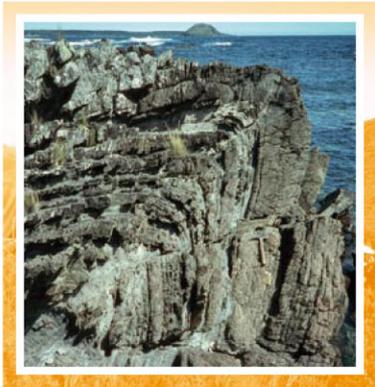


Mineral Resources Tasmania Annual Review



2004 - 2005



DEPARTMENT of
INFRASTRUCTURE,
ENERGY and RESOURCES

Tasmania



MINERAL RESOURCES TASMANIA

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES

***A Division of the Department of
Infrastructure, Energy and Resources***

Annual Review 2004/2005

Mineral Resources Tasmania PO Box 56 Rosny Park Tasmania 7018

Phone: (03) 6233 8377 ● Fax: (03) 6233 8338

Email: info@mrt.tas.gov.au ● Internet: www.mrt.tas.gov.au

Mineral Resources Tasmania

Mineral Resources Tasmania (MRT) is a Division of the Department of Infrastructure, Energy and Resources. The primary role of MRT is to ensure that Tasmania's mineral resources and infrastructure development are fostered and managed in a sustainable way now, and for future generations, in accordance with current government policy, partnership agreements, and the goals of Tasmania *Together*.

This role includes ensuring that there is a fair and sustainable return to the community when mineral or petroleum resources are developed, and includes the provision of information to local government and land management groups for geohazards, groundwater and construction materials.

— Mission —

- To contribute to the economic development of Tasmania by providing the necessary information and services to foster responsible land management, and mineral resource and infrastructure development, for the benefit of the Tasmanian community.

— Objectives —

- Benefit the Tasmanian community by an effective and co-ordinated government approach to mineral resources, infrastructure development and land management.
- Maximise the opportunities for community growth by providing timely and relevant information integrated with other government systems.
- Optimise the operational performance of MRT by developing the organisational structure to support the whole-of-government business processes.

— Activities —

Activities within the Division include:

- Collection, integration, interpretation, publication and presentation of geoscientific information.
- Collection, integration, interpretation, publication and presentation of information promoting Tasmania's mineral resource potential, and land stability and groundwater issues.
- Issue of legal titles to mining tenements, collation and recording of statistics relating to mining production, collection of fees and rentals, management of royalty regimes, and recording of mining tenements.
- Regulation of mineral and petroleum exploration in Tasmania, including offshore waters administered by the State, and the promotion of vacant areas available for onshore and offshore exploration.
- Environmental appraisal, monitoring and management of mining heritage and land access issues.
- Setting and monitoring of standards for both the performance of exploration activities and the technical reporting of exploration records and case histories.

— Major issues and initiatives for 2005/2006 —

- Continue updating data for the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- Undertake a gap analysis of the 3-D geoscientific model and derive new data-gathering initiatives.
- Undertake a series of promotional activities to encourage mineral exploration in Tasmania, including the promotion of the 3-D model of geological structure and major mineralising pathways of Tasmania.
- Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- Complete the extension of the Mornington Core Library.
- Continue the work program on the statewide groundwater monitoring network.
- Continue rehabilitation of abandoned mining sites in Tasmania.

Contents

Mineral Resources Tasmania — Divisional Overview	5
Financial performance	9
Performance indicators	12
Review of MRT Branch Activities, 2004/2005	13
Metallic Minerals and Geochemistry	13
Industrial Minerals and Land Management	16
<i>Registry</i>	20
<i>Urban Geology and Groundwater Section</i>	23
Information Systems and Geophysics	24
Data Management	26
Finance, Royalty and Administration	28
<i>Publications</i>	28
<i>Library</i>	29
Mineral Sector Overview	31
Commodity prices	32
Value of the Tasmanian mineral industry	34
Mineral exploration expenditure	36
Review of Mineral Sector Operations	37
Metallic minerals	37
Industrial minerals	44
Fuel minerals	45
Construction materials	46
Mineral processing operations	49
Annual Report, Rehabilitation of Mining Lands Trust Fund	51

Management of Mineral Resources Tasmania (as at 30 June 2005)

Director, Mineral Resources Tasmania and State Chief Geologist —

Dr A. (Tony) V. Brown

Telephone: (03) 6233 8365; Email: abrown@mrt.tas.gov.au

Managing Geologist (Metallic Minerals and Geochemistry) —

Dr Geoffrey R. Green

Telephone: (03) 6233 8335; Email: ggreen@mrt.tas.gov.au

Managing Geologist (Industrial Minerals and Land Management) —

Ms Carol A. Bacon

Telephone: (03) 6233 8326; Email: cbacon@mrt.tas.gov.au

Manager, Information Systems and Geophysics —

Dr Robert G. Richardson

Telephone: (03) 6233 8324; Email: rrichard@mrt.tas.gov.au

Manager, Royalty, Finance and Administration —

Mr Matthew N. Fitzgerald

Telephone: (03) 6233 8370; Email: mfitz@mrt.tas.gov.au

Manager, Data Management —

Mr Ken G. Bird

Telephone: (03) 6233 8351; Email: kbird@mrt.tas.gov.au

Registrar of Mines —

Mr Dennis R. Burgess

Telephone: (03) 6233 8341; Email: dburgess@mrt.tas.gov.au

Mineral Resources Tasmania

— Divisional overview, 2004/2005

The perception and reality of Tasmania as a place to undertake mineral exploration has not only continued to increase during 2004/2005, but our profile has also been recognised internationally. The Canadian Fraser Institute conducts an annual authoritative survey of the attitude of international mining companies to the attractiveness of 64 jurisdictions world-wide as destinations for mineral exploration investment.

In the 2005 Fraser Institute survey, Tasmania ranked:

- ❑ top for best practices mineral potential (assuming no land use restrictions in place and assuming industry 'best practice');
- ❑ sixth overall for current mineral potential (assuming current regulations and land use restrictions) and second behind Western Australia among Australian jurisdictions; and
- ❑ tenth overall in Policy Potential Index, an overall measure of the attractiveness of government policy for investment by mining companies, the highest of the Australian jurisdictions.

Policy areas where Tasmania scored best included political stability, taxation regime, labour regulations and employment agreements, socioeconomic agreements, (lack of) regulatory duplication, (low) uncertainty concerning the administration, enforcement and interpretation of existing regulations and environmental regulation.

There are a number of factors that have contributed to the growth of mineral exploration expenditure in Tasmania over the past few years and most of these are due to the professional attitude and hard work of all MRT staff.

As in past years, my sincere thanks goes to the staff of MRT for another year of production, maintenance, and delivery of high quality, globally competitive, geoscientific data products, a number of which are based on the 3-D geological model and prospectivity analysis of Tasmania, and data and information resulting from the Western Tasmanian Regional Minerals Program.

This effort, coupled with promotional activity undertaken since the development of the TIGER data system and the 3D geoscientific model, demonstrates what a small but dedicated team can achieve in contributing to the economic, environmental and social well-being of Tasmania.

Growth in mineral exploration activity is essential for the continued development of the mineral sector and for the economic well-being of Tasmania. The mineral extraction and processing sector is Tasmania's largest export industry, accounting for 36 per cent of total exports.

MRT, by providing information on areas of high mineral and hydrocarbon resource potential in Tasmania and its off-shore areas, encourages private sector exploration which will lead to new operations coming on stream as the economic life of existing operations declines. By ensuring

an adequate return from our mineral resources, all Tasmanians can share the benefits of our mineral wealth.

The mining industry in Tasmania again benefited from the continuing improvement in most metal prices during the year. The outlook for 2005/2006 is also positive with the expectation that recent commodity price increases will remain, at least in the medium term.

Allegiance Mining NL completed development of an exploration decline and cross-cut at the Avebury nickel deposit. The Development Proposal and Environmental Management Plan has been approved and the company expects to complete the full feasibility study by October 2005 to enable production to commence in the first quarter of 2006. Infill drilling has been completed, with positive results, and an upgraded resource calculation is under way. Metallurgical testing is close to completion and has also achieved promising results.

Stemcor Holdings Limited has purchased Australian Bulk Minerals (ABM), the operator of the Savage River mine and Port Latta pelletising plant. ABM is continuing a feasibility study into extending the life of the mine by conducting underground mining operations.

Bluestone Tin Limited re-opened the Renison tin mine. The company has acquired the Mount Bischoff mine and is planning to increase production by bringing this mine into production in early 2006. The company is also conducting a feasibility study into treating the tailings from the Renison mine.

There is potential for resumption of mining at two sites on King Island. GTN Resources Limited is conducting a full feasibility study into resuming scheelite mining at Grassy. Tasmanian Titanium Pty Ltd expects to resume heavy mineral sand mining at Naracoopa before the end of 2005. In northeast Tasmania Van Dieman Mines plc plans to commence alluvial tin and sapphire mining at the Endurance and Scotia deposits by the end of 2005.

The Thylacine gas discovery in permit T/30P and the Yolla gasfield are both in Tasmanian waters and are to be developed in the near future. The gas from both these fields will be piped to Victoria.

All other mines continued to perform strongly during the year. Exploration programs are continuing at the Henty, Beaconsfield and Rosebery mines.

MRT initiatives

During 2004/2005 MRT undertook specific major initiatives including:

- ❑ Enhancing the provision of geoscientific data through the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- ❑ Undertaking a series of promotional activities to encourage mineral exploration in Tasmania, which was at a low level at the beginning of the year.

- ❑ Completion of a three-dimensional model of the geological structure and major mineralising pathways of Tasmania to provide new information for explorers.
- ❑ Provision of an appropriate level of resources for environmental monitoring of exploration and mining tenements, and for inspection of mines and quarries.

These initiatives will be followed during 2005/2006 by:

- ❑ Continued updating of data for the TIGER system.
- ❑ Undertaking a gap analysis of the three-dimensional geoscientific model and derive new data-gathering initiatives.
- ❑ Undertaking a series of promotional activities to encourage mineral exploration in Tasmania, including the promotion of the three-dimensional model of geological structure and major mineralising pathways of Tasmania.
- ❑ Producing land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- ❑ Completing the extension of the Mornington Core Library.
- ❑ Continuing the work program on the statewide groundwater monitoring network.
- ❑ Continuing rehabilitation of abandoned mining sites in Tasmania.

Achievements against Strategies for 2004/2005

New initiatives to stimulate mineral exploration in Tasmania

According to Australian Bureau of Statistics (ABS) data, expenditure on mineral exploration for the year ended 30 June 2005 was \$8.3 million, up from \$7.6m in 2003/2004. Tasmania's share of Australian expenditure decreased from 0.97% to 0.81% during the year, although MRT data indicated a much stronger recovery in total expenditure of 196%, from \$8.7 million in 2003/2004 to \$25.8 million in 2004/2005. Despite the recovery of the sector, current expenditure levels are still below the 20-year, non-indexed, average of \$11.4 million.

The increase is related to a number of factors, including the acceptance by the mineral exploration community of the attractiveness of Tasmania as an investment destination. This is underlined by the fact that Tasmania was ranked the most attractive state of Australia to explore in by the world-wide Fraser Institute survey of mineral exploration companies.

Part of the recovery is also due to the stimulus provided by the three-dimensional geological model of Tasmania, including an integrated exploration database and a prospectivity analysis.

Promotion of mineral and petroleum potential

As well as continuing to capture new geoscientific data over areas of Tasmania, the government provided \$85,000 in 2004/2005 to actively market mineral exploration opportunities in Tasmania.

Activities undertaken included the holding of a display at the world's leading exploration forum, the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) and visiting leading international mining companies in Toronto and Vancouver, both as part of an Australian team and as a separate Tasmanian group. The latter also visited companies in Vancouver and London during March 2005.

Displays highlighting the new 3-D model were presented at the PDAC meeting, at the Mining 2004 meeting in Brisbane in November, and at the international Society of Economic Geologists Predictive Discovery Under Cover Conference held in Perth in September 2004.

Promotional missions and functions were conducted in Perth, Sydney, Brisbane, Melbourne and Adelaide by officials from DIER. During these visits, new information resulting from the 3-D model, the Western Tasmanian Regional Minerals Program (WTRMP), the Geoscience Australia-MRT granite and mineralisation project, and the improved client access to MRT information using the TIGER system, were all well received. In particular, there was continued strong support for the 3-D model as a world-first detailed analysis of an entire jurisdiction.

These promotions have been successful and continue to play a direct part in attracting new exploration companies to Tasmania.

Eight offshore petroleum areas were released for bidding in 2004/2005. These areas, in the Sorell and Otway basins off the west coast and in the Bass Basin to the north of Tasmania, were actively promoted at the Australian Petroleum Production and Exploration Association conference held in Perth in April 2005. Production licences were issued over the Yolla gas field in Bass Strait and the Thylacine gas field in the Otway Basin west of King Island.

Collection, integration, interpretation, publication and presentation of data

Verification, upgrading and loading of information into the TIGER system continued. The TIGER system has a single geoscience data model with user interfaces for groundwater, geohazards, geophysics, drilling, mineral deposits, samples and geochemistry. Once loaded the information is made available to clients using the MRT website. Other information available includes mineral tenements and documents held by MRT, and general information for MRT and agency (DIER) clients.

Downloads from the MRT website continued at a high level, with a total of 1704 gigabytes downloaded during the year with a peak of 380 gigabytes downloaded in December 2004. Two full-time staff provide ongoing maintenance and development of this information management system. In addition to data being accessed from the MRT website, 156 data packages were distributed on CD to clients.

The collection and presentation of information on Tasmania's mineral wealth and geoscientific nature continues. Seventy-five 1:25 000 scale geological maps were prepared for digital capture. Capture and output of new or upgraded data was completed for 106 map areas. The high output of maps was in part due to finalisation of the compilations of the geology of the Mount Read

Volcanics, which continued as an MRT initiative following completion of the WTRMP. There was some limited field checking, but primary geoscientific data acquisition was again essentially suspended for the year.

New 1:500 000 scale digital compilations of the *Mining Infrastructure* and *Mineral Deposits and Metallogenesis of Tasmania* maps were prepared and published during the year. A collaborative study with Geoscience Australia on the mineral potential of Tasmanian granitoids was completed, with a successful four-day field excursion followed by a one-day meeting at MRT, attended by 52 people, to present the results of the work. These events were followed by the Tasmanian Minerals Council Exploration Group meeting. Dovetailing these events maximised attendance at both meetings and focussed attention on Tasmania.

General information on groundwater resources, pollution and quality was provided to other agencies, companies and members of the public, in response to enquiries. A slight decrease was noted in the number of groundwater-related telephone enquiries, possibly due to the availability of groundwater data on the MRT website since March 2003. Consultants investigating pollution problems at a number of sites in Tasmania were supplied with information relating to groundwater in the areas concerned.

Work continued on further refining the groundwater database in order to facilitate the entry of new groundwater borehole reports from drillers, with the aim of eventually providing more information via the internet than is available at present.

The program of accurate monitoring of groundwater levels across Tasmania continued, using data loggers set in boreholes to provide real-time information on groundwater levels. Field sampling and check monitoring quality assurance was carried out at approximately six-month intervals at each monitoring location. An overview report of the MRT statewide groundwater monitoring network was published.

Work continues on a series of groundwater maps at 1:250 000 and 1:100 000 scales. These maps summarise the present knowledge throughout Tasmania.

MRT, in partnership with the Department of Primary Industries, Water and Environment (DPIWE), actively contributed towards the management of several dry-land salinity projects financed under the National Action Plan.

Land instability is a significant hazard in Tasmania, with many homes having been destroyed over the years and significant damage caused to infrastructure. By studying and understanding the landslide hazard it is often possible to minimise or avoid the effects of land instability. MRT is actively addressing this hazard in three main areas; hazard mapping, databases and monitoring.

A regional landslide hazard assessment of the Greater Hobart area has been completed. This project was undertaken in partnership with local councils and with funding assistance from the Australian Government through the Natural Disaster Mitigation Programme. The resultant hazard classification maps are assisting councils to make informed decisions on planning and development

issues, especially given the pressure to develop marginal lands around our cities.

The information has also been supplied to other stakeholders, including the geotechnical community and the State Emergency Services' Emergency GIS project. One of the key findings of the landslide study to date is the recognition of a significant risk of debris flows on the flanks of Mt Wellington. To this end MRT is assisting the Glenorchy City Council to investigate options for mitigation of the risk. The landslide team are currently producing hazard maps of the Launceston area to be followed by the North West Coast.

The TIGER landslide database forms a critical data foundation for the landslide project. Currently there are over 1500 records from throughout Tasmania and as resources become available the information will become available live on the internet.

For many years MRT has monitored a number of active landslips that have affected roads, railways and subdivisions. Work has continued on assembling historical information on movement history and damage, and placing this into the landslide database and GIS. This knowledge is being passed onto councils and consultants on request.

Setting and monitoring of standards for exploration activities

MRT is responsible for ensuring that all exploration activity in Tasmania achieves the highest environmental standards and complies with the *Mineral Resources Development Act 1995* and the requirements of other legislation which protects, for example, threatened species and cultural heritage.

The fourth edition of the *Mineral Exploration Code of Practice* outlines the current requirements, the approvals process, and the controls and monitoring procedures that MRT has in place. The Code will be reviewed in the coming year to maintain consistency with the *Tasmanian Reserve Management Code of Practice*.

During the year 72 exploration work programs were submitted to MRT compared to 43 in the previous year. Of these programs 60 were approved, 30 of which were in reserves derived from the Regional Forest Agreement (RFA) and required assessment by the Mineral Exploration Working Group (compared to 14 in the previous year). The almost doubling of exploration work has required MRT to divert more resources to this area of operation to ensure that approvals meet all the legislative requirements in a timely manner.

To comply with the RFA, MRT has developed a system to spatially record exploration activity and attributes that chart the process of approval of individual work programs. All work programs, whether on Crown land, State Forest or private property, are entered on this system to give a complete record of all the environmental information relating to exploration.

The system has also been designed to provide ongoing information on the outcomes of rehabilitation of exploration activity. This system is currently being upgraded to ensure that independent compliance auditing of the exploration work approval system is adhered to and

that derived statistics reflect the requirements of the RFA and the recommendations of the Resource Planning and Development Commission.

Mining Leases

The *Mineral Resources Development Act 1995* provides for the State to grant titles for the extraction of minerals from mines and quarries. Titles are issued for larger scale operations with appropriate rehabilitation bonds and conditions. Shorter terms are preferred for small-scale remote operations to provide for regular environmental review.

At the end of 2004/2005 there were 653 mining leases in force of which 611 were granted and 42 were still in the application stage.

A total of 27 new leases and 93 lease renewals were applied for during 2004/2005. This took the overall total of applications and renewals currently being processed to 269, an increase of approximately 190% since the beginning of the 2004/2005 period.

The bond system was reviewed in conjunction with the Department of Primary Industries, Water and Environment, the Tasmanian Minerals Council and Extractive Industries Tasmania.

Important leases reviewed were for potential new alluvial tin operations in the Gladstone area by Van Dieman Mines plc; Allegiance Mining NL whose development application for mine production near Zeehan is being assessed by the West Coast Council and DPIWE; and Australian Titanium Minerals Limited, which plans to re-open sand mining operations at Naracoopa on King Island.

Town planning is an important constraint on the development of extractive operations. Submissions, representations and appeals were made to the Dorset, King Island, Clarence, Central Coast, Kentish, and Circular Head councils, concerning planning schemes or development applications.

Rehabilitation of Mining Lands Trust Fund

Funding to rehabilitate abandoned mines flows from an agreement between government and the mining and quarrying industries whereby a proportion of the royalty increase introduced in 1995 was to be allocated for rehabilitation.

In 2004/2005 works were undertaken at Balfour, St Helens and Red Hills to revegetate abandoned alluvial tin mines and former exploration activities. Public safety programs were carried out at Mt Bischoff, Zeehan, Balfour and Trial Harbour, mainly installing shaft covers. Funds were provided to the Parks and Wildlife Service for rehabilitation works on quarries at Rocky Cape and to the Royal Tasmanian Botanical Gardens for work on threatened species on former mine sites.

Special initiative — Core Library

The design of the core library extension was completed and construction has commenced. Because of difficulties in engaging contractors and technical issues, the estimated completion date of the project has been delayed until September 2005.

Royalty assessment

MRT is responsible for the collection of mineral royalties from Crown land tenements. Royalty is not a tax but a payment to the community for the purchase of non-renewable resources from the State.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered system, where royalty is paid on the net sales and profit from a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per cubic metre or per tonne basis.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the legislation. The audit program concentrates on the metallic mines which pay royalty based on net sales and profits.

Mineral royalties totalling \$18.4 million were collected during the 2004/2005 financial year. Royalty revenues have increased substantially over the past two financial years due mainly to much improved commodity prices, which have resulted in increased profitability of mining operations. Continued strong demand for commodities from China has pushed up the price of commodities, outstripping the rising Australian dollar.

Royalty revenues are again expected to be around their historically high level in the coming financial year, particularly with the Renison tin mine being re-opened following the purchase by Bluestone Tin Limited. Rising input costs could have some impact on mine profitability in the coming financial year.

Centre for Ore Deposit Research, Special Research Centre (CODES-SRC)

Funding is provided for support for CODES-SRC at the University of Tasmania, in conjunction with the Commonwealth Government and industry. The allocation is used to part-fund honours scholarships, and thus helps increase the knowledge of Tasmanian geology, particularly in the important fields of economic geology and mineralisation. The MRT Library receives a copy of each thesis, which is available for reference use.

CODES was successful in gaining funding for a Centre of Excellence in Ore Deposits and the close linkages with MRT will remain.

Dr A V (Tony) Brown

Director, Mineral Resources Tasmania and State Chief Geologist

Financial Performance

The 2004/2005 consolidated fund appropriation to Mineral Resources Tasmania was \$5.938 million. This funding consisted of:

- ❑ \$3.567 million for salaries for 54.33 full-time-equivalent staff, plus five temporary staff;
- ❑ \$1.953 million for operating expenditure including rent; and
- ❑ \$0.418 million for the Restoration of Degraded Mineral Lands (\$350,000) and a grant for the Tasmanian Government Mining Scholarships at the University of Tasmania CODES-SRC unit (\$68,000).

In 2004/2005, MRT's operating budget was cut by a further \$50,000, which was the second half of the required \$100,000 budget management strategy required in 2003/2004.

As part of the budget process, MRT was required to highlight further savings of \$187,000 from what could be considered low priority activities. MRT could also identify new initiatives to be funded, and could also seek funding under the Capital Investment Program. The budget savings exercise was not easy given the available funding only covers core activities.

Two initiatives were supported for further consideration; these were the Landslip Hazard Mapping and the Promotion of Tasmania's Mineral Wealth programs.

Of the \$187,000 savings identified, MRT was required to cut \$65,000 which effectively went to fund the ongoing \$85,000 Promotion of Tasmania's Mineral Wealth program, which was approved at agency level. The remaining \$20,000 for the program came from the agency contingency fund.

The Landslip Hazard Mapping program went to Budget Committee but was not supported.

Under the Capital Investment Program, MRT received \$465,000 for the Core Library extension stage 2.

Commonwealth funds of \$96,000 per year for two years were approved under the National Disaster Risk Mitigation Program to commence the landslip hazard risk assessment program.

MRT continues to keep a tight control over expenditures to ensure that the division gets value for its limited funding.

Outputs — Application of funds, 2004/2005

Tasmanian government agencies are funded on an outputs basis. The outputs represent the goods and services delivered by MRT, and the cost of delivering those services. The government purchases these goods and services to meet policy objectives. The total output figure does not equal the consolidated fund appropriation available to the division due to the fact that overheads associated with head office are loaded into outputs.

MRT has two outputs for general operating and two for administered payments.

	\$'000
1. Minerals exploration and land management	3,019
2. Tenement management of the exploration and minerals industry	2,632
3. Centre for Ore Deposits Research	68
4. Rehabilitation of Degraded Mineral Lands	350
Total	6,069

Descriptions of Outputs and Outcomes, 2004/2005

1. Minerals exploration and land management

This output covers:

- ❑ the provision of geoscientific data and resource information on Tasmania's metallic, industrial and hydrocarbon mineral endowment;
- ❑ promotion of mineral potential for the stimulation of exploration for metallic and industrial minerals and hydrocarbons; and
- ❑ geoscientific database development, maintenance, output and marketing, including the production of digital geoscientific maps and associated databases.

This outcome achieved its goal of dynamic minerals exploration and land management for Tasmania and offshore waters.

2. Tenement management of the exploration and minerals industry

This output provides for:

- ❑ the provision of geoscientific information essential for the effective and sustainable management of land and mineral resources;
- ❑ provision of advice to all levels of government and the public on land management issues;
- ❑ administration of mining legislation, including the issue of legal titles for mineral tenements;
- ❑ collation and recording of statistics relating to mining production and exploration; and
- ❑ the demand and monitoring of the collection of fees, rentals and royalties.

This outcome achieved its goal of effective and efficient tenement management of the exploration and minerals industry.

Revenue from fees and charges

Mineral Resources Tasmania collects royalties and rents and fees from mineral lands. These revenues are forwarded directly to consolidated revenue and are not available to MRT, except for offshore petroleum revenues which are utilised to administer the *Petroleum (Submerged Lands) Act 1967*.

Mineral royalties totalling \$18.5 million were collected during the 2004/2005 financial year which was a significant increase from the \$9.0 million collected in the

previous year. The increase was the result of very strong commodity prices as well as generally improved operating conditions at the mines, improving profitability. The Tasmanian royalty regime is structured so that companies pay a greater royalty in profitable times.

The operations of individual mines are detailed later in this review.

Mineral Resources Tasmania also collects rents and fees from mineral lands, which are forwarded directly to consolidated revenue. Rents and fees from mineral lands raised \$0.768 million in 2004/2005, which was within budget expectation but below the previous year due to less exploration licence applications being issued.

Increased revenues for petroleum rents and fees were received in 2004/2005 due to a major lease holder making two rental payments in that year. Revenues are then expected to return to the 2004/2005 target figure.

	<i>Target</i>	<i>Actual</i>	<i>Target</i>
	<i>04/05</i>	<i>04/05</i>	<i>05/06</i>
Royalties (\$,000)	8,000	18,501	18,000
Rents and Fees (\$,000)	714	768	714
Rents and Fees — Petroleum			
(net of administration) (\$,000)	56	112	56
Sales of Maps and Publications (\$,000)	14	14	14

Royalty assessment

MRT is responsible for the collection of mineral royalties from Crown Land tenements. Royalty is not a tax but a payment to the community for the purchase of non-renewable resources from the State.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the legislation. The audit program mainly concentrates on the metallic mines which pay royalty based on net sales and profits. Metallic mines pay the vast majority of royalty revenue.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered regime where royalty is paid on the net sales and the profit from a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per cubic metre or per tonne basis.

The two-tiered metallic and coal royalty consists of an ad valorem percentage payable on net sales, and a formula-based percentage of profits. This system requires mining companies to pay a fixed percentage of sales in royalty for ore extracted, and allows the community to benefit further in good times when a company is making a profit.

Following negotiations with the mining industry, new royalty rates were approved in August 1997, with the regime taking effect from 1 July 1997. Non-metallic rates increased from \$1.00 per cubic metre to \$1.20 per cubic metre, while it was agreed that metallic mineral and coal royalties would be increased incrementally over a number of years to the current full level.

The ad valorem rate for net sales is 1.6%. The profit component of the royalty regime is calculated via an exponential formula which increases the percentage of profit royalty paid as the mine's profit increases.

A royalty cap of 5% of net sales has been set so that high-cost, short-life mines are not discriminated against.

Mining companies that expand into downstream processing to produce a near pure specific metal can apply to the Treasurer to receive a 20% rebate on royalties payable. Companies that produce gold doré can apply to claim a 10% rebate on royalties.

The Treasurer has the discretion to increase the gold doré rebate to 20% depending on criteria such as the magnitude of investment undertaken and the benefit to the Tasmanian economy from the investments.

Major contracts awarded over \$50,000

<i>Contractor</i>	<i>Location</i>	<i>Tender</i>	<i>Period of contract</i>	<i>Estimated value of tender (\$)</i>
RJ Welsh and Son P/L	West Moonah	Expansion of core library	12 months	\$490 798

Consultancies less than \$50,000

<i>Consultant</i>	<i>Description of consultancy</i>	<i>Value of consultancy (\$)</i>
Pitt & Sherry Pty Ltd	Taroona inclinometers measurement and report	10 500
GHD	Design and manage shaft covers for Zeehan and Rossarden	16 063
Pitt & Sherry Pty Ltd	Draft remediation strategy for Zeehan	5 000
Nigel Bedford	Draft rehabilitation plan for Royal George	6 453
Gilby Vollus Architects	Design of core library extension	47 025

Mineral Resources Tasmania — Legislation and Committees

Legislation administered

- ❑ Mineral Resources Development Act 1995
- ❑ Mining (Strategic Prospectivity Zones) Act 1993
- ❑ Petroleum (Submerged Lands) Act 1982
- ❑ Beauty Point Landslip Act 1970
- ❑ Lawrence Vale Landslip Act 1961
- ❑ Rosetta Landslip Act 1992

Statutory bodies with MRT representation

- ❑ Nomenclature Board

Non-statutory bodies with MRT representation

- ❑ Ministerial Council for Mineral and Petroleum Resources (MCMPR) and associated Standing Committee of Officials, Task Forces and Working Groups
- ❑ ABS Mining Statistics User Advisory Group
- ❑ Australian Society of Exploration Geophysicists Data Standards Committee
- ❑ Australian Urban Regional Information Systems Association (AURISA)
- ❑ Chief Government Geologists Committee
- ❑ Government Geoscience Information Policy Advisory Committee and associated Working Groups
- ❑ CODES-SRC Advisory Board
- ❑ DPIWE Application Assessment Panel
- ❑ Crown Land Assessment Working Group
- ❑ Groundwater Coordination Committee
- ❑ Inter-Departmental Oceans Policy Working Group
- ❑ Land Information Coordination Committee (LICC)
- ❑ LICC Sub-committee — The List Management Advisory Group
- ❑ Mineral Exploration Working Group
- ❑ Mining Heritage Committee
- ❑ National Groundwater Committee
- ❑ Rehabilitation of Mining Lands Trust Fund Committee
- ❑ Tasmanian Statistical Advisory Committee

2004/2005 Performance Indicators

Growth in mineral exploration activity is essential for future development of the mineral sector and for the economic well being of Tasmania. Exploration activity is underpinned by updating and providing high quality geoscientific data relating to Tasmania's mineral resources. The activities of MRT are directed at the capture, storage and promotion of such information, with the increased availability of this information being measured and correlated with exploration investment. Enhancement of geohazard information is also of high importance to stakeholders of MRT, as is the effective administration of MRT's regulatory framework.

Achievement against internal targets

<i>Action</i>	<i>Target</i>	<i>Result</i>
Provide new data in areas with inadequate geoscientific coverage.	1. Collection of at least 200 km ² of primary digital geoscientific coverage per year. 2. Production of digital geoscientific coverage of ten 1:25 000 scale map equivalents per year.	1. No primary digital geoscientific coverage collected; resources utilised on developing TIGER system and completion of 3D model. 2. Fourteen new 1:25 000 scale maps produced and ninety-two 1:25 000 scale maps were upgraded.
Research and promotion of exploration of Tasmanian petroleum basins.	Promote one offshore area per year.	Eight offshore areas released and promoted at the APPEA and AAPG conferences.
Promote the geoscientific and mineral endowment aspects of Tasmania at various shows, industry conferences, press conferences, open days and other events.	Successful and timely presentation of promotional material at appropriate venues.	Direct promotional visits were made to companies in Canada and Australia. PDAC conference attended in Canada, Mining 2004 conference attended in Brisbane, and Society of Economic Geologists Predictive Discovery Under Cover Conference attended in Perth.
Prioritise and organise rehabilitation works on abandoned mining lands in compliance with the operation of the Abandoned Mining Lands Rehabilitation Trust Fund.	One major program to be completed each year.	Programs at former mine sites at Balfour, Mt Bischoff and St Helens were completed. Work continues in the Zeehan area.
Monitor environmental performance on exploration and mining tenements.	Field inspections as required.	Regular field inspections conducted. Development of compliance auditing system continued.
Digital geoscientific coverage of Tasmania's geohazards.	Completion of one map per year.	Map packages covering the Hobart and Glenorchy areas were completed. Work commenced in the Launceston area.
Digital geoscientific coverage of Tasmania's groundwater resources.	Completion of one map per year.	Compilation of twenty-one 1:100 000 scale groundwater maps and eight 1:250 000 scale groundwater prospectivity maps continued.

Achievement against external targets

<i>Target</i>	<i>2004/2005 result</i>	<i>2003/2004</i>
Increase exploration expenditure and maintain level at 2% of total Australian exploration expenditure.	Official ABS figures showed that exploration expenditure increased to \$8.3 million in 2004/2005, with Tasmania's share of Australian expenditure decreasing to 0.81%. MRT data indicated substantially higher expenditure.	0.97%
Increase level of exploration expenditure to a minimum of \$30 million per financial year.		\$7.6 million
Obtain an increase in the area held under Exploration Licence.	Area held under All Minerals and Non-metallic Exploration Licences increased to 11 819 km ² . A further 58 845 km ² is held for onshore oil exploration.	10 063 km ²
Obtain an increase in the number of Exploration Licences granted.	The number of Exploration Licences held increased to 240.	141
Obtain an increase in the percentage of Strategic Prospectivity Zones (SPZ) held under EL's.	The percentage of land in SPZ areas held under EL's increased to 9775 km ² .	9230 km ²

Mineral Resources Tasmania — Branch Activities, 2004/2005

During 2004/2005 Mineral Resources Tasmania consisted of five branches: Metallic Minerals and Geochemistry; Industrial Minerals and Land Management; Information Systems and Geophysics; Data Management; and Royalty, Finance and Administration.

Because of the integrated nature of the branches, outputs provided under the banner of the Tasmanian Geological Survey are contributed to by staff of all branches.

Metallic Minerals and Geochemistry

During 2004/2005, following completion of the Western Tasmanian Regional Minerals Program and the Three-Dimensional Geological Model of Tasmania, the Metallic Minerals and Geochemistry Branch was mainly involved in upgrading databases for delivery on the world-wide web. Significant effort was directed towards database testing and business development.

Geoscientific data generation

A project on the mineral potential of Tasmanian granites was successfully conducted with Geoscience Australia (GA) under very tight time constraints during the year. This is part of a broader project GA is conducting with all jurisdictions on the eastern seaboard. Highly successful field excursions to examine granites and associated mineralisation, attended by 17 people, and a one-day seminar, held in Hobart and attended by 52 people, marked the culmination of the project. Both events attracted favourable comment from participants.

A record seventy-five 1:25 000 scale geological maps were prepared for digital capture during the year. The high number of maps produced was largely due to having a dedicated geologist involved with the finalisation of the compilations of the geology of the Mount Read Volcanics, continued as an MRT initiative following completion of the WTRMP. A report was written on this work. Several other maps covering areas of northeast and northwest Tasmania were compiled. There was again some limited field checking in some areas, but primary geoscientific data acquisition was again essentially suspended for the year.

A small field project was done in the Kindred and Castra areas in northwest Tasmania to evaluate implications of changes in the geology of the Mount Read Volcanics as a result of interpretation of data from the Western Tasmanian Regional Minerals Program and the 3-D geological model. The text of a report on this work had been completed by the end of the year.

A new 1:500 000 scale compilation of the mineral deposits and metallogenesis of Tasmania was prepared.

During field checking, a new marine fossil (graptolite) locality was discovered in Mathinna Group rocks in northeast Tasmania. This is only the fourth such locality discovered and the discovery has significant implications on the understanding of the geology and controls on gold mineralisation. Photographs of samples have been sent to an expert in Russia for precise age determination.

A report on the geochemistry of Cambrian volcanic rocks from the Thomas Creek area, south of Macquarie Harbour, was complete apart from a contribution from an external collaborator.

A summary of the geology of carbonate replacement (skarn) deposits, economically the second most important type of mineral deposit in Tasmania, was made as part of a world-wide review for the centenary volume of *Economic Geology*.

Several branch members continued to prepare sections for the upcoming new volume on the geological evolution of Tasmania. Sections on Devonian granites and geological structures were completed.

Reports on rocks from far northwestern Tasmania and on the geology of the Norfolk Range–Sandy Cape area were prepared during the year.

Database development

The main work of the branch for the year involved continued contribution to testing of database structures for Project TIGER and verification and capture of data for incorporation in the new system.

A suite of changes to the Samples, Geochemistry and Observations module was completed during the year and testing commenced. Most historical rock sample catalogue data has been migrated to the TIGER platform. Rock type and stratigraphic information on some 9000 rock samples in the MRT collection was compiled.

Drillhole names were edited to a common standard and work commenced on a data dictionary and business rules for the drilling database.

Systematic verification of the mineral deposits database continued and the second series of changes to the database were tested and implemented.

Contributions were made to the development of a database for external references.

Core library

A successful application was made for Capital Investment Program funding to extend the Mornington core library in 2004/2005. Delay was experienced in gaining approvals, but construction had commenced by the end of the year.

The significant level of usage of the core library continued, with 65 visits during the year to inspect drill core, a 25% increase on the previous year.

No core was received during the year following a request by MRT not to submit any until the extension has been completed.

A report on safe handling of asbestos-bearing core was commissioned and equipment purchased. Training sessions on correct handling procedures will be held when the extension is completed.

Mineral exploration and other promotional activities

A paper outlining the state of mineral exploration in Tasmania was presented to the Tasmanian Minerals Council (TMC) Exploration Group meeting at Grindelwald in July 2004. Several branch members attended the next such meeting in Hobart on the day following the MRT granite and mineralisation workshop in May 2005. Holding the meetings on adjacent days maximised the attendance at both the meeting and workshop, particularly from interstate mineral company personnel. From presentations at the TMC meeting in 2005 and feedback during interaction with company personnel, it is clear that both the 3-D model and prospectivity analysis and information from the Western Tasmanian Minerals Program have been major stimuli both to exploration licence applications and the general level of mineral exploration in Tasmania.

A promotional display was held at the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) in Toronto in March 2005. Pre- and post-convention visits were made to companies in Toronto as part of an Australian delegation and also with a Tasmanian team.

Promotional displays were also held at the international Society of Economic Geologists Exploration Under Cover Symposium in Perth in October 2004 and at the Mining 2004 trade show in Brisbane in November 2004, where a paper entitled *Tasmania: new market creates new opportunities* was presented. Answers were provided to queries and requests for information at and after the events.

These activities were well received and resulted in applications for exploration licences.

Presentations and poster displays, including a live three-dimensional display of the 3-D geological model, were made during open days to senior stakeholders of MRT at Rosny Park in March 2005.

A promotional visit was made to fifteen companies in Perth over three days in June 2005.

Articles, promotional material and information on mineral prospectivity and exploration activities in Tasmania were prepared for various specialist mining journals. Regular two-monthly summaries of exploration activities in Tasmania were provided as part of global reviews for the international Society of Economic Geologists newsletter.

Branch members made contributions to displays held at the Burnie, Hobart and Launceston shows. In addition, the petrologist conducted displays and publication sales for the Hobart Gem and Mineral Exhibition in March 2005 and at the inaugural Zeehan Mineral Fair held in Zeehan in October 2004, and presented talks at schools.

One hundred and seven enquiries on gem and mineral matters were answered by the petrologist during the year.

Petrology

The petrologist supervises the petrological and lapidary laboratories, which service internal and external clients, as well as managing or supporting several projects and databases, and being involved with projects and general exploration administration.

The lapidary and petrology laboratories provided a total of \$40,635 worth of analyses and services to both DIER (\$14,255) and external clients (\$26,380). Most of this external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 253 standard thin sections and seven other sections, making a total throughput of 260 samples. Most of these were done on an as-needed basis by our field assistant; this work was valued at \$6,285.

The technical officer for petrological services processed 382 samples by X-ray diffraction, including 135 quantitative dust analyses. He also conducted 30 soil and sizing tests and 401 optical asbestos identifications, for a total of 813 samples processed, valued at \$34,350. About half of his time was spent preparing samples for, and operating, the XRF for the geochemistry section.

A total of 661 external samples were received for investigation, mostly by X-ray diffraction analysis. These samples included 487 for occupational health clients, 23 soils, 16 construction materials, 23 industrial samples, three forensic samples, and 104 general rocks and other samples. This work came from a wide range of external sources, including the Transport and Workplace Safety branches of DIER, Police Tasmania, Hydro Tasmania, DPIWE and other government departments; the University of Tasmania (staff and students), various mining, mineral processing and mineral exploration companies, environmental and occupational health consultants, the general public and miscellaneous businesses. A review of charges was undertaken.

Samples studied included geological materials (construction materials, mineral concentrates, ore samples, rocks, soils, sands, and clays), and anthropogenic materials (including forensic samples, concretes, asbestos sheeting, industrial materials, dusts, acid drainage, etc). Forensic studies continued with work for Police Tasmania.

Considerable time was taken in an overhaul and realignment of the XRD unit. Two digital cameras were also serviced and maintained.

Geochemical laboratory

During 2004/2005 the laboratory was staffed by a senior chemist and a technical officer. A geologist/geochemist and another technical officer provided part-time assistance. Although our sample preparation technician does most of the water analyses, the laboratory is undermanned due to the absence of a 'specialist' chemist/technician in instrumental/wet chemistry. Absence or leave of any

personnel severely limits the ability of the laboratory to supply anything other than provisional results.

The laboratory generates the chemical/geochemical data necessary to maintain Mineral Resources Tasmania's databases. A total of 349 samples, consisting of 144 water samples, 153 rocks and 52 minerals or products, were submitted for 8673 individual determinations during the year.

A total of 394 samples were assayed for 9279 individual determinations. The analysed samples comprised 116 waters, 202 rocks and 76 minerals or products.

Smooth running of the upgraded sample and dust extraction unit continued during the year as a result of careful operation and good maintenance by the operator.

Improved sample boxes used to store crushed and ground samples on pallets have been introduced. This now allows for prepared sample packets to be progressively stored while also giving ease of accessibility.

The Leco Induction Furnace continues to function well after replacing capacitors and resistors last year at a cost of \$2,600. This avoided the need to purchase a replacement instrument valued at about \$45,000.

Careful operation and maintenance has kept the XRF unit and AA instruments operating in a stable condition throughout the year. The data generated by the XRF, as a result of minor alterations to the Windows-based software operating system, is more easily incorporated into the TIGER databases. Apart from saving time on the operation of the unit and data processing, this will further limit the possibility of data transposition errors. The data from the Register of Chemicals is now available in Excel format to complement the XRF, Laboratory Register of Chemical Analyses and water analyses already in Excel format. This allows new data to be freely accessible through the TIGER System.

Other activities

- ❑ Meetings of the Future Together Core Group and associated groups were attended during the year.
- ❑ Four staff members are on safety and workplace harassment committees.
- ❑ A new safety system of communication for staff members engaged in field work was developed and implemented.
- ❑ A branch member is a member, and was convenor for part of the year, of a committee to prepare authority tables for the National Geodata Model, a working group established under the Government Geologists Information Policy Advisory Committee. As part of this work, authority tables for the National Geodata Model were completed and a report on the meeting of the group, held in Melbourne in June 2004, was prepared.
- ❑ Four geologists attended and provided a promotional presentation at the international Society of Economic Geologists Exploration Under Cover Symposium in Perth in October 2004. Follow-up answers to queries were provided.
- ❑ Mineral exploration report and exploration performance assessments were carried out as needed, as was preparation of promotional leaflets for Exploration Release Areas. Particular attention was placed on monitoring performance on exploration licences.
- ❑ Site visits were made to various exploration project sites and mines during the year as a part of reviewing industry progress.
- ❑ Many requests for information on geology, mineral resources, minerals and related matters were received and dealt with promptly.
- ❑ Meetings of the Tasmanian Statistical Advisory Committee were attended during the year.
- ❑ Contributions were made to business process development for tenement administration, mines inspections and publication guidelines during the year.
- ❑ Training sessions on MapInfo GIS software, Oracle Discoverer and four-wheel drive handling were attended by geologists and staff members undertook other self development training during the year.
- ❑ The geologist/geochemist attended a three-day workshop on laboratory quality assurance procedures.

Industrial Minerals and Land Management

This branch is responsible for the investigation and promotion of industrial minerals, including coal and hydrocarbons; the management of mineral tenements, land access issues and environmental control of exploration activity; and the protection of mining heritage. It is also responsible for providing information for the management of groundwater resources and geohazards, especially land stability.

Strategic Prospectivity Zones

Strategic Prospectivity Zones (SPZ) cover 25 200 km² or 37% of Tasmania. The areas in each SPZ occupied by mining tenements at the end of June 2005 are shown below.

SPZ	Metallic		Non-metallic	
	Area (km ²)	Occupied (%)	Area (km ²)	Occupied (%)
Adamsfield	69.7	94.6	3.0	4.1
Arthur	661.5	59.8	382.3	34.5
Balfour	462.8	11.8	392.9	10.1
Beaconsfield	19.0	99.9	0.8	3.9
Cape Sorell	364.0	26.3	0.0	0.0
Mount Read	2972.3	41.5	134.5	2.0
North East	3437.4	35.4	286.5	2.9
Zeehan/Waratah	762.0	41.6	246.7	13.5
	(8328.6)		(1446.6)	

In comparison to last year's occupancy for metallic minerals, the Mount Read SPZ has increased from 26.63% to 41.45%, the North East SPZ has increased from 34.95% to 35.40%, and the Zeehan/Waratah SPZ has decreased from 54.56% to 41.55%.



Petroleum exploration and production

Twelve offshore permits and two onshore permits are currently held for oil and gas exploration, two production licences are held over the Yolla and Thylacine fields, and a retention lease is held over a small acreage adjacent to the Yolla field. No hydrocarbons are produced in Tasmania or offshore waters, but gas production from the Yolla field is expected to commence in early 2006, and from the Thylacine field in mid 2006.

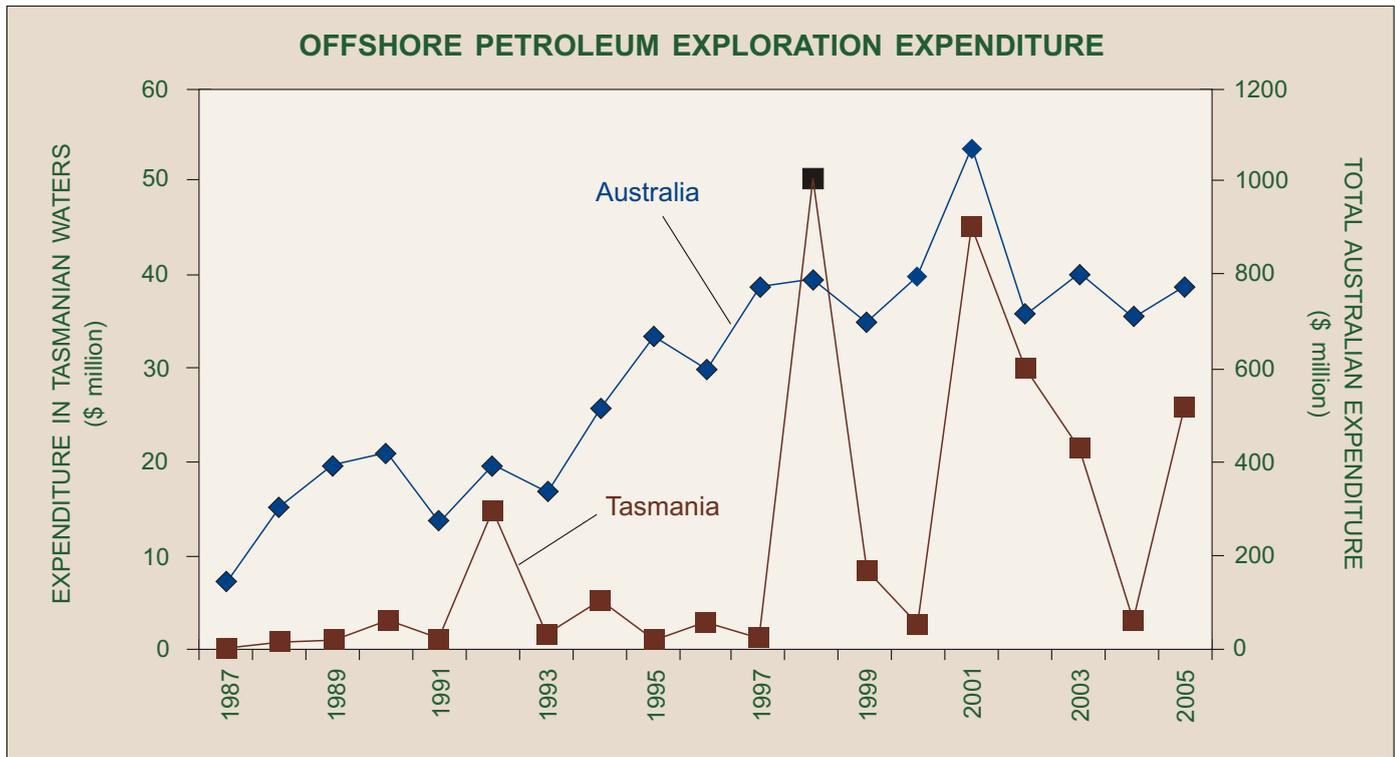
The production licence over the Yolla gas-condensate field in the Bass Basin is held by a consortium headed by Origin Energy Resources Limited and AWE Petroleum Limited. The BassGas project to develop the Yolla field involved construction of a production platform, two development wells and an undersea pipeline to a processing plant onshore Victoria near Lang Lang. The infrastructure was substantially completed by late 2004, but production of gas has been delayed by technical and safety issues. Once commissioning is completed in 2006, this project is expected to supply around 10 per cent of Victoria's natural gas needs for 15 years.

Woodside Energy Limited, on behalf of the Otway Gas consortium, was granted a production licence in July 2004 for the development of the Thylacine gas field, discovered in 2001 in the Otway Basin northwest of King Island. Thylacine will be developed concurrently with the neighbouring Geographe field, in Victorian waters, and the gas will be piped to a processing plant near Port Campbell in Victoria. Production is expected to commence in mid 2006 to supply the growing southeast Australian gas market.

In December 2004, a joint venture headed by Origin Energy Resources Ltd completed the Trefoil-1 exploration well, discovering liquids-rich gas 25 km to the west of the Yolla field. Further work, including a 3D seismic survey planned for late 2005, is required on the Trefoil field before an estimate of recoverable reserves can be made. Santos Limited completed a 632 km 2D seismic survey west of Strahan in the Sorell Basin in January 2005.

Total Tasmanian offshore petroleum exploration expenditure for 2004/2005 was approximately \$26 million. The total offshore petroleum exploration expenditure for Australia in this period was \$775 million.

Four new offshore exploration permits were granted in the Bass Basin and one in the Otway Basin during 2004/2005. The new explorers in the Bass Basin include Benaris Petroleum NV, 3D Oil Pty Ltd, Galveston Mining Corporation Pty Ltd and Exoil Limited. Santos Ltd were granted the new permit in the Otway Basin. Three additional areas, that had been released for competitive work program bidding in early 2004, received no bids and were re-released with a closing date of 21 October 2005. One of these areas, T2004-5 (Sorell Basin), is a Designated Frontier Area, allowing an immediate uplift of 150% on Petroleum Resource Rent Tax deductions for exploration expenditure incurred in the area. MRT staff have been actively involved in promotion of the offshore release areas,



most importantly at major industry conferences. Staff attended the APPEA conference in Perth in April 2005 to promote the offshore acreage.

Cataloguing of sample collections related to offshore petroleum exploration continued during the year. Sixty-four reports received during the year were indexed. Most open-file exploration reports can now be viewed and downloaded from the MRT website.

Onshore, two Special Exploration Licences are held for petroleum exploration, one by Great South Land Minerals Limited and the other by Primeline Petroleum Corporation. OME Resources Australia Pty Ltd holds a Special Exploration Licence for coal bed methane.

Tasmanian Natural Gas Pipeline

Alinta DTH Pty Limited acquired the Tasmanian Natural Gas Pipeline (TNGP) from Duke Energy International in April 2004. The TNGP transports natural gas from Longford in Victoria to Bell Bay, Hobart and Port Latta via approximately 740 km of onshore and offshore pipeline. The gas is sourced from the Gippsland Basin in Bass Strait and made available, via the TNGP, to industrial and domestic markets in Tasmania.

The TNGP project expands the gas market in southeast Australia. A total of 20 permanent staff is employed to operate the pipeline, most of them based in Tasmania.

Industrial minerals

Tasmania Magnesite NL holds retention licences over the large, high-grade magnesite deposits at Arthur River and Lyons River in western Tasmania, and is actively seeking a buyer for the licences.

Mineral Holdings Australia Ltd continues to seek a joint venture partner for the development of dolomite and limestone resources in northwest Tasmania. The company

wishes to develop an export industry based on chemical, industrial and agricultural carbonate products.

The proposal to develop heavy minerals beach sands at Naracoopa, on King Island, by Tasmanian Titanium Pty Ltd, has received all necessary approvals from the King Island Council and the Tasmanian Government. Construction of the processing plant is due to begin in the third quarter of 2005. An eight-year mine life is anticipated, with employment for up to 60 people.

Maydena Sands Pty Ltd holds a retention licence over the Maydena/Pine Hill silica flour deposit. Sampling, testing and marketing of this deposit continued.

Environmental management

The number of exploration work programs submitted for approval has doubled from those submitted in the previous year. This increase has resulted in additional resources being allocated to MRT to ensure that the approvals process meets the environmental and compliance requirements of the Regional Forest Agreement and is both thorough and timely.

Compliance auditing

In 1998/1999 MRT developed a GIS-based system to record and monitor the approval process for exploration programs. A clause in the Regional Forest Agreement (RFA) states that MRT must audit compliance with the *Mineral Exploration Code of Practice*. Following the development of TIGER the decision was taken in 2003/2004 to convert the auditing system to the new corporate database structure to ensure that MRT was meeting the requirements of the RFA. Functional requirements were completed in late 2004 and the in-house redevelopment has continued as resources became available. Progress has been slow but as extra resources have now been allocated to this project the outstanding

parts of the redevelopment will be outsourced during 2005/2006.

Seventy-six work programs were submitted to MRT during the year compared with 42 in 2003/2004. Of those received, seventy were approved (two were withdrawn, three have since been approved and one is still pending). Thirty work programs were within CAR Reserves and required comment from the Mineral Exploration Working Group. Members of the Mineral Exploration Working Group attended a number of on-site field inspections during the reporting period.

Table 1 summarises the types of activities approved, within a broad division of Tasmania's land tenure system.

Table 1: Activities approved

Activity	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill sites	20	10	53	40	30	0
Tracks (m)	2400	900	2330	2250	220	0
Costeans (m)	100	0	100	50	0	0
Helipads	2	4	2	2	0	0
Bulk samples	3	0	28	4	0	0

A total of 3.82 hectares of on-ground disturbance was recorded through the year. Table 2 shows the breakdown of the disturbance for the different land tenures and activity types.

Table 2: Area of disturbance

Activity (ha)	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill sites	0.09	0.05	0.18	0.19	0.14	0
Tracks	1.09	0.40	0.94	0.73	0	0
Costeans	0	0	0	0.02	0	0
Helipads	0.04	0.12	0.08	0.08	0	0
Bulk samples	0.01	0	0.20	0.02	0	0
Camp site	0.01	0.01	0	0	0	0
Total (ha)	1.24	0.58	1.40	1.04	0.14	0

Of the 3.82 hectares of disturbance, 1.57 hectares were rehabilitated during the year, with the remainder to be rehabilitated through the life of the licence. It is a licence condition that all earth-moving disturbance will be rehabilitated on or before the expiry of the licence and prior to the return of the environmental bond.

In Table 3 the area that has been rehabilitated is shown for each activity and land tenure category. A percentage of the area rehabilitated against the disturbances is also shown. Approximately 41% of the area disturbed in the reporting period, for all land categories, has been rehabilitated.

A total of 179.7 line kilometres of gridding was undertaken during the year, with the division between land tenures presented in Table 4 (High Quality Wilderness overlies other Land Tenures).

Table 5 presents the running totals for the last four years of the area disturbed and area rehabilitated.

Approximately 70% of overall disturbance has been rehabilitated. Disturbances are no longer counted as such if:

- no further rehabilitation work is required of the explorer;
- the area is taken up as a Mining Lease.

As High Quality Wilderness is an overlying layer on the above land tenures it is treated separately (Table 6).

Table 3: Area rehabilitated

Activity (ha)	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill sites	0.08	0.03	0.04	0.10	0.08	0
Tracks	0.61	0.25	0.25	0	0	0
Costeans	0	0	0	0.02	0	0
Helipads	0	0.08	0.08	0.08	0	0
Bulk samples	0.01	0	0.20	0.02	0	0
Camp site	0	0	0	0	0	0
Total area rehabilitated	0.7	0.36	0.57	0.22	0.08	0
Total area disturbed	1.24	0.58	1.40	1.04	0.14	0
Percentage of overall disturbance rehabilitated	56	62	40	21	57	0

Table 4: Distribution of gridding

	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
	80.2	18.5	67	20.5	12	0

Table 5: Disturbance and rehabilitation over three years

Year	Car Reserve System	State Forest	Crown Land	Private Property	HEC Land	Total
Disturbance (ha)						
2001/2002	0.42	0.32	0.05	0.16	0.05	1.00
2002/2003	0.07	2.30	0.25	0.02	0.02	2.66
2003/2004	0.44	0.97	0.03	0.10	0	1.54
2004/2005	1.24	1.40	1.04	0.14	0	3.82
Total disturbance	2.17	4.99	1.37	0.42	0.07	9.02
Rehabilitated (ha)						
2001/2002	0.21	0.32	0.05	0.16	0.05	0.79
2002/2003	0.07	2.30	0.25	0.02	0.02	2.66
2003/2004	0.44	0.72	0.03	0.10	0	1.29
2004/2005	0.70	0.57	0.22	0.08	0	1.57
Total rehabilitated	1.42	3.91	0.55	0.36	0.07	6.31
Percentage of overall disturbance rehabilitated						
	65.4	78.3	40.1	85.7	100	69.9

Table 6: Disturbance and rehabilitation, High Quality Wilderness areas

Year	Disturbance (ha)	Rehabilitated (ha)	Percentage of overall disturbance rehabilitated
2001/2002	0	0	100
2002/2003	0	0	100
2003/2004	0.50	0.50	100
2004/2005	0.58	0.36	62
Total	1.08	0.86	79.6

Codes of Practice

The fourth edition of the *Mineral Exploration Code of Practice* is a code under the *Mineral Resources Development Act 1995*. This code is due for review as specified in the Resource Planning and Development Commission *Inquiry into areas to be reserved under the Tasmania–Commonwealth Regional Forest Agreement*. As project funding was not made available during the past financial year the preparation of the fifth edition of the *Mineral Exploration Code of Practice* has been delayed and it may be ready for public comment in 2006.

The second edition of the *Quarry Code of Practice* is a code under the *Mineral Resources Development Act 1995* and is due to be reviewed in the coming year.

Mines inspection

Improved demand and metal prices have dramatically changed the performance and prospects of mining operations over previous years.

The development of a potential nickel mine near Zeehan by Allegiance Mining NL is a prominent example. An exploration decline has been completed and the ore definition drilling program is progressing to develop a bankable feasibility study. Development applications for the mine to produce 320 000 tonnes per annum have been made, with the West Coast Council granting development approval on 30 June.

Bluestone Tin Limited continued dewatering the Renison tin mine to permit underground production. Refurbishment of underground infrastructure and the concentrator was completed. Production problems have gradually been overcome and the mine is producing at 40 000 tonnes of ore per month. Small-scale tin mining operations near Granville Harbour and at South Mount Cameron have also benefited from the resurgence of demand for the metal. Both areas have been idle since the mid 1980's.

Stemcor Holdings Ltd acquired the Savage River iron ore mine operated by Australian Bulk Minerals. Although the operation is planned to cease open-cut mining in 2008, investigations into developing an underground operation in North Pit are proceeding.

Cornwall Coal NL has successfully undertaken trials for the use of its product at TEMCO at Bell Bay. The company developed an open-cut mine at Cullenswood near St Marys to augment underground production at the Duncan Colliery. Rehabilitation is progressing at former operations at the Huntsman open cut and Blackwood colliery at Mt Nicholas.

Planning is proceeding for tungsten and titanium operations on King Island and for tin mining at South Mount Cameron, Scotia near Gladstone, and at Mount Bischoff. All are historically operated mines which have been closed for several years.

Less prominent was Zinifex Australia Limited (Mining) which conducted a review of the stability of the Bobadil tailings dam at Rosebery which is central to the mine's operation.

Leasing

A dispute with neighbours affected by road traffic from a pit near Boys and Plummers roads, southeast of Smithton, exposed problems with the regulation of 'level 1' permits when production rates increase. Permits were subsequently approved for the operation with conditions to control nuisance.

Planning issues

Submissions were drafted for planning schemes which were under review.

The Kentish and Central Coast planning schemes did not reflect mining provisions of the Regional Forest Agreement or the State Reserve system and submissions were made to redress this subject.

Amending the Clarence Planning Scheme has encountered difficulties with consequences for extractive industries. Existing sand operations at South Arm are approaching depletion, and rezoning of a section of the Seven Mile Beach Protected Area is urgently required if the long-term provision of concrete sand for the Hobart region is to be met. MRT is preparing a submission for rezoning in order to make an individual application.

The Dorset Planning Scheme inadvertently prohibited the development of extractive industries or mining for all but small-scale operations. With important potential mining developments, and 60 operating leases being non conforming, it was considered essential to make submissions for the revision of the planning scheme. An amendment providing for discretionary approval of extractive industries by Council was passed in June.

Objection was made to several development applications in close proximity to mineral operations:

- ❑ At Circular Head representations were made to prevent residential development during the subdivision of land containing a quarry.
- ❑ At Grassy, on King Island, a subdivision was approved immediately adjacent to the former King Island Scheelite mine. MRT had concerns that potential mine development may be compromised and objected to the permit.
- ❑ Representation was made concerning a second permit application, for a residential extension to the golf course, at Grassy near the former mine.

DIER held town planning seminars in regional centres covering transport policy. MRT joined the seminars, giving presentations on land stability, groundwater protection and access to minerals.

Rehabilitation

Mine rehabilitation was carried out at abandoned alluvial tin mines near St Helens, at abandoned mine sites at Balfour and Zeehan, and of exploration sites at Red Hills. Shaft protection programs were carried out at Mt Bischoff and weed control was undertaken at the Queensberry, Argent and Florence mine sites. This work was funded by the Rehabilitation of Abandoned Mining Lands Trust Fund. A detailed report is provided later in this review.

Heritage protection

During rehabilitation works at Storys Creek in 2003, jigs and other equipment were salvaged and relocated in order to restore the historical content of the remains of the mine site. Some of the equipment was subsequently removed and sold for scrap. Following a complaint by MRT the police located the individual responsible who was fined \$300 and ordered to pay compensation to MRT of \$800, the sum he had received for the scrap. The remaining material has been tidied up and enclosed by a fence.

Savage River Rehabilitation Program (SRRP)

This program is carried out in partnership by the Department of Primary Industries, Water and Environment and Australian Bulk Minerals.

A peer review of the program was carried out and provided a draft report to date. Waste management on the mine and encapsulation of historic B Dump is considered to be carried out to best practice. The low phreatic surface in the Main Creek tailings dam indicates it is physically stable, although the risk of tailings oxidising may be higher than previously estimated. Consequently the priority of

addressing acid drainage from this dam and the Old Tailings Dam will be increased. Trials have been conducted to prove the most cost effective means of water treatment in the event of mine closure. Magnesite is available on the mine and treatment trials using this material have given promising results.

Mt Lyell remediation

Historic copper emissions into the Queen and King rivers are a major component of the acid emissions from the site. Removal will provide an environmental gain in Macquarie Harbour. A collaborative program between the Commonwealth and the State, utilising National Heritage Trust funds, is administered by the Department of Primary Industries, Water and Environment. The program follows extensive investigations in recent years and has commenced with a program of water treatment at Queenstown. The selected treatment method is copper cementation, which is a proven process. Initial planning has commenced for plant design, drafting an environmental management plan, and approval for the project. Sale of copper is expected to pay for treatment.

Registry Section

The Registry Section maintains a number of mining tenement registers in hard copy and electronic format. The section provides advice to officers within MRT, inquirers from other agencies, the mining industry, the legal profession and the general public on a wide range of matters associated with mining tenements and legislation.

The processing of applications for mining tenements and issue of tenement documentation continues to provide the majority of work for the section's officers.

Close liaison is maintained with professional geological officers of MRT, particularly in relation to maintenance of the TASXPLORE database, monitoring of exploration expenditure, circulation of company reports, and preparation and circulation of the *TasXplorer* news sheet.

The section liaises with a number of other agencies in regard to tenement applications and provides information to field staff who monitor on-ground activity on mining tenements.

Requesting and collation of production and expenditure statistics is an important activity carried out by the section. These statistics provide the basic data for collection of royalties and assessment of exploration levels.

Sixteen Exploration Release Areas (ERA) were offered to potential explorers by way of the *TasXplorer* news sheet, which is circulated widely within the Australian mining community. The news sheet is sent to 219 clients of MRT by facsimile (63) and post (156), and is also available on the MRT website. Applications were received for areas within four advertised ERA's resulting in five exploration licence applications over 219 km² and one mining lease over five hectares.

Officers of the section play a key role in maintenance of the TASXPLORE and REGIS modules within the TIGER database management system.

Mining legislation

The *Mineral Resources Development Act 1995*, which came into force on 1 July 1996, is the principal legislation relating to the management and regulation of mining tenements in Tasmania.

Mineral Resources Tasmania provides information through Service Tasmania outlets, and forms approved under the *Mineral Resources Development Act 1995* are available via MRT's web page or on disc.

Mining Tribunal

Under the *Mineral Resources Development Act 1995*, a Mining Tribunal, consisting of a magistrate, has coverage of all areas of Tasmania. Magistrate Michael Hill, who has acted as the Mining Tribunal for some years, has been temporarily seconded to the position of acting judge in the Supreme Court. The position of Mining Tribunal has been filled by magistrate Zygmunt Szramka, who is based in Launceston.

The Act places an obligation on the Director of Mines to attempt to resolve disputes before there is a formal hearing before the tribunal. In effect this usually consists of an informal meeting, arranged by the Registrar of Mines, between the parties.

Experience to date suggests that the dispute resolution process required by the Act adequately covers most situations that would otherwise require formal determination.

Tribunal claims lodged with Mineral Resources Tasmania during the year, were:

- 74214 *C and J Creagh v J J Stewart & P W Askins* — ELA 28/2004, *Scamander*
Objection by land owner. Objection withdrawn after explorer agreed not to enter objector's land.
- 74218 *Brambles Industrial Services v G A & P M Clarke* — 1218P/M, *Ridgley*
Application for determination of compensation. Mediation conducted by Registrar. Draft compensation agreement agreed to by parties on a year to year basis.
- 74220 *D K Crawford and P & G de Burgh-Day v Southern Ocean Science Pty Ltd* — ELA 46/2004, *Lorinna*
Objections lodged by land owners. Mediation conducted by Registrar. Referred to Mining Tribunal for formal determination.
- 74221 *Tarkine National Coalition v Zinifex Australia Limited* — ELA 41/2003, *Mount Kershaw*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74223 *G Hollingsworth v Geoinformatics Exploration Australia Pty Ltd* — ELA 52/2004, *Loyetea*
Objection lodged by private individual. Mediation conducted by Registrar. Objection withdrawn.
- 74224 *Tarkine National Coalition Inc v Zinico NL* — ELA 41/2004, *Nelson Bay River*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74225 *Tarkine National Coalition Inc v Zinico NL* — ELA 42/2004, *Mount Bertha*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74226 *Tarkine National Coalition Inc v Geoinformatics Exploration Australia Pty Ltd* — ELA 54/2004, *Lake Rosebery*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74227 *J Wrigley v Zinico NL* — ELA 40/2004, *Adamsfield*
Objection lodged by holder of water right. Mediation conducted by Registrar. No resolution to date.
- 74229 *Freshwater Creek Pty Ltd v Kimbolton Coal Company Pty Ltd* — 1679P/M, *Hamilton*
Dispute between land holder and lease holder. Mediation conducted by Registrar. No resolution to date.
- 74234 *Tasmanian Conservation Trust Inc v Metal Sands Ltd* — ELA 56/2004, *Sea Elephant Bay*
Objection lodged to highlight natural values of areas within application area. Mediation conducted by Registrar. Objection withdrawn.
- 74236 *J Wrigley v Southern Ocean Science Pty Ltd* — ELA 62/2004, *Adamsfield*
Objection lodged by holder of water right. No resolution to date.
- 74237 *L Harrison v Southern Ocean Science Pty Ltd* — ELA 61/2004, *Surges Bay*
Objection lodged by land holder. Withdrawn after discussion with Registrar.
- 74243 *Tarkine National Coalition Inc v Geoinformatics Exploration Australia Pty Ltd* — ELA 3/2005, *Huskisson River*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74244 *Tarkine National Coalition Inc v Geoinformatics Exploration Australia Pty Ltd* — ELA 54/2004, *Lake Rosebery*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74246 *Oceania Tasmania Pty Ltd v L Procter* — 123M/1947, 43M/1985 & 19M/1995, *Comstock*
Appeal against caveat. Appeal successful.
- 74247 *Tarkine National Coalition Inc v Primeline Petroleum Corporation* — SELA 5/2000, *Northern Tasmania*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74248 *Tarkine National Coalition Inc v Regency Resources Ltd* — ELA 11/2005, *Pipeline Road*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74249 *Tarkine National Coalition Inc v Regency Resources Ltd* — ELA 10/2005, *Arthur River*
Objection lodged by conservation action group. Mediation conducted by Registrar. Objection withdrawn.
- 74251 *F K H Scheppein v P & A Stenzel* — 1M/1993 & 5M/1997, *Rossarden*
Claim for determination arising out of partnership dispute. Referred to Mining Tribunal.
- 74257 *Lefroy Resources Limited v F C Bardenhagen* — ELA 13/2005
Objection lodged by competing applicant. Objection withdrawn.

Lease Applications, 2004/2005

Total number of all types of exploration rights held as at 30 June 2005

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Exploration Licences —		
Category 1 (Metallic minerals)	151	8 686 km ²
Category 2 (Fuel minerals)	1	61 km ²
Category 3 (Construction minerals)	30	88 km ²
Category 4 (Oil — onshore)	3	58 845 km ²
Category 5(a) (Industrial minerals)	35	1 376 km ²
Category 5(b) & 5(c) (Gemstones)	20	1 608 km ²
Retention Licences —		
Category 1 (Metallic minerals)	16	83 km ²
Category 2 (Fuel minerals)	5	170 km ²
Category 3 (Construction minerals)	14	78 km ²
Category 5(a) (Industrial minerals)	17	88 km ²
Category 5(b) & 5(c) (Gemstones)	3	17 km ²
Prospectors Licences issued	97	Not applicable
Permits to explore for petroleum under the Commonwealth <i>Petroleum (Submerged Lands) Act 1967</i>	12	627 Blocks
Retention Licence under the CPSLA 1967	1	5 Blocks
Pipeline licences held under the CPSLA 1967	3	
Pipeline licences held under the Tasmanian <i>Petroleum (Submerged Lands) Act 1982</i>	1	
Production licences held under the Tasmanian <i>Petroleum (Submerged Lands) Act 1982</i>	2	

Leases applied for

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	1	392
Easement	1	54
Gold	1	48
Gravel	13	154
Sand	1	3
Sand and gravel	2	52
Sand and stone	1	4
Sandstone	1	2
Stone	3	104
Stone and gravel	2	15
Tin	1	25
Total	27	853

Leases granted

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	1	597
All minerals and stone	1	594
Gravel	12	138
Gravel and clay	1	5
Peat	1	9
Sand	5	57
Sand and gravel	3	249
Specimens	1	7
Stone	3	14
Stone and gravel	3	49
Tin	1	9
Total	32	1728

Total number of leases in force at 30 June 2005

<i>Principal product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	31	19 593
All minerals and stone	5	5 680
Clay	6	88
Coal	2	6 289
Copper	1	5
Dolerite	1	40
Dolomite	3	238
Easement	17	338
Gold	15	1 011
Granite	4	50
Gravel	175	2 954
Gravel and clay	2	34
Lime sand	4	219
Limestone	11	1 266
Magnesite	2	1 167
Magnesite, silica and talc	1	29
Magnetite	1	55
Nickel	1	400
Ochre	1	15
Peat	1	9
Quartzite	1	191
Sand	52	3
Sand and gravel	24	1 503
Sand and stone	10	324
Sandstone	5	34
Shale	3	35
Silica	3	306
Silica sand	1	20
Silica, sand and stone	1	50
Slate	3	165
Specimens	14	90
Stone	219	5 101
Stone and gravel	23	442
Tin	8	334
Umber	1	6
Total	652	48 084

Urban Geology and Groundwater Section

This section provides geoscientific information for the management of groundwater resources, waste disposal sites, and geohazards, especially land stability. By ensuring relevant geoscientific data are available to the public and private sectors, better land-use decisions can be made.

Land stability

Land stability is a major issue in Tasmania with many houses being damaged or destroyed over the years. The main focus for the year has been on the production of landslide hazard maps for urban areas. These maps help identify potential risks to structures and society. MRT is working in partnership with local government to ensure the maps include knowledge of past landslides and other geological information that is held in council files. Such knowledge underpins the hazard map methodology and ensures a robust depiction of the potential hazards for the area. The Australian Government has supported the project by providing funding from the Natural Disaster Risk Management Studies Programme and the successor Natural Disaster Mitigation Programme. This has enabled the scope of the project to be expanded and work to be undertaken more quickly.

The Hobart and Glenorchy maps were completed this year. Each study area contains a package of maps detailing the landslide inventory, geomorphology, geology and rockfall, debris flow and deep-seated landslide hazards. Presentations have been made to stakeholders to outline the main findings, with catastrophic debris-flows emanating from Mt Wellington being identified as the most significant risk. The maps are freely available products that can be supplied in paper or digital format.

Work has started on the Launceston map area, with good progress to date. Among the notable activities was a successful stratigraphic drilling program in South Launceston, which provided critical information about the infamous Lawrence Vale landslide and neighbouring landslides.

The Geohazards (landslide) database is a critical infrastructure underpinning the section's activities. The database stores a range of information relating to landslides and associated investigations. Data is routinely added from both internal MRT sources and external sources such as local government. MRT is encouraging external parties to feed the results of investigations into the database where appropriate.

Groundwater

Groundwater is a precious resource in Tasmania that contributes considerably to the prosperity of the State by underpinning various forms of primary industry. As

demands for water increase, careful management is required to ensure long-term sustainable use and to prevent contamination through over-extraction. Inappropriate use of groundwater is leading to salinity problems on farmland in some parts of Tasmania, while contamination associated with various forms of land use is a continuing problem.

Among the activities MRT undertakes is representation on the National Groundwater Committee. MRT has supported a number of salinity studies funded under the National Heritage Trust and National Action Plan by providing data and technical advice, and is a member of the State Groundwater Coordinating Group. While groundwater is under the control of the Department of Primary Industries, Water and Environment (DPIWE), MRT performs several vital functions.

Groundwater monitoring

MRT manages a regional monitoring network of 33 boreholes and an additional network of 20 boreholes in the East Devonport area. An upgrade of the East Devonport network continues with the deployment of twelve new data loggers. The information collected from the networks provides baseline data to enable long-term trends in water quality and quantity to be analysed. Data collected indicate that regional summer drawdown and winter recharge was similar to other years. Pumping from local boreholes over-printed the baseline data record at numerous monitoring sites. The management of several other temporary salinity groundwater networks was transferred to the Land Management Branch of DPIWE.

Groundwater maps

Work on the compilation of a series of twenty-one 1:100 000 scale groundwater maps, designed to provide information to land use planners in an easily understood format, continued in 2004/2005. In association with the 1:100 000 scale Municipal Planning Series maps, eight draft digital 1:250 000 scale groundwater prospectivity maps were produced. Subject to final review, these maps are to be presented and distributed to municipal councils in August 2005 as part of the partnership process.

Groundwater database

The State groundwater database provides a valuable record of groundwater bores throughout Tasmania as it allows site-specific and regional assessments to be carried out. This database can be accessed via the internet and is helping to provide timely information to members of the public. Further development of the database has been undertaken to ensure that it performs in an optimal way. MRT routinely enters standardised drillers' reports into the database. Approximately 115 reports were received during the year, although not all drillers are supplying data.

Information Systems and Geophysics

The main activities of the Branch in the 2004/2005 year were:

- ❑ Ongoing maintenance and development of the TIGER (Tasmanian Information on Geoscience and Exploration Resources) System;
- ❑ Maintenance and development of RIMS (Road Information Management System);
- ❑ Continuing a Business Process Review of MRT's activities; and
- ❑ IT training of MRT staff.

The branch also provided geophysical services and advice to MRT and our clients, and computer and network support for MRT.

The branch is structured to reflect the functions needed to achieve the outcomes required by MRT and provides Project, Operational and Geophysical services. At 30 June there was one fixed-term staff member in the Project Section undertaking the MRT Business Process Analysis Project and five permanent systems support staff in the Operations Section. The systems support staff are deployed within the functional areas of PC and Network Operations or Database and TIGER System Support. Two permanent staff members support the Road Information Management System (RIMS). The Branch Manager is also responsible for geophysical activities.

Major branch achievements during the year included:

- ❑ upgrading most TIGER modules;
- ❑ implementing anti-spam email technology;
- ❑ migrating the samples datasets to the TIGER System;
- ❑ updating the MRT website infrastructure;
- ❑ building an increased information skills-base for MRT staff;
- ❑ continued maintenance and support of the MRT website;
- ❑ updating project management guidelines within MRT to include DIER ICT strategy framework requirements;
- ❑ transferring RIMS reports from custom software to Oracle Reports;
- ❑ supporting the RIMS Phase 3 development;
- ❑ completing functional requirements and design documents for TEAMS II and commencing development; and
- ❑ reviewing guidelines and processes for providing information to the public.

Data capture

Capture of metadata summarising technical documents relating to exploration continued throughout the year, with 155 new summaries entered and 253 summaries updated. In addition to internet searching of the summaries of open-file technical documents held by MRT, all open-file documents relating to onshore or offshore exploration and

open-file MRT publications can be viewed or downloaded in full over the internet.

All mineral exploration reports are required to be in the national standard format for digital reporting and compliance with the report format at initial lodgement remains in excess of 95 per cent. Consultation with and assistance to stakeholders to ensure close compliance with the data formats detailed in the national guidelines has continued and contributed to the high level of conformance with the guidelines. Because of the extended time before topographic base maps in GDA94 are available for all Tasmania, all incoming reports are now being checked to ensure that the geodetic datum used is clearly specified.

MRT website users have experienced some difficulty in downloading very large documents since the facility became available, as documents with more than 600 MB of PDF files were available only as individual pages. Following consultation with users, scanned files have been joined and large documents can now be downloaded either as individual pages or as a series of joined PDF files with a maximum size of 630 MB per joined file.

TIGER System

Following completion of Project TIGER on 30 June 2003 the TIGER System, which provides a single storage environment for MRT's corporate data, is supported entirely from MRT resources. The MRT website enables access to this corporate data and associated metadata from anywhere in the world with internet access.

Using the TIGER system MRT staff enter, maintain and search corporate data relating to all aspects of MRT's activities including tenements, exploration reports, MRT publications, groundwater, drilling, geohazards, samples and observations, mineral deposits and geophysics from a number of browser-based thin client applications accessed via the MRT intranet. Data are delivered to clients through the MRT website using customised textual and spatial searches, and a number of basic datasets are also available for download. A total of 1730 GB was downloaded from the MRT website this year compared to 170 GB last year.

An Information Management Group, that includes both management and technical staff, oversees the ongoing operation of the TIGER System. This group allocates resources in accordance with departmental and divisional priorities and receives information from a number of working groups on issues to be resolved and suggested new functions for the TIGER System. Change request and fail and fix procedures assist the working groups and the developers with continuing the progressive migration of legacy data into the TIGER System, and in defining the functional requirements and specifications for further development of the system.

Data migration into the TIGER System has continued throughout the year and migration of sample data has been completed. Further upgrades to the data model and thin client applications have been required during the migration

to accommodate new business rules and additional data items. A Microsoft Excel bulk loader is being developed for loading and editing sample and geochemical data for the TIGER System. Under the direction of the Information Management Group most of the TIGER modules have had significant upgrades made during the year. Work has started on developing the TEAMS II application for use in monitoring environmental performance during mineral exploration.

IT summary

In accordance with government guidelines, MRT replaces desktop PCs every three years and transfers the original PCs to the Schools Program. New PCs are purchased with the current Microsoft enterprise operating system and as a consequence the progressive introduction of Windows XP has continued following extensive testing of software compatibility. The migration of desktop workstation software to Office XP has now been completed.

There are four network PC servers, three of which run Windows 2000. The main PC network server is running Netware 6.1 with approximately 136 gigabytes of on-line storage. Windows 2000 servers provide anti-virus, email, intranet and image delivery services to MRT staff. Files on the corporate Unix systems are accessed from PCs using Samba software. Automatic gathering of software inventories from desktop PCs and licence metering are part of the IT infrastructure capability.

Two Unix systems provide corporate information technology services to MRT staff. In addition there are Unix servers dedicated to development and testing for the TIGER System, for the MRT intranet, and for Samba. A further two Unix servers host the MRT website. The MRT website is located in the Rosny Park building to simplify maintenance and up-loading of data to the website servers and has a 10 Mbit/sec connection to the internet.

In addition to direct support of the TIGER System the operational group has provided support for many divisional information-related activities. After several months of user testing anti-spam software is now used to filter all incoming email. The MRT Records Disposal Schedule was implemented on a test TRIM database and then implemented successfully into the production environment. A review of MRT's spatial data storage requirements was completed with input from software suppliers and recommended MapInfo as a suitable application for direct access of spatial data stored in Oracle and for less demanding data analysis and display. A number of MapInfo training courses have been held for targeted staff.

Extensive one-on-one and group training has been provided to users in use of the thin client applications in the TIGER System, in the use of the Exposure map viewer client, in use of the MRT website and in use of the Bibliographic Reference Information System that is common across all TIGER modules. Information Systems staff have received external training or undertaken self-training courses in development of applications using Oracle software and in the underlying infrastructure of the TIGER System.

The development and maintenance environments for both RIMS and the TIGER System are co-located within MRT

and this has produced overall benefits for DIER. Following the appointment of an additional staff member a resource of two full-time equivalent staff members was dedicated to RIMS throughout the year for application maintenance and development. A collaborative development environment was established to ensure that the staffing structure was effective and extensive system documentation was written as part of the familiarisation process for the new developer. The move from a custom-written reporting tool to Oracle reports was completed and a number of Oracle Discoverer end-user layers were developed to allow greater user access to the information stored in RIMS. The system infrastructure was upgraded to Oracle 10g as part of the preparations for the use of spatial data in RIMS (Phase 3). Although Phase 3 is being developed by contractors under the direction of the RIMS Management Team, the RIMS developers based at MRT have been involved in providing advice and testing and have received some training in the new applications. Integration of existing code and a large number of completed requests for changes with the software developed by the contractors will not commence until Phase 3 is fully implemented.

The MRT website continued to be well used, with an average monthly download volume of 144 GB and a peak monthly download volume of 380 GB. The MRT website provides a high-speed access point for clients to access the open-file data held in the MRT corporate information management system. The website has been migrated to a new version of Oracle and Oracle Portal which has allowed the use of a dynamic menu and the display of a site map. It has also allowed the use of Oracle spatial replication between MRT's internal and web servers. The website offers Web Map Service/Web Feature Service for a restricted number of datasets and MRT has made geochemical data available as part of the SEEGrid Demonstrator Project. Larger datasets stored on the file system are now automatically replicated on a daily basis as they become open file. In excess of four terabytes of network attached storage is used to accommodate these large data volumes.

Geophysics

The MRT website has indexes of open file geophysical data including gravity base stations, airborne geophysical surveys for which digital data are held, and gravity stations. Where applicable the basic digital data can also be downloaded and new open-file data has been added to the website as it is received. Survey control point information can easily be retrieved from The LIST after carrying out a map-based search on the MRT website.

Preparation has continued for conversion of geophysical data from AGD66 to GDA94 as part of the forthcoming MRT GDA94 project.

Business Process Analysis Project

A project to document and refine MRT's business processes in order to take advantage of the new corporate information management system (TIGER), and to reduce the risks associated with dependence on individuals, continued during the year. The major deliverables will include documentation of revised business processes that

support MRT's core business, better integration of related activities, documentation of the processes used to carry out this project, and training and templates for MRT staff to maintain documentation of business processes for MRT operational and project-based work.

An initial review showed that many activities throughout MRT are related to mineral tenements. Last year the project completed a process review for tenement applications, bonds, renewals, relinquishments/surrenders/expiries, royalty collection and reconciliation, rent demands, annual review reporting, Exploration Release Areas and dealings. Current activities have extended beyond the tenement area with a review of guidelines and processes for provision of information to the public.

Functional requirements and design documents have been prepared for TEAMS II and development of this application is currently in progress. The recent Tasmanian Community Forest Agreement between the State and

Commonwealth governments will increase the requirement for monitoring mineral exploration approvals and subsequent rehabilitation, and makes the move to a more integrated system (TEAMS II) more critical. Functional requirements and specifications for a related system, the Mining Lease Inspection System (MLIS), are currently being prepared. Implementation of the MLIS will also require changes to Registry processes, lease compliance processes and systems, and to the MRDA.

The Business Process Definition Project has involved developing linkages with similar activities in other parts of DIER and government. This has allowed a comparison of MRT's project methodology with DIER requirements and methodologies used elsewhere. As a consequence, the MRT project methodology has been changed to include the DIER ICT strategy framework requirements and a new project management life cycle document and updated templates have been prepared.

Data Management

The role of the Data Management Branch includes:

- geoscientific data management;
- tenement management services;
- management of the Geographic Information System (GIS);
- management of the Computer-Aided Drafting (CAD) system; and
- provision of support drafting services.

During 2004/2005 the capture of 1:25 000 scale digital geological data continued. Following a review, carried out under the Western Tasmanian Regional Minerals Program, data were also upgraded over the Mt Read Volcanics area. This work resulted in the completion of fourteen new map areas and the upgrade of ninety-two map areas:

- thirty-six completed and/or upgraded 1:25 000 scale digital geological maps in northwestern Tasmania (Block, Burnie, Calder, Castra, Cethana, Charter, Cradle, Devonport, Gog, Guildford, Hardwicke, Interview, Kindred, Latrobe, Lea, Liena, Livingstone, Loongana, Loyetea, Luina, Meredith, Mole Creek, Parrawe, Parsons, Pearse, Pencil Pine, Railton, Riana, Ramsay, Rocky Cape, Sheffield, Stowport, Tewkesbury, Ulverstone, Wilmot, Yolla);
- forty-five completed and/or upgraded 1:25 000 scale digital geological maps in southwestern Tasmania (Adamsfield, Ahrberg, Albina, Birchs, Bowes, Collingwood, D'Aguiar, Darwin, Dundas, Endeavour East, Endeavour West, Gormanston, Goulds, Heemskirk East, Heemskirk West, Hibbs East, Hibbs West, Innes, Kelly, Lewis, Loddon, Mainwaring, Mallanna, Montgomery, Moores, Oceana, Osmund, Owen, Philips, Professor, Rosebery, Sarah, Selina, Strahan East, Strahan West, Stringer, Table Head, Teepookana, Trial, Tullah, Tyndall, Varna, Veridian North, Veridian South, Will);

- twenty-four completed and/or upgraded 1:25 000 scale digital geological maps in eastern Tasmania (Beaconsfield, Bell Bay, Bridgenorth, Cluan, Deloraine, Dilston, Exeter, Harford, Launceston, Liffey, Maydena, Montana, Musselroe, Nevada, Parkham, Picton, Port Sorell North, Port Sorell South, Prospect, Quamby Bluff, Skeleton, Weld, Westbury, West Frankford);

Work on the 'seamless' coverage of 1:25 000 scale digital geology of Tasmania continues, with maintenance being carried out on a regular basis. The 1:250 000 scale digital geology of Tasmania was also upgraded as a result of the Mt Read Volcanics upgrade of the 1:25 000 scale data. Maintenance of this data is carried out on a regular basis.

Hardcopy outputs of digital data, at 1:500 000 scale, showing geology with 3D topographic relief, construction material deposit locations, and mineral deposit locations were completed. In partnership with Geoscience Australia, a digital 1:500 000 scale map of Tasmanian granites and associated mineralisation was completed.

As part of the 1:100 000 scale Municipal Planning Series of maps, designed to provide geoscientific and tenement information to municipal councils and land-use planners in an easily understood format, twenty-one draft 1:100 000 scale groundwater prospectivity maps, completed in 2003/2004, were reviewed and the modifications to these maps commenced.

In association with the 1:100 000 scale Municipal Planning Series maps, the eight draft 1:250 000 scale groundwater prospectivity for Tasmania maps, produced in 2003/2004, were also reviewed and the modifications to these maps commenced.

The landslide hazard classification maps, produced in 2003/2004 as part of a regional landslide hazard assessment of the greater Hobart area, were reviewed. Following this review, maps depicting the themes of geology, landslides and geomorphology, potential debris flow hazards, potential rockfall hazards, and potential

deep-seated landslide hazards were produced covering the Hobart and Glenorchy municipal areas.

Together with other staff of MRT, the Branch has been involved with the assessment of areas of Crown land for the Crown Land Assessment and Classification Project (CLAC). Crown land in nineteen municipal areas has been assessed to determine availability under the MRDA and land stability. A total of 195 man hours has been spent on this project to date.

CAD continues to be used as a support tool for many projects, with 48 maps and plans and 107 tenement maps and diagrams being produced throughout the year.

Tenement administration work included:

- thirty-nine new exploration applications processed and entered into the agency's tenement information system;

- eighteen exploration tender area plans produced and entered into the agency's tenement information system;
- ten new mining leases processed and entered into the agency's tenement information system; and
- data on 73 proposed 'on ground' work programs for exploration licences was entered into the agency's information system for monitoring this type of exploration activity.

A total of 1910 hardcopy output products of digital geology/tenement data were produced on demand using the agency's inkjet plotters, with 156 datasets of digital geological data being produced for clients.

Royalty, Finance and Administration

This branch provides the corporate support function for Mineral Resources Tasmania, and is responsible for:

- efficient royalty and fee collections and assessment so that the system is properly managed and accounted for to the satisfaction of the Auditor-General;
- timely provision of a financial, accounting and administrative service to the division in conjunction with the departmental corporate services;
- production of publications relating to the interpretation and recording of Tasmania's geoscientific nature, geohazards and mineral wealth, in both electronic and hard-copy form, including geological reports, promotional documents, newsletters, materials for displays, Exploration Release Area fliers, and other reports and leaflets as required;
- maintenance of the static content of the MRT website;
- ensuring that all corporate information is kept in an orderly manner and is readily retrievable; and
- maintenance of the MRT library collection and development and delivery of library and information services to MRT staff and members of the public.

Publications

Major publications produced during the year included:

- The Mineral Resources Tasmania *Annual Review* for the year 2003/2004.
- *Mineral exploration opportunities in Tasmania. A summary of opportunities for mineral exploration and mineral resource development in Tasmania — February 2005.*

The *Fossicking Areas in Tasmania* book was reprinted, incorporating recent amendments to the boundaries of some areas. A leaflet outlining geological features of the Tasman Peninsula was produced.

Fifteen flyers promoting Exploration Release Areas were produced.

The following reports were issued in the *Tasmanian Geological Record* series during the year:

- 2003/01 — *A review of groundwater in Tasmania*, compiled by C. A. Bacon.
- 2004/01 — *Gold mineralisation and the regional Palaeozoic structure of the Mathinna Supergroup, eastern Tasmania*, by A. R. Reed.
- 2004/02 — *Garnet-bearing and other spotted porphyroblastic metasedimentary rocks from the Balfour area*, by R. S. Bottrill.
- 2004/03 — *The updating and revision of the 1:25 000 scale series geological maps covering the Mt Read Volcanics belt in western and northwestern Tasmania*, by K. D. Corbett.
- 2004/04 — *An overview of the Mineral Resources Tasmania statewide groundwater monitoring network*, by A. R. Ezzy.
- 2004/06 — *Miscellaneous mineral analyses from near Balfour and Temma*, by R. S. Bottrill.
- 2005/01 — *MRT statewide groundwater monitoring network: Data collection — September 2004*, by A. R. Ezzy and M. Latinovic.
- 2005/02 — *Reconnaissance geology of the Norfolk Range–Sandy Cape area, northwest Tasmania*, by J. L. Everard.
- 2005/03 — *Devonian granites and associated mineralisation in northeast and northwest Tasmania*, by J. Taheri and R. S. Bottrill.

The following reports were issued in the *Archaeological Survey Report* series during the year:

- 2001/03 — *An archaeological reconnaissance survey of the alluvial tin mining workings at Melaleuca, South West Tasmania*, by A. Webster.
- 2002/01 — *A brief examination of the Springvale tunnel, Evandale Water Scheme*, by A. Webster.

Work continued on adding and upgrading entries on the DOMINFO database.

Library

The library supports the core activities of MRT by providing geoscientific information to staff, mineral exploration companies, geotechnical consultants, local authorities, researchers, students and members of the public.

The library continues to be staffed by a full-time librarian, with assistance being provided two days per week. The Workplace Standards Tasmania collection, although co-located in the Rosny Park Library, is managed separately by a permanent part-time librarian.

Technical services

The Inmagic DB/Textworks library management software was updated during the year to version 8.00.

Authority checking of subject headings on the library management software was completed.

Work continued on cataloguing journal titles not previously entered into the library management software.

Collection

A number of engineering geology reports were retrieved from secondary storage files and copied and included in the collection.

Occupational Health & Safety books not relevant to the collection were removed and offered to the WST library.

A subscription to AusGeoRef, a bibliographic geoscience database drawn from GeoRef that covers the Australian literature since 1933, was purchased and access to the database made available to all MRT staff via their desktop.

Work continued on updating journal holdings information and removing irrelevant or outdated journals from the collection. Compactus holdings are being clearly labelled as part of this process to improve access to the collection.

All journal subscriptions were renewed. Twenty-one books, reports and standards were purchased during the year.

External publications released during 2004/2005

BLACK, L. P.; *CALVER, C. R.; *SEYMOUR, D. B.; REED, A. 2004. SHRIMP U-Pb detrital zircon ages from Proterozoic and Early Palaeozoic sandstones and their bearing on the early geological evolution of Tasmania. *Australian Journal of Earth Sciences* 51:885–900.

BLACK, L. P.; *MCCLLENAGHAN, M. P.; KORSCH, R. J.; *EVERARD, J. L.; FOUDOULIS, C. 2005. Significance of Devonian–Carboniferous igneous activity in Tasmania as derived from U–Pb SHRIMP dating of zircon. *Australian Journal of Earth Sciences* 52:807–829.

*BOTTRILL, R. S.; *WOOLLEY, R. N.; FORSYTH, A. B. 2004. Topaz from Killiecrankie, Flinders Island, and other Bass Strait islands. *Australian Gemmologist* 22:1–9.

*CALVER, C. R., BLACK, L. P.; *EVERARD, J. L.; *SEYMOUR, D. B. 2004. U-Pb zircon age constraints on late Neoproterozoic glaciation in Tasmania. *Geology* 32:893–896.

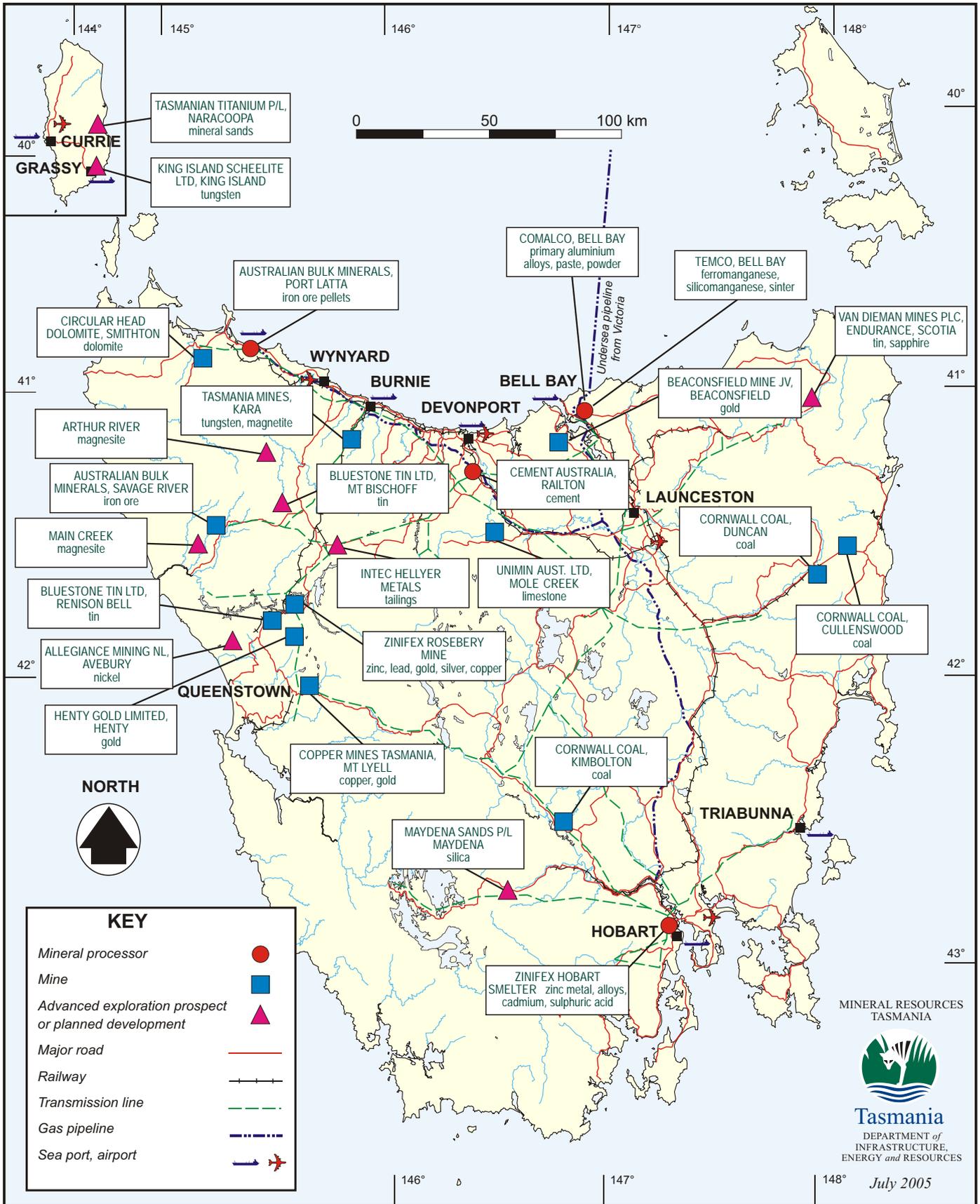
KEMP, N. R.; *BOTTRILL, R. S. 2004. Crocoite — mine is from which mine? *Bulletin de liaison de la Societe Francaise de Mineralogie et Cristallographie* 16(2):49–50.

SECCOMBE, P. K.; DOWNES, P. M.; ASHLEY, P. M.; BRATHWAITE, R. L.; *GREEN, G. R.; MURRAY, C. G.; RUBENACH, M. J. 2005. World skarn deposits: skarn deposits of the Southwest Pacific. *Appendix, Economic Geology One Hundredth Anniversary Volume 1995–2005*.

SUTHERLAND, F. L.; *BOTTRILL, R. S. 2004. Zeolites of western Tasmania. *Australian Journal of Mineralogy* 10:59–72.

— Tasmania —

Infrastructure and Major Mining and Mineral Processing Operations



Mineral Sector Overview

The 2004/2005 year was marked by generally continued high prices for iron ore, coal, base metals and gold, most of which improved or maintained their levels in Australian dollar terms. Tin was a notable exception.

This translated into continued strong performances by the operating mines, with profitability improvement in many cases despite small falls in production, and a continued recovery in the level of mineral exploration.

Contained zinc and copper in concentrates at the Rosebery mine decreased, but an operating profit of \$42.4 million was achieved. Production of copper and gold in concentrate decreased slightly at the Mount Lyell mine, but this was more than ameliorated by a substantial increase in the copper price. Stronger iron ore prices again improved the economic situation of the Savage River mine, despite a minor decrease in production. Work continued on the pre-feasibility study of an underground block-cave operation in the North Pit, but by year's end no decision had been announced on whether the mine would continue as an underground operation after 2008.

The Beaconsfield gold mine recorded decreased production levels, due substantially to a decrease in resource grade, but the amount of ore milled reached a record level and recovery improved. Production also decreased at the Henty mine, but both gold mines remained strongly profitable.

The Kara magnetite-scheelite mine recorded a sharply increased profit and planned to increase magnetite production as well as exploring a nearby scheelite deposit with a view to bringing it into early production.

There was also a large number of development projects under consideration.

Allegiance Mining NL completed construction of a decline and cross cut into the Avebury nickel deposit in January 2005 and development approvals were finalised. Exploration drilling continued to extend the limits of ore-grade mineralisation in the deposit, particularly to the west.

GTN Resources Limited purchased the King Island scheelite deposit and conducted a successful pre-feasibility study that suggested an open-cut operation could be profitable. Resource drilling commenced as part of a full feasibility study. Tasmanian Titanium Limited plans to resume heavy mineral sand mining at Naracoopa, also on King Island, in late calendar 2005.

Van Dieman Mines plc, a newly listed company on the London Alternative Investment Market, plans to resume alluvial tin mining at the Scotia and Endurance deposits in northeast Tasmania in 2006 and for the first time in the region will recover sapphire as a significant co-product, as well as gold.

Intec Hellyer Metals Pty Limited, a wholly-owned subsidiary of Intec Limited, successfully completed pilot plant tests and a pre-feasibility study treating the tailings from the Hellyer mine at a pilot plant in Sydney. At year's end the company was constructing a demonstration plant at Burnie as a central element of a full feasibility study.

Bluestone Tin Limited recommissioned the Renison mine and mill, recommenced tin concentrate production in February 2005, and advanced studies into the treatment of tailings at the mine and reopening of the Mount Bischoff mine at Waratah.

The restored confidence of the industry was paralleled by investment in capital investment programs, including continuation of substantial exploration projects at the Beaconsfield, Henty, Rosebery and Savage River mines and completion of a program at Renison Bell.

The Australian Bureau of Statistics (ABS) reported a 9% recovery in Tasmanian mineral exploration expenditure to \$8.3 million for the year, compared with \$7.6 million in 2003/2004. Tasmania's share of Australian expenditure decreased from 0.97% to 0.81% during the year. MRT data indicated a much stronger recovery in total expenditure of 196%, from \$8.7 million in 2003/2004 to \$25.8 million in 2004/2005. Increases were recorded on all tenement classes, dominated by mining lease expenditure up 380% to \$18.14 million. Exploration licence expenditure increased 59% to \$7.4 million.

Increased interest in Tasmania is reflected by a continued high level of exploration licence applications, with 47 received in 2004/2005. This is down from 62 in 2003/2004, but comparable to the 48 in 2002/2003. Perhaps more significant is the near doubling of approvals for on-ground activity from 38 in 2003/2004 to 75 in 2004/2005.

A large number of projects involved exploration drilling during the year and more were in the planning stage. Newcrest Limited has a major exploration project under way in the Mount Read Volcanics south of Queenstown and is about to start a second major project at Red Hills, east of the Henty mine. TasGold Limited is conducting drilling programs at Wart Hill, south of Macquarie Harbour; in the Golconda area in northeast Tasmania; and near Moina in northern Tasmania. Lefroy Resources Limited is drilling for gold in northeast Tasmania. Zinifex Limited has a very active exploration program for zinc, gold and other metals and is drilling in the Boco area north of Rosebery. Jaguar Minerals Limited has been drilling recently near Balfour in the far northwest.

The unprecedented trend of new companies to conduct capital raisings to create new listed exploration companies based entirely or significantly on Tasmanian projects continued. In 2004/2005, Jaguar Minerals Limited, Bluestone Tin Limited and Stellar Resources Limited listed on the Australian Stock Exchange and Van Dieman Mines plc listed on the Alternative Investment Market of the London Stock Exchange. At year's end a number of other companies were in the process of raising capital.

The renewed activity is partly a result of geoscientific data gathering and promotional activities conducted by government over the last few years, including Project TIGER and the Western Tasmanian Regional Minerals Program, and a number of significant projects can be attributed to this activity. The three-dimensional geological

model and prospectivity analysis of Tasmania is a world's first synthesis of such a large region involving a co-operative approach between government and industry to assist with targeting subsurface mineral deposits. It has attracted significant interest and has materially helped small companies identify areas to explore.

For the first time in more than a decade, a number of factors are combining to reinvigorate the mining and mineral exploration sectors and the outlook has improved significantly over the past year.

Commodity prices and the Australian dollar

Commodity prices generally continued the upward trend from the previous financial year, mainly due to continuing very strong demand for commodities from China.

The Australian dollar remained at fairly high levels throughout the year which impacted negatively on Australian dollar receipts of the United States dollar-priced commodities. In recent times commodity prices have risen beyond the constraints of the Australia dollar, which tends to move with the price of its commodity exports and negate price rises. The dollar started out the year at just under USD 70 and rose to a high of just under USD 80 before finishing the year at USD 76. The average for the year was around USD 75.

Iron ore was the standout performer for 2004/2005. Following a price rise of 19% in 2003/2004, a massive rise of 71.5% was negotiated in early 2005 as a direct result of competition for the commodity between China and Japan.

Gold continued to rise to its current highs throughout 2004/2005, although it did not perform as well as other commodities. Gold started the year at USD 394 and rose to a high of USD 440, but the rising Australian dollar meant that the Australian dollar price for gold did not rise significantly, starting the year at \$564 and rising through a high of \$580 in September before finishing at around \$573 per ounce.

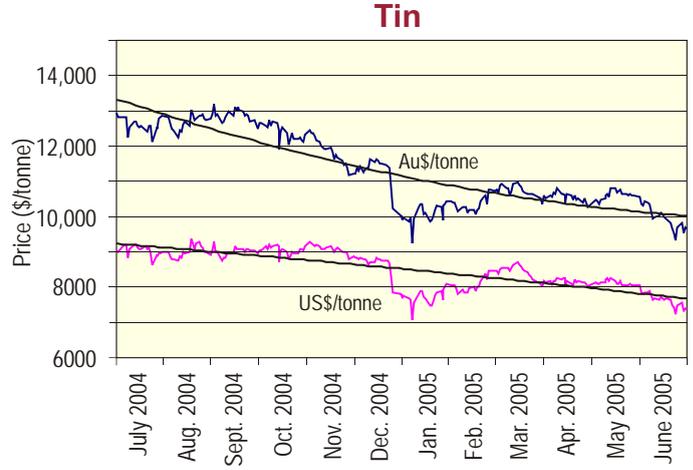
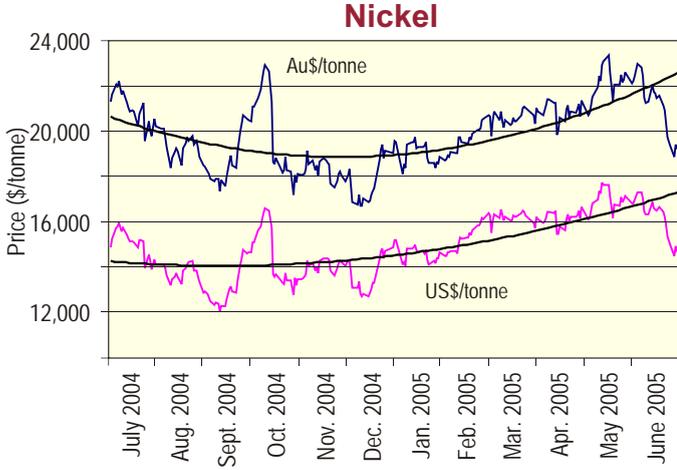
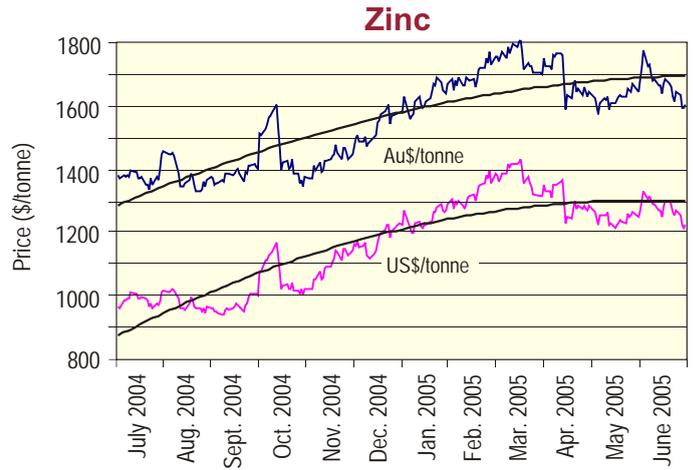
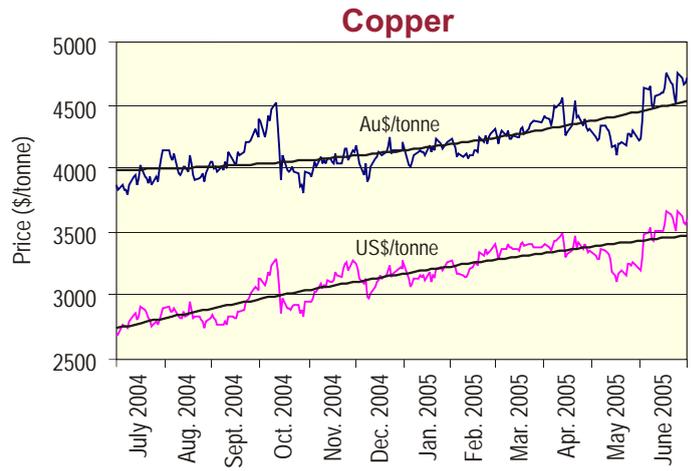
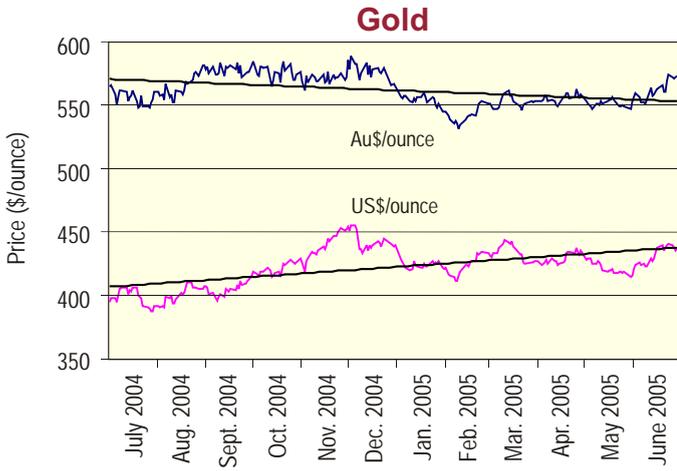
Zinc prices were near historically low levels in 2003/2004 but the price improved markedly throughout 2004/2005, starting at USD 964 per tonne and finishing the year at USD 1223, equating to around \$AUS1600 per tonne.

Tin unfortunately lost its healthy gains of 2003/2004, reaching a high of USD 9861 per tonne but finishing the year at USD 7380. In Australian dollar terms, the price started out at \$12,900, climbed through to a price of \$17,600 and then fell sharply to finish at \$9,660.

Copper continued its prior year gains and remained a strong performer throughout the year, starting at USD 2711 per tonne and rising steadily to USD 3597 by year end. This equates to a high of around \$AUS4709, a price not seen for many years.

The lead price remained fairly flat, finishing the year where it started.

Nickel was up and down throughout the year, starting at USD 14,895 per tonne, rising slightly and then falling to around USD 12,000 per tonne in September before rising again to USD 16,500 in October and then declining again. The price recovered back to USD 17,700 in May and then closed the year at USD 14,700. In Australian dollar terms the price reached a high of \$23,350 and closed the year at around \$19,250.



Australian Dollar : American Dollar



Value of the Tasmanian Mineral Industry

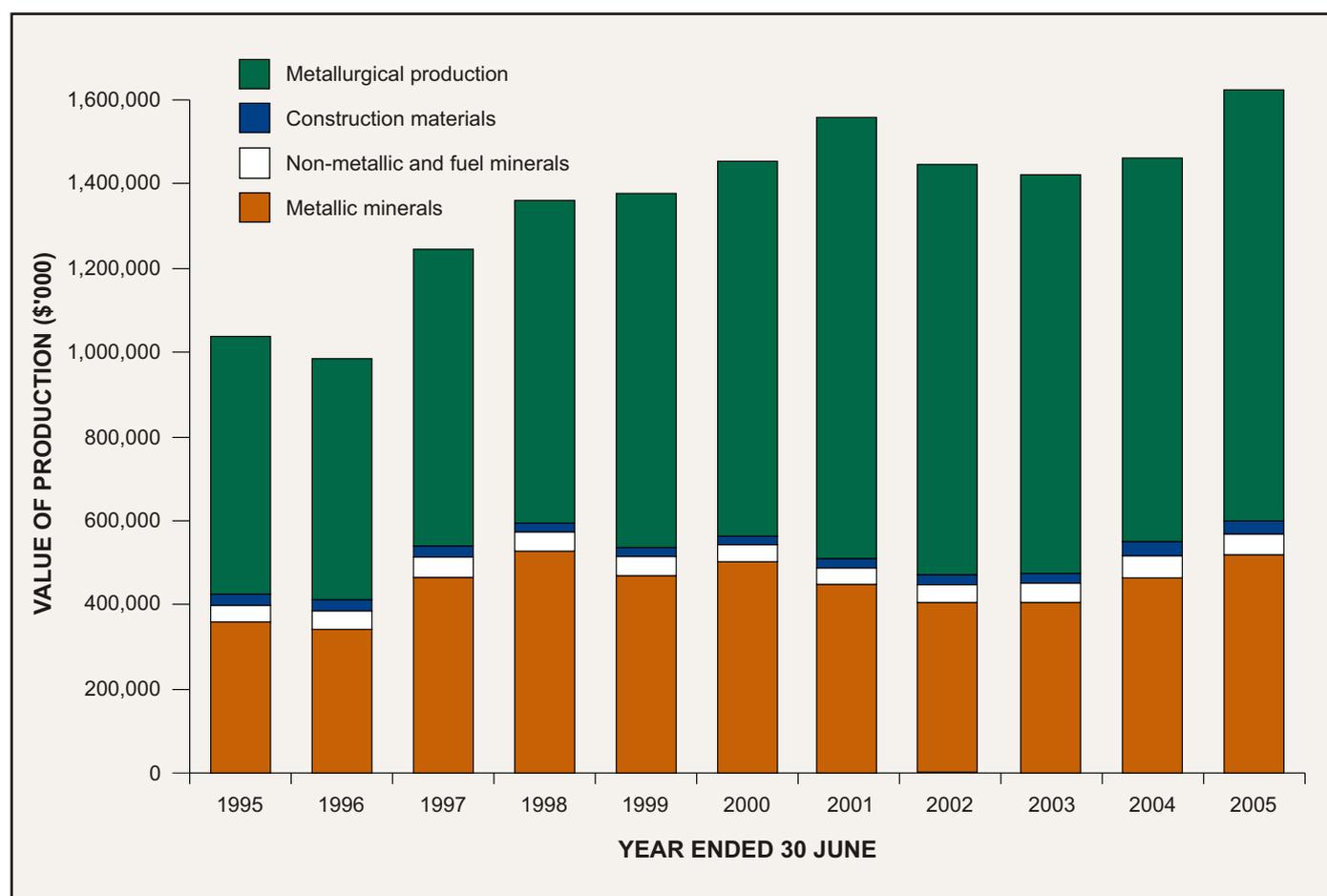
<i>Year ended</i> <i>Commodity</i>	<i>Unit</i>	<i>30 June 2004</i> ² <i>Total Quantity</i>	<i>30 June 2005</i> <i>Total Quantity</i>
Metallic Minerals			
Copper (assayed)	(tonne)	30 340	29 867
Gold (assayed)	(kilogram)	10 872	9 547
Iron ore pellets	(tonne)	2 202 908	2 018 542
Iron (in magnetite)	(tonne)	62 538	69 625
Lead (assayed)	(tonne)	30 619	32 426
Silver (assayed)	(kilogram)	72 588	93 642
Tin	(tonne)	4	708
Zinc (assayed)	(tonne)	94 560	89 075
Value of Metallic Minerals		\$462 832 347	\$517 549 679
Non-metallic, Industrial and Fuel Minerals			
Clay –			
Cement	(tonne)	46 884	11 591
Brick	(tonne)	29 742	35 961
Other	(tonne)	nil	450
Kaolin	(tonne)	14 487	13 926
Dolomite	(tonne)	6 422	11 370
Limestone –			
Agricultural	(tonne)	135 293	149 099
Cement	(tonne)	1 668 804	1 511 761
Chemical and metallurgical	(tonne)	61 975	49 604
Other	(tonne)	57 830	2 808
Silica (glass and other)	(tonne)	135 218	152 967
Sulphuric acid	(mono tonne)	449 812	408 538
Coal (run of mine)	(tonne)	481 914	577 922
Coal (washed)	(tonne)	349 283	314 687
Peat	(m ³)	nil	1
Gemstones	(kg)	-	-
Value of Non-metallic, Industrial and Fuel Minerals		\$48 600 317	\$53 285 009
Construction Materials			
Building stone –			
Freestone	(tonne)	0	154
Other	(tonne)	2 747	8 807
Sandstone	(tonne)	1 872	131
Crushed and broken stone –			
Basalt	(tonne)	854 415	1 010 614
Dolerite	(tonne)	906 740	1 436 113
Limestone	(tonne)	41 056	79 052
Sandstone	(tonne)	202	932
Other	(tonne)	127 939	148 770
Gravel (aggregate)	(tonne)	40 265	45 243
Sand	(tonne)	485 245	581 878
Other road materials	(tonne)	1 755 607	2 442 956
Value of Construction Materials		\$34 040 997	\$43 737 348
Total value with Australian metal prices		\$545 473 661	\$614 572 036
Value added production from Tasmanian and other ores			
Aluminium)			
Cadmium)			
Cement)			
Ferromanganese)		\$912 027 959	\$1 012 242 530
Silicomanganese)			
Sinter)			
Superphosphate)			
Zinc)			
Value of mining and metallurgical production		\$1 457 501 620	\$1 626 814 566
Reported average number of employees ¹		3889	4402

1. Not all operators report full details

2. Figures for 2004 may vary from previously published results because of late or amended returns

Value of Production, 2003/2004 and 2004/2005

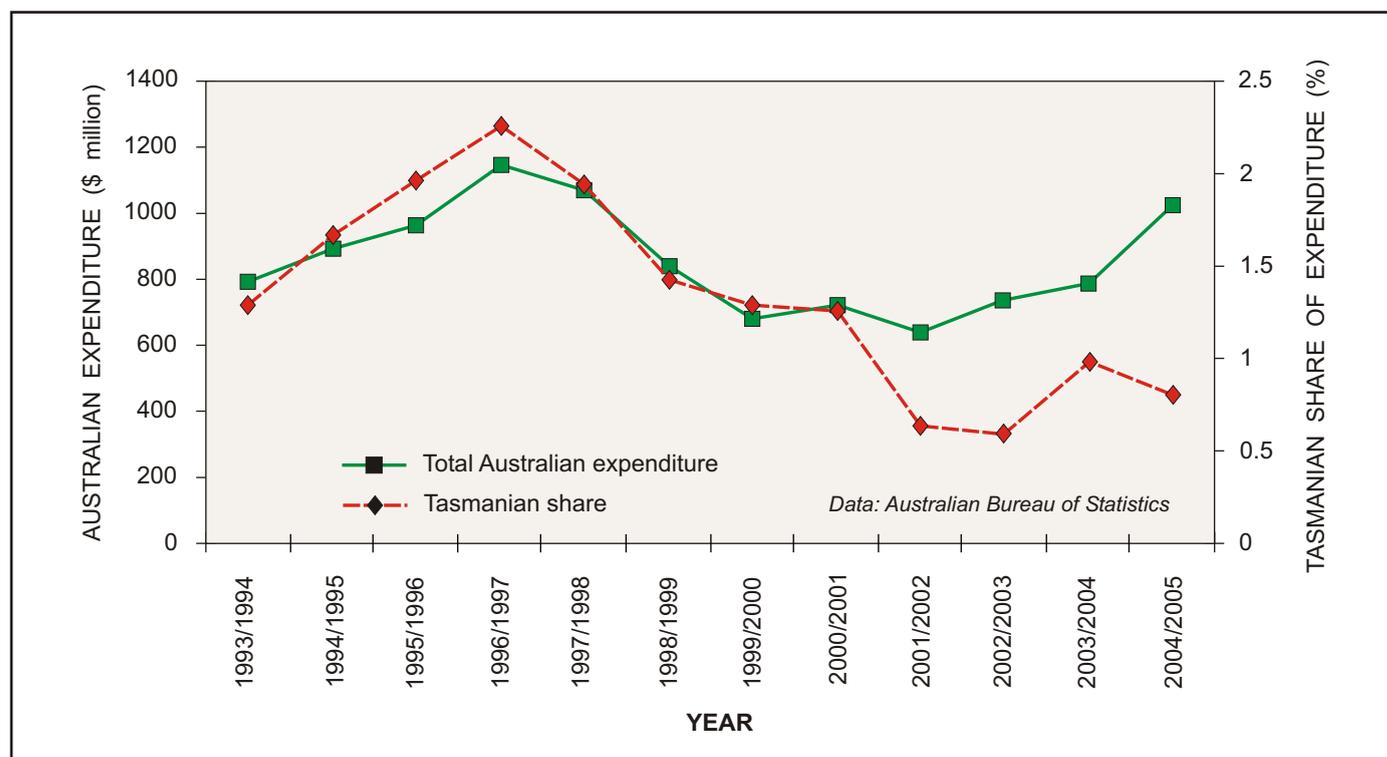
	2003/2004		2004/2005		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Gold	10.9	-	9.5	-	-12.8
Silver	72.6	-	93.6	-	28.9
Zinc	94 560	-	89 075	-	-5.8
Copper	30 340	-	29 867	-	-1.6
Lead	30 619	-	32 426	-	5.9
Tin	4	-	708	-	-
Iron ore pellets	2 202 908	-	2 018 542	-	-8.3
Total metallic minerals	-	462,832	-	517,549	11.8
Non-metallic and fuel minerals	-	48,600	-	53,285	9.6
Construction materials	-	34,040	-	43,737	28.5
Value added production from Tasmanian and foreign ores	-	912,028	-	1,012,242	11.0
Value of mining and mineral processing production	-	1,457,502	-	1,626,814	11.6



Mineral Exploration Expenditure

Year	Australian Expenditure (\$ Million)	Tasmanian Expenditure (\$ Million)	Tasmania as % of Australian Expenditure
1993/1994	792.6	10.2	1.29
1994/1995	893.4	14.9	1.67
1995/1996	960.2	18.8	1.96
1996/1997	1148.6	26.0	2.26
1997/1998	1066.8	20.7	1.94
1998/1999	837.8	11.9	1.42
1999/2000	676.4	8.7	1.29
2000/2001	721.3	9.1	1.26
2001/2002	640.6	4.0	0.62
2002/2003	732.5	4.3	0.59
2003/2004	786.7	7.6	0.97
2004/2005	1028.4	8.3	0.81

Source: Australian Bureau of Statistics — Actual and Expected Private Mineral Exploration, Australia.



Review of Mineral Sector Operations

— Metallic Minerals

BASE METALS

Zinifex Rosebery Mine

This company operates an underground mine and concentrating plant at Rosebery, on Tasmania's West Coast.

Mine production

Overall ore production was 706 300 tonnes at an average grade of 13.4% Zn. Production from the lower levels totalled 602 000 tonnes @ 14.2% Zn and came mainly from K lens and P lens, with smaller contributions from mine ore development in V lens and Lower B lens.

Production from the upper levels totalled 103 700 tonnes at 8.9% Zn, with production coming from remnant mining in B, F, G and H lenses, No. 1 Shaft Pillar (D lens) and cut and fill stoping from 17B South and Access I (B lens).

Mine development

A total of 4609 metres of development was completed in the lower mine which produced an estimated 382 000 tonnes of material. This included 934 metres of development on ore which produced 124 000 tonnes. A further 940 metres of development was completed in the upper mine, including 273 metres in operating ore, producing 59 000 tonnes of material, including 14 000 tonnes of operating ore.

Most of the capital development was required to extend the K, W (formerly known as K North), V and P declines and the P incline to access future ore zones and provide drilling platforms for resource infill and exploration drilling.

Capital development was also undertaken to complete the B-P Decline linking lower B lens with Upper P lens and providing a second means of egress from the lower mine area.

The operating development was in a number of areas including K Lens, P lens, V lens, Lower B, 16 B South and on 12 level around the No. 1 Shaft Pillar.

Mill production

Ore treated totalled 689 500 tonnes grading 14.56% Zn, 5.1% Pb, 0.40% Cu, 145 g/t Ag and 2.1 g/t Au. This was a 7% decrease in the tonnage treated through the concentrator in 2003/2004 due to a 10% decrease in tonnage delivered from the mine. High feed grades of the ore delivered from the mine forced a reduction in milling rates to maintain concentrate grade and recovery targets.

- Zinc concentrate production totalled 154 300 tonnes at 57.3% Zn. This was marginally lower than the previous year but the high quality achieved in the previous year was maintained. The lower tonnage treated was offset largely by the higher feed grade of the ore delivered from the mine.
- Copper metallurgy improved compared to last year with 8700 tonnes of copper concentrate being produced at 20.6% Cu, 7.9% Pb, 4085 g/t Ag, 80.8 g/t Au. Copper recovery for the year was 21% above plan. Gold and silver grades of the copper concentrate were significantly higher than the previous year.
- Lead concentrate output, at 45 700 tonnes grading 64.3% Pb, 954 g/t Ag, was 5.9% higher than the previous year mainly due to the higher feed grades and higher recovery.
- A total of 331 kg of doré was produced at 30% Ag and 64% Au. Gold head grades were marginally higher than the previous year (~4.4%) but gold recovery was down as a result of continuing changes in mineral association.

Resources and reserves (as at March 2005)

The Rosebery mine lease resource inventory shows an overall decrease of 0.698 Mt compared with March 2004. This decrease was mainly due to depletions from mining. Exploration recommenced from underground in January 2004 and from surface in April 2005. No significant resource additions were recorded in 2004/2005.

The ore reserve inventory at Rosebery has decreased by 0.439 Mt overall compared with March 2004. The main reason for the decrease was depletions due to mining, which were partly offset by conversion of resources to reserves in lower P Lens.

Identified Mineral Resources, March 2005

		tonnes (000s)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
Rosebery	Measured	2 238	4.9	17.4	0.49	188	2.8	10.6
	Indicated	861	4.5	16.1	0.61	159	3.4	14.1
	Inferred	2 842	4.9	15.5	0.44	199	2.4	8.5
	Inaccessible	1 867	3.5	11.7	0.73	114	2.0	15.1
	Total Meas + Ind + Inf	5 942	4.8	16.3	0.48	189	2.7	10.1
South Hercules	Total	560	1.9	3.7	0.11	157	3.0	4.4
GLOBAL	Meas + Ind + Inf	6 502	4.6	15.2	0.45	186	2.7	9.6

Identified ore reserves at March 2005 comprised:

<i>Reserves</i>	<i>Tonnes (000s)</i>	<i>Pb (%)</i>	<i>Zn (%)</i>	<i>Cu (%)</i>	<i>Ag (g/t)</i>	<i>Au (g/t)</i>	<i>Fe (%)</i>
Proved	2039	4.0	14.4	0.38	142	2.0	8.3
Probable	289	3.9	13.8	0.32	127	2.2	9.4
Total	2329	4.0	14.3	0.37	140	2.1	8.5

Drilling

A total of 16 200 metres of resource infill drilling and 15 700 metres of deep exploration drilling were carried out. An additional 3500 metres of mine lease exploration drilling was completed.

The main areas targeted were the K North (now re-named W lens) area, south of P Lens, and an area down-plunge of V lens. No significant extensions or new mineralisation were located.

Deep surface diamond drilling commenced to the north of the mine at the end of April 2005. One hole was completed by the end of the financial year and recorded an eleven metre zone of base metal mineralisation approximately 400 metres north of the mine workings.

Exploration for along-strike extensions to the South Hercules resource commenced in March 2005 and was completed by the end of May 2005. Only minor extensions to the known mineralisation were recorded.

Employment

A total of 193 people were employed, including 66 staff, 124 award and 3 casuals. Thirty-five production hours were lost due to industrial action during the year and four lost-time accidents occurred.

For 2004/2005 Zinifex Rosebery Mine recorded a Medical Referral Injury Rate of 22, which represents a 57% decrease on the previous year. This improvement can be attributed to a series of programs rolled out over the 12 months focussing on behavioural safety. Greater employee engagement is highlighted by a more than three-fold increase in participation in job safety observations and feedback processes facilitated by training of the workforce. Employees also participate in daily Positive Attitude Safety System meetings, 'near miss' reporting and hazard identification.

Capital expenditure

Capital expenditure during the year totalled \$21.9 million. Major projects included the Northern Upcast fan upgrade, an AE55 truck, an R2800 loader, a process control upgrade, concentrate handling upgrade and \$10.7 million of mine development.

Community relations

Zinifex Rosebery Mine is a member of the Rosebery Development Association and has provided cash and in-kind support for a number of its projects to improve the townscape and amenities. More than 40 Rosebery and West Coast community, sporting and cultural groups have received support through the mine's comprehensive sponsorship program.

The Rosebery mine demonstrated its commitment to community consultation through the development of the Hercules Closure Plan. This involved consultation with stakeholder groups, including the local community.

A quarterly newsletter *The Explorer* is distributed to the local community to keep them informed on new projects and issues on site.

Further improvements to the use of the abandoned 2 and 5 dams as town sewage treatment ponds are being investigated to improve water quality from the dams, as well as to provide a cheaper and sustainable town sewage treatment system.

A park area that can be enjoyed by local residents has been constructed near the entrance to the mine site and adjoining the Rosebery District Hospital. The area was planted with native trees as part of National Tree Day in a project with pupils from St Josephs Rosebery Primary School.

Environment

The site sustained ISO 14001-1996 certification, and developed and implemented a training video to educate and increase employee awareness of the environmental aspects and impacts of the mine.

Significant progress was made in addressing environmental legacies with the development of a closure plan for the Hercules mine site in collaboration with the Tasmanian Government and stakeholders. Hercules mine, which falls within the Rosebery consolidated mine lease, ceased operations in 2000. The first stage of the rehabilitation works was completed in 2004/2005 through the development of a revegetation plan which involved targeted spreading of lime and fertiliser to promote regrowth.

2004/2005 was a disappointing year, with the 147 non-compliance events reported to the Tasmanian Government. This was the result of problems with the performance of the effluent treatment plant in the first half of the year, which resulted in a series of non-compliance with discharge limits from the Bobadil tailings dam. The problems were subsequently solved and in the second half of the year exceedences were greatly reduced.

Biological monitoring completed on the site's discharge points receiving environments showed an improving picture. Monitoring indicated:

- that there were no significant impacts on the Pieman River ecology from the discharge of the main tailings dam;
- that the Stitt River is reaping the benefits of a joint venture with the West Coast Council to operate the rehabilitated tailings dam as a sewage treatment facility. Studies showed rich aquatic invertebrate life in the river; and
- that the Ring River continues to experience impacts due to historical mining operations in the region.

Intec Hellyer Metals Ltd

The Hellyer tailings resource, which is contained in a water-covered storage dam, comprises 10.88 million tonnes @ 0.16% Cu, 3.0% Pb, 2.8% Zn, 88 g/t Ag and 2.6 g/t Au.

At year-end IHM had four full-time employees in Tasmania and approximately 22 sub-contracted employees. The sub-contracted employees are supporting two activities, a demonstration plant for the Hellyer Metals Project located at Burnie; and care and maintenance for the Hellyer Mill and associated infrastructure.

The aim of the Hellyer Metals Project is to process the Hellyer tailings in order to recover the contained base and precious metals utilising chloride-based hydrometallurgical processing. The proposed process will result in the production of zinc metal, a high-grade lead and silver cement product, gold bullion and a copper intermediate product. Progress included:

- Completion of pilot plant leach campaigns on Hellyer tailings and electric arc furnace dust at Brookvale in Sydney. The pilot plant confirmed high extractions of zinc, lead, silver and copper while gold extractions were lower due to the refractory nature of the gold.
- A pre-feasibility study for the Hellyer Metals Project was completed in August 2004 and \$12 million was raised for the construction and operation of a demonstration plant and the completion of a bankable feasibility study. The plant was opened in September 2005.

Zeehan Zinc Limited

An open-cut mine is being developed in the Comstock area west of Zeehan. Approximately 20 000 m³ of waste has been moved to backfill the South Comstock pit. This operation exposed a pod of zinc-lead-silver mineralisation. A road was constructed to the base of the Swansea waste dump and preparations were made for the diversion of Comstock Creek.

Resources

The Measured and Inferred Resource is 6.7 Mt @ 5.2% Pb, 4.8% Zn and 52 g/t Ag.

Resource definition drilling was undertaken in Allison's and West Load. A total of 338 and 261 metres were drilled respectively.

Rehabilitation

Organic matter was spread over the central waste rock dump and a wetland was created to rehabilitate the pit, which provided the clay for waste rock cover.

COPPER

Copper Mines of Tasmania Pty Ltd — Mt Lyell mine

The Mt Lyell mine, at Queenstown in western Tasmania, employs a total of 429 people. Of these 388 are employed

in mining and production, including 207 working underground. Production from the mine totalled 27 697 tonnes of copper, 16,354 ounces of gold and 121,516 ounces of silver. Waste mined from underground totalled 77 500 tonnes.

Reserves

The Prince Lyell block model has been updated and a revised estimate of the Mineral Resource and Ore Reserve generated as at 31 March 2005. The estimation was done to a 1% Cu cut-off grade and is JORC compliant.

Measured Resource	9 030 000 tonnes @ 1.48% Cu (133 659 tonnes Cu metal)
Indicated Resource	2 643 000 tonnes @ 1.42% Cu (37 538 tonnes Cu metal)
Inferred Resource	5 977 000 tonnes @ 1.39% Cu (82 908 tonnes Cu metal)
Total Resource	17 650 000 tonnes @ 1.44% Cu (254 105 tonnes Cu metal)

The estimated Prince Lyell Ore Reserve is:

Proved Reserve (surface stockpile)	154 000 tonnes @ 1.25% Sn (148 373 tonnes Cu metal)
Proved Reserve	14 881 000 tonnes @ 1.24% Sn (185 019 tonnes Cu metal)
Total Reserve	15 035 000 tonnes @ 1.24% Sn (333 392 tonnes Cu metal)

The Western Tharsis Mineral Resource is reported at a 0.75% Cu cut-off grade and is JORC compliant.

Inferred Resource	11 766 000 tonnes @ 1.26% Sn (148 373 tonnes Cu metal)
-------------------	---

Rehabilitation and environmental control initiatives

CMT has continued the progressive rehabilitation of the site. Significant revegetation projects include follow-up seeding and fertilising of the capped portion of the slag heap, waste rock dump and DPIWE drainage diversion works. Natural revegetation of the larger historic disturbance is being promoted by restricting activities that could disturb rehabilitation, active weed and pathogen control, and fire prevention programs. Healthy and diverse native vegetation communities are now well established in more protected areas of the site, and include King Billy pine regrowth and other alpine and rain forest assemblages. CMT is assisting a local community group, the King River Action Group, with revegetation trials on the King River delta near Strahan.

Ongoing pollution control initiatives include continual improvement of site stormwater drainage treatment, with successful drainage diversion works, additional sediment traps installed and raised awareness of the issue. The frequency of non-compliant discharges from the mine and tailings storage facility has been reducing as a result of improved vigilance, water management practices and awareness of site personnel. There are continuing programs of waste reduction and resource conservation.

A raise of the Princess Creek tailings storage embankment is planned for the summer of 2005/2006. The lift design includes a number of features that will result in improved

discharge water quality, including multiple and controllable decant systems and increased embankment runoff sediment retention.

Capital expenditure

The major capital expenditure was \$4 million for the current tailings dam project.

New development projects include:

- ❑ Wemco Tank Cell for additional recovery of copper;
- ❑ Knelson Concentrator for additional recovery of gold;
- ❑ Underground diamond drilling project for enhancing reserves;
- ❑ Mobile crusher on contract basis to increase the plant throughput; and
- ❑ Surface drilling and exploration.

Gold

Beaconsfield Mine Joint Venture

The joint venture operates a gold mine at Beaconsfield in northern Tasmania. Total modern day gold production surpassed 500,000 ounces in November 2004, just over four years after the resumption of processing. Total historical production is recorded at 854,600 ounces over a period of 37 years.

Production

Production for the year totalled 3890 kg of gold and 464 kg of silver from 240 685 tonnes of ore milled. A total of 145 855 tonnes of waste was mined during the year of which 81 028 tonnes was utilised as backfill underground, with the remainder hoisted to the surface and stockpiled for future tailings dam construction.

Resources and reserves

The ore reserves reported at 30 June 2005 comprised:

Measured Resource	159 000 tonnes @ 25.4 g/t Au (130,000 ounces contained gold)
Indicated Resource	477 000 tonnes @ 17.8 g/t Au (272,000 ounces contained gold)
Inferred Resource	300 000 tonnes @ 9.6 g/t Au (93,000 ounces contained gold)
Total Resource	936 000 tonnes @ 16.4 g/t Au (495,000 ounces contained gold)
Proven Reserve	213 000 tonnes @ 17.7 g/t Au (121,000 ounces contained gold)
Probable Reserve	392 000 tonnes @ 13.1 g/t Au (164,000 ounces contained gold)
Total Reserve	605 000 tonnes @ 14.7 g/t Au (285,000 ounces contained gold)

The Ore Reserve is contained entirely within the Mineral Resource. Mineral Resource and Ore Reserve estimation was undertaken as required under the JORC Code (2004).

Employment

A total of 142 people are employed of whom eight were in technical services, 89 in mining, 34 in processing, eight in administration and three in occupational health and safety. In addition contractors are employed for some mining and maintenance services, security, surface ore haulage and the assay laboratory. Total employees equivalent at year end was 190.

Major projects

A major underground diamond-drilling program continued throughout the year. Approximately 18 000 metres was completed in the 12 months to June 2005 with an additional 5000 metres required to complete the program by October 2005.

Capital expenditure

Capital expenditure for the year totalled \$8,979,590. Major items of capital included the diamond drilling referred to above, several pieces of underground mobile equipment, a replacement rising main in the Hart Shaft for mine dewatering and purchase of a real-time seismic network for the underground mine.

Placer Dome Henty Gold mine

Placer Dome employs 176 people, including 104 staff and 72 contractors, at its Henty gold mine. The operation produced 3958 kg of gold and 1001 kg of silver in 5114 kg of doré. A total of 286 828 tonnes of ore was milled and 91 963 tonnes of waste handled.

Reserves and Resources

Resources and reserves as at December 2004 comprised:

Mineral resources inclusive of reserves above lower cut-off of 4.5 g/t Au:

Indicated Resource	789 000 tonnes @ 10.7 g/t Au (271,000 ounces contained gold)
Inferred Resource	185 000 tonnes @ 9 g/t Au (54,000 ounces contained gold)

Reserves above a cut-off grade of 6.0 g/t:

Probable Reserve	749 000 tonnes @ 10.05 g/t Au (242,000 ounces contained gold)
------------------	--

Significant mine exploration is being carried out from underground workings to investigate the potential for extending mine life.

Major projects

A loss control (safety) management system improvement project has been implemented. The action plan includes Placer Dome Corporate Safety Strategies and promotes safety leadership; transforms safety management to a risk-based model; integrates safety and operational management; reduces risk levels through engineering advances and application of new technology and design; reviews training; and champions safety.

Capital expenditure

A total of \$2 million was expended on a variety of capital improvement programs.

Rehabilitation and environmental control

Henty again achieved a significant reduction in greenhouse gas emissions in 2004/2005 compared to the previous year. The 15% reduction was due largely to a reduction in diesel fuel consumption, and was partially offset by an increase in explosives usage. The diesel fuel consumption reduction resulted from a rationalisation of the mining operations to minimise mobile equipment tramming times and maximise productivity.

An energy efficiency audit of the entire operation was undertaken in late 2004, and a number of opportunities for reducing energy consumption were identified. The highest impact opportunity lies in investigating the compressed air reticulation system underground for potential leakage in order to reduce the load on and operating time of the compressors. This investigation will be carried out during 2005.

The annual biological monitoring survey of the Henty River upstream and downstream of operations continued to confirm that the mine is having no impact on stream fauna. This was the twelfth year that the mine has carried out this survey, which is a good indicator of the mine's performance with respect to managing pollutant levels in discharge water.

Iron ore

Australian Bulk Minerals (Savage River Mines)

On 28 February 2005 Stemcor Pellets purchased the Savage River assets from Ivanhoe Mines. No changes have been made to the current mine plan, which takes production through to May 2009. Pre-feasibility studies to extend mine life continue.

Production

Production from the Savage River mine totalled 1 586 000 million cubic metres of iron ore and 7 042 000 million cubic metres of waste, a total of 8 628 000 million cubic metres mined. Of this 5 388 000 million tonnes of ore were milled producing 2 099 000 million tonnes of concentrates.

Pellet production totalled 2 007 000 million tonnes, with 1 952 000 million tonnes of pellets, 40 000 tonnes of concentrate and 64 000 tonnes of chips being sold.

Reserves

Resources at the end of June 2005 comprised:

North pit	84.59 Mt @ 51.0% DTR
South deposit	29.13 Mt @ 42.9% DTR
Centre pit south	59.01 Mt @ 46.9% DTR
Centre pit north	69.19 Mt @ 51.1% DTR
Centre pit south extension	3.67 Mt @ 45.5% DTR

Measured	101.98 Mt @ 52.2% DTR
Indicated	85.34 Mt @ 45.5% DTR
Inferred	68.28 Mt @ 43.4% DTR
Total	245.6 Mt @ 49.0% DTR

Ore reserves comprised:

North Pit	12.52 Mt @ 51.8% DTR
Centre pit south	3.64 Mt @ 48.8% DTR
Stockpiles	1.41 Mt @ 40.8% DTR
Proved	15.87 Mt @ 50.9% DTR
Probable	1.69 Mt @ 44.7% DTR
Total	17.57 Mt @ 50.3% DTR

Employment

A total of 477 people, including 193 contractors, were employed in the operation at year end, with 224 in the mine, 90 in the concentrator and 163 in the port, pellet plant and administration.

Capital expenditure

A total of \$7.26 million was spent on capital expenditure during the year. Major programs included ball mill No. 2 feed end replacement, drilling, river crossings, tailings dam work, ore pipeline work, and equipment upgrade, replacement and maintenance.

Environment and rehabilitation

Contract weed management continued within the former Savage River township on behalf of the Savage River Remediation Project (SRRP). This contract is due for completion/renewal in September 2005.

In situ classification and segregation of waste rock from pits has continued. This classification was commended during the SRRP peer review. Waste from North Pit went to Broderick Dump and waste from South Centre Pit went to the new North Centre Pit Dump.

ABM has continued funding a Coastcare program from Rocky Cape to East Stanley. The program has been expanded to increase specific areas at Stanley, Black River and Rocky Cape. These extra areas attracted Federal funding.

Dust deposition at Cowrie Point and Crayfish Creek is measured by high volume air sampling with selective PM¹⁰ inlets. The annual averages were 27.82 µg/m³ at Cowrie Point and 24.27 µg/m³ at Crayfish Creek.

Water quality in the Savage River resulting from ABM's operations met specifications.

Tasmania Mines NL

Tasmania Mines NL operates an open-cut mine and processing plant at Kara, southeast of Hampshire in northwest Tasmania, producing magnetite and scheelite. Twenty-one people are employed in management and operations including contractors, together with seven part-time and contract staff.

Production

A total of 172 600 tonnes of ore was mined to produce 69 600 tonnes of magnetite concentrate and 37 000

kilograms of scheelite concentrate. A total of 142 700 tonnes of waste material was mined in the open cut. The majority of the waste mined was moved to the south end of the open cut for permanent storage or used on roads or for rehabilitation around the site.

Reserves and resources

Proved and probable reserves at Kara No. 1 are 1.25 million tonnes @ >30% Fe, with 590 000 tonnes inferred in the north wall. An additional three million tonnes @ >30% Fe are inferred north of 6020N.

Rehabilitation

The majority of the waste overburden mined has been placed at the south end of the Kara No. 1 open cut as permanent rehabilitation/storage. Run off is monitored and directed away from the placed overburden along the contact between the granite rock of the pit and the overburden. Stability is maintained by armouring final slopes with larger size material and limiting the height of overburden slopes with bench horizons.

Major projects

A Marcy ball mill was installed into the processing operation which is expected to lift production to approximately 200 000 tonnes per annum.

Nickel

Allegiance Metals Pty Ltd

Allegiance has identified a resource of four million tonnes of 1.5% Ni on its Avebury project six kilometres west of Zeehan in western Tasmania. Access and infrastructure construction commenced in January 2004.

Initial development of the Viking decline was completed to a total length of 1300 metres. Approximately 104 000 tonnes of development waste was mined, together with a small quantity of ore sample for metallurgical testing.

A significant resource infill drill program from the Viking decline was undertaken into the North Viking, South Viking, North Avebury and Central Avebury resources. Drilling totalled 14 250 metres in 77 diamond-drill holes.

Investigation and planning continued, including metallurgical testing, geotechnical studies, initial mine layout and design and tailings dam design. The West Coast Council has given development approval for future mine development.

Modifications to the Trial Harbour Road by the West Coast Council were commenced to provide for heavy haulage of equipment and product.

With the work completed to date on the Viking decline and the definitive feasibility study, Allegiance will have spent approximately \$20 million on the Avebury project since work commenced in 1996.

Tin

Bluestone Mines Tasmania Pty Ltd

Bluestone Mines Tasmania is a subsidiary of Bluestone Tin Limited. Bluestone purchased the Renison leases, mine, concentrator and associated infrastructure in March 2004. The company has spent considerable effort and resources refurbishing the assets to bring them into production.

Underground work was steadily ramped up in the first half of the financial year with dewatering, rehabilitation of some areas, recommissioning of the underground crusher and shaft haulage system. Development of the Federal Deeps commenced.

Significant refurbishment occurred in the concentrator and the surface crushing facility was replaced. The concentrator was commissioned in February 2005.

In December the company reached agreement to acquire the Mount Bischoff Tin Project.

Production

Ore hoisted from underground comprised 192 000 tonnes @ 1.31% Sn. Ore was won through development in the Envelope, Federal and King ore bodies and stoped from Clarke, Federal, Envelope, King and Blackwood ore bodies.

The concentrator was commissioned in the period and 33 000 tonnes of ore were used in this process. Post commissioning 146 500 tonnes of ore were treated and a total of 910 tonnes of tin in concentrate was produced.

Minor toll processing of oxide tin ores from local prospectors is currently taking place. To the end of June 2841 tonnes had been processed.

A total of 1600 metres of waste development was completed. The South Renison decline was advanced 500 metres from 1630 mRL to 1560 mRL and accesses developed on the 1636, 1618, 1600 and 1577 levels of the Federal ore body. Some minor waste development was also conducted to complete development required for stoping of remnant blocks in the upper part of the mine. All waste mined has been used as backfill or stored underground for use as backfill.

Reserves and resources

As of 31 March 2005 the estimated reserves were:

Renison	1 500 000 tonnes @ 2.02% Sn (30 375 tonnes tin metal)
Mount Bischoff	742 000 tonnes @ 1.23% Sn (9127 tonnes tin metal)
Rentails (tailings)	17 900 000 tonnes @ 0.42% Sn (75 000 tonnes tin metal)
Total	20 142 000 tonnes @ 0.57% Sn (114 502 tonnes tin metal)

The total estimated resources were:

Renison	4 109 000 tonnes @ 1.88% Sn (77 081 tonnes tin metal)
Mount Bischoff	1 903 000 tonnes @ 0.96% Sn (18 267 tonnes tin metal)
Rentails (tailings)	17 900 000 tonnes @ 0.42% Sn (75 000 tonnes tin metal)
Total	23 912 000 tonnes @ 0.71% Sn (170 348 tonnes tin metal)

Environmental program

Recommissioning of site environmental management practices were an integral part of mine recommissioning following cessation of mining and subsequent mine closure by the previous owners.

Personnel were appointed to implement site environmental management practices in accordance with the Site Permit and Bluestone's Corporate Policy.

Monitoring programs were maintained to ensure continuity of data for point source and ambient water quality monitoring. This was particularly important as the mine had been partially flooded by the previous owners and mine dewatering was, and continues to be, a new and key aspect of site water management. Elective monitoring was conducted to better understand the nature of the mine water.

Core activity focussed on assessing site inductions, waste management, hydrocarbon management and hazardous materials management to re-establish past practice and identify opportunities for improvement.

Major projects

Programs completed included:

- ❑ Refurbishment and recommissioning of the concentrator.
- ❑ Replacement of the surface crushing plant.
- ❑ Dewatering of the mine for all but the Rendeeep northern area.
- ❑ Refurbishment of the main underground pump stations and upgrade of the underground high voltage electrical reticulation.
- ❑ Reinstallation of the underground crushing system and commissioning of the haulage shaft.

Projects in progress included:

- ❑ Drill out of the Federal Deeps resource and extension of the ore reserves. In the period 7216 metres of diamond core was drilled in this area.
- ❑ High-grade intercepts were received from the Federal Deeps area resulting in a significant increase in mining reserves from this area. The new additions are of much higher tenor (circa 3% Sn mine grades) and have extended the available mining strike within the Federal Lodes from 300 metres to over 450 metres. The higher tenor ore remains open along strike and at depth.
- ❑ The Federal Deeps intercepts show that as the mineralisation within the Federal Fault deepens and gets closer to the granite (higher temperature

emplacement), there is a change in mineralogy. In particular there is a lowering of the associated sulfide minerals, a switch within the sulfides from pyrite/pyrrhotite to arsenopyrite, and coincidentally there is coarser cassiterite with a higher tenor in tin grade.

Capital expenditure

A total of \$39.5 million was expended on capital at the Tasmanian operations. This comprised plant and equipment, Renison acquisition, Rentails feasibility, mine development, Mt Bischoff acquisition, and exploration.

New developments

The Rentails project is based upon the re-treatment of 17.9 million tonnes averaging 0.42% Sn of tailings produced from the Renison project over the past 40 years. A pre-feasibility study and financial modelling suggest a sound project delivering an average of 5960 tpa of tin metal over a nine-year period.

The scope of the Rentails project has been modified to integrate the re-treatment of the historic tails with the further downstream processing of rejects of the existing Renison operations. The feasibility concept is now to build the project around the following typical feedstock:

- ❑ 1.9 million tonnes per annum at 0.42% Sn of historic tailings;
- ❑ 0.1 million tonnes per annum at 0.40% Sn of Renison tailings; and
- ❑ 0.016 million tonnes at 10% Sn of Renison gravity tailings.

Bluestone intends to continue to advance Rentails towards completing a definitive feasibility study as well as continuing to refine and optimise test work and opportunities for the project. The Rentails project continues to advance to pilot plant test work phase simulating the flotation and fuming processes before completion of definitive study estimates.

Mount Bischoff

The acquisition of the Mt Bischoff project has been completed. Mt Bischoff will be integrated into the Renison project and will provide the ore feed to enable the Renison tin concentrator to operate at full capacity in the ensuing three to four years while additional development and production capacity from the Renison mine is implemented. The mining concept is a simple open-cut operation whereby ore is stockpiled and transported to the Renison tin concentrator at a rate of approximately 200 000 to 250 000 tonnes per annum.

Mining studies have been carried out on the White, Greisen and Gossan Face zones at Mt Bischoff. These are only a sub-set of the overall mineralised system and as such it is anticipated that considerably more economic ore can be accessed. The Mt Bischoff mine is a substantial mineralised system and there is excellent potential for the discovery of more tin mineralisation for open pit and underground mining.

Industrial Minerals

Limestone and dolomite

Beams Bros Pty Ltd

This company operates a limestone quarry at Flowery Gully and a dolomite quarry at Cressy. Twenty-two people are employed. Production for the year comprised:

Metallurgical grade limestone & dolomite	47 000 tonnes
Lime and limestone drains, water treatment etc.	11 000 tonnes
fine limestone and dolomite	85 000 tonnes
dolomite by-product	8 000 tonnes
stone	3 000 tonnes

A total of 22 000 m³ of waste was removed from the Flowery Gully quarry with a further 20 000 m³ of waste being removed from the Cressy dolomite mine.

A small section of the waste dump at Cressy was rehabilitated. Pines were planted and rehabilitation of the dump site continued as stages were finished. Waste oil drums and scrap steel were removed from the Flowery Gully site, with more trees being planted for visual screening at the quarry entrance.

At Flowery Gully a new primary crusher was brought into production and a new haul road was finished.

Circular Head Dolomite and Trading Co. Pty Ltd

This company employed 13 people and produced the following products:

Screenings	23 000 tonnes
Powder	37 000 tonnes
Readymix concrete	8000 cubic metres

Drilling has confirmed that up to 1000 metres thickness of dolomite extends over the 120 hectare mining lease.

A larger screen is being installed to increase capacity.

Capital was expended during the year for a Caterpillar 9306 loader, an upgrade of the powder shed, and a JCB Fastrac spreader and bin.

Unimin Australia Limited

This company operates a limestone quarry and calcine plant at Mole Creek in northern Tasmania.

Employees

The equivalent of 26 staff was employed throughout the financial year. Of these 18 were in the quarry and lime plant operation, one in maintenance, two in administration and five in management and sales.

Production

Total limestone production from Mole Creek was 122 000 tonnes, which included 43 000 tonnes of clean crushed and screened rock and 19 000 tonnes of dirty crushed and screened rock. The remainder was produced for agricultural use and calciner feed. A total of 452 000 tonnes of rock was moved to dump.

Environmental

Continuous emissions monitoring equipment was installed. The site's environmental management plan, operations performance report and Ausplume analysis were submitted to DPIWE, reviewed and accepted. A site rehabilitation and closure plan is included in the plan. A lease extension environmental management plan was submitted but approval is still pending. Design work was completed on a kiln baghouse and cooler, and capital submissions are currently being undertaken.

Major project

The kiln top was successfully replaced with a significant improvement in plant efficiency. Work commenced on improving the access and walkways around the crusher and some mobile plant was replaced. Plant electrics were also upgraded.

Silica

Cominex Pty Ltd

Production of high purity silica flour from the Corinna lease totalled 42 600 tonnes. A further 7400 tonnes of road base gravel was produced with 125 000 tonnes of overburden being stripped.

The operation employed 15 people, comprising eight in open-cut operations, five in trucking to plant and two in administration.

Probable reserves of high purity silica flour totalled 500 000 tonnes with 900 000 tonnes of possible reserves.

Joint tenement holder Sumitomo Australia Limited propose constructing a 60 000 tonne per annum processing plant at Wynyard for the beneficiation of silica prior to export.

Index Mineral Processors Burnie Operations

Twenty staff were employed in silica production at Burnie, with 5600 tonnes of fines product and 15 300 tonnes of coarse product being produced. A proposal to expand production to 40 000 tpa in 2005/2006 has been developed. The documentation for an increase in the production licence is being prepared for submission.

The site environmental management plan review is under preparation for submission to DPIWE in 2005/2006.

The Index Group has commenced an exploration program to prove potential silica deposit reserves in western Tasmania.

Funds were approved to upgrade the beneficiation process to give improved control and the ability to handle feedstock variances, as well as enhance recovery efficiencies. Procurement of equipment has commenced. The forecast total project capital cost is approximately \$1.5 million.

Ceramics

Austral Bricks Tasmania

A total of 32 people were employed at the Longford plant. Total production of clay products was 27 600 tonnes. This included over 25 000 tonnes of brick and 2200 tonnes of

paving. The total volume produced was down 1.1% on the previous year.

Ample reserves of raw materials are available at all sites from where material is currently sourced. A minimum of 15 years resource is available.

Two major items of mobile plant, a fork truck for yard use and a delivery truck including crane and trailer, were purchased at a cost exceeding \$440,000.

Export of product continued to be significant. A total of 9800 tonnes of bricks and pavers was sent to overseas markets including Japan, New Zealand, South Korea and Italy.

K&D Bricks & Pavers

This company continues to manufacture clay products.

Fuel Minerals

Cornwall Coal Company NL

Cornwall Coal operates coal mines at Fingal, Mt Nicholas, St Marys and Hamilton, and a coal washing plant at Fingal.

A total of 66 people were employed, including 47 in underground operations, ten in processing and nine in administration. A further eight people were employed under contract in open-cut operations and 12 in transport. Two lost time injuries occurred at the Duncan Colliery.

Duncan Colliery, Fingal

Production continued throughout the year using a combination of both pillar development and pillar extraction techniques. All underground production by Cornwall Coal from the Fingal Valley was concentrated within the Duncan Colliery.

Blackwood Colliery and Huntsman open cut, Mt Nicholas

The rehabilitation concluded last year has been monitored throughout the year, with the rehabilitation progressing favourably.

Cullenswood open cut, St Marys

Development approval to mine the remainder of the Cullenswood mining lease was granted by the Break O'Day Council, with operations commencing during the year. The resource is being used to augment the supply from Duncan

to satisfy customer requirements. This has arisen due to the difficult characteristics of coal at Kimbolton.

Kimbolton Coal, Hamilton

Very little coal was mined from this resource during the year due to the characteristics exhibited by the coal during handling and use. Investigation work continued throughout the year to identify methods and systems able to be used to allow for successful burning of coal from Kimbolton.

Production

Production for 2004/2005 totalled 575 413 tonnes. This coal was sourced from the Duncan (474 332 tonnes) and Cullenswood (101 081 tonnes) mines. An additional 30 tonnes of coal was purchased.

Washery throughput of raw coal totalled 570 678 tonnes to produce 399 345 tonnes of saleable coal at a washery yield of 69.98%. Coal sales totalled 410 522 tonnes.

Approximately 171 333 tonnes of reject materials were deposited at the Duncan reject dump.

Capital expenditure

A total of \$2.2 million was spent on plant and equipment throughout the year. The major expenditure was on an upgrade of the washing plant by the installation of a new screen to allow for the automatic sizing of coal to TEMCO. A self-contained, self-bunded oil storage facility was purchased and installed to augment and upgrade the environmental performance.

Construction Materials

Boral ACM Tasmanian Quarries

This company employed 28 people (including two contractors), of which 23 were in operations and three were in administration. Production approached one million tonnes, with 34 000 tonnes of overburden being removed.

Rehabilitation continues in stages at South Arm, Launceston and Mt Nassau. Weed management plans have been developed for all sites. The company has extensive reserves for foreseeable operations.

A new Komatsu WA 470 5H Loader was purchased for the Flowery Gully quarry at a cost of \$340,000.

Brambles Industrial Services

BIS has been involved in the extractive industry in Tasmania since the late 1960s and currently operates five sites around northern Tasmania, carrying out open-cut quarrying utilising fixed and portable crushing equipment for the production of pavement, screened sealing and drainage materials, produced from basalt, dolerite and quartzite source rock. Materials produced are supplied to asphalt/sealing contractors, local councils, pre-mix concrete suppliers, roadwork contractors, mining operations and the general public.

The Launceston quarry operation, which incorporates four open-cut mines, has been operating since the late 1970s, with the main office and mine being located at Western Junction, approximately 12 km south of Launceston. The Launceston quarry operation produces road construction and concrete aggregate materials for use in north and northeast Tasmania.

The Ridgley quarry has been operating since 1988 after relocating from the West Mooreville quarry site in the late 1960s. The Ridgley operation is located approximately 15 km south of Burnie. This operation produces crushed basalt quarry products and services northwest and western Tasmania.

Employees

A total of nineteen people, including administration staff, operators and sub-contractors, were employed by BIS during the past year, an increase of three from the previous year.

As at the end of June 2005 the BIS quarry operations in Tasmania exceeded ten years since the last Lost Time Injury, with the Ridgley quarry operation achieving twelve years since the last LTI.

Production

Crushed materials production for the year was sourced from basalt (547 000 tonnes), dolerite (19 700 tonnes) and quartzite (6000 tonnes). A combined 25 000 banked cubic metres of overburden was removed to expose source rock for drilling and blasting at the two basalt operations.

Rehabilitation

Progressive rehabilitation is continuing at all sites across Tasmania with major improvements in reducing airborne dust from fixed plant due to changes to operational procedures and updated dust suppression equipment and practices. A review was carried out of all environmental management plans for all sites; these have now been redrafted and updated to suit current requirements. During the EMP review test drilling was carried out to establish estimated rock reserves for each mine.

BIS Quarry Operations Tasmania achieved certification to 9001:2000 during 2004/2005, which now incorporates compliance to the Department of Infrastructure, Energy and Resources specifications and Australian Standards for pavement materials and aggregates. It also encompasses occupational health and safety and environmental compliance which are controlled by the application of standard operating procedures within the scope of the certification.

Caroline Quarries

This company reported production of 14 000 tonnes of crushed silica and 2000 tonnes of road gravel from their Railton quarry, providing employment for four permanent and casual employees.

During the year a new bench was started on the western section of the quarry, the main direction of the operation. The old stockpile shed was dismantled and the site was landscaped. The application of natural topsoil will commence in spring 2005.

Duggans Pty Ltd

This company employed nine people in operations, administration and laboratory staff at their plant at Cradoc in the Huon Valley. Production for the year totalled 90 000 tonnes of road making products, 24 000 tonnes of concrete products and 12 000 tonnes of construction materials. The production of ready-mixed concrete totalled 11 000 cubic metres.

Improvement to the sediment dams, rehabilitation of benches, and dust and noise control measures were carried out. Total recycling of all waste material from the concrete batch plant was introduced. Concrete waste was crushed and used as road-base materials throughout the Huon Valley.

The main crusher was refurbished, and extensions were made to the precast concrete factory and the administration office.

Increased demand in production provided the company with the opportunity to increase output by more than 50%. There has been a continued supply to the Kingborough and Huon Valley councils, while 'Sub Base (2)' was supplied for the Glen Huon Road project.

Duggans Precast Concrete Division has had a particularly busy year. All aggregates used to manufacture concrete in the Duggans Pty Ltd batch plant are quarried by Duggans Pty Ltd. Large projects have included Zero Davey Street, 81 Macquarie Street, Glenorchy Big W and the Risdon Prison.

Investigations continue into the potential use of Duggans crushed sandstone as a concrete sand. This includes trial mixes, improved washing and crushing facilities, improved processes, and durability tests. Crushed sandstone is now supplied to the public as a landscaping material. The combination of the refurbishment of the main crusher and use of a primary crusher has allowed the production of a harder, finer and higher quality dolerite product.

Gunns Limited — Northeast quarry operations

Gunns Tamar Roadworks group comprises six staff and a variable contractor workforce of up to 30 in peak times. Typically a group working from a quarry would consist of several trucks and a loader, all operated by the contract workforce. During the year approximately 25 people would operate from quarries on an intermittent basis and one person from the Tamar office.

Thirty-two quarries are intermittently operated to produce 133 000 tonnes of road material. Reserves are approximately 900 000 tonnes.

Approximately \$25,000 was spent on progressive rehabilitation and drainage works which does not include stripping and removal of overburden. Access improvement and reconfiguring pits with uneconomic face heights was carried out. Planning for a basalt quarry at Ringarooma is being carried out following amendments to the Dorset Planning Scheme.

During 2004 a number of surveys were carried out to determine the *Phytophthora cinnamomi* status of northeast quarries. The Forestry Tasmania Division of Forest Research and Development was contracted for this work, with four quarries identified as contaminated.

The Tebrakunna Road quarry has been rehabilitated and another location within the 25 hectare lease is being investigated. Mayberry has had little use and will be rehabilitated during this lease, contingent on future supplies of clean stone during the 2005/2006 summer. Gladstone Road was a tin mining site and the washed stone has been used in road works. Discussions have been held with a current tin miner regarding a transfer of material from another mine.

At Carters Track there is currently a significant stockpile of stone in the quarry which can only be used in a location not requiring uncontaminated gravel. It is planned to seek a nearby area not in the drainage of the current quarry and re-open this area, which is strategically placed for forest operations.

Hanson Construction Materials

This company operates a dolerite quarry at Flagstaff Gully Hobart and has acquired a gravel quarry at Calder.

Thirteen people were employed at the Hobart quarry, including eight in production, two in administration and three contractors. Two people were employed at Calder.

Production from the Hobart quarry totalled 278 000 tonnes, consisting of 156 000 tonnes of aggregates and 120 000 tonnes of road materials. The Calder quarry produced 60 000 tonnes of sand. Overburden stripping has been stockpiled for future rehabilitation work at the Hobart quarry. Rehabilitation work at the Calder quarry will commence in September once the rehabilitation plan has been completed.

Rehabilitation continues in all areas of the Hobart quarry with a focus on eliminating pampas grass, with successful results.

Two loaders were introduced at the Calder quarry to replace machines that did not comply to the company's OH&S requirements.

A development application for the Hobart quarry has been submitted to the Clarence City Council to extend quarry reserves to RL305. This application is awaiting the outcome of a new planning scheme.

HBMI Pty Ltd

Direct employment at the Leslie Vale quarry and mobile plants varied from 18 to 20 people. Twelve sub-contractors were directly related to production, while indirectly there were approximately 30 subcontractors, including truck drivers, employed per day.

Production for the year totalled 680 000 tonnes of road making material and 37 200 cubic metres of concrete products. No waste rock was moved due to extraction being conducted on the already developed third bench.

Major projects completed over the past 12 months include the supply of 90 000 tonnes of base and sub-base material to DIER for the Glen Huon Main Road project, the supply of base and pipe bedding to various sites for the gas pipeline project, and numerous subdivisions.

A major electrical upgrade of the Leslie Vale quarry commenced in April 2005. It is expected that \$1,000,000 will be expended on this program over the next year.

Major items of plant purchased include a vertical shaft impactor, an EL Jay 54" cone crusher, and a mobile Extec primary crusher.

Island Resources Pty Ltd

Four people were employed in extractive operations near Scottsdale, in northeast Tasmania, including one part time. Three were employed in administration and management. Two contractors are employed, one full time in transport and the other part time on mobile plant maintenance.

Production for the year totalled 116 000 tonnes. The major products were:

Concrete sand	18 000 tonnes
Concrete block mix	31 000 tonnes
Concrete pipe blend	4 000 tonnes
Retail market sand	13 000 tonnes
FCR Filler sand	5 000 tonnes
Foundry sand (wet & dried)	24 000 tonnes
Concrete gravel	1 000 tonnes
Road gravel	14 000 tonnes
Stone	5 000 tonnes

Waste material remains at approximately 3% of material mined.

Reserves are approximately 49 million tonnes of sand and 2.8 million tonnes of road gravel.

Major projects undertaken during the year included adding a third sluicing bin at the washing plant, extending the drying plant shed, and building a pebble washing and sizing plant. A wheel loader was purchased. Capital expenditure was approximately \$360,000.

Revegetation included plantings of *Eucalyptus rodwayi* seedlings.

Lazenby Sand

Production from the Sandford area totalled almost 10 000 m³ of sand. There were approximately three employees.

Lloyds North

Six people, including contractors, were employed at a basalt quarry at Kindred and the crushing plant at Ulverstone. Production was 106 000 tonnes comprising:

Concrete	46 000 tonnes
Road making	51 000 tonnes
Other	8 000 tonnes

At Kindred 80 000 tonnes is currently stripped with a possibility of another three benches to give 13 to 15 years of quarry life. The Ulverstone quarry has extensive resources.

An electric pump was installed to increase the volume of water to the crushing plant at a cost \$20,000. Guttering and a 10,000 gallon tank to capture water were installed.

Cladding of the south and eastern walls of the crusher house has been carried out. Atomising sprays over the first impact crusher have been installed, with further implementation of sprays to other areas planned.

A development application was submitted to the Central Coast Council for a mobile crushing plant to crush gravel at Kimberleys Road.

Norske Skog

Twenty-two people were employed to produce 87 000 tonnes of road construction materials from thirteen quarry leases on State Forest and eight quarry leases on private property. Small volumes of stripping were stockpiled to access road building materials in the Bannisters, Maynes,

Mt Lloyd, Puzzle, West Uxbridge, Jones and Newbury quarries. Approximately 10 000 m³ of crushed material is stockpiled in quarries ready for use.

All of the quarries have a current life expectancy of at least 10 to 15 years. Volumes from each of the quarries vary significantly from year to year depending on the proximity of any new road construction and maintenance issues. These quarries all produce excellent road pavement materials. A combination of drilling, blasting and crushing is undertaken in some and, where possible, material is either won by excavators or dozers.

Norske Skog has an annual rehabilitation budget of \$30,000 to ensure that works are being carried out in an effective and efficient manner. This work includes levelling of floors, benches, planting of trees and shrubs, and fertilising on areas in quarries which have no further production of gravel materials available.

During the winter months revegetation works were carried out using *Eucalyptus obliqua*, wattles and blackwood in the Shoobridge (2,000), Styx (400), Jones (900), Plenty (1,200) and Blue Gum Knob (500) quarries. Continuous monitoring of drainage issues within quarries is carried out. Replanting and fertilising work was also carried out to permit closure of disused quarries.

RNB Trading Pty Ltd

This company operates a sand screening operation at South Arm to provide sand for the construction and concrete industries. Three people were employed to produce 2000 tonnes of bedding sand and 114 000 tonnes of screened sand. The resource is depleting rapidly, with approximately 250 000 tonnes remaining. Consequently the company is investigating planning requirements for developing its retention licence near Seven Mile Beach.

The company continues to investigate the potential for developing its sand resources at Pioneer in northeast Tasmania. A development application has been lodged for Potato Hill with the George Town Council to permit expansion of this small-scale operation.

The independent lessee at South Arm, G L Males Proprietary Limited, has a plant to wash sand using deeper resources.

Stornoway Quarries Pty Ltd

The Stornoway Group operates in northern Tasmania. Industrial Sands and Silica Ltd operates a screening and drying plant at Port Sorell, Stornoway Hewitt Pty Ltd operates a sand washing plant at Beauty Point, while Stornoway Quarries Proprietary Limited operates a basalt quarry and mobile crusher at Breadalbane.

Treloar Transport Co.

Six people were employed in quarry production and administration. Production was 190 000 tonnes. Major products comprised:

Sub base 1 & 2	60 000 tonnes
Base course	80 000 tonnes
Pit run gravel	10 000 tonnes

Production of base course and sub-base gravel for the Ulverstone to Penguin Bass Highway duplication project resulted in a temporary increase in licence production requirements.

Limestone works were undertaken to mitigate the leaching of iron pyrites to control acid emissions. Testing procedures

were established to eliminate production and sale of iron pyrite contaminated gravel.

A Merlin vertical shaft impact crusher with supporting infrastructure was installed at a cost of \$250,000; a loader was purchased for \$160 000; and a screen was installed within crusher operation costing \$45,000.

Mineral Processing Operations

Cement Australia Holdings Pty Ltd

Continued strong market conditions in the building and construction sectors and significant infrastructure projects on the mainland have kept demand high for cement product from the Railton plant. A total of 148 people are employed full time at the mine and plant operation, including four contractors.

Production

Production of cement clinker totalled 1.02 million tonnes. Failure of the clinker kiln gearbox resulted in extending a maintenance shutdown to a six-week period and a loss of nearly 100 000 tonnes of clinker. Imports from Cement Australia's other facility at Gladstone and from overseas sources resulted in 1.25 million tonnes of cement still being produced for the period.

Of this, 1.12 million tonnes was shipped to Victoria and NSW via the Port of Devonport. Of the remaining production 96 000 tonnes was used for the local Tasmanian and Victorian market. A total of 1.247 million tonnes was despatched from Railton.

Capital expenditure

Capital expenditure totalled \$3.6 million for the period. Major projects included the upgrade of the plant fire main and upgrade of the local bulk market despatch facility, both projects to be commissioned later this year.

Rehabilitation and environmental initiatives

Rehabilitation of the disused quarry, adjacent to the factory, commenced in April 2005. Over 99 000 cubic metres of material were moved to back fill eastern faces of the pit. The project is scheduled to be completed in December 2005.

Weed control programs, including slashing and spraying of declared weeds, were conducted during the summer months. Monthly groundwater bore checks and water quality testing was ongoing.

The site Water Management Plan continues to address the issues surrounding the management of groundwater and surface water from mining and cement manufacturing operations. Geotechnical testing of ground conditions for the placement of drains and pipelines is in progress.

Development

The exploration program that commenced in February 2004 finished in September 2004 for a total of 1000 metres of air core drilling, 2500 metres of RC drilling, 2300 metres of RC pre-collars and 420 metres of diamond core. The ore block model and geological models for Railton have since been updated. A low-grade unit has been identified in the New Mine. As a result, an investigation is underway to change the silica ratio of the raw mix to increase the volume of this material that can be used as ore in our process. The accuracy of the new model is greatly improved.

A total of 158 000 cubic metres of clay were stripped from the northwest, northern, eastern and west cutback areas of the New Mine, with 400 cubic metres of topsoil being stockpiled for future rehabilitation. The northern section of the eastern wall is now on final design. Further expansion of the pit is planned for the western and northern cutbacks.

Comalco Aluminium Bell Bay Ltd

Comalco operates an electro metallurgical aluminium refinery at Bell Bay. Approximately 650 people were employed during 2004 including contractors. Production of aluminium in 2004 was 162 000 tonnes. Capital expenditure for the year was \$27.8 million, with the major expenditure being for completion of the \$30 million smelter upgrade project.

Impact Fertilisers

Production at the Hobart facility exceeded 100 000 tonnes of superphosphate. A total of 105 people were employed, together with an additional 20 contractors.

Environmental programs included completion of an effluent recycling pond, a dust control system was installed for ship unloading, and an air hygiene program was introduced to improve working conditions in the plant.

Construction of additional storage for 24 000 tonnes of finished product has commenced, and air hygiene stage 2 and ship loading dust control are under evaluation.

Tasmanian Electro Metallurgical Co Pty Ltd (TEMCO)

This company operates an electro-metallurgical smelter making ferro-alloys at Bell Bay. The company employs 275 people, with 228 in production and 39 in administration, including eight contractors.

Production for the year comprised 166 500 tonnes of ferro-manganese, 96 500 tonnes of silicon-manganese and 36 000 tonnes of sinter. Sales totalled 166 700 tonnes of ferro-manganese, 93 000 tonnes of silicon-manganese and 147 600 tonnes of sinter.

Environmental controls

Accreditation to ISO 14001 has been maintained. Engineering controls to the flare stacks and updated procedures have been introduced to reduce the incidence of furnace trips and reduce fugitive dust emissions. Investigations of fume dam mud recycling and installing a wet scrubber were carried out. Land care of the TEMCO site has been escalated to reduce fugitive dust emissions and enhance the greening of the site. The rare and threatened species project with the Royal Tasmanian Botanical Gardens is ongoing and will result in the database being completed, as well as creating a position to coordinate the activities and liaise with external partners.

Capital expenditure and major projects

A total of \$8,177,000 of capital was spent. Major projects completed or in progress include:

- ❑ Wet scrubber for sinter plant (2 years) (\$2,983,000).
- ❑ Fume extraction upgrade furnace No. 5 (\$551,000).
- ❑ ERU burner front upgrade (\$549,000).
- ❑ Current monitoring for furnace No. 1 (\$255,000).
- ❑ Gortex bags for furnace No. 5 fume baghouse (\$225,000).
- ❑ Replace general purpose forklift (\$207,000).
- ❑ Replace ERU control system (\$170,000).

Zinifex Hobart Smelter

Zinifex Hobart Smelter is an electrolytic zinc plant located on the Derwent Estuary in southern Tasmania. The smelter is Tasmania's second largest exporter and one of the world's largest zinc producers. Since the early 1990s the site has pursued an investment program to improve its operating and environmental performance.

The Risdon plant produced about 252 000 tonnes of zinc metal in 2004/2005, including a premium zinc diecasting alloy, EZDA. Major customers include manufacturing, chemical and engineering companies in Asia, which use zinc in galvanising, die-casting and pharmaceutical product applications. Production of EZDA was increased by more than 20 000 tonnes to meet increased demand from China.

Other products include sulphuric acid (423 000 tonnes), copper sulphate (1900 tonnes) and cadmium (315 tonnes), which are sold in Australian and overseas markets.

The operation provides direct employment for 537 people and 109 contractors (full time equivalents).

Environmental performance

As part of efforts to improve the health of the Derwent Estuary Zinifex Hobart Smelter support the Derwent Estuary Program, a partnership between the Tasmanian Government, local councils and industry to monitor, restore and protect the Derwent Estuary.

In the past five years in excess of \$10 million has been invested in improving site infrastructure, which has achieved a 50% reduction in metal emissions reporting to the estuary from point sources. Eleven environmental non-compliances and incidents were reported during the year, a 72% decrease from the previous year. This result was achieved through an improved focus on key environmental risks, including an upgrade to the site's stormwater containment infrastructure at the wharf.

Significant progress has been made in reducing site stockpiles of historical by-products through re-processing and export sales. Over 26 000 tonnes of manganese dioxide, which had accumulated on site over the past 70 years, was sold to China for use in the steel industry. Historical stocks of Hobart Leach Product are being recovered for shipping to the Zinifex Port Pirie smelter for reprocessing.

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

Mineral Resources Tasmania administers the Rehabilitation of Mining Lands Trust Fund which is used to carry out rehabilitation of abandoned mines in Tasmania. The trust was established following the proclamation of the *Mineral Resources Development Act 1995*. The State agreed with the mining and quarrying industries to use a portion of mining royalty raised by the Act for rehabilitating Crown land affected by historic mining disturbance. A total of \$467,000 was spent on this program during the past year, with the major programs at Balfour and St Helens.

Balfour

A two-year program of erosion control and revegetation was completed. During the year the bridge across Cassiterite Creek was rebuilt and drains were established on Laans Ridge, which was then revegetated. The Central Balfour shaft was capped and further clean up work was completed at Tin City.

Expenditure totalled \$130,000.

St Helens

Rehabilitation of the Argonaut mine at Golden Fleece Creek was completed during the year. Works entailed the development of rock-lined drains, contouring of eroded gullies and the use of jute matting to stabilise these areas. Native seed was collected on site and spread according to the local micro environment.

Expenditure totalled \$70 000.

Red Hills

Fifteen drill sites and five kilometres of exploration tracks were rehabilitated at Red Hills to the east of the Henty mine in a sub-alpine environment.

Expenditure totalled \$50 000.

Mt Bischoff shaft protection

Work was completed on a shaft safety program at Mt Bischoff which is extensively visited by the public and mineral collectors. Fourteen shafts were made safe by either concrete covers, fences or guard rails. Fences were also installed along open cuts, faces and other workings. A barrier was placed on the No. 5 Adit to the Bischoff Extended mine.

Expenditure totalled \$54,500.

Zeehan area

At Zeehan a small shaft was covered with a steel grating near the Florence mine, and maintenance weed spraying was carried out at the Argent and Florence mines. At the Argent No. 2 shaft Nike Creek was diverted back into its original channel to prevent the creek flowing through the

mine. The diversion will reduce acid discharge from the workings.

Expenditure totalled \$17,000.

Nickel Reward mine

The Nickel Reward mine at Trial Harbour is accessible to the public. A steel grating was installed over the shaft and a barrier was installed over the adit.

Expenditure totalled \$24,400.

Montana mine

A creek at the Montana silver-lead mine was diverted to prevent erosion of the remaining tailings. Unfortunately conditions were too soft to permit further mechanical rehabilitation on the tailings. Limestone rip rap was used to armour the creek and agricultural limestone was stockpiled in preparation for acid neutralisation of the site.

Expenditure totalled \$12,500.

Storys Creek

A three-year sampling program on Storys and Rossarden creeks is in its second year. Lack of high river flows may be skewing results in the recent dry period. Results are still awaited. Expenditure totalled \$7,500.

Some fencing was also erected to provide protection for excavations and salvaged historic equipment which may pose a risk to the public. Expenditure totalled \$6,000.

Quarry rehabilitation

The Parks and Wildlife Service is rehabilitating a disused quarry in the Rocky Cape National Park on behalf of the Trust which provided funds for the program.

Expenditure totalled \$25,000.

Program maintenance

A larger scale program carried out during the year was the aerial fertilising of the Merrywood mine which was revegetated in 2002. Response to date has been promising. Expenditure totalled \$9,800.

The Parks and Wildlife Service carried out rehabilitation on disused exploration tracks in the Lake Johnson Nature Reserve, at Mt Read near Rosebery, in 2002. \$1800 was provided this year for follow-up seed collection. Gorse spraying was again undertaken at the remote Queensberry mine near Zeehan. Expenditure totalled \$6,800.

Threatened species revegetation program

The Royal Tasmanian Botanical Gardens has an ongoing program of protecting threatened species. In 2004 its staff planted a trial plot in conjunction with the St Helens revegetation program, which has proved very successful.

A total of \$10,000 was provided towards the program and to foster further involvement in rehabilitation works.

Anchor Battery

The historic battery at the Anchor mine near St Helens is frequently visited by the public. The footings of the battery are severely decayed and there is a risk that the structure may fall over. Funding of \$5500 was provided to Forestry Tasmania to carry out safety works.

Zeehan weed control

Gorse and broom infestation is rampant in the Zeehan area, with areas affected including abandoned mines. A total of \$20,000 of assistance was provided to the West Coast Weed Strategy.

Forward planning

Emissions of contaminated water and extensive land degradation have resulted from historic mining activities in the Zeehan area. An acid drainage study carried out in 1999 showed that water treatment was beyond the resources of the Trust. Although several individual programs have been carried out since, a strategy to

effectively contribute to overcoming the problems has still to be accepted. Pitt and Sherry Pty Ltd were engaged to review the problems and provide recommendations within the resources of the Trust for its programs to make a meaningful improvement. Expenditure totalled \$5,000.

Site investigation was carried out and a report was drafted by consultant Nigel Bedford for tailings rehabilitation and associated work at Royal George. The costs of the overall program were found to be high in relation to the potential benefits so alternatives limiting the scope of work will be investigated. Expenditure totalled \$7,200.

Shaft cover designs and were investigated at a cost of \$3,800.

Tailings at the Aberfoyle mine at Rossarden were rehabilitated by the Trust in 1997. Revegetation success has been variable across the site due to metal contamination of the only available cover material. A trial was commenced in 2003/2004 using soil conditioners derived from red mud, to gather information on possible application at Rossarden and other sites. Geochemical sampling and analysis was carried out to measure chemical stability of the treatment. Meanwhile grass seedlings are growing satisfactorily. Expenditure totalled \$4,200.

Mineral Resources Tasmania

PO Box 56, Rosny Park, Tasmania, Australia 7018

30 Gordons Hill Road, Rosny Park, Tasmania, Australia

Telephone: +61 3 6233 8377

Facsimile: +61 3 6233 8338