

## Chapter 8 Mining and Energy

### Key Points

- In terms of output, mining is the largest industry in the Territory, accounting for 19 per cent of gross state product (GSP) in 2004-05, compared to 5 per cent nationally.
- Mining output is volatile and production levels can jump markedly as new projects come on line. Global supply and demand conditions and the impact of exchange rate movements on competitiveness are key factors affecting production levels and price.
- In recent years, output has been dominated by oil production from the Laminaria-Corallina oilfields in the Timor Sea, but has been declining as reserves are depleted.
- In the short to medium term, production will be dominated by gas and condensate production from Bayu-Undan, half of which is attributed to the Territory. Liquefied natural gas (LNG) production at the new Wickham Point plant using feedstock gas from Bayu-Undan began in December 2005.
- Strong growth in the value of minerals production, particularly alumina, manganese and gold is expected in 2006-07, with higher production and prices. Prices are expected to moderate beyond 2006-07 as global supply increases.
- In the medium to long term, the level of exploration is expected to continue to increase, consistent with Australian trends and supported by Territory Government initiatives and strong commodity prices.

Mining is the most significant industry in the Territory, accounting for 19 per cent of GSP in 2004-05, compared to 5 per cent nationally (Table 8.1). However, its high contribution to GSP is not reflected in its share of Territory employment. According to Australian Bureau of Statistics (ABS) estimates, employment in the mining industry in 2004-05 totalled 2100 or 2.2 per cent of total resident employment. The Department of Primary Industry, Fisheries and Mines reports a much higher estimate of 4622 employees that reflects definitional differences, as it includes affiliated employment, such as manufacturing employment at Alcan and fly in fly out employees, who are not usually resident in the Territory.

Table 8.1: Mining as a Percentage of Gross State Product and Gross Domestic Product, 2004-05

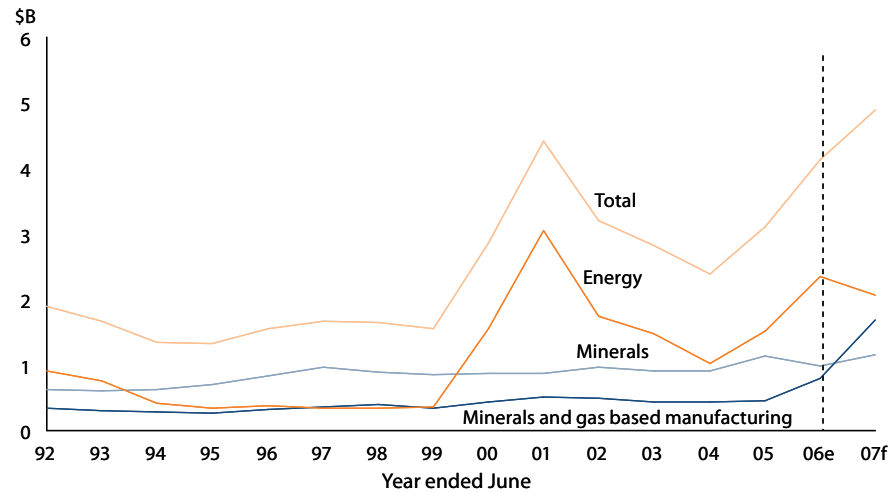
	%
New South Wales	1.8
Victoria	1.2
Queensland	7.3
South Australia	2.1
Western Australia	19.5
Tasmania	1.6
<b>Northern Territory</b>	<b>19.2</b>
Australian Capital Territory	0.0
<b>Australia</b>	<b>4.8</b>

Source: ABS Cat. No. 5220.0

Mining is also an important source of Territory Government revenue through royalties for most onshore mining operations. For 2005-06, royalty revenue is estimated at \$48.6 million, with a further \$3.1 million paid by the Australian Government as a grant in lieu of uranium royalties. Offshore gas and oil falls under the Australian Government’s tax jurisdiction.

In 2005-06, the value of mining and energy production increased by 33 per cent to an estimated \$4.1 billion, a level not seen since 2000-01, when oil production from the Laminaria-Corallina oilfields peaked. The major contributors to the increase were increased production of condensate and liquid petroleum gas (LPG) at Bayu-Undan, and the commencement of LNG production at the new Wickham Point plant (Chart 8.1).

**Chart 8.1: Value of Mining and Energy Production and Processing (nominal dollars)**



e: estimate; f: forecast

Source: Northern Territory Treasury, Department of Business, Economic and Regional Development, Department of Primary Industry, Fisheries and Mines

## Minerals

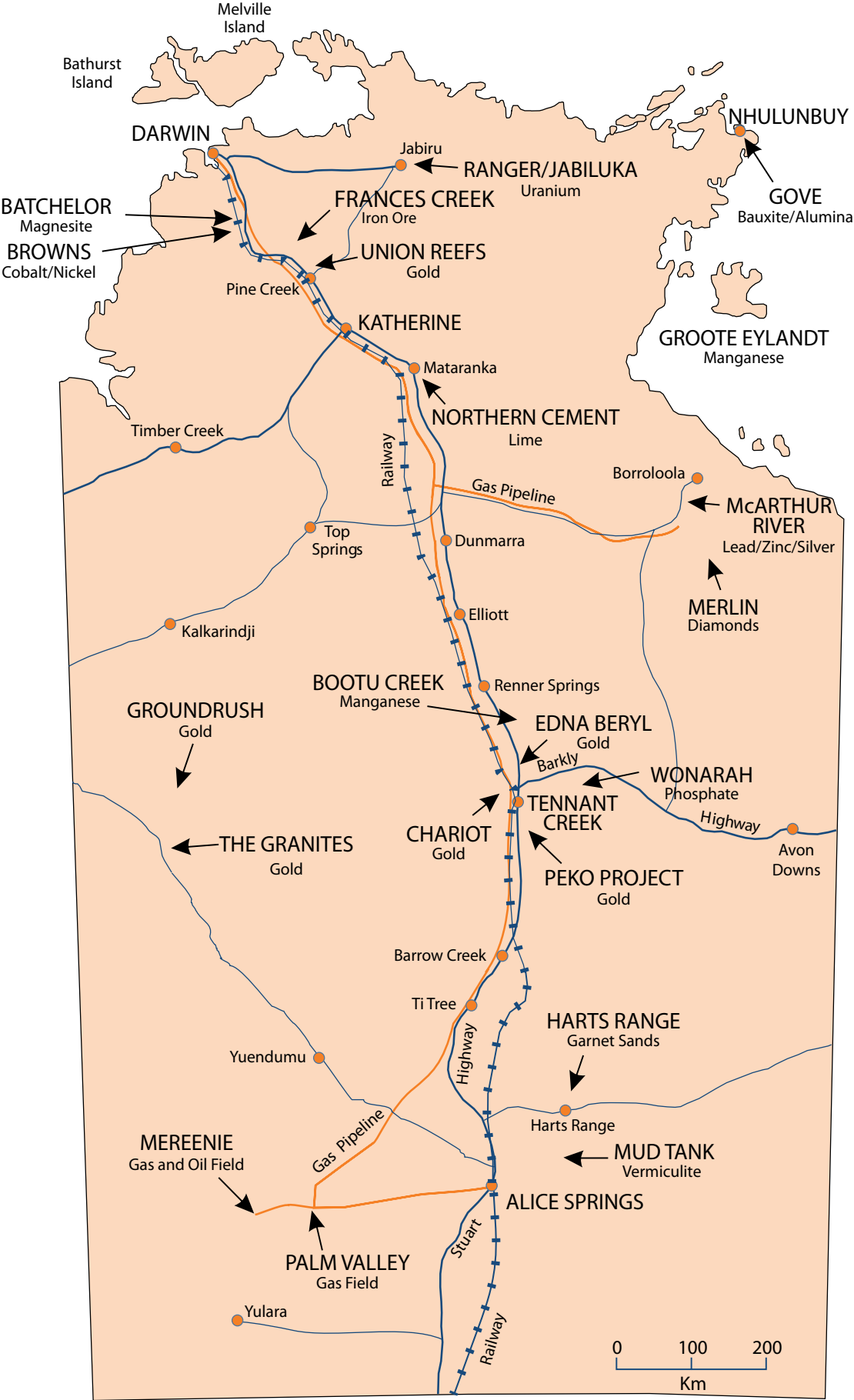
Bauxite production at Gove and manganese production at Groote Eylandt accounted for about 46 per cent of the total value of production in 2004-05, and both mines are expected to continue to dominate mineral production in the medium term. Zinc, lead and silver production at McArthur River accounted for a further 18 per cent of production value in 2004-05, but underground operations ceased in September 2005. The operator’s proposal to move to an open cut operation is currently under consideration by the Territory Government.

Other important mineral resources and operations include:

- gold mines located in the Tanami Desert and Pine Creek areas;
- a new manganese mine at Bootu Creek near Tennant Creek, which commenced production in April 2006;
- phosphate deposits near Tennant Creek;
- garnet sands and vermiculite near Alice Springs;
- magnesite and a major polymetallic deposit of lead, cobalt, copper, nickel and silver in the Batchelor area; and
- the Merlin diamond field south-east of Borroloola.



# Onshore Mineral and Energy Resources

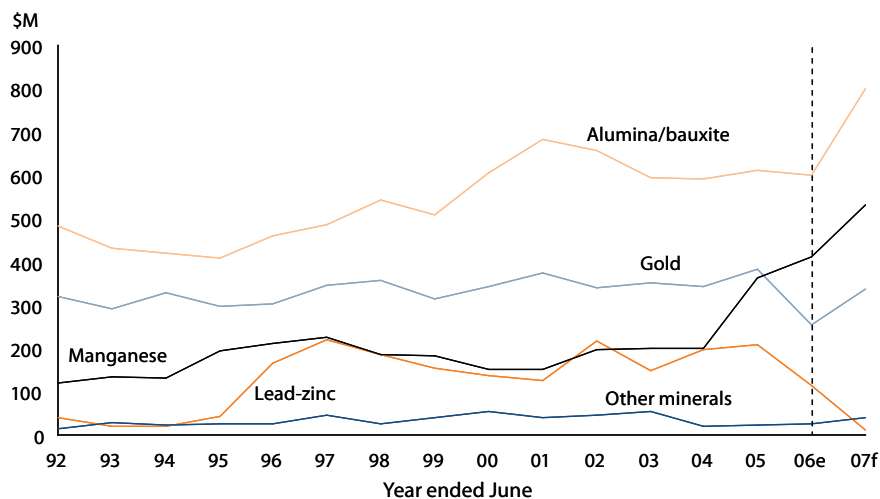


2005-06 Production

The nominal value of mineral production and processing, including manufacturing of alumina, decreased by 9 per cent to an estimated \$1.4 billion in 2005-06 (Chart 8.2).

- The nominal value of gold production decreased by 34 per cent to an estimated \$254 million, due primarily to the closure of The Granites mine's Groundrush ore body.
- The value of bauxite and alumina production decreased by 1.9 per cent to an estimated \$600 million due a temporary suspension to production at the Alcan refinery as part of the G3 expansion project.
- The value of base metals production decreased by 45 per cent to an estimated \$115 million. The conclusion of underground mining operations at the McArthur River mine in September 2005 is estimated to have had a significant impact on the production of lead-zinc concentrate. Despite this, there remains a significant stockpile of ore to be processed. The impact of the decline in production of lead-zinc concentrate was partially offset by strong prices growth.
- The value of manganese production increased by 14 per cent to an estimated \$413 million, driven by higher prices, increased production at the GEMCO mine at Groote Eylandt and the commencement of production at the new Bootu Creek mine.

Chart 8.2: Value of Mineral Production and Processing (nominal dollars)



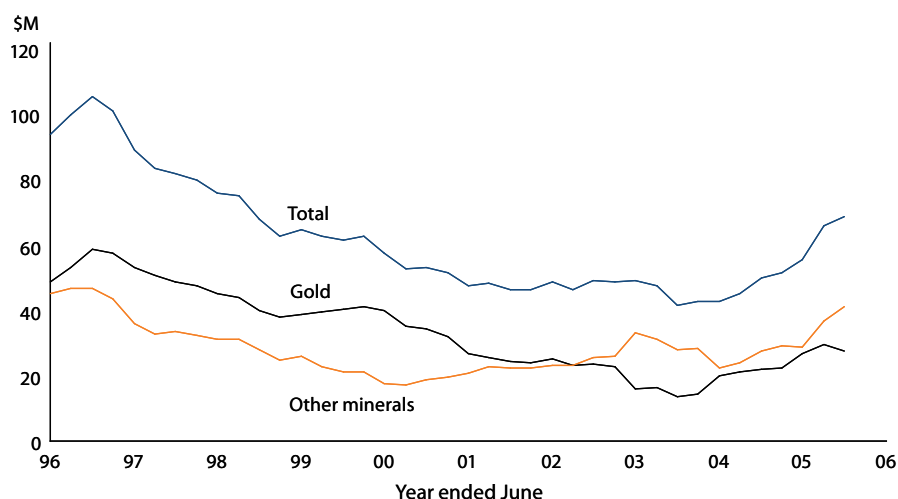
e: estimate; f: forecast

Source: Department of Business, Economic and Regional Development, Department of Primary Industry, Fisheries and Mines

Exploration

Mineral exploration in the Territory and nationally increased significantly in 2004-05 in response to increasing global demand and strong price increases. In the Territory, private mineral exploration expenditure (including exploration for uranium) increased by 31 per cent to \$56 million in 2004-05. Expenditure on gold exploration, at \$27 million, accounted for almost half of total mineral exploration expenditure. In the six months to December 2005, expenditure totalled \$42 million (Chart 8.3).

Chart 8.3: Mineral Exploration  
(moving annual total)



Source: ABS Cat. No. 8412.0

Despite a significant increase over the last two years, the level of exploration remains at a relatively low level. Given the long lead time (typically 10 to 15 years) between the discovery of a major ore body and commercial production, the extended period of low level exploration may have important consequences for production capacity in the medium to long term.

In 2003, the Territory Government implemented a new exploration initiative, Building the Territory's Resource Base, to attract investment. It follows the previous Northern Territory Exploration Initiative, and provides \$15.2 million over four years for the provision of pre-competitive geoscientific data and the promotion of prospectivity. The initiative also supports liaison with Indigenous land owners and the processing of exploration and mining titles.

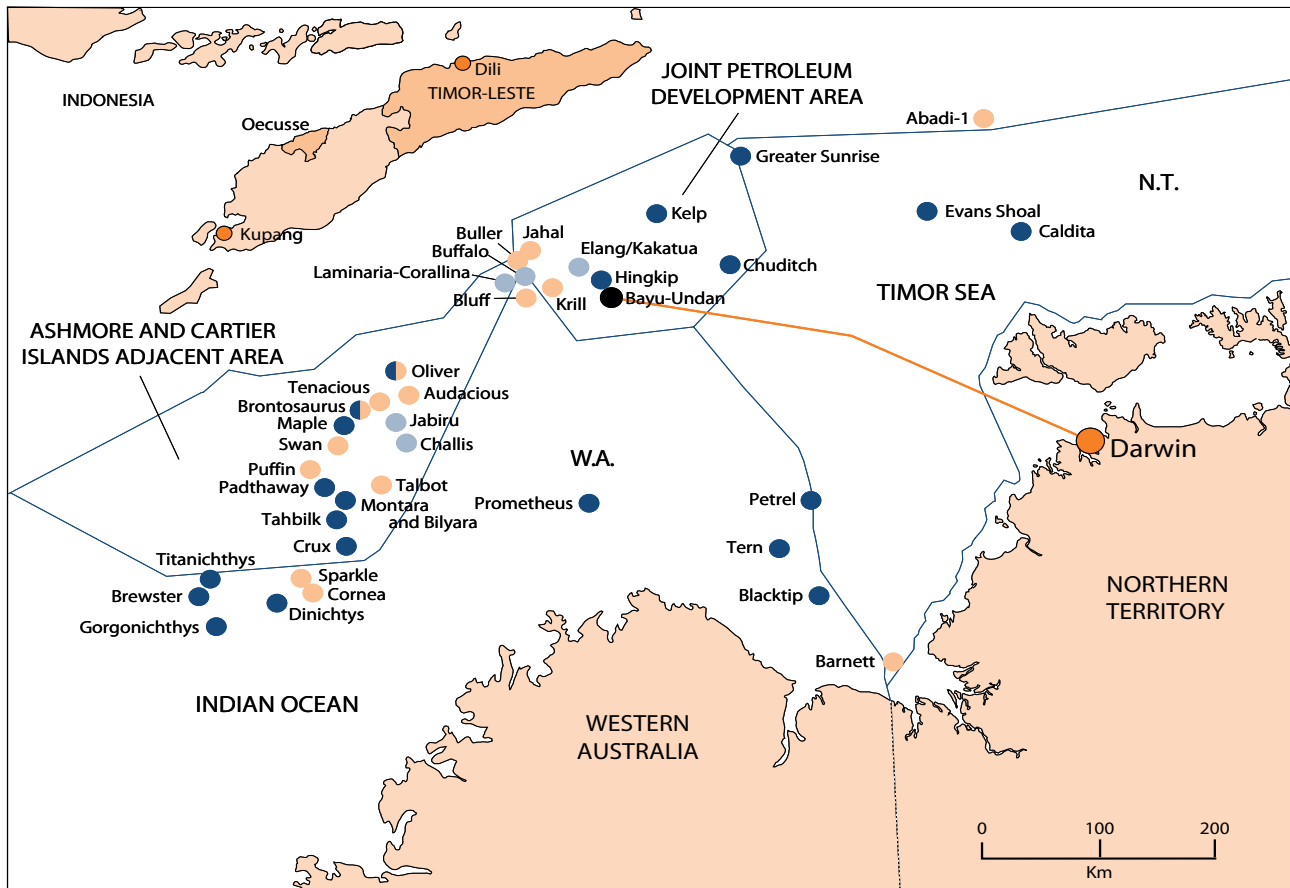
## Energy

The significant energy resources in the Territory are oil, uranium, natural gas, liquid petroleum gas (LPG) and condensate (a light hydrocarbon liquid used to manufacture petrol and petrochemicals, and often found mixed with deposits of natural gas). The major known locations of these energy resources are:

- Ranger, Jabiluka and Koongarra in west Arnhem Land (uranium);
- the Amadeus Basin at Palm Valley and Mereenie (oil and natural gas);
- Greater Sunrise, Evans Shoal, Petrel/Tern and Crux/Argus in the Timor Sea (natural gas and condensate); and
- Laminaria-Corallina, Jabiru and Challis/Cassini in the Timor Sea (oil).

In addition, 50 per cent of the value of oil and gas production from the Joint Petroleum Development Area (JDPA) is also attributed to the Territory. Currently, the two producing fields in the JDPA are Bayu-Undan (gas, LPG and condensate) and Elang/Kakatua (oil).

## Timor Sea Oil and Gas



**LEGEND**

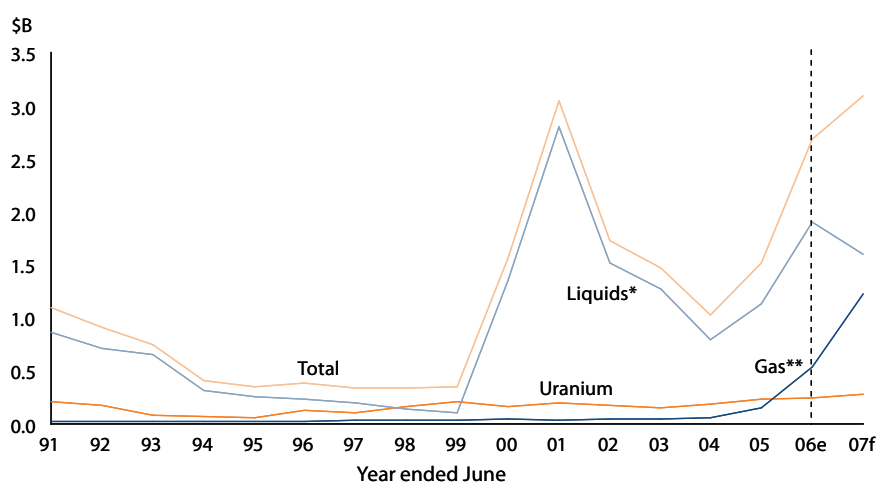
- Producing gas field
- Discovered undeveloped gas field
- Producing oil field
- Discovered undeveloped oil field
- Gas pipeline

### 2005-06 Production

The nominal value of energy production, including LNG, increased by 77 per cent to an estimated \$2.7 billion in 2005-06, reflecting both increased production and higher prices.

- The value of oil production increased by 42 per cent to an estimated \$900 million, driven by a 12 per cent increase in production and higher prices. Production at Laminaria-Corallina, which dominates oil production in the Territory, has declined steadily from its peak in 2000-01, but is expected to increase by 3 per cent following a temporary shutdown in 2004-05 for repair work. Oil production from the mature Jabiru and Challis/Cassini fields recovered in 2005-06 as regular tanker services recommenced.
- The value of uranium ore production increased by 8 per cent to an estimated \$250 million, reflecting higher prices due to increased global energy demand, decreasing supplies of weapons-grade uranium stocks and a growing interest in the potential benefits of using uranium to minimise greenhouse gas emissions.
- The value of gas production, including LNG, increased by 256 per cent to \$542 million, with the commencement of LNG production at the new Wickham Point facility using feedstock sourced from Bayu-Undan.
- The value of condensate production increased by 95 per cent to \$593 million, reflecting increased production at Bayu-Undan.

Chart 8.4: Value of Territory Energy Production (nominal dollars)



\* Oil, condensate and liquid petroleum gas

\*\* Including LNG production

e: estimate; f: forecast

Source: Northern Territory Treasury, Department of Business, Economic and Regional Development, Department of Primary Industry, Fisheries and Mines

**Exploration** Relatively strong global economic growth and significant increases in oil and gas prices led to a resurgence in exploration activity in 2004-05. Private expenditure on oil and gas exploration increased by 193 per cent to \$99 million in 2004-05. Expenditure is expected to increase significantly in 2005-06, with \$131 million recorded in the six months to December 2005.

Like mineral exploration, increased oil and gas exploration has been supported by the Territory Government's Building the Territory's Resource Base initiative through the provision of geoscientific information to explorers and has led to a major increase in onshore exploration permits.

Uranium exploration expenditure, concentrated in west Arnhem Land, increased by 44 per cent to \$6.9 million in 2004-05, triggered by the large price increase since 2003.

## Outlook

**Minerals** The outlook for minerals is determined by global supply and demand, with world economic growth and the exchange rate being major influences on demand. Strong demand is expected to continue into 2006-07, with solid world economic growth, most notably from China. The competitiveness of Australian producers is expected to be enhanced by recent and anticipated further depreciation of the Australian dollar.

The value of mineral production, including minerals processing, in the Territory is forecast to increase by 25 per cent to \$1.8 billion in 2006-07, largely due to expected increases in alumina/bauxite, gold and manganese production.

- Alumina production is forecast to increase by 37 per cent to \$600 million, reflecting increased production associated with the completion of the Alcan G3 refinery expansion and higher prices. Expected price increases are driven by strong demand for alumina from China and a slower than expected buildup of global production. Prices are expected to weaken from 2007 and beyond as new production capacity comes on line.
- Manganese production is forecast to increase by 29 per cent to \$532 million. Prices are forecast to increase by a further 12 per cent on the back of stronger demand and constrained supply. Production volumes will be boosted significantly by a full year of production from the new Bootu Creek mine.

- Gold production is forecast to increase by 32 per cent to \$336 million. Production is forecast to increase by 13 per cent and prices by a further 17 per cent. Production from The Granites mine is expected to fall, but will be offset by a number of new developments if they proceed as planned.

The outlook for base metals is uncertain. Underground operations at the McArthur River mine (lead, zinc, silver) ceased in September 2005 and a proposal to move to an open cut operation is currently under consideration by the Territory Government. A planned open cut operation at the Brown's Deposit near Batchelor (copper, cobalt, nickel) concentrate is also under consideration by the Government. If approved, production is likely to begin in 2006-07. The same operator is also seeking strategic partners to develop a large sulphide orebody containing copper, cobalt, nickel, lead and zinc at the same site.

In addition, there is a proposal to develop an open cut iron ore mine at Frances Creek. Ore from the mine will be transported by rail to Darwin for export. Production is expected to commence in early 2007 and build up to around 1.5 million tonnes annually.

- Oil** Oil production will continue to decline in 2006-07 due to lower production from Laminaria-Corallina, which accounts for about 90 per cent of oil production in the Territory. The decline in production at Laminaria-Corallina is a normal function of declining reserves and will continue. A number of other marginal oil discoveries in the Timor Sea await further appraisal and/or development. These include Audacious, Barnett, Montara, Oliver, Puffin, Talbot and Tenacious. Development options for Audacious and Montara are being reviewed.

The impact of the decline in oil production levels will be offset somewhat by expected further price increases in the short term, supported by strengthening demand, supply constraints and a significant risk premium. The Australian Bureau of Agricultural and Resource Economics (ABARE) forecasts the 2006 oil price to average about US\$60 per barrel before easing back to about US\$57 in 2007.

- Gas** The value of gas production, including LNG, will increase significantly in 2006-07, with the first full year of LNG production at the new Wickham Point facility using feedstock gas sourced from Bayu-Undan.

Looking further ahead, the Territory remains on the verge of a major development phase for gas reserves and for gas-based manufacturing. Should efforts to bring more Timor Sea gas onshore prove successful, it could be used as feedstock for new manufacturing industries. An area at Glyde Point, on the Gunn Point Peninsula to the east of Darwin, has been identified as a potential site for a major gas-based industrial estate and associated port facilities. Possible gas manufacturing projects include further production of LNG or gas-based products, such as methanol, ethane, ammonia/urea fertilisers and various petrochemicals. Timor Sea gas also has the potential to provide a cheap and efficient energy source for the manufacture of alumina, magnesium and other ore concentrates, and for the production of electricity that could advance local value-adding opportunities.

Negotiations between the Timor-Leste and Australian governments concluded in January 2006 with the signing of the Treaty on Certain Maritime Arrangements in the Timor Sea. At this stage, however, development of the Greater Sunrise field is on hold, with Woodside announcing a deferral of the project for at least ten years.



In December 2005, the Northern Territory Government announced the signing of a Heads of Agreement between the Northern Territory Power and Water Corporation, and ENI Australia for the sale of gas from the Blacktip field, a Western Australian administered field 100 km west of Wadeye in the Bonaparte Basin. The agreement binds the parties to work exclusively together to conclude the necessary commercial terms to develop a gas sale agreement for the supply of gas from Blacktip to meet the Northern Territory's long-term gas requirements from 2009.

**Uranium** ABARE has forecast a 22 per cent increase in uranium prices in 2006-07, with some moderation expected in 2007-08 as world supply increases.

In the Territory, the Ranger mine is scheduled to cease mining in 2008, but it has extended its mill processing of the ore through to 2014. The Jabiluka mine remains on a stand-by, care and environmental maintenance status, and the operator has given an undertaking to the Australian Government that mining will not commence until mining at Ranger is concluded. Reserves at Jabiluka are estimated as sufficient to maintain production for nearly three decades.

In April 2006, Australia and China signed a nuclear safeguards agreement that allows for Australian exports of uranium to commence and may lead to increased exploration activity. The potential for new mines in the Territory will continue to be influenced by Australian Government policy, as it retains power over uranium mining.

**Exploration** After gradually declining over the seven years to 2003-04, minerals exploration expenditure is improving, while petroleum exploration has increased sharply. In the medium to long term, the level of exploration is expected to continue to increase, consistent with Australian trends and supported by Territory Government initiatives. The outlook is for increasing exploration for gold, diamonds, nickel, rare earths, uranium and onshore hydrocarbons. Exploration activity is particularly buoyant in several major geological provinces across the southern and central parts of the Territory.