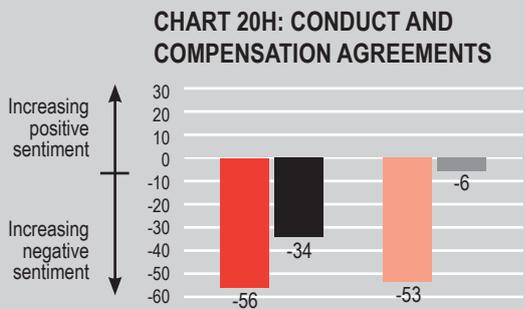
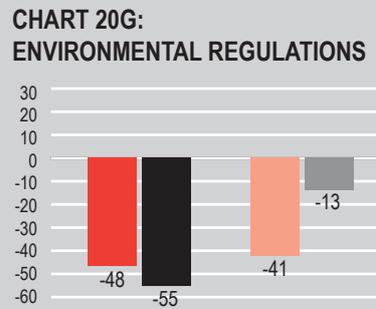
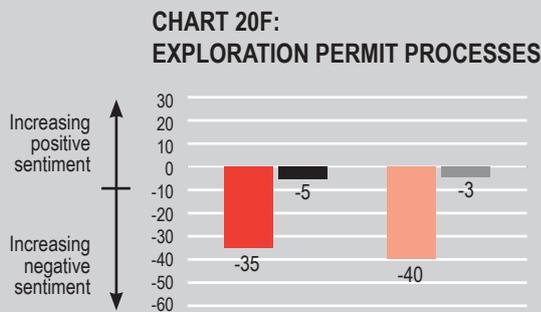
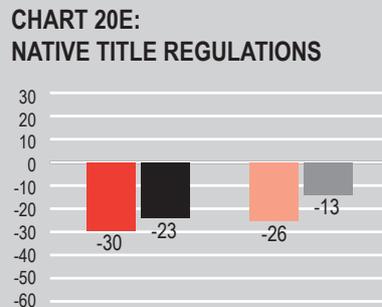
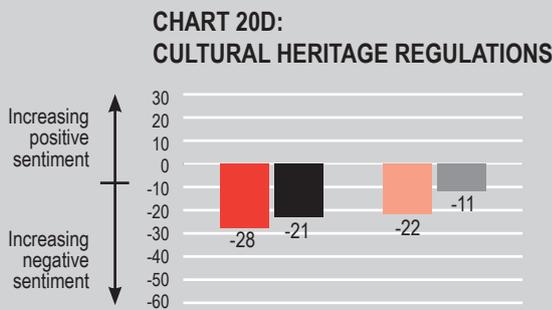


- Availability of pre-competitive geoscientific data is perceived to positively impact on exploration companies commercial objectives.
- In 2011-12, there has been deterioration of sentiment toward government assistance in Queensland.

**KEY**

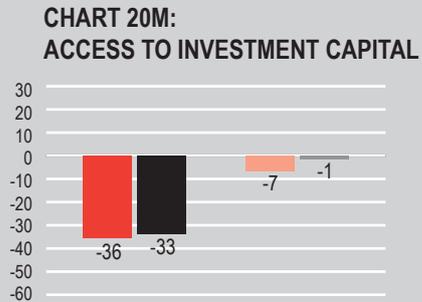
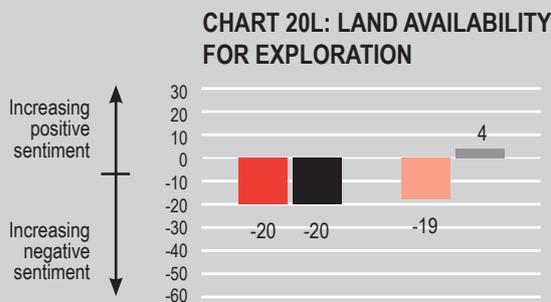
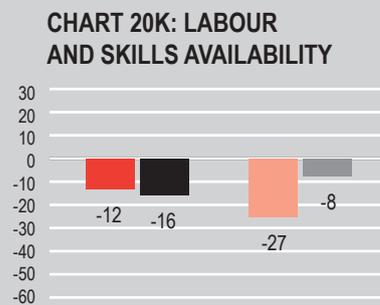
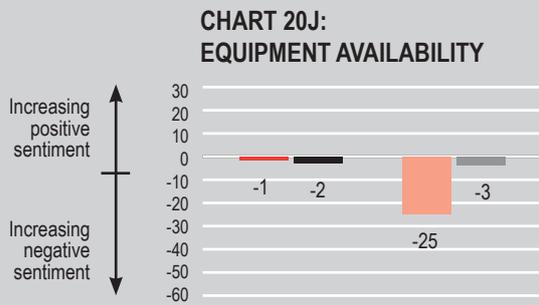
- Queensland 2011-12
- Rest of Australia 2011-12
- Queensland 2010-11
- Rest of Australia 2010-11

**SENTIMENT TOWARDS REGULATORY, LEGISLATIVE AND POLICY STABILITY**



- Sentiment toward factors relating to regulatory and policy matters remain negative and deteriorated further in 2011-12, except for exploration permit processes which showed a slight improvement.
- All of these factors were less favourable in Queensland than for the rest of Australia with the exception of environmental regulations.

**SENTIMENT TOWARDS FACTORS OF PRODUCTION**



- There was notable improvement in sentiment towards equipment availability in Queensland. The sentiment toward the availability of labour and skill has also improved, however the sentiment in terms of land availability for exploration remained negative.
- Compared to 2010-11, the perception of ease of access to capital has notably deteriorated in all jurisdictions.

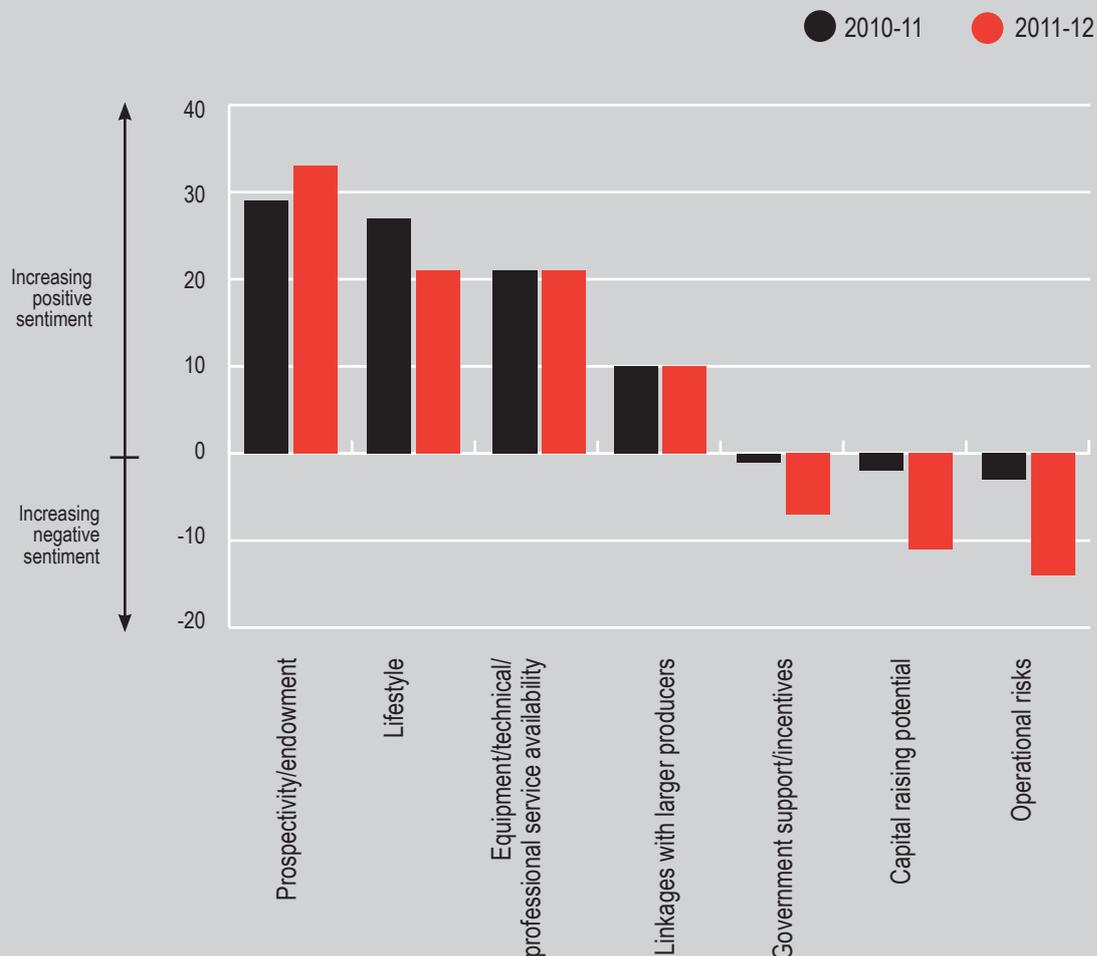
**KEY FINDINGS**

- In comparison with other Australian jurisdictions, Queensland rated stronger in 2011-12 in terms of pre-competitive geoscientific data, equipment availability, labour and skills availability and environmental regulations.
- In comparison with other Australian jurisdictions, Queensland rated notably more negatively on government and departmental assistance, exploration permit processes, conduct and compensation agreements and policy uncertainty.
- Queensland is rating stronger in 2011-12 compared with the 2010-11 sentiment in terms of equipment availability, labour and skills availability and exploration permit processes. In the year-by-year comparison, Queensland rated notably more negatively on government and departmental assistance, land availability for exploration, cultural heritage regulations, native title regulations, access to investment capital, environmental regulations, conduct and compensation agreements and policy uncertainty.

# 4.3.2 INVESTMENT SENTIMENT

Applying the same methodology, companies were asked to indicate to what degree seven individual factors positively or negatively impacted upon their company's decision to headquarter their exploration activities in Queensland. These factors are more macro than the operational factors chosen in Section 4.3.1. The number of responses to this section of the survey was 64 in 2011 and 46 in 2012.

**CHART 21: RESULTS OF SURVEY, SENTIMENT TOWARDS CERTAIN INVESTMENT FACTORS 2010-11 AND 2011-12 (QUEENSLAND ONLY)**



## KEY FINDINGS

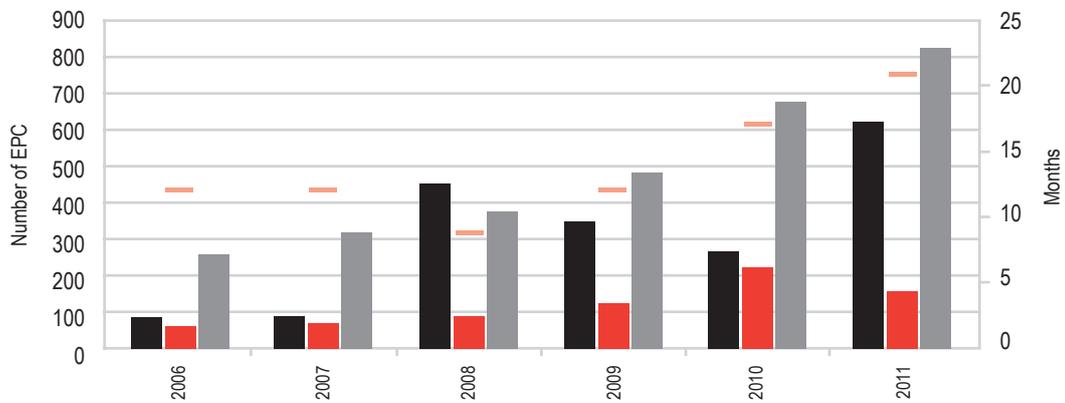
- The following indicators influenced exploration companies' decisions to headquarter in Queensland:
  - the two most important factors were prospectivity/endowment followed by lifestyle
  - equipment/technical/professional service capability and linkages with larger producers were also significant factors
  - government support/incentives, capital raising potential and operational risks were not significant factors.

# 5.0 ACCESS TO THE FACTORS OF PRODUCTION

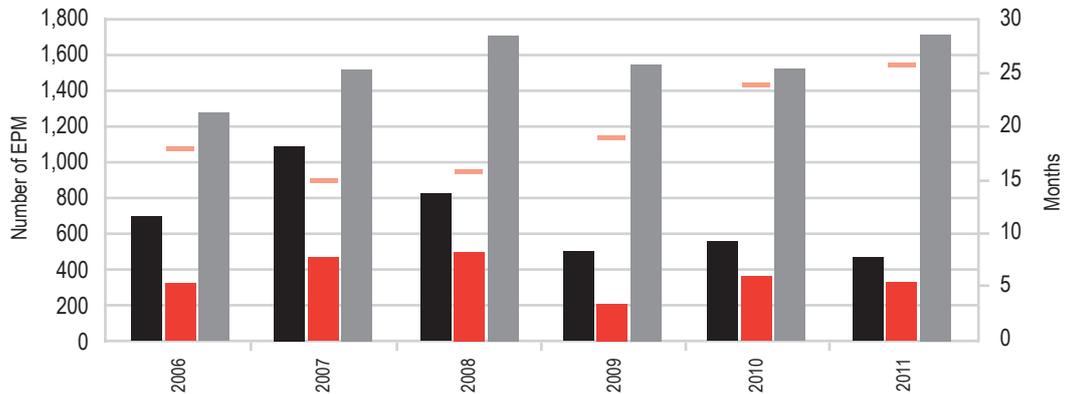
## 5.1 ACCESS TO LAND

A significant factor influencing exploration success is how quickly exploration companies can access land. The average time taken to grant coal and mineral exploration permits and approvals times for petroleum land releases are provided in charts 22 to 24. The charts also indicate the workloads undertaken by the department.

**CHART 22: EXPLORATION PERMITS FOR COAL (EPC)**

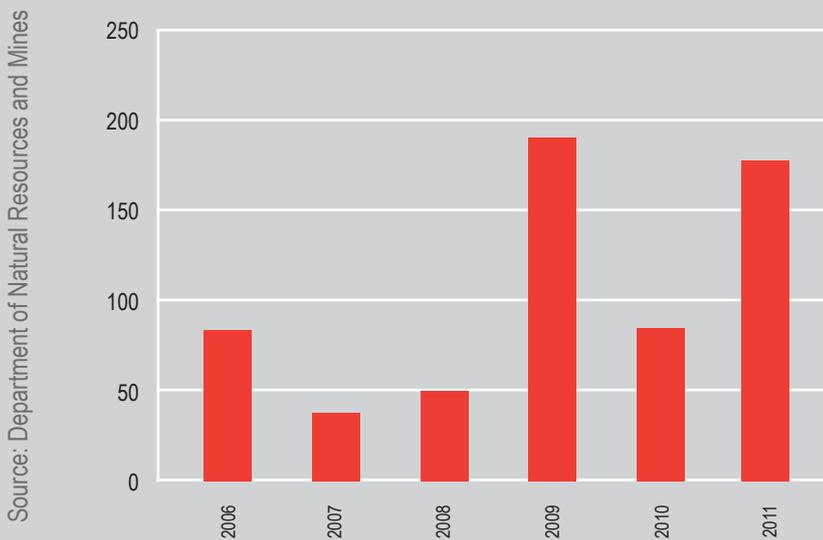


**CHART 23: EXPLORATION PERMITS FOR MINERALS (EPM)**



- Applications lodged
- Granted during year
- Granted and in force
- Average number of months to grant

**CHART 24: DAYS TAKEN TO APPOINT PREFERRED TENDERERS FOR PETROLEUM LAND RELEASES, 2005 TO 2011**



## KEY FINDINGS

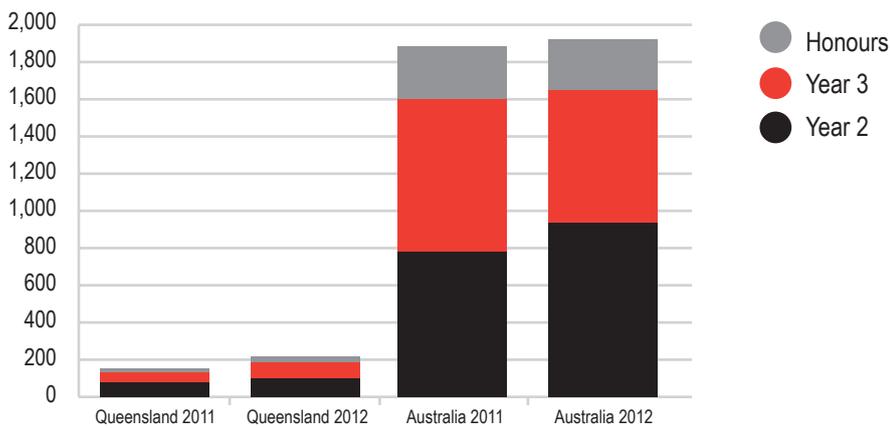
- Exploration Permit Coal (EPC) and Exploration Permit Mineral (EPM) granted in 2011 took on average 21 and 26 months respectively, compared to 17 and 24 months in the previous year.
- Significant increase in new applications for EPC and increase in post-grant dealings associated with more than 2500 granted mineral and coal exploration permits was a significant factor in increasing the time taken to grant EPCs and EPMs in 2011.
- The 2011 petroleum tender round took 183 calendar days to decide the successful tenders, from date of close of the tender process. This assessment was delayed so priority could be given to the progression of petroleum leases to address the priorities of the industry.

# 5.2 ACCESS TO HUMAN AND INTELLECTUAL CAPITAL

Access to a skilled labour force is a significant enabler for growth in the sector. The following charts compare the potential pool of geoscience graduates with current demand to identify general labour market conditions. Queensland's drilling qualification enrolments are also included.

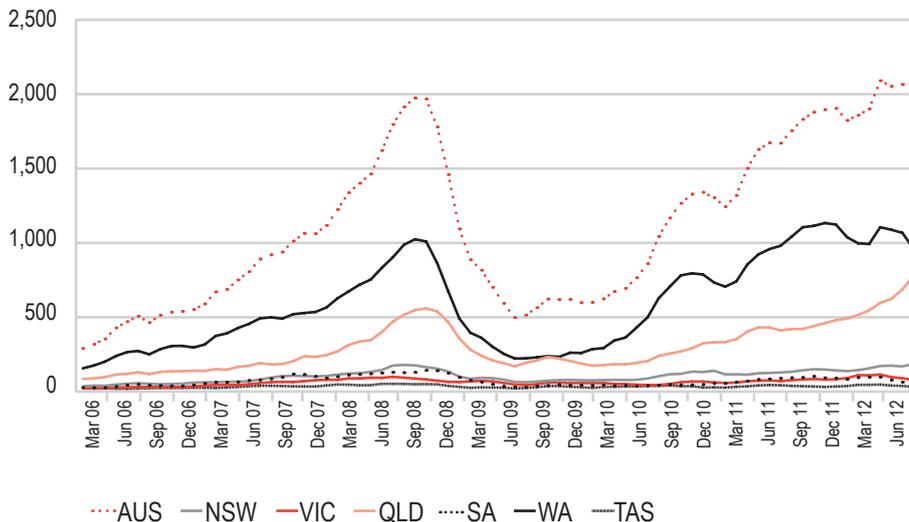
## 5.2.1 SUPPLY AND DEMAND OF WORKERS

**CHART 25: GEOSCIENCE FULL-TIME EQUIVALENT STUDENT LOAD, QUEENSLAND AND ALL AUSTRALIAN UNIVERSITIES, 2011 AND 2012**



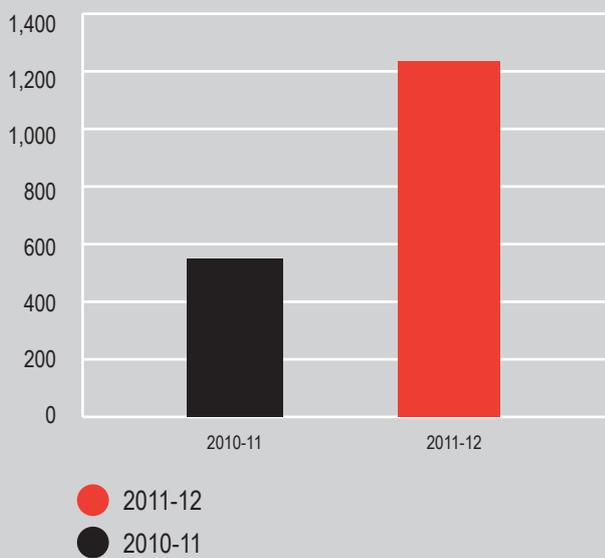
Source: Australian Geoscience Council (AGC)

**CHART 26: INTERNET VACANCIES FOR GEOLOGISTS AND GEOPHYSICISTS, BY JURISDICTION, MARCH 2006 TO JUNE 2012**



Source: Australian Department of Education, Employment and Workplace Relations

**CHART 27: QUEENSLAND PUBLICLY FUNDED DRILLING QUALIFICATION ENROLMENTS BY YEAR, 2010-11 AND 2011-12**



## KEY FINDINGS

- There has been a slight decrease in geoscience FTE loads throughout the Australian tertiary education system. In 2012 the number of enrolments totalled 1885 compared with 1923 in 2011. Of concern in 2012 is the drop in numbers in second year to 779 compared with 936 in 2011. This will have a flow-on effect with fewer graduate and honours students available from 2014 (Chart 25).
- Conversely in Queensland via James Cook University, the University of Queensland and Queensland University of Technology, geoscience student numbers continued to increase across all year levels albeit from a low base. A total of 213 students are enrolled in Queensland representing only 11 percent of the national pool of potential graduates (213 out of 1885) (Chart 25).
- Internet vacancies for geologists and geophysicists in Queensland continued to indicate high demand and showed an ongoing strong upward trend in 2011 and 2012. By comparison, Australian vacancies declined over the past three months and West Australian vacancies have remained steady since the end of 2011 (Chart 26).
- Drilling course commencements in Queensland increased 44 percent with 1233 new enrolments in 2011-12 compared with 548 in 2010-11 (Chart 27). The majority of enrolments in 2011-12 occurred in Certificate II in Drilling Oil/Gas (onshore) with 440 students enrolled in the qualification, representing 35 percent of the total.

# 5.2.2 LIVABILITY OF QUEENSLAND

One of the key factors in attracting and retaining skilled employees is the livability of host communities and the larger city hubs that typically service resource regions. To assess the comparable livability of cities and regions where geoscience professionals currently reside (ie Brisbane, Cairns, Perth, Kalgoorlie-Boulder and Townsville), Synergies Economic Consulting applied a Livability Index using the latest available public data.

## KEY FINDINGS

The main observations of the 2012 livability score for the five cities are:

- Relatively, Brisbane, Cairns and Perth are perceived as the three most livable communities among cities and regions most commonly chosen by geoscience professionals to reside (Chart 28).
- Relatively, Brisbane rates very highly on the economy and health and wellness dimensions; Cairns rates very highly on the environmental sustainability dimension; Perth rates very highly on education and learning dimension; Kalgoorlie/ Boulder rates relatively high on environmental sustainability and economy dimensions and Townsville scores well on the health and wellness dimensions (Chart 29).

CHART 28: LIVABILITY INDEX, OVERALL SCORES

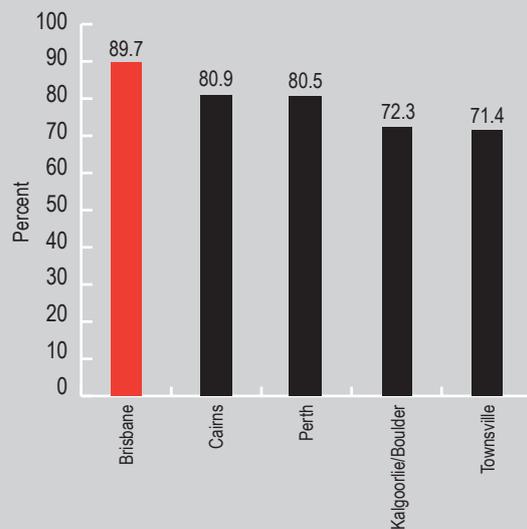
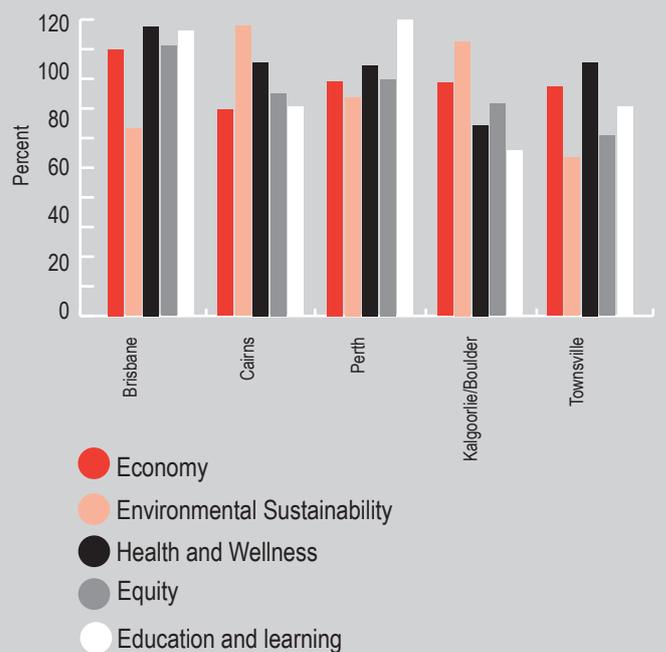


CHART 29: LIVABILITY SCORE BY DIMENSION



Sources: ABS, Public Health Information Development Unit, Council websites, Airline websites, Australian Conservation Foundation, OESR, generated by Synergies Economic Consulting

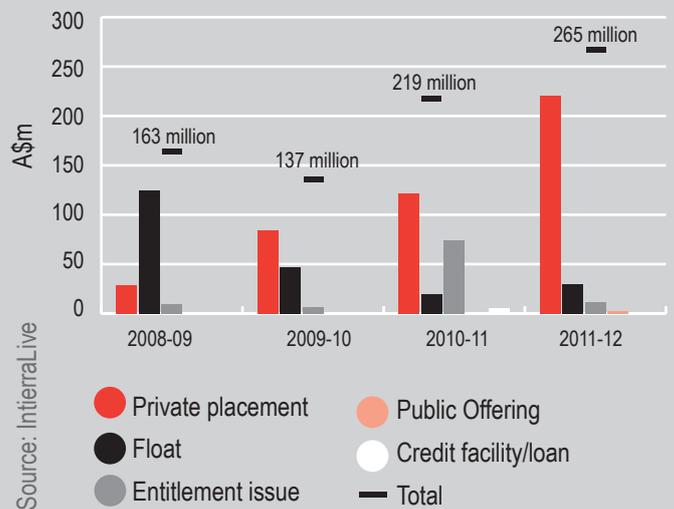
# 5.3 ACCESS TO EQUITY CAPITAL

As many exploration companies have no regular source of revenue, access to equity capital to fund exploration activities is essential. The following charts show the combined domestic and global equity capital raisings of companies conducting exploration activity in Queensland by type of raisings and as a percentage of Australian raisings.

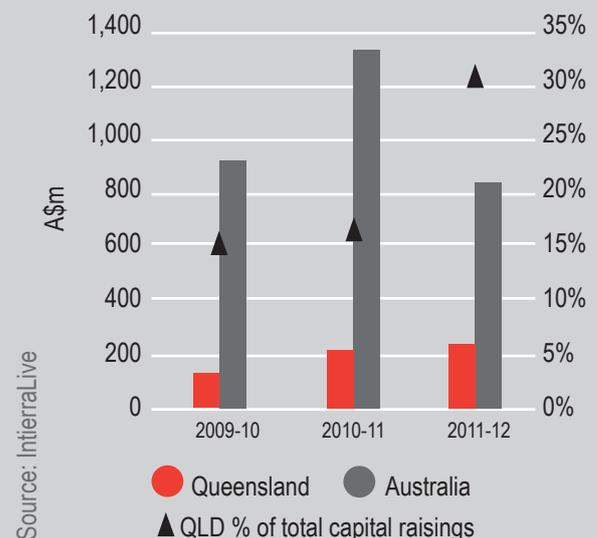
## KEY FINDINGS

- In 2011-12 companies exploring in Queensland announced \$265 million in capital raisings (domestic and global sources via various stock exchanges) – an increase of 21 percent or \$46 million compared with 2010-11 (Chart 30). However, this also reflects the volatility of capital raising in the exploration sector year to year. For example, in 2011-12, a single company raised more than \$180 million in Queensland.
- The main capital raisings in 2011-12 were:
  - private placement (83 percent of total raisings)
  - float (11 percent of total raisings)
  - entitlement issue (5 percent of total raisings)
  - public offering (1 percent of total raisings).
- Despite a significant reduction in capital raisings for minerals exploration in Australia, raisings for Queensland projects increased steadily, accounting for almost one third of all Australian raisings (Chart 31).

**CHART 30: EQUITY CAPITAL RAISINGS OF COMPANIES ACTIVELY EXPLORING IN QUEENSLAND, BY TYPE, ALL DOMESTIC AND INTERNATIONAL SOURCES OF CAPITAL, 2008-09 TO 2011-12**



**CHART 31: COMPARISON OF EQUITY CAPITAL RAISINGS OF COMPANIES ACTIVELY EXPLORING IN QUEENSLAND AND AUSTRALIA, ALL DOMESTIC AND INTERNATIONAL SOURCES OF CAPITAL, 2009-10, 2010-11 AND 2011-12**

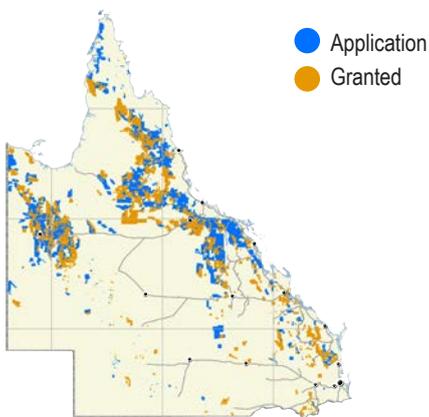


# LAG INDICATORS – EXPLORATION SUCCESS

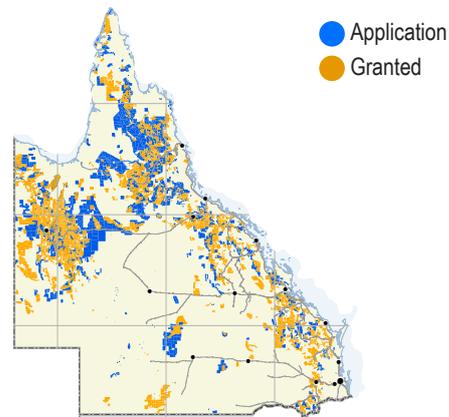
## 6.0 NUMBER OF LODGED AND CURRENT EXPLORATION PERMITS AND AREAS GRANTED

An important measure is whether the number of lodgements and current permits to explore and develop resources is increasing and the amount of land granted for those activities.

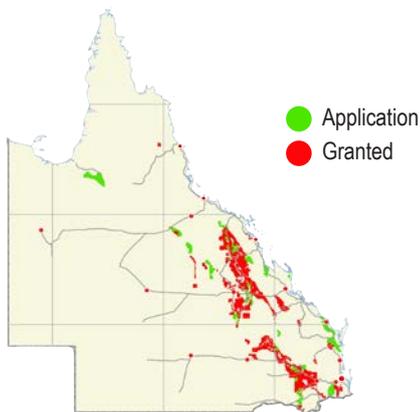
**CHART 32: EXPLORATION PERMIT  
MINERAL COVERAGE, JULY 2005**



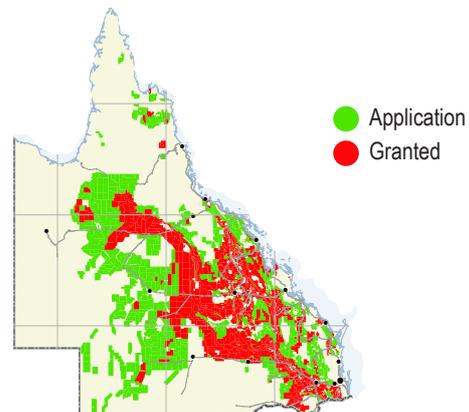
**CHART 33: EXPLORATION PERMIT  
MINERAL COVERAGE, JULY 2012**



**CHART 34: EXPLORATION PERMIT  
COAL COVERAGE, JULY 2005**



**CHART 35: EXPLORATION PERMIT  
COAL COVERAGE, JULY 2012**



### KEY FINDINGS

- There is a significant increase in land under mineral exploration permits from 2005 to 2012 (charts 32 and 33).
- The amount of land granted for coal exploration continued to increase (charts 34 and 35).

# 7.0 MINERALS AND PETROLEUM EXPLORATION

The following charts display a variety of measures to assess Queensland's exploration activities against other Australian jurisdictions in brownfield and greenfield exploration.

## 7.1 BROWNFIELD AND GREENFIELD MINERALS AND PETROLEUM EXPLORATION EXPENDITURE: VARIOUS COMPARISONS

CHART 36: AUSTRALIAN MINERALS EXPLORATION, EXISTING AND NEW DEPOSITS, 2010-11 AND 2011-12

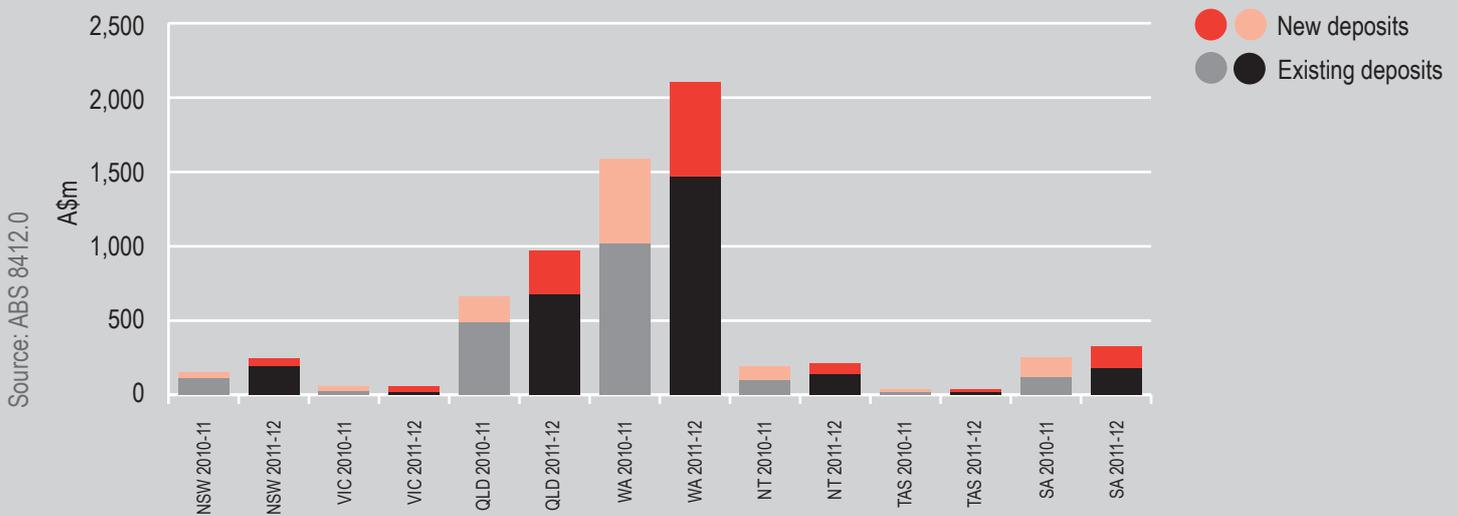
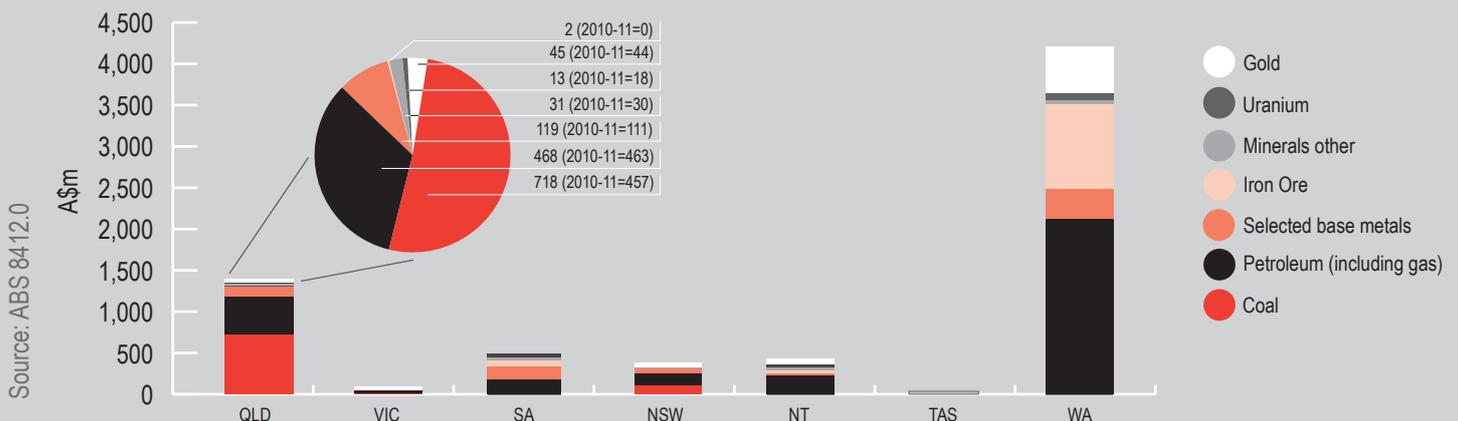
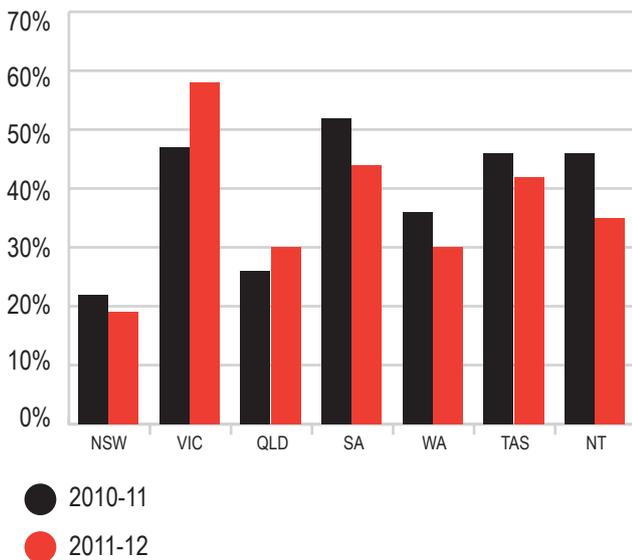


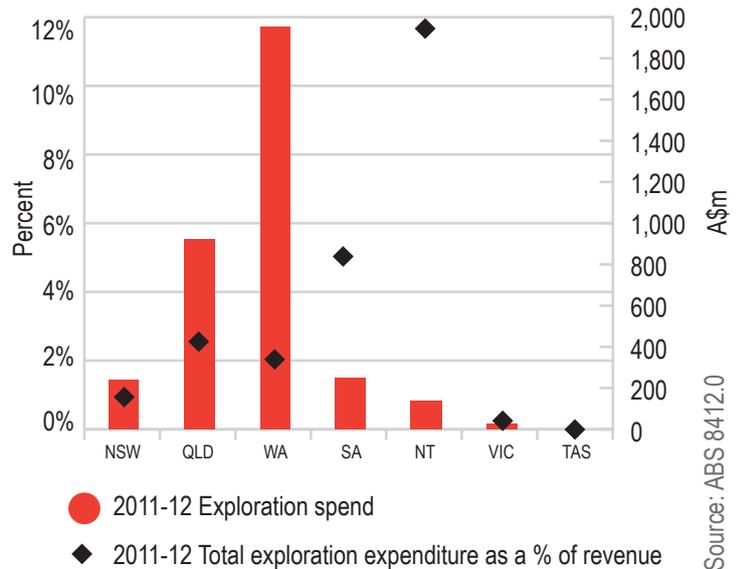
CHART 37: MINERALS AND PETROLEUM EXPLORATION, BY COMMODITY AND JURISDICTION, 2010-11 AND 2011-12



**CHART 38: NEW DEPOSITS (GREENFIELDS) AS PERCENTAGE OF TOTAL MINERALS EXPLORATION EXPENDITURE, BY JURISDICTION, 2010-11 AND 2011-12**



**CHART 39: MINERALS EXPLORATION SPEND AS A PERCENT OF REVENUE, BY JURISDICTION, 2011-12 (COAL, SELECTED BASE AND PRECIOUS METALS AND IRON ORE ONLY)**



Source: ABS 8412.0

Source: ABS 8412.0

### KEY FINDINGS

- In 2011-12, Queensland recorded \$676 million in existing and \$292 million in new mineral deposit exploration. By comparison, Western Australia recorded \$1470 million in existing and \$637 million in new mineral deposit exploration. This represents an increase of approximately 69 percent for Queensland's expenditure in new deposits and approximately 38 percent in existing deposits compared with 2010-11. Western Australia's expenditures increased by 12 percent and 44 percent on new and existing deposits respectively. New South Wales also had a significant increase of approximately 40 percent on new deposits and 64 percent on existing deposits (Chart 36).
- After large increases in petroleum (coal-seam gas) exploration in recent years, Queensland's petroleum exploration expenditures have moderated, increasing marginally to \$468 million in 2011-12. Coal exploration expenditure continued to increase strongly by more than \$260 million to \$718 million in 2011-12 (Chart 37).
- Queensland's greenfields performance as a percentage of total minerals exploration expenditure improved in 2011-12 to 30 percent compared with 26 percent in the previous period. Queensland and Victoria are the only states that recorded an increase in 2011-12 in this area (Chart 38).
- In 2011-12, Queensland spent 2.4 percent of its minerals revenues on exploration, an increase from 1.6 percent in 2010-11. As in the previous 12 month period, the Northern Territory spent the most with 11.4 percent, an increase from 7.1 percent in 2010-11 (Chart 39).

# 7.2 MINERALS EXPLORATION AND MINERALS REVENUES AS A PERCENTAGE OF NATIONAL TOTALS: STATE COMPARISONS

Chart 40 provides a comparison by state of minerals exploration expenditures and revenues as a share of Australian totals.

**CHART 40: PERCENTAGE OF COAL, SELECTED BASE METALS, GOLD AND IRON ORE SALES REVENUES AND EXPLORATION SPEND, BY JURISDICTION, 2010-11 AND 2011-12**



Coal, selected base metals (copper, nickel, silver, lead and zinc), gold and iron ore only

## KEY FINDINGS

- Queensland increased its share of Australia's national exploration expenditure from 24 percent in 2010-11 to 26 percent in 2011-12 while the share of revenue in Queensland decreased from 24 percent in 2010-11 to 22 percent in 2011-12.

# 8.0 PRODUCTION, LEVELS OF RESERVES, YEARS OF RESERVES AND DRILLING SUCCESS BY RESOURCE

Key measures of a successful exploration sector are consistent high quality discoveries (greenfields in particular), increasing levels of resources and reserves (reserves in particular – grade and tonnage), and ‘healthy’ reserve/production ratios (years of available reserves at current production rates).

TABLE 5: QUEENSLAND YEARS OF RESERVES, BY COMMODITY, 2011-12

Commodity	QLD Production	QLD Proved & Probable Reserves	QLD Years of Reserves (Proved & Probable/Yearly Production)
Bauxite ('000t)	21,563	1,602,000	74
Copper (t)	272,000	3,168,349	12
Gold (oz)	564,368	6,227,576	11
Lead (t)	457,000	7,821,643	17
Silver (oz)	51,886,583	649,345,122	13
Zinc (t)	1,031,000	17,392,370	17
Coal (Mt)	172	10,193	59
Coal-seam Gas (PJ) (year ending 2011)	235	35,060	150

Source: IntierraLive, BREE Resources and Energy Quarterly, Department Natural Resources and Mines

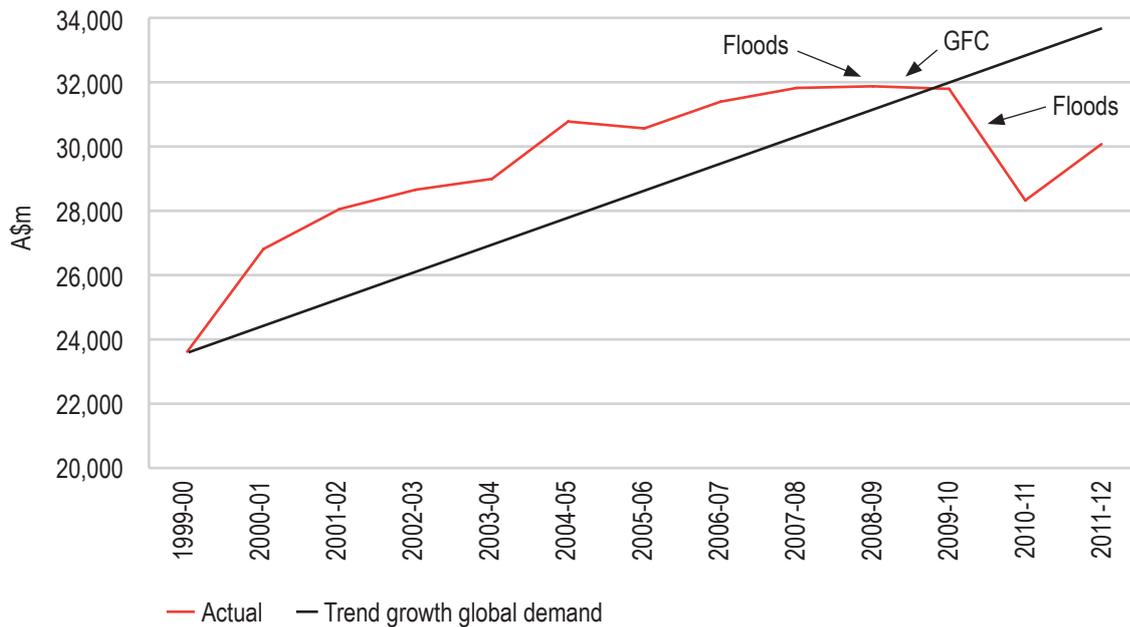
## KEY FINDINGS

- 2011-12 reserve/production levels (ie current Queensland proved and probable JORC reserves/current Queensland production levels) for Queensland bauxite remained at 74 years. However a strong increase in production moved the reserve/production ratio slightly down.
- Reserve/production levels for copper, gold, lead, silver and zinc remain steady and at low levels similar to previous years.
- Reserve/production levels of black coal currently stand at 59 years (metallurgical, thermal and PCI predominantly). This is down from approximately 67 years in 2010-11.
- Queensland reserves in coal-seam gas continued to increase to 35,060 PJ in 2011 providing a current reserve/production level for Queensland of 150 years. This figure is likely to decrease when LNG operations under construction commence production.

# 9.0 MINERALS PRODUCTION AND COMPARISONS WITH GLOBAL DEMAND

Chart 41 shows the actual production of resources in Queensland in comparison with trend growth global demand.

**CHART 41: QUEENSLAND RESOURCES PRODUCTION, ACTUAL AND COMPARISON WITH LONG TERM PERCENTAGE INCREASE IN GLOBAL DEMAND, 1999-00 TO 2011-12 (CONSTANT 2009-10 PRICES)**



Source: BREE Resources and Energy Economics, Resources and Energy Quarterly Rio Tinto Operations Review

## KEY FINDINGS

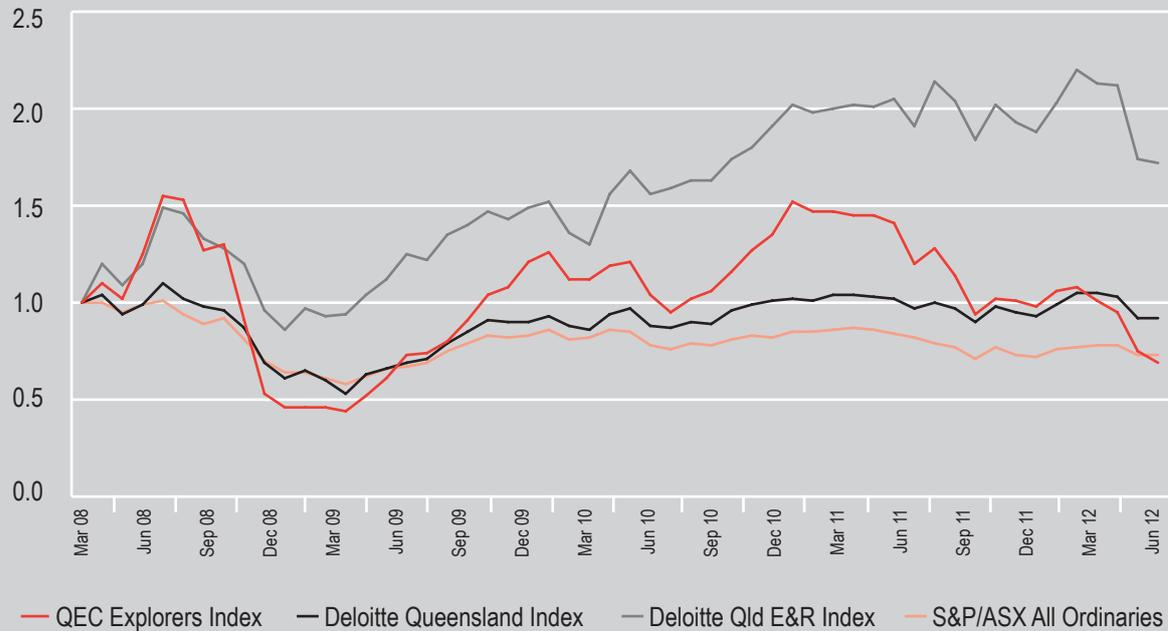
- The collective value of production of Queensland's resources for bauxite, coal, copper, gold, lead, silver, zinc and nickel exceeded global demand (long-term average percentage increase) for these resources in the years between 1999-00 and 2008-09.
- Central Queensland floods in early 2008, the Global Financial Crisis (GFC) in early 2009 and the heavy statewide flooding in 2010-11 significantly curtailed production below the trend line of growth in global demand.
- Over the past 12 months production (in particular for bauxite, zinc and coal) has picked up and the gap between the actual production and the global demand trend has narrowed. However, Queensland's loss of market share after the 2010-11 floods has not been recovered as US producers moved into a market dominated by over-supply into China.

# 10.0 MARKET CAPITALISATION MOVEMENTS

The market's estimates of future profitability, as measured by market capitalisation movements, are a useful measure of anticipated strength in a sector. Provided by Deloitte Touche Tohmatsu, the performance of Queensland-listed exploration companies on the Australian Securities Exchange (ASX) is compared with various other indices in Chart 42.

**CHART 42: QEC EXPLORERS INDEX VERSUS OTHER INDICES**

Base = 1 as at 31 January 2008



Source: Deloitte Touche Tohmatsu

## KEY FINDINGS

The QEC Explorers Index shows a 42 percent decline over the 12 months to 30 June 2012. This compares with an 11 percent decline for the S&P/ASX All Ordinaries and five percent for the Deloitte Queensland Index. The causes of this considerable under-performance are likely to include:

- In June 2012, only 38 percent of the Explorers Index represented 'Advanced Explorers'; the vast majority of the remainder were in the 'Exploration' or 'Grass Roots' categories. The latter, due to their lack of proximity to production, are heavily exposed to commodities demand uncertainty.
- The slowing growth of global commodity demand flowed through to commodity prices, particularly base metals and coal, which directly lowered the prospects of these projects coming to fruition.
- Other than the pricing outlook for commodities, funding is the other pertinent issue. Access to funding is usually plentiful during periods of high prices and reasonably smooth global economic growth. The group able to sustain funding through either debt or equity during weaker periods are the 'Advanced Exploration' group, and usually only the few companies on the cusp of making an initial sale.
- Therefore, fund managers will regularly withdraw funds from these companies given their inherent 'speculative' nature. Sustained periods of outflows in the equity markets are clear indicators of a 'risk-off' approach.

# GLOSSARY

The **Carbon Geostorage Initiative** is a program to provide geoscientific data for the assessment of geological storage sites for the safe long-term storage of greenhouse gases. It is a collaborative project funded by the Queensland Government (\$10m), the Australian Government (\$20m), and the Australian Coal Association for Low Emission Technologies (\$20m).

The **Coastal Geothermal Energy Initiative** is a joint project between the Geological Survey of Queensland and the Office of Clean Energy to investigate potential sources of hot rocks for geothermal energy close to existing transmission lines.

An **entitlement issue** is where shareholders are given the right to subscribe for the new fully-paid share.

**Existing** deposits as defined by the ABS is exploration that is delineating or proving up an existing deposit, including extensions and infill, which has been classified as an Inferred Mineral Resource or higher.

**Exploration expenditure** covers all expenditure (capitalised and non-capitalised) during the exploratory or evaluation stages in Australia, Australian waters, and the Joint Petroleum Development Area (JPDA). Costs include cost of exploration, determination of reserves/ resources, engineering and economic feasibility studies, procurement of finance, gaining access to reserves, construction of pilot plants and all technical and administrative overheads directly associated with these functions.

**Exploration licence/permit** is designed to cover the exploration phase of a project and confers exclusive rights to the exploration for and recovery of samples from the area designated. These rights are granted by relevant Commonwealth, state or territory governments.

A **full-time equivalent (FTE)** measure attempts to standardise a student's actual course load against the normal course load. Calculating the full-time/part-time status requires information on the time periods for actual and normal course loads.

The **Greenfields 2020 program** is an \$18 million program over four years to focus exploration in greenfield and under-explored areas of the state. It is also designed to revitalise interest in what are perceived to be 'mature' provinces, through the application of new ideas, models and technologies. There are seven initiatives in the program with the New Frontiers Initiative concentrating efforts in the Northern Economic Region, Southern Thomson, and Galilee areas. A number of new geoscientific information products will be released over the next few years including new airborne magnetic, radiometric and gravity survey. The Greenfields 2020 program also includes \$3 million for the continuation of the popular and successful Collaborative Drilling Initiative.

The **Geological Survey of Queensland (GSQ)**, as part of the Department of Natural Resources and Mines, provides geoscience and resource information to improve the understanding of the geology and minerals and energy resource potential of Queensland, and promotes the geoscientific data and exploration potential to attract investment.

An **indicated mineral resource** is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.

An **Inferred Mineral Resource** is that part of a mineral resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed, but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, which may be limited or of uncertain quality and reliability.

An **Initial Public Offering (IPO)** or float is the initial raising of capital by public subscription to an offering of securities.

The *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2004 Edition* (the '**JORC Code**' or 'the Code') sets out minimum standards, recommendations and guidelines for public reporting in Australasia of exploration results, mineral resources and ore reserves. The Joint Ore Reserves Committee (JORC) was established in 1971 and published several reports containing recommendations on the classification and public reporting of ore reserves prior to the release of the first edition of the JORC Code in 1989.

The **Interactive Resource and Tenure Maps** system (IRTM) is an online spatial data viewer for maps and spatially referenced images. It has a download facility for many layers and also an interactive web map service that can be linked to an online GIS tool for live data feeds. IRTM also has spatial links to the **Queensland Exploration** reporting system (QDEX) which is an online document management system for lodgement, search and retrieval of statutory exploration and other reports as well as many departmental mining-related publication collections. The link allows spatial searches in IRTM for historical tenure exploration reports in QDEX and some other spatial layers also link to QDEX documents.

**Lag indicators** are the indicators that measure actual exploration success.

**Lead indicators** are the factors that drive exploration activity and performance.

**Livability Index** uses 16 indicators of livability grouped in six dimensions:

- economy (median individual income; unemployment rate; SEIFA; availability and frequency of direct flights to key cities, Index of retail prices)
- environmental sustainability (air quality; water usage per person per year)
- health and wellness (GP services per capita; percentage of overweight persons; alcohol consumption at levels considered to be a high risk to health)
- equity (residential rental house vacancy rates; proportion of rented house; percentage of female councillors)
- education and learning (proportion of people whose highest year of school attended is year 12 or equivalent)
- leadership (percentage of population volunteering in organisations).

Each of the indicators is benchmarked against the top-performing city, which is assigned a base score of 100. The other cities' scores are derived from ratios that compare their respective performance to the performance achieved by the top-performing city.

A simple average is worked out for each of the six dimensions, after which the average score for each dimension is further aggregated into an equal weighting system.

**Market capitalisation** represents the public consensus on the value of a company's equity. An entirely public corporation, including all of its assets, may be freely bought and sold through purchases and sales of stock, which will determine the price of the company's shares. Its market capitalisation is the share price multiplied by the number of shares in issue, providing a total value for the company's shares and thus for the company as a whole.

A **measured mineral resource** is that part of a mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.

A **mineral resource** is a concentration or occurrence of material of intrinsic economic interest in or on the earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, geological characteristics and continuity of a mineral resource are known, estimated or interpreted from specific geological evidence and knowledge. Mineral resources are sub-divided, in order of increasing geological confidence, into inferred, indicated and measured categories.

**National parks** category includes national and state-run parks and nature conservation areas. No mining activity is permitted on an area declared a national park.

**Nature refuges** as defined by the Department of Environment and Heritage Protection, are areas of land voluntarily agreed between a landholder and the government to dedicate and protect for conservation purposes while allowing compatible and sustainable land uses to continue. There are different classifications of nature refuges, some that allow mining activity and some that prohibit altogether (similar to the Strategic Cropping Land triggers, however for environmental benefit).

**New deposits** as defined by the ABS are - exploration on previously unknown mineralisations or known mineralisations yet to be classified as an inferred mineral resource or higher. They include:

- exploration resulting in finding mineralisation that was previously unknown
- exploration on previously known mineralisation that has not been subjected to modern exploration
- exploration within an existing mining tenement for the purpose of finding new sources of mineralisation that have not already been classified as at least an inferred mineral resource.

An **Ore reserve** is the economically mineable part of a measured and/or indicated mineral resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified. Ore Reserves are sub-divided in order of increasing confidence into probable ore reserves and proved ore reserves.

**Potential commercial areas** are effectively a variation on a production lease but the usual requirement to commence production within two years is waived. It might be a field with high-quality reserves, but which requires pipeline and other services to make the recovery of the gas economical.

**Pre-competitive geoscience data** acquisition in Australia refers to the collection, collation and integration of basic geoscientific data by government agencies, essentially Geoscience Australia and the states' geological surveys. These strategic regional geoscientific research programs are generally aimed at upgrading historic data sets and filling data gaps by acquiring, efficiently and economically, modern geoscientific data at geologic province scale 2. Generally, the government agencies assigned priority to upgrading datasets over areas considered to be prospective but under explored.

A **private placement** is the sale of securities to a relatively small number of select investors as a way of raising capital. Investors involved in private placements are usually large banks, mutual funds, insurance companies and pension funds.

A **probable ore reserve** is the economically mineable part of an Indicated, and in some circumstances, a measured mineral resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.

**Probable reserves (oil and gas including CSG)** are those additional reserves which analysis of geoscience and engineering data indicate are less likely to be recovered than proved reserves but more certain to be recovered than possible reserves. It is equally likely that actual remaining quantities recovered will be greater than or less than the sum of the estimated proved plus probable reserves (2P). In this context, when probabilistic methods are used, there should be at least a 50 percent probability that the actual quantities recovered will equal or exceed the 2P estimate. (*Petroleum Resources Management System, 2007*).

**Prospectivity** refers the likelihood that specific types of mineral deposits are present in a geological province and may be discovered with ongoing exploration.

A **proved ore reserve** is the economically mineable part of a measured mineral resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.

**Proved reserves (oil and gas including CSG)** are those quantities of petroleum, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under defined economic conditions, operating methods, and government regulations. If deterministic methods are used, the term reasonable certainty is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90 percent probability that the quantities actually recovered will equal or exceed the estimate. (*Petroleum Resources Management System, 2007*)

The **Queensland exploration** reporting system (QDEX) is an online document management system for lodgement, search and retrieval of statutory exploration and other reports as well as many departmental mining-related publication collections. There is a link between QDEX and the **Interactive Resource and Tenure Maps** system (IRTM), which allows spatial searches in IRTM for historical tenure exploration reports in QDEX and some other spatial layers.

The **Queensland Resource Industry Ambassadors (Exploration Ambassadors)** is a selection of high-profile people associated with the resources sector. The QRIA members provide their time freely to promote resource exploration in the state and provide feedback on best practice measures to attract and secure investment.

**Recreational areas** have features such as trails, ranging from urban cycle and walking paths to river trails and rugged bush tracks. These trails cover 300,000 hectares or less than half a percent of the state. These areas are generally not mining/exploration prohibitive.

**Retention licence** is an intermediate form of tenure between the exploration licence and mining licence allowing the holder of the exploration licence to retain title to the area for a limited time. It is designed to ensure the retention of rights pending the transition of a project from the exploration phase to the commercial mining phase.

**State forests** are forest reserves set by the Governor-in-Council. Mining/exploration tenure can be granted over a state forest area, however conditions are prescribed by the *Forestry Act 1959* to apply to the tenure holder under the resources legislation (for example the *Mineral Resources Act 1989*).

**Selected base metals** are made up of the following minerals: copper, silver, lead-zinc, nickel and cobalt.

**Smart Mining - Future Prosperity** was a package of initiatives designed to double the 2004-05 mineral and petroleum exploration expenditure of \$270 million by 2008-09. This target was easily achieved with expenditure of \$751.4 million in 2008-09, and annual exploration expenditure has continued to rise.

## ACRONYMS

<b>ABS</b>	Australian Bureau of Statistics
<b>ASX</b>	Australian Stock Exchange
<b>DNRM</b>	Department of Natural Resources and Mines
<b>EPC</b>	Coal Exploration Permits
<b>EPM</b>	Mining Exploration Permits
<b>FTE</b>	Full-time equivalent
<b>GSQ</b>	Geological Survey of Queensland
<b>IRTM</b>	The Queensland Government's Interactive Resource and Tenure Maps
<b>JORC</b>	The Joint Ore Reserves Committee
<b>QEC</b>	Queensland Exploration Council
<b>QRC</b>	Queensland Resources Council
<b>QDEX</b>	Queensland Digital Exploration Reports database.

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