

ANNUAL REVIEW

1997-98



Mineral Resources Tasmania



MINERAL RESOURCES TASMANIA

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

Annual Review

1997/98

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Mineral Resources Tasmania – Mission

- ❑ To provide the necessary information and tenement infrastructure to foster responsible mineral resource development and land management for the benefit of the Tasmanian community.

Mineral Resources Tasmania – Objectives

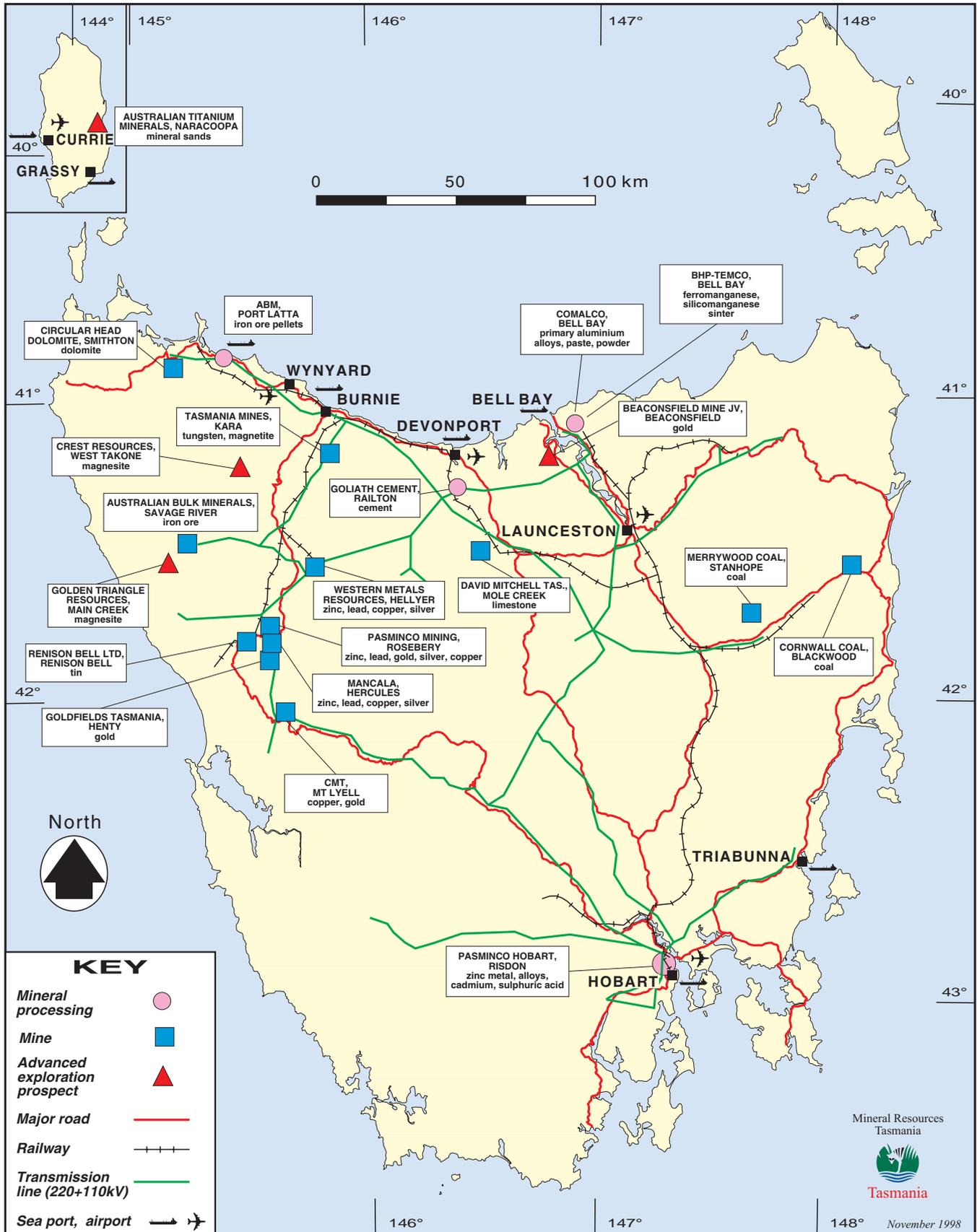
- ❑ To increase the investment in exploration for, and development of, minerals and petroleum in Tasmania and offshore waters;
- ❑ To provide geoscientific information essential for the development of the State's mineral resources and for responsible land management;
- ❑ To ensure a fair and sustainable return to the community when petroleum and mineral resources are developed;
- ❑ To give effect to government policy in relation to mineral and petroleum resources and improve Mineral Resources Tasmania's operational performance.

CONTENTS

Mineral Sector Overview	5
Mineral Resources Tasmania	8
Review of MRT activities, 1997/98	14
Metallic Minerals and Geochemistry	14
Engineering Geology and Groundwater	16
Hydrocarbons and Tenement Management	17
GIS and Geophysics	21
Data Management Group	23
Publications	25
Library	24
Review of Mineral Sector Operations	26
Metallic minerals	28
Non-metallic minerals	33
Ceramics	33
Construction materials	34
Fuel Minerals	35
Mineral processing operations.....	36
Mineral Production Statistics	38
Annual Report, Rehabilitation of Mining Lands Trust Fund	39

Tasmania

Major Mining and Mineral Processing Operations



Mineral Sector Overview

The 1997/98 financial year was a difficult one for the Tasmanian minerals industry, with volatile conditions experienced by the mineral exploration, mining and mineral processing sectors.

Following several years of growth, culminating with an annual exploration expenditure of \$26 million in 1996/97, there was a decline in mineral exploration expenditure to \$20.7 million during 1997/98. The previously buoyant conditions continued into the September 1997 quarter, when an expenditure of \$9.7 million represented 3.2% of the Australian total, the highest proportion for more than a decade. Since that time there has been a decline, with the June 1998 quarter expenditure of \$3.5 million making up only 1.3% of national investment in exploration.

The decline during the year was also reflected nationally, but the Australia-wide decrease of 7% was exceeded by the 20% decrease of expenditure in Tasmania.

The main reason for the fall in expenditure was the successful completion of a number of exploration projects on mining leases. The decline in expenditure on exploration and retention licences of 5.4% was less than the overall national decrease, but the overall level of expenditure on these tenements of \$7.84 million needs to be improved to enhance the possibility of discovery of economically-viable mineral deposits.

Highlights for the year included the continuation of successful exploration programs on the Rosebery and Henty mine leases, excellent progress towards demonstrating the viability of producing magnesium metal from Tasmanian resources, and interesting nickel discoveries.

- Continuing exploration by Pasminco Limited resulted in a 14% increase in the total resources at the Rosebery mine during the year to 11.7 million tonnes of ore at 12.3% zinc, 4.3% lead, 0.35% copper, 139 grams per tonne silver and 2.2 grams per tonne gold. The resources are derived from a 2.3 million tonne measured resource, an indicated 1.5 million tonnes and an inferred 7.9 million tonnes.
- RGC Limited announced the discovery of an inferred resource of 731 000 tonnes of gold mineralisation grading 7.6 grams per tonne at the Mount Julia prospect, south of the Henty mine.
- Crest Resources NL announced an indicated resource at the Arthur River magnesite deposit of 29 million tonnes of ore grading 42.8% magnesium oxide (MgO). The company announced that it would fast track the magnesium project after securing exclusive rights to metallurgical technology from a Ukrainian research institute.
- Golden Triangle Resources NL announced an inferred resource of 47.4 million tonnes of ore with 43.36% MgO at their Main Creek magnesite

deposit, including sections with mineable widths in excess of 10 metres with grades of better than 45% MgO.

- Allegiance Mining NL discovered further lateritic nickel resources in the Andersons Creek area near Beaconsfield, and intersected significant nickel mineralisation in a drill hole at the Avebury prospect, west of Zeehan.

The year also marked a changing of the guard in the Tasmanian exploration scene, with some major contributors to the total Tasmanian industry leaving or diminishing their activities. Rio Tinto Limited effectively ceased exploration in Tasmania and the continued involvement of Aberfoyle Limited was uncertain because of the takeover bid by Western Metals Resources Limited. The decision of RGC Limited to focus on mineral sands and sell its 56% stake in Goldfields Limited, as well as divest its base metal interests including the Renison mine, added to the uncertain climate. On the credit side, Pacific-Nevada Mining Pty Ltd was granted or applied for 18 exploration licences covering a total area of 4233 square kilometres at King Island, the Hunter Group, northwest Tasmania, Cape Sorell and Cygnet. Work on geochemical and geophysical surveys on some of these areas is well underway. In addition, several small companies and individuals were acquiring ground for exploration, including Cobra Resources NL, Jervois Mining NL, CO Haslam, Griffith Geological Consulting Pty Ltd, Anglo Australian Resources NL, and Low Impact Diamond Drilling Specialists.

In short, the mineral exploration industry appears to be in a phase of global contraction and Tasmania is placed in an increasingly competitive market to attract exploration investment. The need for Government to promote the advantages of the State and to supply high quality geoscientific data increased during the year.

The mining industry was equally volatile.

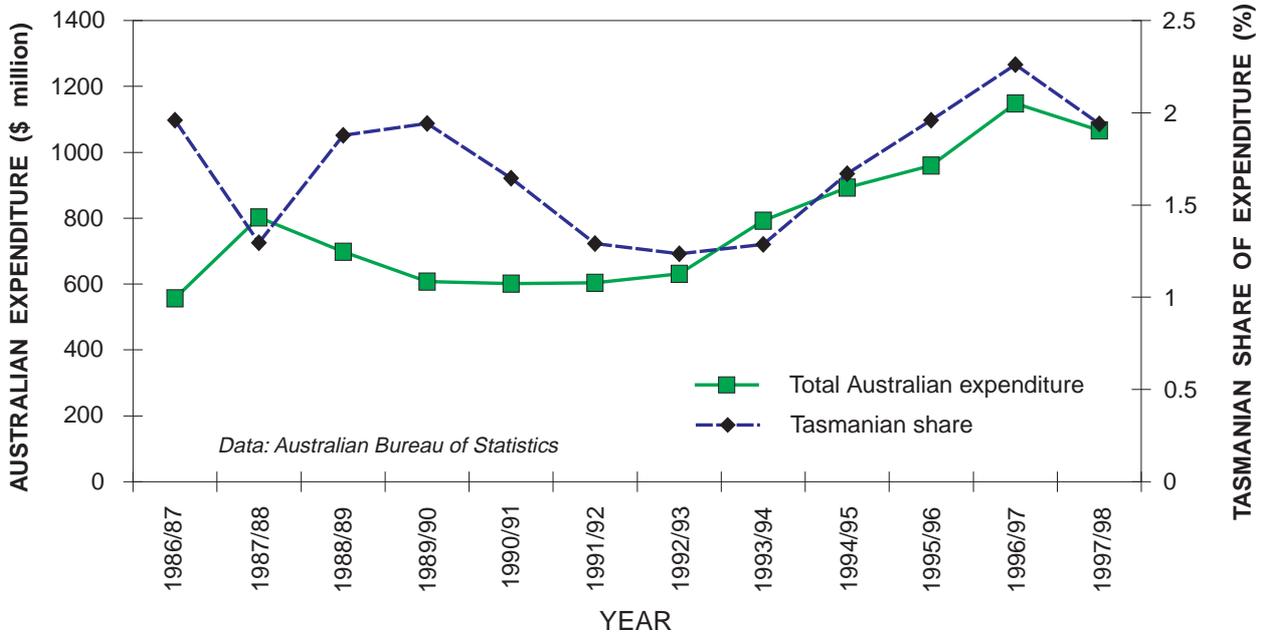
The most positive development was the re-opening of the Savage River iron mine and Port Latta processing plant, now operated by Australian Bulk Minerals. The development of the Beaconsfield gold mine by the Beaconsfield Joint Venture, consisting of 51.51% ownership by Allstate Explorations NL and 49.49% by Beaconsfield Gold NL, was proceeding satisfactorily. The Development Proposal and Environmental Management Plan was accepted during the year, a development decline reached the Tasmania Reef, and a contract was let for the construction of the treatment mill.

The Renison mine, although achieving an operating profit of \$8.1 million for the year, before interest, taxation and currency hedging, was on the market and low copper and zinc prices were affecting

Expenditure on Mineral Exploration 1987/88 to 1997/98

Year	Australian Expenditure (\$ Million)	Tasmanian Expenditure (\$ Million)	Tasmania as % of Australian Expenditure
1987/88	802.2	10.4	1.30
1988/89	697.6	13.1	1.88
1989/90	607.5	11.8	1.94
1990/91	601.5	9.9	1.65
1991/92	603.7	7.8	1.29
1992/93	631.7	7.8	1.23
1993/94	792.6	10.2	1.29
1994/95	893.4	14.9	1.67
1995/96	960.2	18.8	1.96
1996/97	1148.6	26.0	2.26
1997/98	1066.8	20.7	1.94

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



the Mount Lyell and Rosebery mines. Western Metals Resources Limited mounted a takeover bid for Aberfoyle Limited, operators of the Hellyer mine, which is scheduled to cease underground mining in mid 2000.

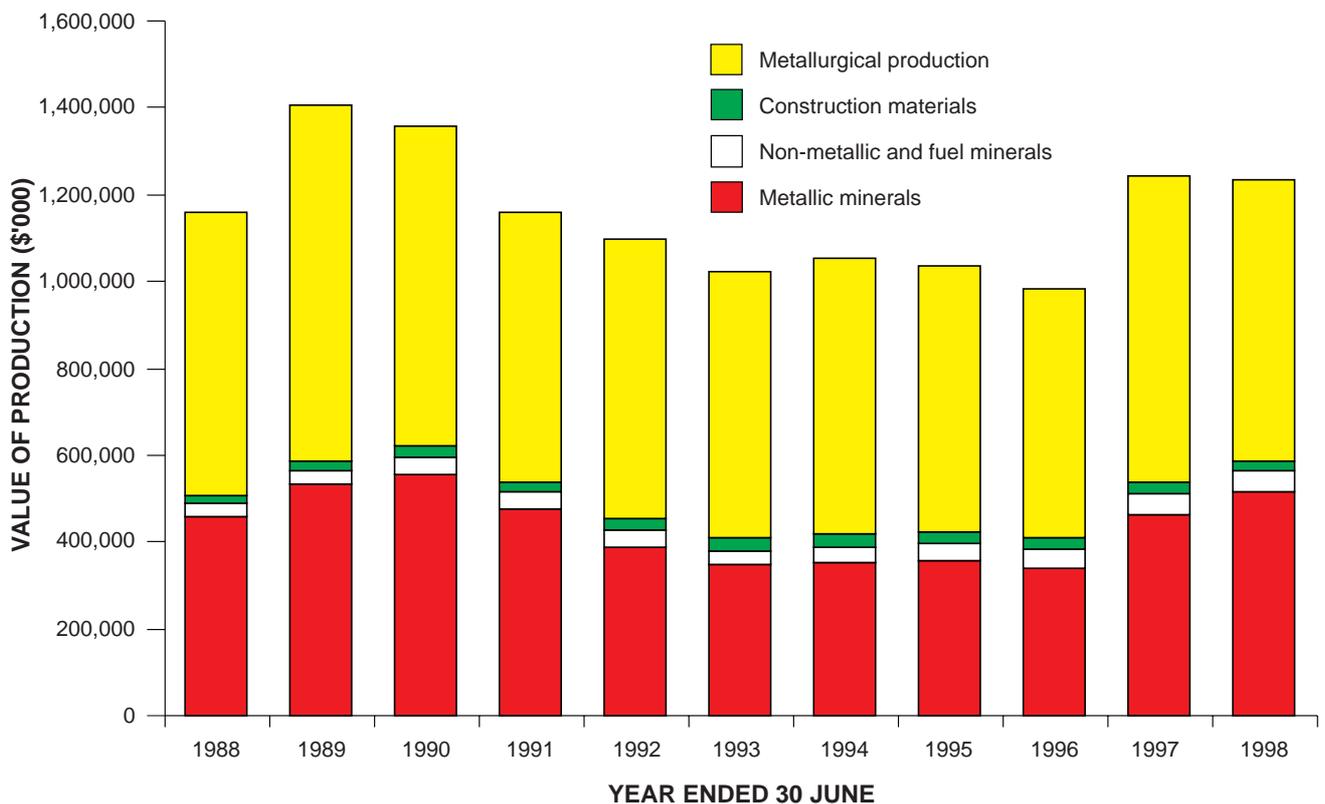
The environment of change was also felt in the mineral processing sector, with BHP announcing that it was looking for a potential buyer for the BHP Manganese Group, which includes the TEMCO plant at Bell Bay. Most operations reported upgrades to plant and equipment resulting in improved environmental performance and efficiency. Comalco at Bell Bay successfully commissioned the most technically advanced fume scrubbing system available to the aluminium industry in September 1997, resulting in a 90% reduction in gaseous fluoride emissions and negligible particulate emissions.

At Pasmafinco's Risdon zinc smelter, a major environmental milestone was achieved with the introduction of the paragoethite production process in December 1997, which resulted in the end of jarosite dumping at sea. TEMCO completed the upgrade of the Number 3 furnace. The Goliath Portland Cement Company Limited at Railton completed a number of capital works, including installing a crusher and conveying system at its new mine site.

In April appraisal well Yolla 2 was drilled in the Bass Basin, confirming volumes of between 450 and 600 billion cubic feet of liquids-rich gas. A second appraisal well is planned to confirm the economic viability of the Yolla field. The White Ibis 1 well was drilled in May on a prospect 40 km west of the Yolla field. This well made a sub-commercial gas discovery which may be tapped as part of a development of the Yolla field.

Value and production of minerals 1997/98 and 1996/97

	1997/98		1996/97		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Gold	3.26	-	2.44	-	+47.5
Silver	139	-	166	-	-16.3
Zinc	183 198	-	186 406	-	-1.7
Copper	27 698	-	24 759	-	+11.9
Lead	57 041	-	65 724	-	-13.2
Tin	9 868	-	8 732	-	+13.0
Tungsten	5	-	2	-	+150.
Iron ore pellets	1 074 655	-	809 359	-	+32.8
Metallic minerals	-	516,367	-	460,907	+12.0
Non-metallic and fuel minerals	-	45,819	-	48,452	-5.4
Construction materials	-	22,280	-	27,797	-19.8
Metallurgical production from imported ores	-	649,427	-	706,686	-8.1
Value of mining and mineral processing sectors	-	1,233,893	-	1,243,842	-0.8



Mineral Resources Tasmania

During the 1997/98 financial year Mineral Resources Tasmania (MRT) operated as a Division of Tasmania Development and Resources (TDR), giving effect to government policy in relation to minerals and petroleum resources and providing essential information for land management in Tasmania.

Following the election of a new Tasmanian Government in September 1998, a reorganisation of the structure of the Tasmanian Public Service resulted in Mineral Resources Tasmania being incorporated as a division of the new Department of Infrastructure, Energy and Resources.

MRT is committed to securing a sustainable future for mineral exploration, mining, quarrying, and mineral processing in Tasmania, by using its resources to promote and encourage:

- new mineral discoveries, following private sector exploration of Tasmania's areas of mineral and petroleum prospectivity;
- better utilisation of known resources, by new and existing companies and other stakeholders;
- strong community and industry support through consultation;
- development and use of world-class environmental land management systems; and
- better land-use decisions by consideration of relevant geoscientific factors.

Growth in mineral exploration activity is essential for the future development of the mineral sector and for the economic well being of Tasmania. Mining and mineral processing accounts for over 40 per cent of Tasmania's export capacity. 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.

To ensure the above, MRT's main activities are:

- the day-to-day administration of the *Mineral Resources Development Act 1995* (MRDA), including the environmental management of exploration;
- the provision of geoscientific information, in the form of digital data base and hard copy maps and reports, so as to attract investment from mineral and petroleum exploration companies to undertake exploration in Tasmania for mineral and petroleum resources;
- the provision of information for land management of groundwater resources, waste management and geohazards, especially land stability; and,

- collection of royalties, rents, fees and associated charges.

MRT Outputs

Under the funding structure operated by the Department of Treasury and Finance, Mineral Resources Tasmania was funded during 1997/98 to undertake five outputs:

- Metallic Mineral Resource Investigation and Promotion Program;
- Industrial Minerals and Hydrocarbon Investigation and Promotion Program;
- Land Management, Environment and Rehabilitation Program;
- Digital Geoscientific Data Capture, Maintenance and Output; and
- Tenement Management and Royalty Administration.

Achievements

Project TIGER

MRT is progressing with the creation of a flexible digital data system that will meet Tasmania's future requirements to store, maintain and distribute geoscientific data.

Phases 1, 2 and 3 of Project TIGER (Tasmanian Information on Geoscientific and Exploration Resources) are internal to MRT and aim to develop an integrated data management system for the organisation.

Phase 4 of Project TIGER will allow MRT, in co-operation with the Department of Primary Industries, Water and Environment, to fully integrate all MRT's land information with data from local government and other State Government agencies for electronic delivery via the Land Information System Tasmania (LIST). This will enable the government, through the development of the LIST central distribution system, to provide up-to-date digital data to mineral exploration companies, all tiers of government, the private sector and the community.

During the 1997/98 financial year Project TIGER Phase 3 moved from the planning phase towards output development. The following planning milestones were achieved:

- Completion of a Project TIGER and Project TIGER Phase 3 Business Plan;
- Development of a Strategic Information Systems Plan (SISP) for Project TIGER;
- Documentation of a Project Execution Plan for Project TIGER Phase 3.

The SISP reflects the integration of the TIGER data management system with the LIST. This integration is being supported by resource sharing between the two projects during development.

Phase 3 of Project TIGER has been subdivided into five modules which are based upon the needs and activities of business units within MRT, with work progressing on Modules 1 and 2. Module 1 is due to deliver a document index and spatial metadata system by January 1999. Module 2 is the redevelopment of the MRT Tenement Management System (REGIS) and is due for completion by the end of April 1999.

National Geoscience Mapping Accord (NGMA) – ‘TASGO’ Project

The objective of the NGMA ‘TASGO’ Project, which was conducted from 1994 to 1998, was to re-evaluate Tasmania’s mineral and petroleum potential by acquiring and interpreting new comprehensive and diverse geological and geophysical data sets, both onshore and offshore, in the Tasmanian region.

The results of a number of specific programs under the project were released as soon as possible after the data were available and preliminary interpretations had been undertaken.

A major workshop, *Tasmania from 2D to 4D*, was held in Hobart during May 1998 at which the results of a number of studies were presented. These included:

- Release of recent land seismic surveys and interpretations;
- Marine seismic data processed, released and publicly presented;
- Numerous papers on specific research topics, including:
 - Geological elements of Tasmania;
 - Northeast Tasmania geometry, broad structure and tectonics of seismics;
 - Structural controls on gold mineralisation in northeast Tasmania;
 - Northwest Tasmania geometry, broad structure and tectonics of seismics;
 - Structural transect across northern Tasmania;
 - Re-evaluation of the structural significance of the Boat Harbour Fault;
 - Apatite fission track thermochronology of Tasmania;
 - Tasmania’s mineral systems and mineral potential, with comments on a pilot Pb-isotope study in northeast Tasmania;
 - U–Pb zircon dating of Proterozoic and some early Palaeozoic rock units in Tasmania;

- Reconnaissance isotope chemostratigraphy of Neoproterozoic carbonate rocks in western Tasmania;
- Nd–Sm characteristics of mafic rock units in Tasmania and implications;
- Results from a detailed gravity-infill and physical property study of King Island;
- Geology of some remote islands between Tasmania and King Island.

- New U–Pb zircon dates published; and
- A new stratotectonic map and time-space plot of Tasmania.

It is expected that a volume of extended abstracts of the papers presented at the workshop will be produced during 1999.

The ‘TASGO’ project officially concluded on 30 June 1998. The tomographic interpretation of the crustal structure of Tasmania, which is being undertaken in conjunction with the Australian Geodynamics Cooperative Research Centre, will not be completed until 2001. Following completion, a workshop will be conducted at which tomographic data and models will be presented, together with any new interpretations of other data collected during the project.

As a follow on to ‘TASGO’, an agreement has been reached with the Australian Geological Survey Organisation for a new, one year NGMA Project, codenamed ‘TASMAP 99’ (Tasmanian Mapping Accord Program 1999). This project will consist of two parts, the first part being to undertake the acquisition of further U–Pb zircon dates (1999–2000). These data will be used to:

- compare quartz-rich sedimentary sequences from eastern and western Tasmania; and
- using zircons derived from granitic samples to test the interpretation, obtained from the seismic data, that the nature of the lower crust under western Tasmania is different to that under eastern Tasmania.

The second part of ‘TASMAP 99’ is to acquire approximately 25 000 km of airborne geophysical data over shallow cover in the north-central part of Tasmania. The acquisition of these data is expected to occur during April–May 1999.

Regional Minerals Program (RMP)

The Regional Minerals Program is a co-operative program between the Commonwealth Government, the State Government and the mining industry.

The aims of the RMP are to:

- propose a regional development plan to identify the infrastructure needed to support an expanded industrial base in Tasmania, together with associated downstream processing opportunities;

- make existing mining and mineral processing operations more cost effective by recommending solutions to common problems, such as infrastructure and energy limitations;
- lower the development cost of new projects; and
- determine the remote sensing and ground data needed to facilitate exploration for minerals, oil and gas.

The project was initiated during 1997/98 with a scoping study and tenders are currently being invited for the consultation phase of the project. The project will be overseen by a Steering Committee comprising representatives from industry, the Commonwealth and Tasmanian governments.

Major Issues and Initiatives Managed and/or Monitored during 1997/98

Restructuring of Outputs

The MRT outputs were restructured to recognise digital geoscientific data capture, maintenance and output. The new output – Digital Geoscientific Data Capture, Maintenance and Output – involves the production of digital data from the metallic mineral, industrial mineral and hydrocarbon investigation activities.

This digital data are used by the mining industry to assess the mineral potential both inside and outside Tasmania’s Strategic Prospectivity Zones. It is also used by other stakeholders for land management purposes and by other levels of government to assist in the assessment of geohazards.

There has also been a refocusing of resources to the Land Management, Environment and Rehabilitation Output because of an increase in activity in this area, particularly in relation to land rehabilitation activities. This output will have increased resources in 1998/99 with the employment of an environment officer who will undertake mine and quarry inspections.

The continued development of the integrated graphical and geographic databases of mineral and petroleum resources will assist in the continued economic development and environmental management of Tasmania’s resources.

Rehabilitation of Abandoned Mining Lands Program

This Administered Payment represents the Tasmanian Government’s contribution towards rehabilitation of abandoned mining land. The level of funding was originally to be set by reference to the amount of revenue arising from the implementation of a specific component of the new royalty regime. The amount allocated for 1997/98 was \$265,000.

The major program for the year was carried out at abandoned alluvial tin mines in northeast Tasmania and included:

- Erosion control works at the Monarch and Endurance mines;
- Dam repairs at Star Hill and Endurance (at the Blue Lake);
- Regrading and revegetation at Star Hill; and
- Water quality improvement trial at the Monarch mine.

At Rossarden seeding and fertilising was carried forward to complete the previous year’s program. A collapsing treatment plant structure at Waratah was removed and the area cleaned up. Studies into acid drainage and metal contamination in water were carried out at the University of Tasmania to enable planning of remedial work in the Zeehan area.

Capital Investment Program

An issue of urgency is the need to expand MRT’s core library facility.

The amount of company-produced exploration drill core that MRT is required, under legislation, to store exceeds the capacity of the present facility and drill core is currently being accommodated in an overflow store, which is now full.

This situation will be critically exacerbated in the near future with the potential for MRT to receive a flood of core requiring archiving. This will result from the cessation of underground mining at the Hellyer mine in 2000, uncertainty over the future of the Mt Lyell mine, and with the mining operation at Rosebery under review. Given the volatility of the mining industry, there may be further major unanticipated storage requirements at short notice.

Unless a new facility is provided, there is a high risk that valuable information, in the form of drill core (replacement cost of \$100 per metre), will be lost. The drill core represents one of the main databases for attracting mineral exploration investment into Tasmania.

Departmental Fees and Charges

	Target 1997/98 (\$,000)	Actual 1997/98 (\$,000)	Target 1998/99 (\$,000)
Rents & Fees	771	781	770
Royalties	7,750	8,200	10,000
Sales of Maps and Publications	3	26	25

CODES-SRC

Funding of \$68,000 for post-graduate scholarships was provided to the Centre for Ore Deposit Research (CODE- SRC) at the University of Tasmania.

Management of Mineral Resources Tasmania (as at 30 June 1998)

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1997/98 Performance Indicators

Growth in mineral exploration activity is essential for future development of the mineral sector and for the economic well being of Tasmania. Mining and mineral processing accounts for over 40 per cent of Tasmania's export capacity. Based on industry estimates, approximately \$22 million was paid to the Tasmanian and local governments in charges, fees and taxes during 1997/98, including \$8.2 million in royalties.

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

Achievement against internal targets

<i>Measure</i>	<i>Target 1997/98</i>	<i>Actual 1997/98</i>	<i>Target 1998/99</i>
Digital geoscientific coverage of Tasmania			
1:250 000 scale maps and associated databases – five maps needed to cover the State	Revision of data for existing five maps	Completed data upgrade and new output for the five maps	(Note 1)
Number of 1:25 000 scale maps (418 maps needed to cover State)	10 (total = 43)	15 (Note 2) (total = 48)	12
Digital geoscientific coverage of Tasmania's geohazards	2 maps completed	1 map completed (Note 3)	3
Collection of primary digital geoscientific data (km ²) (Note 4)	200	200	200

Notes:

- 1 In future this series will automatically be upgraded as new 1:25 000 scale series maps are produced. During 1998/99 the revised 1:250 000 scale data will be generalised and used to produce a 1:500 000 scale geological map of Tasmania.
- 2 The extra number of maps produced during 1997/98 resulted from the data for five maps being captured externally, using reallocated internal funds. This enabled MRT to catch up with decreases in the past two years as a result of resources being allocated to the Regional Forest Agreement process.
- 3 Primary digital geoscientific data relates to the collection and compilation of data about Tasmania's geology and mineral potential. These data are then used for mineral exploration, land management and planning.
- 4 Only one map was produced due to the field officer being involved in a serious accident in December 1996. This resulted in no field work being undertaken between January and June 1997.

Achievement against external targets

<i>Area</i>	<i>Goal</i>	<i>1996/97</i>	<i>1997/98</i>	<i>% Increase</i>
Percentage of total Australian Exploration Expenditure	To increase and hold percentage above 2% (Note 1)	2.26%	1.94%	-14.3%
Exploration Expenditure (financial year)	To increase to a minimum of \$30 million per year	\$26.0 million	\$20.7 million	-20.4%
Exploration Expenditure (calendar year)	To increase to a minimum of \$30 million per year	\$26.0 million (1996)	\$29.6 million (1997)	+13.8%
Area held under Exploration Licence	To obtain an increase	10 019 km ²	9518 km ² (Note 2)	-5.0%
Number of Exploration Licences granted	To obtain an increase	153	132 (Note 3)	-13.9%
Exploration drilling metres completed	To obtain an increase	72 633	86 420	+19.0%
Percentage of Strategic Prospectivity Zones (SPZ) area held under EL's	To obtain an increase	35.1%	30.8% (Note 4)	-12.3%

Notes

- 1 The 2% is based on twice the percentage of the area of Tasmania in respect to the whole of Australia.
- 2 These figures are for metallic and non-metallic minerals only. A further 11 938 km² was held for onshore oil exploration in 1997/98 (11 897 km² in 1996/97). The decrease in area is due to a number of companies having dropped large reconnaissance exploration areas and concentrating on small target areas.
- 3 The decrease in number of applications is due both to the same reason as in Note 2 and an Australia-wide downturn in greenfield exploration. There is also a tendency for exploration to occur over existing mining leases.
- 4 The decrease in percentage is due to the reasons given in Notes 2 and 3.

Financial Performance

In accordance with the *Financial Management and Audit Act 1990* the Department is required to report on the year's financial transactions against the original appropriation. Detailed records were published in the Tasmania Development and Resources (TDR) annual report to Parliament.

In 1997/98, the Mineral Resources Outputs were allocated \$5.107 million. Overall the allocation represented a small increase over the 1996/97 appropriation to cover for CPI indexation of salaries and to pay for the rental of additional temporary storage of core samples.

Revenues from Rents and Fees from Mineral Lands raised \$0.78 million which was comparable to previous years and the budget of \$0.77 million. The increase is largely as a result of a full year of production from the Savage River mine and the impact of the further incremental increase in royalty rates.

Revenues from mineral royalties raised a total of \$8.2 million which exceeded the budget of \$7.75 million.

Outputs – Application of Funds, 1997/98

	\$'000
Metallic Mineral Resource Investigation and Promotion Program	989
Industrial Mineral and Hydrocarbon Investigation and Promotion Program	852
Land Management, Environment and Rehabilitation Program	1,203
Tenement Management and Royalty Administration	971
Digital Geoscientific Data Capture, Maintenance and Output	759
Administered Payments	333
Total	5,107

During 1998, departmental restructures were undertaken following the election of a Labour Government in Tasmania. As a result of this restructure MRT is no longer a division of TDR (now the Department of State Development) and has been attached as a division to the Department of Infrastructure, Energy and Resources.

Mineral Resources Tasmania

— Review of 1997/98

Mineral Resources Tasmania consists of six branches: Metallic Minerals and Geochemical Services; Industrial Minerals, Environment and Tenement Management; Geographical Information Systems & Geophysics; Engineering Geology and Groundwater; 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 most, if not all, branches.

Metallic Minerals and Geochemistry

This section is responsible for administering the allocation of metallic mineral tenements, monitoring the performance of mineral exploration in Tasmania, acquiring primary geological data, providing petrological, mineralogical and geochemical analyses for government, preparing geoscientific data for digital capture and maintaining a number of databases.

The 1997/98 financial year saw further changes in the major metalliferous mining industry of Tasmania, with some operations experiencing difficulty because of declines in the prices of most metals.

Australian Bulk Minerals formally recommenced operations at Savage River and Port Latta on 8 December 1997. Western Metals Limited announced a takeover bid for Aberfoyle Limited, the operator of the Hellyer mine, while the Renison tin mine was sold to Murchison United NL.

During 1997/98 the Metallic Minerals Section was involved in a wide range of activities including the following.

Regional Forest Agreement

The Section provided further technical input during the period leading to the signing of the RFA on 8 November 1997.

Geoscientific data generation

Primary geological data acquisition for the Cethana 1:25 000 scale map sheet, in the Mount Read Strategic Prospectivity Zone (SPZ), was completed and the Wilmot 1:25 000 sheet was compiled for publication. The 1:25 000 scale Dempster sheet, in the Balfour SPZ, was mapped and compilation was advanced at year's end. Mapping of the Picton sheet, in southeast Tasmania, was almost completed.

Seven geological map sheets (Gladstone, Owen, Gormanston, Darwin, Heemskirk, Holder and Folly) were prepared for digital capture.

Reports on sub-projects of the National Geoscience Mapping Accord TASGO Project were prepared and papers on other projects were presented at a TASGO workshop held in Hobart in April:

- reports were completed on the Boat Harbour Fault, a major structure in northwest Tasmania, and on the geology of some islands in western Bass Strait;
- papers were presented by members of the Section on the geology of some islands in western Bass Strait, the lead isotope composition of mineral deposits in northeast Tasmania, and on the Boat Harbour Fault. Section members also contributed to studies of the age of the Mount Read Volcanics and other rock units, and on the interpretation of the seismic survey of offshore Tasmania.

A draft report on the study of the nature of gold mineralisation in the Cygnet area was completed and a report on the Weld River area was well advanced.

The petrologist completed reports on the potential for resources of zeolites and corundum in Tasmania.

A regional study of the structural controls on gold mineralisation in northeast Tasmania was completed to draft report stage. A paper on this work, which represents a major advance in the understanding of the structural controls on gold mineralisation in the region, was presented at the TASGO Workshop. However this project was initiated by MRT and is not part of the TASGO Project.

Promotion of Tasmania's exploration potential and minerals

MRT's exploration promotional booklet was updated and was used in successful visits to mining and investment companies in Perth, Melbourne, Sydney and Brisbane.

An article on the prospectivity and investment climate of Tasmania was written for the Australian Journal of Mining and published during the year.

An illustrated information book and poster was prepared for the official State Mineral Emblem, crocoite. Work on the updating of the Catalogue of Minerals of Tasmania is now substantially complete.

The petrologist led a field trip around Tasmania for a German geological/mineralogical society (Vereinigung der Freunde der Mineralogie und Geologie (VFMG) e.V.).

Core library

The Section prepared a detailed submission for funding of extensions to the core library using the Department of Treasury and Finance Project Initiation Process methodology. Supplementary storage space was hired for overflow from the existing store, but by

year's end had nearly been filled with the remaining space committed for core expected in the near future.

Splitting storage between two localities results in operational inefficiency, potential security problems and a diminution in the level of service provision. Because further major demands are anticipated on the core library in the near future, particularly with the impending closure of the Hellyer mine, a decision on a new or extended facility in the coming year is imperative.

Petrological laboratory

The lapidary and petrology laboratories provided a total of \$44,251 worth of analyses and services to both government (\$21,860) and external clients (\$22,391). Most of the external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 421 standard thin sections, 101 polished thin sections and 24 fluid inclusion chips types, making a total throughput of 546 samples.

The technical officer processed 542 samples by X-ray diffraction (XRD), including 94 quantitative dust analyses. He also conducted 62 soil and sizing tests and 149 optical asbestos identifications, a total of 682 samples processed, valued at \$37,661.

A total of 577 external samples were received for investigation, mostly by XRD. These samples include 174 for the Centre for Ore Deposits Research at the University of Tasmania (CODES SRC), 262 for occupational health clients, 13 construction materials and 128 samples for other paying customers. This external work came from a wide range of sources, including the University of Tasmania, Department of Transport, Hydro-Electric Corporation, Department of Public Prosecution, and various other government departments, various mining, mineral processing and mineral exploration companies, and the general public. Forensic studies required some court appearances.

The laboratory participated in an international 'round-robin' XRD test program for quantitative analysis.

Construction material studies, as a part of the Tasmanian Alkali-aggregate Reactivity Research Project (TAARRP), continued in conjunction with the HEC, Department of Transport, the Concrete Institute and various companies. Some of the work has been produced as consultant reports and individual sponsors cover most of the costs. The project is investigating concrete and aggregate used in major structures (bridges, dams, etc.) in Tasmania, in regard to the form of deterioration known as alkali-aggregate reactivity.

Curatorial work has included the updating of rock collection and storage databases, preparation of displays and posters, and supervision of the rock store. A temporary employee was engaged to produce

an inventory of the rock collections, and a computer database generated for later integration with TIGER and TASROCK.

Geochemical laboratory

Following downsizing in 1996/97, the laboratory is staffed by a senior chemist and a technical officer. A geologist/geochemist provides part time assistance to a maximum of 50% and a second technical officer is used some 30% of the time.

The laboratory supplies the analyses necessary to maintain the databases of MRT. A total of 665 samples that required 12,171 individual determinations were submitted for analysis during the year. The distribution amongst general sample types was 175 water, 298 rock and 192 minerals and products.

For the year a total of 23,379 separate chemical determinations were recorded. This represents an increase of nearly 10,000 determinations from the previous year.

A number of improvements were made to the laboratory during the year. These included:

- a recycling cooling system, saving the wasting of a very large volume of water and eliminating the possibility of a potentially dangerous flood of the ground floor, was installed in June 1998.
- to maintain smoother running of the X-ray fluorescence spectrophotometer (XRF) an updated power conditioner replaced the existing power conditioner which had fused.
- following advice that the XRF was nearing the end of its useful life and spare parts would be unavailable, a decision to upgrade the equipment was made in June 1998.
- Philips will install the XRS upgrade in July 1998.
- relocation of the XRF pellet press to Mornington has enabled easier and more efficient production of pellets. Better ventilation and dust extraction ensure compliance with occupational health and safety considerations.
- the platinum crucibles, used for the fusion of rock samples to determine the major elements by XRS, were remoulded. This has resulted in more efficient production of the glass discs used in rock analyses.
- reconditioning of the fluxer enabled development of a modified method that allowed a substantial backlog in fluorine analyses to be cleared.

On-going activities

A start was made in preparing a comprehensive occupational health and safety policy for field and laboratory work.

Mineral exploration report and exploration performance assessments were carried out as needed, as was preparation of promotional leaflets for Exploration Tender Areas.

Numerous meetings were held with industry and requests for information were answered promptly. Presentations were given to the Tasmanian Minerals Council Exploration Group meetings.

Engineering Geology and Groundwater

Three geologists, including a chief geologist and a senior geologist, staff this section. A consultant geologist was employed from March 1998 to examine sand resources in the Hobart region, while a project officer was appointed in June 1998 to undertake a study of hydrogeological aspects of areas subject to soil salinity. A project geologist from another section is undertaking 1:25 000 scale geological mapping of the Hobart area. This work will have particular application for the proposal to undertake landslide zone mapping in the Hobart region.

The main activities of the section were land-risk mapping in northwest Tasmania and a groundwater study of the Sorell area in southeast Tasmania. Groundwater information was collected from contract water bores from several areas and the compilation of information on groundwater in coastal sands continued. A study of sand resources in the Hobart region commenced during the year, as did a Natural Heritage Trust-funded soil salinity project. A large number of enquiries from the public, other agencies, local government and consulting firms were dealt with. These enquiries included land stability, foundation conditions, groundwater prospects and groundwater protection.

Groundwater

A major part of the groundwater activity during the year was the compilation of groundwater information for the Sorell map quadrangle, one of the drier regions of the State. This compilation mainly used information derived from contract bores, although a few investigative bores were drilled by MRT some years ago.

The majority of bores have been drilled in the Sorell and Dodges Ferry areas, and there is relatively sparse information throughout much of the remainder of the quadrangle. Dodges Ferry does not have a reticulated water supply and consequently numerous bores have been installed. Water quality in the Triassic rocks at Dodges Ferry is very variable but the water is commonly used for garden watering on the sandy soils that occur in the area.

Bores in the Pawleena Road area near Sorell have mainly been drilled in Tertiary basalt and are consistently high yielding, with outputs normally in the range of 2–12 litres per second. Again, quality is a little variable and uses are somewhat restricted because of the salt content, although the water is extensively used for garden watering and irrigation.

Some work has been undertaken on the compilation of groundwater information in the Oatlands quadrangle, and more information on groundwater in coastal sands around Tasmania was collected.

Monitoring of a series of bores around Tasmania continued, with data loggers being used to monitor water levels on a continuous basis. Water samples for chemical analysis are extracted from each of the bores twice a year. Monitoring of bores in the irrigation area between East Devonport–Port Sorell and Sassafras continued. In general, winter rains appear to largely recharge the dominantly Tertiary basalt aquifers in this area.

Groundwater protection issues continued to make up a significant part of the work of the section, mainly involving the assessment of consultant's reports dealing with the establishment of refuse disposal areas. Groundwater data have been supplied to a number of consultants investigating possible groundwater contamination at a number of sites around Tasmania.

Data have been collected from a number of regions in northern Tasmania for compilation of 1:250 000 scale groundwater maps. Of particular note is the Westbury–Whitemore region, where a basalt aquifer at Whitemore supplies irrigation quantities of water (up to 15–20 litres per second) for use on dairying and cropping properties. A summary of groundwater use and potential in the Meander catchment was prepared for the Department of Primary Industries, Water and Environment (DPIWE) as part of their study of water resources in that region.

Advice on groundwater prospects for particular areas continues to be given to property owners and drillers.

The groundwater database, BORIS, has been modified from time to time to provide more appropriate outputs. The database manager has attended workshops to aid in the development of uniform databases on an Australia-wide basis.

The Commonwealth (under the Rural Adjustment Scheme) has funded a joint project with DPIWE to investigate groundwater resources in the northern Midlands–Fingal Valley region, an area frequently subject to drought conditions. Work on the groundwater part of the project will begin in 1998/99.

Engineering geology

The major project undertaken in engineering geology was the continuing preparation of regional landslide risk information for northwest Tasmania. A 1:25 000 scale map covering the Burnie and Stowport areas was completed. This was the third map of a series of six in the project. Some work was undertaken on the next sheets to the west (Wynyard and Calder). The published maps show areas of recently active landslide movements, areas of old landslides and steep areas where care needs to be exercised if

development is proposed. The maps are of particular interest to planners, for the development of planning schemes, and to property owners and developers.

Monitoring of groundwater levels in bores on and around the landslide at Rosetta continues. Technical advice is regularly given to the Glenorchy City Council on aspects associated with the landslide, although the area appears to have largely stabilised over the last year or so.

A consultant surveyor monitors movements on a number of landslides in northern Tasmania twice a year. These landslides threaten property, access roads and railway lines. Movement continues to be indicated on a number of slides, including Pleasant Hills, Legana and Beauty Point.

Advice on land stability is sought by local government, developers, property owners and potential purchasers of property.

Soil salinity project

A project to examine the hydrogeological setting of areas subject to soil salinity is being funded by the Natural Heritage Trust. This 18 month project will be undertaken in close liaison with DPIWE, which has had a funded project for some years to identify areas with soil salinity problems. A project officer was appointed in June 1998 with a planned project completion date of December 1999. The project will involve detailed geological mapping of selected areas, drilling to install piezometers, determination of groundwater flow directions, monitoring of water levels in bores and a study of water chemistry.

Sand resources study of the Hobart area

A \$50,000 study of sand resources in the Hobart area is being supervised within the section. As resources on current leases become depleted, other areas will need to be developed for the extraction of sand/gravel for use in the building and construction industry, particularly in concrete manufacture. Existing large resources of sand are mainly in areas where subdivision for housing has taken place or are within reserves or zones where sand extraction is not a permitted use. This includes Seven Mile Beach, the largest known sand resource in the region, which is zoned a recreation area.

The study will involve surface examination of areas with potential to supply sand as well as the present lease areas. Where possible, drilling and test pitting will be undertaken and broad assessments of resource will be made. The project began in March 1998 with the appointment of a consultant to undertake the study, and is expected to be completed by the end of November 1998. The study is expected to indicate if other areas around Hobart can supply significant quantities of sand and gravel and give some idea of the resources left on current leases.

General

As in previous years, there were a large number of phone enquiries regarding groundwater and engineering geology. These usually relate to groundwater prospectivity and landslide risk but a wide range of advice is sought. Mineral water occurrences are a fairly common subject.

Application was made to the Natural Heritage Trust for funding to examine the effects of waste disposal and particular land uses on groundwater quality. It is proposed to prepare guidelines for geologically-related criteria in the selection of sites for waste disposal.

Advice was given to an Honours student from the University of Tasmania on a project involving land stability at Windermere in the East Tamar area.

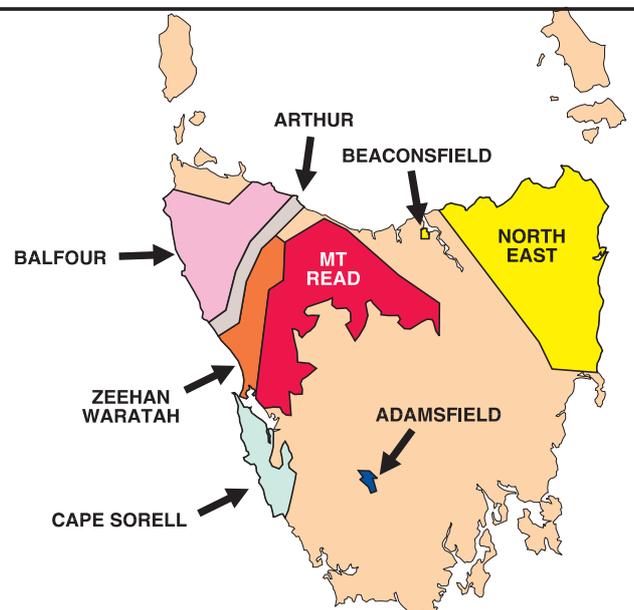
Meetings of committees regarding groundwater water quality and soil conservation were attended throughout the year.

Hydrocarbons and Tenement Management

Strategic Prospectivity Zones

Strategic Prospectivity Zones (SPZ) cover 25 200 km² or 37% of Tasmania. The areas in each SPZ occupied by mining tenements at the end of June 1998 are shown below.

SPZ	Metallic		Non-Metallic	
	Area (km ²)	Occupied (%)	Area (km ²)	Occupied (%)
Adamsfield	0.0	0.0	0.0	0.0
Arthur	937.6	84.7	1.6	0.1
Balfour	2073.4	53.0	3.4	0.1
Beaconsfield	19.0	99.7	4.0	21.0
Cape Sorell	709.2	51.3	0.0	0.0
Mount Read	1463.3	20.4	0.0	0.0
North East	2024.9	20.9	265.0	2.7
Zeehan/Waratah	479.0	26.1	0.0	0.0



Oil and gas exploration

In April 1998 an appraisal well (Yolla 2) was drilled in permit T/RL-1 in the Bass Basin. Drilling confirmed volumes of between 450 and 600 billion cubic feet of liquids-rich gas in the Yolla field. A second appraisal well is planned to confirm the economic viability of the field. The retention licence (T/RL-1) over the Yolla gasfield is held by a consortium headed by Boral Energy Resources Limited. Efforts are continuing to find a market for the gas in either Tasmania or Victoria.

The White Ibis 1 well was drilled in May in permit T/18P on a prospect 40 km west of the Yolla field. This well made a gas discovery that is sub-commercial on a stand-alone basis, but which may be tapped as part of a development of the Yolla field.

Two offshore areas in the Sorell Basin, off the west coast of Tasmania, were gazetted for release in May 1998.

Exploratory drilling by Great South Land Minerals Ltd continued onshore in southern Tasmania.

Industrial minerals

The quarrying of limestone and dolomite for cement and agricultural purposes forms a large part of the non-metallic minerals industry in Tasmania. The development of the new open pit and primary crusher by the Goliath Portland Cement Company Ltd at Railton has resulted in increased production this financial year.

In the past year two magnesite deposits south of Burnie have been the subject of resource delineation drilling and pre-feasibility planning.

The Arthur River-Lyons River deposits are held by Crest Resources Australia NL. In recent drilling an indicated resource of 29 million tonnes of 42.8% magnesium oxide was proven. At a planned production rate of 90 000 tonnes per annum of magnesium this resource would support a plant for in excess of 100 years. Inferred resources in this area are in excess of 180 million tonnes of +40% magnesium oxide. BHP Engineering started preparing a pre-feasibility study towards the end of the financial year.

Golden Triangle Resources NL have tenements over the Main Creek deposits to the south of the Savage River mine. Recent drilling has established an inferred resource of 47.4 million tonnes at 43.36% magnesium oxide. The company is currently undertaking pre-feasibility scoping studies and envisages an underground mine with a minimum of surface disturbance.

Silica is quarried in the Beaconsfield area for use by TEMCO in the production of silico-manganese. Silica flour is mined by H. Nolan from deposits near Corinna and is processed by Index Minerals Pty Ltd at Heybridge. The silica flour is used in the production of high quality lenses and in the electronics industry.

Coal

During the year some re-arrangement of coal supplies for major industries occurred, with the Cornwall Coal Company NL once again assuming a dominant position in the market. As well as producing coal from their own leases, Cornwall also processed raw coal produced at Stanhope by the Merrywood Coal Company Pty Ltd.

Expressions of interest were received to develop coal resources at Langloh, near Hamilton in the State's southeast. Progress on granting a lease was delayed by legal action.

Beach sands

Australian Titanium Minerals' proposal to develop a mine at Naracoopa on King Island has been slow to proceed because of outstanding landowner agreements and permit approvals. These are now resolved and development is awaiting financial approval.

Mining dams

With the repeal of the *Mines Inspection Act 1968* dam approval has reverted to the Rivers and Water Supply Commission. It is anticipated that new dam safety legislation will be drafted. The Henty 'B' residue dam and dams at Tasmania Mines were commissioned during the year.

Environmental management

The environmental monitoring of exploration programs continued with diligence and attention to detail. Regular field visits were made to ensure exploration work was being conducted in an environmentally responsible manner and that rehabilitation of past sites was successful.

The fourth edition of the *Mineral Exploration Code of Practice* was nearing completion at the end of the financial year in preparation for gazetting as a code under the *Mineral Resources Development Act 1995*. The Code will then have legislative backing in common with similar Codes. The fourth edition will comply with the *Mineral Resources Development Act 1995* and the Regional Forest Agreement. In particular new sections will address issues such as biodiversity, geoconservation and the protection of wilderness values.

RiverWorks Remediation Program

An investigation to design a remediation strategy for the Storys Creek and Rossarden abandoned mine sites, in an attempt to reduce acid and heavy metal discharge into the South Esk River system, is being carried out by John Miedecke and Partners Pty Ltd. This investigation will be followed by demonstration trials in 1998/99 in preparation for rehabilitation work. The budget of \$112,000 includes a contribution from the Commonwealth Government RiverWorks program. The Division of Environment and Planning

are providing laboratory analyses and MRT is providing project management as State contributions. It is anticipated that the remediation program will be jointly funded by the Trust and RiverWorks.

Town planning

MRT has continued its activity with planning issues in respect to quarrying and extractive industries. Land use conflicts caused by residential encroachment close to existing operations continue to be a cause of concern. The Division of Environment and Planning has been developing a Model Planning Scheme framework that should result in uniform and sustainable planning decisions being made and greater certainty being provided for the community and industry.

The Howrah Hills Local Area Plan in the City of Clarence was the subject of hearings and court action, which were still in progress in June. MRT has made submissions concerning residential encroachment in the vicinity of the Mornington quarry. Market forces caused the operator, CSR Readymix, to close this operation and carry out some rehabilitation on worked-out benches. The planning situation still requires resolution, as additional long-term rehabilitation of the site, continued operation of the quarry, or an alternative industrial use are still to be approved.

MRT appealed against a decision of the Meander Valley Council to permit a subdivision immediately adjacent to Cresswell's quarry at Deloraine. The applicant withdrew the application and the appeal did not proceed.

Sand extraction in conjunction with development of a horse training facility near Seven Mile Beach did not proceed to fruition. Sand extraction was an allowable land use on this site although the primary land use for the area is recreation.

Mining heritage

MRT chairs the Mining Heritage Committee (MHC) with members from the mining industry, the Queen Victoria Museum and Art Gallery, Department of Primary Industries, Water and Environment, and Forestry Tasmania. The MHC advises MRT on mining heritage policy and on specific issues affecting Tasmania's rich mining heritage.

An archaeological research project was commissioned during 1998 into the goldfields of northeast Tasmania. The aim of this work was to produce an inventory of the remaining mining heritage sites to allow an objective assessment of their heritage values. This work will be used to allow informed decisions to be made on the heritage values during the planning and approval of exploration and mining works.

During the past year MRT has commissioned archaeological reports on:

- the Cuni nickel-copper field north of Zeehan;
- coal bins at the Fenhope Colliery;
- a preliminary investigation of the Queen Hill area at Zeehan; and
- the calciner shed at Waratah.

Registry Section

The Registry Section maintains a number of registers and databases, and provides advice to officers within MRT, inquirers from other agencies, the mining industry and the legal profession on a wide range of matters associated with mining tenements and legislation.

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

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

Thirty-five Exploration Tender Areas were offered to potential explorers by way of the *TasXplorer* news sheet, which is circulated widely within the Australian mining community.

Mining legislation

The *Mineral Resources Development Act 1995* (MRDA) came into force on 1 July 1997. The aims of the MRDA are:

- to create and maintain an internationally competitive and secure investment climate for exploration;
- to help ensure a sustainable mining industry for Tasmania's future;
- to provide best current practice Mineral Tenement Legislation; and
- to best fulfil the needs of industry and the community.

After two years of operation with the new Act industry feedback has been positive and supportive of the legislation. An internal agency working committee has carried out a review of the MRDA and has proposed a small number of amendments to the Act and Regulations. The proposed changes have been approved in principle by Cabinet.

A review of the MRDA under the Legislation Review Program has commenced. The review arises out of an agreement between State and Federal governments and requires assessment of the MRDA in relation to National Competition Policy and imposes on business.

All forms under the MRDA are available in digital form and are provided at no charge to clients of the section.

Court of Mines

Under the MRDA a Mining Tribunal, consisting of a magistrate, has coverage of the whole State. The Act places an obligation on the Director of Mines to attempt to resolve disputes before there is a formal hearing before the Tribunal.

Experience to date suggests that the dispute resolving process built into the MRDA adequately covers most matters that would otherwise need to be referred for formal determination.

Tribunal matters dealt with by MRT or referred to the Mining Tribunal during the year were:

P, K & B Smith v Minister for Mines

P., K. and B. Smith appealed against the Minister's decision to refuse renewal of mining lease 47M/73 at Linda. When the matter was reconvened on 12 May the appellant indicated that he did not wish to proceed with the matter.

Australian Titanium Minerals Ltd v Various landowners, Naracoopa, King Island

Australian Titanium Minerals Ltd (ATM) sought a determination from the Mining Tribunal in regard to a fair and equitable compensation payment for owners of private land where ATM proposes to mine.

A panel was set up consisting of the Director of Mines and representatives from the Tasmanian Farmers & Graziers Association and the Tasmanian Minerals Council. Two meetings were convened by MRT and submissions were heard by counsel for both parties. The Mining Tribunal ratified agreements in regard to a significant portion of the land.

Orders applying similar compensation levels to the remaining land were issued by the Mining Tribunal.

V Threader v G Faulkner and P Moore

V. Threader sought a determination from the Mining Tribunal in regard to the failure of Messrs Faulkner and Moore to comply with a royalty agreement that had been entered into. The claim was withdrawn when the mining lease lapsed.

G & S Wilson and another v Pacific-Nevada Mining Pty Ltd

Objections were lodged in regard to an application for an exploration licence in the Cygnet area. The objectors owned land within the application area. A meeting was convened by the Registrar of Mines at Cygnet for the objectors and other interested parties to discuss proposed work programs with the applicant and representatives of MRT. Following the meeting the objections were withdrawn.

R Fowler v Pacific-Nevada Mining Pty Ltd

Mr Fowler, the manager of a large agricultural property at Rocky Cape, objected to an exploration

licence application over the property. The property was visited by the Registrar of Mines and a representative of the exploration company. Following discussions the objection was withdrawn.

Mineral Holdings Australia Pty Ltd v B A Farquhar

Mineral Holdings Australia Pty Ltd, the holder of two retention licences, sought a determination from the Mining Tribunal in relation to the validity of a caveat lodged against the licences by Mr Farquhar who claimed a long-standing interest. The matter was settled prior to a formal hearing.

C & S Strong and J Morrison v Anglo Australian Resources Ltd

Landowners within an exploration licence application area at Lilydale lodged objections to the application. A meeting with each of the objectors was arranged by the Registrar of Mines who attended with a representative of the applicant. Certain agreements were reached at each meeting. Formal withdrawal of the objections has not occurred.

P Sims v Pacific-Nevada Mining Pty Ltd

P. Sims, representing conservation interests, lodged an objection against an exploration licence at Balfour. A meeting, which included a representative of the exploration company, was convened by the Registrar of Mines. Following discussion the objection was withdrawn.

Lease and Licence Applications

Licences applied for during 1997/98

Product	Number	Area (ha)
All minerals	2	938
All minerals and stone	1	41
Coal	2	447
Dolerite	1	40
Dolomite	1	131
Easements	3	13
Gold	4	659
Gravel	17	743
Sand	3	45
Silica sand	1	20
Stone	16	357
Stone and gravel	1	2
Total	52	3436

Licences granted during 1997/98

Product	Number	Area (ha)
All minerals	4	1747
Coal	1	5489
Easements	2	13
Gold	2	77
Gravel	12	263
Sand	1	2
Silica sand	1	20
Stone	13	168
Stone and gravel	2	6
Total	38	7785

Total number of leases and licences in force at 30 June 1998

Principal product	Number	Area (ha)	Sluiceways
All minerals	36	21 920	
All minerals and stone	3	171	
Clay	7	107	
Coal	8	6 463	
Copper	2	8	
Dolerite	2	42	
Dolomite	5	272	
Easements	26	382	29
Gold	21	1 458	
Gold, stone	1	418	
Granite	4	50	
Gravel	158	3 694	
Gravel and clay	1	29	
Iron	1	4 067	
Kaolin	2	373	
Lime sand	3	207	
Limestone	11	1 266	
Peat	4	858	
Quartzite	1	191	
Sand	56	2 002	
Sand and gravel	25	2 975	
Sand and stone	8	160	
Sandstone	5	50	
Shale	4	39	
Silica	6	454	
Silica, sand and stone	1	50	
Silica sand	2	31	
Silver and lead	1	8	
Slate	4	185	
Specimens	2	8	
Stone	255	6 184	
Stone and gravel	10	445	
Tin	15	1 124	
Water	1	16	5
Total	691	55 707	34

Total number of all types of prospecting rights held as at 30 June 1998

Mining Tenement	Number	Area
Exploration Licences –		
All minerals	118	9 436 km ²
Non metallic	10	82 km ²
Oil (onshore)	4	11 938 km ²
Retention Licences –		
All minerals	15	56 km ²
Non metallic minerals	18	293 km ²
Prospectors Licences Issued	63	Not applicable
Permits to explore for Petroleum under <i>Petroleum (Submerged Lands) Act 1967</i>	5	376 Blocks
Retention Licence under <i>Petroleum (Submerged Lands) Act 1967</i>	1	9 Blocks

GIS and Geophysics

Staff

The staffing of the GIS and Geophysics section stabilised during the year. There are now three permanent staff in the GIS group who form part of the team for Project TIGER and also undertake the capture of exploration data. The Computer Systems Officer Level 1 resigned early in 1998 and interviews were held in June for the selection of a replacement. It is expected that the new officer will commence duties in July 1998.

The main projects of the GIS and Geophysics section were:

- data capture from exploration reports;
- development of the Project TIGER (Tasmanian Information on Geoscience and Exploration Resources) business plan;
- implementation of Project TIGER Phase 3;
- IT support for Mineral Resources Tasmania and the Workplace Standards Authority;
- precise levelling and indexing of aeromagnetic datasets.

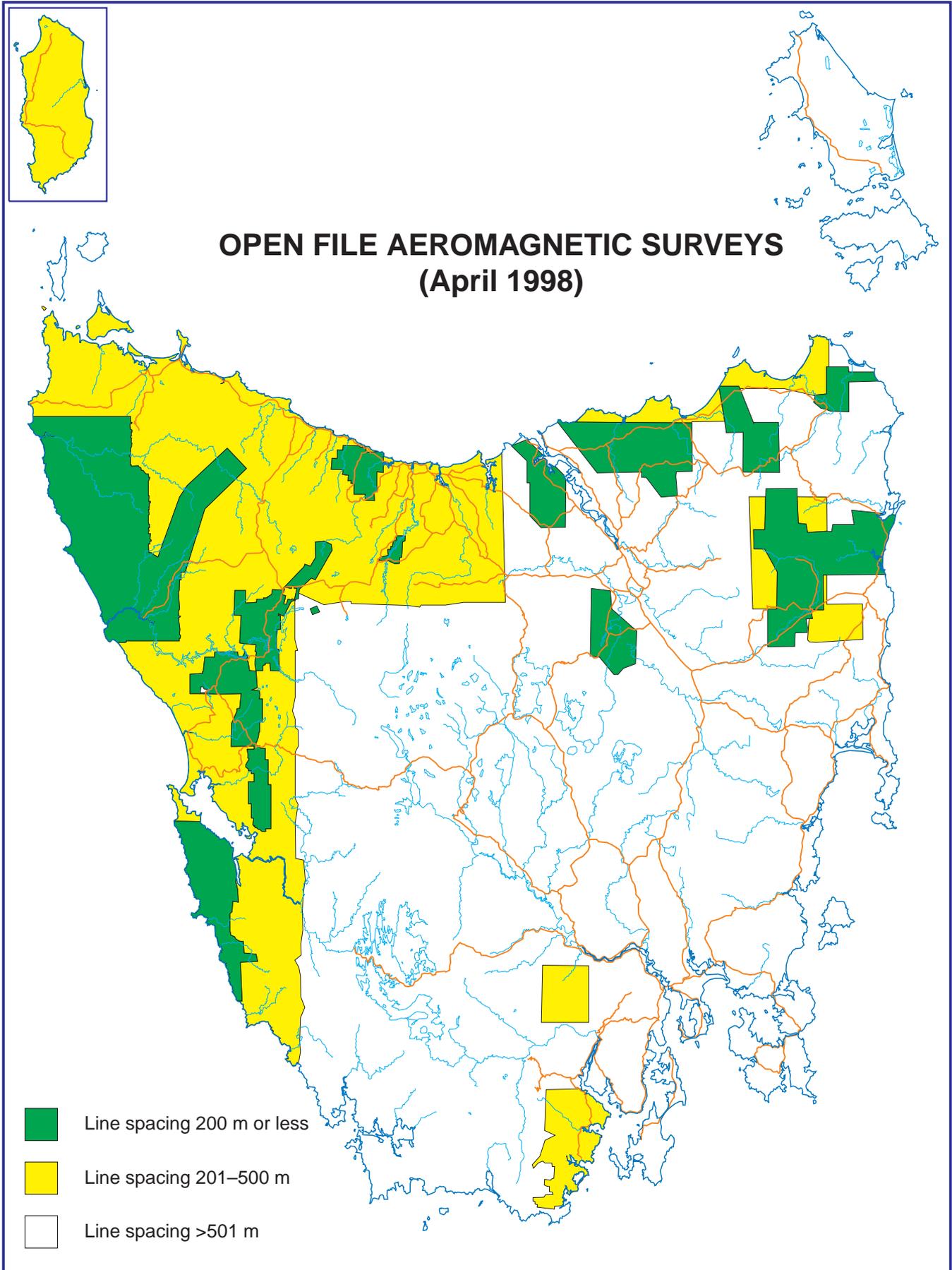
Data capture

Entry of open file stream-sediment geochemistry into databases continued throughout the year. To date 36,417 stream-sediment samples have been entered, representing a total of 252,274 analyses. Samples were mainly from the western half of Tasmania. Digital geochemical data are released simultaneously with the corresponding 1:25 000 scale digital geological map tile. Data compiled during the year covered the Darwin, Dundas, Gormanston, Heemskirk, Maydena, Nevada, Oceana, Owen, Roger, Rosebery, Skeleton, Sumac, Trial, Weld and Wilmot sheets.

Over 1500 company reports have been entered into the TASXPLORE spatial index of exploration activity. This index includes all open file, closed file and restricted reports from late 1986 to the present. The index allows location of a report detailing any of the captured exploration activities (20 themes) that lie within or overlap an area defined on a map of Tasmania. An updated release (version 2, April 1998) of the open file index and the corresponding TASXPLORE textual data has been made on CD-ROM in both ArcView and Map Info formats.

Project TIGER

Project TIGER is redeveloping the MRT information systems. Phase 3 will improve information management within MRT by utilising up-to-date and extensible information technology and is supported by a special appropriation from the 1997/98, 1998/99 and 1999/2000 budgets. This database management system will be populated with existing digital data.



Planning for Phase 3 was completed during the 1997/98 financial year and work commenced on an MRT corporate data model. The TIGER data model makes no distinction between spatial and non-spatial data, with spatial attributes being treated as properties of an object that is stored in the database. The first milestone to be completed in Phase 3 will be redevelopment of the MRT document indexes (TASXPLO, PETXPLO and DOMINFO), presently spread across several applications and operating systems, by October 1998.

The TIGER system is a component of a broader whole-of-government initiative in land information management known as The LIST (Land Information Systems Tasmania). The LIST is hosted by the Department of Primary Industries, Water and Environment and will consolidate all land information in Tasmania into a single data model accessible to the public via the World Wide Web.

Existing MRT databases now have custodians and a detailed examination of the data structures and data flow has commenced. A number of the databases are being either augmented or updated to ease the transition into the TIGER system. Temporary staff are being used to index MRT reports for entry into the DOMINFO database.

IT summary

The computer systems officers provided support to both MRT and the Workplace Standards Authority (WSA) until early in 1998 when WSA appointed two computer systems officers. The Unix network has maintained a high level of availability, but there was a large number of server crashes affecting PC users during the latter part of the year. Updated server hardware and software have been ordered to overcome the difficulties resulting from differences between the desktop and server technologies.

All data communications outside the Rosny Park building are now via the Networking Tasmania Project (NTP). This change has also required transfer of the MRT World Wide Web home page from within TDR to a host within NTP. A number of minor difficulties were associated with the change to NTP. Internally MRT is now using both 10 megabit and 100 megabit ethernet for data communications.

Hardware and software used by MRT have been reviewed as part of Project TIGER. Staff viewing and manipulating spatial data will have a desktop environment including ArcView and ER Mapper, data management staff will have a desktop environment including ArcInfo, and all staff will have browser-based access to textual and standard spatial applications. There will be central data and application servers with links to The LIST. To meet these requirements most desktop PCs have been upgraded and the standard desktop operating system has become Windows NT. Three Unix workstations have also been upgraded to current models.

TASGO Project

This joint undertaking with the Australian Geological Survey Organisation commenced in 1994 with the aim of using high technology studies to determine the character of Tasmania's principal geological structures. A final workshop was held in May 1998 at which the results from the offshore seismic reflection profiles and the preliminary modelling of seismic refraction and wide-angle reflection data were presented. Data are still being collated for construction of a tomographic image of the Tasmanian crust.

Geophysics

Indexing, and precise levelling where required, of airborne geophysical data sets has continued throughout the year. A total of 40 datasets have now been completed. A number of high quality helimag datasets have become open file during the year and these will be levelled and released in the coming year.

Data Management Group

The Data Management Group is responsible for:

- The recording of mining tenements on the Division's maps and plans;
- the management of the Division's Geographical Information System and Computer-Aided Drafting system;
- the provision of support drafting services.

The Division's GIS continues to be developed, maintained and used to meet the requirements of our staff and clients.

During 1997/98 the capture of geological data continued resulting in:

- the capture and output of seven digital geological maps (Rosebery, Dundas, Oceana, Owen, Gormanston, Darwin and Wilmot) at a scale of 1:25 000 in the Mt Read Volcanics Region;
- the capture and output of two digital geological maps (Heemskirk and Trial) at a scale of 1:25 000 in western Tasmania;
- the capture and output of two digital geological maps (Roger and Sumac) at a scale of 1:25 000 in northwest Tasmania;
- the capture and output of four digital geological maps (Maydena, Skeleton, Nevada and Weld) at a scale of 1:25 000 in southern Tasmania;
- the creation of GIS data sets, covering the above project areas, of other databases relative to mineral deposits, drill hole locations, stream-sediment geochemistry locations and rock chemical analysis sample locations;
- the revision of the 1:250 000 scale digital geological data and maps;

- the capture and output of one map (Burnie–Stowport) in the Engineering Geology, Land Stability Hazard Mapping Project, in northwest Tasmania, at a scale of 1:25 000;
- the capture and output of ten digital geological maps of Macquarie Island at scales of 1:50 000, 1:25 000 and 1:10 000.

The capture of digital historic exploration licence boundaries continued.

Sixty-six datasets of geological or tenement data were produced for clients.

Output maps of digital geological data were produced on demand on the division's inkjet plotters.

The computer-aided drafting system continued to be used as a support tool for many projects.

Publications

The Publications Section is responsible for the production of geological reports, promotional books, newsletters and material for displays, Exploration Tender Area flyers, maintenance of the MRT Internet site, and other reports and leaflets as required. Major publications produced during the year included:

- the Mineral Resources Tasmania *Annual Review*;
- *Mineral Exploration Opportunities in Tasmania*.
- Three issues of the *ProspecTas* newsletter were issued during the year.

Reports issued in the *Tasmanian Geological Survey Record* series included:

- 1996/10 – *Reconnaissance isotope chemostratigraphy of Neoproterozoic carbonate rocks in western Tasmania*, by C. A. Calver;
- 1996/11 – *Resource assessment: The Calder–Flowerdale gravel pits*, by J. McKibben;
- 1996/13 – *An assessment of the resource potential for nepheline syenite at Cygnet and elsewhere in Tasmania*, by J. L. Everard;
- 1997/04 – *Interim Management Plan for the Mt Read RAP*;
- 1997/09 – *A re-evaluation of the structural significance of the Boat Harbour Fault, northwestern Tasmania*, by D. B. Seymour;
- 1997/10 – *Some Tasmanian coal statistics (1997)*, by C. A. Bacon;

- 1998/01 – *Stability conditions at Shark Point Road, Penna*, by W. L. Matthews;
- 1998/02 – *Tenement and Cultural Heritage Management at Mineral Resources Tasmania*, by J. Pemberton and C. A. Bacon;
- 1998/03 – *Sorell Basin, Tasmania, Australia. Release of offshore petroleum exploration areas in 1998 – T98-1 & T98-2*, by C. R. Calver;
- 1998/04 – *Platinum Group Elements and their host rocks in Tasmania: A summary review*, by A. V. Brown;
- 1998/05 – *Rock and gravel resources of King Island*, by C. R. Calver.

Library

During the year the library was staffed by a full-time librarian, with assistance being provided two days per week. The Workplace Standards Authority collection, although housed in the Rosny Park library, was maintained separately by a part-time librarian.

Much effort has been put into maintenance and improved access to the collection, particularly the departmental publications, many of which were previously uncatalogued. Two temporary staff were employed from March to index all the MRT publications onto the DOMINFO database as part of Project Tiger. This has resulted in dramatically improved access to this collection and allows for easy printing of the relevant references.

Technical services

Cataloguing of books and serials onto Inmagic DB/Textworks 2.2 for Windows continued during the year. New additions lists were generated and posted on the MRT intranet to allow staff online access. Selected journal contents pages were also posted.

A library services and collection information page was compiled and included on the MRT internet site.

Collection

Because of a general increase in the new subscription prices for journals and a weakening of the Australian dollar against the US dollar, investigations into rationalising our journal collection have commenced.

Despite financial restrictions over 30 books were purchased during the year.

Review of Mineral Sector Operations

Value of the Mining Industry

As well as the direct contribution to the Tasmanian economy through infrastructure development and employment, the mining and mineral processing industries also contribute to the State through royalty, taxes and charges paid to the Tasmanian and local governments.

According to figures obtained by Tasmanian Minerals Council surveys, the total value of sales or shipments for 1997/98 was \$1294 million, a 10% increase over the previous year. Total equivalent full time employment on mine sites was 3948 with a gross annual payroll of \$119 million. Government taxes and charges, including royalties, amounted to \$19.3 million, with electricity and port charges adding a further \$132 million. The minerals industry spent a total of \$634 million on goods and services (excluding electricity), of which \$364 million was spent within Tasmania.

MRT collects royalties and rents and fees from mineral lands, which are forwarded directly to consolidated revenue. In 1997/98, royalty revenue amounted to \$8.2 million compared to \$5.8 million in 1996/97. This increase mainly resulted from a full year of production at the Savage River mine and the impact of the further incremental increase in royalty rates.

An original estimate of \$10.0 million was made for royalty revenue in 1998/99, which was based on increasing mine production and the increased ad valorem royalty rate applicable for the year. The original estimate was made when commodity prices were more favourable. The current market conditions will mean that this revenue target will not be reached.

Audit

The audit program for 1997/98 included on-site visits to four metallic mines and six non-metallic mines. The program continues to ensure that mining companies are paying royalty in line with the regulations.

Royalty regime

In Tasmania a sales and profit-based royalty applies to metallic and coal mines, whilst a production-based royalty is payable on non-metallic materials. The two-tiered metallic and coal royalty consists of an ad valorem percentage payable on net sales, and a formula based percentage of profits.

Following negotiations with the mining industry, new royalty rates were approved by in August 1997, with the new regime taking effect from 1 July 1997. Non-metallic rates increased from \$1.00 per tonne to \$1.20 per tonne, while metallic minerals and coal royalties are being increased incrementally over a number of years.

In 1998/99 the ad valorem component of royalty was payable at 1.5% of net sales. The exponential factor used to calculate the profit component moved to 0.35% from 0.3%. There are two further increments in rates to occur, with the ad valorem rate to move to 1.6% of net sales in 1999/2000 and the exponential rate to become 0.4% in 2000/2001 and beyond. There is a maximum amount of royalty payable at 5% of net sales.

Mining companies that expand into downstream processing to produce a metal receive an automatic 20% rebate on royalties payable. Companies that produce gold doré receive a 10% rebate on royalties. The Minister has the discretion to increase the gold doré rebate to 20%, depending on criteria such as the level of investment undertaken.

Metal Prices and Future Trends

Although it was expected that strong industrial production and economic growth would result in strong growth in mineral consumption, the Australian Bureau of Agricultural and Resource Economics reported that world markets for minerals remained subdued throughout 1997 and 1998, primarily reflecting the significant downturn in economic growth in the Asian economies. Production of major minerals remained strong, and the building of stocks was accompanied by falling prices, with world prices expected to fall further during 1998. Lower world economic growth expected in 1999 is likely to result in relatively weak demand for minerals, at a time when it is expected that supply growth will be maintained. The resultant buildup of stocks will see prices probably remain weak in 1999, although some recovery of gold prices is predicted.

The unfavourable commodity prices are also expected to impact on levels of mineral exploration, with Australian expenditure levels declining by almost 6% in 1997/98, the first fall in six years.

Individual metal prices

Copper

Despite a small rise in early 1998, copper prices declined to an eleven year low at the end of June, despite declining stock levels. With copper consumption by major Asian countries declining and substantial increases in production predicted, it is likely that copper production will exceed consumption, with a resultant sharp decline in the copper price in 1998/99. Australian production of copper is forecast to rise strongly as new mines come into production.

Tin

Unlike most other metals the tin price improved marginally in late 1997 before declining to a low point in January. The price then improved to a new high in June, recovering to around the level of January 1997.

Aluminium

Aluminium prices declined throughout 1997/98, with rising production and weak Asian demand likely to result in increasing stocks and lower prices in 1998/99.

Zinc

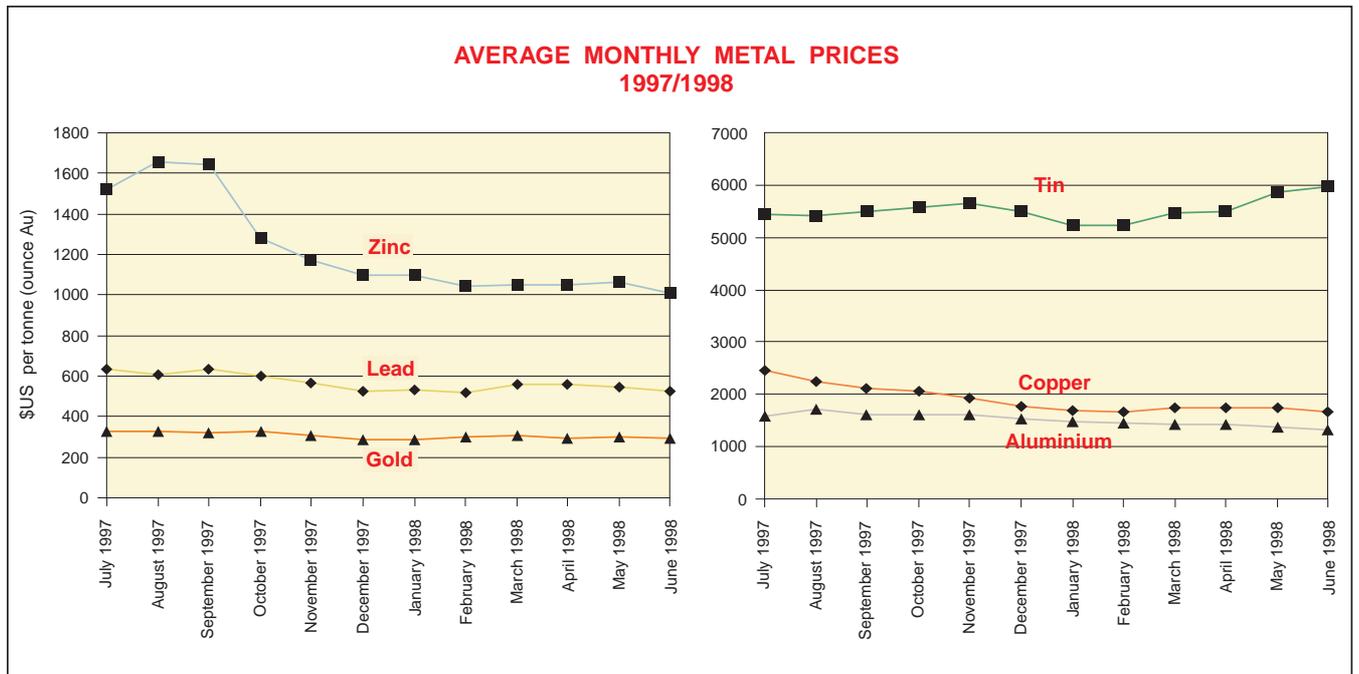
Following a strong peak in prices in the early part of the year, zinc prices fell sharply and continued to decline throughout 1997/98 despite low stock levels. As production exceeds demand, stock levels are expected to increase, with a consequent further decrease in zinc prices in 1998/99.

Lead

The average lead price declined throughout the year. With large falls in demand from Asian countries the average world price of lead is forecast to fall further in 1998/99 as concentrate and metal supply increase faster than consumption.

Gold

Gold prices declined sharply in the last part of 1997 and remained low for the remainder of the 1997/98 year. However the sharp fall in the \$US/\$Aus exchange rate resulted in an effective rise in the Australian dollar gold price to its highest level since October 1996, and Australian gold production in 1997/98 was the highest on record. Global gold prices are expected to only marginally recover during 1998/99, with the Australian price being dependent on the value of the Australian dollar.



Metallic Minerals

Base Metals

Aberfoyle Resources Limited – Hellyer mine

Mining

A total of 1 413 690 tonnes of ore at an average grade of 11.2% Zn, 5.2% Pb, and 141 g/t Ag was mined from underground at Hellyer. Waste rock mined totalled 129 451 tonnes.

Ore recovered from pillars accounted for 60% of the total production. The mined ore grade was in line with predictions, although lower than that of the previous year.

Milling

The mill processed a record 1.44 million tonnes of ore during the year at a headgrade of 10.6% Zn. This headgrade was lower than the previous year.

Concentrate production was:

- zinc concentrate – 229 016 t @ 50.7% Zn;
- lead concentrate – 65 185 t @ 57.1% Pb;
- bulk concentrate – 26 209 t @ 32.6% Zn, 15.3% Pb;
- copper-silver concentrate – 10 791 t @ 11.6% Cu, 4638 g/t Ag.

Concentrate railed to Burnie totalled 366 211 tonnes, with 377 637 tonnes being shipped to smelters.

Developments

A \$270,000 Lead Cleaner High Intensity Conditioning (HIC) unit and a mechanical blast hole cleaner were commissioned. The HIC has improved lead cleaner circuit performance to give a 1–2% overall lead recovery gain. Capital expenditure totalled \$1,096,000.

Ore reserves

Ore reserves at June 1998 were estimated at three million tonnes with a grade of 0.3% Cu, 5.4% Pb, 10.1% Zn, 120 g/t Ag and 1.9% gt/t Au.

Exploration

Transported metal ion (TMI) soil geochemical surveys were conducted southeast and northwest of Hellyer. Twenty-seven diamond-drill holes were drilled during the year, mainly for mine development.

Environmental initiatives

Rehabilitation work continues at the Que River and Cleveland Tin mines. Both sites are nearing completion and re-vegetation results are pleasing.

The Hellyer water treatment plant was commissioned and will contribute to further improvement of the quality of water released from the site.

Employment

The total workforce at June 30 was 294, comprising 161 employees, 113 contractors and 20 apprentices and casuals.

Pasminco Rosebery Mine

Mining

Ore production at the Rosebery mine totalled 482 936 tonnes from underground, 61 826 tonnes from the upper levels, 26 968 tonnes from the Southern open cut, and 1299 tonnes from Allison's. The majority of the ore (64%) was extracted from J Lens, with most of the remainder being extracted from B Lens.

Development activity included 4128 metres geared towards production and 639 metres for the Deep Exploration Project. Operating waste totalled 63 400 tonnes, with the Deep Exploration Project contributing about another 44 440 tonnes.

Milling

A 1.4% increase in tonnage was treated, including the Rosebery and Hercules ores, bringing the total to 649 657 tonnes assaying 9.8% Zn, 2.8% Pb, 0.42% Cu, 84.5 g/t Ag and 1.39 g/t Au. Gold production fell to 50% of the previous year with recovery remaining well below expectations, coupled with deterioration in head grade. While zinc recovery was maintained, the results for copper improved but lead declined.

The mill produced and shipped 106 719 tonnes of zinc concentrate (52.6% Zn), 19 646 tonnes of lead concentrate (62.32% Pb, 1293 g/t Ag), 5553 tonnes of copper concentrate (23.5% Cu, 8.0% Pb, 2179 g/t Ag, 65.3 g/t Au) and 113 kg doré (70% Au, 30% Ag).

Developments

Over \$26 million was spent on capital development including the Deep Exploration Project, northern upcast shaft, primary crushing unit, and a number of upgrades and replacements of underground equipment.

Ore reserves

Identified resources at June 1998 were:

Rosebery:

Proved reserve – 2.039 Mt @ 2.7% Pb, 8.3% Zn, 0.40 % Cu, 83 g/t Ag and 1.6 g/t Au

Probable reserve – 1.361 Mt @ 4.2% Pb, 11.4% Zn, 0.43 % Cu, 155 g/t Ag and 2.6 g/t Au

Rosebery:

Measured resource – 2.334 Mt @ 3.0% Pb, 9.1% Zn, 0.47% Cu, 91 g/t Ag and 1.8 g/t Au
 Indicated resource – 1.480 Mt @ 4.5% Pb, 12.5% Zn, 0.48% Cu, 169 g/t Ag and 2.8 g/t Au
 Inferred resource – 7911 Mt @ 4.6% Pb, 13.2% Zn, 0.28% Cu, 148 g/t Ag and 2.1 g/t Au

South Hercules:

Inferred resource – 0.507 Mt @ 2.1% Pb, 4.0% Zn, 0.12% Cu, 163 g/t Ag and 3.3 g/t Au

Browns Tunnel:

Inferred resource – 0.161 Mt @ 3.0% Pb, 7.3% Zn, 0.70% Cu, 49 g/t Ag and 1.2 g/t Au

Exploration

The Deep Exploration Project continued, with over 20 000 metres of underground deep drilling from the new declines being developed the length of the mine. For the whole mine lease, diamond and RC drilling totalled 74 850 metres, including resource infill and underground and surface exploration.

Geological mapping and soil geochemistry were conducted at the Jones Creek prospect, and extensive drilling and down-hole geophysics were done to the north and south of the mine.

Environmental initiatives

Rehabilitation around the South Rosebery tailings dams, Primrose Hill and process areas has been completed. A new long-term rock disposal area has been developed within the former Assay Creek. The rock will be sealed into cells to eliminate acid drainage.

Employment

At the end of June, the mine had 90 staff employees and 230 award employees.

Hercules Resources Pty Ltd**Mining**

Following the start of the redevelopment of the Hercules mine in August 1996, stable production from the operation was achieved as of November 1997. Ore delivered to Pasminco's Rosebery mill totalled 59 844 tonnes at 8.8% Zn, 2.0% Pb, 0.3% Cu, 34.9 g/t Ag and 0.8 g/t Au.

Nearly 900 metres of hand-held development was achieved, with production drilling totalling 16 777 metres.

Ore reserves

The remaining inferred resource as at March 1998 was 130 064 tonnes @ 11.0% Zn, 2.4% Pb, 0.57% Cu, 40 g/t Ag and 1.06 g/t Au.

Exploration

In anticipation of an extension to the sub-lease area, a surface and underground exploration program has been proposed above 6 level. Some surface exploration was undertaken, with a drilling program expected to begin in August 1998.

Copper**Copper Mines of Tasmania Pty Ltd****Mining**

A total of 2 080 838 tonnes of ore at an average grade of 1.28% Cu was mined from underground at the Mount Lyell mine, 95% by sub-level caving. Waste rock mined totalled 65 525 tonnes.

A front caving mining method was introduced during the year in order to extract remnant ore from the caved area above the existing workings.

Development totalled 2134 metres. Decline development was halted due to the change to the front caving method.

Milling

Mill availability increased to 89.4%, processing all the mined ore. Copper production increased to 24 500 tonnes and gold production remained stable at 14,034 ounces.

Developments

A scoping study examined the feasibility of block caving the extension of the Prince Lyell ore body at depth. The study used orebody interpretations, geomechanical investigation and financial modelling to justify an initial deep diamond drilling program.

Ore reserves

Proved ore reserves at Prince Lyell totalled 6.7 million tonnes @ 1.35% Cu. Probable reserves totalled 20.9 million tonnes @ 1.22% Cu, with the total measured, indicated and inferred resources at Mount Lyell totalling 195 million tonnes @ 0.82% Cu.

Exploration

Sixty-nine holes were drilled on the mine lease for 5067 metres, delineating 3.8 million tonnes of ore. Drilling, CSAMT and downhole EM surveys and geological mapping were conducted at North Lyell, West Lyell and Cape Horn-Comstock.

Environmental initiatives

CMT participated in the RiverWorks program which is trialling treatment options for the historic acid drainage that emanates from the lease. CMT treated 9.8% (over three times the commitment) of the acid drainage pumped from the Prince Lyell mine by co-treatment with alkali tailings.

Revegetation work on the waste rock dump involved direct seeding of locally occurring rainforest species, a first for the west coast. CMT received a Highly Commended in the Tasmanian Landcare Awards – BHP Landcare Research category for work undertaken in the bioremediation of hydrocarbon-contaminated soil on the lease.

Employment

Employment at the end of the year totalled 229, comprising 82 employees and 147 contractors.

Gold

Beaconsfield Mine Joint Venture

The feasibility study was completed during the past financial year and activities directly related to bringing the Beaconsfield gold mine back into production after a period of 85 years commenced.

Mining

Mining of a decline from the 375 metre level commenced during the year, with the orebody being intersected in May 1998. Stopping will commence late in 1998 in order to establish an ore stockpile of around 20 000 tonnes by the time of mill commissioning, scheduled for mid-1999. Waste rock mined over the last year was 88 641 tonnes.

Development

The Hart Shaft has been rehabilitated and first stage borehole dewatering systems, including a pump station on the 375 metre level, have been installed. A fresh air rise/second means of egress is currently being installed, as well as civil constructions for ore hoisting and conveying around the Hart Shaft.

Ore reserves

Reserves of ore are reported as:

- probable: 1.44 million tonnes @ 16.9 g/t Au (780,000 oz);
- indicated: 1.384 million tonnes @ 19.04 g/t Au (847,400 oz);
- inferred: 0.545 million tonnes @ 13.12 g/t Au (229,900 oz).

Exploration

Exploration expenditure on adjacent Exploration Licences totalled \$325,000 for the year. Exploration will continue with the aim of defining additional resources.

Environmental initiatives

The Development Plan and Environmental Management Plan for the Beaconsfield mine was

completed and submitted during the year, and a licence to operate has been issued.

Heritage initiatives

A cultural heritage assessment was completed in June. The original Hathorn-Davey Cornish beam pumps, originally installed in the Hart Shaft around 1904, have been recovered. The pumps are in good condition and will be restored for display in the Grubb Shaft Museum at Beaconsfield.

Employment

The joint venture workforce at June 30, including contractors, was 81.

Goldfields (Tasmania) Limited, Henty mine

Mining

During its second year of production the Henty mine increased ore production by 40% to 102 000 tonnes at a grade of 23.9 g/t Au, 13% higher than last year. Production was dominantly from sill drives and flat back stopes, but bench retreat stoping, introduced late in the year, will provide 60% of the ore in the coming year.

Milling

The mill processed at 85% of its capacity, with plant recovery consistent at 98%. Gold production increased by 38% to 77,000 ounces of gold, with 69,300 ounces shipped.

Developments

Capital development progressed 2100 metres, displacing 90 000 tonnes despite poor ground conditions. The intermediate decline was extended 660 metres south in order to explore above Zone 96. The Zone 15 decline was advanced 280 metres.

Ore reserves

Proved reserves of ore totalled 24 000 tonnes @ 17.8 g/t Au, with a measured resource of 395 000 tonnes @ 21.4 g/t Au and an indicated resource of 144 000 tonnes @ 12.3 g/t Au.

Exploration

Henty announced that its exploration program to the south of the existing Zone 96 resource has delineated targets at Zone 15 and at Mt Julia. The Mt Julia program has included 16 000 metres of drilling with over 30 intersections of mineralisation to date.

Environmental initiatives

Henty's continuing commitment to environmental management was recognised by the Australian Minerals and Energy Environmental Foundation (AMEEF), with an award in the Environmental

Excellence in the Organisation category. Henty was also awarded the Fuji-Xerox Business Award by Landcare Australia.

Employment

Employment comprises 73 full-time employees and up to 100 contractors. Total manpower levels have been reduced by 20% since November 1997 as part of a business improvement program.

William's Hill Mining Group

Mining

Open cut production from the Numbers 1, 2 and 3 Reefs at Linton, in northeast Tasmania, was 300 tonnes of ore assaying 2.0 g/t Au. Some gold was processed locally in Tasmania with some being shipped as loaded carbon to West Australia for processing. About 900 m³ was stripped as ore, with an equivalent volume as waste.

Developments

A new reef in the No. 3 Reef area has been exposed and is being developed. Preparations are underway to open up old underground access to 1 and 2 Reefs.

Exploration

Surface costeaning is being used to delineate reefs prior to open cutting.

Environmental initiatives

Stripped topsoil is replaced and revegetated after surface works are completed.

Employment

The open cut at Linton requires two casual operators and two staff.

Paraclete Resources Pty Ltd

Developments

Paraclete, together with Stonyfell Mining NL, has spent \$1.1 million in site works at the King River gold mine. Plant construction has been completed and work on the tailings dam is proceeding.

Iron ore

Australian Bulk Minerals Tasmanian Operations

Mining

A total of 3 743 000 tonnes of ore was mined from the Savage River open-cut iron ore mine. Waste rock stripped totalled 12 635 000 tonnes.

Production

Iron ore pellet production at Port Latta totalled 820 841 tonnes at 65.99% Fe, with 74 159 tonnes of iron ore concentrate at 67.5% Fe being produced.

Shipments of iron ore pellets from Port Latta totalled 704 275 tonnes, with 32 299 tonnes of iron ore concentrate being shipped.

Developments

Refurbishment of the Savage River and Port Latta facilities was substantially completed and production restarted in November 1997. Work has continued since that date on the reline and re-commissioning of the Port Latta furnaces. A new 1.3 km overland conveyor was constructed at Savage River and the main crushing plant relocated as an in-pit crusher.

The capital expenditure invested in the Savage River-Port Latta redevelopment totalled \$56 million in 1997/98.

A feasibility study into pig iron/steel production at Port Latta was started.

Ore reserves

Proven reserves at 30 June totalled 67.782 million tonnes @ 49.2% recoverable magnetite, with a probable reserve of 13.515 million tonnes @ 45.0% recoverable magnetite.

Environmental initiatives

Land within the former Savage River township was remediated on behalf of the former Department of Environment and Land Management. This work included a weed management program.

A Coastcare grant has been won to assist in remediating Port Latta. This project includes cleaning, revegetation, contaminated land assessment, weed control, a botanical survey and other clean up activities, including community tree planting days during the year.

Employment

The total workforce at June 30 was 385 contractors and 11 direct employees.

Tasmania Mines Limited

Production

The Kara mine produced 55 038 tonnes of magnetite and 950 MTU of scheelite. Sales consisted of 55 900 tonnes of magnetite and 3979 MTU of scheelite.

Capital expenditure at the mine totalled \$621,624.

Ore reserves

Reserves of scheelite-bearing ore comprised:

- proved reserve of 221 000 tonnes @ 0.51% WO₃;

- measured resource of 438 000 tonnes @ 0.51% WO₃;
- indicated resource of 254 000 tonnes @ 0.53% WO₃;
- inferred resource of 339 000 tonnes @ 0.92% WO₃.

Reserves of non-scheelite bearing magnetite ore comprised:

- proved reserve of 632 250 tonnes @ >30% Fe;
- proved reserve of 187 250t @ <30% Fe

Employment

The average number of employees at the mine was 25.

Tin

Renison Limited

All areas of the mine achieved significant improvements compared with the previous year, with ore production, mill throughput, tin production and concentrate grade all increasing. The mine returned to profitable operation during the year.

Mining

At the Renison tin mine, 755 775 tonnes of ore were mined at an average grade of 1.75% Sn. The Rendeep orebodies contributed 32% of this figure. The ore was mined by silling and benching.

A total of 2535.4 metres of development was carried out.

Milling

Ore processed comprised 757 459 tonnes @ 1.74% Sn head grade to produce 16 231 tonnes of concentrate containing 60.8% Sn for an average recovery of 75%. Ore grade and recovery improved as more amenable

ore types were accessed. Tin production for the year was the highest on record.

Shipments to South East Asia totalled 16 458 dry metric tonnes of concentrate averaging 60.2% Sn.

Ore reserves

Ore reserves as at January 1998 comprised:

- proved 3.05 million tonnes @ 1.86% Sn;
- probable 1.52 million tonnes @ 1.92% Sn.

The total measured resource (including ore reserves) totalled 2.97 million tonnes @ 2.04% Sn, with an indicated resource of 2.54 million tonnes @ 1.74% Sn.

Developments

The refurbishment of the acid leach plant was completed with an immediate positive affect on concentrate grade. The acid dilution plant was replaced with a new concentrate acid storage and handling facility. Development continued in the Rendeep area.

Environmental initiatives

Leading edge research with CSIRO into tailing dam hydrology and geochemistry continued with the longer-term objective of ensuring the sustainable protection of receiving waters. A major program of raising the environmental awareness of employees manifested itself in better performance in hydrocarbon and waste management, with a variety of waste segregation and recycling initiatives adopted.

Employment

The total workforce at June 30 was 295, comprising 224 employees and 71 contractors.

Non-metallic minerals

Limestone and dolomite

Beams Brothers Pty Ltd

Production for the year comprised aglime and dolomite fines (76 748 t), metallurgical limestone (30 138 t), other crushed stone (8909 t) and concrete production stone (2800 t).

Commissioning of a new ore-sizer crusher is underway. Capital expenditure of \$200,000 was incurred on the tertiary crushing section, and on a new feeder and frame. Rehabilitation of dump areas continued.

At least 10 years worth of reserves are available in the present lease area.

Employment during the year averaged 24 persons.

Circular Head Dolomite and Trading Co. Pty Ltd

Production for the year totalled 49 021 tonnes of agricultural dolomite and 9115 tonnes of dolomite screenings.

Capital expenditure of \$128,656 was committed to the purchase of plant and machinery.

Employment totalled 12 people, with one contractor on site at year end.

David Mitchell Limited (Mole Creek)

The Mole Creek Lime Plant has reported a record year of sales and production. Sales for the year comprised 30 710 tonnes of agricultural limestone, 4182 tonnes of crushed limestone, 4531 tonnes of chemical limestone and 41 965 tonnes of other limestone product.

Geological fieldwork, drilling, testing and computer modelling have been carried out to identify and quantify reserves. A new ground limestone plant was commissioned and the lime kiln production capacity was increased. The total capital cost of plant upgrade was \$600,000. Employment increased from 27 to 35 employees.

Silica flour

Cominex

Sales of silica flour to the company's principal customer in Japan have resumed, following a suspension in 1996/97 as a result of disruption caused by the Kobe earthquake. The return of the Japanese to the market is expected to lift mine sales to 7200 tonnes in 1998/99 and 9600 tonnes in 1999/2000. An abnormal gravel sale arose as a result of upgrading of infrastructure at the nearby Savage River mine.

Production for the year totalled 5700 tonnes of high purity silica flour, 3300 tonnes of gravel for concrete and 1500 tonnes of road base gravel.

Estimated reserves of high purity silica flour were 90 000 tonnes proved and 1.6 million tonnes inferred.

The workforce strength at year end was eight, with contractors employed as required.

Kaolin

Tonganah Clay Mine

Production of kaolin clay totalled 5058 tonnes. Sales and production were reduced early in the financial year when the Burnie paper mill no longer required product from Tonganah. There were nine to ten full-time employees during the year with up to eight contractors employed at times working on rehabilitation.

Ceramics

K & D Bricks and Pavers

Production of clay bricks and pavers continued at the New Town plant.

Nubrik

Clay, shale and sand, extracted from a number of quarries, were processed into 29 300 tonnes of bricks

and pavers. Product was exported to overseas markets in China, Taiwan, Japan and New Zealand for the first time in the business' history.

Raw material reserves are deemed sufficient for at least fifteen years.

There were 36 full time employees at year end.

Construction materials

Allan Summers Transport

Production of 545 m³ of concrete aggregate and 3159 m³ of road aggregate was recorded from Margetts quarry at Wynyard.

ML & P Barwick

Road construction material produced from the quarry at Clives Hill totalled 20 000 tonnes, with two people being employed. Reserves of 800 000 tonnes are present at this site.

Besser Tasmania Pty Ltd

A total of 20 140 tonnes of sand and gravel was produced from the quarry at Calder, and was sold to local users, including Besser's Ulverstone production centre for bricks, blocks and paving.

Progressive rehabilitation of worked-out areas continued.

Two persons were employed at Calder on open-cut mining and processing.

Boral Resources

Production from Boral quarries state-wide amounted to 820 000 tonnes of crushed rock and aggregates, including 200 000 tonnes supplied as armour rock and fill for the Bass Highway relocation project between Penguin and Howth.

Capital expenditure of \$500,000 was incurred on a new excavator and amenities upgrade for the Launceston quarry site.

Rehabilitation work continued on the Mt Nassau limestone quarry.

Forty-four persons were employed.

Brambles Industrial Services

The total production from Brambles' quarries was 240 000 tonnes of road base, 200 000 tonnes of aggregates and dust for use in concrete and sealing aggregate, and 30 000 tonnes of various rock fills.

Capital expenditure of \$500,000 was spent on screen upgrade, pug mill development and transportable crushing plant upgrade.

Environmental audits of all locations were conducted and action taken to address issues such as revegetation and monitoring of water runoff.

Caroline Quarries P/L

Production from the quarry at Railton was 21 543 tonnes of silica sand, 727 tonnes of general sand, and 25 tonnes of concrete sand.

Rehabilitation work at the quarry continued, the settling pond was enlarged, and rock lining of drains was undertaken.

The quarry was operated by the owner and two employees.

CSR Construction Materials

CSR terminated its lease on the Mornington quarry on 29 April 1998. Production for the year was 118 000 tonnes of crushed dolerite, mainly for road construction.

Capital expenditure of \$500,000 was incurred in quarry closure costs, including rehabilitation.

An extensive rehabilitation program, approved by the former Department of Environment and Land Management and MRT, was initiated.

Duggans Pty Ltd

A total of 45 262 tonnes of construction materials were produced by Duggans Quarries, including 9725 tonnes of aggregate, 4229 tonnes of sub-base, and 18 584 tonnes scalps. Two full-time and one part-time employees were engaged at year end.

Hobart Blue Metal Industries

Production for the year comprised 223 000 tonnes of crushed rock, 7000 tonnes of gravel and 21 400 tonnes of sand.

Tree planting was carried out at Leslie Vale, and further planting is planned for the Clarks sand operation.

Nineteen employees and one contractor were employed.

Industrial Sands and Silica Pty Ltd

A total of 21 000 tonnes of base gravel and 5000 tonnes of sand was produced by three employees.

Males Sand

Concreting sand, bedding sand and coarse sand were produced from pits at South Arm.

Pioneer Concrete (Tasmania) Pty Ltd

Production of crushed dolerite from the Flagstaff Gully quarry totalled 200 593 tonnes. This comprised concrete product (79 800 tonnes), road construction material (63 400 tonnes) and other product (57 393 tonnes).

Capital expenditure on a new crusher and new dust extractor totalled \$242,000.

Progressive rehabilitation work continued. Ten employees and three contractors were engaged in quarry operations.

Fuel minerals

The Cornwall Coal Mine No Liability

Production

Production from the various mines totalled 456 336 tonnes of raw coal, with an additional 58 000 tonnes of coal being purchased from the Stanhope mine. Washery throughput of raw coal totalled 535 749 tonnes for the production of 378 809 tonnes of saleable coal. Approximately 157 000 tonnes of reject material was deposited at the Duncan reject dump.

Sales for the year totalled 371 000 tonnes, with markets being re-established with several companies.

Duncan Colliery

This mine remains on care and maintenance.

Blackwood Colliery

Production has come from continued easterly retreat along the No. 2 conveyor. Panels were developed and extracted in turn to the north and south to recover coal between faults and from the boundary pillar to the old Mt Nicholas workings.

Headings in the 1A section were rehabilitated for continued development, with 376 metres being advanced by the close of the year. Conditions have been generally adverse, with water being encountered from the seam and from roof cracks, and some minor faulting occurring. A mudstone band was encountered near the top of the seam, thickening to 600 mm at which point mining continued beneath the band. The thickness of the material between the working roof and the sandstone has varied up to 2.1 metres. Fracturing has seriously affecting bolting costs and productivity.

Blackwood No. 3

Workings have been re-established in the Cornwall Seam below the Blackwood No. 1 mine. The intake portal has been established and the surface conveyor erected. The return roadway is being driven by cleaning up and extending a previously formed heading. By the end of the year, development was advanced about 100 metres and still in poor roof conditions.

Huntsman No. 2 open cut

Mining has been in a down-thrown block where surface contours have been higher, resulting in up to 35 metres of cover for 2.1–2.2 metres of seam. The

block is 75% extracted. Rehabilitation of earlier mined areas is progressing.

Capital Expenditure

A total of \$349,000 was spent on capital equipment during the year, mainly in developing the new portal at the Blackwood Colliery and on plant improvements at the Fingal washery.

Safety

There were no lost time injuries during the year,

Rehabilitation

Revegetation growth at Huntsman No. 1 is progressing well and progressive rehabilitation continues at Huntsman No. 2. At Duncan the fine coal stockpile has been reduced and No. 1 and reject dams are being progressively covered with coarse reject material.

Employment

A total of 85 people was engaged in the operation. Of 66 employees, 43 work underground while nineteen contractors were employed in the open cut operation and coal transport.

Merrywood Coal Company Pty Ltd

Production

Total raw coal production for the year was 75 624 tonnes, with washed coal production totalling 52 180 tonnes. At the Stanhope Colliery 953 000 cubic metres of waste was moved to achieve the required production. Development included an access road, crushing plant and amenities improvements. Exploration drilling carried out totalled 3500 metres. Four hectares of rehabilitation work was carried out.

Additional rehabilitation was carried out at the Merrywood open-cut mine.

Employment

Eighteen people were employed in the operation, including transport.

Capital Expenditure

A total of \$35,000 was expended on improvements to the crushing plant and for its connection to the HEC grid.

Mineral Processing Operations

Comalco Aluminium (Bell Bay) Limited

Production of aluminium for the 1997 calendar year totalled 138 000 tonnes of hot metal. Employment at the Bell Bay operation totalled 683, with an additional 78 contractors engaged in the operation.

Capital expenditure during 1997 totalled \$43,500,000.

In September 1997 the smelter successfully commissioned a fume scrubbing system. Dry scrubbing provides the smelter with the world's best environmental practice resulting in 90% reduction in fluoride gas emission and negligible fluoride particulate emission. This is recognised as the most technologically advanced system available to the aluminium industry. At its peak, the project directly employed a construction workforce of over 200 people. It is estimated that more than 30% of the total capital expenditure (approximately \$14,000,000) was spent directly in Tasmania.

During the latter half of 1997 the smelter embarked on a performance enhancement program, which resulted in employees contributing thousands of ideas to reduce cost and improve the performance of the business.

Goliath Portland Cement Company Limited

Production

Production at the Railton mill totalled one million tonnes of clinker and 1.1 million tonnes of cement, with 985 000 tonnes of product being shipped to NSW and Victoria on MV *Goliath*.

Raw material consumption comprised 1.5 million tonnes of limestone, 70 000 tonnes of clay, 22 000 tonnes of magnetite, 25 000 tonnes of silica, 50 000 tonnes of gypsum and 156 000 tonnes of coal.

Employment

A total of 189 people, including three contractors, was employed in the operation.

Capital expenditure

A total of \$14,800,000 was expended during the year. Major projects were the installation and commissioning of a 1000 tonne per hour twin rotor hammer crusher and trunk conveying system from the new quarry to the plant, and the erection of a 300 metre x 55 metre building to enclose crushed limestone pre-blending beds for reducing dust emissions.

Development and Rehabilitation

Over 500 000 tonnes of overburden were removed as part of the development program at the quarry.

Rehabilitation work included covering the southern overburden dump with topsoil and spray seeding, repairs to a landslip in the old quarry, installation of drainage lines, and widening of the settling ponds spillway.

Environmental management

In addition to development projects the triennial review of the environmental management plan was drafted and the rehabilitation plan was completed. An environmental management system and a greenhouse energy management system are being developed.

Impact Fertilisers Pty Ltd

Production

Production of single superphosphate totalled almost 186 000 tonnes, of which 73 000 tonnes was shipped to mainland destinations.

Raw material requirements were 114 000 tonnes of imported phosphate rock and 70 000 tonnes of sulphuric acid from the Pasmaico Hobart Smelter.

Employment

Sixty-nine people, including six contractors, were employed in the operation with an additional 21 people being employed at depots.

Capital works

A maintenance store and mobile workshop were constructed and improvements were made to depots at Kilafaddy and Smithton.

Environmental control

Road works and landscaping were carried out to decrease dust emissions, improvements were made to diesel storage, and designs have been done for a rock phosphate storage facility.

Tasmanian Electro Metallurgical Company Pty Ltd

Production

Production from the Bell Bay smelter for 1997/98 totalled 95 900 tonnes of ferromanganese, 89 400 tonnes of silicomanganese, 5600 tonnes of fines and 270 900 tonnes of sinter. Product sales for the year totalled 107 100 tonnes of ferromanganese, 101 900 tonnes of silicomanganese, 10 800 tonnes of fines and 2900 tonnes of sinter.

Employment

Total employed in the operation was 286 people, including eleven contractors.

Capital expenditure

Capital expenditure for the year totalled \$8,700,000. Major projects were the completion of the upgrading and relining of No. 3 furnace, the sinter plant waste gas 'main' replacement and fan modification, and upgrading of the security system.

Environmental control

Two wastewater recycling initiatives were carried out, with utilisation of contaminated water from furnace off gas scrubbing and storm water recycling being introduced. A sustainable quantum reduction in dust emissions was achieved through improvements of the electrostatic precipitator at the sinter plant and overcoming problems with pyrophoric dust collection at No. 1, 2 and 3 furnaces.

A slag metal separation plant, including a jig plant, was commissioned to recycle valuable material and provide sized slag for sale.

Vegetation work included two separate plantings of TEMCO propagated species back to their source areas through the Rare and Endangered Species Alliance with the National Parks and Wildlife Service.

Environmental management

The University of Tasmania study of Deceitful Cove continues. TEMCO is approaching full compliance with BHP Minerals/Copper Environmental Management System. This complies with ISO 14001 and the Mineral Industry Code for Environmental Management. New environmental management plans were drafted for the smelter site and the quarry at Beaconsfield.

Pasminco Australia Limited, Pasminco Hobart Smelter

Production

A total of 197 000 tonnes of zinc metal and alloy was produced from zinc concentrate sourced mainly from the Broken Hill, Rosebery and Hellyer mines.

Major by-products produced from the treatment were sulphuric acid, secondary leach residue, copper sulphate and cadmium.

Zinc and alloy production was adversely affected by the introduction of a process change from jarosite to paragoethite production. The over-riding production emphasis for 1998/99 will be upon completing the successful implementation of the paragoethite circuit.

Employment

A total of 621 people were engaged at the Risdon plant, with an additional 235 contractors being engaged in various tasks.

Capital expenditure

In excess of \$12 million was spent on capital works during the year, with additional major expenditure on

a demolition program for decommissioned plant. The major projects included rehabilitation of the jarosite storage area, upgrade of wharf cranes, foreshore stack replacement, paragoethite drying plant and process plant, gypsum production, office automation and contaminated water pond upgrade.

Major projects planned for 1998/99 include acid tank bunding, foreshore scrubber replacement, enhancement of the paragoethite process, electrolysis basement improvements, and EZDA production and casting ventilation improvements.

Environment and community

Environmental milestones included the update of the site Environmental Management Plan, commencement of a program of environmental education, and reduction of paragoethite drier bag-house emissions.

Capital expenditure on environmental improvements included extension of the contaminated water pond, the commencement of the jarosite stockpile rehabilitation, and demolition works as part of the site improvement program.

There was one significant environmental incident for the year, a release of sulphur trioxide in July 1997. This promoted a HAZOP study that resulted in a remedial program.

Environmental management initiatives in 1998/99 will include site contamination and rehabilitation investigations, development of waste and materials management strategies, and improvements to the electrolytic division basement.

The environmental awareness program will continue, with specific departmental induction programs and an environmental module for site leaders being developed. The site environmental monitoring program will be reviewed and re-focused, in conjunction with Department of Primary Industries, Water and Environment.

Successful community relations initiatives from 1997/98 will continue, including meetings with community and consultative groups.

Occupational Health and Safety

Safety performance improved, with lost-time accidents falling to four during the year. No accidents were recorded for a period of over 200 days. Initiatives for 1998/99 include a special emphasis on housekeeping, and reviews of emergency preparedness procedures and specialised work permits.

Tioxide Australia Pty Ltd

Operations at the Heybridge site ceased in 1996. Final plant demolition and rehabilitation of residue dams were completed during the financial year.

Value of the Tasmanian Mineral Industry

<i>Year ended Commodity</i>	<i>Unit</i>	<i>30 June 1997 Total Quantity</i>	<i>30 June 1998 Total Quantity</i>
METALLIC MINERALS			
Cadmium	(tonne)	0	0
Cobalt oxide	(tonne)	0	0
Copper (assayed)	(tonne)	24 759	27 698
Gold (assayed)	(kilogram)	2 435	3 256
Iron ore pellets	(tonne)	809 359	1 074 655
Iron (in magnetite)	(tonne)	39 123	55 038
Lead (assayed)	(tonne)	65 274	57 041
Molybdenum	(tonne)	0	0
Pyrite	(tonne)	0	0
Silicon (metallic or as alloy)	(tonne)	0	0
Silver (assayed)	(kilogram)	165 811	138 764
Tin	(tonne)	8 732	9 868
Tungsten as tungstic oxide	(tonne)	2	5
Zinc (assayed)	(tonne)	186 406	183 198
VALUE OF METALLIC MINERALS		\$460 907 344	\$516 367 280
NON-METALLIC AND FUEL MINERALS			
Clay -			
Cement	(tonne)	102 976	44 735
Brick	(tonne)	38 831	26 155
Other	(tonne)	22 649	95 579
Kaolin	(tonne)	31 251	6 742
Dolomite	(tonne)	14 177	6 183
Limestone -			
Agricultural	(tonne)	106 246	108 007
Cement	(tonne)	1 525 764	1 149 310
Chemical and metallurgical	(tonne)	33 296	34 886
Other	(tonne)	51 660	66 230
Silica (glass and other)	(tonne)	157 945	127 044
Sulphuric acid	(mono tonne)	395 820	270 660
Coal (run of mine)	(tonne)	545 820	566 720
Coal (washed)	(tonne)	297 274	380 300
Peat	(m ³)	2 192	5 868
VALUE OF NON-METALLIC AND FUEL MINERALS		\$48 451 637	\$45 818 650
CONSTRUCTION MATERIALS			
Building stone -			
Freestone	(tonne)	1 520	957
Granite	(tonne)	170	0
Other	(tonne)	1 618	1 450
Sandstone	(tonne)	587	136
Crushed and broken stone -			
Basalt	(tonne)	792 184	805 964
Dolerite	(tonne)	1 244 301	872 809
Limestone	(tonne)	49 142	20 606
Sandstone	(tonne)	311	102
Other	(tonne)	177 518	144 184
Gravel	(tonne)	81 096	73 510
Sand	(tonne)	381 413	346 369
Other road materials	(tonne)	1 574 217	1 426 971
VALUE OF CONSTRUCTION MATERIALS		\$27 796 967	\$22 280 239
TOTAL VALUE WITH AUSTRALIAN METAL PRICES		\$537 155 948	\$584 466 169
METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES			
Aluminium)		
Aluminium sulphate)		
Cadmium)		
Cobalt oxide)		
Ferro-manganese)		
Ferro-silicon)	\$706 686 390	\$649 426 640
Silico-manganese)		
Sinter)		
Superphosphate)		
Titanium dioxide)		
Zinc)		
VALUE OF MINING AND METALLURGICAL PRODUCTION		\$1 243 842 338	\$1 233 892 809
REPORTED AVERAGE NUMBER OF EMPLOYEES¹		4060	3935

(1) Not all operators report full details

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

The Rehabilitation of Mining Lands Trust Fund (RMLTF) was established in 1997 following the proclamation of the *Mineral Resources Development Act 1995*. Abandoned mining lands for which no person or organisation can now be held responsible are the target of this trust fund. The Trust draws its funds from a negotiated increase in the royalties paid by the mining and quarrying industries.

MRT has written a strategy which addresses the issues surrounding the establishment of the fund and administering committee, the aims of rehabilitation, the selection of sites, and the priorities for rehabilitation. The strategy outlines the processes to be followed when developing a rehabilitation plan and the procedures to be followed for the appointment of consultants and the awarding of tenders.

During the past financial year work was completed in northeast Tasmania in the old tin mining areas around Gladstone and at Rossarden. A brief description of the works completed is outlined below.

Rehabilitation of abandoned tin mines, northeast Tasmania

The Committee approved the appointment of SEMF Holdings Pty Ltd (SEMF) to prepare a rehabilitation concept plan for the Monarch, Star Hill and Endurance mines in northeast Tasmania. SEMF was also engaged to prepare tender documents, assist in the selection of tenders, and to project manage the work in consultation with MRT.

SEMF produced reports on:

- rehabilitation concept plans;
- rehabilitation designs and costings;
- inspection of dams;
- water quality assessment;
- met acid generation testing.

Rehabilitation work completed included:

- gully erosion earthworks at the Endurance mine;
- stabilisation and rehabilitation of a major gully at the Monarch mine;
- recontouring and seeding at the Star Hill mine;

- construction of a trial biological filter at the Monarch mine;
- repairs to Blue Lake dam wall and spillway;
- repairs to dam spillway at Star Hill.

A total of \$299 567 was spent on these projects.

The majority of the work was carried out by Stornoway Gravel Constructions Pty Ltd with SEMF Holdings Pty Ltd as consultants. The environmental performance of both companies and MRT was recognised by winning the Case Earth Award for a contract under \$1,000,000 in value. The Earth Awards are awarded annually by the Civil Contractors Federation in conjunction with The Earthmover and Civil Contractor Magazine and are sponsored by Case Corporation Pty Ltd. The awards recognise those organisations which achieve innovation and best practice in the field of environmental management of civil construction projects. Credit in the awards was given to Stornoway for their environmental management system which is accredited to ISO 14 000. This is the first time that Tasmanian organisations have received awards in the national competition.

At Rossarden revegetation of tailings dams was still in progress during July. The costs of \$77,492 were largely payments carried over from work completed during 1997/98.

The water quality assessment report and acid generating testing has shown that the large expanse of tailings at the Endurance mine is affecting the runoff to the Ringarooma River system. The Committee has therefore approved further earthworks at the Endurance site to start to address the acid drainage problem and to stabilise gully erosion. Other work will include a joint project with the Scottsdale High School involving revegetation at the Monarch mine.

Zeehan area

Investigations were carried out in the Zeehan area by honours students at the University of Tasmania. This work, costing \$6,400, involved collecting data in preparation for a rehabilitation program in 1998/99.

Minor programs included capping an accessible shaft near Zeehan at the former Montana mine (\$5,500) and removing an unsafe structure at Waratah adjacent to the historic 'calciner' (\$6,400).