



Annual Report for the year ending 30 June 1992





TASMANIA DEPARTMENT OF MINES

**Annual Report
for the year ending
30 June 1992**

TASMANIA DEPARTMENT OF MINES



*The Hon. Tony Rundle MHA
Minister for Mines*

I am pleased to submit for your consideration and presentation to Parliament the annual report of the Department of Mines for the year ending 30 June 1992.

This report is the first presented to you following the re-establishment of the Department of Mines in February this year. This step represents an important commitment by Government to secure the future of the mining industry in this State, and has been well received by both industry and departmental staff.

I look forward to the challenge of working with you in achieving growth and security in our industry whilst gaining the acceptance of the public at large of the importance of mining and mineral processing to the way of life of all Tasmanians.

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OVERVIEW

Decreases in the value of the Australian dollar and movement in some commodity prices have had a positive effect on value of industry sales during the year. During 1991/92 increases in major commodity prices in Australian dollars were:-

- Zinc — increased by 27% from \$1,555 to \$1,965 per tonne.
- Tin — increased by 17% from \$9,412 to \$10,834 per tonne.
- Copper — increased by 5% from \$2,914 to \$3,027 per tonne.

On the other hand the lead price fell by 4% to \$763 per tonne during the same period and the volume of sales of lead concentrates from Hellyer and Rosebery have fallen with associated increased stockpiles.

During 1991/92 the total value of metallic minerals mined increased by 16% from \$475M in 1990/91 to \$551M, bringing production close to the 1989/90 figure of \$556M. The value of production of both non-metallic minerals and construction materials was reduced by 9% and 15% respectively, probably as a consequence of international circumstances.

Recent expenditure by the industry on capital works to improve productivity and reduce costs has placed it in a good position to benefit from any upturn in price and demand at the end of the recession.

Unfortunately, the downturn in the industry is reflected in a reduction of mineral royalties (Y209 and Y212) of 12% from \$5.350M in 1990/91 to \$4.729M in 1991/92. This means that the Department has run at a "notional" loss of \$330,000 (receipts \$6.278M, budget \$6.608M) for the first time in several years, in contrast to surpluses of \$568,000 in 1990/91 and \$797,000 in 1989/90.

Although revenue from rents and fees of mineral lands (Y208) improved marginally from \$734,000 to \$784,000 during the year, the area held in exploration licences for metallic minerals is at an all time low of approximately 5500 km². The modest revenue increase is due to longstanding exploration licences attracting higher annual rentals per square kilometre.

This reduction can be in part equated to the world-wide downturn of exploration activity associated with falling metal prices. However the downturn in exploration appears also to be associated with the exploration industry's visualisation of sovereign risk in this State.

On currently known reserves, most of Tasmania's major mines will have reached the end of their life by the year 2000. Intensive exploration is essential to preserve the viability of the West Coast mining industry by the discovery of new ore bodies.

Tasmania has not been regarded as a gold province and did not share in the exploration boom of the late 1980s, promoted by the surge in the gold price. Exploration expenditure in this State suffered, with the rush of funds to gold concerns interstate. The State did, however, maintain its market share of base metals exploration expenditure. The year 1991/92 saw a further drop in this market share in Tasmania.

However while companies maintained good faith in adhering to the work programs offered, exploration expenditure was reduced as companies dropped all but the most prospective ground.

On a more positive note, there has been an improvement in the accident frequency rate on all mines, works and quarries to 62 lost time accidents per million hours worked, although the mean duration of such injuries has increased from 14.0 to 16.3 days lost. However frequency rates at Comalco, Temco and the coal mines remain a concern, being in excess of 100 lost time injuries per million hours worked with an above average mean duration at Comalco.

REVIEW OF DEPARTMENTAL ACTIVITIES

The year in review has been one of achievement for the Department, even with the constrained budget environment. There have been numerous examples of innovation and improvement in productivity and service delivery using the same, and in some cases reduced staff resources.

The highlight of the year was probably the completion of the Mount Read Volcanics Project on 30 June 1992. The project has been almost universally applauded by industry, inside and more importantly outside the State, as the kind of regional basic data acquisition that Government should be providing as "seed" capital for future exploration investment by the private sector. Unfortunately the termination of funding has meant the termination of employment of Mount Read Project temporary employees, who are all thanked for their contributions to the Project and whose specific expertise will be missed.

During the report period, the consultations associated with the development of the Mineral Resources Development Act, the successor to the Mining Act, continued and the production of a draft discussion paper and recommendations was completed. The legislation is expected to be placed before Parliament in late 1992/93. The process involved a wide range of officers from this and other Departments but the input of Mr D. R. Burgess — Registrar of Mines as the co-ordinator of the process deserves special mention.

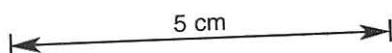
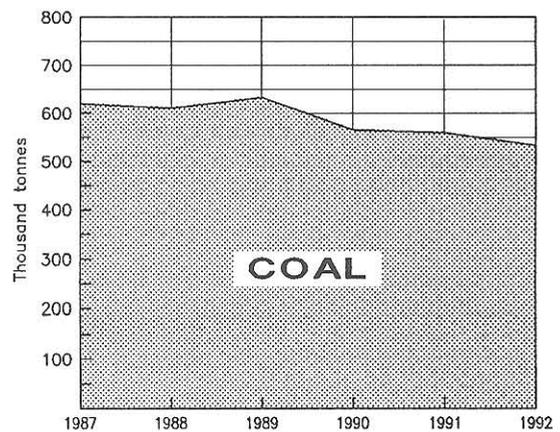
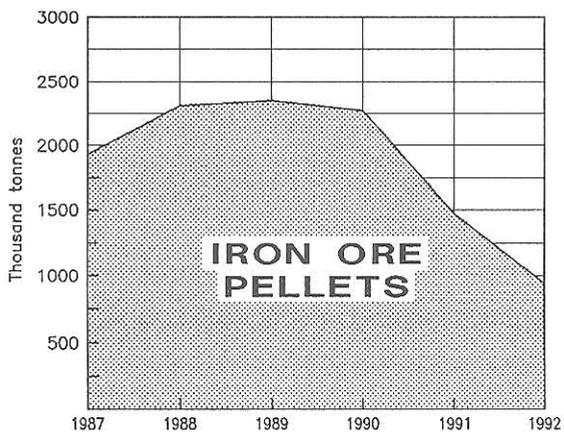
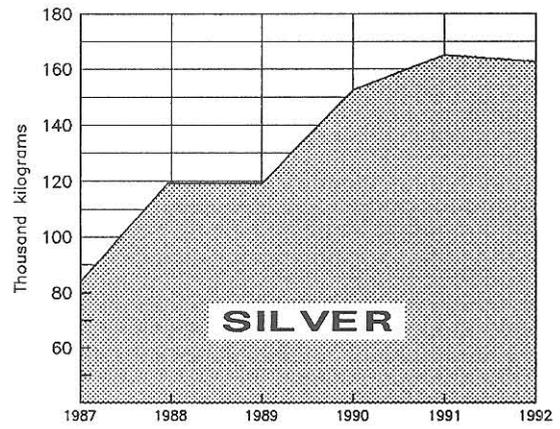
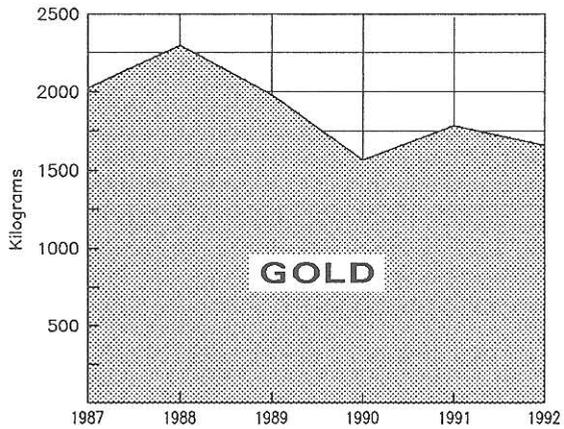
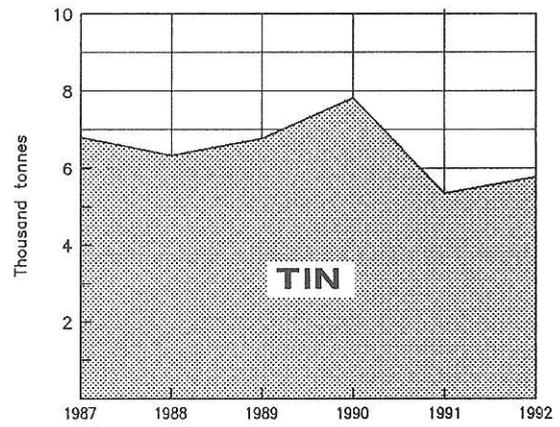
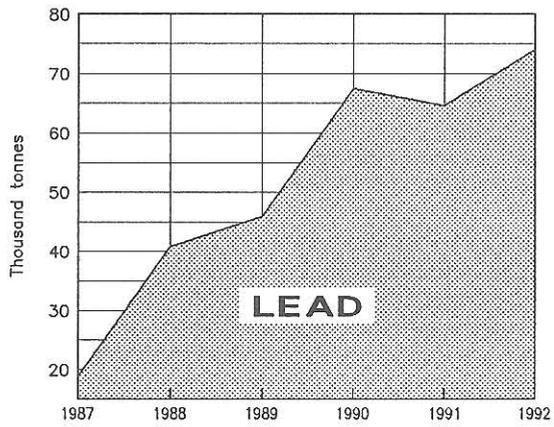
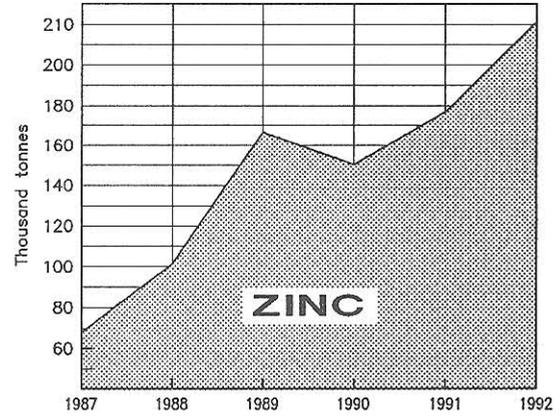
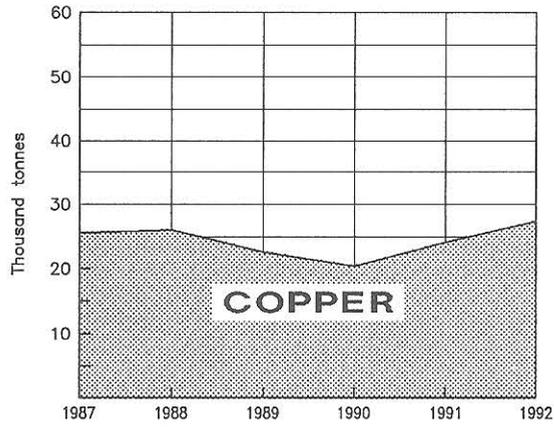
A second edition of the "Mineral Exploration Code of Practice" was produced during the year. This edition incorporated innovations from industry and a clarification of the effect of various land status on access for exploration and mining. Ms C. A. Bacon — Manager Environmental Policy is to be complimented on this document, which has been welcomed by industry.

The Department has continued development of the Geographic Information System (GIS) to include the Launceston 1:250 000 geological map, incorporating all the latest 1:50 000 information, all lease and licence applications, and various geoscientific and exploration data bases.

The Dangerous Goods Division has maintained and increased its emphasis on industry training, participating in courses for the drivers of dangerous goods vehicles, shofirers, and for the storage and handling of agricultural and veterinary chemicals.

During the report period, the regional mapping effort has been concentrated in the economically-important areas of Zeehan,

PRODUCTION TRENDS OF MAJOR COMMODITIES



Alberton and Trowutta. The remapping of the 30 year old Zeehan map sheet has developed an entirely new model for the basic structural control of this area, which indicates extensive new areas of prospectivity thrust under older non-mineralised rocks. Recent work at Alberton has revealed structural control on the gold-bearing quartz veins which will aid future exploration.

Regional staff involvement in the urban mapping project in Launceston and Hobart will provide modern maps to aid planning development for the regions.

Permanent staff of the Economic Geology Section have been the backbone of the Mount Read Volcanics Project since 1985 and special mention should be made of the contributions of Drs Corbett, Duncan and Green and Dr Richardson of Geophysics.

The Engineering Geology Section has continued to provide extensive consultation services to developers, councils and

industry and has provided the bulk of geological survey earnings during the year.

The Geophysics Section has completed a major detailed gravity survey over the Rosebery area for Pasmenco. Special note should be made of the inputs of Dr Richardson and Mr Sedgman in developing the data base systems and computer communications within the Department.

Potential developments in petroleum exploration have been a highlight of the year. SAGASCO resources have applied to drill two wells in 1992/93 which will be the first spudded in the State since 1986. The Maxus Energy Corporation intend to continue interpretation work on T/ 24P, which will probably lead to drilling in 1993/94. The Maxus interest and that of Ansbachall on T/26P is almost entirely due to the dedicated promotional work of Mr Peter Baillie.

*Reports of the
Divisions of the
Department of
Mines*

RESOURCE PLANNING AND POLICY DEVELOPMENT

ENVIRONMENTAL MANAGEMENT

Maintaining close supervision of exploration activities throughout the year continued to be an important part of the role played by the Environmental Section. Encouraging results have been obtained from this monitoring and education, particularly in the increasing effort by exploration companies to minimise the impact on the environment of their on-ground activities.

The Section has remained active in pursuing the responsibility for the rehabilitation of disturbed sites as a result of past mineral exploration activities. Some of these projects have been undertaken jointly with other Government agencies. This includes the decision to implement a program of manual rehabilitation and clean up of an area with a long history of small-scale mining and exploration for tin and tungsten in the Interview River area. At Adamsfield, in the World Heritage Area, a rehabilitation project on a larger scale, including several days of earthworks with machinery, was implemented following consultation with the incoming and the previous explorers. This Department was instrumental in the organisation, supervision and monitoring of this project. Re-seeding with local provenance vegetation and fertiliser applications is presently being conducted as time permits. Some other areas targeted for similar rehabilitation projects include a disturbance in the Heazlewood River area and a very visible section of track left from exploration in the early 1970s in the Anthony Valley.

The momentum of a joint venture project with Pasmenco Exploration, rehabilitating disturbance from previous exploration companies, has continued in conjunction with Pasmenco's current drilling program on their Burns Peak exploration licence on the West Coast. A smaller project of a similar nature was instigated with Aberfoyle Resources in the Red Hills area, south of Mt Murchison.

Previous drill sites and access tracks constructed for the Department's Drilling Section are regularly visited and monitored for rehabilitation. This includes the ongoing application of tea-tree slash and fertiliser where needed and as has been necessary, and control of the spread of noxious weeds by a spraying program.

With stocks of the *Mineral Exploration Code of Practice* handbook becoming exhausted, the opportunity to revise and update a second edition was taken. A very useful addition to the Code is a new section which helps clarify the land tenure situation in Tasmania by explaining the different land classifications and how they relate to the exploration industry.

The Department commissioned a vegetation study over the Mt Read area to complement an earlier study undertaken over the Henty Gold Mine lease. A management plan for the Mt Read RAP, which is almost entirely covered by two current mining leases, was drafted and will be finalised in consultation with the current lessees. The aim of the plan is to provide a management framework for the RAP by which the scientific values of the flora will be protected, whilst recognising the current rights and obligations of the lessees. The detailed maps of vegetation will enable works to be planned so as to avoid disturbance of the more important portions of the flora.

Reports written during the year reflect the Section's continued involvement in coal and some industrial minerals.

- 1992/01 Notes on previous mining and exploration activities in the Interview River area
- 1991/18 Some Tasmanian Coal Statistics (Revision 1)
- 1992/05 Sand at Dysart
- 1992/07 Industrial Minerals in Tasmania — Kaolin
- 1992/17 Land classification in Tasmania — a guide to explorers
- 1992/18 Possibility of 'inrush' at Duncan Colliery

Guidelines for fossickers were drawn up and the Lune River Fossicking Area added to the list of available ground. These areas enable amateur fossickers to collect rock and mineral specimens from land set aside for this purpose.

A report on previous mining activities at Adamsfield in the World Heritage Area was commenced to assist in evaluating future exploration proposals and their effect on the cultural heritage of the region. A brief archaeological inspection of the Storys Creek area was commissioned to assess the impact of proposed drainage works.

Work continued intermittently on an inventory of sites in rainforest previously occupied by mining or exploration activities.

COMPUTER SERVICES

Computer Services has had an active year of systems development and maintenance.

The in-house record management system (CARMS) replaced the old MAPPER system, saving the Department approximately \$1200 per month in external computing fees. CARMS is a more versatile system and gives the Department control over its development. It is planned to transfer the Dangerous Goods Section data to CARMS as soon as possible.

Corporate database developments include a production statistics module of REGIS allowing for data entry/update/query and the generation of customised production returns. This system has dramatically improved the data quality of production returns and relieves the Department of many tedious hours of checking. A future development will be automatic statistical reporting for inclusion in the annual report and for provision to the Australian Bureau of Statistics.

Maintenance of the corporate data base (INGRES) has been made more efficient with the purchase of INGDBA, a data base administration utility. The acquisition of software utilities is seen as strategically important in assisting a Department with limited computing personnel.

Developments in the Geographic Information Systems (GIS) field include the near completion of digital data collection for the North East 1:250 000 geology map and digital capture of

the 1:50 000 Mt Lyell and 1:25 000 Queenstown geology maps. The GIS continues to provide a high level of support to management and industry in the land use decision process. Nine digital data licence agreements were issued for which the Department received \$2760 in payment and \$2500 for payment in kind from CODES.

RESOURCE DRAFTING

Significant advances in the Geographical Information System (GIS) have highlighted the year in Resource Drafting.

All lease/licence applications from 1 January 1992 have been entered into the GIS and diagrams necessary for location and lease documentation drawn up, using a program (TASML) developed by the computer and drafting sections. As well as mining tenement information, land tenure details (at scale 1:500 000) which may affect mining in Tasmania are now available on GIS.

Other data sets held in GIS include: MIRLOCH (Mineral Deposits), CONMAT (Construction Materials), Geology of Tasmania at scale 1:500 000, Geology of North East Tasmania at scale 1:250 000, and Forestry Commission data on vegetation, rainforest areas, and Huon Pine and King Billy Pine areas.

The Section dealt with an increase of 20% in property searches to 4,253 for the year resulting in an income of \$127,590. The growth is a direct result of the growing public awareness of the necessity for 'clear' title to land.

REGISTRY

The Registrar of Mines acted as Co-ordinator and Convener of Working Groups who met and formulated recommendations on the framework for a new Mining Act.

The Section continued further development of REGIS, the Mining Tenement Data Base, with major emphasis on recording of exploration licence expenditure data.

The collection of production and royalty reports was examined and initial steps taken to link these important activities to the REGIS system.

Utilisation of word processing and desktop publishing techniques has reduced the Section's dependence on preprinted stationery. Lease and licence documents are prepared on a case-by-case basis and printed with a laser

printer. The resulting documents are easier to read and more suited to the current era.

COURT OF MINES

Tasmania is divided into four mining districts, each with a Warden of Mines. The wardens, who are magistrates, hear disputes arising under the *Mining Act 1929*. The wardens as at June 1992 were:

- Mr M. R. Hill, Central Mining District and Southwestern Mining District
- Mr S. F. Mollard, Northwestern and Western Mining District
- Mr A. G. Shott, North and Northeastern Mining District

Cases referred to the warden during the year consisted of:

Western Red Mining NL v Cavenridge Pty Ltd. Objection to Exploration Licence 13/91. Agreement between parties ratified by Wardens Court.

R. Burton v Aberfoyle Resources Ltd. Objection to Exploration Licence 7/91. Objection withdrawn prior to hearing.

Bona Vista Estate Pty Ltd v Merrywood Coal Co Pty Ltd. Objection to Exploration Licence 21/91. Matter still to be resolved.

A. & S. Barnes v K. A. White. Objection to Exploration Licence 18/91. Objection withdrawn prior to hearing.

J. C. Youl v Merrywood Coal Co Pty Ltd. Objection to Exploration Licence 20/91. Objection withdrawn prior to hearing.

F. W. Lannen v Oceania Tasmania Pty Ltd. Application for forfeiture of 44M/88, 45M/88 & 46M/88. Application withdrawn.

R. J. Burton v Helix Resources NL. Objection to Exploration Licence 27/91. Objection dismissed on the basis that objector had no locus standi. Order made for costs against objector.

R. J. Burton v Jervois Mining Ltd. Objection to Exploration Licence 26/91. Objection dismissed on the basis that objector had no locus standi. Order made for costs against objector.

Various objectors v RNB Trading Pty Ltd. Objection to Exploration Licence 4/90. Matter still to be resolved.

MINES INSPECTION

The Mines Inspection Division comprises the Mines Inspection Branch and the Drilling Branch, and has responsibility for:

- monitoring working environments at mines and metallurgical works to ensure the health and safety of employees;
- assisting with the processing and monitoring of mining leases; and
- provision of a drilling service, principally for the Geological Survey and other Government agencies.

MINES INSPECTION BRANCH

GENERAL

The Mines Inspection Branch is engaged in the administration of the *Mines Inspection Act 1968 and Regulations*. The Branch also provides assistance to other divisions of the Department of Mines and to other agencies in regard to the administration of other legislation.

The Mines Inspection Act relates to mines, quarries, sand and gravel pits, metallurgical works and certain underground operations of the Hydro-Electric Commission. Crown operations of relevant nature are included.

Other pieces of legislation in which the Branch has some involvement include:

- The Dangerous Goods Act
- The Mining Act
- The Environment Protection Act
- The Industrial Safety, Health and Welfare Acts

Staffing the Branch for most of the year were four mining engineers, one mechanical engineer, one electrical engineer, two industrial chemists and two technical officers. A new industrial chemist joined the Branch in January 1992, replacing the retiree of April 1991. The strength of mining engineers remained at the depleted level of four, following the resignation of the then Chief Inspector in June 1991.

Work-place inspections continued to be carried out in routine fashion. Special investigations were undertaken following the occurrence of significant accidents and incidents. Complaints from the public regarding blasting and other mining activities, and from employees concerning unsafe conditions or work practices, were investigated and remedial measures were established. Occupational health monitoring programmes were undertaken at mines, quarries and works. Approvals were issued in respect of 62 diesel engines for use underground and for a number of plans and proposals associated with mining, shaft sinking and tunnelling operations. Examinations were held in connection with certificates of competency and certificates were issued to the successful candidates as shown in Table 1.

OCCUPATIONAL HEALTH SURVEYS

During the year, 17 surveys were undertaken by the Occupational Health Unit of the Mines Inspection Branch. This Unit comprises the two industrial chemists and the two technical officers. The operations at which these surveys were conducted were as follows:

<i>Operation</i>	<i>No. of Surveys</i>	<i>Samples</i>	<i>Field Days</i>
Pasminco Metals-EZ, Risdon	2	41	9
Temco	2	123	12
Savage River Mines, Savage River	1	137	9
Savage River Mines, Port Latta	1	164	19
Duncan Colliery	1	4	2
Mount Lyell	1	7	2
Industrial Sands	1	24	5
Nubrik	1	22	3
K & D Brick	1	33	4
Boral Quarries, Flowery Gully	1	12	2
Anchor Mine	1	61	6
Readymix Quarry, Mornington	1	20	3
Pioneer Quarry, Flagstaff Gully	1	22	3
Boral Quarry, Bridgewater	1	36	4
Ulverstone Quarries, Kimberleys Road	1	6	1
Total	17	712	84

In all but a very few cases, the samples taken were of atmospheric contaminants. Total inspirable dust was the predominant sample taken for the determination of the concentrations in the atmosphere of respirable dust and respirable quartz. The concentrations in the dust samples of such other contaminants as asbestiform minerals, cadmium, lead, manganese, fluoride particulates, respirable allergens and polyaromatic hydrocarbons were also determined in appropriate cases. Samples were also taken to determine concentrations in the atmosphere of acid mist, gaseous fluorides, carbon monoxide and sulphur dioxide.

Where testing indicated sub-standard conditions, measures were prescribed to improve employee protection.

MECHANICAL AND ELECTRICAL INSPECTIONS

All major mines, quarries and works were inspected by the mechanical and electrical engineers to ensure compliance with the regulations and relevant standards. Accidents and incidents involving mechanical and electrical equipment were investigated. Approval of diesel engines for use underground and certification of crane and winder drivers continued to be undertaken to suit industry's needs.

Assistance was given to the Dangerous Goods Inspectorate on matters including fuel tanks and tankers and hazard zoning.

LEASE INSPECTION AND REHABILITATION

Lease applications are inspected to verify the location of the lease and to determine lease conditions. Rehabilitation bonds were established in collaboration with the Department of Environment and Planning. Progress with rehabilitation was monitored by inspection.

Rehabilitation by the companies concerned was undertaken at all the major mine sites and also at a number of quarries and

Table 1
CERTIFICATES OF COMPETENCY

The following certificates of competency were issued by the Board of Examiners in accordance with the provisions of the Mines Inspection Regulations.

MINE MANAGER'S CERTIFICATES

<i>Certificate Number</i>	<i>Name</i>	<i>Date</i>	<i>Mine</i>
Metalliferous			
338/91	Leo Robert Dawson	20.12.1991	Mt Lyell
339/91	Peter Austen Myers	20.12.1991	Mt Lyell
340/91	Stuart Graham Scholes Smith	20.12.1991	Mt Lyell
341/92	Brian Baird Hamilton Dawes	30.04.1992	Hellyer
Restricted			
R13-91	Peter Austen Myers	9.08.1991	Mt Lyell
R14-91	Owen Peter Manson Griffiths	27.08.1991	HEC
R15-91	Cameron Charles Foot	27.08.1991	HEC

In addition, 49 restricted crane drivers' certificates of competency were issued.

gravel pits, chiefly following cessation of operations. Work on rehabilitating the King Island Scheelite site was completed in accordance with the approved Environmental Rehabilitation Plan.

LEGISLATION

The *Mines Inspection Regulations 1991* were gazetted in December 1991 and represent a complete revision of the old regulations. They are written in plain English and represent four years of work and preparation.

The *Mines Inspection Amendment (Registration and Notification of Construction) Bill 1990* succeeded in the House of Assembly but failed in the Legislative Council and therefore was not enacted. If the Bill had been enacted, regulations could have been made requiring fees to be paid for registration of premises and for construction and demolition undertaken.

Because of the dissolution of Parliament for the holding of State elections, the *Workplace Protection Bill 1991* and the *Occupational Health and Safety (Workplace Safety) Miscellaneous Amendment Bill 1991* failed to be presented to the Upper House for a second reading and consequently were not enacted. Both were presented to Parliament by the Department of Employment, Industrial Relations and Training and were passed by the Lower House. Both, if enacted, would have affected the Mines Inspection Act.

In December 1991, *Administrative Arrangements Order (No. 3) 1991*, made under the *Administrative Arrangements Act 1990*, placed administration of the Mines Inspection Act under the Minister for Employment, Industrial Relations and Training.

MEDICAL EXAMINATIONS FOR MINING INDUSTRY EMPLOYEES

Consequent upon the *Mines Inspection Regulations 1991* being promulgated, the provisions of the *Mines Inspection (Medical Examinations) Regulations 1991* are now presented in the *Mines Inspection Regulation 412 (Health checks)*.

This regulation provides for mining industry employees to be medically examined on a regular basis at the expense of the employer. The regulation is designed to replace the *Workers' (Occupational Diseases) Relief Fund Act*, shortly to be repealed, in making provision for such medicals.

Considerable progress has been made towards establishing the format of the medical examinations.

SAFETY SEMINAR AND AWARDS

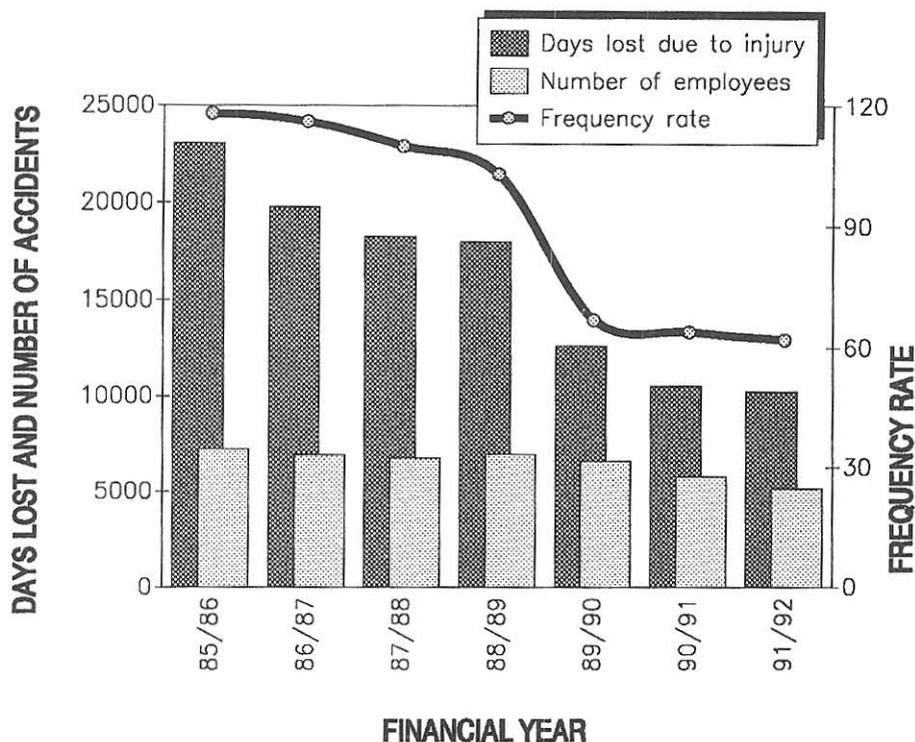
Another occupational health and safety seminar was staged during the year. The theme was *Health and Safety — Working Together* and the venue was the Launceston Country Club. Again, the Tasmanian Chamber of Mines was co-sponsor. A large gathering of employees' safety representatives, supervisors and managers from mining, mineral processing and other heavy industries attended and the seminar was generally considered to be the most successful held to date.

At the seminar, awards were made to the winners of the 1990/91 Department of Resources and Energy/Tasmanian Chamber of Mines Safety Competition. The Honourable Michael Weldon, the then Minister for Resources and Energy, made the presentations. The names of these winners were announced in last year's Annual Report of the Department of Resources and Energy.

The winners of the awards for 1991/92 were:

- Major contribution to mining industry safety — Tioxide Australia Pty Ltd
- Safest underground mine — Renison Limited
- Safest smaller surface operation — Tonganah Clay
- Safest larger surface operation — Goliath Portland Cement Co. Ltd

ACCIDENT STATISTICS, 1985-1992



HEALTH AND SAFETY TRAINING AND COMMITTEES

Members of the Mines Inspection Branch continued to give lectures on legislation, occupational health and general safety as part of the training of workers' safety representatives. Inspectors continued to attend safety committee meetings at mines and works.

MINE RESCUE

The Mines Inspectorate continued to be represented on the statewide Mine Rescue Committee. Inspectors officiated at the annual Tasmanian Mine Rescue Competition, which in 1991 was held at the Rosebery Mine of Pasmaenco Mining.

REPRESENTATION ON OUTSIDE ORGANISATIONS

The Branch continued to be represented on the following committees:

- Tasmanian Dams Safety Committee
- Chamber of Mines Occupational Health and Safety Committee
- Pasmaenco Metals-EZ Cadmium Committee
- Asbestos Advisory Committee
- SAA Committee ME/18 Mining Equipment
- SAA Committee EC/33 Mines Electrical Equipment
- SAA Committee MS/11 Hazard Zoning

With its mission successfully completed, the Asbestos Advisory Committee was disbanded.

ACCIDENT STATISTICS

The 1991/92 accident statistics are presented in Table 2. Figures for the underground operations at the Hydro-Electric Commission's Anthony Power Development scheme are shown in that table in the 'Employment and Accident Statistics 1991/92' but are not included in the 'Mine Injury Classification 1991/92' which follows, nor in the 'Accident Statistics 1985-1992'.

The endeavour to improve safety in the mining industry continued and the efforts throughout the year by management, employees and the Inspectorate to achieve this end were again rewarded. For the seventh year in succession, the numbers of lost-time accidents and days lost due to accidents were fewer than for the previous year. A decrease occurred in the incidence rate from 13% to 12% and also in the frequency rate, which dropped a further two points to the all-time low level of 62. The mean duration rate increased from 14 to 16 days per lost-time accident.

Accidents in 1991/92 resulting in one to three days lost time per accident accounted for 34% of the total; in four to ten days lost time, a further 35%; and in more than ten days lost time, a further 31%.

The number of accidents occurring underground was 105, or 16.8% of the total.

Two fatal accidents were recorded. Both occurred on the surface.

Table 2
EMPLOYMENT AND ACCIDENT STATISTICS, 1991/92
(IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 1885)

<i>Employer</i>	<i>Manhours Exposure</i>	<i>No. of Injuries</i>	<i>Days Lost</i>	<i>No. of Employees</i>	<i>Frequency Rate</i>	<i>Incident Rate (%)</i>	<i>Mean Duration</i>
Aberfoyle-Hellyer	503 500	35	477	273	70	13	13.6
Aberfoyle-Que River	7 890	0	12	4	0	0	-
Mount Lyell	940 520	59	1 127	451	63	13	19.1
Pasminco Rosebery	627 755	17	453	324	27	5	26.6
Renison	579 530	11	199	265	19	4	18.1
Savage River	472 919	48	368	222	101	22	7.7
Tasmania Mines	62 042	3	8	25	48	12	2.7
Tonganah Clay	26 483	0	0	15	0	0	-
All Mines	3 220 639	173	2 644	1 579	54	11	15.3
Comalco	1 730 347	219	4 149	985	127	22	18.9
Goliath Cement	470 136	3	22	231	6	1	7.3
Mole Creek	42 722	2	28	23	47	9	14.0
Pasminco-EZ Risdon	2 588 509	76	1 480	1 248	29	6	19.5
Port Latta	166 094	6	90	76	36	8	15.0
TEMCO	756 835	84	897	434	111	19	10.7
Tioxide Aust.	503 068	4	21	254	8	2	5.3
Ceramics	164 533	19	293	86	115	22	15.4
All Works	6 422 244	413	6 980	3 337	64	12	16.9
Tasmania Coal	11 158	0	0	6	0	0	-
Merrywood	24 491	3	14	13	122	23	4.7
Cornwall Coal	188 781	25	251	130	132	19	10.0
All Collieries	224 430	28	265	149	125	19	9.5
All Quarries	185 730	10	313	96	54	10	31.3
TOTALS	10 053 043	624	10 202	5 161	62	12	16.3
HEC Anthony	275 515	16	377	182	58	9	23.6

DEFINITIONS

FREQUENCY RATE

This is the number of lost-time injuries in the year, related to a million work-hour unit, as follows:

Lost Time Frequency Rate = Number of lost-time injuries × 1 000 000 / Work-hours exposure

INCIDENCE RATE

This is the number of lost-time injuries × 100 / Number of Employees

MEAN DURATION RATE

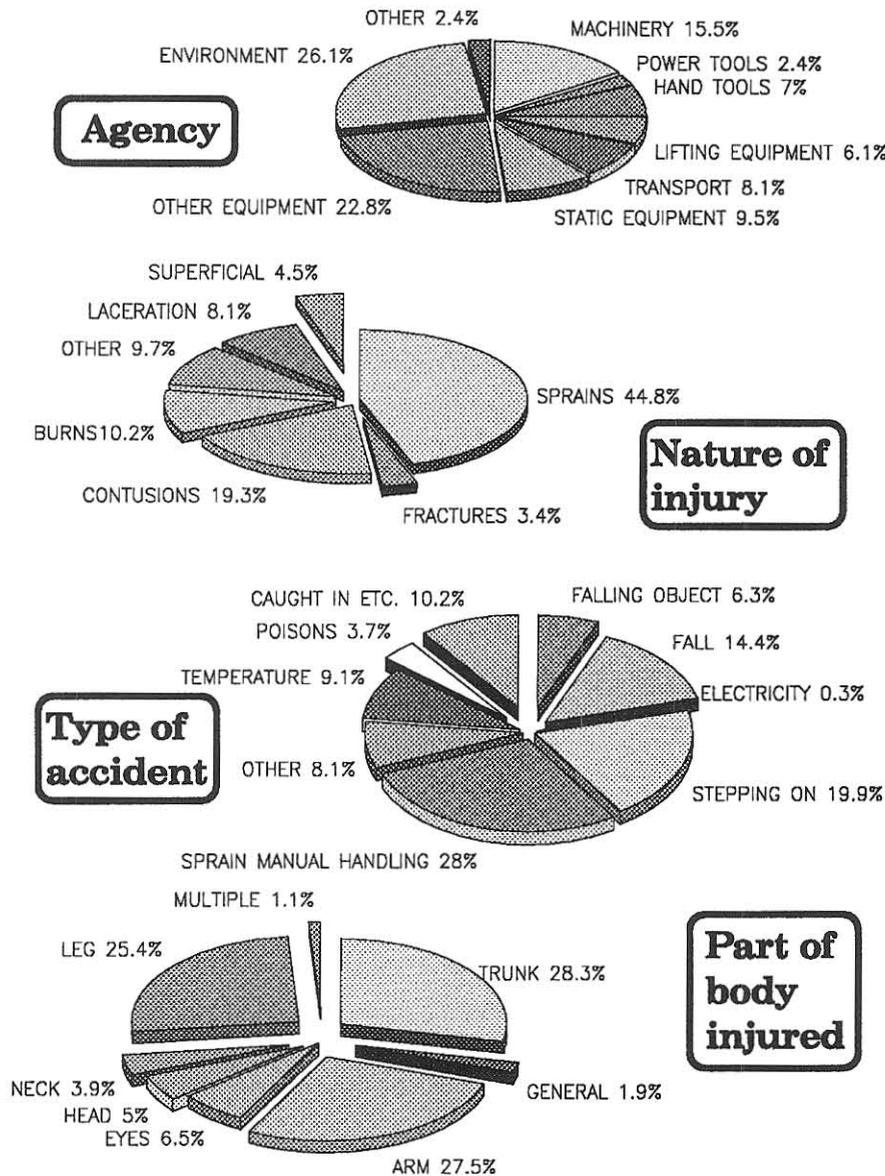
this is the time lost per lost-time injury, as follows:

Mean Duration = Days Lost (shifts) / Number of lost-time injuries

SEVERITY RATE

Severity Rate = Days (shifts) lost × 1 000 000 / Work-hours exposure

MINE INJURY CLASSIFICATION, 1991/92



Fatal Accidents

- ☐ J. Higbid, a contract diamond-drilling assistant, was killed at a surface drilling site as a result of being struck on the head by pieces of a bursting pulsation damper which was on line with a water-supply pump.
- ☐ J. A. Crawford, a contract driver, died as a result of the truck he was driving along a surface haul road capsizing and his head being crushed beneath the inverted cab.

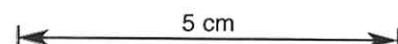
Non-Fatal Lost Time Accidents

The following are brief descriptions of the more serious non-fatal accidents which occurred.

Fall: An operator fell from the top of the prime-mover of his DJB-550 truck, receiving multiple fractures.

Falling objects: An underground operator suffered a broken leg when a length of rail being handled by a front-end loader dropped on him; an underground miner received back injury as a result of being struck on the head by a dislodged length of ventilation tubing; a miner received multiple bruising from being struck by a falling rock; in separate incidents, two miners were seriously hurt by falls of rib coal.

Other equipment: A contract sand blaster received hand lacerations as a result of being hit by a stream of sand whilst clearing an equipment blockage; a contract diamond-drilling assistant had four toes amputated by the drill ram striking his foot; a platman had an elbow fractured when his arm became jammed between two rail cars; an operator received fractures when his foot became jammed between two locomotives; a truck driver received whiplash injury to his neck when the raised tray of his truck struck the portal of an adit; an operator suffered a fractured fibula as a result of being struck by the bucket of a front-end loader; an operator received deep



lacerations in his right calf when he was struck by the extending ram of a pneumatic cylinder he was attempting to move; a truck driver received bruises to his body when his truck left the mine road and rolled over.

Electricity: An electrician suffered severe burns to his face, neck and hands when an electric panel serving an open-cut dewatering pump exploded; an employee received burns from an incorrectly wired holding furnace burner control panel.

Significant Incident

Two separate dust explosions and fires occurred in the zinc dust plant at Pasmaico Metals-EZ. The plant was shut down by the Inspector of Mines concerned pending redesign by consultants. Only one minor injury resulted.

DRILLING BRANCH

Two to three drilling crews operated for most of the year. At the beginning of the year, four crews were available. Because of the Government's cost-cutting requirements, the drilling strength was progressively reduced so that at the end of the year only one crew remained.

Again, drilling was chiefly undertaken for State agencies, in particular the Department of Roads and Transport, the

Department of Construction and the Geological Survey Division of the Department of Mines. A total of 6671 metres of drilling was achieved, as detailed in Table 3 and summarised below:

Stratigraphic drilling	1389 metres
Mineral investigation	160 metres
Site investigation	2153 metres
Groundwater drilling	2969 metres

Stratigraphic drilling was carried out near Mathinna and at St Leonards for the Launceston geodata project. Mineral investigation drilling was completed at Weld River. A geothermal investigation was started near Smithton and was still in progress at year end. All this work was undertaken on behalf of the Geological Survey Division.

Numerous site investigations were undertaken, the most important of which were at Sells Point, Risdon, Longford, Grindelwald and Hadspen. Water bores were drilled in the North East at Lilydale and Pipers River, and also in the Hobart area. Groundwater contours were determined by means of seven holes drilled at Benders Quarry in the South West Heritage Area. Dewatering holes were drilled at the Rosetta landslip.

Table 3
DRILLING RESULTS, 1991/92

<i>Location</i>	<i>Purpose</i>	<i>Drill</i>	<i>No. of Holes</i>	<i>Depth</i>
Diamond Drilling				
Mathinna	Stratigraphic investigation	Longyear 44 No. 2	3	547.5
St Leonards	Stratigraphic investigation	Longyear 44 No. 2	4	179.5
Weld River	Mineral investigation	Longyear 44 No. 2	2	159.5
Mathinna	Stratigraphic investigation	Longyear 44 No. 1	2	299
Risdon	Site investigation	Gemco 210D	21	243.1
Cambridge.....	Road investigation	Longyear 38 No. 2	6	100.2
Deloraine.....	Landslip investigation	Longyear 38 No. 2	3	51.5
			41	1580.3
Auger-Diamond Drilling				
Hadspen.....	Road investigation	Gemco 210D	6	59.4
Cooe.....	Road investigation	Gemco 210D	4	116
Devonport	Victoria Bridge	Gemco 210D	5	82.7
Pateena Rd.....	Road investigation	Gemco 210D	6	76.2
Cambridge.....	Road investigation	Gemco 210D	9	84.1
CSIRO	Site investigation	Gemco 210D	1	25.8
Coal River	Bridge investigation	Gemco 210D	6	53.2
Taroona High School	Landslip investigation	Gemco 210D	10	215.5
Deloraine	Road investigation	Gemco 210D	6	67.5
Illawarra Road.....	Road investigation	Gemco 210D	4	59.8
Selfs Point	Site investigation	Gemco 210D	2	26.7
Grindlewald.....	Site investigation	Gemco 210D	6	59.7
Exton Overpass	Site investigation	Gemco 210D	2	33.8
Westbury	Road investigation	Gemco 210D	4	48.5
			71	1008.9
Rotary-hammer drilling				
Scottsdale.....	Groundwater	Warman 1000	1	54
Pipers River	Groundwater	Warman 1000	4	224
Lilydale	Groundwater	Warman 1000	2	132
Lune River.....	Groundwater	Warman 1000	7	419
Mt Rumney	Groundwater	Warman 1000	4	240
Colebrook	Groundwater	Warman 1000	4	242
Jericho	Groundwater	Warman 1000	7	498
Rosetta	Dewatering holes	Warman 1000	3	162
Smithton	Geothermal investigation	Warman/Longyear 44	1	363.1
Longford	Site investigation	Warman 1000	3	35
Sorell	Groundwater	Warman 1000	6	366
Dodges Ferry.....	Groundwater	Warman 1000	3	222
Pontville.....	Groundwater	Warman 1000	6	95
Brighton.....	Groundwater	Warman 1000	1	27
Stonor	Groundwater	Warman 1000	2	60
Parattah	Groundwater	Warman 1000	11	390
Hadspen.....	Bridge site	Warman 1000	39	552.8
			104	4081.9
		TOTAL	216	6671.1

MINING INDUSTRY — MAJOR OPERATIONS

MINES

ABERFOYLE RESOURCES LIMITED (HELLYER DIVISION)

Operations at the Hellyer underground mine continued, resulting in 1 261 000 tonnes of ore being mined and 1 330 000 tonnes of ore being milled. The ore mined contained on average 13.0% Zn, 7.2% Pb and 149 g/t Ag. The milled tonnage included ore from the Que River mine.

Sub-level open stoping again produced the bulk of the ore mined. Pillars recovered under hangingwall cave conditions and development were other sources of ore.

Concentrate production for the year was as follows:

- zinc concentrate — 224 787 tonnes @ 51.2% Zn and 3.2% Pb;
- bulk concentrate — 85 967 tonnes @ 33.4% Zn, 16.3% Pb and 282 g/t Ag;
- lead concentrate — 62 251 tonnes @ 61.0% Pb, 7.6% Zn and 569 g/t Ag;
- copper/silver concentrate — 8671 tonnes @ 5050 g/t Ag and 12.7% Cu.

During the year, exploratory diamond drilling, directed towards determining the southern extremity of the Hellyer orebody, intersected previously unknown subeconomic barite mineralisation west of the Jack Fault. Infill diamond drilling of the orebody at a spacing of 20 metres from sites within the mine and on surface was completed. Further infill drilling at intervals of 10 metres was carried out in zones of structural complexity.

Ore reserves as at 30 June 1992 were reported to be 12.0 million tonnes containing 11.9% Zn, 6.0% Pb, 0.3% Cu, 140 g/t Ag and 2.2 g/t Au.

Capital expenditure for the year amounted to \$6.4 millions. Raising of the tailings dam and underground development were the chief items.

The workforce strength was constant over the year at 247 employees, including contractors.

ABERFOYLE RESOURCES LIMITED (QUE RIVER DIVISION)

Because of exhaustion of the resource, mining operations ceased on 30 November 1991, following which the pumps were removed and the mine was allowed to flood.

In the year prior to closure, 37 844 tonnes of ore were produced and 43 metres of development were advanced.

A total of 72 981 tonnes of broken ore at 11.02% Zn, 5.29% Pb, 0.52% Cu, 149 g/t Ag and 1.3 g/t Au was transported to the Hellyer concentrator, thus depleting all the Que River stockpiles.

All operating personnel were retrenched by the end of December and environmental rehabilitation of the mine area commenced.

Because of the presence of facilities utilised by the Hellyer mine, such as explosives magazines, batching plant and administration offices, Aberfoyle Resources will be retaining the Que River mineral lease.

BEACONSFIELD OPERATIONS PTY LTD, BEACONSFIELD

Lack of funds resulted in development work ceasing before the end of last financial year and exploration following suit shortly afterwards. Pumping at the Hart Shaft halted in November 1991, with the water level in the shaft at 160 metres below the collar.

Water is rising in the Hart Shaft at the average rate of 0.5 metres per week and on 30 June 1992 the level was at 141 metres from the collar. It is the declared intention of Normandy Poseidon, the new managers, not to allow the level to rise above 120 metres from the collar.

THE CORNWALL COAL COMPANY NL, FINGAL

The Cornwall Coal Company operates underground mines and an open cut at Blackwood, near Cornwall; the Duncan underground mine near Fingal; and a washery at Fingal. Production from the mines during the year totalled 480 168 tonnes of raw coal. Washery production amounted to 293 204 tonnes of saleable coal from the treatment of 480 456 tonnes of raw coal. Customer demand was weak over most of year because of the depressed economy, and the level of sales was down on that of last year.

Blackwood

Pillar extraction continued at Blackwood No. 1 underground mine, where a new Joy 12CM12 continuous miner with remote controls was introduced. Reserves have been depleted to the extent that production at the current level can only be supported until the end of calendar 1992.

Development at Blackwood No. 2 underground mine has advanced to 1000 metres from the adit portals. Drifts have been driven in sandstone at two major faults to access resources lying to the west and north of the headings driven from the points of entry. This mine will replace No. 1 as a principal coal producer when No. 1 becomes exhausted.

Raw coal production from these two mines totalled 276 173 tonnes. No coal was mined in the open cut.

Duncan

Development proceeded to a distance of 6.5 kilometres from the point of entry and was then halted. Adverse geology and long travelling time made further advance uneconomic. Pillar extraction was commenced and continued throughout the rest of the year. Raw coal production amounted to 203 995 tonnes.

General

During the year, administration was moved from Launceston to Fingal. Company employment was reduced from 138 to 127.

**MERRYWOOD COAL COMPANY PTY LTD,
ROYAL GEORGE**

In 1991, Avoca Transport Company Pty Ltd officially changed its name to the Merrywood Coal Company Pty Ltd. During the year under review, the Merrywood Coal Company operated at Merrywood, near Royal George, open-cut mining *in situ* coal left behind by an old underground mine. Over the year, 400 000 cubic metres of overburden were removed and 61 900 tonnes of raw coal were mined and processed. Sales for the year amounted to 52 600 tonnes of processed coal.

Processing is carried out by means of crushing and sizing. Modification to the plant during the year included a new screen to reduce product top size and cyclones to improve fine coal quality. Recovery of saleable coal from raw-coal feed is claimed to be 85%.

The company's workforce comprises 13 full-time employees at Merrywood plus 3 full-time and 1 part-time at the company's Launceston workshop. The road-hauling contractor associated with the operation employs five full-time truck drivers.

**MINETECH RESOURCES PTY LTD
— SOUTH COMET MINE, DUNDAS**

Minetech Resources operated the South Comet Mine throughout the year. Mining produced 30 250 tonnes of ore, of which 29 541 tonnes at 11.2% Zn, 4.6% Pb and 92 g/t Ag were treated in the Pasmenco concentrator at Rosebery.

A decline from the lowest adit level to access ore lying below was commenced in January 1992 and will continue to be developed. A small diamond-drilling programme was started before year end to determine the extent and grade of any ore lying below the known ore horizon.

**THE MOUNT LYELL MINING AND RAILWAY CO.
LTD, QUEENSTOWN**

Mine production totalled 1 685 114 tonnes of ore at an average grade of 1.53% copper. Of this total, 1 582 087 tonnes of ore was hoisted by the Prince Lyell No. 1 Shaft, the rest being trucked to the surface by way of the Main Decline.

The tonnage achievement was appreciably better than for the previous year and only slightly below the budget requirements. The grade achievement was 0.12% copper below the requirement. Mine production and crush and hoist crews worked 12-hour shifts on a continuous operation basis, commencing from the third week of the year. This is believed to have significantly contributed to the mine achieving near-budget tonnage. Grade suffered as a result of the poor grade performance of pillar 513.

Prince Lyell pillars 513, 52 and 53 were blasted down during the year and production from the first stope in the 60 Series commenced late in the year. Production from the Royal Tharsis orebody ceased during the year.

Mine development for the year amounted to 3677 metres of driving and 340 metres of rising, inclusive of raise-bored holes. A total of 3027 metres of driving was achieved in the 60 Series, inclusive of the 60 Series Decline which advanced 76 metres.

The rest of the driving was achieved in the 50 Series, where development of 115 Sub and 200 Sub was completed.

The concentrator operated on 256 days, treating 1 679 769 tonnes of ore to produce 88 458 tonnes of copper concentrate and 80 229 tonnes of pyrite concentrate. The copper concentrate contained 23 540 tonnes of copper, 3 459 960 grams of silver, and 565 862 grams of gold. A 19 shifts per week continuous roster was in place until changed to a 4 days, 12 hours per shift roster nearly halfway through the year.

Capital expenditure totalled \$3.5 million, of which mine development accounted for \$2.6 million. Equipment purchases included an 11 kV substation for underground and an underground communications systems.

Exploration carried out on the lease included downhole SIROTEM, diamond drilling and 1:1000 scale mapping. The diamond drilling comprised one hole of 560 metres to test an anomaly identified by the SIROTEM survey. All the work was undertaken at Comstock.

Ore reserves as at 30 June 1992 are reported to be as follows:

- proved — 3 012 990 tonnes @ 1.78% Cu, 0.51 g/t Au and 3.05 g/t Ag;
- probable — 1 934 098 tonnes @ 1.74% Cu, 0.50 g/t Au and 3.11 g/t Ag.

A report by Flitcroft and McKeown on the resource potential of the Mount Lyell lease, bearing the title "Old Mines — New Vision" gives an estimate of ore potential from 22 sources, excluding the North Lyell-Crown Lyell area, at 396 million tonnes at 0.6% copper. This potential ore is over and above the indicated and inferred resources that are quantified in the company's ore reserve statement.

The strength of the workforce averaged 453 employees for the year.

PASMINCO MINING, ROSEBERY

Ore production from the Rosebery mine, at 538 528 tonnes, was 10% below the budget requirement. However the headgrade of mine production was appreciably above target. Much of the tonnage shortfall was due to a shortage of ore sources as a result of the inability during the year to make a start on extracting the 15 level crown pillar remnants.

Mining of the 15 level crown pillar remnants was delayed because of the need to retain use of the 14 level pump station until such time as the 17 level pump station becomes capable of pumping directly to 7 level. Any extraction of the crown pillar remnants would have rendered the 14 level facility unusable.

Development achievement, at 2919 metres, fell short of the budget requirement by 27%. Priority was placed on 'J' lens stope preparation, where production is scheduled to commence in 1992/93, together with the extension of the Main Decline and 19 level haulage towards 'B' lens in the far north of the mine.

Work continued in the 17 level pump station, where one high-lift Mars pump was operational pumping dirty water at year end. A permanent pump installation on 19 level was completed and commissioned. Shaft facilities were improved by modification of the maintenance system for the loop-rise switch and upgrading of the skip retarder system.

A total of 567 720 tonnes of ore was milled at the Rosebery concentrator at a head grade of 11.12% Zn, 3.56% Pb, 96 g/t Ag and 2.5 g/t Au. Small mines contributed 29 540 tonnes to this total. No ore was taken from the Que River mine.

Concentrate production was as follows:

- zinc concentrate — 105 416 tonnes @ 53.6% Zn;
- lead concentrate — 21 861 tonnes @ 65.4% Pb and 1,294 g/t Ag;
- copper concentrate — 5638 tonnes @ 27.2% Cu, 5.4% Pb, 1,777 g/t Ag and 84.1 g/t Au.

Zinc recovery to concentrates was the highest on record. Concentrate qualities were the best ever realised.

A gold doré plant was commissioned in April 1992 with an output potential of 350 kg per annum of gold in doré.

Exploratory diamond drilling amounted to 9936 metres for surface sites and 23 559 metres from underground sites. Ore reserves were added to in 'J' lens and in 'B' lens.

Ore reserves as 30 June 1992 were reported to be as follows:

- proved ore — 1.5 million tonnes @ 3.1% Pb, 9.6% Zn, 0.52% Cu, 109 g/t Ag and 2.4 g/t Au;
- probable ore — 3.3 million tonnes @ 3.7% Pb, 11.8% Zn, 0.42% Cu, 138 g/t Ag and 2.3 g/t Au.

A total of \$2,274,000 was committed to capital items. Work related to the deviation of the Emu Bay Railway line around the Bobadil tailings dam and the raising of the dam continued. Automation of the sandfill pumping station was in progress at year end.

The workforce was further reduced during the year, from 340 employees at the beginning of the year to 300 at the end. The use of contract labour increased.

RENISON LIMITED, RENISON BELL

Renison operated for most of the year under the Renison 91 Survival Plan, which was designed to minimise operating costs and maximise tin production to counter the low tin prices which prevailed. During the latter part of the year, the concentrator operated on 12-hour shifts according to a roster of 10 operating days followed by four maintenance days. This scheme halves the number of plant shut-downs and start-ups necessary over a year and increased the time available for maintenance.

Tin production for the year was slightly ahead of budget, and overall performance corresponded to the survival plan. Ore produced from underground was 532 061 tonnes at 1.48% Sn and ore treated in the concentrator amount to 533 880 tonnes at 1.41% Sn. Concentrate produced was 11 212 tonnes, having a grade of 53.6% Sn and a tin content of 6007 tonnes.

Primary development headings were advanced a total of 1409 metres, which was slightly more than the budget requirement. Included in this total was 246 metres achieved in the North Renison Decline. This decline was recommenced during the year and is heading towards the Renison Deep (RenDeep) resource.

The RenDeep resource lies at the northern end of the mine, below 600 metres from the surface. Exploration drilling to

delineate this resource, amounting to a total of 12 663 metres, was carried out mostly from surface. The extension of the North Renison Decline will provide a drilling platform for further evaluation of the area as well as access for future mining.

Ore reserves as at 1 January 1992 were reported to be as follows:

- proved ore — 1.9 million tonnes at 1.4% Sn;
- probable ore — 3.4 million tonnes at 1.4% Sn.

Employment increased by 19 over the year to be 250 employees at year end.

RGC (TAS.) LTD AND LITTLE RIVER RESOURCES PTY LTD — HENTY PROJECT

A 21-year duration mine lease was granted at the beginning of the financial year. Following submission of an Environmental Management Plan, a Licence to Operate Scheduled Premises was also granted. Application was made for an easement to accommodate tailings ponds and associated infrastructure.

A 575 metre deep vertical hole was diamond drilled at the proposed shaft location on Gooseneck Hill to determine ground conditions and water pressures. No exploration drilling was undertaken after July 1991.

Capital expenditure on diamond drilling, environmental monitoring, and rehabilitation and engineering studies totalled \$690,700.

SAVAGE RIVER MINES

The 5-year operating plan which was evolved following the purchase of the company by Pickands Mather and Co. International late in September 1990 was based on the production of 1.3 million tonnes of saleable product per annum. Increased demand by the Australian and Asian markets resulted in production being raised to the rate of 1.4 million tonnes per annum.

Negotiations on the price of pellets resulted in a reduction of 7% being effective from April 1992. Confidence in the market has led the company into undertaking a feasibility study for a further five years of operation after 1995.

Material movement from the three open cuts amounted to 10.6 million tonnes. This tonnage included 4.13 million tonnes of ore fed to the mill, from which 1.481 million tonnes of magnetite concentrate were produced. The Port Latta plant produced 1.452 million tonnes of pellets. Sales amounted to 1.510 million tonnes of pellets and 71 361 tonnes of concentrate and chips, all of which were shipped utilising the Port Latta ship-loading facility.

Waste stripping of the Northern Deposit continued to have high priority in an attempt to make good the situation which developed as a result of the proposed mine closure. The north end of the Central Pit provided most of the ore sent to the mill during the year. Development of a northern extension to the South Lens Pit was in progress at year end.

The only exploratory drilling undertaken was a small programme to define the zone of mineralisation lying between the South Lens and the Northern Deposit.

Capital expenditure activity included the diamond-drilling programme, plant corrosion control, and mine site rehabilitation.

A small reduction in workforce number occurred, from 308 at the beginning of the year to 296 at the end. These numbers relate to the total from Savage River, Port Latta and Wynyard.

SPECTRUM RESOURCES — ANCHOR MINE, LOTTAH

Low tin prices and failure to achieve operating cost targets forced Spectrum Resources to place the Anchor Mine on care and maintenance as from December 1991.

Before closure, 544 metres of underground development was undertaken resulting in 29 000 tonnes of ore being produced. At the same time 36 300 tonnes of ore were milled at a head grade of 0.43% Sn, resulting in 180.5 tonnes of concentrate being produced at an approximate grade of 61% Sn.

Major modification to the concentrator was effected by the installation of a new rod-mill grinding circuit.

TASMANIA COAL COMPANY — HUNTSMANS COLLIERY, MT NICHOLAS

Operations continued on a small scale at the Huntsmans open-cut coal mine, situated at the foot of Huntsmans Cap, Mount Nicholas, near St Marys. Approximately 103 000 cubic metres of overburden were stripped during the year and 13 500 tonnes of coal were mined.

Three seams are mined by the open cut; these are referred to as the M1, the M2A and the M2. Only coal from the M2 seam is treated and offered for sale. Coal from the M1 and M2A seams is stockpiled for possible future treatment in a washing facility.

Treatment currently amounts to crushing only to the size range required by the customer.

Market penetration has so far not been substantial. Sales for the year amounted to 5750 tonnes.

TASMANIA MINES LIMITED — KARA MINE

Operations at the Kara Mine comprised open-cut mining and the milling of the ore so produced, plus tailings reclaimed for stockpile. A total of 81 440 tonnes of ore and 34 050 tonnes of waste were mined at the Kara No. 1 open cut. An additional 700 tonnes of ore were produced from the Kara North deposit for testing in the mill. The reclamation of 105 272 tonnes of magnetic tailings and 19 698 tonnes of non-magnetic tailings provided further mill feed material.

A total of 254 416 tonnes of ore and tailings were treated by the mill. Scheelite and magnetite concentrates produced amounted to 493 tonnes and 147 877 tonnes respectively. The grade of the scheelite concentrate was 41.9% WO₃.

Tests were carried out by the APPM Research Department (Burnie), by BHP Raw Materials (Port Kembla), and in the Kara mill on 2437 tonnes of magnetite skarn material won from a recently granted mineral lease in the vicinity of the Blythe River. Results of these tests are encouraging.

At year end, the workforce comprised 16 full-time employees, 1 part-time employee and 3 contractors. Company employees

took over the mining operations from contractors during the year. Rock haulage continued to be the function of contractors.

WORKS

COMALCO ALUMINIUM (BELL BAY) LIMITED, BELL BAY

The manufacture of carbon products, smelting of alumina, metal alloying and casting continued to be the principal activities at the works. Production of aluminium totalled 122 570 tonnes, of which 88% was in the form of ingots, blocks and T-bars. Other forms of product included billets, granules, powder, paste and hot metal for Southern Aluminium Pty Limited.

Raw materials consumed included 234 485 tonnes of alumina from Gladstone, Queensland, and coke, furnace oil, pitch, aluminium fluoride and synthetic cryolite from interstate and overseas.

Upgrading of plant and processes continued. A new liquid pitch plant was completed and commissioned, and a new employee's amenities complex and a rehabilitation and fitness centre were built and equipped. Capital expenditure for the year amounted to \$19,230,000.

GOLIATH PORTLAND CEMENT CO. LTD, RAILTON

Clinker production for the year was 539 000 tonnes, which permitted a further 95 000 tonnes of clinker to be added to stocks. These stocks are now sufficient to enable cement production to continue without interruption over the 4-months clinker production stoppage which is planned to occur late in calendar year 1992. Modification to the clinker plant will be undertaken during this stoppage, allowing the rate of cement production to be stepped up from 2000 to 3000 tonnes per day.

Further construction work was undertaken during the year in connection with the plant expansion scheme. A total of \$70.4 million was spent on items of a capital nature.

Overburden stripping at the existing quarry amounted to only 15 000 cubic metres instead of the usual 250 000 cubic metres. This was because limestone production from this source is now being phased out. Overburden stripping from the replacement quarry is planned to commence during the 1992/93 summer.

No exploration was undertaken, as limestone reserves sufficient for another 150 years at the increased production rate have already been established.

The number of permanent employees decreased during the year from 213 to 207.

IMP SILICA, HEYBRIDGE

IMP (Index Mineral Processors) commenced production of silica flour at the former MK Silica plant in January 1992. Difficulty was experienced in meeting the client's quality specifications and early operation was sporadic in consequence. It is believed that this difficulty had been surmounted by year end.

PASMINCO METALS-EZ, RISDON

A new record production level of 209 444 of marketable zinc metal was achieved. Zinc concentrate roasted amounted to 434 465 tonnes, which was also a plant record. Good production levels were achieved for cadmium (493 tonnes), lead residue (42 441 tonnes), copper sulphate (1859 tonnes) and sulphuric acid (359 100 tonnes).

Capital expenditure for the year was \$19.5 million. Construction of the new Effluent Treatment System was completed and commissioning took place. Work commenced on construction of the No. 5 Acid Plant. The old Calcine Plant was demolished.

Employee number at year end was 1,196.

PIONEER SILICON INDUSTRIES, ELECTRONA

Closure of operations duly took place on 26 August 1991. The plant was subsequently purchased by Hazell Brothers.

TASMANIAN ELECTRO-METALLURGICAL COMPANY, BELL BAY

Temco, Australia's only ferro alloy plant, has been operated by BHP at Bell Bay since 1962.

Production for the year amounted to:

- 70 603 tonnes of ferromanganese;
- 75 482 tonnes of silicomanganese;
- 18 904 tonnes of ferrosilicon; and

- 251 572 tonnes of sinter.

Approximately 65% of these products were exported.

Raw materials consumed amounted to 412 365 tonnes from Australian mainland sources, 134 308 tonnes from Tasmanian sources, and 35 461 tonnes from overseas. Materials from the mainland comprised Groote Eylandt manganese ore; iron ore, quartz and coke from Whyalla; and coal and coke from New South Wales. Tasmanian-sourced materials comprised silica, limestone, dolomite, woodchips and iron ore pellets. Coke and electrode paste were imported from Japan and Norway respectively.

No major capital works were undertaken. Small capital projects undertaken during the year, including a silicomanganese storage shed, continuation of the spillage collection project, and the relining of No. 1 Furnace, cost \$4.47 million.

TIOXIDE AUSTRALIA PTY LTD, HEYBRIDGE

Market conditions improved only slightly over the conditions which prevailed last year. Titanium oxide production reflected that slight improvement.

Capital expenditure, which amounted to \$300,000, was directed towards plant replacement, environmental control and site rehabilitation.

The scale-down of operations and consequent restructuring of the workforce was completed. Employment was reduced from 236 to 206 persons.

DANGEROUS GOODS INSPECTORATE

INTRODUCTION

Over the years, accidents involving the manufacture, storage, handling and transport of dangerous goods have amply shown that there are particular risks inherent in these operations. Therefore, the legislative measures contained in the *Tasmanian Dangerous Goods Act 1976* and *Dangerous Goods Regulations 1990* are in place to control the inherent risks and to reduce the residual risks associated with dangerous goods operations to levels which are As Low As Reasonably Practicable (ALARP). The physical or chemical characteristics of most dangerous goods means that, at best, the residual risks can only be reduced to ALARP levels, they can seldom, if ever, be considered negligible in absolute terms.

As it is generally recognised that, with dangerous goods, a residual risk is always present, it is important that the legislative process imposes a requirement for emergency response planning in order to mitigate the consequences of an accident. An emergency response plan in combination with HAZCHEM placarding enables emergency responders to provide an immediate and appropriate response in the event of a dangerous goods accident. These provisions have been drafted into the *Dangerous Goods Regulations 1992*, currently awaiting instructions from the Department of Premier and Cabinet concerning their implementation.

When considering the concept of inherent and residual risk it can be appreciated that safety is something that does not just happen, it has to be created. Therefore, the primary objective of the State Dangerous Goods Inspectorate (DGI) is to enforce the Act and Regulations so that the level of risk associated with dangerous goods does not jeopardise the safety of the public, property or the environment. This objective also requires a commitment from the management of the dangerous goods industry to legislative compliance and the maintenance of technical integrity through competent operational practices.

DANGEROUS GOODS ACT 1976 AND REGULATIONS 1990

The scope of the Tasmanian dangerous goods legislation covers the basic questions of classification, placarding, labelling, packaging, storage, conveyance, licensing, site inventories, emergency response planning, investigation of incidents and specific requirements based on the Australian Dangerous Goods Code, the Australian Explosives Code and the Australian Standard.

There were no amendments to the *Dangerous Goods Act 1976* pertaining to dangerous goods. However, the *Administrative Arrangements Act 1990* was amended by the *Administrative Arrangements Amendment Order (No. 3) 1991*, gazetted on 25 December 1991, which transferred responsibility for the administration of the *Dangerous Goods Act 1976* from the Department of Resources and Energy (DRE) to the Department of Employment, Industrial Relations and Training (DEIRT). The afore-mentioned amendment was gazetted without prior warning or notification to the Inspectorate and, in effect, stymied the planned gazetting of *Dangerous Goods Regulations 1992* in January 1992.

The *Dangerous Goods Regulations 1992* are primarily a re-draft of the *Dangerous Goods Regulations 1990* in order to

integrate the Fireworks Amendment Regulations of 1991 and to incorporate the Worksafe Australia guidelines on HAZCHEM placarding, emergency response planning and inventory requirements, into a consolidated document for ease of reading.

The *Dangerous Goods (Fees) Regulations 1992* were developed concurrent with the *Dangerous Goods Regulations 1992* in order to facilitate the changes in the afore-mentioned regulations.

MAINTENANCE AND DRAFTING OF LEGISLATIVE CONTROLS

Much time and effort has been spent by dedicated Government and industry representatives throughout Australia in adopting the sound principles contained in the complex texts of UN Committee of Experts, Recommendations on Dangerous Goods, into national codes and standards adopted by reference in State legislation. The successful culmination of this work means Tasmanian dangerous goods legislation can be maintained and fine-tuned in a cost-effective manner through active participation in the various Sub-Committees of the National Advisory Committee on the Transport of Dangerous Goods (ACTDG) and relevant Standards Association of Australia (SAA) standing committees.

The principles contained in international and national codes and standards, as embodied or adopted by reference in the *Tasmanian Dangerous Goods Regulations*, achieve:-

- (i) harmonisation with international codes and standards formulated by internationally recognised expert panels and committees on dangerous goods; and
- (ii) harmonisation with national codes and standards in the interests of uniform State and Territory legislation.

The Inspectorate is represented on the following standing committees:-

- Advisory Committee on the Transport of Dangerous Goods
- Advisory Committee on the Transport of Dangerous Goods — Competent Authorities Sub-Committee
- Advisory Committee on the Transport of Dangerous Goods — Drafting Sub-Committee
- Advisory Committee on the Transport of Dangerous Goods — Explosives Drafting Sub-Committee
- Australasian Conference of Chief Inspectors of Explosives
- Australian Liquid Petroleum Gas Association — Working Committee
- MOLAC Senior Officers Group (Dangerous Goods)
- Standards Association of Australia — CE/5 Committee on Explosives
- Standards Association of Australia — CH/9 Committee on Chemicals

- Standards Association of Australia — ME/15 Working Committee on LP Gas
- Standards Association of Australia — ME/17 Working Committee on Flammable and Combustible Liquids
- Southern Regional Disaster Planning Group
- Tasmanian Hazardous Substances Management Committee and Associated Working Groups.

The standing National Advisory Committee on the Transport of Dangerous Goods, 5th Edition of the *Australian Code for the Transport of Dangerous Goods by Road and Rail* will be published by the end of July 1992.

The new edition of the Standards Association of Australia Australian Standard AS1940 — *The Storage and Handling of Flammable and Combustible Liquids* — will be published around July 1992.

EDUCATIONAL SERVICE TO INDUSTRY

The Inspectorate provides a training and consultancy service to industry in all areas of its activities. This service provides the Inspectorate with the opportunity to liaise and develop a rapport with industry in relation to the legislative controls governing dangerous goods.

The Inspectorate has been instrumental in developing, organising, presenting or actively participating in the following training initiatives:—

- The development and participation in the 'approved' training course for the Tasmanian Transport Industry Skills Centre in conjunction with the National Road Transport Industry Training Committee in relation to the training of drivers responsible for the transport of dangerous goods.
- Developing, organising and presenting 'approved' shot-firers course and examination system within the State in accordance with the requirements of the *Dangerous Goods Regulations 1990*.
- Participation in the Agricultural and Veterinary Chemicals Association of Australia training courses in Tasmania in conjunction with Tasmanian Adult and Further Education (TAFE) programmes.
- The Inspectorate has also been pro-active in encouraging the dangerous goods industry to run training seminars for staff in relation to technical and legislative controls associated with dangerous goods.

STAFF

The Inspectorate recognises the importance of training and, this year, Inspectors have undertaken, or commenced, the following training courses:—

- (a) Three year, part time, University of Tasmania, Associate Diploma Course on 'Emergency Management'. The course covers the application of safety standards, risk assessment techniques, and emergency response planning methodology.
- (b) ICI Engineering training courses on:—
 - (i) Process Plant Risk Analysis Course

(ii) Hazardous Areas Seminar

(iii) Chlorine and Ammonia Gas Seminar

An internal working group, known as WG6.1, has produced draft *Guidelines for the Storage of Pesticides*. The final document, when published, will be used as a reference manual on the regulatory requirements for the storage of pesticides in Tasmania by both the dangerous goods industry and the Inspectorate.

The members of WG6.1 are to be commended for their efforts in producing a very concise, user friendly, working document, covering a very complex legislative area. In producing such a document, the Inspectorate has once more demonstrated what can be achieved by a small, highly motivated team.

The Inspectorate's ability to act as an integrated team enabled it to maintain a full range of services to the public and industry through a sustained period of operational instability as a result of the State Occupational Health and Safety (OH & S) Review. The report of the review body predictably concluded that the Inspectorate should be transferred to DEIRT, in line with the terms of reference provided by the latter body.

While the report of the review body recognised that the Act and Regulations did not place any responsibility on the Inspectorate for OH & S functions, it failed to recognise that the approaches used for the management of occupational safety are not adequate for technical safety in the dangerous goods field of inherent risk with potential for major accidents. While occupational and technical safety may be complementary fields of safety, they are at different ends of the risk spectrum and require different approaches, different disciplines and different staffing.

DANGEROUS GOODS INSPECTORATE ACTIVITIES

The Inspectorate carried out 158 safety enforcement inspections in relation to the monitoring of bulk imports and exports of Class 1, 2.1, 3.1, 3.2 and 5.1 dangerous goods through the ports of Stanley, Burnie, Devonport, Bell Bay and Hobart.

There was a relative decrease in this activity of 5% when compared with the 1990/91 figure of 166. Full statistical details are contained in Tables 2 and 3.

The Inspectorate carried out 2156 random and statutory safety inspections in relation to licensed storage and retail sale outlets of dangerous goods. This figure represents a relative increase of 8% in this activity when compared to the 1990/91 inspection figure of 2003.

There were 318 planning proposals approved which, despite the current recession, showed a relative increase of 32% over the 1990/91 figure of 240. This activity initiated 442 statutory inspections in connection with processing planning approvals for the licensing of new premises and the alteration of existing licensed dangerous goods premises.

Full statistical information in relation to licences, permits and approvals issued for the import, manufacture, storage, use and sale of dangerous goods is contained in Table 1.

Technical, legislative and general enquiries take up a considerable proportion of the Inspectorate's time and 6905 such calls were recorded. A conservative estimate indicates

that, on average, each lasted 0.25 hours and would have utilised the services of one Inspector for 46 weeks.

The explosives magazine at Dilston handled 6424 issues and 5619 deposits, representing a total throughput of 12,043 cases. This figure represents a relative decrease in magazine throughput of 12% on the 1990/91 figure of 13,714. Full statistical records for the total amount of explosives and explosive-grade ammonium nitrate imported into the State during the year are contained in Table 3.

Activities in relation to shot-firer training and examinations continues to increase, with the issue of 153 'shot-firer permits' representing a relative increase of 16% when compared with the 132 'shot-firer permits' issued in 1990/91.

Requests for assistance on the disposal of any hazardous material that cannot be properly disposed of at the premises at which they are kept were dealt with by the Inspectorate. To this end, the Inspectorate acts in an advisory capacity only, in relation to packaging and storage within the jurisdictions of the source of origin prior to disposal. All matters relating to the movement of hazardous waste is referred to the Department of the Environment and Planning.

INCIDENTS

There were 41 incidents investigated involving dangerous goods, eight less than last year. The majority of the incidents can be attributed to human failure and non-compliance with existing legislation. It is seldom clear in such circumstances if new legislative initiatives would have prevented them. Three incidents are summarised below to illustrate some of the points covered in the report:

Human Ingenuity

In this incident, a tank container, correctly placarded, was delivered to the wrong consignee. Instead of the mis-match between the tank connections and on-site tank connections triggering further investigation, human ingenuity intervened to overcome the perceived problem.

DATE: 18 February 1992
LOCATION: Tonganah
DANGEROUS GOODS INVOLVED:
 Hexane and Copper-Chromium-Arsenate
 Classes 3.1 and 6.1/8

A 30 kL tank of hexane consigned to a pyrethrum extraction plant was mistakenly delivered to a timber preservation plant.

On finding the delivery connections did not match, a 75 mm to 63 mm adaptor was constructed on-site in order to accept the hexane delivery into bulk copper-chrome-arsenate (CCA) storage tanks.

Shortly after delivery had started a site employee discovered that the product was not CCA as expected and stopped the operation. However, approximately 500 litres of hexane had been delivered into the CCA tanks contaminating two 14 kL tanks of CCA concentrate with the hexane.

The remaining hexane was delivered to the correct site.

The contaminated CCA was subsequently recovered and transported to a petroleum depot in Launceston with a view to recycling.

Human Carelessness

This incident can be attributed to a sequence of events resulting from careless procedures and work practices.

DATE: 28 October 1991
LOCATION: East Devonport
DANGEROUS GOODS INVOLVED:
 Nitric Acid Class 8/5.1

A drum containing waste oil was accidentally connected into a reticulated cleaning system at a milk processing plant.

The drum was thought to have contained a cleaning agent consisting of a mixture of nitric acid and phosphoric acid, but had been used to dispose of waste oil following plant maintenance. When the mixture was realised the contaminated system was drained into 200 litre drums and stored on-site pending disposal. One of the drums later ruptured, venting off nitrogen dioxide gas.

Prompt action by company staff and officers from the Tasmania Fire Service, wearing full protective gear, prevented a potentially dangerous situation developing.

There were no injuries as a result of the incident.

Murphy's Law

It is reputed that one of Murphy's laws states that a design fault will not manifest itself until after the final inspection.

DATE: 16 December 1991
LOCATION: Burnie
DANGEROUS GOODS INVOLVED:
 Sulphuric Acid Class 8

Following the filling of four rail tankers an operator, whilst dipping a tanker to determine its overall content, dropped the dip stick and dislodged a drain plug in the bottom of the tank.

Approximately 40 tonnes of acid was lost. However, the tankers were being filled in a designated area and the acid flowed through a dedicated drainage system whilst being diluted with fresh water.

CONCLUSION

While the above incidents serve to highlight the inherent risks associated with dangerous goods they must be looked at in perspective, that is, in terms of the many million tonnes of dangerous goods handled every day of the year throughout the world, without incident.

It is vital to recognise this achievement and the harmonisation that now exists in dangerous goods legislation in order to be able to deal effectively with the siren calls, now increasing in crescendo, from those who wish to regulate the dangerous goods industry in some new and more exciting way.

However, the community, dangerous goods industry, and the Inspectorate depend upon retaining legislation that contains workable and enforceable provisions that are practicable and reasonable in cost benefit terms commensurate with ALARP 'risk levels'.

GEOLOGICAL SURVEY

REGIONAL GEOLOGICAL MAPPING

Although ten geologists and a stores supervisor are listed as part this Section's staff, one geologist is engaged in Launceston geodata mapping, another is working on a University project, a third was Acting Private Secretary to the Minister for Forests and Mines for four weeks, and a fourth took leave without pay at the end of the year to join the Geological Survey of Zimbabwe. The remaining geologists continued working under budget constraints similar to the previous financial year.

MAPPING

During the year the mapping effort was concentrated in areas of interest to the mining industry. The budget allowed re-mapping of the Zeehan map sheet to continue and a resumption of mapping the Trowutta sheet of the Geological Atlas 1:50 000 Series, work on which had been temporarily halted in 1990.

Zeehan Map Project

The last year of the three-year programme of remapping the 30 year old Zeehan 1:63 360 sheet has been completed and the work is being compiled for publication at a 1:50 000 scale. Mapping of this region, which is of central importance to West Coast mineral exploration, has revealed that the Precambrian Oonah Formation is thrust over rocks of Eocambrian and possibly younger ages to the west of Zeehan. Faulted repetitions of rock sequences from the Rosebery area have been followed south to the western slopes of Mt Dundas. Furthermore, in the Pieman River to the NW of Renison Bell, asymmetrical, NW-verging folds and related possible thrusting have been identified in rocks of Eocambrian and Lower Cambrian age. The new information gained in this extensively mineralised region extends areas of interest for mineral exploration under the cover of shallow thrust older rocks.

Alberton Map Project

Mapping of the Alberton 1:50 000 map sheet was completed, which completes the Geological Atlas 1:50 000 Series of northeastern Tasmania. Information has now been provided on the granitoids of the Scottsdale and Blue Tier batholiths, and the structural environments of the sedimentary rocks of mineral provinces, e.g. Mathinna gold province.

The Scottsdale batholith in the Alberton region was divided into six mappable intrusive granitoid units and their order of intrusion determined. A number of granitoid bodies of the Blue Tier batholith have been mapped.

Detailed mapping in the host to gold-bearing quartz veins — the Mathinna Beds — identified mega-kinking structures for the first time, which will aid future mineral exploration.

Resulting rock-unit distribution maps are not only being used in mineral exploration but also forestry plantation planning programs.

Trowutta Map Project

Mapping in the Trowutta region resumed after it had been discontinued in the previous year. Some 65% of the sheet has now been completed.

In the western part of the quadrangle mapping of the Eocambrian-Cambrian rocks has shown that the Smithton Basin can be considered prospective for volcanogenic base metal sulphide and gold mineralisation, and there may be potential for Renison-type mineralisation in a lower dolomite sequence. Increased interest in mineral exploration has also resulted from discoveries of clastic horizons in the Basin which contain fragments of felsic igneous rocks which are associated with mineralisation elsewhere in the State.

To the east of Trowutta, structural evaluation of the Precambrian sequences is enabling the construction of controlled, balanced cross-sections. Further east, detailed work, particularly on structural characteristics, has started on the highly prospective metamorphic rocks of the Arthur Lineament.

Compilations of the mapped areas have been made available to help determine land stability, groundwater and the distribution of soils and construction material in this densely-vegetated region.

Hobart Map Project

Commencement of the re-mapping of the Hobart 1:50 000 sheet indicates that Early Permian Bundella mudstones are considerably more widespread than previously recorded. Alluvial and Tertiary deposits are being precisely delimited and the complex fault systems accurately located to aid in planning urban development of the region.

COMPLETED 1:50 000 COMPILATIONS AND EXPLANATORY NOTES

The 1:50 000 sheets of Dover and Alberton have been compiled for publication. The re-mapped Zeehan sheet is being compiled.

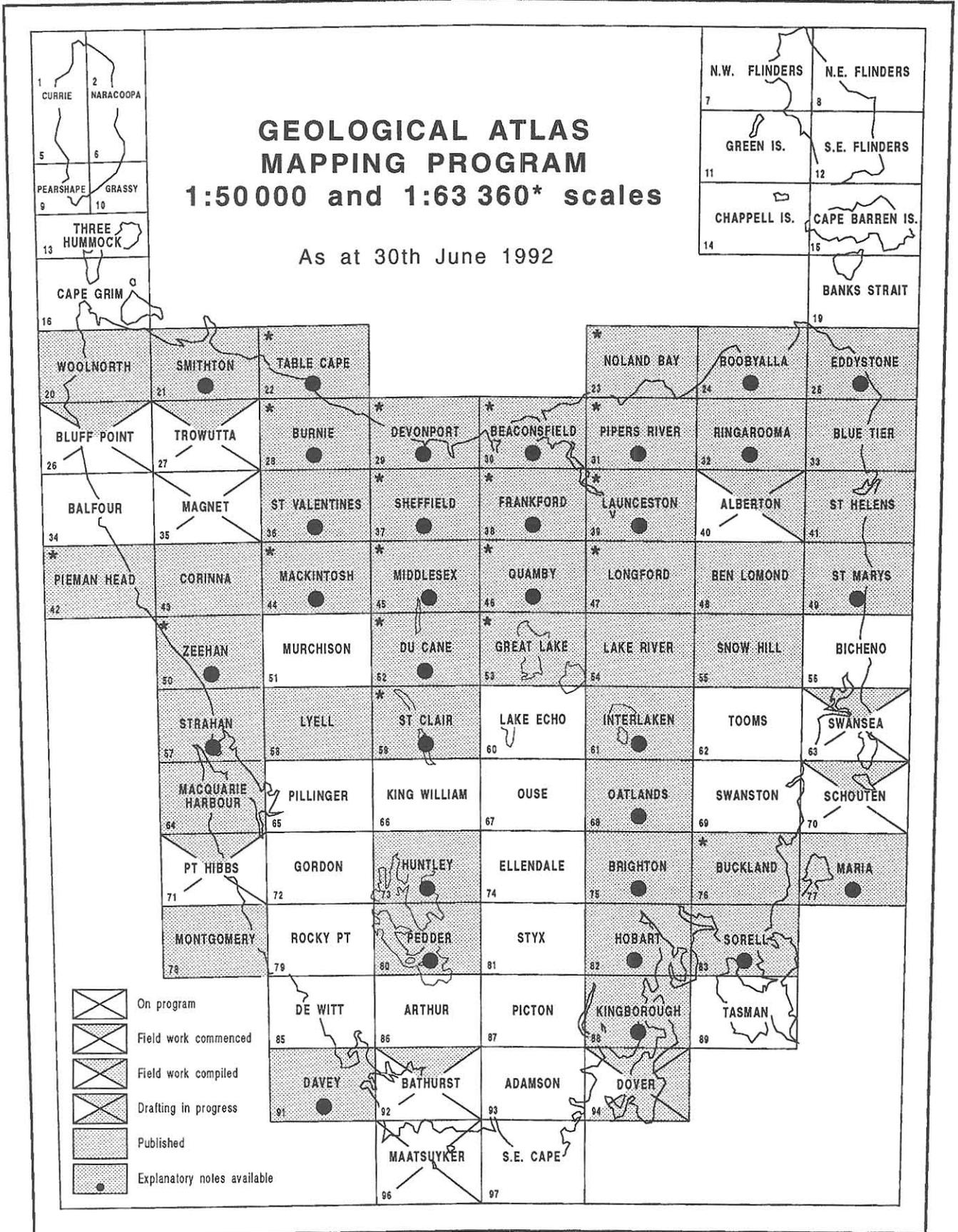
Entry into GIS of the Launceston sheet data for viewing at 1:250 000 scale is nearing completion.

Explanatory Notes for the St Helens, Ben Lomond/Snow Hill, Lyell and Woolnorth 1:50 000 map sheets are being prepared.

GENERAL

During the year an ANZMEC meeting relating to the Mining Act and Mineral Royalties, and a BMR Tectonic Map Committee, were attended.

A report was compiled on the preliminary work on limestone drill core from Risbys Basin, near Maydena.



5 cm

ECONOMIC GEOLOGY

This Branch is responsible for the assessment of the State's mineral resources both discovered and undiscovered, mapping of mineral provinces, researching mineralising processes, and the provision of such information to industry, Government and the general public. It regulates the mineral exploration industry, maintains a complete library of all exploration reports, historical and current, produced in Tasmania and provides petrographic and mineralogical services to the mining, mineral exploration and metallurgical industries, occupational health, environmental monitoring and the general public.

Branch staffing levels have remained constant at eleven permanent officers. One geologist is still seconded to environmental monitoring but another has returned from the post of liaison officer in the Minister's office, making seven geologists available to carry out responsibilities at year's end. Essential support is provided by an Executive Officer and two technical officers.

REGULATION

Over the year exploration activity has remained at the low level of recent years, with 17 new exploration licences covering an area of 5536 km² being granted for metallic minerals. Exploration programmes, reports (90) and renewal applications were assessed and approved for 78 exploration licences and 24 retention licences.

Exploration tenders (3) were received and processed for 38 areas advertised under the Exploration Tender Area system, and five new exploration licences were awarded.

MT READ VOLCANICS PROJECT

This important project, designed to increase the information available to mineral exploration companies, has been running since 1985 on special funding. The eleven temporary staff employed to generate the information consisted of three

geologists, one analyst, two database clerks, two draftsmen, two part-time field assistants and one technical officer.

The current year proved to be the last year in which special funds were made available and, as a result, the employment of the ten temporary staff was terminated in July 1992. Fresh initiatives planned to commence in the North East (NETGOLD) and the North West (AMB) failed to attract new funding.

The Mt Read Volcanics Project successfully generated numerous maps, reports and databases, and will be the subject of an assessment report in which all the products will be listed.

Mineral Resource Mapping

Three geological mapping teams worked in the Jukes-Darwin area and were based in Queenstown for the whole summer field season. One camp was based in an exploration hut on Slate Spur and was helicopter-supported. Otherwise access to the area was helped considerably by 4-wheel drive bikes on existing tracks.

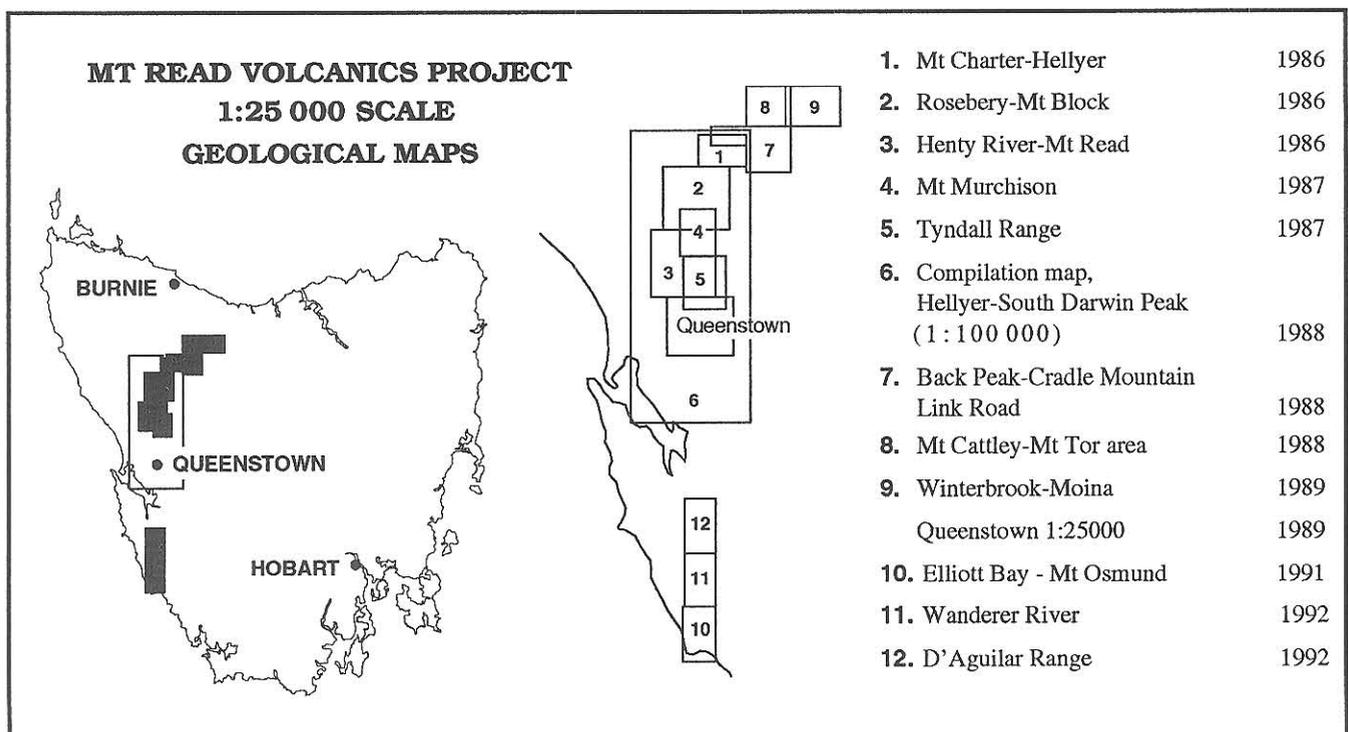
Printing of mapping completed in the two previous seasons in the South West has been completed, with Maps 10 (Elliott Bay-Mt Osmund), 11 (Wanderer River-Moores Valley) and 12 (D'Aguilar Range) now available. The results of the current season's work are now being drafted.

Explanatory notes for Map 4 have now been published as *Geology and mineralisation of the Mt Murchison area*.

Isotope and Alteration Studies

A major consulting report was produced entitled *The Origin of the Gold Mineralisation at the Henty Prospect*.

Two smaller consultant reports were also provided to Pasmenco, covering work undertaken at Rosebery and the Bastyan Dam.



Databases

The object of this project was to provide industry with computerised databases relevant to mineral exploration and mining in the State.

TASXPLORE, the database of unpublished reports covering mineral exploration by companies, now contains 4030 entries and is continually being updated. Microfiche of all open-file reports are available for purchase.

DORIS, a drill-hole database, includes information on all drilling carried out in Tasmania. The total number of entered holes is 15,842. All drill logs have now been microfiched and those on open file are available for purchase.

DOMINFO, a database of Department of Mines publications, has not been completed because of other priorities. However work is progressing and DOMINFO is expected to be operational in the coming year. An ore reserves data base, TASRESERVES, has been produced and contains the published grade-tonnage information on the State's most significant mineral deposits.

MINERAL RESOURCE ASSESSMENTS

Advice is continually provided to Government and State Departments on the mineral resource implications of additional World Heritage Areas or National Parks. Branch members contributed mineral resource and geological information to the Henty Zoning Plan — a pilot land-use study being conducted by the Department of Environment and Planning.

COMMODITY STUDIES

Gold

Research on lode gold deposits in northeastern Tasmania is being compiled into three comprehensive reports on the Mangana, Mathinna and Alberton areas to stimulate exploration in the region. Studies on gold in metamorphic aureoles in the Lisle area are also continuing, and include drilling, petrology and geochemical surveys.

Studies also progressed on gold distribution in the Mt Lyell ores.

The database of Tasmania gold deposits (as part of the MIRLOCH computer database) is essentially complete, with 1245 gold-bearing deposits recorded.

Limestone

The Branch has been involved in the search for high-grade metallurgical limestone to substitute for the limestone being produced at Benders Quarry, Lune River. Exploration has identified a potentially suitable resource at Risbys Basin, Maydena. The work has involved geological mapping, gridding, systematic chip sampling, chemical analysis and a diamond-drill hole. The prospect now requires a drilling programme to measure the limestone resource and confirm its suitability for development.

PETROLOGY

A total of 1279 samples were received for investigation, of which 1140 were non-Geological Survey samples (compared

with 780 for last financial year), comprising 406 samples from the Centre for Ore Deposit and Exploration Studies (in-kind agreement), 469 samples from the Mines Inspection Branch, and 265 samples from other clients. Revenue generated was \$14,401, from a wide range of external sources, including the Hydro-Electric Commission, the Tasmania Police and other Government Departments, various mining and exploration companies, miscellaneous businesses, and the general public. Samples studied included geological material such as clay, mineral concentrates, rocks, soil, sand and ore samples, and other materials namely asbestos, industrial materials, metallurgical products, dust and concrete. Silica-bearing dusts, asbestos, tailings and other materials of occupational health significance are still being submitted for testing (615 samples).

A study of concrete aggregates was carried out for the HEC.

Departmental studies in progress include work on skarns from the Tenth Legion Mine and Weld River, samples from Jukes-Darwin, and glaucophane-bearing amphibolites from the Corinna district. Mines Inspection work included dust analyses and research into asbestos at Savage River Mines, using X-ray diffraction, scanning-electron microscopy and optical microscopy.

The TASROCK database now has 1827 registered samples. Work is in progress on the CHEMDAT database of rock analyses, which will be combined with the above database on the GIS system.

The MIRLOCH database of mineral deposits in Tasmania now has 2735 entries, covering coal, metallic and industrial minerals, and is being steadily updated. Large parts of the State are now essentially complete in this regard (59 out of 72 geological quadrangles). The demand for GIS plots of this data is increasing.

The MRV physical properties database now has all 420 samples geochemically analysed, petrographically described and registered in TASROCK.

Curatorial work has included the preparation of displays, supervision of rock stores, and upgrading of the above databases.

Petrology Laboratories

The lapidary laboratories prepared 366 polished thin sections, 1449 standard thin sections, and 17 miscellaneous sections, making a total throughput of 1832 samples (up 10% on last year).

The technical officer for petrological services processed 977 samples by X-ray diffraction, including 314 quantitative dust analyses, 141 quantitative clay analyses, and 522 routine identifications. He also conducted 261 physical property tests and 40 optical asbestos identifications. Overall throughput is up 49% on last year.

GENERAL

The following publications were produced during the year:

- ten general reports;
- three MRVP geological maps, 1:25 000 scale;
- one MRVP geological map notes;

- one MRVP ore genesis report;
- one mineral resource report;
- three consultant reports;

Branch members contributed to three papers in a 1992 Special Issue of the international journal *Economic Geology on Australian volcanic-hosted massive sulphide deposits*. A section was written for the St Helens map sheet explanatory notes.

On 24-27 March, a field excursion was conducted to present the Corinna map and accompanying field guide to industry, academic and other users. There were 28 people in attendance, comprising eleven from industry, six from CODES, and eleven from the Department of Mines. During the excursion, visits were arranged to the mine sites at the Corinna silica and Savage River iron deposits.

During the year Branch members contributed towards the Mining Act Review, the World Heritage Area management plan, the Forestry Recommended Areas for Protection, and the Queenstown Trade Expo, and to planning for a major conference to promote mineral exploration in Tasmania to be held in Hobart in September.

ENGINEERING GEOLOGY AND GROUNDWATER

Staff numbers within the section remained stable and are the same as at the end of last year, i.e. an acting deputy chief geologist, two acting senior geologists, a project geologist (who for much of the year has acted as a senior geologist) and a surveyor. A project geologist from the Regional Mapping Branch has been undertaking a special project within the section. Two vacancies for geologists remain unfilled within the section.

Work on the landslide at Rosetta has continued to take up a major proportion of the section's time and has resulted in a large reduction of effort that can be given to other major projects. Advisory work has been a significant part of the other work undertaken within the Branch, and this has involved land stability, refuse disposal areas, foundation conditions and groundwater prospects. Field work on a joint local council and Department of Mines project has continued. Support staff make a significant contribution to the work of the section.

LAND STABILITY

Work at the Rosetta landslide has resulted in the completion of a report on field investigations involving detailed surface mapping, slope analysis, drilling, surveying and analysis of regular surveys across the landslide area to monitor movement. The installation of three vertical drill holes to aid in dewatering of the landslide was supervised, and regular monitoring of a number of piezometers and flows from horizontal holes for dewatering has been undertaken. A considerable amount of time and effort has been given to the proclamation of an 'A' Landslip area and a proposed 'B' Landslip area on and around the landslide.

Advice on stability of properties proposed for subdivision as housing estates has been provided in many areas of the State. The southern part of the State figures prominently in these

requests as for last year, but the North West Coast and Tamar regions also continue to make up a significant proportion.

Supervision and logging was undertaken on several drill holes in the vicinity of Taroona High School to aid in assessing stability conditions before a final decision is made on the school's expansion.

Telecom requested advice on whether landslides are likely to affect a proposed optic fibre cable route in the north of the State. Stability conditions and erosion potential has been examined in association with forest harvesting at Hellyer River, Bicheno, Koonya and Weegen.

Land transfer search forms, on which stability information is provided, numbered 4253 for the year.

Regular surveys have continued to monitor movement on landslides in several locations throughout the State.

There has been input into a project (arranged by the Forestry Commission) for the production of an inventory of landslides in forest areas. Involvement with the group concerned with forest operation in steep country continued, resulting in a code of practice being developed.

No further work has been undertaken on the regional land stability survey of the North West Coast due to requirements to undertake other functions. About two-thirds of the field work has been completed.

GROUNDWATER

Numerous requests were obtained for advice on groundwater prospects at widely spread locations throughout the State. The dry summer to early autumn period resulted in an increase in these requests.

The installation of the network of regional monitoring bores was completed during the year, with the drilling of holes in the northeast part of the State. Standing water level variations and quality will be monitored in these holes.

The Branch was involved in supervision of contract waterboring in the Lower Midlands, as well as drilling at Lune River in an attempt to establish regional groundwater flow directions in the vicinity of the limestone quarry.

The completion of the Midlands groundwater study and the compilation of the study of groundwater resources in the Sheffield area have been delayed because of other work requirements. Compilation and map preparation is continuing for the North East Tasmania groundwater study. The Devonport groundwater study is ready for publication.

The Department of Primary Industry, Fisheries and Energy has a Commonwealth funded project (NSCP) that is examining soil salting in agricultural areas. The Department of Mines is contributing to this project by drilling shallow holes to install piezometers, so that near-surface groundwater quality can be studied.

URBAN ENGINEERING GEOLOGICAL MAPPING

Work on projects that have been jointly funded with Local Government, involving detailed soil and rock property study in and around urban areas, has continued.

Ulverstone: Maps associated with the project have been printed, sample testing is finished, and the report compilation is near completion.

Launceston: Detailed mapping and shallow drilling to collect samples for material property testing has continued. The mapping will result in a much more detailed knowledge of the geology of the region. The identification of a relationship between problem areas (landslide prone and reactive clay) and particular stratigraphic units or topographic features appears to be a probable result of the survey.

WASTE DISPOSAL SITES AND POSSIBLE GROUNDWATER POLLUTION

Waste disposal and its possible effects on groundwater quality continues to be an important aspect of the work of the Branch.

About 25 refuse disposal areas (both operating and proposed) have been examined throughout the year. A relatively detailed study was undertaken on a possible regional refuse disposal site at Dulverton, south of Latrobe.

Advice was given on the installation of monitoring boreholes at timber treatment plants at Scottsdale and Longford. Possible effects on groundwater of a fish waste composting operation at Leslie Vale was assessed, and an industrial waste disposal operation at Kimberleys Road, Ulverstone, was examined.

FOUNDATION INVESTIGATIONS

Surveys to examine foundation conditions and ease of excavation have been undertaken at a number of reservoir sites. This has usually involved an inspection of the geology followed by refraction seismic surveys. Sites investigated include Clive Hill, Ridgeway, and Mt Pleasant (Kingston).

Drilling and a seismic survey were undertaken at the proposed extension of the sewerage treatment plant at Selfs Point. Geological, seismic and resistivity surveys were carried out along a proposed water supply pipeline at Kempton.

Severe erosion problems are occurring in part of the Supply River in northern Tasmania and a seismic traverse was undertaken to determine whether near-surface bedrock occurs under the area, so that structures that would control the erosion rate can be built. This was undertaken at the request of the Rivers and Water Supply Commission.

A seismic survey was conducted at Kings Park, Launceston, to help determine foundation conditions for a proposed development plan for the site.

SURVEYING

Surveys to monitor movement on landslides at a number of locations throughout the State were undertaken on a regular basis. New survey lines were established near the St Leonards reservoirs towards the end of the year to determine whether any movement is occurring.

Surveys were undertaken of the regional monitoring bores and drill holes at Taroona, St Leonards and Lune River quarry.

A lease boundary along Waterhouse Road was surveyed and preparation was made to survey coal mine workings at Fingal on a regular basis.

CONSTRUCTION MATERIALS

A summary of the properties of Jurassic dolerite was undertaken at the request of a potential user. Dolerite has a wide distribution and is used extensively for road making, as a component of concrete, and in erosion resisting walls and breakwaters.

Searches to determine whether areas proposed for rural subdivisions should be reserved for the extraction of construction materials (gravel, sand or clay) have been conducted for a number of locations.

EDUCATIONAL ACTIVITIES

Seminars and meetings at which contributions were made by Branch members include a waste disposal seminar at Perth (Tasmania), a landcare meeting at Bream Creek, the Institute of Valuers seminar at Cradle Lodge, and a Whole Farm Planning workshop at New Norfolk.

As in other years, a course of lectures and excursions on engineering geology was given to engineering students at the University of Tasmania. Talks and excursions have been organised for students of Friends School, and a number of students have spent several days on work experience within the section.

GENERAL

A position paper on procedures for dealing with mining relics was prepared.

GEOPHYSICS

GENERAL

The Geophysics Branch provides geophysical and computing advice and services for both departmental and other users, acquires and/or processes basic regional data, and reviews the geophysical activities of the exploration industry. Products of particular interest this year have been a new map of the major Tasmanian granitoid bodies and colour contour maps of enhanced aeromagnetic data.

The Branch activities for the year were dominated by contracting of both computing and field service. This, coupled with financial and staff restrictions, has resulted in a major curtailment of normal Branch activities. The Branch is staffed by the Supervising Geophysicist and a Technical Officer (Electronics).

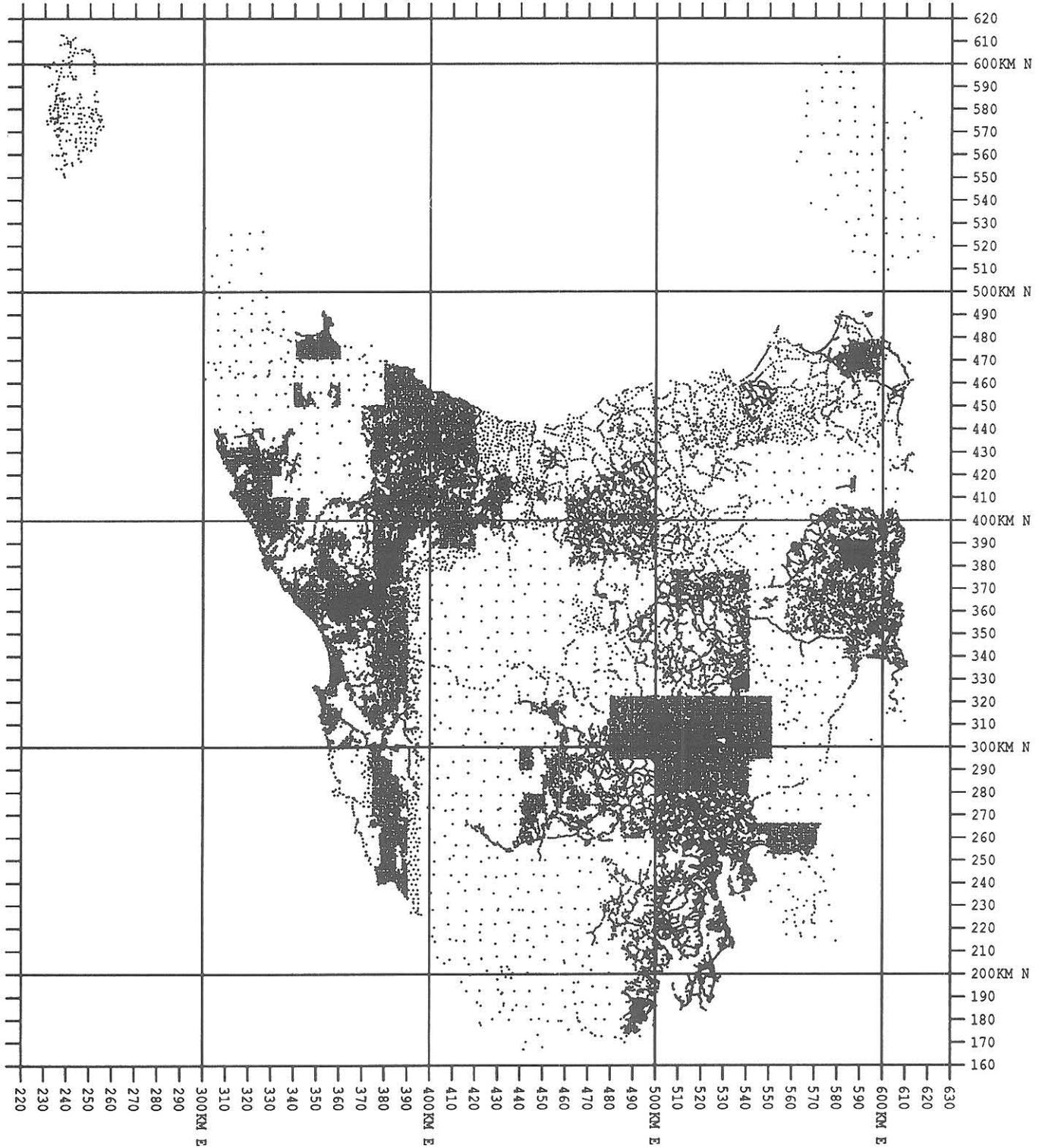
GRAVITY-MAGNETICS

Gravity data acquisition was entirely in western Tasmanian under contract to mineral exploration companies. Of the 1298 stations occupied, over 90% were also levelled to an accuracy of 0.3 m or better. In areas of poor position control and where the vegetation allowed, GPS receivers were used for accurate positioning. All new data were reduced and corrected for integration with the Tasgrav database.

A number of methods of enhancement of aeromagnetic data were tested during the year to demonstrate the correction of terrain clearance problems and the features revealed during various types of derivative processing. Banded colour contour maps were used to assist in qualitative interpretation.

DISTRIBUTION OF TASMANIAN GRAVITY STATIONS

30 JUNE 1992



5 cm

Production of the colour maps was accelerated by the use of a simple banded colour pixel map display program to allow setting of the colour breakpoints quickly on a PC and access to an electrostatic plotter.

Several sets of open-file aeromagnetic data were reprocessed, including simulating increased line spacing, to determine the optimum parameters for acquisition of regional data in areas of low magnetic relief. It was found that the critical parameters were accurate knowledge of the magnetometer position in X, Y and Z, minimal variation from the nominal terrain clearance, a low-noise high-resolution system, and flying of a square line pattern. For northeast Tasmania it is recommended that a square flight line system with a 400 m spacing be used, and that a terrain clearance of 80 m be maintained.

COMPUTING

Use of the mini-computer has continued at a high level. There has been little new program development, apart from enhancements of existing database software, and most work has been magnetic and gravity data processing and database searching. The Ethernet has been extended and most PCs in the Rosny Park building are connected to it using Novell software. The Macintosh computers, on an Appletalk network, are also connected to the Novell server.

On-site searching of the drill-log and drill-core databases is now possible using a personal computer located at the core store.

ELECTRONICS

With the rapid expansion of the computer network, the electronics technician spent approximately 70% of the year working on network hardware and software for linking the personal computers and Macintosh computers to the servers. He was also responsible for installation and support of the CARMS records management system.

In addition to routine Departmental repairs, instrument repairs have been effected for a number of outside clients.

GEOCHEMISTRY

The Huminex System for geochemical exploration continues to be the main research line undertaken in the geochemical laboratory. Several improvements to the soil application of the procedure were made during the year. The application to water was successfully tested for base metals in waters south of Macquarie Harbour. Results for gold have shown that at the part per trillion level, at which this metal occurs in natural waters, the analytical results can be variable when based on small water volume. This problem is being addressed by attempting to develop a field sampling procedure which will enable concentration of the humic substances in water from volumes of up to ten litres.

The laboratory has undertaken limestone analyses required for the Benders Quarry investigations and has also carried out soil analysis as part of a Parks, Wildlife and Heritage study of track pollution by use of copper arsenate treated logs.

Dissolved organic carbon analysis as a measure of water quality has been used widely during the year, with samples being processed for the Inland Fisheries Commission, HEC, Environment and Planning and Local Councils.

PETROLEUM EXPLORATION

GENERAL

The Section is responsible for petroleum exploration in Tasmania's offshore and onshore areas, and in addition to administering the relevant Acts relating to petroleum exploration, performs reviews and conducts research projects relating to the geological evolution and prospectivity of the offshore and onshore sedimentary basins. The Section continued to be staffed by the Petroleum Geologist, receiving specialist input from other Departmental officers as required.

Papers outlining aspects of offshore prospectivity were presented at the *1991 Offshore Australia Conference* (Melbourne, November 1991) and the *Gippsland Basin Conference* (Melbourne, June 1992).

The Department provided financial support and supervision for a student from the National Centre for Petroleum Geology and Geophysics (University of Adelaide) as part of his Honours studies. The student, David Zampatti, completed a thesis entitled *Diagenesis of Eastern View Group Sediments, Bass Basin*.

Collaborative work continued with the University of Western Australia and the University of South Australia into sedimentary and tectonic features of Tasmania's potentially petroleum-bearing Lower Palaeozoic and Precambrian rock successions and their relationship with similar successions in Victoria. Two papers resulting from this work are currently in press, and a further three are in preparation.

The Petroleum Geologist took part in preparation of the Department of Mines Corporate Plan and completed his term as National Secretary of the Geological Society of Australia Inc.

OFFSHORE

Current offshore exploration permits are shown in Table 4. The number of exploration permits remained the same as the previous year, with the granting of new permits T/25P (Bass Basin) and T/26P (Otway Basin) offset by the surrender of T/14P (Bass Basin) and T/15P (Darroon Basin). Areas in the Gippsland Basin (T921) and Sorell Basin (T922) were made available for work programme bidding as part of the First 1992 Offshore Release.

SAGASCO Resources Ltd have applied to drill the exploration wells *King-1* and *Flinders-1* in the Bass Basin. These wells will be the first Tasmanian offshore wells drilled since 1986.

Bridge Oil Limited acquired 405 line km of new seismic data in the Darroon Basin during September.

Amoco withdrew from the consortium holding the Retention Lease over the Yolla oil and gas discovery (T/RL1). The field is being considered as a possible source of natural gas for Tasmania, although further drilling is necessary to prove sufficient reserves to ensure adequate supply.

ONSHORE

Conga Oil Limited (EL 1/88) switched the thrust of their search for hydrocarbons from possible Ordovician-sourced to Permian rocks within the Tasmania Basin.

Table 4

OFFSHORE PETROLEUM EXPLORATION PERMITS

Title	Holder	Blocks	Expires
T/18P	SAGASCO Resources Ltd and others	59	24.8.92
T/23P	Shell Company of Australia	38	22.12.95
T/24P	Maxus Energy Corporation	72	02.1.96
T/25P	SAGASCO Resources Ltd and others	43	02.12.97
T/26P	Ansbatchall Pty Ltd	94	08.7.98

The Department commenced investigations into a possible source of geothermal energy in northwestern Tasmania. Gas seeping along a 1.5 km linear feature about 5 km northeast of Smithton has a typical geothermal chemical signature, and a drilling programme is being undertaken to determine the geothermal gradient in the area.

GEOLOGICAL SUPPORT

LIBRARY

Collection

The financial constraints imposed on the library budget were partly offset by the strength of the Australian dollar, facilitating continual growth of the library's collection.

Additions to the library stock were:

	<i>Purchased</i>	<i>Donated</i>
Monographs	55	103
Pamphlets	-	18
Non-book items	-	65
Serial titles	3	4
Company Exploration Reports	-	157

No journal subscriptions were cancelled.

Reference and Information Services

Overall, there has been a rise in the use of the library, with increases in all areas of Reference Services except two.

The number of outside users decreased by 2.9% to 626 and the number of commercial searches on the TASXPLORE database decreased by 38% to 16. This is a direct result of the downturn in mineral exploration in the State during the last year.

In contrast, there was an increased demand in the other services provided by the library. These are summarised below:

	<i>Number</i>	<i>Change (%)</i>
Reference queries	1971	+21%
Computer searches	342	+13.2%
Loans	590	+8.05%
Inter Library loans	343	+1.2%
Open File reports consulted	890	+28%

The reports relating to the Exploration Tender Area service continue to be available through the library in hard copy and on microfiche.

A library service was also provided to the hydrological staff of the Rivers and Water Supply Commission during the year.

Technical Services

The library continues to use the INMAGIC software for the processing and accessioning of library materials. All new monograph and journal issues which deal with a discrete subject are added to the database, with 671 items being added during 1991/92.

The library collection was reorganised during the year when conference rooms were built in the library. At the same time, the chemical and mining journals which had been previously housed in the Launceston laboratory were interfiled in the main collection.

CARTOGRAPHIC DRAFTING

The following progress was made on colour map production:

1:50 000 Geological Atlas Series

Snow Hill — Printed
Corinna — Printed
Woolnorth — Drafted and printed
Dover — Drafting commenced

1:25 000 Mt Read Volcanics Project Geological Maps

Wanderer River-Moores Valley — Drafted and printed
D'Aguilar Range — Drafted and printed

Engineering Geology (1:10 000)

Ulverstone — Drafted and printed

Northeast Groundwater

Winnaleah Geology (1:10 000) — Printed
Lilydale Geology (1:10 000) — Completed, awaiting printing
Scottsdale Basin Hydrology (1:60 000) — Completed, awaiting printing

The majority of the drafting for geological bulletins, reports and other support services has continued to be handled by our two computer-aided drafting stations. In all approximately 130 maps and diagrams were produced.

PUBLICATIONS

The range of material produced continues to reflect the high level of use of the Section by all Branches of the Department. Major geological publications printed during the year were:

- Geological Survey Bulletin 64 — *The Coal Resources of Tasmania*, by Carol A. Bacon
- Geological Survey Bulletin 69 — *Hellyerian and Tamarian (Late Carboniferous – Lower Permian) invertebrate faunas from Tasmania*, by M. J. Clarke
- Mount Read Volcanics Project Geological Report 3 — *Geology and mineralisation of the Mt Muchison area (MRVP Map 4)*, by A. W. McNeill and K. D. Corbett

The Explanatory Report for the St Helens 1:50 000 scale map sheet was at the printer at the end of June, while Bulletins 67 (Geology and Groundwater Resources of the Devonport–Port Sorell–Sassafras Tertiary Basin) and 68 (The Quaternary geology and glaciation of the King Valley) were awaiting printing. The Explanatory Reports for the Lake River and Macquarie Harbour map sheets were in preparation. An updated List of Publications was produced in November.

Publications prepared and printed for other Departmental branches included:

- Annual Report, Department of Resources and Energy, 1990/91
- Annual Report, Dangerous Goods Inspectorate, 1990/91
- Safety Bulletin
- Guide to the Tasmanian Mines Inspection Act and Regulations (Parts 1 and 2)
- Notes for the Tasmanian Shot-firer (3rd and 4th Editions)
- Notes on Procedures for Occupation of Land for Mining Purposes (13th Edition)
- Exploration Licences — General Conditions (March 1992)
- Retention Licences — General Conditions (April 1992)
- Mineral Tenements — Guidelines for Reporting (March 1992)
- Mining Tenements: Approval and Processing Procedures
- Advice to Prospectors
- Occupational Health and Safety Unit — Schedule of Charges
- Numerous minor leaflets, notices and forms were produced as required.

Reports

Reports completed during the year are shown below. Reports on the Rosetta landslide and Savage River asbestos were produced in larger numbers to meet specific demands. Four consultancy reports were issued during the year.

LIST OF REPORTS 1991/92

- 1991/07 *The mineralogy of gold in Mt Lyell copper concentrates*, by R. S. Bottrill and D. McP. Duncan [6 May 1992]
- 1991/11 *Control of the TEAC tape replay unit (Revision 1)*, by R. J. Sedgman [28 August 1991]
- 1991/12 *Silica fume analysis — A preliminary report*, by R. S. Bottrill [24 July 1991]
- 1991/13 *A proposal for an ion probe component in the National Mapping Accord Project in Tasmania*, by N. J. Turner [29 July 1991]
- 1991/14 *FORTRAN programs for the implementation of MIRLOCH (Revision 3)*, by R. G. Richardson [30 July 1991]
- 1991/15 *TASROK — A computer-based catalogue for Tasmanian rocks (Revision 4)*, by R. G. Richardson [30 July 1991]
- 1991/16 *Structure of the Beaconsfield and Lefroy goldfields*, by C. McA. Powell [9 August 1991]
- 1991/17 *The Lisle goldfield — a brief history*, by G. J. Dickens [1 November 1991]
- 1991/18 *Some Tasmanian coal statistics (Revision 1)*, by C. A. Bacon [5 September 1991]
- 1991/19 *MIRLOCH (a mineral resources location and characterisation system — Users Manual, version 2)*, by R. S. Bottrill and P. L. F. Collins [24 September 1991]
- 1991/20 *Rosetta landslide. Geological investigation and slope risk assessment*, by R. C. Donaldson [15 October 1991]
- 1991/21 *Synopsis of the regional geology of the Macquarie Harbour, Point Hibbs, and Montgomery 1:50 000 map sheets*, by A. V. Brown, R. H. Findlay, M. P. McClenaghan and D. B. Seymour [14 February 1991]
- 1991/22 *Some physical properties of dolerite*, by D. J. Sloane [31 October 1991]
- 1991/23 *Possible effects of forestry operations on slope stability and springs in the Mt Koonya area*, by B. D. Weldon [6 December 1991]
- 1991/24 *Stability assessment, 14 Livingstone Street, South Hobart*, by B. D. Weldon [13 December 1991]
- 1991/25 *Asbestos at Savage River*, by R. S. Bottrill [23 December 1991]
- 1991/26 *Groundwater conditions at a CCA treatment mill near Scottsdale*, by D. J. Sloane [20 December 1991]
- 1992/01 *Notes on previous mining and exploration activities in the Interview River area*, by C. A. Bacon [7 January 1992]

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| <p>1992/02 <i>The 10th Legion Thrust, Zeehan District. Distribution, interpretation, and regional and regional and economic significance</i>, by R. H. Findlay and A. V. Brown [9 January 1992]</p> <p>1992/03 <i>Maydena DDH1: Appraisal of the limestone resources at Risbys Basin</i>, by C. R. Calver [13 February 1992]</p> <p>1992/04 <i>Gas seeps at Smithton and Kimberley</i>, by P. W. Baillie [24 February 1992]</p> <p>1992/05 <i>Sand at Dysart</i>, by C. A. Bacon [30 March 1992]</p> <p>1992/06 <i>Corinna 1:50 000 Geological Map. Field guide to selected rock exposures</i>, by N. J. Turner [23 March 1992]</p> <p>1992/07 <i>Industrial minerals in Tasmania — Kaolin</i>, by C. A. Bacon [1 May 1992]</p> <p>1992/08 <i>PHYSROP — A data base for physical property data from samples registered in TASROK (Revision 1)</i>, by R. G. Richardson [16 March 1992]</p> <p>1992/09 <i>Examination of a landslide in a private forest near Weegen</i>, by B. D. Weldon [17 March 1992]</p> <p>1992/10 <i>Northeast Goldfields: A summary of the Tower Hill, Mathinna and Dans Rivulet goldfields</i>, by J. Taheri and R. H. Findlay [6 August 1992]</p> <p>1992/11 <i>A geophysical model of the major Tasmanian granitoids</i>, by D. E. Leaman and R. G. Richardson [4 May 1992]</p> <p>1992/12 <i>Kara and other nearby magnetite resources</i>, by N. J. Turner [5 May 1992]</p> | <p>1992/13 <i>Dust particulates and asbestiform material, Savage River Mines, Savage River</i>, by M. E. Curtain [15 May 1992]</p> <p>1992/14 <i>P-T-H₂O-CO₂-O₂ calculations in metamorphic rocks using EXCEL</i>, by B. D. Goscombe [26 May 1992]</p> <p>1992/15 <i>Examination of land at Loudon Street, South Hobart</i>, by B. D. Weldon [27 May 1992]</p> <p>1992/16 <i>GRDIMAGE — A Fortran program for displaying banded colour pixel maps</i>, by R. G. Richardson [29 May 1992]</p> <p>1992/17 <i>Land classification in Tasmania — A guide for explorers</i>, by C. A. Bacon [29 May 1992]</p> <p>1992/18 <i>Possibility of 'inrush' at Duncan Colliery</i>, by C. A. Bacon [16 June 1992]</p> <p>1992/19 <i>The optimum specifications for regional aeromagnetic surveys in northwest Tasmania</i>, by R. G. Richardson [15 June 1992]</p> <p>Work Stations</p> <p>Both software and hardware were upgraded during the year, including the purchase of a new laser printer and larger monitors. This upgrading has markedly improved the efficiency of the work stations.</p> <p>Photographic</p> <p>Only limited photographic work was carried out during the year. All staff members were photographed for the production of identity badges. Further photographs were taken in the Rosetta area to record the progress of house damage caused by the landslide.</p> |
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CHEMICAL LABORATORY

The transfer of the Chemical Laboratory to Hobart required the installation of the sample preparation equipment in an area at Mornington, and this was completed and operating by August 1991.

The 1991/92 financial year was one of training for the relocated Chemical Laboratory. A graduate chemist was trained in the analysis of waters, environmental dust samples for metal content, and some ores and minerals for metal content. The Project Chemist was being trained on the XRF, and the new XRF operator had to familiarise himself with our older XRF Phillips model 1400.

A total of 10,156 chemical determinations were completed and another 11,181 had been prepared and were in some stage of analysis.

For the year 1,305 samples were prepared and analysed; the breakdown is as follows:

Water	259 samples
Liquors	5 samples
Alloys	16 samples
Rocks	199 samples
Minerals and products	826 samples

The proportion of in-house work for the Geological Survey and Mines Inspection was 67%, with 33% being for outside clients.

Some of the companies and enterprises which used the chemical laboratory in 1991/92 are listed below:

Rallinga Mine
 City of Glenorchy
 Boral Ltd
 N.W. Prospecting
 Mineral Holdings
 University of Tasmania
 Stornoway Hewitt
 Tas. Rainbow
 Pasminco Mining
 The Water Connection
 ACL Bearing Co.
 ANM
 French's Mill
 Gilbar Metals
 Benders Quarry
 Tas. Consulting Services
 Goliath Cement
 Spaulding Drillers
 Edgell-Birds Eye
 Soil Test Research
 Roberts Pty Ltd
 Department of the Environment

A considerable number of samples were also analysed for individual people.

CORPORATE SERVICES

On 18 February 1992, as part of the reorganisation of Government Agencies, the Department of Resources and Energy was renamed the Department of Mines, and the Energy Resources Division and the Water Resources Division of the former DRE were transferred to the newly constituted Department of Primary Industry, Fisheries and Energy.

With these new administrative arrangements, work has commenced to review the structure of the Corporate Services Division of the Department of Mines.

Key features of this review are the need to strengthen the financial services section of the Division, to increase resources devoted to the review and verification of royalty payments, and to put in place financial reporting systems which support the output based orientation which the Department has adopted and which will, in 1993/94, report on a program basis in its annual report.

Significant improvements have been made in the records management area with the introduction of the new computer-aided records management system (CARMS). The system will allow for on-line enquiries and the bar coding of all files, which will eliminate manual file tracking.

The word processing area has been significantly upgraded with the introduction of intelligent work stations linked to a central processor. Using the hard area network, word processing can be extended to other work stations in the Rosny Park offices.

STAFFING

Departmental staffing at 30 June 1992 totalled 122 with the following divisional and geographic distribution:

Administration	26
Mines Inspection	14
Dangerous Goods	10
Geological Survey	47
Chemistry	5
Resource Planning and Policy Development	12
Others (Mt Read)	8
	<u>122</u>

STAFF DEVELOPMENT

Forty-nine staff members have attended courses, seminars and conferences during the year, a majority of whom took part in activities relating to their own area of expertise. Two officers are undertaking a management development course through TAFE. The remaining attendances were at various human development and information technology courses.

ACCOMMODATION

The Department continues to occupy office accommodation in Burnie, Launceston and Rosny Park. Internal alterations were made in the Rosny Park offices to rationalise office accommodation in anticipation of the inclusion of the Rivers and Water Supply Commission within the building. This move did not eventuate.

In Burnie negotiations are continuing on alternative arrangements in Reece House, and in Henty House, Launceston, Mines Department staff have moved to other offices within the building.

DAMAGE TO PROPERTY

The incidence of vandalism and damage to departmental property has increased during the year. The number of attempted break-ins has also increased over previous years. Action has been taken in response to this increased threat by the installation of additional security systems.

OFFSHORE PETROLEUM

The administration of offshore petroleum permits is a responsibility of the Division. This has included the registration of a number of dealings in existing permits, the granting of a new permit, and the surrendering of two permits.

STATISTICAL TABLES

Mining Production and Dangerous Goods

Table 5

VALUE OF THE MINERAL INDUSTRY

<i>Year ended Commodity</i>	<i>Unit</i>	<i>30 June 1991 Total Quantity</i>	<i>30 June 1992 Total Quantity</i>
METALLIC MINERALS			
Cadmium	(tonne)	143.32	238.38
Cobalt oxide	(tonne)	0	0
Copper	(tonne)	24 283	27 292
Gold	(kilogram)	1 773	1 714
Iron ore pellets	(tonne)	1 488 668	959 792
Iron (magnetite)	(tonne)	174 625	131 733
Lead	(tonne)	64 880	73 853
Molybdenum	(tonne)	3.43	0
Pyrite	(tonne)	27 839	38 692
Silicon (metallic or as alloy)	(tonne)	10 083	1 603
Silver	(kilogram)	165 121	164 837
Tin	(tonne)	5 386	5 729
Tungsten as tungstic oxide	(tonne)	870	229
Zinc	(tonne)	176 804	210 853
Value of metallic minerals		\$474 776 360	\$550 518 455
NON-METALLIC AND FUEL MINERALS			
Clay-			
Cement	(tonne)	not reported	88 400
Brick	(tonne)	32 905	59 652
Other	(tonne)	49 610	38 054
Kaolin	(tonne)	57 411	29 758
Dolomite	(tonne)	34 240	49 323
Limestone-			
Agricultural	(tonne)	99 947	99 947
Cement	(tonne)	746 098	772 758
Chemical and metallurgical	(tonne)	58 085	16 124
Other	(tonne)	47 321	39 212
Sulphuric acid	(mono tonne)	147 014	243 865
Coal (run of mine)	(tonne)	560 589	486 797
Coal (washed)	(tonne)	339 006	300 101
Peat	(m ³)	3 486	3 821
Value of non-metallic and fuel minerals		\$39 225 269	\$36 411 522
CONSTRUCTION MATERIALS			
Building stone-			
Freestone	(tonne)	272	1 424
Granite	(tonne)	865	381
Other	(tonne)	74	352
Crushed and broken stone-			
Basalt	(tonne)	870 320	983 206
Dolerite	(tonne)	947 936	971 653
Limestone	(tonne)	51 752	52 256
Sandstone	(tonne)	1 060	5 424
Other	(tonne)	194 624	136 603
Gravel	(tonne)	34 868	32 586
Sand	(tonne)	426 439	448 108
Other road materials	(tonne)	936 144	1 174 859
Value of construction materials		\$23 404 761	\$19 928 844
TOTAL VALUE WITH AUSTRALIAN METAL PRICES		\$537 406 390	\$606 858 821
METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES			
Aluminium)		
Aluminium sulphate)		
Cadmium)		
Cobalt oxide)		
Ferro-manganese)		
Ferro-silicon)	\$622 903 124	\$483 237 450
Silico-manganese)		
Sinter)		
Superphosphate)		
Titanium dioxide)		
Zinc)		
VALUE OF MINING AND METALLURGICAL PRODUCTION		\$1 160 309 514	\$1 090 096 271
REPORTED AVERAGE NUMBER OF EMPLOYEES¹		6 242	5 512

(1) Not all operators report full details

Table 6

MINERAL PRODUCTION FROM TASMANIAN SOURCES SINCE 1880
QUANTITY OF PRODUCTION AS AT 30 JUNE 1992

<i>Commodity</i>	<i>Unit</i>	<i>Quantity in Current Year</i>	<i>Total Quantity</i>
METALLIC MINERALS			
Antimony	(tonne)	-	3
Bismuth	(kilogram)	-	110 080
Cadmium	(tonne)	238	4 946
Chromite	(tonne)	-	2 687
Cobalt oxide	(tonne)	-	165.3
Copper (blister) to 1918 (now shown under Silver and Copper)	(tonne)	-	169 273
Copper matte	(tonne)	-	6 326
Copper ore to 1918 (now shown under Copper)	(tonne)	-	42 439
Copper (from 1919)	(tonne)	27 292	1 076 936
Crocoite	(kilogram)	3	1 353
Gold	(kilogram)	1 714	123 883
Ilmenite	(tonne)	-	558
Iron ore pellets	(tonne)	959 792	49 904 242
Iron oxide (including hematite, limonite and magnetite)	(tonne)	131 733	1 059 272
Lead (from 1919)	(tonne)	73 853	1 013 832
Manganese	(tonne)	-	1
Manganese dioxide (from 1957)	(tonne)	-	13 521
Mercury	(kilogram)	-	7 697
Molybdenum	(tonne)	-	162
Monazite	(tonne)	-	34
Nickel	(tonne)	-	237
Osmiridium	(kilogram)	-	960
Pyrite (to 1971)	(tonne)	-	2 124 070
Pyrite (from 1972)	(tonne)	38 692	1 667 823
Rutile	(tonne)	-	1
Rutile (concentrates)	(tonne)	-	40 027
Scheelite (concentrates)	(tonne)	-	57 261
Silica for silicon alloy production	(tonne)	110 450	1 137 409
Silicon	(tonne)	1 603	36 987
Silver-lead ore to 1918 (now shown under Silver and Lead)	(tonne)	-	1 101 295
Silver (from 1919)	(kilogram)	164 837	3 471 188
Tin	(tonne)	5 729	300 930
Tungsten (as tungstic oxide)	(tonne)	229	35 073
Zinc	(tonne)	210 853	2 776 019
Zinc sulphate (from 1957)	(tonne)	-	4 306
Zircon (concentrates)	(tonne)	-	39 001
NON-METALLIC MINERALS			
Asbestos	(tonne)	-	4 044
Barite	(tonne)	-	2 240
Clay (from 1958)	(tonne)	186 106	4 433 923
Dolomite	(tonne)	49 323	393 328
Graphite	(tonne)	-	41
Kaolin	(tonne)	29 758	487 303
Limestone-			
Agricultural and other	(tonne)	129 335	2 603 106
Carbide	(tonne)	-	1 081 509
Cement	(tonne)	772 758	18 583 070
Chemical and metallurgical	(tonne)	16 124	6 210 109
Ochre	(tonne)	-	2 949
Pebbles (from 1957)	(tonne)	-	31 757
Sulphuric acid	(mono tonne)	243 865	5 564 286
Sand (moulding)	(tonne)	-	1 442
Silica	(tonne)	-	701 248
Talc	(tonne)	-	338

Table 6

**MINERAL PRODUCTION FROM TASMANIAN SOURCES SINCE 1880
QUANTITY OF PRODUCTION AS AT 30 JUNE 1992 (continued)**

<i>Commodity</i>	<i>Quantity in Unit</i>	<i>Total Current Year</i>	<i>Quantity</i>
FUEL MINERALS			
Coal (run of mine)	(tonne)	486 797	17 817 412
Shale	(tonne)	-	42 239
Peat	(m ³)	3 821	31 234
CONSTRUCTION MATERIALS			
Building stone-			
Freestone	(tonne)	1 424	30 980
Granite	(tonne)	381	133 167
Other stone	(tonne)	352	38 520
Crushed and broken stone (from 1958)-			
Basalt	(tonne)	983 206	17 701 117
Dolerite	(tonne)	971 653	29 722 276
Limestone	(tonne)	52 256	1 122 250
Sandstone	(tonne)	5 424	284 204
Other	(tonne)	136 603	11 102 536
Gravel (from 1958)	(tonne)	32 586	48 265 095
Sand (from 1958)	(tonne)	448 108	9 030 817
Other road-making material	(tonne)	1 174 859	11 730 735

Table 7

**NUMBER AND AREA OF LEASES AND LICENCES APPLIED FOR
DURING THE YEAR TO 30 JUNE 1992**

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	5	413
Basalt	1	6
Coal	1	4
Easements	3	135
Gold	4	116
Granite	2	10
Gravel	14	133
Limestone	3	691
Sand	2	7
Sand and gravel	1	6
Shale	2	18
Silica	1	19
Slate	1	3
Specimens	1	14
Stone	15	646
Stone and sand	1	13
	<u>57</u>	<u>2 234</u>

Table 8

**NUMBER AND AREA OF NEW LEASES AND LICENCES
GRANTED DURING THE YEAR TO 30 JUNE 1992**

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	4	171
Coal	3	3 577
Easements	2	30
Gold	2	93
Granite	1	4
Gravel	8	114
Sand	5	161
Sand and gravel	2	200
Silica	2	355
Stone	22	558
Tin	1	50
	<u>52</u>	<u>5 313</u>

Table 9

**TOTAL NUMBER OF LEASES AND LICENCES IN FORCE
ON 30 JUNE 1992**

<i>Principal product</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
All minerals	51	12 427	-
Clay	11	252	-
Coal	14	6 640	-
Copper	5	1 276	-
Dolomite	2	131	-
Easements	62	642	218
Gold	37	2 859	-
Granite	7	40	-
Gravel	138	3 188	-
Gravel and stone	8	569	-
Iron	1	1 959	-
Kaolin	2	373	-
Lead and zinc	6	477	-
Limestone	14	2 335	-
Magnesite, silica and talc	1	29	-
Peat	5	772	-
Sand	69	2 194	-
Sand and gravel	27	2 969	-
Sand and stone	11	188	-
Savage River Easements	12	2 248	-
Shale	3	7	-
Silica	17	1 546	-
Silver and lead	2	24	-
Slate	6	189	-
Specimens	3	30	-
Stone	207	9 445	-
Tin	63	8 624	-
Wolfram	1	4	-
	807	61 527	218

Table 10

**TOTAL NUMBER OF ALL TYPES OF PROSPECTING RIGHTS HELD
AS AT 30 JUNE 1992**

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Exploration Licences —		
All minerals	96	5 536 km ²
Non metallic	10	278 km ²
Oil	2	61 218 km ²
Retention Licences —		
All minerals	14	81 km ²
Non Metallic	12	406 km ²
Prospectors Licences	24	524 ha
Miners Rights	8	2 ha
Owners Rights	2	214 ha
Permits to explore for Petroleum under <i>Petroleum (Submerged Lands) Act 1967</i>	5	306 blocks
Retention Licence under <i>Petroleum (Submerged Lands) Act 1967</i>	1	9 blocks

Table 11

**LICENCES, PERMITS AND APPROVALS ISSUED FOR THE IMPORT,
MANUFACTURE, STORAGE, USE AND SALE OF DANGEROUS GOODS,
1991-92**

	1991/92	1990/91
Licences to keep flammable liquids and dangerous goods	2537	2533
Licences to sell explosives and safety cartridges	148	147
Private magazine licences	263	95
Import explosives licences	29	31
Convey explosives licences	16	18
Manufacture explosives licences	2	2
To sell fireworks licences	10	6
Applications for shotfirers permits	153	78
Applications for plan approvals	318	225
Landing permits (fireworks and explosives)	52	73
Transfers and information retrieval requests	56	105
Manufacture dangerous goods licences	6	6
Import dangerous goods licences	15	16
Gas suppliers licences	56	43
Exemptions	-	-

Table 12

IMPORTS OF FLAMMABLE LIQUIDS, 1991-92

<i>Product (tonnes)</i>	<i>Bell Bay</i>	<i>Burnie</i>	<i>Devonport</i>	<i>Hobart</i>	<i>Total (tonnes) 1991/92</i>	<i>Total (tonnes) 1990/91</i>
Aviation Gasoline	500	-	-	-	500	1 400
LP Gas	7 674	-	18 144	11 154	36 972	31 738
Unleaded Petrol	15 614	10 739	29 509	46 115	101 977	85 780
Super Petrol	42 935	22 878	55 505	110 871	232 189	233 400
Kerosene — Aviation - Jet	11 116	-	-	14 252	25 368	25 866
Kerosene — Lighting & Power	-	-	-	-	-	-
Bitumen Feed Stock	-	-	-	19 228	19 228	28 880
AGO and Distillate	45 687	29 589	50 191	84 702	210 169	203 854
Heating and Fuel Oil	12 532	28 856	15 245	14 555	71 188	32 255
Total (tonnes)	136 058	92 062	168 594	300 877	697 591	643 213
Number of Tankers	26	9	35	38	108	97

Table 13

IMPORTS OF EXPLOSIVES, 1991-92

<i>Product (cartons)</i>	<i>Bell Bay</i>	<i>Stanley</i>	<i>Burnie</i>	<i>Devonport</i>	<i>Total 1990/91</i>	<i>Total 1990/91</i>
Blasting Explosives 1.1D		14 775	18 572		33 347	34 846
Blasting Powder 1.1D					-	-
Detonating Cord 1.1D					-	-
Propellant Powder 1.1C					-	-
Detonators 1.1B		1 982	738	265	2 985	3 116
Detonators 1.4B					-	3
Gunpowder 1.4G					-	-
ISANOL 1.5D					-	192
Total cartons		16 757	19 310	265	36 332	38 157
Ammonium Nitrate (tonnes)	150		1 318		1 468	300
Number of Shipments	1	43	16	1	61	50 ship 20 aircraft

There were no imports for Bell Bay, Hobart

Export of Explosives (a) Smithton — 6 cartons 1.1B Detonators
(b) Burnie — 1 carton 1.1D Blasting Explosives, 26 cartons 1.45 fireworks

Financial Statements

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REPORT ON FINANCIAL ACTIVITIES

The accompanying financial statements of the Department of Mines have been prepared in compliance with the provisions of the Financial Management and Audit Act 1990 and are in agreement with the relevant accounts and records so as to present fairly the financial transactions for the 12 months ending 30 June 1992 and such components of financial position which are required by Treasurer's Instructions to be disclosed in the Financial Statements.

At the date of signing we are not aware of any circumstances which would render the particulars included in the financial statements misleading or inaccurate.

D. A. LOUEZ

FINANCE MANAGER

G. A. KENNEDY

SECRETARY

31 August 1992



AUDIT REPORT

DEPARTMENT OF MINES

Scope

In accordance with the provisions of the Financial Management and Audit Act 1990, I have audited the financial statements, notes and supplementary information for the year ended 30 June 1992. The Secretary of the Department of Mines, as Head of Agency, is responsible under the provisions of Section 27 (1) of that Act for the preparation and presentation of the statements and the information contained therein. I have conducted an independent audit of the financial statements in order to express an opinion on them to the Secretary.

The audit has been planned and performed in accordance with Australian Auditing Standards to provide a reasonable level of assurance as to whether the financial statements are free of material mis-statement. My procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as required by Section 40 of the Financial Management and Audit Act 1990, as to whether, in all material respects, the financial statements are presented fairly in accordance with Australian accounting concepts and standards and applicable legislation so as to present a view which is consistent with my understanding of the financial transactions during the period and the financial position at the end of that period.

The audit opinion expressed in this report has been formed on the above basis.

Audit Opinion

In my opinion, the financial statements of the Department of Mines have been drawn up in accordance with the Financial Management and Audit Act 1990, Statements of Accounting Concepts and applicable Accounting Standards so as to present fairly the financial transactions during the year ended 30 June 1992 and the components of financial position at that date disclosed in pursuance of the Act.

This opinion relates solely to the financial statements contained on pages 54 to 69.

A handwritten signature in black ink, appearing to read "A J McHugh". The signature is written in a cursive style and is positioned above the printed name and title.

A J McHugh
AUDITOR-GENERAL

28 October 1992

HOBART

AGENCY SUMMARY

1. HIGHLIGHTS

PROGRAM 1: MINES AND MINERAL RESOURCES

- The Department's budget required supplementation to fund three full drilling teams against one originally budgeted for in 1991/92.
- Geological consultations raised \$177,763 during the year in a period of reduced investment in the mining industry. In addition, an extensive detailed gravity survey was completed raising \$148,000 resulting in a total of \$325,763 in consulting fees.
- \$356,000 was provided for the Mount Read Volcanic Project which was completed during the year. The project, which began in 1985/86, has provided innovative geological, geophysical and geochemical information for use by the private sector in exploring these Cambrian volcanic rocks.
- \$50,000 was again provided for Tasmanian Government Research Scholarships to assist in post-graduate research in applied geology, geochemistry and mineral processing.
- The Discussion and Draft Papers on the review of the Mining Act are close to finalisation.
- \$58,000 was provided as part of a grant indexed over six years to the National Centre for Ore Deposit and Exploration Studies.

PROGRAM 3: EXECUTIVE

- As a consequence of new administrative arrangements for State Government agencies the Department of Resources and Energy was renamed the Department of Mines, and the Water Resources and Energy Resources Divisions of the former Department were transferred to the then Department of Primary Industry, Fisheries and Energy.
- With the re-establishment of the Department of Mines work immediately commenced to develop the Corporate Plan. It is anticipated that the plan will be released early in the 1992/93 financial year.

2. ECONOMIC FACTORS

Most revenue items associated with the Mining activities in Tasmania, such as royalties and rents, are dependent on the levels of profits and activity within the mining and mineral exploration industries and by international factors, such as metal prices, commodity stocks and supplies, and currency fluctuations. Such uncertainties make revenue forecasting difficult.

A reduction in metal prices in 1991/92 resulted in royalty payments being significantly lower than estimated.

3. PRICING AND CHARGING

Departmental policy is to regularly review all fees and charges and set them at levels which reflect the costs associated with the delivery of service.

Consultation charges for services by the Geological Survey and the Laboratories are set within the upper quartile of industry charges.

Coinciding with the development of the Corporate Plan a program budgeting system will be developed based on functional outputs. The extent to which current fees and charges represent full cost recovery will then be assessed.

4. CAPITAL PROJECTS

An amount of \$12,000 was allocated in 1991/92 to complete the construction of the new diamond-drill core store located at Mornington.

The total cost of the project including installation of core-tray racking was \$878,000.

5. PERFORMANCE INDICATORS

The Department is in the process of developing performance indicators at a sub-program level and will develop efficiency and effectiveness indicators for output oriented activities as part of the development of a program budgeting system.

6. RISK MANAGEMENT POLICIES

The Department does not have a formal risk management strategy. However, following the re-establishment of the Department of Mines a review of effective management controls will be undertaken. An internal audit charter has been accepted and an audit program commenced which will address as part of its charter a risk management program.

7. ASSET MANAGEMENT POLICIES

An inventory control system is currently in place. By 30 June 1993 an assets register will be established and a statement of asset management practices developed aimed at:

- reducing and insuring against the risks of loss, theft and deterioration;
- ensuring assets are efficiently and properly utilised, valued appropriately and disclosed in management and other reports.

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The following summary explains the principal accounting policies adopted in the preparation of the financial statements which have been prepared in accordance with the Financial Management and Audit Act 1990, the Australian Accounting Standards and Statements of Accounting Concepts (where appropriate). Unless otherwise stated the accounting policies are consistent with those used in previous years.

STATUTORY MATTERS

During 1991/92 the Department of Resources and Energy was renamed the Department of Mines, and the Water Resources and Energy Resources Divisions were transferred to the Department of Primary Industry, Fisheries and Energy (DPIFE). Consequently financial information in respect of Programs 2 and 4 for 1991/92 are reported under DPIFE.

(a) Basis of accounting

The financial operations are funded through the Public Account on a program basis and accordingly the financial statements comprise of a summary of expenditure from the Consolidated Fund by program, as shown in the Consolidated Fund Appropriation Act 1991-92 and a summary of receipts credited to the Consolidated Fund classified in the same manner as in the Receipt section of the Supporting Budget Information (Budget Paper No. 1). Detailed statements of transactions are also provided. The balances and movements in Accounts of the Special Deposits and Trust Fund administered by the Agency, which do not necessarily operate on an annual basis, are provided in Table E.

In this context, the Agency's accounts are maintained on a cash accounting basis which has the following effect on the statements presented:

- creditors are not taken up because payments are recorded as they occur;
- receipts are brought to account when payments are received;
- provisions are not generated because payments are charged and funded as they occur.

Supplementary financial information has been provided which shows revenues due and uncollected and expenditure claims and commitments outstanding in relation to the Consolidated Fund and the Special Deposits and Trust Fund.

- (b) The financial statements and supplementary information only include identifiable direct costs and liabilities, and do not reflect the total costs of the operations of the Agency. Costs such as rent and cleaning of office accommodation, rates and taxes, and employer contributions to the Retirement Benefit Fund are not included.
 - (c) In accordance with a transitional arrangement (as per Treasurer's Instruction No. 702(3)(m), a statement of assets employed has not been prepared. A statement of assets employed will be prepared for the financial year ended 30 June 1993.
 - (d) Employee Entitlements for long service leave and annual leave are calculated on the basis of legal entitlement as at reporting date.
2. Summaries of revenue and expenditure claims outstanding as at 30 June 1992, together with expenditure commitments are provided in Table F. Liability for Employee Entitlements (excluding superannuation and accrued salaries) are also shown.
 3. A summary of losses and damage to property is provided in Table G. There were no write offs during the financial year.
 4. Explanations of major variations in expenditure and receipts are included following Tables B and D.
 5. Grants totalling \$108,000 appropriated under Consolidated Fund Appropriation Act Item No. C603 and C828 were made to the University of Tasmania during 1991/92.

<p style="text-align: center;">NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS (cont.)</p>

6. The financial statements have been prepared with amounts expressed to the nearest \$1 or \$1,000.

Some departure from this general policy has been necessary to ensure completeness and accuracy of information.

In respect of Consolidated Fund amounts rounded to zero, the actual amount was:

- Receipts — Y207 Sale of Government Property \$261
 - Expenditure — Program 3, A11 Materials and Supplies \$412
7. Accommodation costs for the Department of Mines were provided for by the Public Offices Branch in 1991/92. Occupancy is by way of a financial lease which commenced on 4 January 1982 and is for 30 years.

DEPARTMENT OF MINES

Table A

Division 23

CONSOLIDATED FUND
SUMMARY OF EXPENDITURE
AND RECEIPTS

YEAR ENDED 30 JUNE 1992

EXPENDITURE

1990/91 Actual \$'000		Estimate \$'000	1991/92 Actual \$'000	Variation \$'000
6 720	<i>Appropriation Act:</i>	6 107	6 311	(204)
353	Program 1: Mines and Mineral Resources	313	297	16
	Program 3: Executive			
7 073	Total Expenditure	6 420	6 608	(188)

RECEIPTS

1990/91 Actual \$'000	Item:	Estimate \$'000	1991/92 Actual \$'000	Variation \$'000
5	Y207 Sale of Government Properties	-	-	-
734	Y208 Rent and Fees from Mineral Lands	662	784	122
300	Y209 Royalties on Iron Ore Pellets	250	204	(46)
248	Y210 Storage of Explosives and Flammable Liquids	250	263	13
5 050	Y212 Mineral Royalties	5 650	4 525	(1 125)
435	Y337 Mines	620	488	(132)
	Y850 Miscellaneous	-	8	8
10	L800 Sale of Government Assets	-	6	6
6 782	Total Receipts	7 432	6 278	(1 154)

Financial information in respect of Programs 2 and 4 is reported on by the Department of Primary Industry, Fisheries and Energy (Refer Note 1).

DEPARTMENT OF MINES

Table B

Division 23

CONSOLIDATED FUND
EXPENDITURE — APPROPRIATION ACT

YEAR ENDED 30 JUNE 1992

1990/91 Actual \$'000		Estimate \$'000	1991/92 Actual \$'000		Variation \$'000
	PROGRAM 1: MINES AND MINERAL RESOURCES				
	Recurrent Services				
5 768	A100 Operating Expenses	5 468		5 666	(198)*
	A001 Salaries and related payments		4 131		
	A011 Materials and supplies		353		
	A012 Communication		141		
	A013 Property services		138		
	A014 Travel		249		
	A015 Transport		173		
	A016 Office machines and equipment		1		
	A017 Printing and publications		78		
	A018 Electronic data processing		235		
	A019 Recruitment and other personnel expenses		83		
	A020 Miscellaneous		84		
50	C603 Tasmanian Government Research Scholarships	50		50	-
400	C772 Mt Read Volcanics Project	350		356	(6)*
54	C828 National Centre for Ore Deposits and Exploration Studies: Grant	58		58	-
18	C830 Seismic Net maintenance	-		-	-
6 290	Total Recurrent Services	5 926		6 130	(204)
	Works and Services				
210	F100 Building construction and associated expenses	12		12	-
220	H100 Other works and purposes	169		169	-
	H001 Plant and equipment		101		
	H003 Furniture and fittings		5		
	H004 Computing equipment		21		
	H005 Vehicles and seacraft		25		
	H022 For the purposes of the <i>Mineral Resources Act 1951</i>		17		
430	Total Works and Services	181		181	-
6 720	TOTAL PROGRAM 1: MINES AND MINERAL RESOURCES	6 107		6 311	(204)

* Additional funding was approved under Section 11(2) of the Public Account Act 1986.

DEPARTMENT OF MINES

Table B

Division 23

CONSOLIDATED FUND
EXPENDITURE — APPROPRIATION ACT (cont.)

YEAR ENDED 30 JUNE 1992

1990/91 Actual \$'000		Notes	Estimate \$'000	1991/92 Actual \$'000		Variation \$'000
	PROGRAM 3: EXECUTIVE					
	Recurrent Services					
353	A100		313		297	16
	A001			224		
	A011	6		-		
	A012			3		
	A013			4		
	A014			23		
	A015			9		
	A019			25		
	A020			9		
353	Total Recurrent Services		313		297	16
353	TOTAL PROGRAM 3: EXECUTIVE		313		297	16
TOTAL DIVISION 23						
6 643	Recurrent Services		6 239		6 427	(188)
430	Works and Services		181		181	-
7 073	TOTAL EXPENDITURE FOR AGENCY		6 420		6 608	(188)

DEPARTMENT OF MINES

Table D

Division 23

CONSOLIDATED FUND — RECEIPTS

YEAR ENDED 30 JUNE 1992

RECURRENT — State						
1990/91 Actual			Estimate	1991/92 Actual		Variation
\$'000		Notes	\$'000	\$'000	\$'000	\$'000
5	Y207	<i>Sale of Government Properties</i>	6	—	—	—
734	Y208	<i>Rent and Fees from Mineral Lands</i>		662	784	122
		Lease Rentals			352	—
		Submerged Land Rentals and Fees			121	
		Mining Fees and Rights			40	
		Exploration Licences			156	
		Transfer and Application Fees			7	
		Search Fees — Mining Act			64	
		Sale of Maps & Publications			22	
		Assay Fees			15	
		Other			7	
300	Y209	<i>Royalties on Iron Ore Pellets</i>		250	204	(46)
248	Y210	<i>Storage of Explosives & Flammable Liquids</i>		250	263	13
		Licencing			131	
		Shot Firers Permits			9	
		Inspection fees			29	
		Approved premises — applications			16	
		Storage of explosives			52	
		In-house training			19	
		Other			7	
5 050	Y212	<i>Mineral Royalties</i>		5 650	4 525	(1 125)
		Metallics			3 871	
		Other			654	
435	Y337	<i>Mines</i>		620	488	(132)
		Drilling Fees			157	
		Geological Services			326	
		Other			5	
—	Y850	<i>Miscellaneous</i>		—	8	8
6 772		Total Recurrent Receipts		7 432	6 272	(1 160)
10	L800	<i>Sale of Government Assets</i>		—	6	6
10		Total Capital Receipts		—	6	6
6 782		TOTAL RECEIPTS		7 432	6 278	(1 154)

DEPARTMENT OF MINES

EXPLANATION OF SIGNIFICANT VARIATIONS
--

CONSOLIDATED FUND — EXPENDITURE

PROGRAM 1: MINES AND MINERAL RESOURCES

\$'000

A100: Operating Expenses

+198

The planned reduction of the Department's drilling operation was not effected until the end of the financial year. An additional \$253 000 was required to maintain the three drilling crews, the cost of which, in part, was offset by savings in salaries.

CONSOLIDATED FUND — REVENUE

Y208: Rent and Fees from Mineral Lands

+122

The increase is due to a large lease being taken out during the year, together with an increase in other lease rentals and fees from analyses.

Y209: Royalties from iron ore pellets

-46

Sale of iron ore did not meet expectations during 1991/92, resulting in royalty being based on a rate per tonne and not profits.

Y212: Mineral Royalties

-1 125

Revenue from this item is entirely dependant upon the state of the mining industry. Metal prices for lead and zinc were relatively low for most of the year, resulting in revenue being less than estimated for 1991/92.

Y337: Mines

-132

Revenue from geological services was \$151,000 lower than estimated for 1991/92. The non-implementation of a Mines Inspection Fee (\$103,000) was offset by a favourable variance from drilling services (\$127,000).

DEPARTMENT OF MINES

Table E

SPECIAL DEPOSITS AND TRUST FUND

T281 SMALL TIN MINERS ASSISTANCE SCHEME
--

**STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR
ENDED 30 JUNE 1992**

FUNCTION AND PURPOSE OF ACCOUNT

An agreement was made in 1986-87 for a grant of \$79 700 by the Commonwealth Government to the State Government for the payment of subsidies to small tin miners.

The subsidy payable to small tin operators is subject to the following conditions.

In the case of borrowings up to a maximum of \$20 000 — 50% of interest payments on loans or leases on borrowings by eligible small tin mine operators since 24 October 1985 not exceeding an amount of \$8000 in respect of any one small tin mine.

Applications were considered within a three year period commencing on 1 October 1986 and the State repaid \$35 060 of uncommitted amounts as at 30 September 1989, as specified in Part 6 of the Agreement to the Commonwealth.

1990/91		1991/92
Actual \$'000		Actual \$'000
31	Opening Balance	29
-	Receipts	-
31	Sub Total	29
2	Less Expenditure Subsidy to small-scale tin miners (Refer T752)	2
2	Total expenditure	2
29	Closing Balance	27

DEPARTMENT OF MINES

Table E

SPECIAL DEPOSITS AND TRUST FUND

T466 DEPOSIT ACCOUNT

STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR
ENDED 30 JUNE 1992

FUNCTION AND PURPOSE OF ACCOUNT

Amounts are received from individuals and companies as security against failure to perform or rehabilitate leases and licences under the Mining Act. Amounts are returned when leases or licences are cancelled or replaced by a bank guarantee. In the event of failure to rehabilitate the lease or licence area the deposit is forfeited and transferred to T757 Forfeited Performance Deposit Account.

1990/91			1991/92
Actual \$'000		\$'000	Actual \$'000
185	Opening Balance		241
81	Receipts Deposits received		22
266	Sub total		263
20	Less Expenditure Deposits refunded	79	
5	Deposits forfeited	1	
25	Total expenditure		80
241	Closing Balance		183

An additional \$4.3M in bank guarantees is held as security against failure of individuals and companies to perform or rehabilitate leases and licences.

DEPARTMENT OF MINES

Table E

SPECIAL DEPOSITS AND TRUST FUND

T588 DEPARTMENT OF MINES ASSET MANAGEMENT ACCOUNT
--

**STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR
ENDED 30 JUNE 1992**

FUNCTION AND PURPOSE OF ACCOUNT

The establishment of this account represents the first stage of transferring responsibility for asset management to the Department. The account provides for the purchase and disposal of motor vehicles, the sale of minor items of equipment, the disbursement of these proceeds at the discretion of the Department, and the receipt of contributions from the Consolidated Fund to fund any shortfall in the replacement of motor vehicles.

1990/91 Actual \$'000		\$'000	1991/92 Actual \$'000
	Opening Balance		-
	Receipts		
	Transfer from Trust Account (T697)	177*	
	Transfer from Consolidated Fund (H100)	25	
	Sale of motor vehicles	8	
	Sale of equipment	11	
	Total receipts		221
	Sub Total		221
	Less Expenditure		
	National Grid Management Council	3*	
	Resources and Energy — co-location costs	13*	
	Equipment disposal costs	1	
	Total expenditure		17
NIL§	Closing Balance		204

§ T558 was created in 1991/92 and therefore comparative figures are not available

* These transactions, which are outside the purpose of the account, result from the separation of the Department of Mines from the former Department of Resources and Energy and are currently the subject of discussion with the Department of Treasury and Finance.

DEPARTMENT OF MINES

Table E

SPECIAL DEPOSITS AND TRUST FUND

T741 GORDON RIVER
POWER DEVELOPMENT*STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR
ENDED 30 JUNE 1992

FUNCTION AND PURPOSE OF ACCOUNT

The Mt Read Project commenced in 1985/86 when Cabinet approved the allocation of \$2 million from the Gordon River Power Development compensation account. Since then amounts have been transferred from the Consolidated Fund each financial year to the Department's section of this Trust Fund. The Mount Read Volcanics Project represents a major Government initiative designed to encourage maximum private sector mineral exploration effort in probably the most productive and prospective rock unit in Australia by provision of innovative regional geological, geophysical and geochemical information.

1990/91 Actual \$'000		\$'000	1991/92 Actual \$'000
13	Opening Balance		11
	Receipts		
400	Transfer from Consolidated Fund (C772)		356
413	Sub Total		367
	Less Expenditure		
329	Salaries	239	
11	Travelling expenses	49	
-	Motor vehicle expenses	2	
1	Production of maps	8	
4	Photographic expenses	1	
14	Purchase of minor equipment	18	
4	Expendables	5	
39	Hire of helicopter	6	
402	Total expenditure		328
11	Closing Balance		39

* This balance represents only the Department's proportion of the overall balance (\$292 414DR) of T741 in the Special Deposits and Trust Fund as at 30 June 1992.

DEPARTMENT OF MINES

Table E

SPECIAL DEPOSITS AND TRUST FUND

T752 MINING TRUST FUND

STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR
ENDED 30 JUNE 1992

FUNCTION AND PURPOSE OF ACCOUNT

Provides assistance by means of loans to individuals and companies for the purpose of mining. Amounts are received from repayment of loans, interest and Commonwealth Government subsidies.

1990/91 Actual \$'000		\$'000	1991/92 Actual \$'000
107	Opening Balance		65
	Receipts		
6	Repayment of loans	5	
6	Repayment of interest	5	
2	Commonwealth subsidy (Refer T281)	2	
14	Total receipts		12
121	Sub Total		77
	Less Expenditure		
56	Assistance to individuals and companies	-	-
56	Total expenditure		-
65	Closing Balance		77

The balance of outstanding loans at 30 June 1992 was \$98,000

DEPARTMENT OF MINES

Table E

SPECIAL DEPOSITS AND TRUST FUND

T757 FORFEITED PERFORMANCE DEPOSITS ACCOUNT
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**STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR
ENDED 30 JUNE 1992**

FUNCTION AND PURPOSE OF ACCOUNT

Funds are provided from the forfeiture of mining companies performance deposits. Payments are made for the cost of the physical examination of mining exploration sites and for the purposes of associated restoration costs.

1990/91 Actual \$'000		\$'000	1991/92 Actual \$'000
27	Opening Balance		24
	Receipts		
5	Deposits forfeited	1	
18	Call on guarantees	19	20
50	Sub Total		44
	Less Expenditure		
26	Restoration costs		13
24	Closing Balance		31

DEPARTMENT OF MINES

Table F

**REVENUE AND EXPENDITURE OUTSTANDING
AS AT 30 JUNE 1992**

EXPENDITURE		
1990/91 \$		1991/92 \$
	CONSOLIDATED FUND	
	A100 Operating Expenses	
	Materials and supplies	2 308
	Communications	404
	Travel	728
	Transport	1 957
	Office machines and equipment	602
	Printing and publications	738
	Automatic data processing	384
	Recruitment and other personnel expenses	350
13 300	Total Consolidated Fund	7 471
	SPECIAL DEPOSITS AND TRUST FUND	
	T588 Department of Mines Asset Management Account	3 600
620	Total Special Deposits and Trust Fund	3 600
13 920	TOTAL CLAIMS ON HAND AND UNPAID	11 071
	REVENUE DUE AND UNCOLLECTED*	
	CONSOLIDATED FUND	
86 827	Revenue other than royalty payments	129 764
1 035 525	Royalty payments	1 450 000
1 122 352	TOTAL CONSOLIDATED FUND	1 579 764

* Revenue due and uncollected is comprised of Revenue other than royalty payments and being invoices raised and unpaid at 30 June 1992 and Royalty payments being an estimate of royalties payable on mineral production in the quarter ended 30 June 1992.

At the time of this report no exemption from the payment of royalties had been granted.

DEPARTMENT OF MINES

Table F

**EXPENDITURE COMMITMENTS
AS AT 30 JUNE 1992**

1990/91 \$		1991/92 \$
	CONSOLIDATED FUND	
	A100 Operating Expenses	
	Materials and supplies	5 911
	Property services	1 925
	Transport	131
	Automatic data processing	3 785
	Total A100 Operating Expenses	11 752
	H 100 Other Works and Purposes	
	H1 Plant and equipment	3 857
	Total H100 Other Works and Purposes	3 857
22 600	Total Consolidated Fund	15 609
	SPECIAL DEPOSITS AND TRUST FUND	
	T741 Gordon River Power Development	829
-	Total Special Deposits and Trust Fund	829
22 600	TOTAL EXPENDITURE COMMITMENTS AS AT 30 JUNE 1992	16 438

LIABILITY FOR EMPLOYEE ENTITLEMENTS

Estimates for employee entitlements as at 30 June 1992 are:

LEAVE TYPE	NO. OF DAYS	COST ESTIMATE \$'000
Recreation	3159	443
Long Service Leave	6274	638
Total Estimated Liability For Employee Entitlements		1 081*

* Refer Note 1(d)

DEPARTMENT OF MINES

Table G

**LOSS, DEFICIENCY, DESTRUCTION AND
DAMAGE TO PUBLIC OR OTHER MONEY, OR
PUBLIC OR OTHER PROPERTY**

DAMAGE

22.8.1991	GV 6521	\$998	No recovery — Departmental driver was at fault.
25.11.1991	GV 8126	\$360	No recovery — Departmental driver was at fault.
8.1.1992	GV 8458	\$505	No recovery — Departmental driver was at fault.

LOSS

1.7.1991	Regent pump with Honda GX140 engine S/No. 1672777, Cost \$486, Hadspen. Reported to police, not recovered.		
12.9.1991	Various equipment, cost \$800, Mornington. Reported to police, not recovered.		
29.3.1992	Stihl brushcutter S/No. 11818299, Stihl hedgetrimmer S/No. 118589088 plus various tools, cost \$1354, Rosny. Reported to police, not recovered.		
15.3.1992	Various tools, cost \$219, Queenstown. Reported to police, not recovered.		