



**Mineral Resources Tasmania
Annual Review, 2008/2009**

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

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Annual Review
2008/2009***

Mineral Resources Tasmania

Mineral Resources Tasmania (MRT) is a Division of the Department of Infrastructure, Energy and Resources (DIER). MRT is Tasmania's corporate entity for geoscientific data, information and knowledge, and consists of a multi-tasking group of people with a wide range of specialist experience.

The role of MRT is to ensure that Tasmania's mineral resources and infrastructure development are managed in a sustainable way now, and for future generations, in accordance with present Government Policy, Partnership Agreements and goals of *Tasmania Together*.

— Mission —

- To contribute to the economic development of Tasmania by providing the necessary geoscientific information and services to foster mineral resource and infrastructure development and responsible land management 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 geoscientific information for integration 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 on Tasmania's geohazards.
- Regulation of mineral and petroleum exploration and development in Tasmania, including offshore waters administered by the State, and the promotion of vacant areas available for onshore and offshore exploration.
- Setting and monitoring of standards for both the performance of exploration activities and the technical reporting of exploration records and case histories.
- Environmental appraisal, monitoring and management of mining heritage and land access issues.
- Issue of legal titles for 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.

— Major issues and initiatives for 2009/2010 —

- Continue work on the *TasExplore* geoscientific data initiative by continuing to upgrade the geological mapping of northeast Tasmania and King Island. Construction of a revised three-dimensional geological model of northeast Tasmania will commence.
- Continue updating data in the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- Undertake 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.
- Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- Provide resources for environmental monitoring of exploration and mineral tenements, and for inspection of mines and quarries.
- Continue the rehabilitation of abandoned mining sites in Tasmania.

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**Management of Mineral Resources Tasmania
(as at 30 June 2009)**

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Divisional Overview, 2008/2009

The 2008/2009 global financial crisis caused a major drop in mineral exploration expenditure and thus activity in Tasmania. The mining sector generally rode out the crisis well, with the mineral extraction and processing sector being Tasmania's largest export industry accounting for 44.8% of exports worth \$1.56 billion.

The main challenges facing government and the industry over the next three to five years are:

- the changing world attitude to the minerals industry;
- environment and infrastructure development requirements; and
- the Tasmanian Government's policy for mineral development that underpins what MRT can achieve.

Geology underpins our total life cycle. Soil (agriculture, forestry) is derived from rocks. Rocks contain ore bodies, store water (groundwater) and move due to earth processes (volcanic activity, land and mud slides, earthquakes and resultant tsunamis). Geoscientific data and research is the basis of understanding these processes.

Minerals are essential to meeting the needs of society. All products used in everyday life that are not grown are derived from extracts of products from the mineral and petroleum industry, therefore a high level of mineral exploration activity is essential for the future development of the mineral sector and for the economic well-being, not only of Tasmania, but also of the world.

Due to these variables, the State requires a critical mass of earth scientists, tenement management staff and support staff to address the changing conditions. This is the contribution that Mineral Resources Tasmania (MRT) makes to the Tasmanian community.

In a global sense, MRT represents Tasmania's Geological Survey Organisation (GSO) with the added functions of administration, tenement management (including lease inspections) and royalty collection. Therefore, MRT has two roles:

- to obtain geoscientific data and convert that data into both information and a knowledge base that can be used by a wide range of end-users; and
- to undertake tenement administration to ensure a fair return to Tasmanians for the use of the State's mineral resources.

The role of a GSO is to provide geoscientific knowledge as a basis for national and/or regional development, not only for mining and land use decision making, but also for infrastructure development and the general health and well being of the community. GSOs need to interpret their geoscientific data to derive information and knowledge that can be understood and used by society in general.

GSOs are also the purveyors of knowledge not only for the minerals and infrastructure industries but also for society as a whole. Social or urban geology is the provision of geoscientific information needed to bridge the gap between government, industry, other stakeholders and the community. GSOs also need to provide relevant information and monitoring in all stages of a mine life cycle, from exploration through operation to closure and rehabilitation.

The tenement management role includes administration of onshore and offshore exploration and mining tenements, environmental monitoring of exploration activities, determining rehabilitation requirements on exploration sites

and ensuring compliance, and reviewing and updating codes of practice as required.

MRT's future is to build on its past achievements to allow for the continuing growth of financial and physical development within Tasmania while acquiring, maintaining, interpreting and distributing data, information and knowledge to allow new challenges to be addressed.

This is my last annual overview of the activities of Mineral Resources Tasmania. After sixteen years as State Chief Geologist and fifteen years as Director, Mineral Resources & State Chief Geologist, I have decided to retire in the second half of 2010.

Throughout my period as director, the staff of MRT have worked as a cohesive team, constantly achieved targets and then built on the results produced to realise even better outcomes. I wish to acknowledge the work of, and sincerely thank, all MRT staff, past and present, for their hard work and dedication, without which MRT could not have developed the robust business model and digital databases required to service the needs of all Tasmanians.

With the successful construction of the TIGER System (2003), the development of the 3D geoscientific model of Tasmania (2004) and the acquisition of numerous regional remote sensing data sets (1995–2007), MRT staff have delivered all major projects initiated under my directorship since 1994 on time and within budget.

The promotion of data, information and knowledge from these projects has, in turn, led to increased mineral exploration investment in the State as well as providing local government and developers with digital information for pro-active land management and infrastructure development.

For mining to be sustainable it must not only contribute to the economic growth of the State, but also accept responsibility for its environmental and cultural impacts. There is also a need for a range of local economic activities to be developed in mining areas that should endure when a mineral deposit is depleted.

As the majority of the State's export income comes from the mining, forestry and agriculture/fishing sectors, Tasmania cannot ignore the realities of competing in a global market. It is much more exposed to international competition than other more industrialised States.

This means that future government policy for Tasmania's financial well being needs to be attuned to the needs of these export industries and the infrastructure on which they depend.

Tasmania's west and northwest districts are widely recognised throughout the world as an important mineral-rich area. This area must continue to be available for mineral exploration, as the site of probable new mines for both metallic and non-metallic minerals and possible geothermal power development.

Geothermal power developments will add to Tasmania's present low-greenhouse renewable energy sources, low sovereign risk profile, and access to growing Australian and Asian markets.

This leads to a requirement for government, and the community at large, to understand the need to continue to obtain new geoscientific data, as well as updating old data.

Australia's ability to maintain a sustainable society requires solutions that arise from such data. There is also a need to derive economic benefits from mining of our mineral

resources without long-term detrimental effect to our natural environment. We must therefore ensure that responsible remediation of the effects of withdrawing these assets from the Earth are undertaken.

Government should therefore continue to carry out rehabilitation work on abandoned mine sites, for which no individual or company can now be held responsible; and undertake land stability studies and monitor and map underground water supplies, not only to assist in responsible land management but to improve regional community amenities and maintain local environmental conditions.

If these basic needs are recognised then government needs to accept that sustainable development of mineral resources and new value-adding processes can only occur in partnership with local communities, so that continued economic growth and maintenance of jobs can occur in the industry and in surrounding regional communities.

It is therefore very important for the State to maintain a critical mass of earth scientists, tenement management staff and support staff to provide practical and policy advice on constantly changing issues and challenges involving earth processes and mining tenements. This is the role of Mineral Resources Tasmania.

The external environment in which Tasmania must operate suggests the future direction for MRT activities. This can be achieved by:

- providing appropriate geoscientific input for mineral development and land use planning and management so as to maintain a high quality of life for all Tasmanians;
- opening avenues to encourage investors to consider Tasmania as an investment area;
- ensuring that the existing geoscientific information necessary to plan and construct infrastructure projects is readily accessible; and
- ensuring a fair return to Tasmanians for the use of the State's mineral resources.

These goals can be obtained through MRT by:

- interpreting geoscientific data to produce information and knowledge which will allow all end-users to understand and fully appreciate the need for such data, information and knowledge;
- maintaining and updating the data management system (TIGER) that contains geoscientific and tenement related data sets;
- integrating the data sets held by MRT with other whole-of-government data sets and making them accessible through the MRT and other government web sites;
- ensuring that users can easily determine the existence of the data sets;
- managing mining tenements to meet government expectations for environmental matters and a fair return to Tasmania;
- making the integrated data sets rapidly accessible in the formats required by users at the user's preferred location;
- keeping the MRT component of integrated data sets current; and

- ensuring a client focus by providing contact details for further information.

Geoscientific investigations record past and present processes to allow a blueprint for our future to be developed. This blueprint:

- provides the resources needed to maintain our lifestyle;
- helps us keep our communities safe from geohazards; and
- is critical for the protection of our unique environments.

Therefore specific government policy and resources are needed to:

- encourage new greenfields exploration by continuing to provide new geoscientific data to extend and upgrade areas of mineral resource potential;
- encourage exploration activities for, and development of, non-metallic minerals;
- develop programs to promote Tasmania as an area with low sovereign risk for new investment opportunities;
- continue to enforce high environmental standards for exploration and mining activities; and
- develop strategies to combat the perception that Tasmania is a green lockup.

Two specific issues that need to be overcome in the not too distant future are the problems of:

- negative perceptions that the mining sector uses old technology, is dirty, and environmentally unfriendly; and
- the funding decline from government for the geoscientific sector.

If that scenario is accepted, then the future for MRT will be to provide a framework within which geoscientific data/information/knowledge can continually be obtained, interpreted and delivered, to contribute to the economic, social and environmental development of Tasmania.

Following a policy based on the above criteria will lead to:

- defining priority areas for the gathering of new geoscientific data;
- improving public awareness of geoscientific data being applied to solving day-to-day problems, such as providing natural hazard risk assessment, as well as to the minerals area;
- demonstrating how geological understanding can aid in assessing environmental risk;
- improving how we apply geoscientific information to maintain our land and water quality; and
- improving the co-operation between agencies responsible for spatial data, and the development of more effective agency structures.

I hope to be leaving MRT in good hands and with a hope that an improved financial future will lead to better resources for MRT and a better financial environment for Tasmania and Tasmanians.

Dr A (Tony) V Brown
*Director, Mineral Resources
 & State Chief Geologist*

Summary of Activities, 2008/2009

The mining industry in Tasmania was affected by lower metal prices during the last financial year. The outlook for 2009/2010 is presently uncertain, but optimistic, as commodity prices generally increased towards the end of 2008/2009, although not reaching the high levels experienced in 2007/2008.

Royalty revenue collected for the State by MRT totalled \$27.8 million in 2008/2009, which is above the last five year average but below last year's high.

Exploration successes during the year include the announcement of tin and tungsten resources at Mount Lindsay, north of Renison Bell, by Venture Minerals Limited to complement the iron ore resource announced last year. New zinc-lead-gold-silver resources were announced by Bass Metals Ltd at the Fossey zone at the southern end of the old Hellyer ore body. A study has been undertaken into commencing a new mining project there in early 2010.

Two petroleum exploration wells were drilled in offshore Tasmanian waters, Peejay-1 in the Bass Basin and Jarver-1 in the Sorell Basin. Unfortunately neither encountered economic hydrocarbons. Nine offshore seismic surveys were completed during the year. Offshore petroleum exploration expenditure was approximately \$37 million.

The Avebury nickel mine produced its first concentrates in July 2008 but due to sharply lower nickel prices, the mine was placed on care and maintenance in December and concentrate production from the mill ceased in January.

The Rosebery zinc mine continued to operate successfully during the year, but lower metal prices forced curtailment of mineral exploration, upgrade of the mill and construction of a new ventilation rise. Construction of a new tailings dam did proceed.

The sale of most of OZ Minerals' assets, including the Rosebery and Avebury mines, to China Minmetals Non-Ferrous Metals Company Limited was completed in June.

Bass Metals Ltd continued its profitable open-cut operation at the Que River mine. The Hellyer tailings retreatment project, operated by the Intec Limited-Polymetals Pty Ltd joint venture, closed at the end of August following the collapse in the zinc price. Bass Metals then purchased the Hellyer mill with a view to treating ore there when mining recommences at Hellyer.

Australian Bulk Minerals became part of Grange Resources Limited, with a consortium of Chinese companies, headed by the Shagang Group, becoming major shareholders in the company. The open-cut mine at Savage River is being expanded to extend the mine life by up to fifteen years.

Metals X Limited continued mining tin ore at Mount Bischoff and Renison Bell. A feasibility study into recovering tin and copper from the Renison Bell tailings dam was completed during the year and although it was found that the project is technically and economically feasible, it is unlikely that the project will be financed until world economic conditions and metal prices improve.

Following receipt of all approvals, King Island Scheelite Limited has formalised its joint venture with the Hunan Nonferrous Metals Corporation to commence the redevelopment of the Grassy scheelite mine and at year end was conducting geotechnical and metallurgical studies. Acquiring land for the project is underway.

Exploration programs continued at the Mount Lyell, Beaconsfield and Henty mines.

Van Dieman Mines Pty Ltd commenced trial mining at its alluvial tin mine at the Scotia deposit near Gladstone, but the operation was placed under care and maintenance in February when the company appointed administrators.

Tasmanian Advanced Minerals Pty Ltd continued silica flour extraction from tenements at Corinna and Blackwater and continued silica flour treatment operations at their plant near Wynyard. The Wynyard plant reduced operations to one shift but has recently received increased orders and is now hiring staff to run a second shift.

The Thylacine and Yolla gasfields are both in Tasmanian waters. Thylacine commenced production in September 2007, while Yolla began production in October 2006. The gas from both of these fields is piped to Victoria.

The new Commonwealth *Offshore Petroleum and Greenhouse Gas Storage Act 2006* was proclaimed in 2008. This Act replaced the *Offshore Petroleum Act 2006* which had replaced the long standing *Petroleum (Submerged Lands) Act 1967*. Tasmania finalised its amendments to the mirror legislation and four sets of Regulations on 16 June 2008.

Major initiatives

The major initiatives and issues affecting MRT in 2008/2009 included:

- Continuation of the four-year *TasExplore* geoscientific data and promotion initiative, with acquisition of aeromagnetic and radiometric data over northeast Tasmania and the Furneaux Group, and geological data acquisition in central northern Tasmania to upgrade old geological mapping, especially where discrepancies with the 3-D geological model were noted. All airborne geophysical data sets and associated interpretation reports have been released and the final stage of the gravity survey in northeast Tasmania was completed. New geological mapping in central northern Tasmania has been completed, compiled and submitted for drafting.
- Enhancing the provision of geoscientific data through the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- Undertaking a series of promotional activities to further encourage mineral exploration in Tasmania.
- Provision of resources for environmental monitoring of exploration and mining tenements, and for inspection of mines and quarries.

The major issues and initiatives for 2009/2010 are to:

- Continue work on the *TasExplore* geoscientific data initiative through continuing to upgrade the geological mapping of northeast Tasmania and King Island. Construction of a revised three-dimensional geological model of northeast Tasmania will commence.
- Continue updating data in the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- Undertake 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.
- Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.

- Provide resources for environmental monitoring of exploration and mineral tenements, and for inspection of mines and quarries.
- Continue the rehabilitation of abandoned mining sites in Tasmania.

Achievements against strategies identified for 2008/2009

New initiatives to stimulate mineral exploration in Tasmania

The buoyant investment climate in mineral exploration was maintained to the end of calendar year 2008. According to Australian Bureau of Statistics (ABS) data, expenditure on mineral exploration for the 2008 calendar year was \$30.8 million, up 12% from the previous year. Tasmania's share of Australian exploration expenditure was 1.18%, down from 1.47%. ABS data show that \$16.9 million, or 55% of total expenditure, was spent on the search for new deposits.

MRT data indicate that the ABS continues to under-report Tasmanian exploration expenditure, as the MRT figure for calendar year 2008 was \$40.10 million of which \$20.39 million or 50.8% of the total was spent on exploration licences.

The high proportion of expenditure directed to the search for new deposits in both data sets is an extremely satisfying result, as it indicates investment in the future Tasmanian mining industry.

The figures for the March 2009 quarter show that the global economic crisis had severely impacted on the level of activity, with the ABS reporting total expenditure of \$3.3 million, the lowest quarterly figure for two years. This compares with \$2.85 million recorded by MRT.

Promotion of mineral and petroleum potential

The Tasmanian Government provided \$240,000 in 2008/2009 to actively market mineral exploration opportunities in Tasmania. Activities undertaken included the presentation of a paper and holding a display at the world's leading exploration forum, the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) in Toronto, and visiting leading international mining companies in Tokyo, Toronto, London and Vancouver, both as part of an Australian team and as a separate Tasmanian group. Presentations were made at an Australian Mineral Exploration Investment seminar at the Australian embassy in Tokyo, and to the University of British Columbia in Vancouver.

In addition to the PDAC meeting, displays and presentations were made at the Mining 2008 meeting in Brisbane in November, to the Tasmanian Minerals Council Exploration Group Meeting at Launceston in May, and to the Association of Mineral Exploration Companies Convention in Perth in May.

Promotional missions and functions were conducted in Perth, Sydney, Brisbane and Melbourne by officials from DIER. During these visits, there was continued strong positive feedback on the mineral potential, infrastructure and business climate in Tasmania, as well as the geoscientific programs conducted by MRT. These promotions have been successful and continue to play a direct part in attracting new exploration companies to Tasmania, as well as stimulating interest in potential new mining and mineral processing projects. Several meetings were also held with companies on a one-on-one basis with DIER personnel.

Regular two-monthly updates on exploration progress in Tasmania were provided to the international Society of Economic Geologists newsletter as part of a global review of mineral exploration.

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 geohazards, geophysics, drilling, mineral deposits, samples and geochemistry. Once loaded, the information is made available to clients using the MRT web site. Other information available includes mineral tenements and documents held by MRT, and general information for MRT and DIER clients.

The recorded volume of downloads from the MRT web site totalled 5602 gigabytes, compared to a total of 2538 gigabytes in the previous year. Approximately 2000 gigabytes of this resulted from downloads in one month (May 2009) but even discounting this there has been a significant increase in download volume over the previous year. Some of this increase may be attributed to a higher level of desktop studies during the current period of financial constraint by business. The peak of 707 gigabytes was downloaded in June 2009. Development and maintenance of the TIGER system was successfully carried out using a combination of contractors and MRT staff. In addition to data being accessed from the MRT web site, 150 data packages were distributed on CD to clients.

Data capture/output was completed for the remaining eleven *TasExplore* initiative map tiles in central northern Tasmania (Cethana, Gog, Lea, Liena, Loongana, Loyetee, Pencil Pine, Railton, Riana, Ulverstone and Wilmot). Data capture/output was also completed for five other 1:25 000 scale map tiles (Grassy, Gordonvale, Propsting, Rookery and Tiger).

New aeromagnetic and radiometric data for northeast Tasmania were released in December 2007 and three interpretive reports were released in February 2008. The geophysical data, including Lidar data acquired in December 2008, are providing a firm basis for the geological mapping team. Mapping of the Mathinna Supergroup sedimentary succession in northeast Tasmania was continued by a team of six geologists and is about 60% complete, with the first mapped subdivisions of this major unit being defined. The work is also identifying major structures and will provide a better understanding of the controls of gold location and a major foundation for the 3-D geological model of the region. Two geologists continued work on King Island. The Grassy sheet has been published and identifies new prospective areas for tungsten mineralisation. Another two map tiles, Naracoopa and Stokes, were close to completion at year's end.

A report on the petrology of rocks from the Savage River iron deposit was published during the year and provides a new understanding of the origin of the deposit. The project will conclude with an examination of the geochemistry of the deposit, with work nearing completion. This work will have important implications for future exploration of the Arthur Lineament of northwest Tasmania.

A revised edition of *A Catalogue of the Minerals of Tasmania*, the first in some forty years, was published during the year.

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 mapping project of the North West Coast area and the northern Tamar Valley will be published soon, with maps of the Launceston, Hobart and Glenorchy areas having been completed in previous years. Funding assistance from the Australian and Tasmanian governments through the Natural Disaster Mitigation Programme (NDMP) has supported this project. The resultant landslide maps are assisting local governments 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.

The TIGER Geohazards (landslide) database forms a critical data foundation for the landslide project and to service enquiries from stakeholders. There are currently about 2300 records in the database, including details of landslide damage.

Historically, MRT has monitored a number of active landslides in Tasmania that have affected roads, railways and subdivisions. The Tarooa landslide at Hobart and the Lawrence Vale landslide at Launceston are currently being monitored. The Lawrence Vale landslide is monitored on an annual basis and no detectable movement was recorded in this time. The Tarooa landslide in comparison continues to move very slowly. A near real-time monitoring facility was established at Tarooa at the beginning of the year and is providing important information on the relationship of rainfall and groundwater to landslide movement.

The monitoring facility is able to remotely detect ground movement that allows timely warnings to stakeholders. A satellite-based radar survey (InSAR) was undertaken with the aim of better defining the area of active movement. The results of this study were inconclusive and require further analysis. A review of historical monitoring on the Tarooa site was undertaken in preparation for a risk assessment in June. The risk assessment workshop, addressing a range of elements at risk from the Tarooa landslide, was held at the Kingborough Council. The workshop, attended by a range of stakeholders including service providers and a community group, was organised by MRT in partnership with a stakeholder group and facilitated by the State Emergency Service.

There is a growing amount of evidence to suggest that parts of Tasmania are susceptible to tsunamis. In order to improve our understanding of the risks posed by this hazard MRT coordinated a project, funded through the NDMP, in the Hobart area to determine whether tsunamis have affected the area during the last 10 000 years. A report on palaeotsunami investigations has been completed and passed onto the State Emergency Service while a compilation of historical records will be published shortly. MRT has collaborated with Geoscience Australia to model tsunami inundation and calibrate it against the geological record. This information will be useful for emergency management planning and Local Government planning schemes. Preliminary results from the tsunami studies have recently been used in the Lauderdale Quay Canal Development hearing.

Aeromagnetic data were collected over the southwestern margin of the Gippsland Basin as a joint project with Geoscience Australia.

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.

During the year 70 exploration work programs were submitted to MRT, compared with 96 in the previous year. Of these programs 58 were approved, 18 of which were in reserves derived from the Regional Forest Agreement (RFA) and required assessment by the Mineral Exploration Working Group.

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 into this system to give a complete record of all the environmental information relating to exploration.

This system provides an integrated textual and spatial environment to ensure that 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 2008/2009 there were 597 mining leases in force. A total of 34 new leases and 80 lease renewals were applied for during 2008/2009. This took the overall total of applications and renewals currently being processed to 228.

Mining development continued during the year, requiring assessment and approval of several operations. The downturn in the minerals industry resulted in some mine closures and other operations reducing to care and maintenance.

At Hellyer, the Polymetals Pty Ltd–Intec Ltd joint venture tailings mining project closed. Open-cut development of the former Que River mine by Bass Metals Ltd continued and regular shipments of ore were made to Rosebery for treatment. Metals X Limited continued mining at Mount Bischoff, with the tin ore being transported to Renison Bell for treatment. Operations at the Beaconsfield gold mine resumed normal levels with good production reported. Mining to recover alluvial tin commenced at Scotia near Gladstone, but a fall in the tin price resulted in the operation being placed in receivership soon after. Development of the Fenton Seam at Mt Nicholas by the Cornwall Coal Company is continuing.

Town planning can be an important constraint on the development of extractive operations. Submissions, representations and appeals have been made to the Northern Midlands, Glenorchy, Clarence and Meander Valley councils concerning planning schemes or development applications. A long running appeal over the Tolosa Street quarry in Glenorchy was resolved. The most important representation was to the Northern Midlands Council concerning a proposed residential development adjacent to three quarries at Western Junction, with a successful outcome being achieved.

Alleged illegal mining was investigated at Sandford, Buckland, Northern Midlands and at Circular Head.

Rehabilitation of Mining Lands Trust Fund

The major focus of activity during 2008/2009 was again on shaft safety, with mine shafts at Pipers River, Lefroy, Blessington and Mount Victoria being either capped or fenced to provide for public safety. Remediation works began on mine tailings at Royal George and a mine camp was removed at the Den Reserve near Pipers River. Weed control was continued at Punks Terror near Dunorlan and at The Badgers near Sheffield. A total of \$163,100 was spent on trust fund projects during 2008/2009.

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 their non-renewable resources.

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 profits earned from the operation. Royalty on the recovery of industrial minerals and construction materials 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 legislation. The audit program concentrates on the metallic mines which pay royalty based on net sales and profits.

Mineral royalty revenues received for 2008/2009 totalled \$27.8 million, above the five-year average of \$25 million but lower than the previous year because of the global financial crisis and the associated impact on commodity prices. Revenues were better than originally predicted, following the initial rapid decline in commodity prices, due to a moderate strengthening in commodity prices, particularly for copper.

Financial Performance

The 2008/2009 consolidated fund appropriation to Mineral Resources Tasmania was \$7.01 million. This funding consisted of:

- \$4.23 million for salaries for 52.6 full-time-equivalent staff, plus four temporary staff;
- \$1.67 million for operating expenditure, including rent;
- \$0.17 million for the restoration of degraded mineral lands;
- \$0.24 million for the promotion of Tasmanian mineral opportunities; and
- \$0.70 million for the third year of the four-year *TasExplore* project, which included the funding for the four temporary staff.

MRT was also funded \$369,000 through the Capital Investment Program to replace the X-ray fluorescence spectrophotometer.

In 2006/2007 MRT was funded \$5.06 million over four years under Election Commitment funds to undertake the *TasExplore* project, which is to acquire new data for updating TIGER and the 3D geological model, and to undertake a comprehensive promotional program.

There were no significant variances in funding between the 2007/2008 and 2008/2009 appropriations. The onset of the global financial crisis placed significant stress on the State's financial capacity and the Department of Infrastructure, Energy and Resources was required to make significant expenditure cuts to assist in meeting the budget task. As a result, MRT made a number of cuts to existing programs, which included vacancy management. The significant impact of the cuts will be felt more in the 2009/2010 financial year.

Commonwealth Natural Disaster Mitigation Programme funds were carried forward to continue the Tasmanian Landslide Mapping Program (\$57,937). Funds were also carried forward from 2007/2008 for the Tarooma landslide and Tarooma real-time monitoring projects (\$38,136 and \$30,422), as well as for a project investigating the occurrence of palaeotsunamis in the Hobart area (\$19,072).

Outputs — Application of funds, 2008/2009

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 overheads associated with head office and carry forward funds that are loaded into outputs.

Descriptions of Outputs and Outcomes, 2008/2009

MRT has two outputs:

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;
- the 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.

The desired outcome is 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;
- the provision of advice to all levels of government and the public on land management issues;
- the administration of mining legislation, including the issue of legal titles for mineral tenements;
- the collation and recording of statistics relating to mining production and exploration; and
- the audit and monitoring of fee, rental and royalty collection.

The desired outcome is effective and efficient tenement management of the exploration and minerals industry.

Output	\$'000
1. Minerals exploration and land management	4,338
2. Tenement management of the exploration and minerals industry	3,325
Total	7,663

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 *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.

Mineral royalties totalling \$27.8 million were collected during the 2008/2009 financial year, a significant decrease from the \$41.4 million collected in 2007/2008. The decline was due to the global financial crisis and the impact it had on commodity prices.

The original forward-estimate budget for 2008/2009 was \$42.7 million. This estimate was reduced to \$23 million in December 2008 following the collapse of commodity prices, and the obvious impact this had on the revenues and profitability of mines in Tasmania. The improved revenue was mainly due to some moderate strengthening in commodity prices, particularly copper.

Whilst mineral royalty revenues have declined, the revenues remain above the \$4.5 million collected in 2002/2003 and above the five-year average of \$25 million.

	Target 08/09	Actual 08/09	Target 09/10
Royalties (\$,000)	42,700	27,805	34,000
Rents and Fees (\$,000)	1,113	1,556	1,560
Rents and Fees — Petroleum (net of administration) (\$,000)	270	163	203
Sales of Maps and Publications (\$,000)	23	28.4	23

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 \$1.719 million in 2008/2009, which was above budget expectation.

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 regime where royalty is paid on the net sales and on the profit of a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a 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 only

requires mining companies to pay a lesser fixed minimum royalty in times of no profitability, but ramps up to a maximum of 5% of net sales as profits increase.

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.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the legislation.

— Mineral Resources Tasmania — Legislation and Committees

Legislation administered

- Mineral Resources Development Act 1995
- Mineral Resources Development Amendment Act 2006
- Mining (Strategic Prospectivity Zones) Act 1993
- Offshore Petroleum and Greenhouse Gas Storage Act 2006
- 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
- Chief Government Geologists Committee
- Government Geoscience Information Committee and associated Working Groups
- CODES Centre of Excellence in Ore Deposits Advisory Board
- CODES Centre of Excellence in Ore Deposits Science Planning Committee
- Crown Land Assessment Working Group
- Inter-Departmental Oceans Policy Working Group
- Land Information Coordination Committee (LICC)
- LICC Sub-committee — The LIST Management Advisory Group
- Mineral Exploration Working Group
- National Virtual Core Library Project Committee
- Rehabilitation of Mining Lands Trust Fund Committee
- Tasmanian Statistical Advisory Committee

Mineral Resources Tasmania — Review of Branch Activities, 2008/2009

During 2008/2009 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 2008/2009, the Metallic Minerals and Geochemistry Branch continued work on the government-funded initiative TIGER Geoscience (*TasExplore*) Project, but also continued to develop databases for delivery on the world-wide web and to verify and update existing databases.

The continued high level of mineral exploration activity in Tasmania during the first half of the year maintained high work loads in processing exploration tenement applications and reviews, extracting and maintaining metadata from reports, and attending to a greater number of enquiries. The high level of Exploration Release Area promotional documents prepared was maintained throughout the year. This is affecting the capacity of the branch to adequately deal with these demands as well as achieve the time frames required by the *TasExplore* project.

Geoscientific data generation

Work continued on a project to understand the nature of the Savage River iron ore deposit, as part of a broader review of the mineral endowment and potential of the Arthur Lineament. A report was published on the petrology of the rocks in the mine area. At year's end work was advanced on the final stage of the project, development of an understanding of the mode and timing of formation of the deposit and implications for regional mineral potential.

Following receipt and preliminary interpretation of new geophysical data, a team of geologists continued work on updating the geology of northeast Tasmania, with particular emphasis on the rocks hosting the main gold, tin and tungsten deposits of the region. At year's end mapping of these Mathinna supergroup rocks was 60% complete, with significant advances in understanding the geology and structure of the region having been achieved. Two geologists worked on King Island and at the end of the year the Grassy 1:25 000 scale map sheet had been published. Mapping of the Naracoopa and Stokes sheets was nearing completion.

A revised edition of *A Catalogue of the Minerals of Tasmania*, the first in some forty years, was published during the year and is proving to be a very popular addition to the mineralogical literature and an effective vehicle for promoting the diversity and quality of minerals and semi-precious stones of Tasmania.

An agreement to obtain a hyperspectral infra-red core logging device, funded by the Commonwealth, under the National Critical Research Infrastructure (NCRIS) Auscope Virtual Core Library Project, was completed during the year. At 30 June permanent installation in the core library was expected within a few months.

Database development

A significant part of the work of the branch for the year continued to be testing of database structures for the TIGER System and verification and capture of data for incorporation in the system.

The samples, geochemistry and mineral deposits databases were transferred to the production environment and data made available on the internet. Information on 1749 new samples and revised data on a further 4016 samples was added to the database during the year.

Branch members continued to contribute to the development of a national data model for mineral deposits and occurrences.

Core library

The increasing level of usage of the core library continued, with 174 drill core inspection days occurring during the year, a 3% increase on the previous year.

A total of 21.8 km of core was added to the library collection during the year.

During the year a team from the Centre of Excellence in Ore Deposits at the University of Tasmania (CODES) continued using the core library as the site to determine detailed physical properties of rocks from drill core, as part of a major project aimed at improving metallurgical recovery from ores.

Improvements to the safety regime in the core library continued during the year. These included:

- A safety barrier and appropriate signage have been installed at the entry to the core library.
- The small fork lift truck was repaired and modified to operate on gas to improve safety and efficiency.
- Two diamond saws have been rewired and fitted with earth leakage devices.
- A draft safety induction process was prepared.
- Toilet facilities were upgraded.
- A new core inspection conveyor was installed during the year.

Remaining storage is very limited and installation of new racking in the half of the new area completed in 2005/2006 is an urgent priority.

Mineral exploration and other promotional activities

The Tasmanian Government provided \$240,000 in 2008/2009 to actively market mineral exploration opportunities in Tasmania. Activities undertaken included presentation of a paper and holding a display at the world's leading exploration forum, the Annual Meeting of the

Prospectors and Developers Association of Canada (PDAC) in Toronto and visiting leading international mining companies in Tokyo, Toronto, London and Vancouver, both as part of an Australian team and as a separate Tasmanian group. Presentations were made at an Australian Mineral Exploration Investment seminar at the Australian embassy in Tokyo and to the University of British Columbia in Vancouver.

Several meetings were also held with companies on a one-on-one basis with DIER personnel. In addition to the PDAC meeting, displays were presented at the *Mining 2008* meeting in Brisbane in November.

A paper, poster and promotional display were presented at the Australian Earth Sciences Convention in Perth in July. Presentations were made at the *Mining 2008* meeting in Brisbane in November, to the Tasmanian Minerals Council Exploration Group Meeting at Launceston in May, and to the Association of Mineral Exploration Companies Convention in Perth in May.

Promotional missions and functions were conducted in Perth, Sydney, Brisbane and Melbourne by officials from DIER. During these visits, there was continued strong positive feedback on the mineral potential, infrastructure and business climate in Tasmania, as well as the geoscientific programs conducted by MRT.

Information on developments and opportunities in Tasmania was provided for a feature article on Tasmania in *Gold and Minerals Gazette*. Bi-monthly updates on exploration activity in Tasmania were again supplied as part of world-wide reports on exploration in the Society of Economic Geologists Newsletter.

These promotions have been successful and continue to play a direct part in attracting new exploration companies to Tasmania, as well as stimulating interest in potential new mining and processing projects.

Petrology

This section is staffed by a full time petrologist, who supervises the petrological and lapidary laboratories which service internal and external clients, and by a technical officer, who provides 50% of his time to the section.

The lapidary and petrology laboratories provided a total of \$36,926 worth of analyses and services to both DIER (\$23,060) and external clients (\$13,866). Most of this external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 482 standard thin sections and 66 other sections, making a total throughput of 548 samples. A field assistant did most of these on an as-needed basis, and this work is valued at \$15,020.

The technical officer processed 266 samples by X-ray diffraction, including 80 quantitative dust analyses. He also conducted 32 soil and sizing tests and 75 optical asbestos identifications, for a total of 373 samples processed, valued at \$21,906.

A total of 241 external samples were received for contract investigations, mostly by X-ray diffraction analysis. These samples included 150 for occupational health clients, 41 soils, 7 construction materials, 12 industrial samples, 19 forensic samples and 12 general rocks and other samples. This external work came from a wide range of external sources, including the Transport Branch of DIER, and Workplace Standards Tasmania, Tasmania Police, other government departments, the University of Tasmania, mining, mineral processing and mineral exploration

companies, environmental and occupational health consultants, the general public and miscellaneous businesses.

Difficulties were experienced with the operation of the X-ray diffractometer during the year, but were overcome following minor repairs.

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

The petrologist, as official radiation safety officer, has overseen some radiation storage, X-ray equipment safety inspections and other safety issues. Laboratory safety audits are underway.

Curatorial work has included cataloguing, sorting, compiling and storage of rocks and thin sections, and general supervision of the rock store. The old rock collection and storage databases continue to be digitised and migrated into the TIGER system. The sample storage system is being reorganised to improve safety aspects. The oldest samples are gradually being boxed and palletised to make space for new samples, with over 10,000 done to date.

The petrologist liaises with lapidary clubs and companies, the Tasmanian Minerals Council and the general public on lapidary and gem and mineral collecting matters. MRT was represented at gem and mineral shows in both Hobart and Zeehan, and this included substantial sales (over \$1800) of books, maps, fossicking licences and other products.

A new, revised and enlarged edition of *A Catalogue of the Minerals of Tasmania* was completed during the year, while a revised edition of *Alluvial Gold* is in preparation. Advice was also given on proposed additions to the designated fossicking areas in Tasmania.

The petrologist assists with the storage of radioactive, asbestos-bearing and other dangerous substances, and has updated the guidelines for their handling.

About 121 public and commercial enquiries on subjects including minerals, mining, gem, soil and rock-related matters, particularly in regard to gem, rock and mineral locations and identification, occupational health issues, and mine locations were answered. The petrologist also gave talks on geology and mineralogy to several schools, provided mineralogical and curatorial advice to the Tasmanian Museum and Art Gallery when required, and gave a presentation on forensic geology to the Forensic Society.

Geochemical laboratory

The laboratory was staffed for 2008/2009 by a senior geochemist, who supervises the section but only works in the area for about 60% of his time, and three technical officers who work in the section for 50 to 80% of their time.

The laboratory generates the chemical/geochemical data necessary to maintain MRT's databases and is a cornerstone of its geological investigations. A total of 460 samples were submitted for 14,177 individual determinations during the year.

The X-ray fluorescence (XRF) spectrometer operated with increasing difficulty throughout the year, with a number of breakdowns. The argument for the machines obsolescence was accepted during the previous year and a budget was provided for its replacement. Following a rigorous tender process, in which four tenders were received and meticulously reviewed, an order was placed for a new instrument in May.

A new fluxer for preparing fused discs was obtained in July and performed well, but modifications were required to meet Australian electrical safety standards.

The Leco Induction Furnace continues to function, after the capacitors and resistors were replaced in 2004, and provides reliable data. Obtaining the essential components carbon dioxide and sulphur, necessary to complete major element analyses and provide data for mineral potential investigations, relies on effective Leco operation. The Leco is an instrument in excess of 25 years old and sourcing replacement parts is increasingly difficult.

Modifications were made to methods of gold and antimony determination, with resulting improvements in the accuracy and precision of assays.

A system for automatic labelling of samples submitted to the laboratory was developed and implemented during the year.

Attention to safety issues continued during the year. The compressor at the rock crushing laboratory was inspected and certified. Rock crushing procedures were modified and waste is encapsulated in bags for safe disposal.

The ventilation system for the chemical store was upgraded. Instruction sheets for, and labelling of, chemicals were upgraded.

A review was made of asbestos containing equipment and all affected material was identified and safely disposed of.

Other activities

- Field staff updated first aid qualifications in August and fire warden refresher courses were attended by relevant staff.
- Field staff attended a training course in operations in remote and isolated areas.

- Five staff members are on safety committees, including as Chair.
- A branch member is on a committee to prepare authority tables for the National Geodata Model, a working group established under the Government Geologists Information Policy Advisory Committee.
- Another branch member is on a committee to provide a national model for mineral deposits data.
- A further branch member is on the Operations Committee for the National Virtual Core Library Project and on a national Ad-Hoc Committee on Reporting Resources.
- Site visits were made to various exploration project sites and mines during the year as a part of reviewing industry progress.
- 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. A submission was prepared on expenditure commitments on exploration tenements in the light of the global economic crisis.
- Many requests for information on geology, mineral resources, minerals and related matters were received and dealt with promptly.
- The science planning meetings of the Centre of Excellence in Ore Deposits at the University of Tasmania (CODES) were attended.
- Three geologists attended parts of the CODES course on brownfields exploration in June and a paper was presented.

Industrial Minerals and Land Management

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

ENVIRONMENT, LAND MANAGEMENT & INDUSTRIAL MINERALS

Industrial Minerals

Tasmania Magnesite NL holds Retention Licences over the large, high-grade magnesite deposits at Arthur River and Lyons River in western Tasmania. The company recently changed ownership and has lodged a Mining Lease application over an area contained within the Retention Licences and is seeking approval to mine. The owners continue to look for opportunities for the use of this resource, while the CSIRO is progressing with the development of a commercial magnesium metal process.

Dr Alan Bond and Associates Pty Ltd progressed with plans to extract ilmenite from the existing stockpile at Naracoopa, on King Island, and intend to follow that with the mining of heavy mineral beach sands. They have recently delivered heavy equipment to King Island to allow for the transport of the existing stockpile. A number of possible joint venture partners are talking to the owners about further downstream processing potential.

There has been active exploration for silica flour throughout the past year. Tasmanian Advanced Minerals Pty Ltd has continued mining at the Corinna and Blackwater mines south of the Arthur River. The company has recently lodged a Mining Lease application in the Hawkes Creek area to the west of the Blackwater operation and is continuing treatment of silica flour at its Wynyard plant.

Environmental Management

The number of exploration work programs submitted for approval has dropped back from ninety-six at the height of the mineral exploration boom to seventy in the current year.

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*.

The auditing system (TEAMS II) allows the detailed recording of all exploration activities across Tasmania's many types of land tenure. The life of the exploration activity is tracked from proposal through approval, works completed and rehabilitation. The following tables of statistics are produced as standard reports from the system. As the system records exploration details and has to account for the changes in land tenure, it is not possible to directly compare this year's statistics with those in previous years.

Seventy work programs were submitted to MRT during the year compared with ninety-six in 2007/2008. Of those received, fifty-eight were approved, fourteen were withdrawn and four have since been approved. Eighteen work programs were within CAR Reserves and required comment from the Mineral Exploration Working Group.

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 site	70	33	122	13	36	2
Helipad site	3	3	0	0	0	0
Bulk sample site	0	0	4	0	0	0
Camp site	4	3	0	0	0	0
Costean (km)	0	0	0.39	0.20	0	0
Grid (km)	10.97	6.59	6.03	0	3.3	0
Track (km)	2.43	2.33	2.27	0.57	0.22	0

A total of 9.04 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 (ha)

Activity (ha)	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill site	0.60	0.15	0.49	0.07	1.86	0
Track	3.32	2.03	1.34	0.57	0.23	0
Costean	0	0	0	0.08	0	0
Bulk sample site	0	0	0.37	0.11	0	0

Of the 9.04 hectares of disturbance, 1.01 hectares were rehabilitated during the year, with the remainder to be rehabilitated through the life of the licences. 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 security deposit.

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 (Table 2) is also shown. Approximately 11% of the area disturbed in the reporting period, for all land categories, has been rehabilitated.

Table 3: Area rehabilitated (ha)

Activity (ha)	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill site	0.07	0.01	0.05	0	0.03	0
Track	0.12	0.05	0	0.25	0.23	0
Costean	0	0	0	0.08	0	0
Bulk sample site	0	0	0	0.11	0	0

Table 4 presents the running totals for the last four years of the area disturbed and area rehabilitated.

Table 4: Disturbance and rehabilitation over four years

Year	Car Reserve System	State Forest	Crown Land	Private Property	HEC Land	Total
Disturbance (ha)						
2005/2006	2.96	1.74	0.18	0.06	0.05	5.00
2006/2007	3.83	4.63	0.16	0.38	0.03	9.03
2007/2008	6.22	3.96	0.17	0.50	0.03	10.88
2008/2009	3.92	2.19	0.83	2.10	0.00	9.04
Rehabilitated (ha)						
2005/2006	2.22	0.44	0.17	0.06	0.00	2.90
2006/2007	2.00	3.47	0.16	0.38	0.03	6.03
2007/2008	0.62	0.85	0.05	0.26	0.00	1.79
2008/2009	0.19	0.05	0.43	0.26	0.00	0.94

Approximately 34% of overall disturbance has been rehabilitated. Disturbances are no longer counted as such if no further rehabilitation work is required of the explorer, or if the area is taken up as a Mining Lease.

As High Quality Wilderness is an overlying layer on the above land tenures it is presented separately (Table 5).

Table 5: Disturbance and rehabilitation, High Quality Wilderness areas

Year	Disturbance (ha)	Rehabilitated (ha)	Percentage of overall disturbance rehabilitated
2005/2006	1.70	1.70	100%
2006/2007	0.74	0.30	41%
2007/2008	4.62	0.09	2%
2008/2009	2.18	0.06	3%

Note: High Quality Wilderness is an overlay on top of the Car Reserve System and State Forest so is not added in to the total area of disturbance to avoid double counting.

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. It is planned to have the revised code ready for public comment in 2010.

The second edition of the *Quarry Code of Practice* is a code under the *Mineral Resources Development Act 1995* and is currently under review.

Mines Inspection

Exploration on Mining Leases

On-lease exploration programs were approved on the Rosebery, Que River, Renison, Mount Bischoff and Henty leases.

Mine rehabilitation

The Savage River Remediation Program (SRRP) is a joint program between the Department of Primary Industries, Parks, Water and Environment (DPIPWE) and Grange Resources to improve historic environmental liabilities at the Savage River mine. Work continued during the year to investigate and reduce legacy acid drainage on the mine site. A peer review of the program was undertaken by a team of experts including Ward Wilson, David Williams, Peter Scott and John Miedecke. A report including recommendations for

future directions for the program has been received and is under consideration. Representatives from the SRRP presented a paper at the International Conference on Acid Rock Drainage held in Sweden.

A remediation program is underway to reduce acid drainage from the Mt Lyell mine into the Queen River, which discharges into the King River and Macquarie Harbour. A proposal to treat acid seepage from the Mt Lyell lease continues to be investigated by DPIPWE. Further work is planned for 2009/2010.

Town planning and quarries

Comments were provided to municipal councils and submissions were made at Tasmanian Planning Commission hearings for the review of planning schemes for the Devonport and Meander Valley municipalities. Land stability, access to mineral resources and encroachment onto extractive industries continue to be key issues across most municipalities.

The requirement for a level 2 permit at Fieldwick's quarry at Dianas Basin resulted in a Planning Scheme Amendment and permit application before the Tasmanian Planning Commission.

In the past the quarry at Tolosa Street, Glenorchy, encroached into the Wellington Park. Although a boundary adjustment was negotiated, the lessee appealed against conditions applied to the permit. The appeal has been resolved with the boundary adjustment being successful.

Hanson Construction Materials Pty Ltd is pursuing a quarry extension at Flagstaff Quarry. The extension will require a new Mining Lease, a rezoning application and permit.

The Northern Midlands Council received an application to rezone land near three quarries at Western Junction, for tourism and residential use. MRT objected to the residential component of the application. The quarries are considered to be of regional importance and any residential encroachment will impede their development. Hearings by the Tasmanian Planning Commission occurred in October 2008 and a decision was handed down to prevent the proposal.

Several reports of illegal mining and illegal extraction were followed up around the State.

Work continued on the development of the mining lease inspection system (MLIS) to interface with REGIS in the TIGER System. Development of the mine disturbance GIS (MLIGIS) program continued.

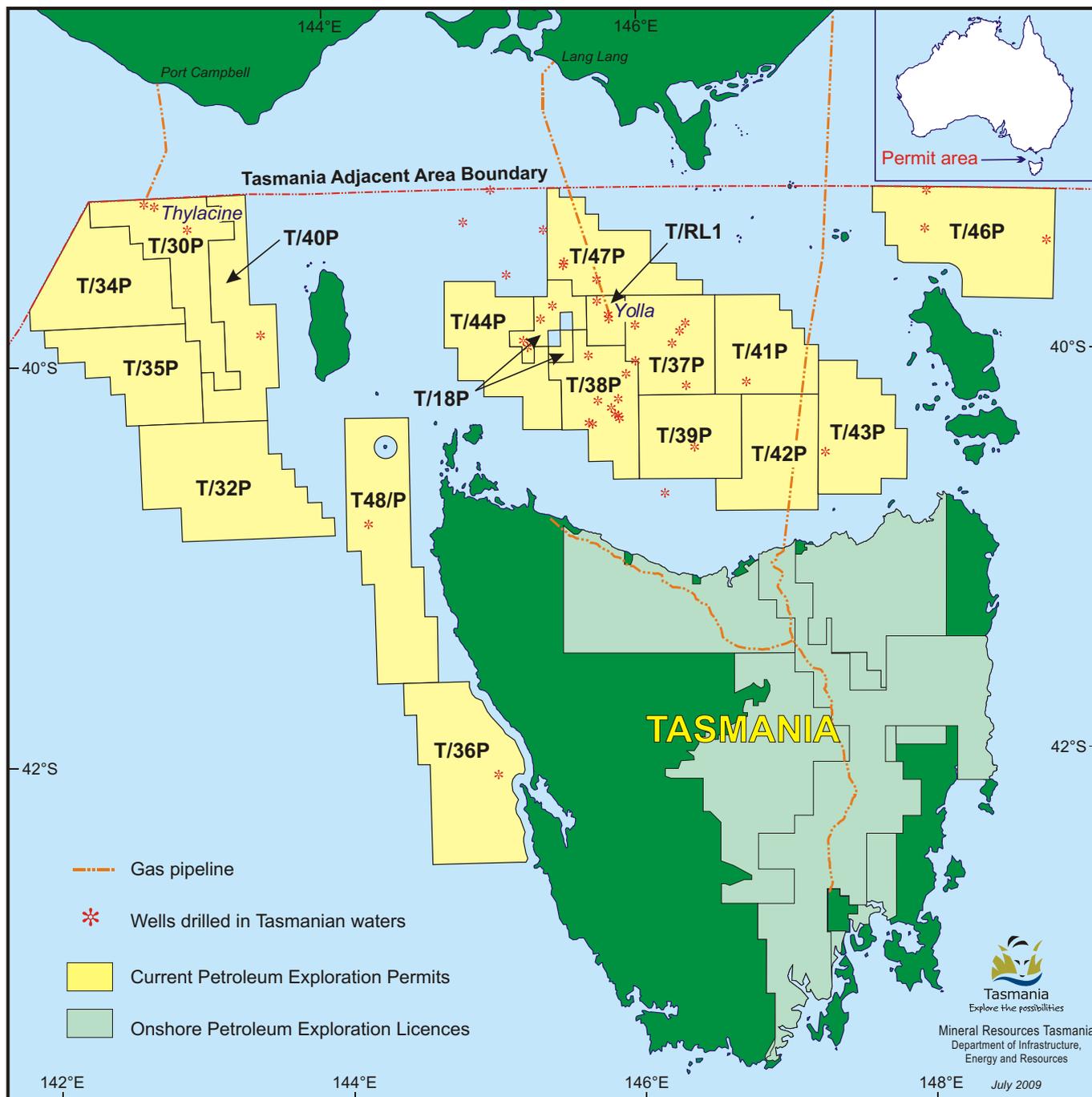
HYDROCARBONS

Petroleum exploration and production

Seventeen offshore permits and two onshore permits are currently held for oil and gas exploration. Three production licences are held over the offshore Yolla and Thylacine fields, and a retention lease is held adjacent to the Yolla field. Hydrocarbons are produced in Tasmanian offshore waters from the Yolla field, where production commenced in the third quarter of 2006, and from the Thylacine field, where production commenced in September 2007.

The BassGas consortium, headed by Origin Energy Resources Limited and AWE Petroleum Limited, holds the Yolla gas-condensate field in the Bass Basin. The production infrastructure includes a production platform, two development wells and an undersea pipeline to an onshore

TASMANIAN OFFSHORE ACREAGE AND ONSHORE PETROLEUM EXPLORATION LICENCES



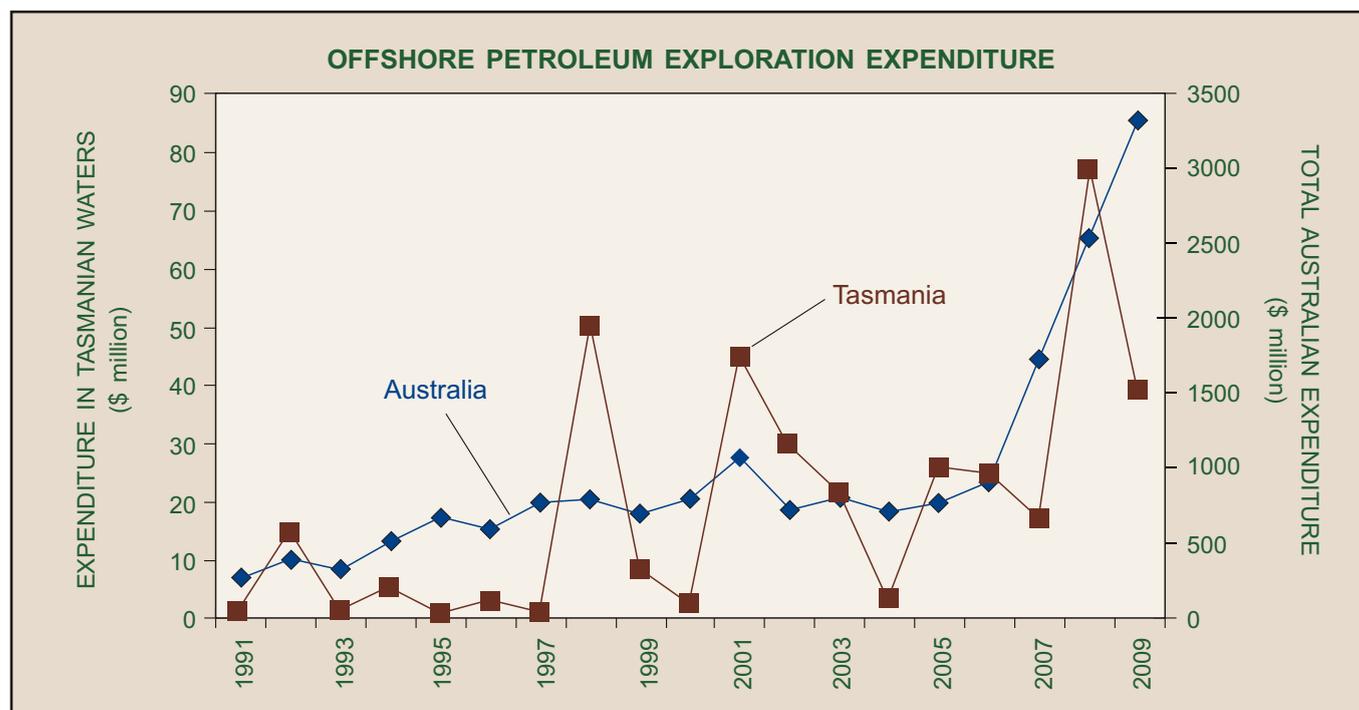
processing plant near Lang Lang in Victoria. Commissioning was completed in late 2006, with this project expected to supply around 10 per cent of Victoria's natural gas needs for fifteen years.

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. The Thylacine platform and undersea pipeline were installed in late 2005, and drilling from the platform began with Thylacine South-1, a deviated exploration well that successfully proved a southern extension to the Thylacine field. An additional production licence was subsequently granted to allow production from the southern extension. Four development wells were completed by October 2006, and gas from the field is piped to a processing plant near

Port Campbell in Victoria to supply the growing southeast Australian gas market.

During the year the exploration well Peejay-1 was drilled in permit T/39P by a joint venture consisting of Beach Petroleum Ltd and Benaris Petroleum NV. Sited in the southern part of the Bass Basin, the well was dry. After completing this well, the West Triton jack-up drill rig moved to a nearby site in permit T/38P to drill the Spikey Beach-1 exploration well. Unstable seafloor conditions prevented the rig from commencing drilling and the well was postponed until a semi-submersible drill rig became available, which did not occur until after the end of the reporting year.

Geotechnical seabed survey work was carried out during the year at a number of sites in T/34P, T/18P and T/LI, in preparation for drilling in the coming months.



The *Offshore Petroleum Act 2006* was replaced by the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* on 21 November 2008. Progress was made on consolidation of the regulations under the new Act. Progress was also made towards the implementation of a National Offshore Petroleum Regulator (NOPR) similar to the National Offshore Petroleum Safety Authority (NOPSA).

Total Tasmanian offshore petroleum exploration expenditure for 2008/2009 was approximately \$39 million. Cataloguing of sample collections related to offshore petroleum exploration continued during the year, with 94 reports being received during the year and indexed. Open-file exploration reports can be viewed and downloaded from the MRT web site.

Onshore, two Special Exploration Licences are held for petroleum exploration, one by Great South Land Minerals Limited and the other by Primeline Petroleum Corporation. Preparations for drilling in both licences were underway during 2008/2009.

Tasmanian Natural Gas Pipeline

Babcock Brown Infrastructure (BBI) acquired the Tasmanian Natural Gas Pipeline (TNGP) from Alinta DTH Pty Ltd on 1 September 2007. Powerco Tasmania Pty Ltd, which is owned by BBI, is the day-to-day manager of the pipeline. 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. Ten permanent staff are based in Tasmania to operate the pipeline.

ENGINEERING GEOLOGY

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

Land Instability

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 possible to minimise or avoid the effects of land instability. MRT is actively addressing this hazard through landslide susceptibility zoning and the monitoring of specific landslides.

A set of landslide maps for the region from Devonport to Boat Harbour Beach on the North West Coast, conforming to the Australian Geomechanics Society Landslide Risk Management Guidelines for zoning, is nearing completion. This area is renowned for the high incidence of landslides, particularly close to the coast where there is increasing pressure from urban development. The landslide maps are intended to improve land-use decisions by regulators and other stakeholders. This project is in partnership with local Councils and with funding assistance from the Australian and Tasmanian government's Natural Disaster Mitigation Programme (NDMP).

The TIGER landslide database forms a critical data foundation for the Landslide Map Series. Ongoing data entry and maintenance occurred during the year and there are now about 2300 records from throughout Tasmania.

MRT continues to coordinate the ongoing monitoring of the Tarooma landslide in Hobart and the Lawrence Vale landslide in Launceston. Regular inclinometer surveys provide information for the management of these areas and their surrounds. With funding assistance from the NDMP, MRT installed a near real-time monitoring facility for the Tarooma landslide to improve our ability to understand the causal factors to landslide movement. While movement has yet to be detected, the facility is providing valuable information on the relationship of groundwater response to rainfall. A review of the Tarooma landslide was undertaken in order to prepare for a Risk Assessment Workshop held at Kingborough Council. One of the outcomes of this work was the greater appreciation among the stakeholders of the risks associated with the site and the agreement to seek additional funds, as a stakeholder group, to address outstanding questions.

In addition to the activities outlined above, general information was provided to various stakeholders, including comments on planning schemes and significant developments.

Tsunami

With funding assistance from the NDMP, assistance was provided to Geoscience Australia to undertake inundation modelling in the greater Hobart area. This work is in addition to a palaeotsunami investigation and historical research undertaken in previous years. The combined research will be peer reviewed in the coming year. MRT is closely involved with the State Emergency Service in providing technical advice to guide their activities in addressing this hazard.

TENEMENT ADMINISTRATION

This Tenement Administration Section (previously known as the Registry 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 mineral tenements and legislation.

During the last twelve months the section was involved in the *Tenement Administration Review Project* which involved a thorough examination of the various lease and licence procedures to ensure they efficiently meet the requirements of the *Mineral Resources Development Act 1995*. The review resulted in a rationalisation of the processes and procedures of tenement administration combined with a change in many work practices.

The processing of applications for mineral tenements and issue of tenement documentation continues to provide the majority of work for the Section's officers. The Section has historically maintained a number of mineral tenement registers, in both hard copy and electronic format, but during the financial year a transition was made to entries in the Register being made in electronic format only.

The Section liaises with a number of other agencies and local government in regard to tenement applications and provides information to field staff that monitor on-ground activity on mineral tenements.

The Section is also responsible for the compilation of data to enable the collection of mineral tenement rentals and royalties for the State.

Requesting and collation of production and expenditure statistics is an important and essential activity carried out by the Section. These statistics provide the base data for assessment of the performance of the mining and exploration industries in Tasmania.

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

Thirty-one Exploration Release Areas (ERA), covering 10 176 km², 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 249 clients of MRT by facsimile (69) and post (180), and is also available on the MRT web site. Applications were received for areas within six of the advertised ERA's resulting in six exploration licence applications covering 3207 km² of ground.

Officers of the Section also play a key role in the maintenance of the TASXPLOER and REGIS modules within the TIGER database management system.

Mineral Legislation

The *Mineral Resources Development Act 1995* is the principal legislation relating to the management and regulation of mineral tenements in Tasmania.

Mineral Resources Tasmania provides information through *Service Tasmania* outlets and forms approved under the *Mineral Resources Development Act 1995* are available for downloading on MRT's web site.

The *Mineral Resources Regulations 2006*, replacing the *Mineral Resources Regulations 1996*, came into force on 28 June 2006.

Mining Tribunal

Under the *Mineral Resources Development Act 1995*, a Mining Tribunal, consisting of a magistrate, has jurisdiction to hear a wide range of mining disputes.

The Act places an obligation on the Director of Mines to attempt to resolve disputes before the tribunal. In effect this usually consists of informal mediation, arranged by the Director 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

Tribunal claims lodged with Mineral Resources Tasmania during the year ending 30 June 2009, or still in progress, were:

J Hepehi and A Winkel v G Smith — 1243P/M

- Objection lodged by landowners in relation to encroachment by adjoining quarry operation. Mediation held. Referred to Mining Tribunal.

M & E Phelan v T Kapitany — 25M/2000

- Appeal against registration of caveat on a mining lease.

J and P Meny, P & G De Burgh-Day, D Yorkston and J Bentley, B Wisse and A Willock, T Wilson, K Dillon v Dove River Pty Ltd, Gujarat NRE Resources NL, Southern Ocean Science Pty Ltd and J McDougall — EL16/2008

- Objections lodged by landholders. Referred to Mining Tribunal.

S Dolliver, R J Broadby, T Mangels, L Wall and B Pearson, S Chaffer, S L Routley v Black Rock Energy Pty Ltd — EL39/2008

- Objections by landowners not wanting exploration on property. Objections withdrawn.

P Perry and C Rattray v J D, S R and J C Nichols — EL 49/2008

- Objections by landowners withdrawn.

North East Excavations (Tas) Pty Ltd v G C Alexander — 1869P/M

- Dispute in relation to access. Applicant withdrew application.

Peter Sims v Shree Minerals Pty Ltd — EL54/2008

- Resolved after mediation and objection withdrawn.

R Goudsouzian v HBMI — EL56/2008

- Objection by landowner. Objection withdrawn following mediation.

B J Hansberry, D Wingfield, L J Nicklason, R T Thekathyl, L Watson, I C Mathews v Minemakers TTT Pty Ltd — RL 1/2009

- Objections by land holders. Objections withdrawn.

Lease Applications, 2008/2009

Total number of all types of exploration rights held as at 30 June 2009

Mining Tenement	Number	Area
Exploration Licences —		
Category 1 (Metallic minerals)	182	11 381 km ²
Category 2 (Fuel minerals)	15	1 970 km ²
Category 3 (Construction minerals)	37	3 000 km ²
Category 4 (Oil — onshore)	4	40 828 km ²
Category 5 (Industrial minerals)	70	5 663 km ²
Category 6 (Geothermal)	6	26 551 km ²
Retention Licences —		
Category 1 (Metallic minerals)	27	115 km ²
Category 2 (Fuel minerals)	5	163 km ²
Category 3 (Construction minerals)	21	104 km ²
Category 5 (Industrial minerals)	22	105 km ²
Prospectors Licences issued	224	Not applicable
Permits to explore for minerals under the Commonwealth <i>Offshore Minerals Act 1994</i>	1	486 blocks
Retention Licence under the Commonwealth <i>Offshore Minerals Act 1994</i>	1	20 blocks
Permits to explore for petroleum under the Commonwealth <i>Petroleum (Submerged Lands) Act 1967</i>	17	892 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 CPSLA 1967	3	8 blocks

(Note: Exploration licences and retention licences may include more than one category)

Leases applied for in 2008/2009

Product	Number	Area (ha)
All minerals	1	108
Clay	1	11
Dolerite	4	944
Gravel	14	211
Limestone	1	25
Nickel	1	946
Sand	6	265
Stone	4	96
Stone and gravel	1	12
Tin	1	17
Total	34	2 635

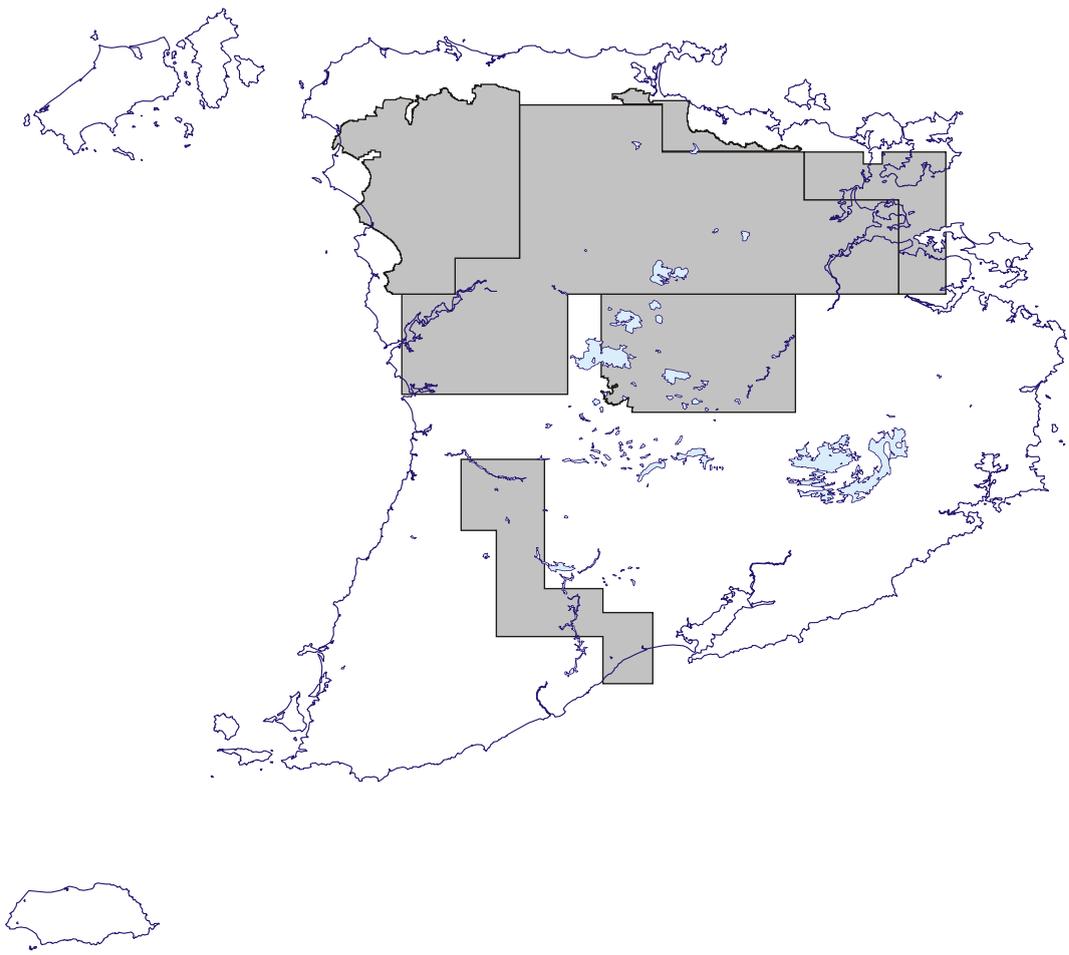
Leases granted in 2008/2009

Product	Number	Area (ha)
Dolerite	1	208
Easement	2	560
Gold	1	40
Gravel	12	181
Sand	2	14
Sand and gravel	1	58
Stone	4	82
Stone and gravel	1	12
Total	24	1 155

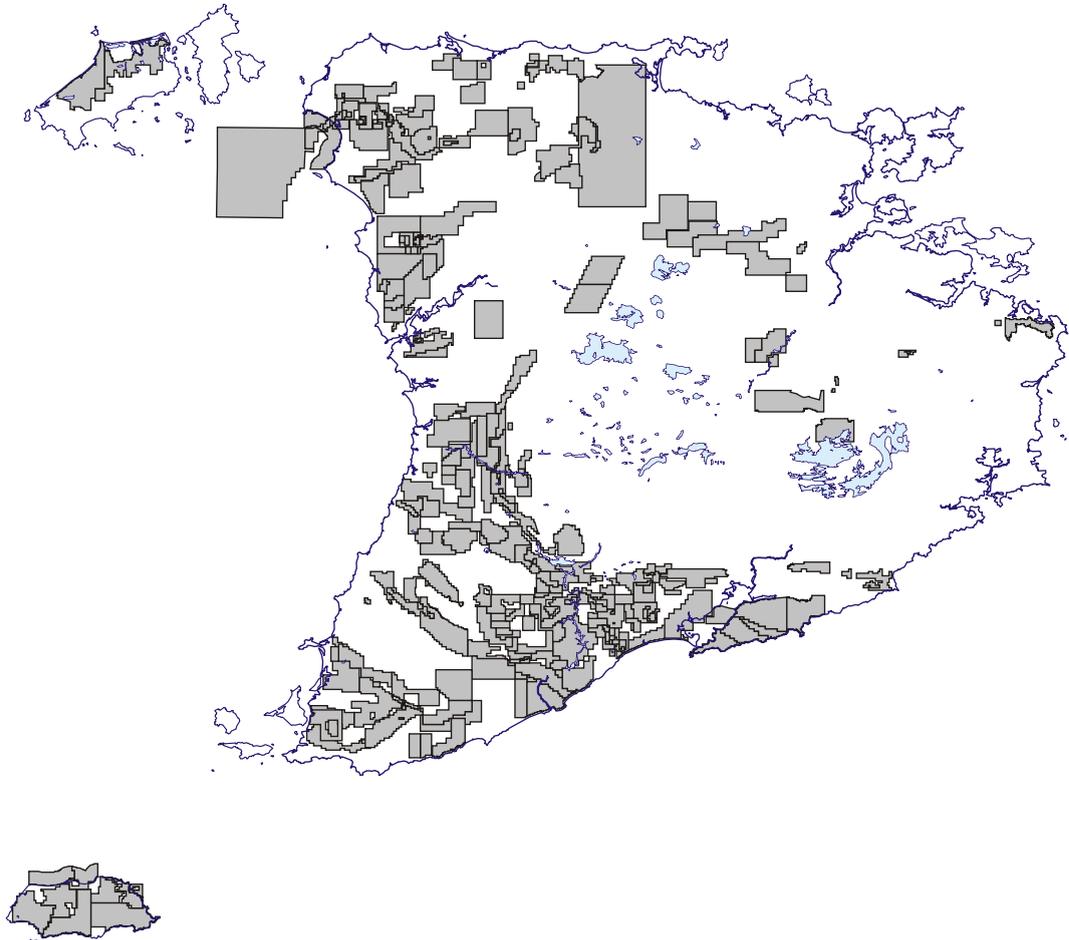
Total number of leases in force at 30 June 2009

Product	Number	Area (ha)
All minerals	25	19 064
All minerals and stone	6	6 066
Clay	5	94
Coal	2	6 289
Coal and stone	1	175
Copper	1	5
Dolerite	5	1 152
Dolomite	2	138
Easement	16	1 946
Gold	10	893
Granite	2	24
Gravel	161	3 051
Gravel and clay	1	29
Lime sand	3	21
Limestone	6	1 293
Nickel	2	1 346
Peat	1	9
Quartzite	1	191
Sand	55	2 557
Sand and gravel	24	1 193
Sand and stone	13	936
Sandstone	4	30
Shale	2	35
Silica	2	324
Slate	3	165
Specimens	8	70
Stone	203	5 446
Stone and gravel	22	396
Tin	10	711
Tungsten	1	544
Totals	597	54 193

Exploration Tenements held for Geothermal Substances as at 30 June 2009



Exploration Tenements held for Metallic, Fuel, Construction and Industrial Minerals as at 30 June 2009



Information Systems and Geophysics

The main activities of the Information Systems and Geophysics Branch in the 2008/2009 year were:

- Ongoing maintenance and development of the TIGER (Tasmanian Information on Geoscience and Exploration Resources) System;
- Completing acquisition of good quality gravity data over northeast Tasmania as part of the *TasExplore* Project;
- Participating in a National Geoscience Agreement potential field study of offshore areas north and east of Flinders Island;
- Supporting the information technology environment in MRT;
- Migrating data into the TIGER System; and
- Preparing materials for and participating in MRT promotional activities.

The branch also provided geophysical services and advice to MRT and our clients.

The branch is structured to reflect the functions needed to achieve the outcomes required by MRT and provides information systems and geophysical services. Debbie Donato, Information Systems User Support Officer, resigned in September 2008 and Mark Duffett, Senior Geophysicist, commenced in February 2009. At 30 June there were four permanent systems support staff in the Operations Section and two in the Geophysical Section. The information systems support staff are deployed within the functional areas of PC and network operations or database and TIGER system support.

Major branch achievements during the year included:

- implementing an enhanced map viewer on the MRT web site;
- producing a combined grid of good quality aeromagnetic data over Tasmania and Victoria that includes the transition from the Bass Basin to the Gippsland Basin;
- completion of the acquisition and integration of new gravity data from northeast Tasmania as part of the *TasExplore* project;
- introducing significant improvements into a number of TIGER modules;
- building an increased information skills-base for MRT staff; and
- participating in major national and international promotional activities.

Geophysics

The *TasExplore* Project is acquiring new airborne and ground geophysical data over northeast Tasmania and the Furneaux Group as part of the 2006 State election initiative to encourage mineral exploration in northeast Tasmania and parts of northwest and central northern Tasmania. Flying commenced early in 2007 and all new aeromagnetic and radiometric data from the Furneaux Group and northeast Tasmania were released in 2007. A series of qualitative and quantitative interpretation reports based on the new airborne data were released in March 2008 and are available on the MRT web site. The final phase of ground gravity data acquisition was completed in April 2009, with a total of 4286 new readings being integrated with the existing data. This has resulted in the substantial revision of pre-existing data.

Preparation has started on acquiring the infrastructure needed to produce a new three-dimensional geological model of northeast Tasmania, one of the outputs from the *TasExplore* Project. The available software for 3D geological and geophysical modelling was reviewed and a suite of software that meets the requirements of the project has been purchased.

As part of a joint National Geoscience Agreement project MRT has been provided with good quality aeromagnetic data from offshore areas north and east of Flinders Island. These data include the transition from the Bass Basin to the Gippsland Basin and have been combined with other good quality aeromagnetic data over Tasmania and Victoria to produce a gridded dataset covering the two States.

The MRT web site 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. New open file data has been added to the web site as it is received. Links are now provided on the web site to documents relating to the airborne surveys. Geodetic survey control point information can be easily retrieved from The LIST after carrying out a map-based search on the MRT web site.

During the year 6013 open and closed-file gravity readings were added to the State database which now contains a total of 81,386 stations. Significant gaps remain in the State coverage, with major gaps in the northeast being targeted this year and last as part of the geophysical component of the *TasExplore* Project. The gravity base station information available on the MRT web site has been extended with the addition of a number of new stations in northeast Tasmania.

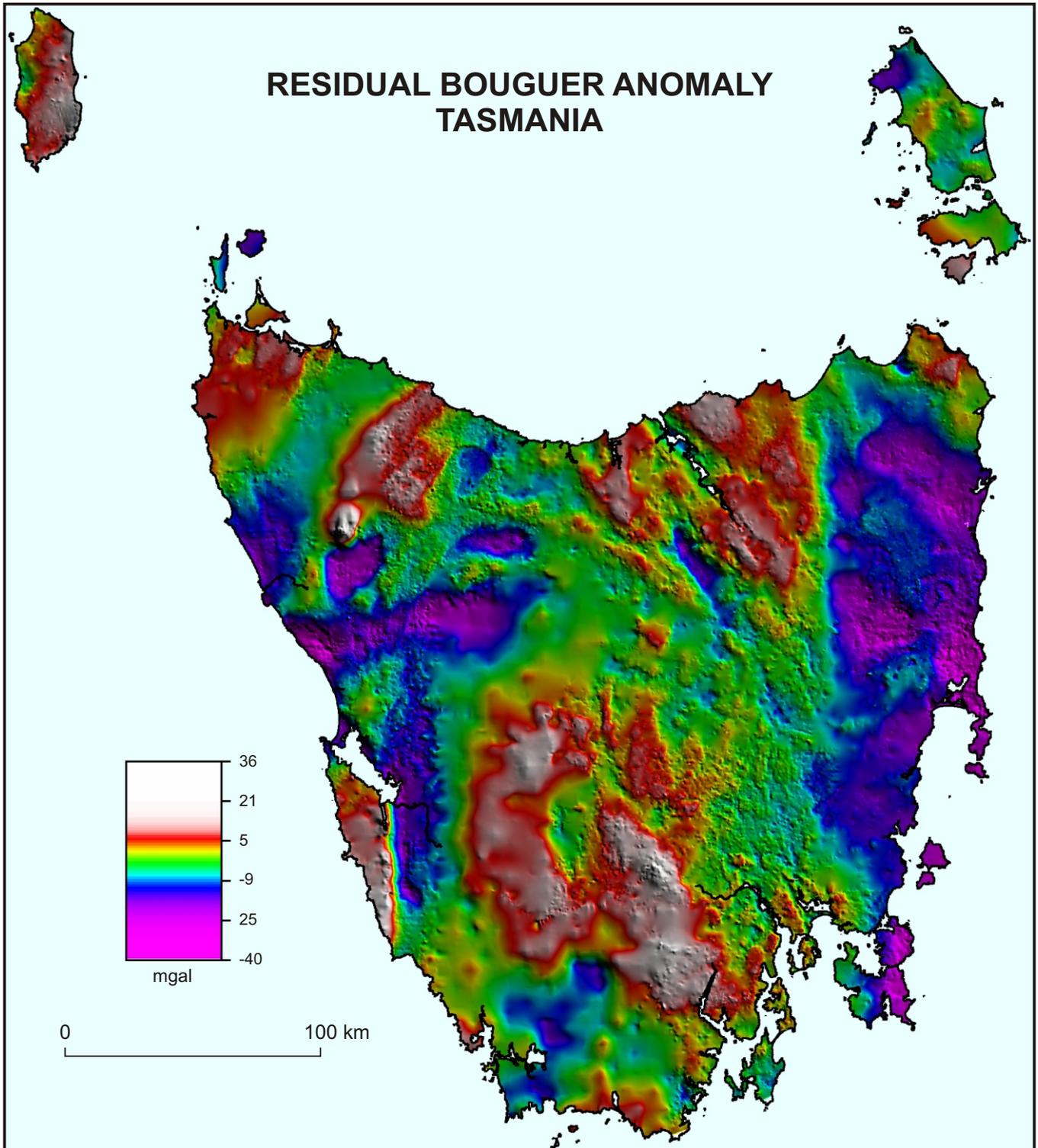
As part of the *TasExplore* project a revised mantle model (MANTLE09) has been developed to allow the Bouguer gravity data to be corrected for the effects of the Mohorovicic discontinuity and oceanic crust, resulting in a residual Bouguer anomaly that more closely relates to the major geological units. In the coming year the Tasmanian gravity data will be integrated with the Bass Basin gravity data provided by GeoScience Victoria to allow calculation of a residual Bouguer anomaly over the combined area.

The branch has participated extensively in both the production of promotional materials and in promotional activities on MRT booths at a number of national and international conferences.

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, has been supported entirely from MRT resources. As recommended in a 2006 review, maintenance and targeted enhancement of the TIGER System has been undertaken by means of a series of small contracts where the contractors work closely with Information Systems and other MRT staff. This strategy has proven effective, with a number of significant improvements being made to all the TIGER intranet applications used by MRT staff and to searching and delivery of information on the MRT web site.

The GDA94 datum has now been implemented across the TIGER System and on the MRT web site. In most modules spatial location information is retained with the original



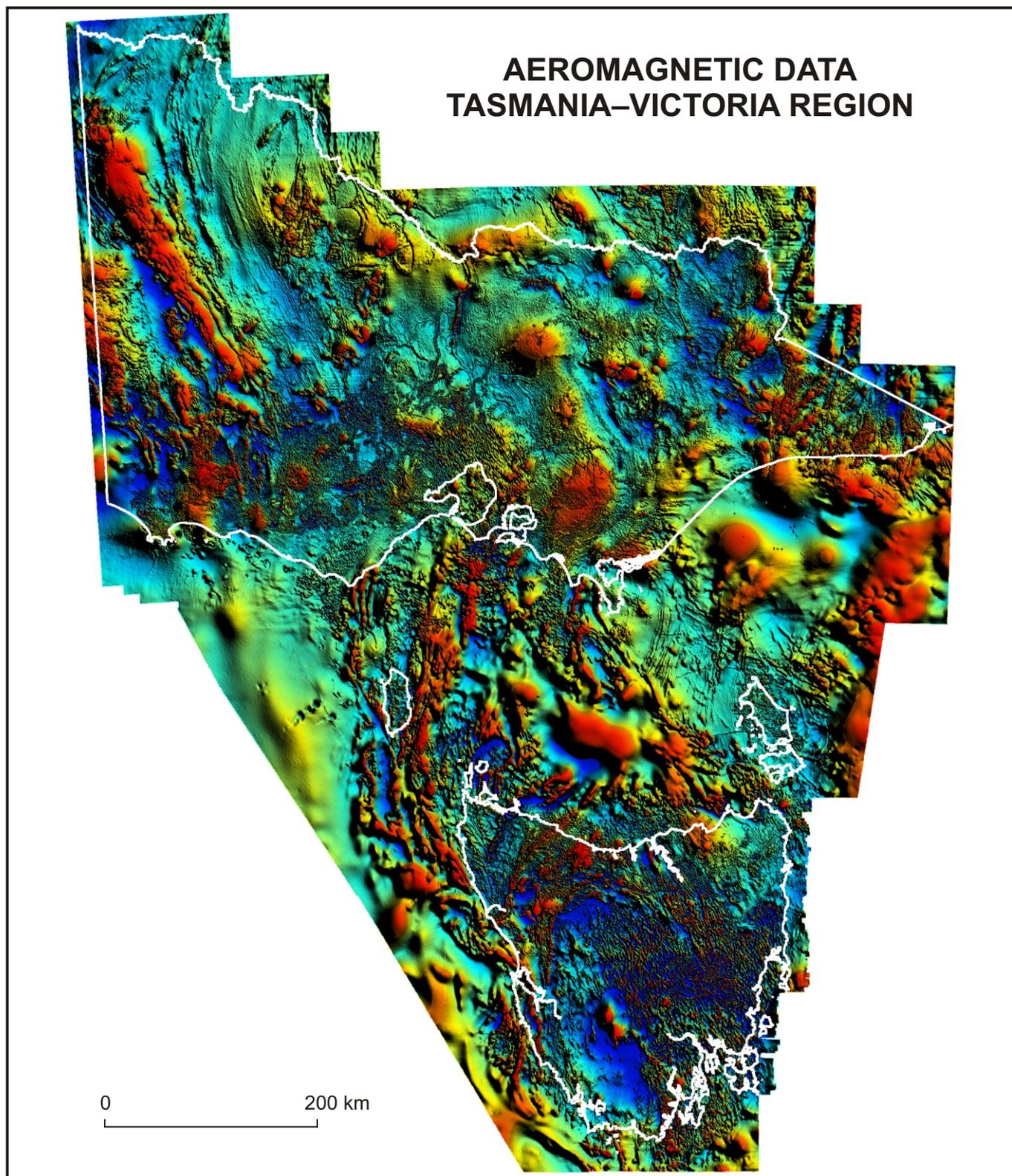
values as entered and a corresponding spatial data object created with un-projected GDA94 values.

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, drilling, geohazards, samples, geochemistry and observations, mineral deposits and geophysics from a number of browser-based thin client applications accessed via the MRT intranet. The MRT web site enables access to this corporate data and associated metadata from anywhere in the world with internet access. Data are delivered to clients through the MRT web site using customised textual and spatial searches and a number of basic data sets are also available for download.

A total of 5602 GB was downloaded from the MRT web site this year compared to 2538 GB last year; this increase is assumed to reflect a change in explorer focus from field to office-based studies. The number of visits per day has dropped to an average of 368 from last year's lowest average value of 698 over the course of the year.

Major enhancements to TIGER this year included implementation of a new map viewer client on the MRT internet site, development and implementation of a global contact/client/distribution list across all TIGER modules, and consolidation of all authority lists across TIGER. All TIGER reporting now uses Oracle Reports and the previous Microsoft Access reporting system has been shut down. The textual interface for the Mining Lease Inspection System and

AEROMAGNETIC DATA TASMANIA–VICTORIA REGION



the Samples, Geochemistry and Observations module of TIGER were also implemented this year.

The TIGER mineral occurrence data model has been mapped to GeoSciML with assistance from GeoScience Victoria staff as part of AuScope to allow delivery of this information early next year using OGC web services.

IT summary

In accordance with government guidelines, MRT replaced desktop PCs that were three years old and offered the original PCs for transfer to the Schools Program. New PCs are purchased with the Microsoft Windows XP operating

system. All desktop PCs run Microsoft Office 2007. For spatial analysis MRT uses both ESRI products and MapInfo. The use of MapInfo and extensions has increased during the year. There has been proof of concept testing and limited production use of wireless broadband for field staff to access the MRT network.

There are several network PC servers running Windows Server. The main PC network server is running Netware 6.5 with approximately 600 gigabytes of on-line storage. Windows 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. Windows Server Update Services is implemented

throughout the Microsoft-based components of the MRT network. Single sign-on has been introduced across the entire network including PC servers, the TIGER system, mail and Unix servers and has reduced the burden on users previously required to remember and maintain separate passwords for each function. MRT will be moving to a whole-of-DIER email platform early in 2009/2010 to provide integrated mail and calendaring functionality.

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 web site. The MRT web site is located in the Rosny Park building to simplify maintenance and up-loading of data to the web site servers and has a 50 Mbit/sec connection to the internet. A 1 Mbit/sec link has been established from Rosny Park to the Mornington core store.

Through the Chief Government Geologists' Committee and the Government Geoscience Information Committee, MRT has been involved in development work by AuScope Limited to make geoscientific information available using OGC web standards. In June 2009 the AuScope Web Services Roadshow was held in Hobart with a focus on the benefits of delivering information using OGC web services and the implementation steps required for MRT to deliver geoscientific information using web services. It is planned to deliver MRT mineral occurrence data using web services early in 2009/2010.

Use of the MRT web site increased significantly, with an average monthly download volume of 467 GB compared to 211 GB last year and a peak monthly download volume of 2269 GB. The daily average number of visits decreased from a minimum of 698 per day last year to an average of 368 per

day this year. The MRT web site provides a high-speed access point for clients to access the open-file data held in the MRT corporate information management system. Oracle spatial replication is used between MRT's internal and web servers. The web site offers an OGC Web Map Service allowing connection from popular GIS packages to a restricted number of data sets. Larger data sets stored on the file system are now automatically replicated on a daily basis as they become open file.

Data capture

Capture of metadata summarising technical documents relating to onshore exploration continued throughout the year, with 266 new summaries entered and an additional 331 summaries updated. A high proportion of the reports lodged were associated with either reductions in tenement area or relinquishment of tenements. 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. Compliance with the report format at initial lodgement has continued at approximately 95 per cent compared to the target of 100 per cent. This is an improvement over the previous year and appears to correspond to a lower level of activity by explorers and hence reduced volumes of reporting. Consultation with and assistance to stakeholders has ensured that non-compliant reports have been updated to conform to the data formats detailed in the national guidelines. Because of the extended time before GDA94 topographic base maps will be available for all Tasmania all incoming reports continue to be checked to ensure that the geodetic datum used is clearly specified.

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.

The capture of 1:25 000 scale digital geological data continued during 2008/2009. This work resulted in the completion of five new map areas.

- Four completed 1:25 000 scale digital geological maps in southwestern Tasmania (Gordonvale, Propsting, Rookery and Tiger);
- One completed 1:25 000 scale digital geological map in northwestern Tasmania (Grassy).

The data capture/output was completed for the revision of eleven map areas for the *TasExplore* initiative in central northern Tasmania (Cethana, Gog, Lea, Liena, Loongana, Loyetea, Pencil Pine, Railton, Riana, Ulverstone and Wilmot).

The conversion of existing 1:25 000 scale digital geological maps from the AGD66 datum to the GDA94 datum continued.

Work on the seamless coverage of the 1:25 000 scale digital geology of Tasmania continues, with maintenance

being carried out on a regular basis. Maintenance of the 1:250 000 scale digital geology of Tasmania was also carried out on a regular basis.

Work continued on the landslide hazard series maps for Devonport, Burnie, Ulverstone and Wynyard.

CAD continues to be used as a support tool for many projects, with 25 maps and plans and 226 tenement maps and diagrams being produced throughout the year.

Tenement administration work included:

- Thirty-two new exploration license applications processed and entered into the MRT spatial tenement information system;
- Fifty-eight Exploration Release Area plans produced and entered into the MRT spatial tenement information system;
- Thirty-six new mining leases processed and entered into the MRT spatial tenement information system; and
- The production of maps and data files for 57 proposed 'on ground' work programs for exploration licences.

A total of 1029 hardcopy output products of digital geology and tenement data were produced on demand and 150 data sets of digital geological data were produced for clients.

Royalty, Finance and Administration

This branch provides the corporate support function for Mineral Resources Tasmania. The main activities of the branch include:

- Ensuring that effective royalty and fee collection systems and assessment programs are in place so that revenues are properly managed and accounted for to the satisfaction of the Auditor-General.
- The timely provision of financial, accounting and administrative advice to the division in conjunction with departmental corporate services.
- The 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.
- The maintenance of the static content of the MRT web site.
- Ensuring that all corporate information is kept in an orderly manner and is readily retrievable.
- Maintaining the MRT library collection and ensuring that resources are provided to undertake the development and delivery of information services to MRT staff, the mineral industry and members of the public.
- Providing executive support to the Director of Mineral Resources Tasmania.

Information and Access Services

Publications

MRT produces a range of publications to support its activities, including geological reports, promotional documents, newsletters, materials for displays, Exploration Release Area flyers, and other reports and promotional materials as required.

Major publications produced during the year included:

- The Mineral Resources Tasmania *Annual Review* for the year 2007/2008.
- *A Catalogue of the Minerals of Tasmania*, by R. S. Bottrill and W. E. Baker (Geological Survey Bulletin 73). This 254 page all-colour book updated and extended previous catalogues issued in 1910 and 1969.

Thirty-one flyers promoting Exploration Release Areas were produced. A considerable amount of promotional and display material was produced as required.

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

2001/09 — *Inclusions of high pressure origin in Tasmanian Cainozoic basalts: A catalogue of localities*, by J. L. Everard.

2008/01 — *Revisions to geological maps in the southern part of the Dial Range/Fossey Mountain Trough, northern Tasmania, with emphasis on Cambrian geology*, by M. J. Vicary.

2008/02 — *The Tasmanian security deposit system for mining and exploration tenements*.

2009/02 — *Geological setting of Jurassic plant fossils near Lune River*, by C. R. Calver.

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

Library Service

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. Library assistance, two days per week, was previously provided by an MRT technical officer. Since his retirement in February 2009 there has been no library assistance.

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 12.00.

Work is continuing on DB-Textworks database maintenance and cleanup.

Collection

All journal subscriptions were renewed and an additional six subscriptions, chiefly in the area of geophysics, were added to the collection.

A stocktake of the open file Tasmanian Company Reports collection was completed.

Work continued on reports not previously entered into the DOMINFO database to ensure scanned copies are available online and to make hard copies available in the library collection.

Electronic access

The library intranet pages were updated. Online access to journal subscriptions has been provided to all titles where full-text access is included in the cost of the print subscription, and to a selection of titles only available electronically.

Some work was undertaken, in co-operation with the DIER Library, using WebPublisher in an attempt to make the combined catalogues of the DIER Library and the MRT Library available from their respective intranet sites. Training in the use of WebPublisher was undertaken and some progress was made designing search screens.

Mineral Sector Overview

An adequate level of mineral exploration activity is essential for the future development of the mineral sector and for the economic well-being of Tasmania.

As a result of the global economic crisis, the level of mineral exploration dropped sharply in 2008/2009, particularly in the latter half of the year. According to the Australian Bureau of Statistics (ABS), expenditure on mineral exploration in Tasmania for the year was \$20.4 million, down 38% on the record \$32.4 million recorded in 2007/2008. Tasmania's share of national expenditure was down significantly from 1.32% to 0.92%.

One positive feature of the data is that expenditure on exploration for new deposits, down 21% to \$11.9 million, was less affected by the downturn than that on existing deposits, down 52% to \$8.4 million. Tasmania's share of expenditure on exploration for new deposits barely changed, down from 1.48% to 1.42%.

Mineral Resources Tasmania data recorded a higher expenditure of \$25.87 million, also down 38% on the \$41.54 million of the previous year. Of this \$12.54 million, or 49%, was spent on exploration licences, the same proportion as 2007/2008. This high proportion is gratifying in that it shows a continuing commitment by the private sector to discover the new deposits needed to sustain the future mining industry.

During 2008/2009, total production of mineral products was valued at \$2.451 billion. Mineral products worth \$1.56 billion, representing 44.8% of Tasmania's mercantile export income, were exported, down from 53% in the previous year. Despite this fall, due to lower commodity prices, Tasmania's mining and mineral processing sector continued to be a pillar of the State's economy and with economic recovery the proportion is expected to recover in 2009/2010.

MRT, by providing information on areas of high mineral resource potential in Tasmania, 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.

Producing mines

The robust nature of Tasmanian mining was underscored by the majority of operations surviving the worsening economic conditions and lower metal prices attending the global recession. However the industry was not entirely immune and three operations closed during the year:

- In August, the Hellyer tailings re-treatment operation of Intec Limited closed.
- In December, OZ Minerals Limited announced that the Avebury nickel mine would be placed on care and maintenance and ore was processed until March.
- In February, the alluvial tin operation of Van Dieman Mines Pty Ltd at Gladstone was placed under care and maintenance after not proceeding beyond trial mining and milling, and the company appointed administrators.

On the positive side, the Tasmanian tin operations of Metals X Limited at Renison Bell and Mount Bischoff ramped up production during the year and operations were cash positive at the end of the year. A feasibility study into treating tailings at Renison Bell to recover tin and copper was successfully completed and the project was shown to be

technically feasible. Development of the project will be deferred until metal prices and economic conditions improve further.

The Beaconsfield gold mine returned to full production during the year and all the debt of Beaconsfield Gold NL was repaid during the year. The Henty gold mine was purchased by Bendigo Mining Limited from Barrick on 1 July 2009 and Bendigo announced an aggressive exploration program to prolong mine life.

The Rosebery mine continued to operate successfully during the year, but lower metal prices forced curtailment of mineral exploration, upgrade of the mill and construction of a new ventilation rise. Construction of a new tailings dam is proceeding. In June, the sale of most of OZ Minerals' assets, including the Rosebery and Avebury mines, to China Minmetals Non-Ferrous Metals Company Limited was completed.

Bass Metals Ltd continued its profitable open-cut operation at the Que River mine. Bass purchased the Hellyer mill from Intec Limited with a view to treating ore there when mining recommences at Hellyer.

Australian Bulk Minerals has become part of Grange Resources Limited, with the consortium of Chinese companies, headed by the Shagang Group, becoming major shareholders in the company. The open-cut mine at Savage River is being expanded.

The Mount Lyell mine at Queenstown continued to operate successfully.

Cominex Pty Ltd and Sumitomo Australia Ltd have transferred the silica flour tenements in northwest Tasmania to Tasmanian Advanced Minerals Pty Ltd. Silica flour is used to make LCD screens. The new company has recently received Level II permits to allow the extraction of 50 000 cubic metres a year at the Corinna and new Blackwater mines. Tasmanian Advanced Minerals Pty Ltd completed the construction of a silica flour treatment plant near Wynyard.

Cornwall Coal NL continued underground mining at the Duncan colliery at Fingal. Despite some difficulties, mining of the Fenton seam at Mount Nicholas commenced after portal construction was completed for the Blackwood No. 4 mine. Open-cut mining in the Fingal Valley continued at the Cullenswood mine, and at the Kimbolton mine in the Derwent Valley.

Seventeen offshore permits and two onshore permits are currently held for oil and gas exploration. Three production licences are held over the offshore Yolla and Thylacine fields, and a retention lease is held adjacent to the Yolla field.

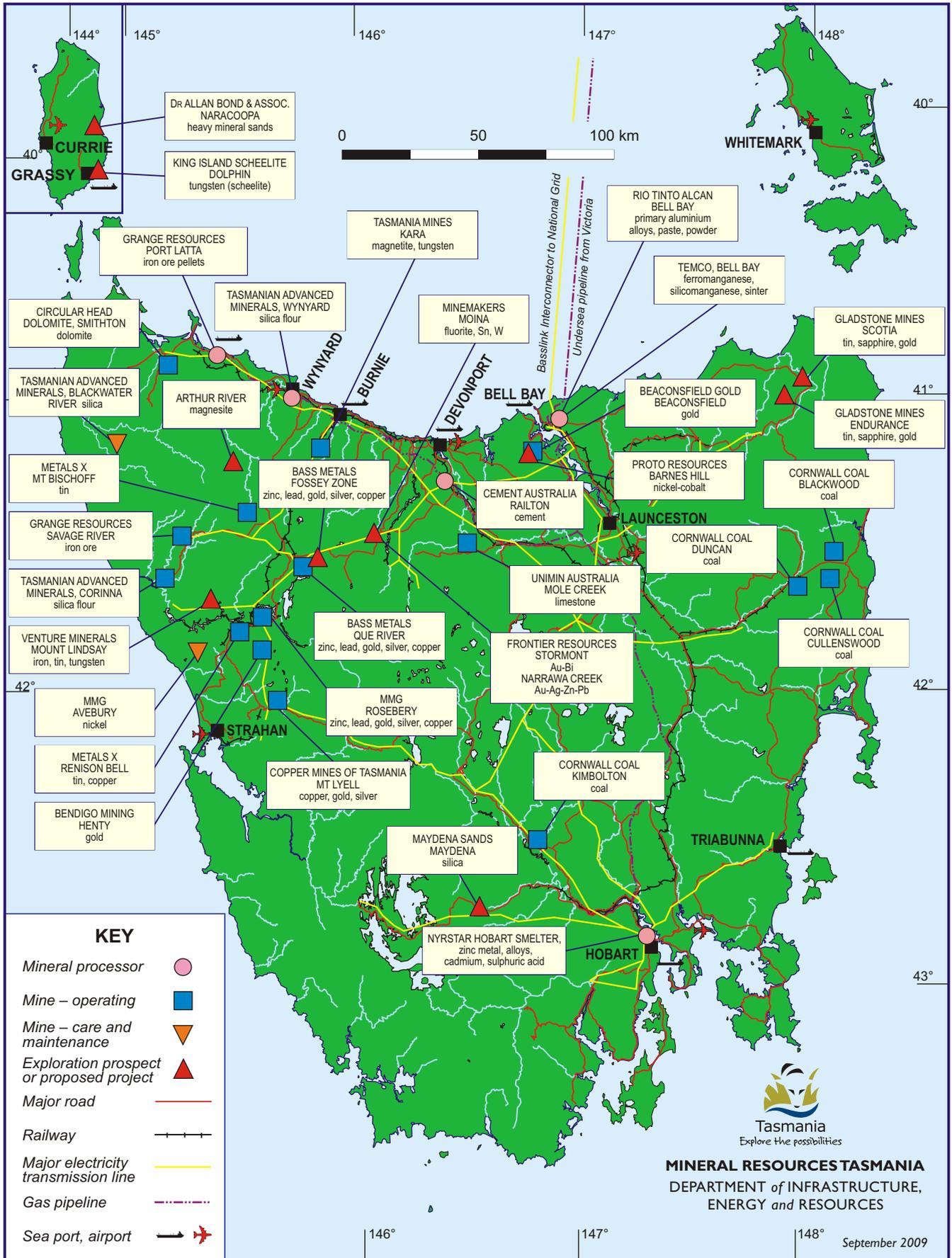
New developments

Following receipt of all approvals, King Island Scheelite Limited has formalised its joint venture with the Hunan Nonferrous Metals Corporation to commence the redevelopment of the Grassy scheelite mine and at year's end was conducting geotechnical and metallurgical studies and acquisition of land for the project to get underway.

Proto Resources and Investments Limited has advanced its scoping study into operating a nickel-cobalt laterite mine and processing plant at the Barnes Hill deposit, near Beaconsfield. Ten per cent of the resource has been drilled to a status enabling definition of a Measured Resource, and metallurgical tests indicate good nickel and cobalt recoveries combined with low acid consumption. Proto is proceeding

— Tasmania —

Major Mining and Mineral Processing Operations and Proposed Projects



with the final phase of the feasibility study into the project to be completed by mid 2010.

Mineral exploration highlights

Although the general level of exploration decreased there was strong activity on a few key projects.

Bass Metals Limited established a combined indicated and inferred resource for the Fossey Zone, the barite-rich southern extension of the Hellyer deposit, of 0.83 million tonnes containing 9.1% zinc, 4.6% lead, 0.3% copper, 120 g/t silver and 2.5 g/t gold at a combined 5% Pb + Zn cut off. This is part of a broader zone of 2.5 million tonnes of 1.9 g/t gold, 66 g/t silver, 3.3% zinc and 1.5% lead at a 1 g/t Au cut off. Preliminary metallurgical tests have yielded better recoveries than achieved from the Hellyer ore body.

Venture Minerals Ltd has announced an inferred resource of 30 million tonnes at 33% iron as magnetite in the No. 2 and Main zones of the Mount Lindsay mine, northwest of Renison Bell. Twenty-three million tonnes of 0.2% tin and 5.7 million tonnes of 0.3% tungstic oxide (WO₃) have also been identified within and immediately adjacent to the magnetite zones. A scoping study suggests that the deposit may be economically viable. The company also announced drill intersections of 71 metres of 57% iron and 29.8 metres of 60.1% iron at the Stanley River prospect 3.5 kilometres to the west. The iron occurs as a hematite gossan and has been traced over 1800 metres of strike. Venture is investigating the deposit as a possible source of direct-shipping iron ore. There are also other zones of mineralisation to be followed up.

During the year, Metals X Limited increased total resources of tin ore from 4.4 Mt at 2.01% Sn to 7.2 Mt at

1.82% Sn at the Renison Bell mine, mostly in the Federal zone.

During the year Greatland Gold plc reported single metre re-splits of composite reverse circulation (RC) drill samples with assays of 7.1 g/t, 6.1 g/t and 4.8 g/t gold from the Warrentinna project north of Branxholm. Rock chip samples collected adjacent to RC drill holes at the Derby North prospect returned 18.8 g/t, 13.5 g/t and 4.95 g/t gold, confirming a new zone of mineralisation with open pit potential.

Iron Mountain Mining Ltd has announced assay results from drill holes into iron skarn deposits near Hampshire. Sixteen holes into the Hampshire deposit had intersections ranging from two to 13 metres of 43.1% to 66.0% iron, while holes at Kara North intersected six to 43 metres of 41.4% to 60.6% iron and zones of low grade tin mineralisation, including 41 metres at 0.22% tin and 51 metres at 0.22% tin, although the latter is not metallurgically amenable. Follow-up diamond drilling has intersected higher grade tin, including six metres of 0.47%.

Intensive exploration continued at the Avebury mine and environs during the first half of the year, with new total resources for the Avebury deposit announced at 22.02 million tonnes of 0.97% nickel at a 0.4% Ni cut off.

Frontier Resources Limited has established Indicated and Inferred Resources of 209 000 tonnes of 2.1 g/t gold, 1.3% lead, 1.1% zinc and 19.5 g/t silver at the Narrawa prospect and an Inferred Resource of 91 400 tonnes of 4.6 g/t gold, 0.3% bismuth and 3.5 g/t silver at the Stormont mine, both in the Moina area.

Value of the Tasmanian Mineral Industry

Year ended Commodity	Unit	30 June 2008† Total Quantity	30 June 2009 Total Quantity
Metallic Minerals			
Copper (assayed)	(tonne)	30 483	30 655
Gold (assayed)	(kilogram)	5 532	7 617
Iron ore pellets	(tonne)	2 423 240	2 184 389
Iron (in magnetite)	(tonne)	135 629	155 725
Lead (assayed)	(tonne)	29 285	39 409
Scheelite	(tonne)	11	17
Silver (assayed)	(kilogram)	98 663	100 928
Tin (assayed)	(tonne)	0	3 880
Zinc (assayed)	(tonne)	95 541	92 742
Nickel (assayed)	(tonne)	0	1 729
Value of Metallic Minerals		\$803 316 729	\$1 055 041 068
Non-metallic, Industrial and Fuel Minerals			
Clay — Brick	(tonne)	29 323	33 691
Other	(tonne)	5 600	0
Kaolin	(tonne)	6 905	11 523
Dolomite — Agricultural	(tonne)	40 978	54 541
Chemical and metallurgical	(tonne)	44 885	16 269
Limestone — Agricultural	(tonne)	95 522	100 654
Cement	(tonne)	1 856 125	1 883 235
Chemical and metallurgical	(tonne)	24 213	22 353
Other	(tonne)	62 693	55 960
Silica (glass and other)	(tonne)	205 190	138 371
Silica (metallurgical)	(tonne)	-	44 955
Coal (run of mine)	(tonne)	725 228	578 548
Coal (washed)	(tonne)	468 895	433 810
Peat*	(m³)	0	0
Gemstones‡	(kg)	0	0
Value of Non-metallic, Industrial and Fuel Minerals		\$55 429 254	\$53 603 739
Construction Materials			
Building stone — Freestone	(tonne)	192	563
Other	(tonne)	13 047	7 765
Sandstone	(tonne)	927	473
Crushed and broken stone —			
Basalt	(tonne)	1 084 704	1 059 815
Dolerite	(tonne)	1 271 318	1 300 731
Limestone	(tonne)	62 002	58 348
Sandstone	(tonne)	45	650
Other	(tonne)	178 917	166 178
Gravel (aggregate)	(tonne)	36 420	45 085
Sand	(tonne)	626 899	579 747
Other road materials	(tonne)	2 219 886	1 960 875
Value of Construction Materials		\$71 889 846	\$63 327 739
Total value with Australian metal prices		\$930 635 829	\$1 171 972 546
Value added production from Tasmanian and other ores		\$1 726 904 160	\$1 279 030 826
(aluminium, cadmium, cement, lead-copper, ferromanganese, silicomanganese, sinter, sulphuric acid, superphosphate, zinc)			
Total value of mining and metallurgical production		\$2 657 539 989	\$2 451 003 372

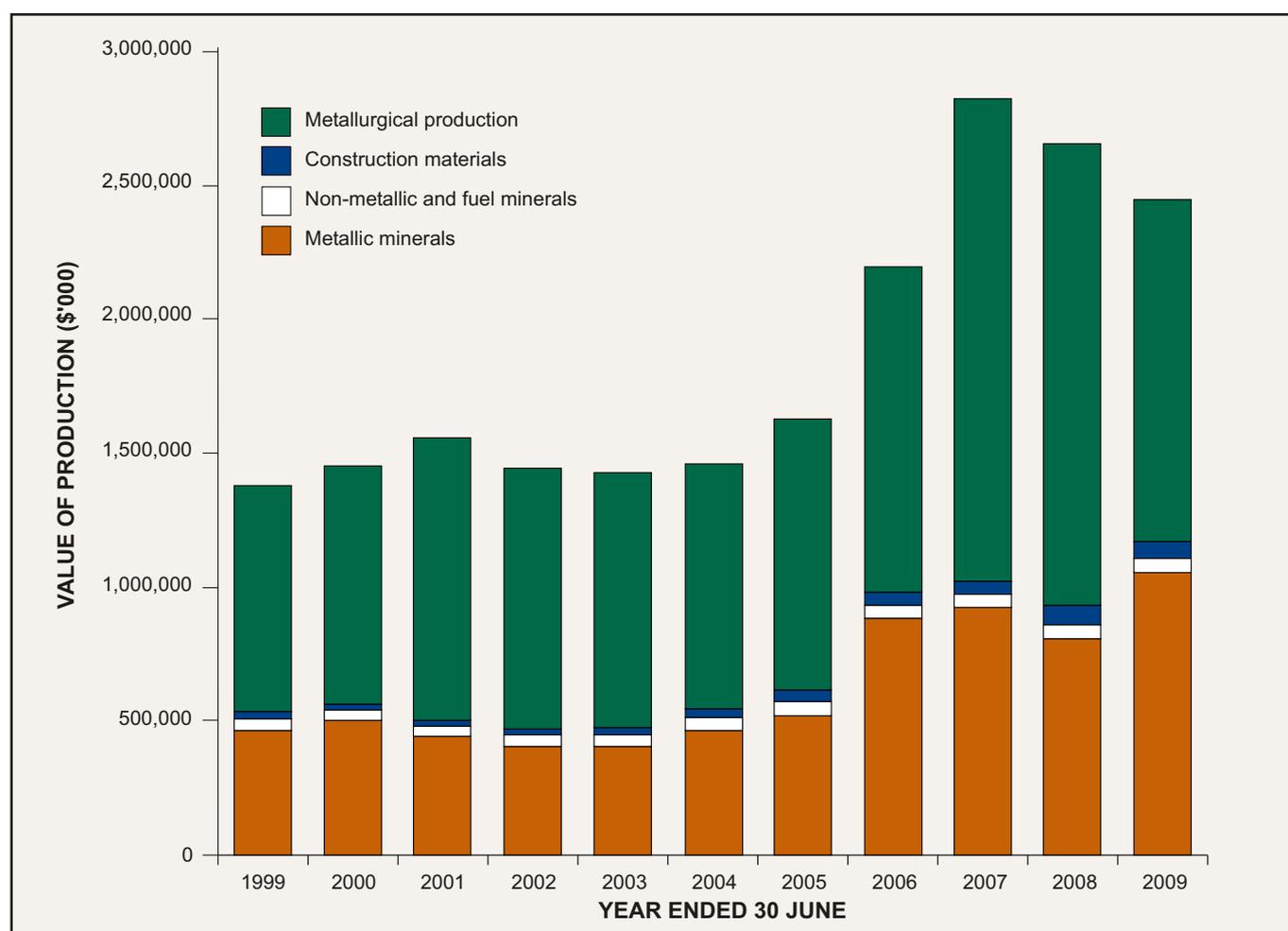
† Figures for 2008 may vary from previously published results because of late or amended returns

* Peat — production less than one tonne

‡ Gemstones — value only recorded

Value of Production, 2007/2008 and 2008/2009

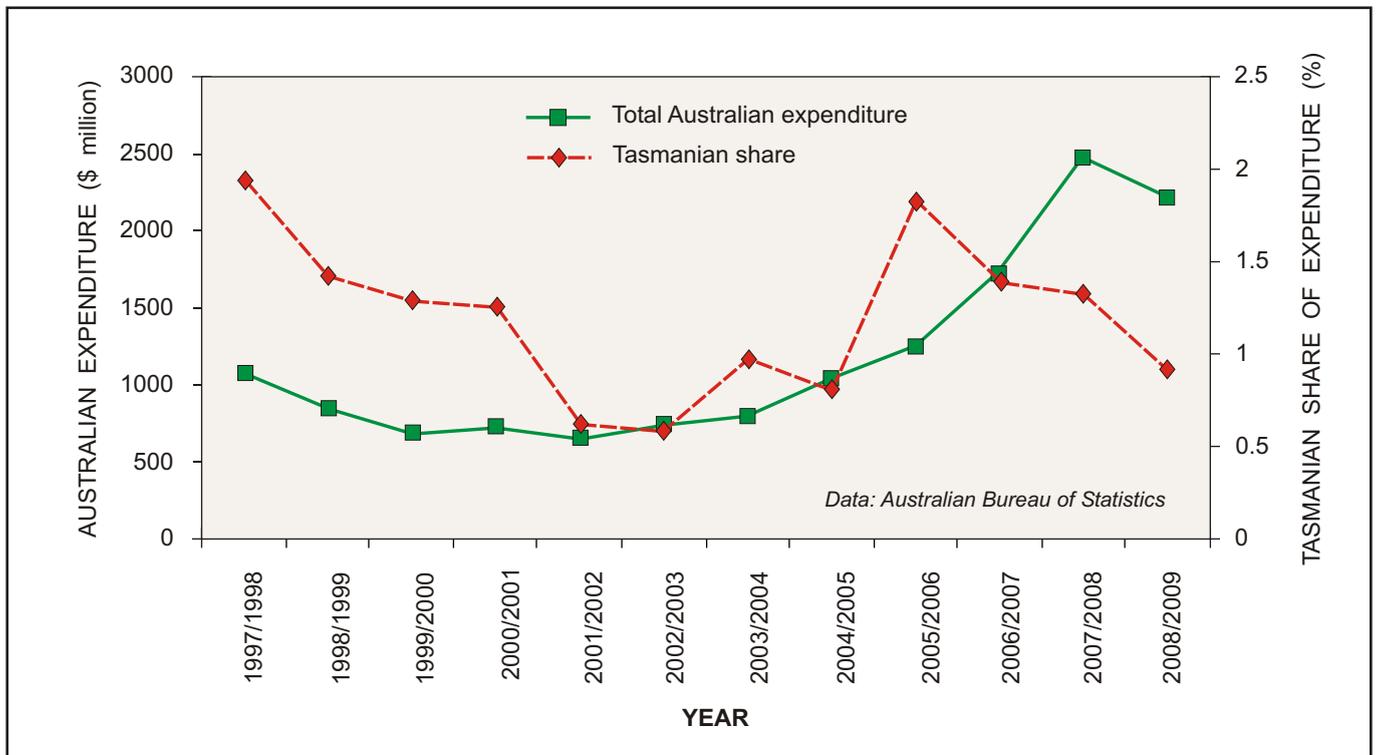
	2007/2008		2008/2009		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Copper	30 483	–	30 655	–	+0.6
Gold	5.5	–	7.6	–	+38.2
Iron ore pellets	2 423 240	–	2 184 389	–	-9.9
Lead	29 285	–	39 409	–	+34.6
Silver	98.6	–	100.9	–	+2.3
Tin	0	–	3 880	–	–
Zinc	95 541	–	92 742	–	-2.9
Total metallic minerals	–	803 317	–	1 055 041	31.3
Non-metallic and fuel minerals	–	55 429	–	53 603	-3.3
Construction materials	–	71 890	–	63 328	-11.9
Value added production from Tasmanian and foreign ores	–	1 726 904	–	1 279 030	-25.9
Value of mining and mineral processing production	–	2 657 539	–	2 451 003	-7.8



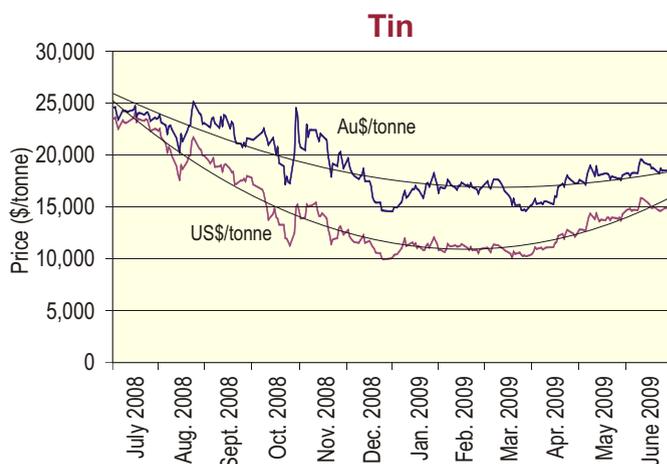
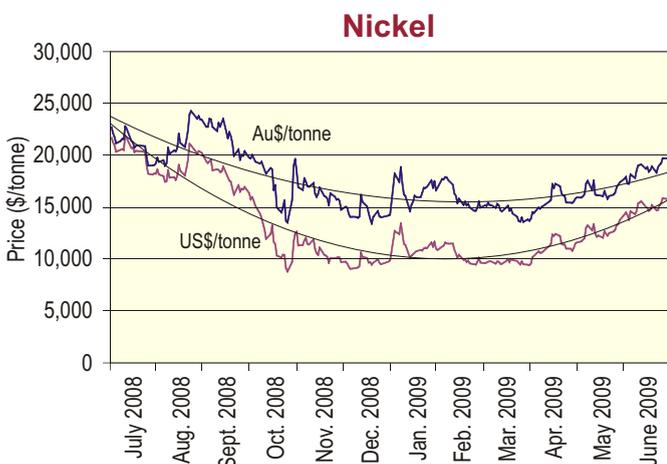
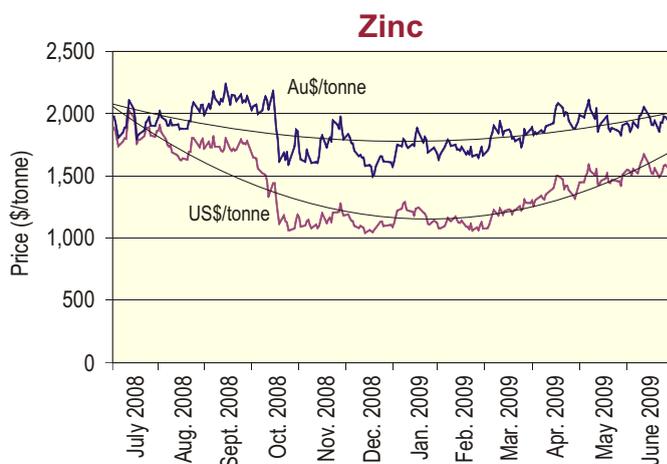
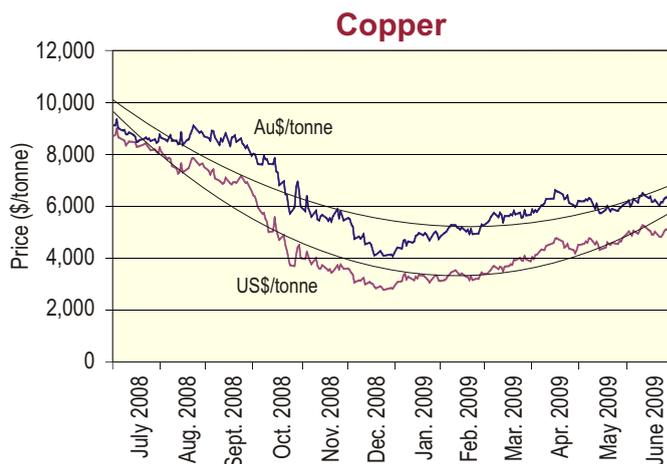
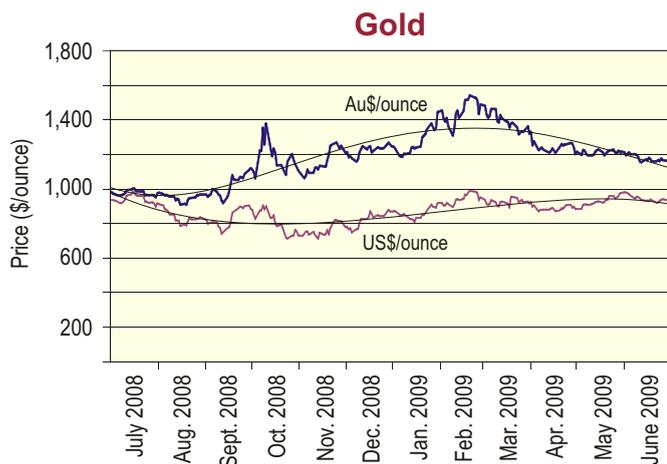
Mineral Exploration Expenditure

Year	Australian Expenditure (\$ million)	Tasmanian Expenditure (\$ million)	Tasmania as % of Australian Expenditure
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
2005/2006	1240.7	22.6	1.82
2006/2007	1714.6	23.7	1.39
2007/2008	2461.4	32.4	1.32
2008/2009	2221.2	20.4	0.92

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



Commodity prices and the Australian dollar



— Review of Mineral Sector Operations —

Metallic Minerals

Base Metals

Minerals and Metals Group (MMG) Rosebery mine

The underground zinc-lead-copper-gold-silver mine and concentrator at Rosebery, on Tasmania's west coast, was operated by OZ Minerals Limited for most of the year. The sale of most of OZ Minerals' assets, including the Rosebery and Avebury mines, to China Minmetals Non-Ferrous Metals Company Limited was completed in June. A total of 203 people are employed in the operation.

Mine production

Total underground ore production was 716 600 tonnes at 11.34% Zn, compared to a planned production of 773 308 tonnes at 12.99% Zn. Production from the lower levels totalled 664 390 tonnes and came mainly from K lens and P lens, with a smaller contribution from V lens ore. Production from the upper levels totalled 52 210 tonnes, with production coming from B North and remnant mining in B South and F lenses.

Mine development

Mine development advance was 5237 metres, with 438.9 metres driven in the upper levels and 4798.5 metres advanced in the lower mine.

Most of the capital development was at 17K, 46K, 33P and 38P for the 'Ventilation Upgrade' to increase the volume of air into the mine. The K decline was also extended to access future ore zones and provide drilling platforms for resource infill and exploration drilling.

The operating development was in a number of areas including K Lens (47–50K), and V lens (32–37V).

	Upper Mine		Lower Mine	
	Advance (m)	Tonnes (est.)	Advance (m)	Tonnes (est.)
Capital	378.5	2 784.9	2 111.9	155 435
Operating ore	13.1	1 094	1 413.7	118 044
Operating waste	47.3	3 474	1 272.9	93 431
Total	438.9	7 352.9	4 798.5	366 910

Mill

The mill treated lower grade ore at high feed rates at the start of the reporting period. The reduction in metal prices forced a change in feed grades for the last half of the reporting period. Overall the feed grade has remained consistent between periods, with higher feed throughput being achieved.

The processing plant available operating hours were increased significantly from last year, which has allowed an increase in ore tonnes processed due to increased plant stability.

Ore treated totalled 743 600 tonnes from Rosebery and 68 000 tonnes from Que River, for a total throughput of 811 683 tonnes. The overall grade was 11.39% Zn, 4.11% Pb, 0.35% Cu, 137 g/t Ag and 1.59 g/t Au. Production totalled:

- 146 400 tonnes of zinc concentrate @ 55.68% Zn.

- 41 000 tonnes of lead concentrate at a grade of 65.08% Pb and 1191 g/t Ag.
- 7259 tonnes of copper concentrate at a grade of 20.6% Cu, 8.61% Pb, 5398 g/t Ag and 49.3 g/t Au.
- 487 kilograms of doré at 33.3% Ag and 62.8% Au.

There was an increase in Zn flotation concentrate production over the previous year, with concentrate grade also improving.

Lead concentrate production rose significantly from that of the previous year, which was a direct consequence of the increased feed grade. Copper concentrate production was sustained while the production of doré declined from the 499 tonnes recorded in the previous year.

Resources and Reserves

Resources and Reserves for the Rosebery mine have been compiled for end of year requirements and are reported using the *Australasian Code for Reporting of Identified Mineral Resources and Ore Reserves*. Mineral resources quoted are inclusive of the reported ore reserves.

The Rosebery mine lease resource inventory at the end of March 2009 shows an overall decrease of 1.1 million tonnes compared with 2008. The main reasons for the decrease are:

- Re-interpretation of measured, indicated and inferred resource of P Lens (-1.93 Mt);
- Re-interpretation of measured, indicated and inferred resource of K Lens (-0.64 Mt);
- Re-interpretation of measured, indicated and inferred resource of W Lens (-0.32 Mt).

The significant decrease of the resource at Rosebery was largely due to drilling and re-interpretation of P, K and W lenses and mining depletion, which exceeded resource upgrades in K2 and V lenses.

Identified Mineral Resources as at March 2009							
Reserves	Tonnes ('000)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
<i>Rosebery:</i>							
Measured:	3 800	3.9	14.3	0.5	146.9	2.1	9.7
Indicated:	2 895	3.9	15.5	0.5	130.2	2.1	11.6
Inferred:	7 411	3.9	11.1	0.3	140.4	1.6	6.6
Sub total:	14 106	3.9	12.9	0.4	140.1	1.9	8.5
<i>South Hercules:</i>							
Measured:	977	1.5	3.1	0.1	133	2.44	4.3
Total Resource:	14 189	3.6	12.3	0.4	139.9	1.9	8.5
Ore Reserves, Rosebery mine							
Reserves	Tonnes ('000)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
Proved	1 729	3.6	13.3	0.38	131	1.81	7.2
Probable	1 421	3.8	15.7	0.46	129	1.77	8.7
Total	3 150	3.2	14.4	0.42	130	1.79	7.9

Total ore reserves at Rosebery have decreased by 1.8 million tonnes. This is mainly due to resource downgrades in P, K and W lenses, and an increase in the cut-off grade.

Positive changes to the reserve were due to:

- Increase in resource confidence, in particular the V lens and K2 lens, increased reserves by 2.52 million tonnes.
- Redesign of the whole mine was undertaken in March 2009 optimising stope and development designs.

Negative changes to the reserves were due to:

- Stopes with a NSR value below \$175 were removed from the reserves.
- Stopes and development in E and F lenses were removed from the reserves. The confidence of extracting this material was considered too low for it to be included in reserves.
- 50K lens stopes changed from Proven to Probable reserves due to change in the geological resource category.
- Depletion due to mining.
 - B-Lens completed
 - K42–46 panel completed
 - P45–48 panel is nearing completion
 - V-Lens above the 37 level completed.
- Change in forecast exchange rates and metal prices. The major change was the long-term forecast zinc price which dropped US10c a pound to US90c, hence requiring higher grades to meet stipulated cut-off values.
- Mining depletion accounted for a downgrade of 638 000 tonnes.

There are no reserves outside Rosebery mine.

Rosebery Mine Lease exploration

Approximately 6.285 line kilometres of gridding and track cutting were completed in the Jupiter mine area and internal geological mapping was carried out.

Three rock chip samples were collected from Jupiter adits 1, 2 and 3 and six rock-chip samples were collected along the Jupiter access road in August. Soil sampling was conducted in the Jupiter mine area from approximately 6.285 line kilometres of gridding and track cutting. Whole-rock geochemical samples were collected from North Mount Black drill holes 339R, 344R, 345R, 346R, 361R and 374R.

Approximately nine line kilometres of gridding and track cutting were completed in the North Mount Black area for down-hole EM studies of hole 374R. Casing operations failed and the project was terminated.

Zonge Engineering and Research completed 10.85 line kilometres of gradient array IP data collection over the southern RML. Results are currently being interpreted.

Diamond drilling

A total of 254 diamond-drill holes were drilled for a total of 55 353 metres. Expected drilling rates of 20 metres per shift per rig average were seldom achieved during the reporting period, largely due to staffing issues on the drill rigs. Major improvements were seen throughout the year in terms of down time attributable to mine delays (e.g. fumes, ventilation, etc.).

The majority of drilling conducted has been resource infill drilling, upgrading confidence levels for parts of V, K, P, K2 and Y lenses. The main target areas for underground exploration were W Lens extensions down-dip and up-dip and along strike.

Surface exploration drilling was conducted to the north and south of current known mineralisation. Three northings were drilled starting from 2800 mN targeting along strike of

the prospective host position and Rosebery ore lenses. One hole was drilled at South Mount Black, exploring the southern strike extension of the host position. Further drilling at South Mount Black was deferred due to economic conditions and will be considered as part of future drilling programs.

'Project Horizon' is an OZ Rosebery internal project with the aim of increasing the mine life of Rosebery beyond twenty years. 'Horizon' involves an increase in exploration expenditure of \$19 million over three years, and was approved in May 2006. The drilling was conducted concurrently with surface exploration.

The 'Horizon' project also entailed deep drilling from numerous underground locations, including the Northern Exploration Decline. The underground 'Horizon' drilling was centred on down-dip and up-dip extensions of W Lens. Plans were in place to explore down-dip of V lens but funding constraints postponed this part of the project.

Exploration for 2009/2010 will target down-dip extensions of K, V and X lenses.

Capital expenditure

A total of \$35.4 million was expended during 2008/2009, with further expenditure of \$50 million planned during 2009/2010. Capital expenditure during the year was mainly directed at the Rosebery ventilation upgrade (\$11.26 million), capital mine development (\$11.2 million) and Bobadil tailings dam works (\$2.5 million).

Personnel

Oz Rosebery Mine originally obtained AS4801 certification in September 2007, with this being maintained throughout 2008/2009. The Safety Management System has undergone continuous improvement since this time, with increased training and awareness on hazard identification, revised job safety observation program, and additional communication and consultation processes.

The Wellness Program has continued to align with site SHE initiatives including fatigue management, early intervention, stress management and working in heat, daily alcohol testing and a new drug testing program. The program has also continued to increase engagement of employees, contractors and their families to promote a healthier lifestyle.

OZ Rosebery Mine recorded three Lost Time Injuries (LTI) in 2008/2009. The first occurred in June 2008 and involved an employee that experienced dehydration and heat stroke after working in hot underground conditions. The second occurred in December 2009, when a worker was conducting duties in an IT basket when it struck the wall, jolting him in the basket. He struck his left knee which later required surgery to repair. The third occurred in February 2009 whilst a worker was grouting in cable bolts. Grout was released from the grouting tube at such a force that it removed his PPE, with the employee sustaining eye damage. The All Injury Frequency Rate (AIFR) twelve-month rolling average was 172.3 as at 30 June 2009, a significant decrease from the 239.30 recorded at 30 June 2008. The decrease in AIFR over the past 12 months shows that the injury prevention strategies being implemented on site are resulting in improved site performance.

The AIFR improvement is supported by implementation of proactive measures over 2008/2009, which was supported by the five-point safety plan. This plan involves the following five key activities:

- (1) Weekly manager's safety walkabout to reinforce the safety standard expected across the site.
- (2) *Extreme Safety Focus* is a quarterly program where extensive education, training and promotion of a safety issue are conducted.
- (3) *Hearts and Minds Program* involves presentations by personnel that have been affected by workplace injuries and discussions of the choices they have made.
- (4) *Safety Intervention Program* encourages the workforce to observe their workmates at work and intervene if they detect any unsafe acts or conditions.
- (5) *One-on-One Discussions* involved all personnel discussing safety one-on-one with their manager once removed to obtain their thoughts and ideas on improvements or initiatives that can be introduced into the workplace.

Environment

MMG Rosebery reported two non-compliance events to the Tasmanian Government during the 2008/09 year, which is a 50% reduction from 2007/08. The reportable events were both uncontrolled discharges of effluent from the site effluent treatment plant to nearby waterways. One event was triggered by a site-wide power outage that was experienced by the West Coast region. The other event was caused by a mechanical failure of effluent pumping pipework. The design of the failed pipework has since been improved and capital infrastructure planning to mitigate the effects of further site power outages is underway. Site drainage management continues to be a focus for the operation and has been progressed in 2008/09 with the development of a catchment hydrological model that will provide more accurate data for planned improvements to the site effluent system.

In February 2009 the site was re-certified against the ISO 14001 Environmental Management System Standard following a triennial external audit.

Significant progress was made in addressing environmental legacies, with rehabilitation monitoring continuing at the Hercules mine site. The acid mine drainage reticulation project completed last year is now operational. A final report was also received on the five-year site remediation project (Hercules Assessment Index for Rehabilitation). This indicated that targeted lime and fertiliser applications have improved site soil condition resulting in enhanced levels of vegetation recruitment and establishment. Annual vegetation plot monitoring will continue in 2009/10. Further studies were also progressed as part of a DPEMP approval application for prospective mining activities at the South Hercules site near Mt Hamilton.

Following installation of the lime dosing plant at No. 2 and 5 dams, water quality has improved to the extent that controlled effluent discharges direct to the Stitt River were possible within Environment Protection Notice discharge criteria. Works to remove vegetation from the downstream batters of the dams were also carried out to allow improved monitoring of seepage tracks which is carried out monthly through dam surveillance audits.

The lifting of the Bobadil dam embankment by two metres was completed in stages during 2008/09. Stage 6A was completed and stage 6B was in progress. Extensions to the Bobadil rock quarry were made, with five blasts required to provide rock-fill for downstream raising and rock buttressing. Additional piezometer wells were also installed to enhance the stability monitoring of the embankments carried out through monthly dam surveillance audits. Improvements to spigotting and the positioning of the

supernatant and decant ponds throughout 2008 has enhanced the level of water treatment and the embankment structural stability. As Bobadil dam is nearing the end of its operational life further studies have been progressed into life of mine tailings disposal options for the site. Studies into the option of constructing a new tailings storage facility at the South Marion oak site, adjacent to Bobadil dam but across the Pieman River, have been progressed and DPEMP approval documents are being prepared.

Toxicological testing for a likely biological indicator species for the site Bobadil Outflow mixing zone in Lake Pieman has been progressed. Acute testing of a local water flea was completed in 2008/09 but chronic testing was abandoned following difficulties maintaining test populations. The results from the tests completed to date have been shared with other West Coast mining operations with a view that all may benefit from the development of appropriate water quality objectives for Lake Pieman in liaison with the Tasmanian Government.

Biological monitoring of aquatic fauna communities has been carried out for seven years at the operation's three discharge receiving environments. At the main discharge point, Bobadil Outflow, monitoring indicates that there is a localised influence at the mixing zone on Lake Pieman, with faunal diversity reducing 20% since 2005 and abundance reducing 30–50% since 2006. These trends appear to be ongoing, and are related to the presence of the effluent. Monitoring at the Stitt River receiving environment suggests moderate to significant impairment, with a decline in macro-invertebrate diversity by 40% compared to reference streams. The Ring River remains in a severely degraded state with reduced levels of diversity and abundance due to the impacts of historical mining operations in the region. Biological monitoring of the three sites will be continued in 2009/10.

An increased focus has been placed on dust monitoring for the mine site and Rosebery township. A detailed dust characterisation survey involving 31 passive sampling sites was completed over twelve months in 2008. Results from the survey indicated that two of the 31 sites experienced fugitive dust levels beyond recommended guidelines. These sites are located at the main ore stockpiling area within the operational footprint of the mine. Dust management strategies specific to these sites have been implemented and dust deposition is continuing to be monitored.

Noise and vibration monitoring was continued for the Rosebery township following upgrade of the sampling equipment. No community noise or vibration complaints were received in 2008/09.

Community relations

Two residents of Rosebery approached the mine regarding water seepage issues in their front yards. MMG agreed to assist residents to conduct investigations into the quality and source of the local water seepage. A consultant was hired on behalf of residents and an independent report was conducted. The Environment Protection Association, Department of Health and Human Services and West Coast Council also assisted residents. MMG has no ongoing actions in the matter.

The Community Lead Testing Program, part of MMG Rosebery's commitment to the local community, was undertaken during March 2009. Many Rosebery residents participated and discussed questions they had with MMG staff in attendance. Community involvement, knowledge and awareness of lead is important to ensuring continual

improvement for our community and is consistent with the site Values and Behaviour program of respect, integrity, action and results.

Together with our neighbouring industries and the West Coast Council, a tree planting day was organised where all primary schools on the West Coast gathered in Zeehan to participate in tree planting activities as part of National Tree Day. Over 200 trees were planted in Zeehan. Next year the program will move to a different West Coast town.

MMG participated in the MST Workplace Solutions Local Community Partnerships Career Expo at the Rosebery District High School. A female underground truck driver, a geologist and our site surveyor attended the expo and interacted with the students, discussing their roles at the mine and talked about safe working practices. The geologist took along a collection of interesting rocks and our surveyor set up a total station which intrigued the students with methods of measuring angles and distances.

Other community support activities included:

- The Rosebery annual Christmas parade.
- MMG Rosebery Golf Open.
- Provided Zeehan Heritage Museum with video on underground operations for display purposes.
- Local Senior Citizens presented with complimentary tickets to *Ten Days on the Island* events.
- Rosebery Athletic Club Carnival.
- Rosebery District High School Award for Excellence.
- St Josephs Convent School Award for the child who has shown the most interest and ability in the science/math's areas.
- Health West Student Photographic Competition — Family Matters—Family Fun.
- 2009 Major Sponsor of Rosebery Toorak Football Club.
- Tullah Challenge — multi-sport event — paddle, cycle and run.
- *Ten Days on the Island* sponsorship.
- MMG Rosebery Festival.
- Quarterly operations briefings to the community.
- Raising safety awareness in Rosebery High School students.

Bass Metals Ltd

Bass Metals Ltd, through the Que River Mining Alliance with Mancala Mining Pty Ltd, operates the Que River mine near Waratah in western Tasmania. An average of 54 people are employed.

Mining operation

Que River is an open-cut mine recovering remnant ore left by the previous underground operation conducted by Aberfoyle Resources in the 1980s. Production for the year was 66 608 tonnes of ore mined at 18.9% Zn, 10.2% Pb, 272 g/t Ag, 5.9 g/t Au and 0.4% Cu.

A total of 66 935 tonnes of ore was sold to MMG Australia Limited during the year in accordance with a binding Ore Sales Agreement. A significant inventory position has been maintained, with 5565 wet tonnes remaining as at the end of the year.

Profitability of the operation enabled the company to fund its exploration program and corporate costs, as well as the purchase the Hellyer mill from Intec Limited.

No lost time injuries or material environmental incidents occurred during the year.

Resources and Reserves

Que River Pit Reserves as at 30 June 2009 comprised:

JORC Classification	Tonnes (%)	Cu (%)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)
Total Probable	87 000	0.7	3.2	6.3	95	1.0
Total Proven	13 700	0.4	10.9	19.4	279	5.5
Total Reserves	101 070	0.7	4.3	8.0	120	1.8
Inferred Resource	6 000	0.2	7.2	13.7	176	3.6
Total In-pit Inventory	107 070	0.6	3.9	7.5	110	1.4

Further definition of the Que River resource and a new estimate of the Hellyer tailings dam resource were made following the acquisition of the Hellyer mill and associated infrastructure and the Hellyer mine lease from Intec Limited, which was completed during the year. An initial and updated resource estimates were made on the Fossey deposit during the year. Further potential has been recognised in the Que River–Hellyer area and a major exploration program is planned.

JORC Classification	Million tonnes	Cu (%)	Pb (%)	Zn (%)	Ag (g/t)	Au (g/t)
Fossey¹						
Indicated	0.69	0.4	6.1	10.4	143	2.5
Inferred	0.11	0.3	4.3	7.4	106	2.1
Total	0.80	0.4	5.8	9.9	137	2.5
Hellyer remnants²						
Indicated	0.64	0.4	4.0	6.8	83	1.3
Inferred	0.11	0.2	4.9	8.1	107	1.5
Total	0.75	0.3	4.1	7.0	87	1.3
Que River³						
Measured	0.08	1.3	3.1	6.0	119	1.6
Indicated	0.45	1.2	2.8	5.6	85	0.7
Inferred	0.18	1.0	2.6	4.8	72	0.7
Total	0.72	1.1	2.8	5.4	85	0.8
Total massive sulphide	2.27	0.5	3.0	5.2	76	1.1
Hellyer tailings⁴						
Measured	4.9	0.2	3.1	2.8	105	2.7
Indicated	2.5	0.2	3.0	2.6	104	2.6
Inferred	2.1	0.2	2.9	1.7	103	2.4
Total	9.5	0.2	2.8	2.5	104	2.6
Mount Charter⁵						
Indicated	1.9			0.7	36	1.2
Inferred	4.2			0.4	35	1.2
Total	6.1			0.5	36	1.2

1. Fossey Resource is as reported to ASX on 18 August 2009.

2. Hellyer Remnant Resource is as reported to ASX on 26 October 2007.

3. Que River Resource is as reported to ASX on 14 September 2009. Includes in-pit reserves and resources reported in table above.

4. Hellyer Tailings Resource is at 30 June 2009 and was reported to ASX on 23 June 2009.

5. Mount Charter Resource is as reported to ASX on 30 October 2006.

Rounding errors may occur

Metallurgical tests on the Fossey sulphide ore have yielded satisfactory results.

A Notice of Intent to mine and process at Hellyer was lodged in December. The company is seeking a two-stage approval process, the first stage being construction of a decline to access the Fossey deposit and the second stage for ongoing mining and processing. Various options for mining and treating ore from Fossey, Que River and Hellyer are under consideration.

Capital expenditure

Capital expenditure during the year was dominated by the purchase of the Hellyer mill, mine lease and associated infrastructure for \$4.01 million. A total of \$61,233 was spent on capital infrastructure for the Que River mine.

Copper

Copper Mines of Tasmania Pty Ltd, Mount Lyell

This company operates the Mount Lyell underground copper mine and concentrator at Queenstown, employing 289 people in operations.

Production

Ore mined totalled 2 558 094 tonnes, with 2 398 635 tonnes being milled, producing 98 761 tonnes of concentrate containing 27 421 tonnes of copper, 15 675 ounces of gold and 135 953 ounces of silver. Waste mined total 41 470 tonnes.

A total of 2959 metres of development was advanced, 2337 metres in ore and 606 metres in waste. Drilling totalled 4787 metres for Prince Lyell resource definition.

Resources and Reserves

The Prince Lyell (1440–1315) estimated ore reserve at 31 March 2009, at 1% Cu cut-off grade, was:

Proved reserve (Surf Stockpile)	0.2 Mt @ 1.25% Cu, 0.31 g/t Au 3 kt Cu metal
Proved reserve (recovered in situ)	3.0 Mt @ 1.48% Cu, 0.36 g/t Au 45 kt Cu metal
Probable reserve (recovered in situ)	1.6 Mt @ 1.51% Cu, 0.37 g/t Au 24 kt Cu metal
Probable reserve (from cave)	6.5 Mt @ 1.15% Cu, 0.29 g/t Au 75 kt Cu metal
Total Proved	3.3 Mt @ 1.46% Cu, 0.36 g/t Au 48 kt Cu metal
Total Probable	8.1 Mt @ 1.22% Cu, 0.30 g/t Au 99 kt Cu metal
Total Reserve	11.4 Mt @ 1.29% Cu, 0.32 g/t Au 146 kt Cu metal

The Estimated Mineral Resources at 31 March 2009 (in addition to Reserve) for lease IM/95 were:

Prince Lyell (below 1315) (Inferred)	5.1 Mt @ 1.2% Cu, 0.3 g/t Au 62 kt Cu metal
Prince Lyell – Cave (2092–1465) (Inferred)	9.4 Mt @ 0.9% Cu, 0.2 g/t Au 84 kt Cu metal
Western Tharsis (Indicated)	2.9 Mt @ 1.3% Cu, 0.3 g/t Au 38 kt Cu metal
Western Tharsis (Inferred)	7.3 Mt @ 1.3% Cu, 0.3 g/t Au 97 kt Cu metal
All Resources (M, I and Inf)	24.7 Mt @ 1.1% Cu, 0.3 g/t Au 282 kt Cu metal

Employment

The company employed a total of 102 people in management, maintenance and administration. A further 187 contractors were employed in production, transport, treatment and maintenance.

Environmental programs

Copper Mines of Tasmania has continued with its environmental improvement program. The legacy of an old site designed to drain direct to the river has been a challenge. Ongoing pollution reduction projects have included improved stormwater treatment and monitoring of environmental dust. Increased recycling of waste materials and investigation into sustainable waste management practices continues. Environmental hazard reduction projects have included improved tailings and concentrate pipeline containment, especially at environmentally critical stream crossings. Revised pipeline maintenance practices are resulting in improved water and energy efficiency. Biodiversity conservation projects completed during the year include feral animal and weed control programs and improved fire control measures.

Copper Mines of Tasmania is actively involved with a variety of community environmental groups, including the Queenstown Landcare Group and the West Coast Weed and Fire Management Group, and has been awarded recognition in the Tidy Towns program.

Copper Mines of Tasmania has continued to assist the State with its program to treat acid drainage from historic Mount Lyell mining activities.

Capital expenditure

A total of \$5.316 million was provided for capital expenditure. Major items were \$3.804 million for decline development, \$454,900 for relocation of existing mobile crusher, \$220,953 for new pumps to upgrade the 1615 pump station and \$139,427 for a WT103 Mono Pump.

Gold

Beaconsfield Mine Joint Venture

This mine has 156 employees plus 56 contractors for a total of 212 people.

During the year, a record 271 391 tonnes of ore at 8.9 g/t gold was mined, with 70 178 ounces of gold produced at a recovery rate of 90.7%. Ore Reserves as at 31 December 2008 comprised:

Proved Reserve	270 000 tonnes @ 11.9 g/t Au, 103 000 ounces contained gold
Probable Reserve	518 000 tonnes @ 9.7 g/t Au, 162 000 ounces contained gold
Total Reserve	787 000 tonnes @ 10.5 g/t Au, 265 000 ounces contained gold

Resources (including Reserves) as at 31 December 2008 comprised:

Measured Resource	321 000 tonnes @ 14.3 g/t Au, 148 000 ounces contained gold
Indicated Resource	481 000 tonnes @ 13.5 g/t Au, 209 000 ounces contained gold

Inferred Resource	177 000 tonnes @ 10.4 g/t Au, 59 000 ounces contained gold
Total Resource	979 000 tonnes @ 13.2 g/t Au, 416 000 ounces contained gold

In addition there is a low grade open-cuttable resource on an exploration licence held at Lefroy in the old Pinafore mine, which has an Inferred Resource of 818 000 tonnes of 1.5 g/t gold for a gold content of 38 000 ounces.

Capital expenditure during the year was \$4.8 million, of which \$1.6 million was spent on a new tailings dam.

Bendigo Mines Limited Henty gold mine

New ownership

Bendigo Mining Limited (BML) conducted negotiations with Barrick in quarter 4 of 2008/2009 resulting in BML purchasing Henty effective from 1 July 2009. Barrick's Closure Strategy ceased, with BML focussing on extending mine life with near-mine and lease exploration.

Production

A total of 300 428 tonnes of ore at an average grade of 6.4 g/t Au was mined from the underground gold mine near Queenstown and processed during the year. Gold production for the year was 1789 kilograms, with 1157 kilograms of silver also being produced. Waste mined totalled 75 000 tonnes.

Resources and Reserves

Reserves at 31 December 2008 comprised 364 984 tonnes at 7.815 g/t gold (Probable), containing 91,710 ounces of gold. The reserves are based on a gold price of US\$725 and the resources are based on a gold price of US\$850, according to the direction of Barrick Corporate. Ore reserves increased by 98 141 tonnes containing 4,240 ounces of gold in 2008, after allowing for material milled in the preceding 12 months. There were no sterilisations. Grade control drilling of Julia South has downgraded reserves by 9,755 ounces. Development and grade control drilling of Darwin North and the subsequent remodelling has led to an increase of 15,766 ounces. The Tyndall Zone has remained in the resource inventory following an unfavourable cost analysis in the third quarter of the year.

Resources (outside Reserve) as of 31 December 2008 comprised 180 088 tonnes at 7.994 g/t gold (Indicated) and 31 778 tonnes at 7.235 g/t gold (Inferred), for a total of 211 866 tonnes at 7.880 g/t gold (Indicated and Inferred). There were no resources in the Measured category.

Employment

Total employment of staff and contractors was 146, with 20 employed in administration, 69 employed on surface in the concentrator, maintenance and geology, and 57 employed underground.

Environment and major projects

In light of the dwindling reserve base, much focus was placed on mine closure planning during 2008/2009. Several significant investigations were commenced during the year in order to clearly identify the extent of rehabilitation works required. These included:

- Tailings dam geotechnical investigation;
- Tailings dam geochemical investigation;

- Waste rock dump geochemical investigation;
- Underground water rebound assessment; and
- Contaminated site assessment.

Final reports on all investigations are expected in the third quarter of 2009, and the Mine Closure Plan will be updated based on the outcomes.

A 2.5 m embankment lift was carried out on the Newton TSF in early 2009. This will provide capacity for an additional two years of production at current throughput rates.

In response to an incident in April 2009, in which some 30 tonnes of tailings were discharged to the environment following a pipeline failure, a significant portion of the tailings pipeline was upgraded to butt welded poly, removing the mixture of victaulic, electrofusion and friction couplings that had previously been used. This project was completed in early July at a total cost in excess of \$150,000.

Biological monitoring was undertaken in the Henty River for the seventeenth year, again confirming an absence of impact on the stream fauna of the upper Henty River from mining operations.

Capital expenditure

Capital expenditure was \$816,000, with the major item being the tailings dam embankment lift (\$699,161). Other expenditure related to the purchase of light vehicles (\$56,049), Cyanide Code Compliance Project work (\$34,593), installation of mill control air system (\$32,445), work on the mobile crusher (\$20,143) and work on the ESO building (\$7,783).

Iron ore

Grange Resources Limited (Savage River mine)

During the year, Australian Bulk Minerals merged with Australian Stock Exchange listed company Grange Resources Limited, which is now the owner of the Savage River iron ore mine and Port Latta iron ore pelletising plant.

A total of 608 people are employed in the operation, including 153 contractors. These are split between the mining operation (279 people), mobile maintenance (87 people), Savage River concentrator (72 people), town site (35 people), Port Latta plant (104 people) and administration, finance and safety (31 people).

A total volume of 17 744 497 cubic metres of material was mined during the year, including 995 908 m³ of ore and 16 748 589 m³ of waste. Ore crushed totalled 5 715 677 tonnes with 2 289 699 tonnes of concentrate being produced. Pellet production totalled 2 174 415 tonnes, with 2 174 318 tonnes of pellets, 60 144 tonnes of concentrate and 103 281 tonnes of iron ore chips being sold.

Ore Reserves and Resources

Block models were prepared for each part of the deposit using Surpac software. Mineralisation was interpreted in section and in plan using all available drilling, mapping and grade control data. These interpretations were then used to build three-dimensional wireframes, which were constructed for each geological domain.

Models were estimated using Ordinary Kriging for the North Pit and Inverse Distance Cubed weighting for the other parts of the deposit. Estimation parameters were prepared for each of the major areas of mineralisation by Snowden Mining Industry Consultants.

These recommendations were used to assist in the classification of the resource.

Resources and reserves are categorised in accordance with the JORC Code. Estimated, Measured and Indicated Mineral Resources include those Mineral Resources modified to produce the estimated Ore Reserves. Resources which are not reserves did not have demonstrated economic viability at the time of this report.

Ore Reserves as at 31 May 2009 comprised:

Deposit	Reserve category	Million tonnes	Grade (% DTR*)
North Pit	Proved	35.34	52.5
	Probable	68.19	49.4
	Total	105.53	50.4
Centre Pit South	Proved	8.22	44.8
	Probable	2.74	39.1
	Total	10.97	43.4
South Deposit	Proved	7.38	43.6
	Probable	1.07	45.7
	Total	8.45	43.9
Stockpiles: crushed ore	Proved	0.14	49.0
In pit stocks	Proved	1.31	33.0
Total stockpiles	Proved	1.45	34.6
Total Ore Reserve	Proved	52.39	49.6
	Probable	72.00	48.9
Total		124.40	49.2

* DTR = Davis tube recovery, a measure of the mass proportion of magnetite iron ore

Mineral Resources as at 31 May 2009 comprised:

Deposit	Resource category	Million tonnes	Grade (% DTR)
North Pit	Measured	39.33	56.5
	Indicated	88.49	52.6
	Inferred	41.87	50.5
	Total	169.69	53.0
South Deposit	Measured	12.29	44.4
	Indicated	5.57	43.5
	Inferred	11.25	40.9
	Total	29.11	42.9
Centre Pit South	Measured	15.91	49.5
	Indicated	16.24	48.5
	Inferred	22.77	43.1
	Total	54.93	46.6
Centre Pit North	Measured	17.23	55.0
	Indicated	24.44	53.2
	Inferred	15.67	49.0
	Total	57.34	52.6
Centre Pit Southern Extension	Measured	1.79	47.0
	Indicated	1.22	43.8
	Inferred	0.65	44.3
	Total	3.67	45.5
Total Mineral Resource, including stockpiles reported above	Measured	88.01	52.7
	Indicated	135.96	51.7
	Inferred	92.22	47.2
	Total	316.20	50.7

Environment and rehabilitation activities

Contract weed management continued around the mine and town area in partnership with the Savage River Rehabilitation project. New broom growth is again

considerably down on previous years, but significant pampas grass growth is being seen, especially in unused areas of the mine. Difficult access to these areas is proving the biggest problem.

In situ classification and segregation of waste rock from pits has continued. Waste from North Pit went to Broderick Creek Dump. The flow through has been extended further to the north and the dump extended to the west. The classification system was audited by RGS Environmental and training for grade controllers has been carried out.

Grange has continued funding a Coastcare program from Rocky Cape to East Stanley. Further funding was provided to progress weed management at the Nut at Stanley.

Dust deposition at Cowrie Point and Crayfish Creek is measured by high volume air sampling with selective PM¹⁰ inlets. The annual averages were 37.57 µg/m³ at Cowrie Point and 21.68 g/m³ at Crayfish Creek.

Water quality in the Savage River downstream from Grange's operations was satisfactory. Improvements in the Savage River water quality continue through projects associated with the Savage River Rehabilitation project.

Capital expenditure

A total of \$37.32 million was spent on fixed assets in 2008/2009 with a further \$538,248 expenditure in progress as at 30 June. Major items included a new motor for one of the autogenous mills (\$2.4 million), \$1.3 million on a ball mill, \$6.0 million on the in-pit workshop, \$3.46 million on the fuel and lubrication farm, \$2.25 million on the Reliability Centre and \$1.78 million on the administration building.

Tasmania Mines NL, Kara mine

Tasmania Mines operates the Kara No. 1 and smaller Eastern Ridge open-cut mines and a processing plant southeast of Hampshire in North West Tasmania.

The operation produces up to 350 000 tonnes of magnetite ore per year from a northerly-plunging synclinal skarn-style mineralised deposit, with mining operations proceeding from south to north and becoming gradually deeper. Scheelite concentrate is produced as a by-product of the magnetite mining and processing operations.

Mining operations consist of the mechanised excavation of weathered (oxidised) ore and overburden and blasting of fresh ore and waste with production blast holes. The mine utilises uniform ten metre bench heights with 70° bench faces and an operating bench slope angle between 42 and 45°. All ore mined is now crushed within the open pit by a mobile crusher and subsequently moved by truck from the open cut to a stockpile area adjacent to the processing plant. Waste material and overburden is stacked as permanent dump material in the mined-out south end of the open cut or used in the rehabilitation of the old coarse tailings dump.

The Kara No. 1 open cut contains 29 years of proven and probable reserves at a production rate of 350 000 tonnes of magnetite ore per year. Additional target resources have been indicated by previous exploration drilling programs immediately to the north of the current reserves and to the north of the Companion River. Tasmania Mines is in the process of re-evaluating the resources at Kara North.

Production

Tasmania Mines produces magnetite and scheelite concentrates from the Kara No. 1 open cut. A total of

302 766 tonnes of magnetite ore was mined and 277 524 tonnes of ore fed to the mill, with 95 582 tonnes of magnetite concentrate produced. A total of 17 300 kilograms of scheelite concentrate was also produced from the ore treated.

Waste overburden mined in the open cut totalled 871 605 tonnes. A sizeable component of this involved the removal of old dumps and tailings material from an area that is required for access and mining of the known reserves. The majority of the waste mined was moved to the south end of the open cut for permanent storage, with small quantities used on roads or for rehabilitation around the site. Old tailings that have been moved have been placed into the core of the old coarse tailings dam where they are to be sealed and rehabilitated using waste rock covered with overburden.

Employment

The company has a work force of sixteen full-time and two part-time employees, fourteen to eighteen contractors on a continuous basis in excavation, ore haulage and maintenance, and about ten consultants and contractors in specialised roles as required.

Reserves and Resources

Tasmania Mines currently operates mainly in the Kara No. 1 open cut with limited activity in the Eastern Ridge open cut. The principal product mined is magnetite ore with scheelite extracted as a by-product. All original resource exploration/definition drilling was conducted at a time when the principal product was scheelite ore. The association between the magnetite and scheelite mineralisation enabled the definition of magnetite resources for operational purposes from existing drill core information for all reserves south of 6070N. To the north of 6070N the reserve has been estimated utilising a digital resource model prepared from assay information from a resource drilling program completed in 2008.

The following ore reserve estimate for Kara No. 1 (JORC compliant) as at 30 June 2009 is based upon subtraction of production from the months of January to June 2009 from the Kara No. 1 Ore Reserve for 31 December 2008.

Proved Reserve	2 100 462 t @ 45.9% Fe ₃ O ₄
Probable Reserve	8 274 513 t @ 43.1% Fe ₃ O ₄
Inferred Resource	400 000 t @ 55.1% Fe ₃ O ₄
Total Reserve*	10 374 975 t @ 43.7% Fe ₃ O ₄
Less mined	248 710 t @ 49.4% Fe ₃ O ₄
Total Reserve	10 126 265 t @ 43.5% Fe ₃ O ₄

* Does not include Inferred Resource

At the maximum planned production rate of 350 000 tonnes a year this equates to a reserve life of 29 years. Reserves and resources at other deposits (Kara North 266, Location 5 and Eastern Ridge) were estimated in the 1980s before the inception of the JORC code. The data for these areas is only used internally and is not published.

Future targets will be immediately to the north of the Kara No. 1 pit and the Kara Magnetic Anomaly.

Rehabilitation, environmental initiatives and pollution control initiatives

All rehabilitation, environment and pollution control objectives are achieved by adherence to the 2006 Environmental Management Plan which is to be updated shortly. A Mine Closure Plan has been produced for

Tasmania Mines by Pitt and Sherry; this is to be updated and combined with the updated 2009 EMP.

Major projects completed or in progress

A height increase of 1.5 metres in the existing tailings storage dam is in progress to provide additional storage and to ensure that the completed dam complies with relevant legislation.

Preparation, design and approval processes are ongoing for a new tailings dam with sufficient capacity to accommodate tailings storage from the known reserves. The new dam is adjacent to and within the same drainage pattern as the existing tailings storage. Completion of the planning and implementation of the tailings storage facility is currently the most significant project on site for Tasmania Mines.

The Kara North 266 target has been re-evaluated and a plan is in production to detail the mining process. Tasmania Mines intends to mine this deposit with Kara No. 1 at the current approved rate of production. The deposit is an extension of the Kara No. 1 ore body with similar mineralisation but higher scheelite content. All access to the area is in place and the existing plant, waste storage and tailings storage facilities may be utilised to mine the deposit. It is intended that waste and overburden from Kara No. 1 will be used to return the profile to its original state following mining.

Capital expenditure

A regrind mill to produce coal wash product has been purchased and will be operational by the end of 2009 at a cost of \$350,000. Improvements to the scheelite processing facility, costing a total of \$600,000, are planned and equipment installation is due to commence before the end of 2009.

New developments

The completion of resource block modelling has permitted software (project management) driven mine scheduling to be implemented. Each 10 m × 20 m × 20 m block (and sub-cells) within the pit design is contained within a resource-driven schedule and all waste, access and production data is derived from the schedule which is updated quarterly and re-run.

Nickel

Minerals and Metals Group (MMG) Avebury mine

The Avebury mine has been on care and maintenance since March 2009. A total of six staff were employed as at 31 July 2009.

Production

A total of 440 810 tonnes of ore grading 0.96% nickel was processed during the year to yield 17 214 tonnes of concentrate containing 16.6% nickel.

The concentrator plant was commissioned and operational in July 2008. Mining activity ceased in January 2009 and the concentrator plant was put into care and maintenance in March 2009. Operational control was handed over to the Rosebery site.

Plant ramp up was well ahead of expectations and target mill throughputs were achieved within the first few months.

In an effort to remain profitable in the declining price market, the operation processed high-grade feed in the last few months of operation.

Concentrate production was on target but production of contained nickel was well below target due to lower than targeted plant recoveries and operating to dilute penalty elements below cut-off grades.

Resources and Reserves

The Avebury mine resources block models grades are modelled on a 0.4% Ni cut off, with resource and reserve figures quoted using various block cut offs above this. The current reserve is based on a 0.7% block cut off and has been calculated from the January 2008 model.

The January 2008 Mineral Resource was estimated by interpolating nickel, sulphur and cobalt into block models using an ordinary kriging algorithm. Twenty-nine mineralised nickel domains were established using either geological boundaries or a 0.4% Ni contour. Three main mineralised bodies form the bulk of the Avebury reserve including the Viking, North Avebury and Central Avebury deposits. Other significant mineralised bodies include the East Avebury, Saxon, Seymour and Norland Inferred Resources to the east of the Avebury mine.

At January 2009 the Avebury Mineral Resources, at 0.4% Ni cut off, comprised:

- Inferred — 13.97 Mt @ 0.94% Ni;
- Indicated — 4.67 Mt @ 0.95% Ni;
- Measured — 3.38 Mt @ 1.12% Ni;
- Total: 22.02 Mt @ 0.97% Ni, with 214 000 tonnes of contained nickel.

At 0.7% Ni cut off, the Mineral Resources comprised:

- Inferred — 10.71 Mt @ 1.04% Ni;
- Indicated — 3.75 Mt @ 1.03% Ni;
- Measured — 3.12 Mt @ 1.16% Ni;
- Total: 17.58 Mt @ 1.06% Ni, with 186 000 tonnes of contained nickel.

The Avebury deposits are amenable to large scale bulk mining methods. Mineralised widths vary from four to forty metres and average around ten metres true width.

The North Avebury deposit forms a sub-vertical to steeply north-dipping tabular sheet on the northern perimeter of the thick North Avebury ultramafic intrusive body. It is between two and forty metres in thickness and extends approximately 400 metres along strike and 300 metres down dip.

The Central Avebury deposit is located on the southern side of the North Avebury ultramafic intrusion. It strikes NW–SE and extends for over 200 metres in strike length and 100 metres down dip.

The Viking deposit is located on the upper margin, and north and south limbs of a thick, semi-concordant ultramafic sill. The top of the sill plunges west at approximately 20 degrees and mineralisation extends over a strike length of 600 metres and down-dip for approximately 150 to 300 metres. Exploration drilling demonstrates that mineralisation extends a further 350 metres down plunge to the west.

Ore reserve estimates have been produced for the Avebury deposit utilising the 2008 resource model. Only the economic portions of the measured and indicated resource

using a cut-off grade of 0.7% nickel are included within the reserve statement.

- Probable Reserve — 4.006 Mt @ 0.98% Ni, with 39 179 tonnes of contained nickel;
- Proved Reserve — 1.839 Mt @ 0.92% Ni, with 16 887 tonnes of contained nickel;
- Total Reserve — 5.844 Mt @ 0.96% Ni, with 56 066 tonnes of contained nickel.

The 2008 reserve (at 0.7% Ni cut-off) represents a 12.8% increase in contained nickel from the 2007 reserve statement. Overall ore tonnes have increased by approximately 23% but grade has fallen around 9%. This is in line with the recent announcement of the resource upgrade where tonnes increased by 17.4% and contained metal increased 10.7% from the 2007 resource.

The current reserve is restricted to the Avebury and Viking deposits and consists of multiple ore lodes. The Viking deposit reserves extend 600 metres along strike and to more than 450 metres below the surface. The Avebury deposit reserves extend 315 metres along strike and beyond 500 metres below the surface.

Exploration

Underground exploration or resource definition drilling comprised 42 holes for 4321.5 metres, all drilled on the North Avebury, Central Avebury or Viking lodes. The near-mine surface exploration drilling program was designed to test the depth extensions of the Viking resource (Viking Extended) and the region between East Avebury and Avebury. A total of twelve holes were completed for 8174.6 metres. A further five holes, totalling 1876.8 metres, were drilled to test the continuity and extent of mineralisation at the Pontiac prospect.

Environment

A care and maintenance plan came into effect following the cessation of mining at Avebury. The aim of the plan is to make the plant, equipment and infrastructure safe and stable and to minimise any potential for environmental harm during the decommissioning and closure phase. All staff and contractors have left the site with the exception of a small maintenance team supervised from MMG Rosebery.

At the time of decommissioning there were surface stockpiles of potentially acid-forming ore and waste rock (PAF). As part of closure strategies, geochemical characterisation test-work on the PAF stockpiles was completed and only a small amount of samples returned positive NAG (Net Acid Generating) results. Further test work on the known acid generating stockpiles is now underway to determine if they are of real concern. Once this is completed management of the acid-forming materials will be either by submersion in the tailings dam, capping with benign waste rock and/or storage in the underground environment.

The underground mine is continuing to be dewatered and the effluent from this is managed for release to nearby waterways following clarifying through a wetland system.

Environmental Protection Notice license limit negotiations are continuing to be progressed with the Tasmanian government.

Tin

Bluestone Mines Tasmania Pty Ltd — Renison Bell and Mount Bischoff

Bluestone operates an underground tin mine at Renison Bell and an open-cut tin mine at Mount Bischoff.

Employment

As at 30 June 200 employees and 49 contractors were employed in Tasmanian tin operations. These comprised 100 employed in underground mining, 74 in maintenance, 52 in processing, ten in OHSE, eight in open-cut mining and five in administration.

Production

A total of 283 189 tonnes of ore was mined from the Renison Bell underground operation at a grade of 1.53% tin, with 218 226 tonnes being mined from the Mount Bischoff open cut. A further 412 793 tonnes of waste was mined from Renison Bell.

Production of tin in concentrate for export totalled 3256.55 tonnes.

Ore Reserves

Proved Ore Reserves as at 30 June 2009 totalled 212 000 tonnes grading 1.66% Sn. These comprised:

- Renison Bell: 211 000 t @ 1.67% Sn, 0.8% Sn cut off;
- Mt Bischoff: 1000 t @ 0.89% Sn, 0.5% Sn cut off.

Probable Reserves totalled 18.833 million tonnes @ 0.52% Sn, comprising:

- Renison Bell: 1.066 Mt @ 1.80% Sn, 0.8% Sn cut off;
- Mt Bischoff: 238 000 t @ 1.14% Sn, 0.5% Sn cut off;
- Rentals: 17.53 Mt @ 0.44% Sn, 0.21% Cu.

Total Mining Reserves of 19.046 Mt @ 0.54% Sn comprised:

- Renison Bell: 1.277 Mt @ 0.8% Sn cut off;
- Mt Bischoff: 239 000 t @ 0.5% Sn cut off;
- Rentals: 17.530 Mt

Identified Mineral Resources as at 30 June 2009 totalled 27.614 million tonnes grading 0.81% Sn, and 20.444 million tonnes grading 0.25% Cu. These comprised:

Project	tonnes	Sn (%)	tonnes	Cu (%)
<i>Measured</i>				
Renison Bell	664 000	1.95		
Mt Bischoff	1 000	0.89		
Rentails	18 371 000	0.44	18 371 000	0.21
Sub-total	19 036 000	0.49	18 371 000	0.21
<i>Indicated</i>				
Renison Bell	3 015 000	1.66	121 000	0.29
Mt Bischoff	1 305 000	0.68		
Sub-total	4 320 000	1.36	121 000	0.29
<i>Inferred</i>				
Renison Bell	3 555 000	1.93	1 952 000	0.59
Mt Bischoff	703 000	0.47		
Sub-total	4 258 000	1.69	1 952 000	0.59
<i>Totals</i>				
Renison Bell	7 234 000	1.82	2 073 000	0.57
Mt Bischoff	2 009 000	0.61		
Rentails	18 371 000	0.44	18 371 000	0.21
Total Resources	27 614 000	0.81	20 444 000	0.25

Rehabilitation, environmental and pollution control initiatives and major projects completed or in progress

Since mining commenced at Mount Bischoff the acid and metal levels in the Waratah River have improved due to the administration of the agreed Environmental Management Plan that focussed on improving and removing 'legacy' issues in the area, as well as detailed monitoring of the mining activities.

Capital expenditure

Capital expenditure for 2008/2009 totalled \$32,050,906.

Tungsten

King Island Scheelite Limited Grassy

Scheelite resources at the former Dolphin and Bold Head mines on King Island are currently subject to on-going evaluation and development planning by the joint venture partners King Island Scheelite Limited and Hunan Nonferrous Metals Corporation.

A Feasibility Study, completed in 2006 and updated in 2007, provided for a ten-year open-cut operation to 200 metres on the remnant Dolphin deposit resources, delivering 600 000 tonnes per annum to an adjacent mill producing 3000 to 3500 tonnes per annum of contained tungstic oxide (WO₃) in a high-grade scheelite concentrate.

The joint venture partners commenced a review of the planned operation in late 2008 to reflect results of metallurgical test work in China using whole-ore-flotation techniques, inclusion of remnant Bold Head resources in the early stages of the mine plan, and a redesign of the seawall and the Dolphin open cut necessitated by new geotechnical information.

A project team has been assembled to undertake this review and the associated technical studies. Apart from geotechnical drilling and minor ground studies, no mining operations were undertaken on site during the year.

Identified *in situ* mineral resources as at 30 June 2009 comprised:

- Dolphin (JORC compliant): Indicated and Inferred Resources 13.4 million tonnes at 0.65% WO₃ to 308 m below sea level, at a 0.25% WO₃ cut-off grade.
- Bold Head (pre-JORC): Measured and Indicated Resources 1.7–1.9 million tonnes at 0.8–0.9% WO₃, at a 0.3% WO₃ cut-off grade.

Industrial Minerals

Limestone and dolomite

Beams Bros Pty Ltd

Beams Brothers operates a limestone quarry at Flowery Gully and a dolomite quarry at Cressy, employing a total of 24 people. Production of limestone and dolomite during the year totalled 140 000 tonnes, comprising 38 000 tonnes of metallurgical grade limestone, 12 000 tonnes of lime and limestone for water treatment/neutralisation, 81 000 tonnes of fine limestone and dolomite for the Beaconsfield Gold mine, 4900 tonnes of dolomite by-product and 5200 tonnes of limestone mixing stone. Extensive reserves exist at the Flowery Gully site, while the Cressy lease has a medium reserve level.

During the year 36 000 m³ of waste material was removed from the Flowery Gully and Cressy quarries. Dump pads at both the sites were levelled for rehabilitation works.

Major capital expenditure during the reporting period included installation of an additional 30 tonne dump truck into Flowery Gully.

Circular Head Dolomite and Trading Co. Pty Ltd

The Circular Head Dolomite and Trading Company employs 15 people in its dolomite quarry at Smithton. Total production consisted of over 110 000 tonnes of materials, including 54 000 tonnes of screenings, 45 000 tonnes of dolomite powder and 11 000 cubic metres of ready-mix concrete.

Unimin Australia Limited

Total production from the Mole Creek quarry included approximately 20 000 tonnes of stone, 35 000 tonnes of aglime and 50 000 tonnes of lime. Overburden waste removed to the dump site totalled approximately 350 000 tonnes. The equivalent of 30 staff was employed throughout the financial year. Twenty of these were in the quarry and lime plant operation, one in maintenance, three in administration and six in management and sales.

Ceramics

Austral Bricks Tasmania

Twenty-one individuals and one contractor are employed by Austral Bricks Tasmania. Production for the 2008/2009 financial year totalled over 26 000 tonnes of bricks and pavers, which included the export of approximately 7000 tonnes of product to New Zealand, Japan and Korea.

Minor rehabilitation has been undertaken at both the Longford and Relbia pits. More substantial works were performed at the Greenhill Forest site. The annual environmental audit was successfully completed.

Ample reserves of material are available at all sites.

K&D Bricks & Pavers

This company continues to manufacture clay bricks and pavers in the Hobart suburb of New Town.

Fuel Minerals

Cornwall Coal Company NL

The Cornwall Coal Company employs 100 people in coal mining, washing and transport in the Fingal Valley and at Hamilton.

Production continued throughout the year using a combination of both bord and pillar and Miniwall techniques. Almost all underground production by Cornwall Coal from the Fingal Valley was concentrated within the Duncan Colliery, with a negligible amount from Blackwood 4.

Duncan Colliery

Production continued throughout the year using bord and pillar mining to extract old mine workings, following the recovery and re-support of these workings.

Delays in the establishment of Blackwood No. 4 and the exhaustion of quality reserves at Duncan has necessitated continuation of mining at Duncan in areas of low yield until the end of 2010.

Blackwood Colliery No.2 and No. 3

The rehabilitation at these sites has been monitored throughout the year and is progressing.

Blackwood Colliery No. 4 entry

The high wall failed in July 2008 blocking access to the transport roadway portal with all mining ceasing until the high wall was stabilised. The transport roadway portal was relocated and all mining resumed in January 2009 from an area cleared near the existing box cut to complete a new 280 metre long transport roadway to link with existing workings. These were holed into in early 2009. The main mine ventilation fan and conveyor drivehead and gantry were installed in May–June 2009.

Huntsman No. 2 open cut

The rehabilitation has been monitored throughout the year although major bushfires throughout the region in previous years and torrential rains this year have caused extensive washouts which will require further rehabilitation.

Cullenswood open cut

Cullenswood continued to produce coal throughout the period to augment the supply and quality of coal being supplied from Duncan Colliery in an endeavour to satisfy

customer requirements. A contractor utilises trucks and shovels to remove overburden and stockpile the coal on site prior to transport to the Fingal washery. Economically recoverable reserves at Cullenswood are limited and are expected to be exhausted in early 2010. Further exploration has been undertaken within the Cullenswood property.

Kimbolton Coal

The quality of coal mined from Kimbolton is such that it needs to be washed and blended with coal from the Fingal Valley to meet customer requirements, while production and transport costs are uneconomic unless combined with a backload transport arrangement. Mining is undertaken on a limited discontinuous basis throughout the year, with production being matched with sales levels to southern customers.

Production

Production of raw coal for 2008/2009 totalled 484 454 tonnes. This coal was sourced from the Duncan (385 295 tonnes), Cullenswood (31 289 tonnes), Blackwood 4 (7128 tonnes) and Kimbolton (60 742 tonnes) mines.

Washery throughput of raw coal totalled 604 121 tonnes to produce 384 155 tonnes of saleable coal at a washery yield of 63.3%. Coal sales totalled 394 161 tonnes.

Approximately 221 000 tonnes of reject materials were deposited at the Duncan reject dump.

Employment

The company employed 100 people (including contractors) in the operation. This comprised 80 people employed in underground mining, processing and administration, with a further twelve contractors employed in coal transport and eight in open-cut operations.

Capital expenditure

A further \$1.0 million has been spent up until the end of June 2009 to develop the third entry and establish associated infrastructure at Blackwood No. 4.

Rehabilitation

Rehabilitation at the Huntsman and Blackwood 2 and 3 areas continued to be monitored throughout the year.

Construction Materials

BIS Industrial Logistics

During the 2008/2009 financial year BIS Industrial Logistics operated five mining leases at Launceston, Ridgley, East Devonport and St Helens. BIS continued to operate an additional eleven mining leases recently acquired from Fieldwicks Pty Ltd.

The Launceston BIS operation incorporates four open-cut quarries, which have been operational since the late 1970s. The main office and quarry are located at Western Junction, approximately twelve kilometres south of Launceston. The Ridgley quarry, located approximately fifteen kilometres south of Burnie, has been operating since 1988. BIS utilises fixed and portable crushing equipment to produce pavement,

screened sealing and drainage materials from basalt, dolerite and quartzite.

A total of 18 employees and contractors were employed by BIS Industrial Logistics during the past year, including administration staff, full and part-time operators and sub-contractors. With the addition of the new operations, employee numbers have increased to 43.

Ongoing progressive rehabilitation continued across all BIS sites, with major improvements in reducing airborne dust from fixed plant from changes to operational procedures and updated dust suppression equipment and practices.

BIS Industrial Logistics maintained tri-certification to AS9001, AS4801 and ISO14001 during the year. This

certification incorporates compliance to Department of Infrastructure, Energy and Resources specifications and Australian Standards for pavement materials and aggregates, and Australian Standards for Occupational Health and Safety and Environmental compliance.

Boral Resources (Tasmania) Limited

Boral Quarries operates hard-rock quarries at Bridgewater, Launceston, Flowery Gully and Nook, and a sand operation at South Arm. The company employs a total of twenty-five personnel.

During the 2008/2009 financial year Boral experienced strong demand for concrete sand and aggregates. The upgrade of the East Tamar Highway in the north as well as a number of road projects in close proximity to the Bridgewater quarry delivered strong road base volumes.

Production for the year exceeded one million tonnes of material, one third of which was concrete aggregates, asphalt and spray seal markets, 8% sand, and the remainder road base products.

All quarries have extensive reserves based on current demand levels. The construction of a haul road at the Launceston quarry to enable access to additional reserves on the site was completed, with extraction of the additional reserves expected to commence in 2009. Realignment of the haul road at Nook is also being undertaken.

The Tasmanian Government compulsorily acquired eleven hectares of land at the Bridgewater quarry for the construction of the Brighton Transport Hub. The project will be a significant opportunity for the quarry as well as challenging with the disruption to traffic flows as the project commences.

During the year the Nook primary crusher was replaced and a new 966 loader was acquired for the Launceston quarry. The secondary crusher at Flowery Gully was also replaced, improving efficiency and costs.

The company has upgraded the dust suppression measures at the Bridgewater quarry. Dust extraction equipment has been installed on the quarry screen house in an effort to reduce the amount of dust being emitted to the atmosphere. Captured dust will be recycled back into the silos for use in road base products.

Rehabilitation is underway at a number of redundant operations around Tasmania.

Duggans Pty Ltd

Duggans Pty Ltd operates six mining leases and pre-cast concrete production factories at Cradoc in the Huon Valley and at Launceston. Approximately 65 staff are employed across Duggans operations. Production of raw materials totalled 93 500 tonnes, consisting of 60 000 tonnes of road materials, 31 000 tonnes of construction materials and 2500 tonnes of construction sand.

Major projects completed or progressed during the reporting period included the Vos Construction Offices at Western Junction, Southport jetty replacement, Legana Chickenfeed, Freycinet development and several subdivision developments.

No waste materials were stripped or extracted during the year. Recycling of concrete waste has continued and maintenance has been undertaken on site sediment ponds. Environmental Management Plans are in the process of being upgraded, and investigations into the use of underground hot

water for water requirements for the pre-cast factory are underway.

Fieldwicks Pty Ltd

During late June 2008 eleven of the twelve mining leases held by Fieldwicks Pty Ltd were acquired by BIS Industrial Logistics.

FR & CM Lazenby and Son

The FR & CM Lazenby and Son sand extraction operation at South Arm employed the equivalent of four full-time and one part-time personnel during the 2008/2009 financial year. Production during this period totalled approximately 12 000 tonnes. Considerable reserves are estimated within the two mining leases.

GL & DH Males Pty Ltd

GL & DH Males operates a sand pit at South Arm and a retail operation in South Hobart, employing three full-time and seven casual staff.

Production from the South Arm mining lease consisted of concrete sand, coarse (washed) sand, horticultural sand, bedding sand and sandy loam.

Future sources of dune sand will include re-working old areas. Coarse sand reserves are expected to maintain supply for the next ten to twenty years.

Rehabilitation works at the South Arm lease are continuing in line with the site's Environmental Management Plan. The dunes on the southeastern side of the property have been re-contoured and seeded with *Acacia sophorae*, *Acacia floribunda* and *Myoporum insulare*. Transplanting to the foot of the dune also continued.

Gunns Forest Products P/L

Gunns Forest Products Pty Ltd manages and operates 51 licensed quarries across Tasmania, providing road construction and maintenance materials for approximately 6000 kilometres of forest road. New construction of gravelled forest roads in 2008/2009 totalled 138 kilometres. The total direct cost of the road construction and maintenance programs for the year was over \$9.5 million.

Quarrying and road construction were performed by contractors under the supervision of company staff. In the peak of the construction period approximately 60 people were engaged in quarrying and road work, reducing to approximately 15 people during the winter months when most activity was road maintenance.

Eight full-time staff are currently employed in quarrying works. During the 2008/2009 financial year approximately 122 000 tonnes of material was mined and removed from licensed quarries.

All licensed quarries are subject to the provisions of a management plan which includes a requirement to progressively rehabilitate and restore mined-out sections of quarries, including ongoing remodelling of benches and housekeeping to clean sumps and drains.

Gunns Forest Products Pty Ltd has a certified Environmental Management System compliant with ISO 14001. In addition the company's forestry operations (including quarrying and road activities) and forest management system is certified compliant with the Australian Forestry Standard. All forestry activities, including

quarrying and road works, are subject to annual independent third party audits. All southeast quarries were internally audited during 2008/2009.

Hanson Construction Materials Pty Ltd

Hanson Construction Materials has fifteen full-time and one part-time employee at their operations in Hobart, Calder and Potato Hill (George Town). During the 2008/2009 reporting period 150 000 tonnes of aggregates, 149 000 tonnes of road materials and 60 000 tonnes of sand were produced across the three operations.

A Development Proposal and Environmental Management Plan (DPEMP) for the Hobart quarry has been prepared for submission and is currently awaiting rezoning application results from the Clarence City Council before the final version is submitted. This is a high priority as access to quarry reserves is becoming limited.

Rehabilitation works have continued in all areas of the Hobart quarry, with contractors engaged to eliminate pampas grass. A recent review of Potato Hill has identified a need to focus on weed eradication over the coming months.

HBMI Pty Ltd

Hobart Blue Metal Industries (HBMI) operates a dolerite quarry at Leslie Vale, fourteen kilometres south of Hobart. The company has fourteen permanent employees in production, two with the mobile equipment, and three in the weighbridge and support staff. A further 30 people are employed as subcontractors for material deliveries, drill and blast activities, and maintenance as required.

A new Environmental Management Plan has been prepared for the Leslie Vale quarry.

Lloyds North

Lloyds North employs ten people at the Kimberleys Road and Riggs Road quarries near Ulverstone.

Production from the Riggs Road quarry totalled 85 000 tonnes of basalt. The oversize rock reduction program continued in 2008/2009.

Production at Kimberleys Road consisted of 56 000 tonnes of aggregate and 25 000 tonnes of base coarse material. Compliance with the Environment Division's EPN also continued. Plant safety upgrades and process improvements continued into 2008/2009.

Norske Skog Boyer

Norske Skog operates quarries primarily to maintain State forest and private roads used for timber harvesting and transport to supply its Boyer paper mill. During the year approximately nine kilometres of new forestry roads were built, with upgrades and maintenance undertaken to existing roads.

Production for the year consisted of 23 000 tonnes of raw, crushed and screened material. The majority of material is won by dozer/excavator. Minimal drill/blast is expected in

the future. Norske Skog outsource labour and machinery in the operation of their quarries, with one full time Norske Skog employee supervising contractors.

Due to the variation in demand for quarried material (based on the location of new roads required for harvesting operations and road maintenance, a function of the location of harvesting operations, transport routes and weather) it is anticipated that demand in future years will be similar to current levels, but will reduce slightly over time. Reserves in the existing quarries are unknown but should be sufficient for the next decade of operations.

RNB Trading Pty Ltd

During the 2008/2009 financial year RNB Trading employed four personnel at their sand extraction site at Llanherne. Production consisted of 97 000 tonnes of building sand and 2000 tonnes of bedding sand.

Stripping was conducted progressively until the exotic weed cut leaf nightshade became apparent. A weed management plan has been implemented to manage this. Rehabilitation efforts have been hampered by unusually wet conditions.

Stornoway Quarries Pty Ltd

Stornoway operates quarries at Breadalbane and Birralee in northern Tasmania. The operations produced 134 000 tonnes of gravel products, 54 000 tonnes of screened aggregates, 24 000 tonnes of crushed sub base and 33 000 tonnes of crushed aggregates for the concrete market.

There were ten employees during the year. Capital expenditure included \$1.25 million on a crusher, two screening plants, an excavator and a loader.

A DPEMP was submitted for quarry expansion at Breadalbane.

Treloar Transport

Treloar Transport Company operates the Shackley Hill quarry at Sheffield, employing five full-time staff and a contract driller and shot firer. Production for the twelve month period totalled 120 000 tonnes of material, with sales comprising 35 000 tonnes of sub-base material, 50 000 tonnes of base course, 20 000 tonnes of pit-run gravel and 15 000 tonnes of other products.

Major projects completed or in progress during the year have included production of base course for the Meander Valley Highway project. Main capital expenditure included purchase of a new loader and improvements to the secondary crusher to increase throughput.

An updated safety audit was completed for the quarry operations and the recommendations are now being implemented. Acidic drainage produced through the oxidation of pyrite continues to be treated with crushed limestone and settling ponds.

Mineral Processing Operations

Cement Australia Holdings Pty Ltd

A total of 142 people are employed full time at the mine and cement plant at Railton. Production of cement clinker from the plant kiln totalled 1.13 million tonnes. This clinker was used to produce 1.25 million tonnes of cement, 1.13 million tonnes of which was shipped to Victoria and New South Wales via the Port of Devonport. Of the remaining production, 125 000 tonnes was utilised in the local Tasmanian bulk and bag markets. Total dispatches from the Railton factory totalled 1 249 875 tonnes.

Major projects and new developments

An RC drilling program was conducted in April 2009 in the eastern cutback. This helped in defining the grades and clay boundary in the area and the block model was updated with new data. Approximately 247 000 BCM of clay was stripped from the north cutback stages. Eastern cutback development was focussed on moving the pinnacle zone and successfully reaching the competent stone. Long-term mine scheduling work is being done to determine the next cutback development. Further expansion of the mine will likely be in a west and northwest direction.

Capital expenditure

Capital expenditure for the period was \$6.3 million. The main project commissioned during 2009 was the replacement of the kiln precipitators with a bag filter to reduce emissions from the kiln system, with the total expenditure on this project reaching \$19.2 million. Alternative fuels for the kiln system saw the commissioning of the SCL (spent cell liner) plant which burns the cell liner material from Rio Tinto Alcan at Bell Bay. Other smaller projects were commissioned during the year, notably the kiln shell cooling fans which dramatically reduced the cooling fan noise around the kiln system.

Environmental

Rehabilitation of the old mine waste dumps was carried out during this period with revegetation with native plants to be done in coming years. The new mine waste dump first cut batter was rehabilitated with hydro mulch and native seeds. A total of 10 899 BCM of topsoil was stripped from the north cutback stage and stockpiled for future rehabilitation.

Work on the Site Water Management Plan (SWMP) continues. This plan addresses the issues surrounding management of groundwater and surface water from mining and cement manufacturing operations. Stage 1 — Surface Water Management, which involved the lining of over two kilometres of Browns Creek Drain to improve water quality,

was completed in late 2007. Stage 2 groundwater bores were completed in mid 2009 but the project was not successful. Stage 3 water treatment is at the design stage but has been delayed by current economic and market conditions.

Nyrstar Hobart Pty Ltd

Nyrstar Hobart has a workforce of 506 employees and 91 contractors at its zinc smelter on the western bank of the River Derwent at Risdon. Production for the year consisted of approximately 250 000 tonnes of zinc and 400 000 tonnes of sulphuric acid.

Reserves/Resources

Nyrstar source the majority of its concentrate requirements from within Australia, predominantly from the Century and Rosebery mines. Nyrstar Hobart is also focussed on sourcing a higher percentage of secondary zinc oxides to increase flexibility of feed to the site.

Rio Tinto Alcan — Bell Bay

The Bell Bay aluminium smelter directly employs a total of 523 individuals and 47 contractors. Production during the 2008/2009 financial year totalled 178 709 tonnes.

Capital expenditure for the year totalled \$19.52 million. The company entered into an agreement with Cement Australia where spent cell linings, a by-product of the smelting process, are recycled through the Railton cement kiln, where the carbon is burnt as fuel and the refractory material becomes cement clinker. More than \$8 million was invested to implement the project.

Tasmanian Electro Metallurgical Co. Pty Ltd (TEMCO)

This company operates an electro-metallurgical smelter making ferroalloys at Bell Bay, the only manganese ferroalloy plant in Australia. Four electric-arc furnaces and a sinter plant produce high-carbon ferromanganese, silicomanganese and sinter.

Impact Fertilisers Pty Ltd

This company employs 118 full time employees. Production of fertilisers at the Risdon plant for the 2008/2009 financial year totalled 138 000 tonnes.

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

The major focus of activity during 2008/2009 was mine site safety, with eighteen mine shafts at Pipers River and Burns Creek being either capped or fenced to provide for public safety. Minor safety works were carried out at Warrentinna, Lefroy, Mount Victoria and Gipps Creek.

Minor works, including site maintenance and preparation for revegetation, were carried out at several abandoned mine sites and quarries. Prominent among these was the continuation of preparation and planning for rehabilitation of historic tailings at Royal George. Funds were also allocated to native seed collection for future revegetation at Royal George and the Argonaut mine at St Helens.

In total, approximately \$163,100 was spent from the Rehabilitation of Abandoned Mining Lands Trust Fund during the 2008/2009 period.

Mine safety

- Thirteen open mine shafts were capped with concrete panels and an abandoned mine camp was removed on a section of the Den goldfield near Pipers River. Expenditure totalled \$33,500.
- Five open shafts were capped with concrete panels at Burns Creek. Expenditure totalled \$12,800.
- Two open shafts were capped with concrete panels and two shafts were fenced at Bakers Tier near Lefroy. Expenditure totalled \$9,100.
- Grating was fitted to the Crown Prince adit adjacent to Mt Victoria Road. Expenditure totalled \$4,900.
- Grating was fabricated for shafts at Warrentinna. Expenditure totalled \$8,400.

- A safety fence was installed above the Great Republic adit at Gipps Creek. Expenditure totalled \$600.
- Fabrication of concrete panels to establish ready stock for shaft capping totalled \$40,200.

Mine site rehabilitation

- Design and specifications were completed for diversion drainage around historic tailings at Royal George. Preparatory work was carried out for revegetation of tailings, including application of lime and fertiliser, weed management and native seed collection. Expenditure totalled \$36,600.
- Revegetation work was carried out on abandoned exploration tracks near Balfour. Expenditure totalled \$7,800.
- Weed management and vegetation maintenance continued at Merrywood. Expenditure totalled \$2,150.
- Maintenance work was undertaken on erosion controls at Storys Creek. Expenditure totalled \$1,250.
- Native seed was collected for future revegetation at the Argonaut mine, St Helens. Expenditure totalled \$3,000.
- Water quality monitoring and site investigations were undertaken at the Cleveland mine, Luina. Expenditure totalled \$1,000.

Quarry rehabilitation

Revegetation maintenance, encompassing weed control and revegetation monitoring, continued at the Punched Terror quarry at Dunorlan and The Badgers quarries at Sheffield. Expenditure totalled \$1,800.

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