NORTH WEST QUEENSLAND STRATEGIC DEVELOPMENT STUDY

SUMMARY
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SUMMARY OF OUTCOMES

The investigations undertaken as part of the North West Queensland Strategic Development Study clearly highlight that North West Queensland features some of the strongest unrealised economic potential in Australia.

North West Queensland is entering a unique period with perhaps the best opportunities in a generation to realise its development potential. Australia is set to turn significant attention to the North West region as it seeks new and alternative sources of growth, and as the ‘Asian century’ creates broad opportunities across the resources, agricultural, tourism, education and professional services sectors.

Currently the North West is an underdeveloped region, with vast mineral, land, and water resources but lacking the critical transport, electricity, and water storage infrastructure and the skilled labour force to support these natural assets.

As of 2014, North West Queensland currently has:

- A resident population of 35,143 persons growing at 1.5% p.a.
- Employment totalling approximately 20,000 jobs by place of work.
- Gross Regional Product (GRP) of $4.3 billion.
- 2,454 registered businesses.
- Average personal incomes of $953.10 /week (1.2 times the state and national average).

The realisation of the strategic development priorities presents a path for the North West to fully capture its potential as a driver of the Queensland and Australian economies.

Through operational activity alone, the strategic development priorities have the potential to generate, on a long-term ongoing basis:

- A near two-fold increase in real GRP to $7.8 billion.
- A near 40% increase in employment to around 28,000 jobs.
- A 25% increase in resident population to around 44,000 persons.

These impacts exclude the significant construction based stimulus and flow-on opportunities through increased industry and population mass, which are likely to generate substantial additional activity. These benefits will flow to the broader state and national economies through a number of channels:

- Broad taxation and royalty income.
- Greater export values and volumes flowing through Queensland’s supply chain.
- Broad employment opportunities.
- Population decentralisation and decreased infrastructure pressures in major centres.

The North West faces significant challenges in its development, which can only be overcome through coordinated action and investment by all three levels of government, existing industry and new investors, and with the support of key non-government stakeholders.

Where the challenges facing North West Queensland are overcome, the region offers opportunities of a scale which are difficult to match either nationally or internationally.
STRATEGIC DEVELOPMENT PRIORITIES

The following four strategic development priorities have been articulated for the region based on economic potential, available resources, and the major national and international economic trends set to impact the region over the coming decades:

- New Mine Exploration and Development.
- Irrigated and Intensified Agriculture.
- Energy Generation, Security, and Export.
- Supply Chain Productivity, Efficiency, and Reliability.

An overview of each of the strategic development priorities is provided in the following sections. Detailed action plans and identified responsible stakeholders for realising the priorities are provided in the North West Queensland Strategic Development Study Report.

The outcomes of this study aim to assist governments and major investors to develop their future interests in the region in the best interest of the North West community and economy.
STRATEGIC DEVELOPMENT PRIORITY 1:
NEW MINE EXPLORATION AND DEVELOPMENT

Overview of Development Priority

Identifying and establishing additional mine capacity remains one of the most viable avenues for substantial economic development in North West Queensland. Mining is a key priority, not only for the North West but also Queensland and Australia as a whole due to:

- Known and potential mineral reserves.
- Relatively low labour requirements for the level of output generated.
- Established supporting and service industries.
- Potential levels of profitability sufficient to overcome remoteness and cost barriers.
- Royalty and export revenues generated.

The North West is already a major established minerals producer, with the industry contributing $1.9 billion to Gross Regional Product (GRP) in 2011-12. However, the region retains excellent prospectivity across a range of existing and new commodities as highlighted in Figure 1.

This diversity of production and opportunity provides the North West with significant protection against the commodity price volatility which intensifies the boom-bust cycle of many resource producing areas. This diversity and level of prospectivity places the North West in a strong position moving forward, as ongoing strong Asian demand is met by rising global production levels.

Figure 1: North West Queensland Known Mineral Deposits

Source: GHD
This strategic development priority takes a two tiered approach to unlocking the potential of mining as a future driver of economic development in North West Queensland:

- Utilising a high-level exploration program to de-risk and unlock a new wave of private exploration investment.
- Addressing the key infrastructure and policy barriers to new mine development and investment.

Table 1: New Mine Exploration and Development Overview

<table>
<thead>
<tr>
<th>Description</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Goal</td>
<td>To leverage private sector exploration activity and maximise new mine development in North West Queensland.</td>
</tr>
</tbody>
</table>
| Targeted Outcomes                | • Increased share of Queensland and Australian mining exploration activity  
                                   | • Acceleration of new mine development                                 
                                   | • Increased local employment                                          
                                   | • Increased and diversified minerals production                       |
| Progress Measures                | • Scale and share of resource exploration investment ($ and % increase on current)  
                                   | • Mining industry gross value add and employment ($ and % increase on current)  
                                   | • Timeframes for new mine development (initial applications to production) |
| Key Development Initiatives      | • Leading exploration program ($10-20 million p.a. expanding Geological Survey of Queensland high level exploration and incentivising deeper and broader private exploration activities)  
                                   | • Addressing mine development hurdles (continued reduction in green and red tape, incentivising and delivering the key enabling mine infrastructure) |

Source: AEC
Value of Pursuing Regional Opportunities

High-level analysis of the New Mine Exploration and Development strategic development priority suggests that pursuing these development initiatives could deliver the following ongoing annual benefits to the North West Queensland economy and community:

Table 2: New Mine Exploration and Development Economic and Demographic Impacts

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Leading Exploration Program</th>
<th>Addressing Mine Development Hurdles</th>
<th>Total Regional Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Outcome</td>
<td>Two-fold increase in exploration and mining support services activity</td>
<td>30% increase in resource output</td>
<td>-</td>
</tr>
<tr>
<td>Economic Impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output ($M)</td>
<td>$447.8</td>
<td>$1,555.9</td>
<td>$2,003.7</td>
</tr>
<tr>
<td>GVA* ($M)</td>
<td>$209.9</td>
<td>$871.7</td>
<td>$1,081.6</td>
</tr>
<tr>
<td>Income ($M)</td>
<td>$108.3</td>
<td>$218.2</td>
<td>$326.5</td>
</tr>
<tr>
<td>Employment (FTE)</td>
<td>930</td>
<td>2,034</td>
<td>2,964</td>
</tr>
<tr>
<td>Resident Population</td>
<td>1,070</td>
<td>2,339</td>
<td>3,409</td>
</tr>
</tbody>
</table>

* Gross Value Added

Note: Due to the long-term and initial nature of the strategic development priorities, these estimates should be considered indicative only. Estimates include direct and indirect impacts.
Source: AEC

These benefits only consider ongoing long-term benefits and do not include the significant construction stimulus of new mine development, which itself is likely to generate billions in additional activity. These benefits will flow to the broader Queensland and Australian economies through the following channels:

- Increased royalty revenues and export income.
- Employment opportunities for non-resident workers.
- Population decentralisation and reduced congestion and infrastructure pressures in major centres.
STRATEGIC DEVELOPMENT PRIORITY 2: IRRIGATED AND INTENSIFIED AGRICULTURE

Overview of Development Priority

Agriculture has been a mainstay of the North West economy throughout its history. A lack of irrigation infrastructure has thus far prevented the industry from fully realising its potential as a driver of economic growth.

Once the key water storage infrastructure is established, the region is well placed to capture the benefits of rising Asian and broader emerging market demand. Food security concerns combined with rising incomes and changing food preferences provide a strong medium to longer term outlook for the North West’s agricultural production.

Secure access to water resources is essential for quality life in the region as well as for industrial purposes.

This strategic development priority seeks to unlock the plethora of opportunities for higher intensity agricultural and aquaculture production identified across the North West region.

Table 3: Irrigated and Intensified Agriculture Overview

<table>
<thead>
<tr>
<th>Description</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Goal</strong></td>
<td>To enhance and diversify the agricultural production of North West Queensland and capture the strategic value adding opportunities across the supply chain.</td>
</tr>
<tr>
<td><strong>Targeted Outcomes</strong></td>
<td>• Increased and diversified agricultural production (both overall and per hectare)</td>
</tr>
<tr>
<td></td>
<td>• Increased and diversified local industry employment</td>
</tr>
<tr>
<td></td>
<td>• Increased manufacturing/processing activity and employment</td>
</tr>
<tr>
<td><strong>Progress Measures</strong></td>
<td>• Agricultural industry gross value add and employment</td>
</tr>
<tr>
<td></td>
<td>• Additional irrigation storage infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Local employment and population growth</td>
</tr>
<tr>
<td><strong>Key Development Initiatives</strong></td>
<td>• Irrigated agriculture (potential for up to 50,000ha in most years)</td>
</tr>
<tr>
<td></td>
<td>• Intensified beef cattle industry</td>
</tr>
<tr>
<td></td>
<td>• Extensive/semi intensive aquaculture (Black Tiger Prawn production in the Gulf of Carpentaria)</td>
</tr>
<tr>
<td></td>
<td>• North West abattoir (potential for 100,000 head+ p.a.)</td>
</tr>
<tr>
<td></td>
<td>• Regional water storage infrastructure</td>
</tr>
</tbody>
</table>

Source: AEC
The key North West Queensland water storage infrastructure projects for enabling irrigated and intensified agriculture are provided in the figure and table below:

**Figure 2: Key North West Water Storage Infrastructure**

![Figure 2: Key North West Water Storage Infrastructure](source: CSIRO (2013))

**Table 4: North West Water Storage Infrastructure**

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Estimated Capital Cost ($M)</th>
<th>Storage (GL)</th>
<th>Annual Yield (GL)</th>
<th>Cost/GL of Yield ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Scale Irrigation Storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O’Connell Creek</td>
<td>$230</td>
<td>127</td>
<td>34</td>
<td>$6.8</td>
</tr>
<tr>
<td>Cave Hill Dam</td>
<td>$250</td>
<td>248</td>
<td>40</td>
<td>$6.2</td>
</tr>
<tr>
<td>Green Hills Dam</td>
<td>$335</td>
<td>227</td>
<td>172</td>
<td>$2.0</td>
</tr>
<tr>
<td>Dagworth Dam</td>
<td>$475</td>
<td>498</td>
<td>326</td>
<td>$1.5</td>
</tr>
<tr>
<td>Small Scale Irrigation Storage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Off-Stream Storage</td>
<td>$1.1</td>
<td>0.6</td>
<td>0.5</td>
<td>$0.2</td>
</tr>
</tbody>
</table>

Source: CSIRO (2013), GHD
Value of Pursuing Regional Opportunities

High-level analysis of the Irrigated and Intensified Agriculture strategic development priority suggests that pursuing these development initiatives may deliver the following benefits to the North West Queensland economy and community in most years:

Table 5: Irrigated and Intensified Agriculture Economic and Demographic Impacts

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Irrigated Agriculture/Intensified Beef Cattle</th>
<th>Extensive / Semi Intensive Aquaculture</th>
<th>North West Abattoir</th>
<th>Total Regional Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Outcome</td>
<td>50,000ha irrigated agriculture industry</td>
<td>20 x 20 ha Black Tiger Prawn Farm</td>
<td>100,000 head p.a. meat processing facility</td>
<td>-</td>
</tr>
</tbody>
</table>

**Economic Impacts**

<table>
<thead>
<tr>
<th>Target</th>
<th>Output ($M)</th>
<th>GVA ($M)</th>
<th>Income ($M)</th>
<th>Employment (FTE)</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigated Agriculture/Intensified Beef Cattle</td>
<td>$286.1</td>
<td>$149.4</td>
<td>$38.3</td>
<td>1,049</td>
<td>1,929</td>
</tr>
<tr>
<td>Extensive / Semi Intensive Aquaculture</td>
<td>$12.0</td>
<td>$4.1</td>
<td>$2.1</td>
<td>32</td>
<td>59</td>
</tr>
<tr>
<td>North West Abattoir</td>
<td>$263.2</td>
<td>$79.4</td>
<td>$23.5</td>
<td>566</td>
<td>1,042</td>
</tr>
<tr>
<td>Total</td>
<td>$561.3</td>
<td>$232.9</td>
<td>$63.9</td>
<td>1,647</td>
<td>3,030</td>
</tr>
</tbody>
</table>

Note: Due to the long-term and initial nature of the strategic development priorities, these estimates should be considered indicative only. Estimates include direct and indirect impacts.

Source: AEC

These benefits will flow to broader Queensland and Australia through the following channels:

- Increased taxation revenues and export income.
- Further establishing the country as an international food bowl at a time of rising demand and increasing concerns for food security.
- Population decentralisation and reduced congestion and infrastructure pressures in major centres.
STRATEGIC DEVELOPMENT PRIORITY 3: ENERGY GENERATION, SECURITY AND EXPORT

Overview of Development Priority

Energy cost and accessibility is a critical barrier to economic development for a significant proportion of North West Queensland. Where the key enabling infrastructure gaps are overcome, a solid pattern of opportunities exists for the North West to become a significant energy producer and exporter.

The key barriers to be overcome include:

- Vast distances for transmission and distribution infrastructure.
- Mismatches between mine (average 10 years) and energy generation (20 years+) investment timelines.
- Small and sparsely distributed resident populations limit the capacity to generate load demand on commercially attractive scale.

While the challenges for the region are significant, so are the opportunities, with more competitive power generation a potential catalyst for new mine development and tailings dam processing, more intensive agricultural production, and key value adding activities across the mining and agricultural sectors:

- Meat processing.
- Cotton ginning.
- Expanded refining / beneficiation.

The outlook for energy generation in Australia is currently uncertain, with a combination of rapidly rising consumer prices, an oversupply of generation on the National Electricity Market (NEM), and significant policy uncertainty regarding carbon pricing and renewable energy subsidies.

The strength and diversity of North West energy generation potential places the region in a strong position to service future demand under a range of price and regulatory outcomes:

- Natural gas extraction and generation from Lawn Hill and the Georgina Basin.
- Low cost coal fired generation in the east of the region.
- A range of renewable generation options spanning solar, tidal, wind, and geothermal.
- Long term potential for nuclear generation with significant uranium deposits.

This strategic development priority seeks to unlock the significant energy generation and flow-on industry potential uncovered for the North West region.
Table 6: Energy Generation, Security and Export Overview

<table>
<thead>
<tr>
<th>Description</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Goal</td>
<td>To develop North West Queensland as a competitive energy and environmental products producer and exporter, enhancing the viability of current and future industry and supporting the energy needs of broader Queensland and Australia.</td>
</tr>
</tbody>
</table>
| Targeted Outcomes         | • Increased power generation in North West Queensland  
                            • Reduced energy costs versus broader Queensland and Australia  
                            • Increased industry viability and new investment |
| Progress Measures         | • Power generation levels within North West Queensland  
                            • Additional transmission and gas pipe line infrastructure  
                            • Relative power costs for non-Community Service Obligation (CSO) subsidised users |
| Key Development Initiatives| • Regional power supply:  
                            • Expanded regional transmission network  
                            • NEM connection  
                            • Natural gas network based on the Lawn Hill gas fields and Georgina Basin |

Source: AEC

Value of Pursuing Regional Opportunities

High-level analysis of the Energy Generation, Security and Export strategic development priority suggests that pursuing these development initiatives may deliver the following long-term annual benefits to the North West Queensland economy and community.

Table 7: Energy Generation, Security and Export Economic and Demographic Impacts

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Regional Power Supply</th>
<th>Natural Gas Industry &amp; Network</th>
<th>Total Regional Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Outcome</td>
<td>Two fold increase in power generation</td>
<td>6 million tonne per annum LNG industry</td>
<td>-</td>
</tr>
<tr>
<td>Economic Impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output ($M)</td>
<td>$168.5</td>
<td>$3,297.8</td>
<td>$3,466.3</td>
</tr>
<tr>
<td>GVA ($M)</td>
<td>$70.2</td>
<td>$2,166.3</td>
<td>$2,236.5</td>
</tr>
<tr>
<td>Income ($M)</td>
<td>$24.6</td>
<td>$341.0</td>
<td>$365.6</td>
</tr>
<tr>
<td>Employment (FTE)</td>
<td>320</td>
<td>2,636</td>
<td>2,956</td>
</tr>
<tr>
<td>Population</td>
<td>442</td>
<td>1,819</td>
<td>2,261</td>
</tr>
</tbody>
</table>

Note: Due to the long-term and initial nature of the strategic development priorities, these estimates should be considered indicative only. Estimates include direct and indirect impacts.

Source: AEC

These benefits are not inclusive of a range of additional factors which are likely to be major economic development drivers associated with this strategic development priority:

- Construction stimulus associated with new transmission, pipeline, and generation development.
- Reduced operating costs and increased viability for existing large industry users and new investment.
- Reduced Queensland Government Community Service Obligation (CSO) payments.

These benefits will flow to broader Queensland and Australia through the following channels:

- Increased energy security and reliability.
- Reduced Queensland Government CSO payments.
- Population decentralisation and reduced congestion and infrastructure pressures in major centres.
STRATEGIC DEVELOPMENT PRIORITY 4: SUPPLY CHAIN PRODUCTIVITY, EFFICIENCY, AND RELIABILITY

Overview of Development Priority

The export intensive nature of the North West resource and agricultural industry and the sheer scale of the North West make the region’s export supply chain a vital enabler for both existing and future development opportunities.

The upfront capital costs associated with rail and port infrastructure present challenges for smaller volume or infrequent capacity seekers to gain cost effective access.

The Port of Townsville has identified a range of expansion projects in order to service both short to medium and growing longer term demand. Staged expansion of the Port of Townsville has been identified as one of five Priority Port development areas under the Queensland Ports Strategy.

The north-south road corridor currently features limited potential to reliably transport significant commodity volumes, and is subject to significant flooding in the Gulf of Carpentaria. This lack of access constrains the potential of the Port of Karumba to expand and service the growing longer-term minerals and agricultural commodity volumes produced in North West Queensland.

Aside from current access limitations, the Port of Karumba has been shown to be a key regional asset with significant potential to expand within an efficient transhipping framework.

This strategic development priority identifies the key supply chain infrastructure investments to ensure the North West is a competitive investment and export destination, with the capacity to service the broader strategic development priorities.

Table 8: Supply Chain Productivity, Efficiency, and Reliability Overview

<table>
<thead>
<tr>
<th>Description</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Goal</td>
<td>To further develop a globally competitive supply chain for North West Queensland.</td>
</tr>
<tr>
<td>Targeted Outcomes</td>
<td>• Provision of key transport infrastructure to address current gaps</td>
</tr>
<tr>
<td></td>
<td>• Increased access to export infrastructure for small-medium enterprises</td>
</tr>
<tr>
<td></td>
<td>• Enhanced and diversified port access for the region’s supply chain</td>
</tr>
<tr>
<td>Progress Measures</td>
<td>• North West commodity export volumes (primarily agriculture and resources)</td>
</tr>
<tr>
<td></td>
<td>• Additional sealed road and rail infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Improved quality and reliability of existing road and rail infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Number of small to medium mining and agricultural operators</td>
</tr>
</tbody>
</table>
Key Development Initiatives

- Port of Karumba enhanced transhipping
- New Cloncurry Common User Rail Load Out Facility
- Expanded rail and berth access to the Port of Townsville
  - Townsville Eastern Access Rail Corridor
  - Townsville Port Common User Rail Receival Facility
  - Port of Townsville Expansion Project
- Improved regional road access:
  - Flinders Highway enhancements
  - Burke Developmental Road improvements
  - Landsborough Highway upgrades
  - Hann Highway upgrades
  - Gulf Highway upgrades
  - Kennedy Highway upgrades
- Retention of the Century Mine pipeline corridor for future linear infrastructure

Value of Pursuing Regional Opportunities

The main value in pursuing Supply Chain Productivity, Efficiency, and Reliability is in supporting the increased viability and sustainability of:

- Existing operations, particularly:
  - Mining.
  - Agriculture.
  - Tourism.
- New industry opportunities, including:
  - New mine development.
  - Irrigated agriculture.
  - Aquaculture.
  - Beef cattle fattening and finishing.
  - Expanded tourism product.

In addition, the projects will provide a significant construction stimulus for the regional economy. High level modelling of three development initiatives below suggests that the combined construction phase will deliver:

Table 9:Supply Chain Productivity, Efficiency, and Reliability Construction Phase Impacts

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Hann Highway Upgrade</th>
<th>Sealing Burke Developmental Road</th>
<th>Common User Facility</th>
<th>Total Regional Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Outcome</td>
<td>Sealed remaining 100km Lynd Junction to Hughenden &amp; 34km South to the Landsborough Highway</td>
<td>450km sealed highway</td>
<td>$20M common user facility at Cloncurry</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Impacts</th>
<th>Output ($M)</th>
<th>GVA ($M)</th>
<th>Income ($M)</th>
<th>Employment (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Outcome</td>
<td>$168.6</td>
<td>$61.8</td>
<td>$32.9</td>
<td>260</td>
</tr>
<tr>
<td></td>
<td>$1,788.5</td>
<td>$655.0</td>
<td>$348.7</td>
<td>2,756</td>
</tr>
<tr>
<td></td>
<td>$25.5</td>
<td>$9.4</td>
<td>$5.0</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>$1,982.6</td>
<td>$726.2</td>
<td>$386.6</td>
<td>3,055</td>
</tr>
</tbody>
</table>

Note: Due to the long-term and initial nature of the strategic development priorities, these estimates should be considered indicative only. Estimates include direct and indirect impacts.

Source: AEC
For further information regarding the North West Queensland Strategic Development Study, please contact:

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