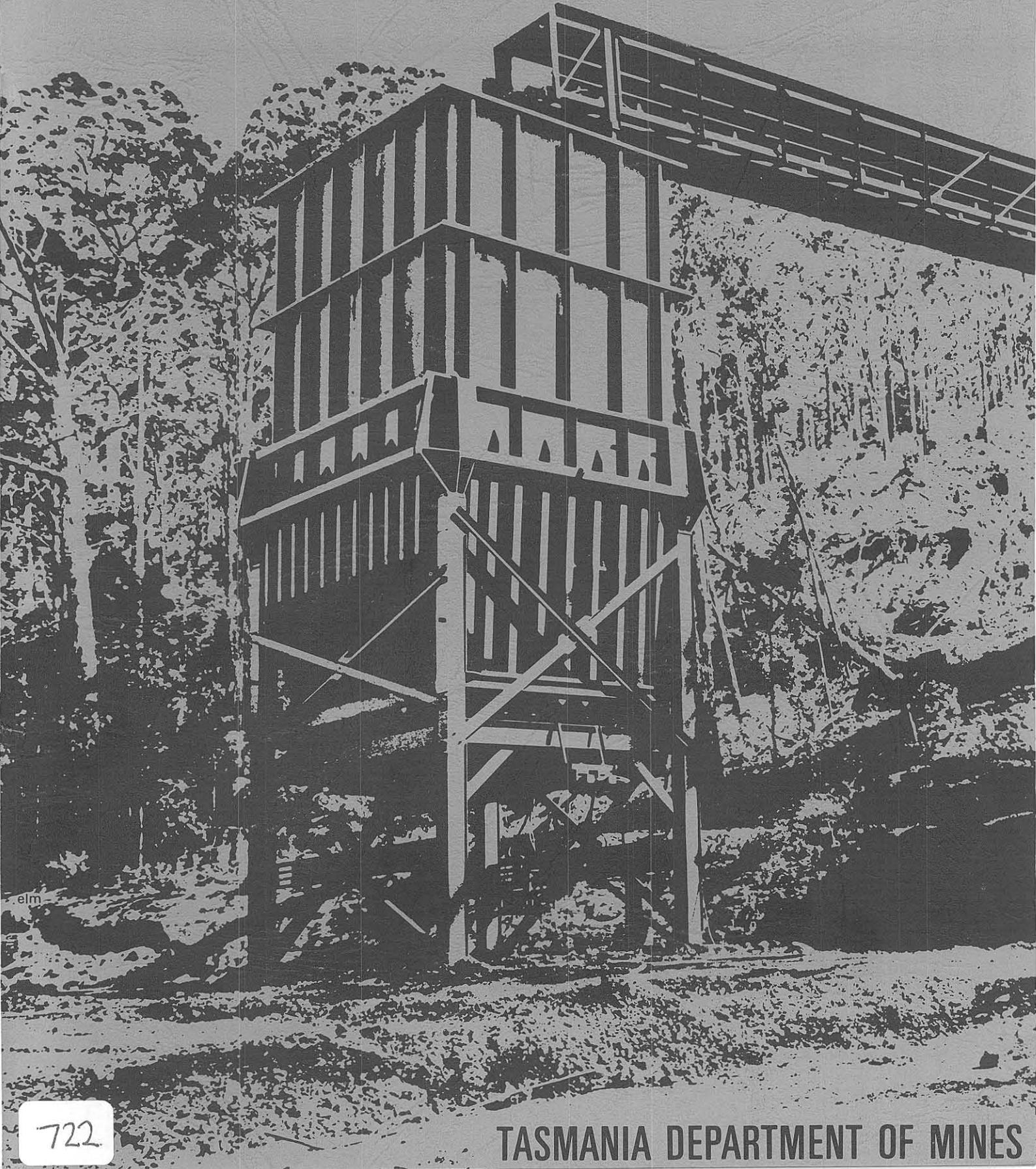


REPORT OF THE DIRECTOR OF MINES

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TASMANIA DEPARTMENT OF MINES



1982

PARLIAMENT OF TASMANIA

DIRECTOR OF MINES

REPORT FOR THE YEAR ENDED 30 JUNE 1981

Presented to both Houses of Parliament by His Excellency's Command

By Authority:

I. C. CARTER, Acting Government Printer, Tasmania



BLACKWOOD COLLIERY (see page 52): Coal conveyor and bin (above), main adit and mine buildings (below).

[Photos: P. Allan]

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REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart, 31 July 1982

THE MINISTER FOR MINES

SIR,

I present my report on the mining industry for the twelve months ended 30 June 1981. This period follows my half-year report to 30 June 1980 initiating the changeover from reporting by calendar year.

As the first table below shows, production from the last year to this has been remarkably steady except for heavy falls in lead and zinc. The falls in value of production of these two metals was further exacerbated by the falls in price. Overall the total value fell to \$313 million reflecting the general slump in world metal prices.

My predecessor from time to time sounded alarms at the expansion of National Parks over prospective mineral-bearing land and I cannot forbear from emphasising his concern, and drawing attention to another insidious encroachment, the movements to have vast areas of the State entered in the Register of the National Estate. This would have an inhibiting effect on mineral explorers, adding harassment to their difficulties of climate and terrain.

Details of production and value of all mining products are shown elsewhere in this report but particulars of the principal minerals are summarised below —

	1979-1980		1980-1981	
	Quantity	Value \$ million	Quantity	Value \$ million
Copper (tonnes)	20 040	39.8	23 593	39.6
Gold (kilograms)	1 323	19.7	1 248	18.9
Iron ore pellets (tonnes)	2 187 304	46.0	2 202 665	44.8
Lead (tonnes)	15 694	16.4	12 710	8.6
Silver (kilograms)	56 907	31.6	36 214	15.4
Tin (tonnes)	6 580	101.0	7 026	92.9
Tungsten as tungstic oxide (tonnes)	2 799	35.0	3 111	39.0
Zinc (tonnes)	57 809	42.0	41 270	30.1
Coal (tonnes)	279 197	4.1	304 727	5.7

DEVELOPMENTS

RENISON LIMITED

Negotiations are continuing with an East German company for a licence to construct and commission a tin concentrate fuming plant. This would enable the company to recover higher quantities of tin from its ores. The project could cost from \$15 to \$20 million.

This is in addition to the \$20 million expansion program completed in February which increased the company's production capacity from 630 000 tonnes to 850 000 tonnes per year.

The company is also investigating the possibility of establishing another mine at its Blue Tier prospect in north-eastern Tasmania. Exploration is continuing to determine the potential reserves.

MT LYELL MINING AND RAILWAY COMPANY LTD

Early in the year the company announced plans for a \$14 million capital and exploration program. Four 50-tonne underground trucks have been commissioned and a fifth is under consideration.

Work has also started on extension of the main decline to lower levels of the mine. It has also been decided to install a long-term pump station near the bottom of the Prince Lyell No. 1 shaft.

In its exploration program the company is anxious to delineate new ore bodies at shallower depths rather than continue following the Prince Lyell ore body down.

At the end of 1980 two new ball mills were commissioned. These replaced eleven smaller mills and increased capacity from 260 to 300 tonnes of ore an hour.

The success of the company's operations is still being badly affected by the strengthening of the Australian dollar against the British pound. The reason for this is that Mt Lyell's copper is sold in pounds sterling on the London Metals Exchange.

CORNWALL COAL COMPANY N.L.

The company opened a second mine near Fingal to be known as the Blackwood mine. When the new mine is in full production it is hoped to achieve a total output of 750 000 tonnes from the Duncan and Blackwood mines. The Duncan mine has been modernised and upgraded since the take-over by Goliath Cement Holdings Ltd in September 1979. This has included the replacement of uneconomic units and facilities for employees. Much remains to be done to enable the company to meet the increased demand for coal as a substitute for oil.

ELECTROLYTIC ZINC COMPANY

A liquid effluent collection and recycle system was successfully commissioned at Risdon during the year. This plant collects plant drainage for processing and return as process water.

The system has cost the company \$2.5 million. Environmental monitoring of the Derwent estuary and surrounding waters has demonstrated the improvements in environmental quality.

Two of the older acid production units have been replaced by a new contact sulphuric acid plant which treats 800 tonnes per day.

Industrial disputes caused delays in completion of the extensions to the Rosebery concentrating mill. As a result ore from the Que River mine could not be treated on a regular basis from the planned date of February 1981. Capacity of the mill has been increased from 650 000 tonnes a year to 800 000 tonnes.

QUE RIVER MINE

As mentioned in the note on the Electrolytic Zinc Co. there were delays in completion of the concentrator at Rosebery. Deliveries of ore from Que River to Rosebery commenced on 18 February 1981, but were limited to 2 000 tonnes per week. Some stockpiling of ore at Que River was also necessary.

The main vertical shaft at the mine has been developed to a depth of 238 metres. In addition the joint venture has constructed 53 new houses at Waratah for mine workers.

ABERFOYLE AND STOREYS CREEK MINES

After putting considerable effort and money into the exploration and development of the Lutwyche vein system the company sold the mines to Forestwood Australia Limited and Gold Copper Explorations Limited.

The mine is to be operated as Rossarden mine. Work is proceeding on development above 13 level and designs are being prepared for the shaft arrangement at the Lutwyche vein system.

CLEVELAND TIN MINE

Active exploration has continued and drilling has located low grade mineralisation in most holes. Mineralisation was intersected at depth containing tungsten, molybdenum and bismuth. Production was badly affected by industrial action.

Improvements in the profitability of the mine is expected to come from a higher head grade of ore treated and better mill recovery. Recent exploratory diamond drilling at the mine has found tungsten/molybdenum/tin mineralisation.

KING ISLAND SCHEELITE

The main declines advanced 118 metres at Dolphin and 88 metres at Bold Head. Work has started on the erection of a new cement fill plant to mix Goliath cement with the mill tailings for use as fill underground. Modifications were made to the artificial scheelite plant which is now capable of the designed output of high grade scheelite.

SAVAGE RIVER

The Dahlia Mining Company which owns 50 per cent of Savage River Mines has assigned 90 per cent of its interest to five Japanese steel companies. Two furnaces at Port Latta have been converted to coal feed. This should reduce oil requirements by about 20 per cent.

This company is now the only foreign supplier of iron ore pellets to Japan.

MT BISCHOFF TIN PROSPECT

Metals Exploration Limited has continued to make encouraging progress. An additional 49 diamond drill holes and 3 extensions have been drilled to investigate regional targets and to undertake infill drilling on previously known mineralisation.

CRA Exploration Pty Ltd has continued to meet all expenditure. Comstaff Pty Ltd and Preussag Australia Pty Ltd also hold an interest in this project.

PRODUCTION

COPPER

The Mount Lyell Mining and Railway Company Ltd at Queenstown is the principal producer but significant quantities come from the lead-zinc ore of the Electrolytic Zinc Company at Rosebery and the tin ore of Cleveland Tin N.L. at Luina.

The Mount Lyell Company milled 1.7 million tonnes of ore to produce 82 802 tonnes of copper concentrate containing 21 147 tonnes of copper, 3 875 kilograms of silver and 467 kilograms of gold. The concentrates are shipped by road, rail and sea through Burnie to Port Kembla and Japan.

The Electrolytic Zinc Company produced 2 045 tonnes of copper in concentrates and Cleveland Tin N.L. 401 tonnes.

IRON ORE

Savage River Mines shipped 2.2 million tonnes of pellets produced at the Port Latta plant from ore mined at Savage River.

Negotiations are still proceeding for the acquisition of the northern magnetite deposits.

TIN

Total production was 7 027 tonnes, an improved rate of production compared with that for the previous 18 months.

Renison Limited, the major producer, milled 652 002 tonnes of ore to produce 5 546 tonnes of tin in concentrates. Additional tables and cells came into operation in February to bring the treatment up to a rate of 850 000 tonnes per year. Investigation of a fuming process for low-grade concentrate continued.

Mine exploration continued and ore reserves were set at 16.4 million tonnes. Expenditure on outside exploration was \$2 900 000.

At the Cleveland mine concentrates containing 1 122 tonnes of tin were obtained from 356 455 tonnes of ore. Exploration drilling was stepped-up and ore-grade mineralisation was outlined.

The Aberfoyle and Storeys Creek mines were taken over from Aberfoyle Limited by Rossarden Mines Limited and production continued. At the Aberfoyle mill 36 339 tonnes of ore were treated to produce cassiterite concentrates containing 152 tonnes of tin. Hopes are centred on the Lutwyche Section.

Hydraulic mining by Amdex Mining Limited at the Pioneer and Endurance mines produced 113 tonnes of tin concentrates.

TUNGSTEN

Tungsten is produced as scheelite by King Island Scheelite Limited at Grassy and by Tasminex N.L. from the Kara mine at Hampshire.

The first-named milled 408 124 tonnes of ore to produce 251 940 metric ton units of WO_3 . Mine development proceeded normally.

Tasminex treated 97 500 tonnes of ore for 162 tonnes of concentrate. An evaluation of the mine placed ore reserves at 900 000 tonnes of grade 0.66 per cent.

Production of tungsten as wolfram by Rossarden Mines Limited was 121.8 tonnes in concentrates from the Aberfoyle and Storeys Creek mines. A contribution of 77.2 tonnes of concentrates from 14 300 tonnes of ore from the Oakleigh Creek Mine was made by Central Tasmanian Tungsten Pty Ltd.

ZINC

The Electrolytic Zinc Company at Rosebery milled 540 074 tonnes of ore to produce three concentrates containing 41 270 tonnes of zinc, 12 710 tonnes of lead, 2 045 tonnes of copper, 32 366 kilograms of silver and 7 811 kilograms of gold.

The zinc concentrates are treated at the Company's Risdon works together with concentrates from the Broken Hill mines.

Que River Mining Pty Ltd went into production, carting 29 691 tonnes of ore to the Rosebery mill of the Electrolytic Zinc Company and stockpiling 26 366 tonnes.

METAL PRICES

The following table shows the average Australian metal prices:—

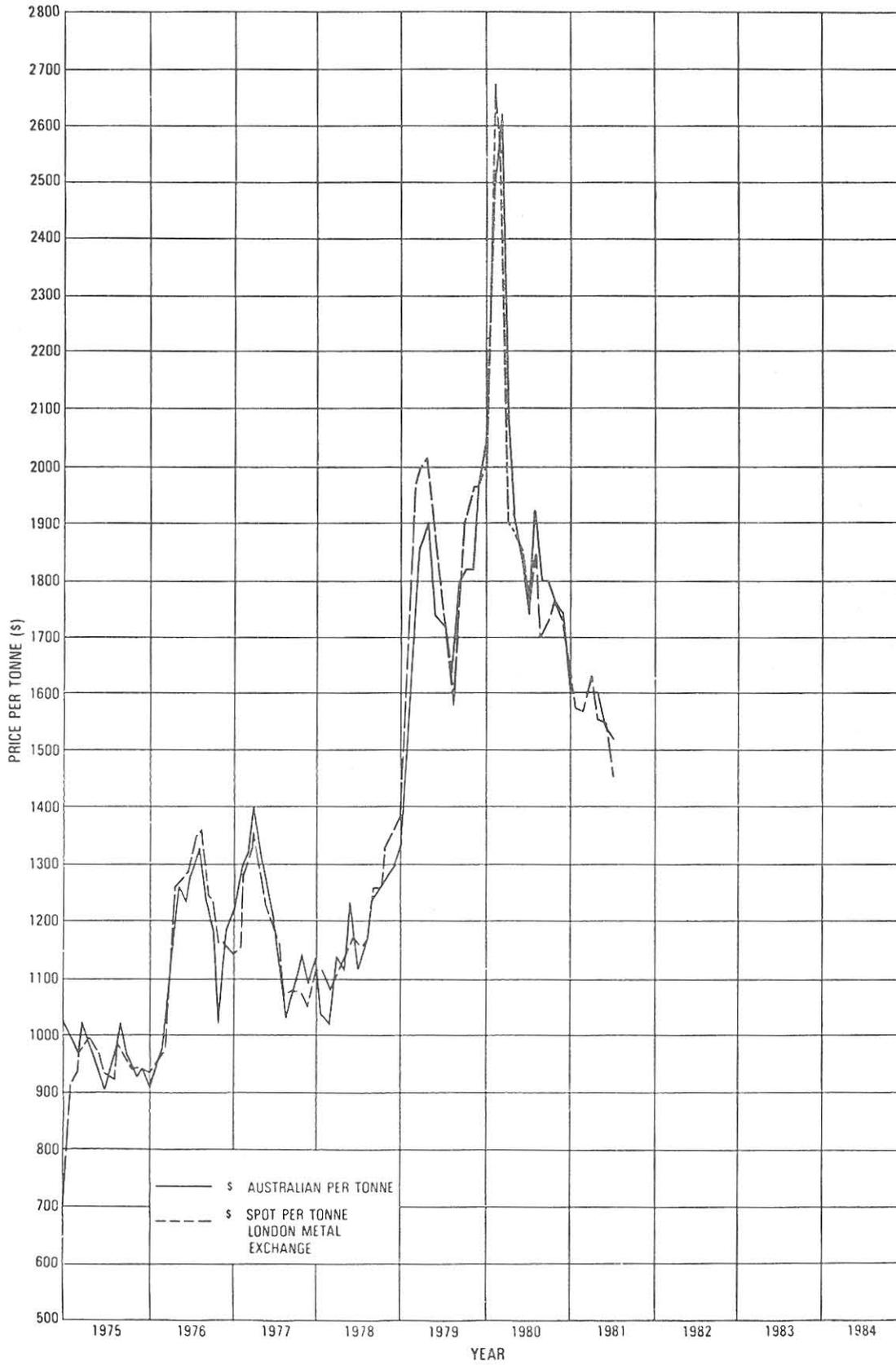
<i>Commodity</i>	<i>Unit</i>	<i>1978-79</i>	<i>1979-80</i>	<i>1980-81</i>
		\$	\$	\$
Copper	tonne	1 506.67	1 975.00	1 698.25
Gold	kilogram	6 526.09	14 014.55	15 524.38
Lead	tonne	791.25	1 041.50	679.17
Silver	kilogram	186.26	563.63	421.73
Tin	tonne	12 827.33	15 413.08	13 457.25
Tungstic oxide	unit	120.10	124.60	125.14
Zinc	tonne	674.17	725.25	725.25

GENERAL

The year from 1 July 1980 to 30 June 1981 was a time of depressed metal prices world-wide. The causes were many and varied but the major one was an economic recession which affected all the major Western countries. The variations which did occur to prices were more often than not the result of political disruptions, currency fluctuations or industrial disputes. The predictions for the future were pessimistic and there seems little hope for improvement in the short to medium term.

COPPER PRICES

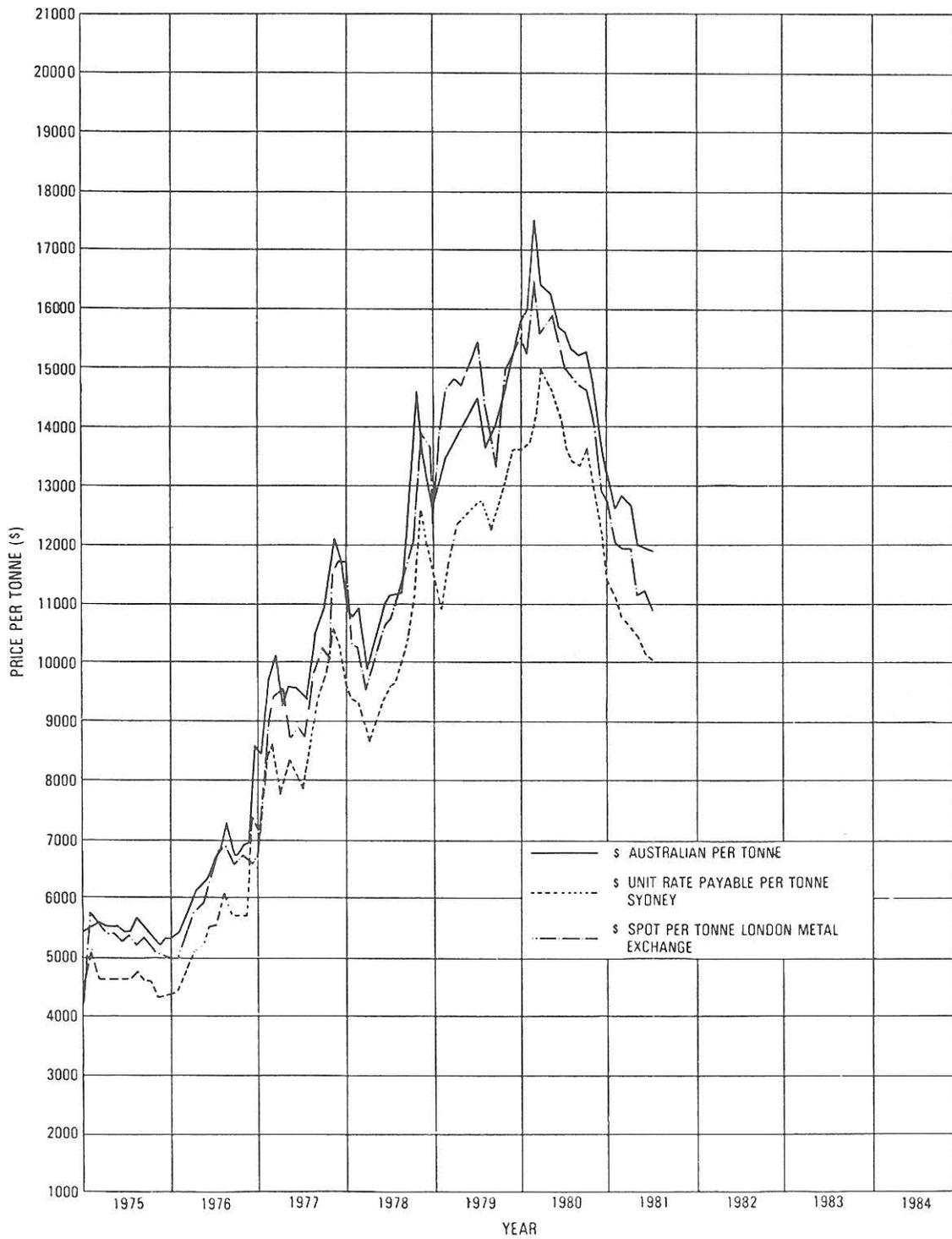
MONTHLY AVERAGES, JANUARY 1975-JUNE 1981



5 cm

TIN PRICES

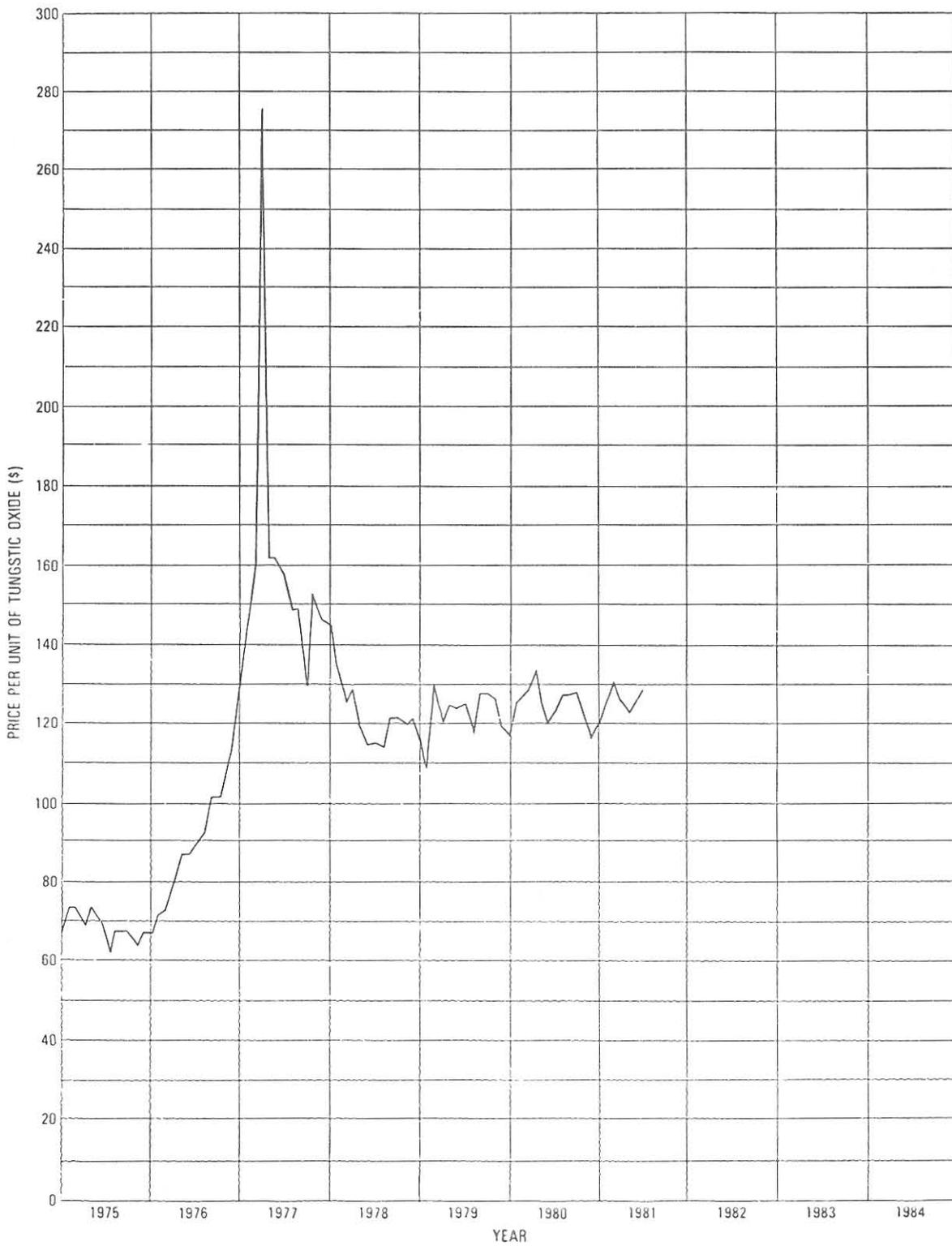
MONTHLY AVERAGES, JANUARY 1975-JUNE 1981



5 cm

TUNGSTEN PRICES

MONTHLY AVERAGES, JANUARY 1975-JUNE 1981



5 cm

COPPER

The Australian price in July 1980 was \$1 920 per tonne but declined steadily for the rest of the year. In December it had reached \$1 600 and this was maintained through to April. In May the price dropped to \$1 540 and in June by a further \$20 to \$1 520.

The Australian situation was not affected by overseas events or trends as was the situation with the L.M.E. price. This was £898 per tonne in July when the United States copper workers began a strike following the expiry of their labour contract on 30 June. The price in August was £902 but drifting lower despite the continuing strike. By January 1981 the price was down to £792 because of the recession, rising interest rates in the U.S.A. and profit taking. The price had sunk to £776 in February when some weak signs of improvement were noted. It eased gently upward until by June 1981 it stood at £853.5.

TIN

The Australian price was \$15 376 in July. This was the high point for the year as the market got steadily worse. The price declined every month (with minor exceptions in September and February) until in June it had reached \$11 882 per tonne.

The General Services Administration in the U.S.A. began offering tin from its stockpile in July 1980. The initial arrangement was for offers to be made by tender up to 500 tonnes on a sealed bid basis each fortnight. Only 5 tonnes were sold up to 30 November 1980 as the G.S.A. consistently refused bids. The method was then changed to daily 'off the shelf' offering at a fixed price. Sales were made under this system but only in small lots — the total from December to April was only 370 tonnes.

The L.M.E. price was £7 255 per tonne in July and declined to February when it reached £5 840. It rose slightly to the end of the year when it was £6 260.

The terms of the 5th International Tin Conference Agreement were extended for twelve months to allow for negotiations over the 6th Agreement. These negotiations were unsuccessful and a fourth session was held in June 1981. The major producers were critical of the U.S. Government for its stockpile releases and its reluctance to compromise.

TUNGSTEN

The price has been relatively stable for some years now and there were no major fluctuations during 1980–1981. In July the price was \$127.28 per metric ton unit and this dropped to the year's low of \$116.57 per metric ton unit in November. The high point for the year was \$130.28 per metric ton unit in February and in June 1981 it was \$128.65 per metric ton unit.

There is always a possibility of disruption to the market by sales from the General Services Administration stockpile. This has not happened for some time but the market is very sensitive to the possibility.

ZINC

This is the only metal of the four discussed where the price was greater at the end of the year than the beginning. This is not a source of joy to the producers however because the year end price is too low to cover production costs in many cases.

The July 1980 price was \$695 per tonne and this remained static until October when it rose to \$716. There was no further movement until April, when the price was \$723 per tonne. The June price was \$826 per tonne.

The L.M.E. prices showed more variation but they were relatively minor. In July 1980 it stood at £300 per tonne and in June 1981 it had reached £403 per tonne.

EXPLORATION

Sixty-seven applications were received for exploration licences during the year. Seven of these were for coal, oil and shale and 60 for other minerals.

At the end of June there were 126 current licences for exploration. Expenditure on Exploration Licences and Special Prospectors' Licences for the year totalled \$11 354 367 compared with \$5 656 902 for 1979-1980.

The moratorium imposed on South-West Tasmania on 19 September 1978 has continued to apply during this year. It is to remain in force until the Forestry Commission and National Parks and Wildlife Service have prepared management plans for the area. Amendments to the Forestry Act and the National Parks and Wildlife Act were completed late in 1980.

In January 1981, the Premier requested a meeting be convened of officers from the Forestry Commission, National Parks and Wildlife Service, Environment, Mines and South-West Tasmania Committee to consider the proposed exploration guidelines for South-West Tasmania. The draft guidelines prepared by the South-West Tasmania Committee were used as a basis for discussion.

Licence holders are required to report at regular intervals on the results of their exploration work.

All reports submitted to the Department are held for official purposes and remain confidential until —

- (1) a period of five years has elapsed from the date when the report was due to be submitted;
or
- (2) a licence expires, is relinquished, or is cancelled; or
- (3) the area to which a report relates is no longer held by the licensee;

whichever occurs first.

COAL

The Cornwall Coal Company N.L. operated both the Duncan and Blackwood mines during the year. Total output for the year was 304 727 tonnes. This was an increase of 25 530 tonnes over the previous year. The average number of employees increased from 111 to 130 of whom 79 worked underground.

The Blackwood mine commenced the year with six men working on the portals of the Blue Seam and is now 350 metres underground. The Duncan mine has been modernised and upgraded since the takeover by Goliath Cement Holdings Ltd in September 1979. This has included the replacement of uneconomic units and improved facilities for employees.

On 7 May 1981 Exploration Licence 17/81 was granted to Cornwall Coal Company N.L. This area had previously been exempt from the provisions of the Mining Act and had been extensively drilled by the Department of Mines.

The Shell Co. has continued its investigations at two locations. One is on its own licence (E.L. 18/77) in the vicinity of Avoca. It also has a joint venture with Industrial and Mining Investigations Pty Ltd on E.L. 5/61 on the East Coast of Tasmania. Drilling has continued in this area and the planned program will extend into the next twelve months.

There has been increased interest in applications for licences to explore for coal. Tasmanian coal is expected to become increasingly competitive with alternative energy sources in the longer term.

OIL

The following table shows details of permits issued under the Petroleum (Submerged Lands) Act 1967 which were current at 30 June 1981:—

<i>Title</i>	<i>Blocks</i>	<i>Holder</i>	<i>Expiry Date</i>
T/5P	16	Hematite Petroleum Pty Ltd	16.7.84
T/6P	32	Hematite Petroleum Pty Ltd	16.7.84
T/12P	60	Amoco Australia Petroleum Company, Tasman Oil Inc.	4.4.85
T/13P	224	Otter Exploration N.L.	4.4.85
T/14P	42	Cue Minerals N.L.	9.1.86
T/15P	272	Weaver Oil and Gas Corp. Aust.	19.2.86
T/16P	32	Weaver Oil and Gas Corp. Aust.	19.7.86
T/17P	16	Van Dieman's Land Resources N.L. and Others	7.8.86
T/18P	118	Bass Strait Oil and Gas N.L. and Others	22.7.86
T/19P	243	Perthshire Petroleum Ltd	27.3.87

Details of the four permits issued in Bass Strait during the year are as follows:—

T/16P was issued to Weaver Oil and Gas Corporation Aust. for a total area of 32 blocks. These blocks had been relinquished by Hematite Petroleum Pty Ltd from T/6P.

T/17P was issued to a consortium of Australian companies including —

Van Dieman's Land Resources N.L.
Oil and Minerals Quest N.L.
Nickel and Minerals Search N.L. (now Terrex Resources N.L.)
Bulldog Oil and Gas Ltd
Pasadena Projects Pty Ltd
Theseus Investments Ltd

This group also has an application pending for a further 75 blocks in the north-west part of Bass Strait.

T/18P was issued to Bass Strait Oil and Gas N.L. and Others which is another Australian consortium of companies including —

Tasmanian Oil and Gas N.L.
Bass Strait Oil and Gas N.L.
Terrex Resources N.L.
Hampton Oil and Gas Group Pty Ltd

T/19P was issued to Perthshire Petroleum Ltd which is a part of the Kaneb Services Inc. Group of companies and of Weaver Oil and Gas Corporation of Houston Texas, U.S.A.

With the assistance of the Bureau of Mineral Resources, the offshore areas round the west, south and east coasts of Tasmania have been divided into four prospective areas. It is intended to invite applications for the four areas later this year.

LEGISLATION

The following amendments were made to the Acts and Regulations administered by the Department.

MINING ACT 1929

Act No. 3 of 1981 provides for the appointment of the Director of Mines for periods not exceeding five years and removes subsection to the Public Service Act.

MINES INSPECTION ACT 1968 AND REGULATIONS

Act No. 7 of 1981 provides for the Chief Inspector of Mines as for the Director above.

Statutory Rules 1981, No. 29 makes technical amendments to the Regulations relating to lighting, noise, construction work, winding, conveyors and electricity usage.

DANGEROUS GOODS ACT 1976

Act No. 6 of 1981 provides for the Chief Inspector of Explosives as for the Director above.

AUSTRALIAN MINERALS AND ENERGY COUNCIL

The Council met on 3 April 1981 in Launceston. A rare event as meetings are normally held in capital cities.

Important matters discussed have included —

- (1) National approach to co-ordinating resource management.
- (2) Joint Commonwealth/State offshore mining legislation.
- (3) Formula for offshore petroleum royalties.
- (4) National Petroleum Advisory Committee report.
- (5) National Energy Conservation Program.
- (6) Use of L.P. gas in vehicles.
- (7) National coal combustion test facility.
- (8) Commonwealth/State joint study group on the processing of raw materials.
- (9) Commonwealth/State relations with particular regard to mineral development and energy projects.

The Tasmanian Premier called on the Federal Government to extend the \$80 per tonne subsidy on L.P. gas sold in Tasmania. The subsidy must continue in view of the fact we did not have a broad energy base such as in other States.

The Commonwealth Government hopes that 15 per cent of all Australian vehicles will be using liquefied petroleum gas in place of petrol within five years.

REVENUE

REVENUE COLLECTED DURING THE YEAR ENDED 30 JUNE 1981

<i>Heads of Revenue</i>	<i>\$</i>
Mines Department (Drilling)	46 622
Drilling on E.L. 17/81 (Cornwall Coal Co.)	407 112
Rent and Fees of Auriferous and Mineral Lands	411 587
Iron Ore Royalty	299 734
Mineral Royalties	3 256 800
Survey Fees	2 755
Fees under the Dangerous Goods Act	47 267
	4 471 877

COMPARATIVE STATEMENT OF REVENUE FROM MINES BEING RENTS, FEES, STORAGE OF EXPLOSIVES, ETC., PAID TO THE TREASURY DURING THE YEARS 1975-76 TO 1980-81

<i>Year</i>	<i>\$</i>	<i>Year</i>	<i>\$</i>
1975-76	884 877	1978-79	2 621 380
1976-77	1 866 370	1979-80	5 837 682
1977-78	2 455 353	1980-81	4 471 877

The above statement does not include Stamp Duties upon Transfer of Leases and Licences or Commonwealth Grant Water Resources.

ROYALTIES

The royalty on sand and gravel remained unchanged at 30 cents per cubic metre. The three tier system for other minerals applied for the full period.

The amount of royalty collected in the period was \$3 256 800 consisting of \$38 147 from the mining of sand and gravel and \$3 218 653 from other mining operations.

Two companies elected to pay royalty on proceeds and one elected to pay on profits.

LEASES AND LICENCES

NUMBER AND AREA OF NEW LEASES AND LICENCES ISSUED DURING THE YEAR ENDED 30 JUNE 1981

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Coal	1	1 666	....
Gold	11	701	....
Gravel and sand	15	1 881	....
Minerals	12	308	....
Stone	13	3 154	....
Tin	32	877	....
Easements	4	12	....
Water	1	....	10
	89	8 599	10

TOTAL NUMBER OF LEASES AND LICENCES IN FORCE ON 30 JUNE 1981

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Antimony	1	32	....
Bauxite	5	183	....
Clay	20	356	....
Coal	18	5 304	....
Copper	4	2 393	....
Dolomite	4	126	....
Gemstone	3	22	....
Gold	73	3 035	....
Granite	2	6	....
Iron ore	18	1 692	....
Kaolin	1	346	....
Limestone	5	615	....
Marble	2	32	....
Minerals	79	11 297	....
Osmiridium and chromite	2	184	....
Peat	2	92	....
Sand and gravel	120	9 570	....
Silica	11	641	....
Slate	2	99	....
Stone	120	8 536	....
Silver, lead and zinc	16	879	....
Tin	395	12 454	....
Uranium	1	81	....
Wolfram and tin	13	2 752	....
Water	112	....	1 576
Easement	87	1 442	....
Total	1 116	62 169	1 576

NUMBER AND AREA OF LEASES AND LICENCES APPLIED
FOR DURING THE YEAR ENDED 30 JUNE 1981

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Coal	1	115	....
Gold	10	363	....
Gravel and sand	19	1 430	....
Minerals	25	1 264	....
Stone	19	3 133	....
Tin	20	306	....
Easements	6	27	....
Water	6	....	520
Total	106	6 638	520

TOTAL NUMBER OF ALL TYPES OF PROSPECTING RIGHTS HELD
AS AT 30 JUNE 1981

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>	
Permits to enter and search on private land, including owners' consents	16	26 805	ha
Exploration licences	126	58 039	km ²
Special Prospectors' licences	5	136	km ²
Miners' Rights	2	0.5	ha
Prospectors' licences	32	714	ha
Authorities to prospect under the Aid to Mining Act 1927	....	....
Permits to explore for petroleum under the Petroleum (Submerged Lands) Act 1967	10	1 055	blocks

MINES DRAFTING SECTION

Officers of this Section attended Cartographic and Microfilm Seminars during November 1980. An important liaison was established with local users of microfilm resulting in the commencement of filming map records of the Section.

Exploration licence sheets, dating from their inception, have been filmed and mounted into microthin jackets. Copies have been made available for sale to the public in diazo and hard copy form. Security copies of all films are kept at the Microfilm Bureau.

February saw the filming of Mining Tenement Sheets, the recording of which is designed to provide a back-up in case of catastrophe such as loss or damage. The format used for the original series was microthin jackets, but future series will be a combination of these and aperture cards. Replaced series of security updates will become part of the historic Tenement Chart Series.

In May 1981 all historic Tenement maps dating back to the 1850's were filmed and mounted on aperture cards. These charts are frequently used for research matters and once again security copies will be held by the Bureau.

The mine location series were also filmed in May.

During June 1981 filming of Mine Working Plans commenced as a result of the requirement under the Mines Inspection Act for mining companies to send copies of working plans to the Department on an annual basis. Annual filming will involve about 400 plans. Experimental filming of Underground Mine Plans was carried out during the year and logging has commenced.

A new series of plan transparencies has been introduced to the section. This is the 1:100 000 topographic series. All exploration licence details have been transferred to these sheets which have been brought up-to-date with information on State Reserves, Management areas and other Reserves affecting application of the Mining Act.

Programming of lease and licence details is underway and information recoverable from this program will include: numerical list of leases, leases of a given lessee, leases and tenements within a co-ordinated area, list of water rights, list of private land leases and list of prospecting licences and miners rights.

Printout information will also include — map reference, mineral type, locality, area, and co-ordinates.

New series Tenement charts at 1:20 000 produced during the year include Brilliant Creek, Mt Saddleback and Waratah. In various stages of completion are — Lynchford, Gladstone, Monarch and Mt Arthur.

Working charts and transparencies now total 550. This large increase is a result of greater activity in areas involving the management of Crown lands which have a direct impact on mining activities.

Eighty-three diagrams were drawn Subject-to-Survey with a further sixteen prepared from actual survey. Transparencies and copies were prepared from all diagrams for lease documentation.

This section recorded 84 applications for mineral leases on Crown land and 33 over private property. Charts and descriptions were issued for 77 Special Prospectors' Licences, Exploration Licences and Authorities to Prospect.

Dyelines for office use and sale to the public totalled 3 200. Photostat copies for sale and office use amounted to 78 000.

COURT OF MINES

A. and S. Annan v. B.H.P. Co. Ltd. Objection to exploration licence, 37/79, Styx River. The application was withdrawn by the plaintiff.

Tasmanian Conservation Trust and Tasmanian Wilderness Society v. White Industries Ltd. Objection to exploration licence, 5/80, Geeveston area. The application was withdrawn by the plaintiffs.

Tasmanian Conservation Trust and Tasmanian Wilderness Society v. White Industries Ltd. Objection to exploration licence, 6/80, Glovers Bluff. The application was withdrawn by the plaintiff.

N. W. Fearn v. C. Faulkner. Forfeiture of lease 78M/73. The application was withdrawn by the plaintiff.

R. K. McDermott v. F. J. Griffiths and D. C. Dunkley. Forfeiture of leases 90M/72 and 4M/73. Lease 90M/72 was forfeited by the Warden of Mines and the application for 4M/73 was withdrawn by the plaintiff.

S. A. Clark v. Electrolytic Zinc Co. of Australasia Ltd. Forfeiture of lease 123M/47. The application was withdrawn by the plaintiff.

M. Reynolds v. R. M. McLellan. Forfeiture of leases 20M/72, 21M/72, 22M/72, 26M/72. The leases were forfeited by the Warden of Mines.

G. E. Johnson v. F. Bardenhagen. Objection to lease application 1041P/M and Water Licence application 9W/80. The applications were dismissed by the Warden of Mines.

P. J. Price v. N.S.W. Mining Pty Ltd. Forfeiture of lease 11635/M. The lease was forfeited by the Warden of Mines.

B. Marshard v. F. K. H. Scheppein. Forfeiture of lease 62M/69. The lease was forfeited by the Warden of Mines.

Billop Pty Ltd, Connorville Station Pty Ltd, Connorville Estates Pty Ltd, Connells Pty Ltd, H. A. Reed, C. E. Reed and R. E. Lawrence v. Shell Company of Australia Ltd. Objection to exploration licence 65/80, Longford. The objection was adjourned.

MINE MANAGERS' CERTIFICATES

Metalliferous Mine Managers' Certificates were issued by the Board of Examiners under the Mines Inspection Act 1968, to the following:—

By examination viva voce —

<i>Certificate No.</i>	<i>Name</i>
276/80	Andrew John Cullum
277/80	Alan John Titley
278/81	Hugh David Swain

VALUE OF TASMANIAN MINERALS IN RECENT YEARS WITH AUSTRALIAN METAL PRICES

<i>Year</i>	<i>\$</i>	<i>Year</i>	<i>\$</i>
1971-72	126 387 262	1976-77	277 266 070
1972-73	133 238 921	1977-78	291 496 400
1973-74	164 699 058	1978-79	322 919 534
1974-75	173 297 481	1979-80	372 810 760
1975-76	190 490 321	1980-81	344 392 266

MINERAL PRODUCTION SINCE 1880

QUANTITY AND VALUE OF PRODUCTION AS AT 30 JUNE 1981

Commodity	Unit	Total Quantity	Total Value
METALLIC MINERALS			
Antimony	(tonne)	3	\$ 2 034
Bismuth	(kilogram)	110 080	503 385
Cadmium	(tonne)	3 253	12 825 516
Chromite	(tonne)	2 687	259 083
Cobalt oxide	(kilogram)	132 176	952 631
Copper (blister) to 1918 (now shown under Silver and Copper)	(tonne)	169 273	27 577 054
Copper matte	(tonne)	6 326	267 472
Copper ore to 1918 (now shown under Copper)	(tonne)	42 439	1 155 476
Copper (from 1919)	(tonne)	801 621	578 184 710
Crocoite	(specimens only)	....	48 467
Gold	(kilogram)	103 830	120 557 467
Ilmenite	(tonne)	558	2 512
Iron ore pellets	(tonne)	27 909 438	435 824 664
Iron oxide (including hematite, limonite and magnetite)	(tonne)	298 401	1 663 912
Lead (from 1919)	(tonne)	581 681	135 822 873
Manganese	(tonne)	1	6
Manganese dioxide (from 1957)	(tonne)	12 028	437 638
Mercury	(kilogram)	7 697	90 251
Molybdenum	(tonne)	45	173 172
Monazite	(tonne)	34	1 214
Nickel	(tonne)	237	81 036
Osmiridium	(kilogram)	881	1 418 771
Pyrite (to 1971)	(tonne)	2 124 070	10 239 957
Pyrite (from 1972)	(tonne)	1 524 975	....
Rutile	(tonne)	1	36
Rutile (concentrates)	(tonne)	40 027	8 270 047
Scheelite (concentrates)	(tonne)	54 140	260 924 562
Silica for silicon alloy production	(tonne)	315 208	6 664 299
Silicon as silicon alloys	(tonne)	356 475	78 729 766
Silver-lead ore to 1918 (now shown under Silver and Lead)	(tonne)	1 101 295	12 858 582
Silver (from 1919)	(kilogram)	2 276 125	139 516 986
Sulphur as sulphuric acid	(mono tonne)	4 221 007	77 850 509
Tin	(tonne)	235 867	696 419 873
Wolfram (concentrates)	(tonne)	22 304	49 531 120
Zinc	(tonne)	1 582 118	512 920 717
Zinc sulphate (from 1957)	(tonne)	3 251	324 177
Zircon (concentrates)	(tonne)	39 001	5 039 899
NON-METALLIC MINERALS			
Asbestos	(tonne)	4 044	34 284
Barite	(tonne)	2 240	16 478
Clay (from 1958) —			
Brick	(metre ³)	1 769 828	5 023 632
Tile	(metre ³)	71 310	182 009
Other	(metre ³)	557 118	2 365 408
Dolomite	(tonne)	129 224	1 151 126
Graphite	(tonne)	41	214
Kaolin	(tonne)	197 660	8 065 987
Limestone —			
Agricultural and other	(tonne)	1 442 985	4 755 426
Carbide	(tonne)	1 081 509	5 936 189
Cement	(tonne)	11 605 042	22 601 143
Chemical and metallurgical	(tonne)	5 152 547	11 809 997
Ochre	(tonne)	2 949	23 483
Pebbles (from 1957)	(tonne)	27 003	571 612
Sand (moulding)	(tonne)	864	9 550
Silica	(tonne)	439 341	1 257 058
Talc	(tonne)	338	2 154
FUEL MINERALS			
Coal	(tonne)	11 944 265	47 062 231
Shale	(tonne)	42 239	62 462
Peat	(tonne)	10 971	658 392

MINERAL PRODUCTION SINCE 1880 — *continued*
 QUANTITY AND VALUE OF PRODUCTION AS AT 30 JUNE 1981 — *continued*

<i>Commodity</i>	<i>Unit</i>	<i>Total Quantity</i>	<i>Total Value</i>
CONSTRUCTION MATERIALS			\$
Building stone —			
Freestone	(metre ³)	16 828	975 921
Granite	(metre ³)	7 639	344 722
Other stone	(metre ³)	14 697	134 688
Crushed and broken stone (from 1958) —			
Basalt	(metre ³)	5 279 805	33 758 631
Dolerite	(metre ³)	10 370 450	52 628 099
Limestone	(metre ³)	465 277	2 241 403
Sandstone	(metre ³)	54 081	230 078
Other	(metre ³)	5 131 214	29 791 435
Gravel (from 1958)	(metre ³)	25 934 254	72 354 099
Sand (from 1958)	(metre ³)	3 248 848	11 743 038
Other road-making material	(metre ³)	3 680 251	8 843 937
			3 501 774 760

STATISTICS RELATING TO THE MINERAL INDUSTRY

Commodity	Unit	Year ended 30 June 1980		Year ended 30 June 1981	
		Total Quantity	Value	Total Quantity	Value
METALLIC MINERALS			\$		\$
Cadmium	(tonne)	143	836 240	106	462 800
Chromite	(tonne)	1 039	99 140	566	63 236
Cobalt oxide	(kilogram)	2 312	88 386	2 097	78 088
Copper	(tonne)	20 040	39 756 623	23 593	39 583 214
Crocoite	(specimens only)	....	....	....	2 280
Gold	(kilogram)	1 323	19 689 795	1 248	18 836 569
Iron ore pellets	(tonne)	2 187 304	45 980 176	2 202 665	44 755 534
Iron oxide	(tonne)	15 946	156 160	20 600	211 210
Lead	(tonne)	15 694	16 481 250	12 710	8 536 777
Manganese dioxide	(tonne)	131	4 379	285	9 549
Molybdenum	(tonne)	25	96 848	20	76 324
Silica for silicon alloy production	(tonne)	82 536	2 063 400	26 239	655 975
Silicon as silicon alloys	(tonne)	33 715	10 805 869	46 213	16 161 235
Silver	(kilogram)	56 907	31 591 172	36 214	15 417 902
Sulphur —					
Sulphuric acid from zinc concentrates	(mono tonne)	100 109	2 040 510	56 820	1 345 666
Tin	(tonne)	6 580	101 091 799	7 026	92 826 175
Tungsten as tungstic oxide	(tonne)	2 799	34 942 621	3 111	38 958 309
Zinc	(tonne)	57 809	41 926 301	41 270	30 148 419
VALUE OF METALLIC MINERALS		....	347 650 669	....	308 129 262
NON-METALLIC MINERALS					
Clay —					
Brick	(metre ³)	72 127	286 705	74 693	373 465
Other	(metre ³)	17 134	86 199	14 289	71 445
Dolomite	(tonne)	14 757	175 281	9 872	134 247
Kaolin	(tonne)	18 281	1 430 817	22 411	1 803 078
Limestone —					
Agricultural	(tonne)	43 756	276 484	50 453	357 633
Carbide	(tonne)	41 012	615 180	21 001	315 015
Cement	(tonne)	514 818	1 544 454	557 995	1 673 985
Chemical and metallurgical	(tonne)	90 279	948 608	99 509	1 053 654
Other	(tonne)	21 791	78 869	12 041	31 085
Pebbles	(tonne)	1 044	54 250	2 078	66 245
Silica	(tonne)	9 603	55 142	10 490	60 760
VALUE OF NON-METALLIC MINERALS		....	5 551 989	....	5 940 612
FUEL MINERALS					
Coal	(tonne)	279 197	4 106 062	304 727	5 628 899
Peat	(tonne)	880	168 270	702	132 864
VALUE OF FUEL MINERALS		....	4 274 332	....	5 761 763
CONSTRUCTION MATERIALS					
Building stone —					
Freestone	(metre ³)	671	71 803	1 191	28 577
Granite	(metre ³)	....	....	1 370	6 850
Granite (red)	(metre ³)	368	65 206	....	....
Other	(metre ³)	6	42	16	3 300

STATISTICS RELATING TO THE MINERAL INDUSTRY — *continued*

Commodity	Unit	Year ended 30 June 1980		Year ended 30 June 1981	
		Total Quantity	Value	Total Quantity	Value
Crushed and broken stone—			\$		\$
Basalt	(metre ³)	651 867	5 811 034	558 173	5 588 875
Dolerite	(metre ³)	200 626	1 967 789	217 105	2 171 050
Limestone	(metre ³)	14 604	121 626	12 731	127 310
Sandstone	(metre ³)	6 958	52 459	3 755	38 400
Other	(metre ³)	312 400	2 561 656	737 029	7 375 587
Gravel	(metre ³)	1 394 272	7 704 110	1 307 185	7 864 585
Sand	(metre ³)	245 837	1 443 503	210 844	1 068 525
Other road making materials	(metre ³)	73 539	396 050	57 222	287 570
VALUE OF CONSTRUCTION MATERIALS			20 195 278		24 560 629
TOTAL VALUE WITH AUSTRALIAN METAL PRICES			377 672 268		344 392 266
METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES			313 805 273		345 618 137
VALUE OF MINING AND METALLURGICAL PRODUCTION			691 477 541		690 010 403
AVERAGE NUMBER OF EMPLOYEES			9 437		9 798

AID TO MINING

Under the provisions of the Aid to Mining Act 1927, financial assistance may be made available to companies or individuals who hold mineral leases. Loans are secured by a registered mortgage deed and repayments are required at the rate of 7.5 per cent of the proceeds of minerals produced and sold.

Repayments of royalty from assisted parties are credited to the Mining Trust Fund and are then available to other applicants.

During 1980–81 assistance totalling \$19 000 was made available. One amount of \$10 000 was made available to a tin miner for the purchase of a dump truck. An amount of \$9 000 was provided for drilling operations on a mineral lease owned by two individuals.

STAFF MOVEMENTS

Name	Position	Remarks
Ashton, S.	Field Assistant	Commenced 12.3.81
Bird, B. E. (Mrs)	Draftswoman	Resigned 30.1.81
Hampson, R. N.	Mining Engineer	Resigned 26.6.81
Hitchcock, J. C.	Clerk	Commenced 22.1.81
Karimalis, M. A. (Mrs)	Clerk	Resigned 10.10.81
Leaman, D. E.	Geophysicist	Resigned 30.6.81
Lennox, P. G.	Geologist	Resigned 16.1.81
Lister, J. R.	Field Assistant	Resigned 13.2.81
Mackinnon, H. M. G.	Draftsman	Resigned 27.3.81
Martin, N. M.	Laboratory Technician	Resigned 30.9.81
Richardson, K. M.	Drilling Superintendent	Commenced 8.9.80
Summons, T. G.	Geologist	Resigned 22.5.81
Symons, J. G.	Director	Retired 6.9.80
Triffett, M. J.	Field Assistant	Commenced 20.10.80
Thompson, A. (Miss)	Laboratory Technician	Commenced 14.4.81

SCHOLARSHIPS

No new scholarships were granted.

D. Polya continued his studies at the University of Tasmania. In February 1981, his scholarship was extended to enable him to undertake his Honours degree. The subject selected for his Honours was 'A Study of Geology of the Cambrian Rocks in the vicinity of the Murchison Gorge'.

Mr P. B. Ketelaar's scholarship was terminated at the end of 1980.

OVERSEAS VISITS

Mr R. C. Thomas attended the Chief Inspectors of Explosives Conference in New Zealand from 16 to 20 February 1981.

Mr Murchie attended the Chief Inspectors of Mines Conference in New Zealand from 21 March to 4 April 1981.

Mr W. L. Matthews attended the International Geological Congress in Paris, France from 7 to 27 July 1980. Approval for Mr Matthews to attend was subject to him personally meeting all costs apart from the registration fee.

RETIREMENT

Mr J. G. Symons retired on 6 September 1980 after over twenty-five years of service as Director of Mines. He directed the development of the Department into a multi-disciplined professional organisation capable of advising government and industry on the many facets of mineral resources. During this period, value of production rose from £13 232 644 in 1954 to \$690 010 403 in 1980. It was an era of sustained growth which established the State as a significant mineral producer. All the staff of the Department join me in wishing him a long and happy retirement.

MINES NEWS

A quarterly newsletter of the Tasmania Department of Mines was introduced in December 1980. The newsletter seeks to communicate within the Department and also inform industry and members of the public of the role we play in developing the State's resources. Denis Burgess of the Mines Drafting Section has been the driving force behind the establishment and continuation of our newsletter.

I am happy to say that it has received a wide acceptance not only here but also interstate.

CONCLUSION

Appreciation is recorded of the services rendered by officers of the Department and by the Wardens and Registrars of Mines.

H. MURCHIE, Director of Mines.

OPERATIONS AND PRODUCTION

1. METALLIC MINERALS

CADMIUM

QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value (\$)</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value (\$)</i>
1927-1976	2 644	9 834 096	1979	141	760 870
1977	149	731 250	1980*	68	442 000
1978	145	594 500	1980-81	106	462 800
			Total	3 253	12 825 516

* January to June.

This is a by-product obtained by the Electrolytic Zinc Company of Australasia Ltd at its Risdon Works from zinc concentrates produced from the Rosebery and Williamsford mines.

CHROMITE

QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value (\$)</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value (\$)</i>
1978	684	61 312	1980*	432	45 115
1979	1 006	89 420	1980-81	567	63 236
			Total	2 689	259 083

* January to June.

NORTHERN CHROMITE PTY LTD, BEACONSFIELD

The mining and retreatment operations were placed on a care and maintenance basis in November 1980 until a full assessment of the recoverable mineral content of the Rifle Range Hill deposit has been completed.

COBALT OXIDE

The source of the 2.097 tonnes of cobalt oxide of value \$78 088 was the same as that of cadmium.

COPPER

SOURCE QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>From tin ores</i>		<i>From lead-zinc ores</i>		<i>In blister copper</i>		<i>From copper ores</i>		<i>Totals</i>	
	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>
1919-1976	6 296	6 995 383	33 149	29 593 241	501 143	208 564 870	163 660	183 720 720	704 248	428 874 214
1977	433	519 836	2 966	3 509 792	....	....	17 690	20 772 332	21 089	24 801 960
1978	450	547 864	2 163	2 596 818	....	....	19 454	23 586 223	22 067	26 730 905
1979	453	820 955	2 318	4 172 383	....	....	18 255	32 865 587	21 026	37 858 925
1980*	228	478 990	1 336	2 787 693	....	....	8 034	17 068 809	9 598	20 335 492
1980-81	401	659 976	2 045	3 415 383	....	....	21 147	35 507 855	23 593	39 583 214
Total	8 261	10 023 004	43 977	46 075 310	501 143	208 564 870	248 240	313 521 526	801 621	578 184 710

* January to June.

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN

T. E. Evans, Mining Engineer, Burnie, reports —

PRODUCTION

All the ore produced came from underground sources. Approximately 85 per cent was produced by stoping, which was almost entirely carried out by means of the open-stoping method. The balance of 15 per cent came from mine development.

During the period, mass firings took place of the Prince Lyell 22/23, the Cape Horn 6/7 and the Intermediate Lens 205 stope pillars.

The Prince Lyell 22/23 was by far the most massive of these pillars, having had a total mass of approximately 519 400 tonnes. The incorporated rib pillar was drilled over entirely with 165 mm diameter holes and was the first pillar at Mount Lyell to have been developed for the subsequent employment of this size of blast hole. Nearly 150 tonnes of explosives were used in the firing.

Production for the year was as follows:—

1. Tonnage of ore hauled from the mine —

<i>Source</i>	<i>Tonnes</i>
Prince Lyell and 'A' Lens	1 576 214
Cape Horn	95 548
Crown 12 West	9 117
Royal Tharsis	3 209
Total mine	1 684 088
Grade of ore hauled (% copper)	1.35
Ore treated at the concentrator (tonnes)	1 683 300
Copper concentrate produced (tonnes)	80 802
Containing —	
copper — 21 147 tonnes;	
silver — 3 874 877 grams; and	
gold — 466 572 grams	
Gross value of production	\$44 280 000

MINE DEVELOPMENT

The mine development achieved during the period is summarised as follows:—

<i>Mine Area</i>	<i>Drives and Crosscuts (metres)</i>	<i>Rises (metres)</i>	<i>Total (metres)</i>
Prince Lyell and 'A' Lens — 20 and 30 Series	4 195	768	4 963
Prince Lyell No. 1 Shaft area	319	3	322
Main Decline extension	870	26	896
Cape Horn	624	276	900
Crown Twelve West	228	11	239
Total mine	6 236	1 084	7 320

This amount of development is 40 per cent more than that achieved over the previous twelve months.

Most of the increase took place in lateral development and was in consequence of more intensive activity in the Main Decline and of the successful operation of the hydraulic jumbo on the 10-metre and 22-metre levels.

During the period, the Main Decline was extended to below the 14 Level (from the No. 1 Shaft). Rising and sub-level development was finished in the Southern Exhaust Airway extension between the 92-metre and 195-metre levels, enabling the boring of stripping holes around the pilot rise to commence. Development of the new pumping station at Prince Lyell No. 1 Shaft continued. Ground support continued to be a salient feature of development operations.

REPORTED ORE RESERVES AS AT 30 JUNE 1981

Mine	Ore (tonnes)	Copper (%)	Silver (g/tonne)	Gold (g/tonne)
PROVED ORE				
Prince Lyell	6 169 000	1.43	3.0	0.4
Cape Horn	56 000	1.38	3.0	0.4
'A' Lens	515 000	1.21	1.5	0.2
TOTAL	6 740 000	1.41	2.77	0.39
PROBABLE ORE				
Prince Lyell	15 012 000	1.44	3.0	0.4
Cape Horn	1 568 000	1.81	3.3	0.5
'A' Lens	1 606 000	1.37	1.5	0.2
Royal Tharsis	1 878 000	1.46	1.5	0.2
Twelve West	14 000	9.50	30.6	0.2
TOTAL	20 078 000	1.47	2.78	0.38

Projections from exploratory-drilling and development exposures indicate the existence of 'Possible Ore', as follows:—

Mine	Ore (tonnes)	Copper (%)	Silver (g/tonne)	Gold (g/tonne)
POSSIBLE ORE (NOT RESERVES)				
'A' Lens	1 418 000	1.25	1.5	0.2
Prince Lyell	3 000 000	1.30	3.0	0.4
Crown Three	1 187 000	1.67	4.0	0.4
Western Tharsis	1 720 000	1.37	2.0	0.4
TOTAL	7 325 000	1.37	2.63	0.36

METALLURGICAL DEVELOPMENTS

The most important development during the period was the complete replacement of the grinding circuit. Two large ball mills with a processing capability of 300 t/h and giving a product containing 3.5 to 4.0 per cent of +65 mesh material were commissioned in October 1980. These replaced eleven small mills which produced material containing 10.0 to 12.00 per cent of +65 mesh at a rate of 260 t/h.

Copper recovery did not improve despite the finer flotation feed produced by the new grinding circuit. It is believed that this is because a minor textural change has occurred in the Prince Lyell ore, reducing the recovery potential. As mining has progressed from south to north in the 20 Series stopes, the pyrite content of the ore has progressively increased. With this, there is a small increase in difficult-to-treat chalcopyrite-pyrite middlings present in the flotation feed.

With the finer grinding and the consequent production of a finer concentrate, maintenance of an acceptable filter-cake moisture level became difficult. Use of a filter aid (Aerodri 100) successfully overcame the problem.

CAPITAL EXPENDITURE

A total of \$4 611 000 was expended on the following capital items:—

Plant Items —

- Eimco 918 LHD unit;
- DJB D550 truck;
- Atlas Copco Boomer H121;
- mine drilling equipment;
- diamond drilling equipment;

mine service vehicles;
compressors;
road-maintenance equipment;
replacement road vehicles; and
miscellaneous equipment.

Major Projects —
completion of ball mill installation;
Main Decline extension; and
No. 1 Shaft pump station.

Mine Development —
Southern Exhaust Airway; and
mine installations.

CLEVELAND TIN N.L., LUINA

This company, reviewed under Tin, produced 1 916 tonnes of copper concentrates containing 401 tonnes of copper valued at \$659 976.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This company, reviewed under Zinc, produced 2 045 tonnes of copper valued at \$3 415 383.

GOLD

QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Kilograms</i>	<i>Value \$</i>	<i>Year</i>	<i>Kilograms</i>	<i>Value \$</i>
1880 to 1976	97 307	61 217 729	1979	1 490	13 884 521
1977	1 616	6 976 251	1980*	641	10 873 565
1978	1 618	8 768 832	1980-81	1 248	18 836 569
			Total	103 920	120 557 467

* January to June.

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN

This company recovered 467 kilograms from sludge in the electrolytic copper refinery valued at \$7 339 262.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

Concentrates produced by this company contained 781 kilograms valued at \$11 494 280.

AMAX IRON ORE CORPORATION (MINERALS EXPLORATION DIVISION)

The old Tasmania Gold Mine's Harts Shaft recovery operation reached a depth of 50 metres below the old shaft collar.

The construction of the 70 000 000 litre settling dam, associated silt tray, piping and discharge channel was completed.

AMDEX MINING LIMITED, SOUTH MOUNT CAMERON

Concentrates produced by this company contained 0.170 kilogram of gold valued at \$3 027.

LISLE GOLDFIELD

Part time mining and prospecting continued on a very small scale.

MATHINNA GOLDFIELDS

Interest in this old gold mining area was shown by Tasminex N.L. and Mineral Holdings Australia Pty Ltd and some sampling of old operations was carried out.

IRON ORE (PELLETS)

SAVAGE RIVER MINES, SAVAGE RIVER AND PORT LATTA

<i>Production</i>	<i>Tonnes</i>
Savage River —	
All material	14 311 041
Rock to waste	9 211 520
Crude ore	5 099 521
Concentrate produced	2 174 501
Concentrate pumped	2 175 383
Port Latta —	
Pellets produced	2 202 665
Pellets shipped	2 170 151
Pellets inventory	202 060
Concentrate sold	528

MINING

E. C. Leyland, Senior Mining Engineer, Burnie reports —

Mining operations in the pit were concentrated mainly on the 16th and 17th benches, with the mining of the East Wall second slice progressing down to the 12th bench. At the end of the year this work on the 12th bench was 70 per cent complete. The second slice is yielding larger quantities of ore with the increase in depth, so that when undertaken the slice along the 14th bench will be totally in ore.

Horizontal holes were bored along the final outline of the 10th bench, forty holes being drilled to varying depths, with the deepest being 250 m. Evaluation of the degree of dewatering and depressurisation continued and the status of the program was reviewed with the consultant firms D. Piteau and the Australian Groundwater Consultants. Following this review, additional holes were drilled to gauge the effect on localised problem areas. These holes were drilled into the Eastern Wall on the south end of 17 bench, and into the 'Western Knob' from both the east and west sides. A 'pre-pinning' trial was undertaken on a section of the Eastern Wall, 11th bench centre, to assess the effect of final wall terminal blasting. Two slump failures of about 0.23 million tonnes each occurred on the upper limits of the Western Wall, northern end. There was no damage to equipment or personnel, but operations on the lower benches were deferred until the height of the wall was reduced.

Some preliminary work on dam construction in the Main Creek valley was undertaken. It is proposed to establish a rock dump and tailings disposal area in Main Creek, however, a re-evaluation of the economics of the scheme is in progress.

MILLING

Following further successful trials with the furnace addition of coal as a partial fuel oil substitute, coal feed systems had been fitted to three of the five furnaces by the end of the year. Orders have now been placed to extend the coal feed systems to the remaining furnaces.

An additional bentonite mixing reel was installed on the mixing conveyor in September 1980. The consequent improvement in mixing efficiency brought about a significant reduction in bentonite usage.

A new, common, bottom gas water and spillage sump discharge screening system was commissioned to replace the old classifier system. It is intended to use this sump system to recover contaminated concentrate from the clarification basin.

Pellets were loaded on 25 vessels averaging 86 806 tonnes per shipment. Two direct shipments of fuel oil were discharged at Port Latta and, with the inclusion of road freighted fuel, a total of 22 937 tonnes was received. Two shipments of bentonite (20 121 tonnes, dry) were imported.

CAPITAL EXPENDITURE

The main areas of capital expenditure were —

- Purchase of two new 85-tonne haulage trucks;
- Purchase of one new Cat 16G grader;
- Installation of haulage truck radio despatch system;
- Replacement of main air blower filters;
- Purchase of new fork lift, Port Latta;
- Dewatering slopes and surface drainage in the pit;
- Corrosion control;
- Housing insulation and stump repairs.

IRON OXIDE
QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
Prior to 1977	226 037	1 006 042	1979	16 246	154 660
1977	12 793	102 200	1980*	8 400	84 000
1978	14 325	105 800	1980-81	20 600	211 210
			Total	298 401	1 663 912

* January to June.

A. Pearson continued to mine hematite at the Iron Cliffs mine, and supplied a cement works with 20 600 tonnes of hematite valued at \$211 210. The average number of persons employed was six.

LEAD
QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
Prior to 1977	512 445	85 180 923	1979	16 375	17 140 828
1977	16 027	8 523 445	1980*	7 217	6 867 850
1978	16 907	9 573 050	1980-81	12 710	8 536 777
			Total	581 681	135 822 873

* January to June.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This company, reviewed under Zinc, produced 12 900 tonnes of lead concentrates and the total content of lead in lead, zinc and copper concentrates was 12 710 tonnes valued at \$8 536 777.

Specimens of Lead Minerals**ADELAIDE MINE, DUNDAS**

Production of mineral samples of crocoite realised \$9 500 with stock on hand valued at \$6 000. Underhand stoping has continued on good specimen material, however, it will be necessary shortly to drive a new adit at a lower horizon down the hill. Two men worked the lease but for one month was curtailed by bush fires and the need to assist the town of Zeehan.

RED LEAD AREA

Production of specimen crocoite was valued at \$8 000. One man, the lease-holder, extended the workings of the open cut and at the end of the year had good specimen material visible in three faces. Some damage to the track resulted from the bush fires.

MANGANESE DIOXIDE

This is recovered as a sludge in the electrolysis of zinc sulphate at the Risdon Works of the Electrolytic Zinc Company of Australasia Limited, the original source being the ore from its West Coast mines. The production of 285 tonnes was valued at \$9 549.

MERCURY**QUANTITY AND VALUE OF PRODUCTION**

<i>Year</i>	<i>Kilograms</i>	<i>Value \$</i>	<i>Year</i>	<i>Kilograms</i>	<i>Value \$</i>
Prior to 1977	7 676	90 144	1979	....	....
1977	21	107	1980*	....	....
1978	....	....	1980-81	....	....
			Total	7 697	90 251

* January to June.

This is recovered at the Risdon Works of the Electrolytic Zinc Company of Australasia Limited from the roaster gases in the calcining of zinc concentrates. The ore containing the mercury is mined at the company's mine on the West Coast. Recovery was first made early in 1967. Total production to date is 7 697 kilograms valued at \$90 251.

MOLYBDENUM

The King Island Scheelite mine produces a molybdenum concentrate as a by-product of the artificial scheelite plant. A total of 54 tonnes of molybdenum concentrate was produced.

OSMIRIDIUM

Total production to date is 881 kilograms valued at \$1 418 771.

PYRITE

Total production to date is 3 649 045 tonnes.

No value is reported for pyrite as this is now included in the value reported for sulphur as sulphuric acid.

SILICA FOR SILICON ALLOY PRODUCTION**THE BROKEN HILL PTY COMPANY LIMITED, BEACONSFIELD**

This company mined and supplied to the Tasmanian Electro-Metallurgical Company 26 239 tonnes of silica valued at \$655 975.

SILICON**TASMANIAN ELECTRO-METALLURGICAL COMPANY PTY LIMITED, BELL BAY**

In the production of silicon as silico-manganese this company smelted 27 338 tonnes of local Beaconsfield quartzite combined with slag from ferro-manganese production for a yield of 46 213 tonnes of silico-manganese valued at \$16 161 235. The average number of persons employed is shown under Ferro-Manganese.

SILVER

Silver is produced solely as a by-product from the treatment of copper, lead, zinc and tin ores. A total of 36 214 kilograms of silver was produced for a value of \$15 417 902 at the West Coast mines of the Mt Lyell Mining and Railway Co. Ltd, Queenstown, Electrolytic Zinc Company of Australasia Ltd, Rosebery and Cleveland Tin at Luina.

ABERFOYLE LTD, ROSSARDEN

Now reported under Rossarden Mines.

AMDEX MINING LIMITED, PIONEER

J. Dempster, Mining Engineer, Launceston reports —

ENDURANCE MINE, SOUTH MT CAMERON

Production for the year came from the No. 1 mine, Riverside mine and the Clifton mine. The sluice box at the latter mine was replaced by the skid mounted jig unit obtained from the Pioneer mine.

PIONEER MINE

All overburden stripping ahead of the mining face was achieved by a monitor and gravel pump. A radiometric density measurement system was installed to monitor the stripping.

A new 12 × 10 gravel pump with a 300 kW electric motor was installed in series with the existing gravel pump.

A new treatment plant with a 200 t/h treatment capacity was erected west of the main working face.

CLEVELAND TIN N.L., LUINA

T. Evans, Mining Engineer, Burnie reports —

Over the twelve months to 30 June 1981, 338 147 tonnes of ore were hauled from the mine and 356 455 tonnes of ore were treated at the concentrator. Concentrates were produced from the ore which contained 112 174 metric tonne units of tin in the form of cassiterite and 401 tonnes of copper.

The ore treated had an average grade of 0.51 per cent Sn and 0.21 per cent Cu.

The ore hauled from the mine came from the following sources:—

	<i>tonnes</i>
Hall's lenses	144 449
Khaki lenses	104 259
B-South lenses	59 624
Henry's lenses	29 815

Stoping produced 59 per cent of this ore and mine development produced 41 per cent.

Also hauled from the mine during this period were 135 064 tonnes of waste.

STOPPING

During the period, 275 272 tonnes of ore were broken in stopes and 65 677 metres of stopping holes were bored, of which 7 299 metres were of down holes, 165 mm in diameter. Bored reserves increased from 317 300 tonnes at the beginning of the period to 425 800 tonnes at the end.

Strike retreat sublevel open stopping was once again the method mostly employed. The vertical crater retreat method gave way to benching with 165 mm diameter holes in the B-South orebody.

MINE DEVELOPMENT

Mine development progressed as follows:—

<i>Development Type</i>	<i>Metres Advanced</i>
Decline	430
Drives and crosscuts	2 178
Rises in ore	428
Rises in waste	61
Total	3 097

The main decline was developed to a position just above the 26 Level. Development of the lower levels on the Hall's and Henry's lenses remained the top priority and there was activity during the period on the 17, 18, 20, 21, 22, 23 and 24 levels. Most of the rises located in ore were slot rises and were developed by means of the vertical crater retreat method.

DIAMOND DRILLING

Diamond drilling was carried out during the period, as follows:—

<i>Purpose</i>	<i>Metres Drilled</i>
Production assistance	3 795
Underground exploration	4 878
Surface exploration	675
Total	9 348

Production assistance drilling was chiefly concerned with defining the Hall's lenses from the 22 and 23 levels and the Khaki lenses from the 11 and 14 levels. Underground exploration drilling was appreciably intensified and covered deep Hall's lenses, successfully outlining ore-grade mineralisation in C Lens and Foley's Zone in the central footwall, where several holes intersected 0.3 per cent WO_3 in a stockwork zone surrounding a quartz porphyry dyke.

ORE RESERVES

Mineable ore reserves on 21 October 1980 stood at 2 477 000 tonnes at 0.57 per cent Sn in the form of cassiterite and 0.24 per cent Cu.

EXPLORATION

During 1980–81, the E.L. area was completely covered by new photogrammetry and an aerial DIGHAM survey. Surface exploration was carried out which included further mapping aided by ground magnetics of the area immediately north of the mineral lease, and line cutting, soil sampling and magnetics over the Magnet Range area in the north of the E.L. area.

METALLURGICAL PERFORMANCE AND DEVELOPMENTS

Sixty-one point eight per cent Sn as cassiterite and 53.3 per cent Cu recovery in the concentrator in respect of each metal was higher than for the previous year and reflected the effectiveness of the further modifications which were made to the treatment processes.

These modifications included the installation of new primary screening equipment, and additional fine screening capacity in the secondary grinding circuit along with the replacement of the original flotation cell mechanisms by more up-to-date ones.

CAPITAL EXPENDITURE

Expenditure on capital items during the period was as follows:—

	\$
Replacements (net of disposals)	138 000
Increasing/maintaining production	631 000
Welfare/environment/safety	123 000
	892 000

MANPOWER

The average number of persons employed by department was as follows:—

Staff — all departments	65
Award —	
Mining	54
Milling	55
Engineering	80
Other	19
Total	273

RENISON LIMITED, RENISON BELL

Ore hauled to the surface stockpile, or delivered direct to the crusher, totalled 656 371 tonnes. The sources of this ore were as follows:—

<i>Orebody</i>	<i>Tonnes</i>
Penzance	142 522
Colebrook	112 897
North Stebbins	87 097
Melba	85 644
South Stebbins	54 981
Murchison	53 593
Ring	48 418
Howard	46 734
Dreadnought	18 306
Sligo	4 674
Bassett	907
Federal	598
	656 371

CONCENTRATOR PLANT

Ore treated	652 002 tonnes
Ore grade	1.20 % Sn
Concentrate produced	11 763.99 tonnes
Concentrate grade	47.14 % Sn
Tin contained in concentrate	5 545.80 tonnes
Concentrator recovery	70.76 %

MINE DEVELOPMENT

Mine development achieved during the period was as follows:—

<i>Driving and cross-cutting</i>	<i>Ore (m)</i>	<i>Waste (m)</i>	<i>Total (m)</i>
Renison mine	17.7	290.6	308.3
North Bassett	2.6	....	2.6
South Bassett	150.3	189.7	340.0
Sligo	47.6	24.2	71.8
North Stebbins	130.1	182.0	312.1
Colebrook	....	60.9	60.9
Penzance	195.6	5.2	200.8
Howard	122.8	348.7	471.5
South Stebbins	152.3	280.0	432.3
Murchison	18.0	....	18.0
Dreadnought	34.4	....	34.4
Melba	48.8	....	48.8
Ring	271.8	517.4	789.2
Argent	....	124.4	124.4
	<u>1 192.0</u>	<u>2 023.1</u>	<u>3 215.1</u>
<i>Rising—</i>			
Total Mine	123.7	201.6	325.3

Activity was most intense in the Ring, Howard and South Stebbins areas. Elsewhere in the mine, the Renison Decline was advanced 34 metres to a position 317 metres below sea level. Development of a stope sill at the 1910 Level on the Penzance Orebody was commenced and progressed to near completion. The North Bassett Exploration Drive was advanced one round after an extensive cover grouting program was carried out to seal off water associated with the fault zone which the drive must traverse.

In the No. 4 Ventilation Rise System, the 4A section was stripped to the finished diameter of 4.5 metres and the top portion of the section, from surface down to a depth of 50 metres, was rockbolted and shotcreted. The 4B section of the system was completed at pilot size and was in process of being stripped to finished size at the close of the period. The fan and its ancillaries have been installed at the surface site.

STOPING

Mechanised cut and fill was the only stoping method employed. Stopes were backfilled with either waste rock from development or heavy-media reject material from the concentrator as mining progressed.

Mining commenced in the Howard orebody, a section of the No. 3 Horizon, from two sills, one situated at the 2000 Level and the other at the 2035 Level.

Mining was continued in the Ring orebody and was extended to the Ring 3 ore zone.

MILLING

Overall plant availability was 81.8 per cent, compared with a budgeted availability of 94.0 per cent, chiefly due to the occurrence of industrial disputes.

At the end of February 1981 the concentrator began to treat ore at the expanded rate of 850 000 tonnes per year.

Crusher operating time was extended so that the required fine-ore tonnage might be produced. Additional grinding capacity was provided by the commissioning of a new 3.66 metres diameter by 3.05 metres Vickers ball mill. Expanded and re-arranged sulphide flotation circuits and gravity plant circuits were put into operation. A high capacity 10-metre diameter Enviroclear thickener was installed and commissioned to dewater fines prior to the preparation of tin-flotation feed by cycloning.

Heavy media separation plant operations were carried out satisfactorily, with the existing equipment being of adequate capacity to handle the higher production rate.

In the sulphide flotation section, the extra capacity needed was provided by the installation of new large cells. Froth stability problems were encountered in floating sulphide feed which had been scalped of fines and these problems had not been resolved at the end of the period.

In the gravity plant, 52 new tables were commissioned and changes were made to the treatment circuits. Previously, the gravity tailings were circulated back to the gravity feed by way of regrind, while in the new arrangement, two-stage treatment is employed with the regrind process in between.

Investigation of the potential of low-grade concentrate fuming to increase tin production continued, with several plant trials taking place in the tin flotation section.

Research laboratory extensions were completed and research activity was maintained at a high level, with the laboratory being involved with the concentrator expansion, process control development and evaluation work associated with areas outside the mineral lease.

EXPLORATION AND RESERVES

Exploration in the Renison Bell area was directed towards the detailed definition of extensions to known ore zones in the Renison mine as well as to the longer-term definition of potential ore zones both on the Renison Mining Lease and in the adjacent area covered by the Argent Dam Exploration Licence. As a result of this work, the Renison mine ore reserves were increased from 15.6 to 16.4 million tonnes.

Details of the ore reserves as at June 1981 are as follows:—

Ore Zone	Proved		Probable		Total	
	Tonnes 000's	Grade % Sn	Tonnes 000's	Grade % Sn	Tonnes 000's	Grade % Sn
No. 1 Horizon	....	....	200	0.85	200	0.85
No. 2 Horizon	2 250	1.21	2 980	1.10	5 230	1.14
No. 3 Horizon	1 450	1.57	3 090	1.27	4 540	1.36
Melba	500	1.08	....	....	580	1.08
Federal Structure	1 940	0.84	3 920	0.96	5 860	0.92
Total Mine	6 220	1.16	10 190	1.09	16 410	1.11

CAPITAL EXPENDITURE

A total of \$10 810 478 was spent on capital items during the twelve-months period ended 30 June 1981, broken down into expenditure categories as follows:—

	\$
Community projects	338 043
Expansion program	6 711 079
Lease buildings and services	528 638
Mine development	237 889
Underground equipment	458 602
Mill plant and equipment	375 914
Mobile equipment	1 000 363
Motor vehicles	240 124
Instruments, laboratory and workshop equipment	66 423
Office equipment	315 369
Fuming project	538 034
	\$10 810 478

MANPOWER

At 30 June 1981 the labour complement, staff and award workers, was as follows:—

Mining	115
Metallurgical	158
Engineering	169
Administration	41
Geological	16
Employee relations	22
Total	521

Turnover of permanent employees over the twelve months was 27.2 per cent. This figure is the lowest for labour turnover on record.

EXPLORATION

During 1980–81, Renison Limited continued its extensive exploration effort directed towards finding hydrothermal ore deposits. Two million nine hundred thousand dollars were spent on projects undertaken in the Renison Bell, Heemskirk Granite, Meredith Granite and Blue Tier areas. Approximately 70 per cent of this expenditure was incurred on core drilling.

In the Heemskirk Granite area west of Zeehan, core drilling programs were carried out to completion on the skarn zone covered by the St Dizier Mining Leases (51 per cent Renison interest) and on the Federation Plateau (E.L. 11/76). Drilling in the St Dizier area produced encouraging results and further drilling there is believed warranted. However, drilling for low-grade disseminated greisens on the Federation Plateau produced disappointing results and only a very limited amount of additional drilling will be carried out.

Over the southern flank of the granite in the area west of Zeehan and over the adjacent sediments, geological, geophysical and geochemical surveys were undertaken. The results obtained from some of the areas were most encouraging and so it has been planned to carry out follow-up ground surveys and some drilling in these areas in 1981–82.

In the Meredith Granite area north of Renison Bell, Renison Limited holds an interest in three Exploration Licences and was engaged in a number of exploration programs aimed at assessing the mineral potential of both the granite and the adjacent sediments. Drilling was carried out at Merton Hill yielding results which indicate further drilling to be warranted. Mineralogical studies were undertaken on the Mount Lindsay skarns and the results of these led to diamond drilling in the area. Reconnaissance geochemical, geological and geophysical surveys were undertaken in the remote Wilson River region and these produced targets for subsequent testing by drilling.

On the East Coast, evaluation continued of the tin potential of the Blue Tier granite on E.L. 9/76 (60 per cent Renison interest). Work was chiefly directed towards the detailed definition and the bulk sampling of the Anchor Mine deposit. However, studies aimed at the better understanding of the region were also carried out.

ROSSARDEN MINES LTD

In April 1981 Rossarden Mines Limited acquired the mine properties of Aberfoyle Tin Limited situated at Storeys Creek.

PRODUCTION

During the year the production at Storeys Creek was obtained by recovering remnant pillars and it is expected that ore reserves will be exhausted in 1981.

At the Rossarden Mine production came mainly from the upper levels of the mine but these areas are showing declining widths and grades.

The exploration and development effort was concentrated in the Lutwyche section.

Five hundred and twenty-six metres of development were completed, 335 metres in the Lutwyche section, 112 metres in the Aberfoyle section and 79 metres at Storeys Creek. Thirty-six thousand three hundred and thirty-nine tonnes of ore were treated at the Rossarden mill producing 205 tonnes of tin concentrate and 167 tonnes of wolfram concentrate. Total value of production was \$3 632 756.

PROSPECTS

The new company will be concentrating their main effort in the Lutwyche section to establish production stopes above 13 level. Diamond drilling to establish extensions of known lodes below 13 level will be the main exploratory effort.

The retreatment of the jig tailings and sand tailings dumps will be pursued and this will involve extensive alterations in the mill.

SMALL PRODUCERS

The production of sundry small producers is summarised as follows:—

BRANXHOLM - DERBY AREA

<i>Name of Producer</i>	<i>Tin Concentrates Tonnes</i>	<i>Contained Tin Metal Tonnes</i>	<i>Value \$</i>
Banks, K.	0.111	0.069	850
Banks, R.	0.438	0.223	2 744
Hayes, R.	4.635	2.935	43 315
Johnson, N.	5.886	3.924	51 632
Johnson, N. C. and V. A.	7.982	5.119	67 018
Jones, E.	4.639	3.180	39 554
Kerrison, K.	3.899	2.502	32 961
Kerrison, D.	0.046	0.029	403
Mutual Mining	2.351	1.331	16 227
Oliver, P.	0.482	0.301	3 896
Price, P.	0.750	0.473	6 004
Rainbow, W.	2.322	1.644	22 491
Reynolds, D. and T.	0.955	0.711	9 741
Taipan Tin	3.510	2.357	32 373
Wainwright, G.	0.028	0.015	209
Whittaker, G.	0.131	0.047	493
Yaxley, T.	0.337	0.238	3 254

PIONEER - SOUTH MT CAMERON - GLADSTONE AREA

<i>Name of Producer</i>	<i>Tin Concentrates Tonnes</i>	<i>Contained Tin Metal Tonnes</i>	<i>Value \$</i>
Andrew Duncan Pty Ltd	5.325	3.778	50 636
Blackberry, D.	1.806	1.239	16 243
Curtis, K.	0.045	0.025	348
Fisher, G.	0.644	0.296	4 385
Groves, L. J.	0.254	0.189	2 254
Lawry, D.	0.100	0.065	876
Lawry, L. A.	0.049	0.032	489
Lawry, R. G.	13.251	9.510	126 952
McDonald, W.	0.048	0.028	428
Moore, N.	6.208	4.333	59 699
Mott, J. G.	0.096	0.062	913
Reynolds, M.	2.314	1.676	21 847
Summers, I.	0.487	0.330	4 282
Worbey, R. M.	4.384	3.110	44 207
Wood, C. V.	5.385	3.913	52 944
Wood, V.	2.791	2.003	21 669
Wines, K.	1.753	1.120	15 999

EAST COAST

<i>Name of Producer</i>	<i>Tin Concentrates Tonnes</i>	<i>Contained Tin Metal Tonnes</i>	<i>Value \$</i>
Dawe, V. C.	0-056	0-037	515
Dwyer, D. B.	0-153	0-107	1 589
Fitzallen, G. L.	0-048	0-035	536
Franks, W.	0-567	0-401	5 384
Gillies, B.	0-054	0-030	417
Gillies, F.	0-053	0-037	614
Lewis, D.	0-533	0-346	5 211
Packwell Mining	5-127	3-370	47 284
Pitchford, B.	0-046	0-032	445
Reynolds, J.	0-105	0-075	1 015

WEST COAST (BALFOUR - WARATAH - PORT DAVEY)

<i>Name of Producer</i>	<i>Tin Concentrates Tonnes</i>	<i>Contained Tin Metal Tonnes</i>	<i>Value \$</i>
Colgan, R.	0-838	0-543	8 309
Crane, A.	0-050	0-020	278
Fenton and McKendrick	0-199	0-128	1 848
Glozier, M.	0-247	0-163	2 171
Holloway, R.	0-051	0-033	459
Kenworthy, D.	0-503	0-303	4 198
King, C. D.	1-203	0-893	12 893
Laan, M.	0-681	0-424	5 383
Laan, P.	8-321	5-193	69 757
Laffer, R.	14-632	7-209	93 438
Ralph and Guy	17-294	12-445	170 442
Smith, A. R.	0-068	0-045	664
Tatlow, S.	0-096	0-042	501
Willson, P.	7-933	5-930	81 327

TITANIUM

Titanium as titanium dioxide is reported under Foreign Ores.

TUNGSTEN (SCHEELITE)

QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes (Concentrates)</i>	<i>Tonnes (WO₃)</i>	<i>Value \$</i>
1917 to 1976	39 505	9 222	110 163 281
1977	3 276	2 397	38 878 558
1978	3 429	2 490	30 058 958
1979	3 231	2 379	29 178 743
1980 (January to June)	1 928	1 423	17 937 884
1980-81	3 536	2 771	34 707 138
Total	54 905	20 682	260 924 562

KING ISLAND SCHEELITE LIMITED, GRASSY

Mr R. Billingham, Mining Engineer, Hobart reports —

PRODUCTION STATISTICS

Ore Mined (tonnes) —	
Dolphin Mine	251 482
Bold Head Mine	154 132
Total	405 614
Mill throughput (tonnes)	408 124
Average head grade (%WO ₃)	0.76
Concentrates produced (tonnes)	3 374
Concentrate grade (%WO ₃)	74.67
M.T.U.s produced	251 940
Molybdenum trisulphide concentrate (tonnes)	54.47

DOLPHIN MINE

Development advances made were —

		m
Main Decline		118
Level drives and cuddies		1 095
Ramps		374
Raise bore		64
Hand rising		111
Total		1 762

The Main Decline advanced to 282.5 m below sea level after slow progress due to pumping problems. A sump was developed and the planned direction of the decline was changed. Level drives and ramps were mainly advanced to provide access to the stopes and the Lower Wedge open stope area adjacent to the Decline Fault. Lower Wedge development was at a reduced size and extensive use was made of grouted bolts and cables and shotcrete. Ore was obtained from the Wedge, Pit and Central stopes, which produced 206 128 tonnes and stope development which produced 45 354 tonnes. The possibility of using contractors to develop the Lower Wedge open stoping area was investigated, but it was decided to use mine labour as being less costly.

The rock mechanics program continued both as a mine function and also in conjunction with C.S.I.R.O. under the A.M.I.R.A. Project of Geomechanics of Underground Metalliferous Mines. A consultant provided independent evaluation of all monitoring and design works. Several different monitoring devices were used throughout the mine to determine ground movement and stresses. No abnormal movement or water inflow was recorded.

BOLD HEAD MINE

Development advances made were —

		m
Main Decline		88
Quartzite Decline		28
Waste development		656
Stope development		528
Hand rising		216
Total		1 516

The Main Decline progressed slowly due to ventilation problems which necessitated a redesign of the mine ventilation system and proposals for further airways. The Quartzite Decline was halted in January when access to the Fault Block stoping areas was obtained. T42 access was then advanced with priority. Hand rising totalled 216 metres and changes were made in planning whereby some of the long raise-bore rises were eliminated and short hand rises were substituted. Main sources of ore during the period were the Fault Block, C1 and C2 lenses.

MILLING

Mill throughput, at 408 124 tonnes, was 3 247 tonnes lower than anticipated due to industrial action causing ore shortages. During these periods low grade stockpile material, flotation tailings and vanner tailings were treated. Production was 2 337 tonnes of gravity concentrate and 1 037 tonnes of artificial scheelite with an overall recovery rate of 81.94 per cent.

The artificial scheelite plant operated well apart from the problem of heat loss in the autoclave leaching section. A total of 60 days was lost because of this which resulted in feed shortages to the precipitation plant. This new chemical plant continued to produce a more saleable concentrate than the gravity plant.

MINE MAINTENANCE

The use of an intensive planned maintenance and overhaul program for mining equipment produced satisfactory mechanical availability of underground trucks and loaders. Overhauls were carried out in mainland Tasmania by William Adams Tractors and Dale B. Elphinstone. Major maintenance in the mill involved repairs to the thermal oil circuit in the artificial scheelite plant.

In the power station, a major overhaul was carried out on No. 5 Mirrless generator engine, and top overhauls were carried out on Nos 2 and 4 engines. Maximum demand was 7 200 kW and overall energy generation increased by 4.07 per cent to 41 116 000 kWh. Investigations were made into the use of waste heat from exhaust gases.

CAPITAL EXPENDITURE

Capital expenditure was —

	\$
Mining	1 862 300
Concentrating	350 267
Engineering	237 642
Administration	61 110
Total	\$2 511 319

Number of persons employed as at 30 June 1981 —

	<i>Males</i>	<i>Females</i>	<i>Total</i>
Underground	122	.....	122
Surface	331	33	364
Totals	453	33	486

TASMINEX N.L., KARA MINE

Mr E. C. Leyland, Senior Mining Engineer, Burnie reports —

PRODUCTION

	Tonnes
Ore treated	97 500
Concentrate (67% WO ₃)	161.8
Magnetite (+60% Fe)	67 360

During the twelve month period, production was entirely from the Kara No. 1 orebody in the main pit. The large increase in ore production was required by increased mill operating hours, i.e. the change-over from a two shift per day operation to three shifts per day, and to greater mill availability following the conversion to electricity. All the ore was treated in the Kara concentrator by primary-secondary crushing, ball mill grinding, wet drum magnetic separation with final gravity concentration on Wilfley tables. This primary concentrate was upgraded, following drying, by high-intensity magnetic separation. All the scheelite concentrate was sold and shipped to Europe, with the magnetite being stockpiled pending possible sales.

EXPLORATION

McIntyre Mines (Australia) Pty Ltd, continued their exploration activities on E.L. 17/68 throughout the year. Detailed investigations were made of known skarn occurrences in outlying parts of the E.L. and a diamond drilling program consisting of eight holes of total length 225 m was completed at the Kara South location. No significant new occurrences of scheelite were discovered. A new evaluation of the Kara properties was made by Golder Associates on behalf of McIntyre Mines and this was completed in November 1980. In this evaluation a new estimate of mineable ore reserves was given as 900 000 tonnes at 0.66 per cent WO₃.

CAPITAL EXPENDITURE

The total capital expenditure for the twelve month period was \$166 683 the major item of expenditure being \$69 000 for a new International 515 front-end loader.

MILLING

No significant improvements or alterations were made during the year, but in May 1981 a survey of the operation of the concentrating plant was carried out by the Central Metallurgical Services Division of Aberfoyle Ltd. A preliminary report recommends major upgrading of the plant.

TUNGSTEN (WOLFRAM)

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes (Concentrates)	Tonnes (WO ₃)	Value \$
1899 to 1976	21 369	2 450	39 216 876
1977	185	136	2 214 489
1978	196	140	1 691 781
1979	126	111	1 362 604
1980	88	63	794 199
1980-81	475	339	4 251 171
Total	22 439	3 239	49 531 120

CENTRAL TASMANIAN TUNGSTEN PTY LTD — OAKLEIGH CREEK MINE**DEVELOPMENT**

Driving	(m)
Rising	252.0
Declining	40.0
	6.7

Following the completion of the cross-cut from the decline, as access to the 200 m level, driving North and South was undertaken. The vein although consistent in width, did not portray the amount of mineralisation exhibited in the upper levels. Each development cut was processed through the mill as a separate bulk parcel, and the assessed grade from this treatment confirmed that the vein at this horizon was sub-economic. A rise was commenced in the central section of the orebody and advanced 20 m above the 200 m level to test for the lower limit of economic values below the 240 m level. Results were again disappointing and the lower development program was abandoned in December 1980.

The sub-level development for the remaining stoping blocks above the 200 m level was completed. Nine stopes in total were blocked out and, following reappraisal of grade, ore breaking in all the stopes to be mined (seven and a half) was finalised before the end of the year. No significant addition to ore reserves was made during the year, however a drilling program was planned for late 1981 in an attempt to delineate further economic reserves at depth. Bulk tests of parcels of ore from each stope were treated in the mill and confirmed that the factor originally used to convert the point-counting sampling technique into a head grade for the mill was too high.

The gravity plant was worked on three shifts with the abrasive nature of the ore and host rock continuing to cause severe wear on the primary and secondary crushers. The attention and maintenance requirements of the crushing section not only occupied a large proportion of the available time of the small number of staff but also resulted in an erratic flow pattern of ore through the gravity section. Recovery was thus below 40 per cent.

	tonnes
Ore treated	14 300
Concentrate (>72%)	77.2
Value	\$690 951

In July 1981 the mine and plant were put on a care and maintenance basis until the drilling program is completed.

ZINC

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1919 to 1976	1 330 197	341 909 886	1979	59 396	43 968 329
1977	63 070	42 745 279	1980*	26 432	19 070 688
1978	61 753	35 078 116	1980-81	41 270	30 148 419
			Total	1 582 118	512 920 717

* January to June.

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

RISDON

EXTRACTION FROM CONCENTRATES

	Tonnes
From other than Tasmanian ore —	
Zinc	143 813
Cadmium	489
Cobalt oxide	24.46
Superphosphate	105 077
From Tasmanian ore —	
Zinc	41 270
Cadmium	106
Manufactured products —	
Aluminium sulphate	3 731
Ammonium sulphate	640

WEST COAST DIVISION

	Tonnes
Concentrate produced —	
Zinc concentrate	82 454
Lead concentrate	12 900
Copper concentrate	22 328
Recoverable quantity in ore mined —	
Zinc	41 270
Lead	12 710
Copper	2 045
Cadmium	106
Cobalt oxide	2.09
Silver	32.366
Gold	0.781
Manganese dioxide	285

WEST COAST MINES

R. Billingham, Mining Engineer, Hobart reports —

DEVELOPMENT

Rosebery: A total of 4 174 m of driving and cross-cutting and 575 m of raising was advanced during the year. Activity was centred on 16 and 17 levels and the decline area where much of the development was on sub-levels for the bulk stopping blocks. The decline advanced 752 m north and south and ore and waste passes were developed.

Hercules: A total of 556 m of driving and cross-cutting and 82 m of raising was advanced during the year. Development continued on 7 level.

A total of 7 969 m of diamond drilling was completed in the mining areas for planning and services.

PRODUCTION

Operations were centred on Rosebery, Rosebery open cut and Hercules. Farrell Mine remained on a care and maintenance basis. At Rosebery the open cut produced 40 229 tonnes, and underground sources 414 500 tonnes. Hercules produced 62 953 tonnes, giving a total of 517 682 tonnes mined.

Production was severely affected by a seven week strike in September-October 1980.

ORE RESERVES

Ore reserves as at 30 June 1981 were —

Rosebery, 7 643 600 tonnes; Hercules, 400 500 tonnes; Farrell, 71 000 tonnes.

Overall ore reserve grades were —

Pb, 5.0 per cent; Zn, 15.6 per cent; Cu, 0.79 per cent; Fe, 13.9 per cent; Ag, 133 grams/tonne;
Au, 3.0 grams/tonne.

MILLING

The mill expansion construction to permit increased throughput including the milling of Que River ore continued and was scheduled for completion in August 1981.

EMPLOYMENT

Mining	.....	596
Engineering	.....	302
Treatment	.....	86
Other	.....	139
Total	.....	1 123

CAPITAL EXPENDITURE

Major capital expenditure during the 1980-81 year included the commencement, continuation or completion of the following projects:—

1. Purchase of mining equipment —
 - 2 HB4KE electric loaders
 - 1 Caterpillar grader
 - 2 DJB 35 tonne trucks
 - 1 Wagner service vehicle
 - 1 HB12 diesel loader
 - 1 Robbins 43RH raise borer.

2. Purchase or continuation of surface and mill equipment —
 1 15 tonne mobile crane
 On stream analysis in the mill complex
 Rosebery Mill expansion
 7 Level workshops and maintenance area
 Material handling bins
 Stores compound and building
 Surface haulage truck.

RISDON WORKS

P. Allan, Mining Engineer, Hobart, reports that major developments included —

Completion of a contaminated water treatment facility to collect, treat and recycle plant effluents.

Continuation of the design and construction of plant modifications for the treatment of concentrates from the Elluro mine.

Completion of construction and bringing on to line of an 800 tonnes per day sulphuric acid plant.

Design and construction of a spent electrolytic cooling tower for No. 5 Electrolytic Cell Unit.

Design and construction of a pilot plant to study processes for the treatment of calcines at Risdon.

Design and construction of a start-up gas scrubber for fluid roaster gas.

Design and installation of an instrument control system in the 'Pachuca Section' of the Leaching Division.

Construction of a fourth jarosite mixing tank.

Installation of a new milling machine in the mechanical workshop.

Purchase and installation of polypropylene plates and frames for the filter presses.

The average number of persons employed was 2 032.

QUE RIVER MINING PTY LTD, QUE RIVER

T. E. Evans, Mining Engineer, Burnie reports —

GENERAL

Early in the twelve months period, the Que River Shaft was equipped for production hoisting and the shaft winder was commissioned for two-drum operation. Contractors, who were already engaged in development work in the decline from surface at the beginning of the period, commenced developing from the shaft in October 1980. Ore shipments to the Electrolytic Zinc Company, Rosebery, commenced on 19 February 1981.

These ore shipments were carried out by contractor's road transport. Initially, the shipment rate was below the planned level due to the commissioning of the facilities at Rosebery for handling and treating the ore being delayed. Subsequently the rate increased to approximately planned level.

Housing construction at Waratah was a salient feature of the surface development work accomplished during the period. The first phase of the house construction program, comprising fifty-three units, was completed in December 1980.

MINE DEVELOPMENT

Development was carried out from the decline from surface and concurrently from the shaft from October onwards.

In the decline area, 779 metres of development and 105 cubic metres of stripping were achieved. One hundred and five metres of this development were accomplished in ore.

MANPOWER

Employee strength averaged 102 over the period.

At the commencement of the period, there were 103 persons on site, 11 of whom were directly employed by Que River Mining Pty Ltd. A gradual reduction in numbers then took place so that by December 1980 there were only 88 persons on site, of whom 26 were Que River Mining employees. At 30 June 1981 the site workforce however was up to 122, composed of 44 direct employees of Que River Mining Pty Ltd, 18 maintenance and haulage contractors, who will remain on site on a permanent basis, and 60 mine development and construction contractors, whose work at the mine will terminate by the end of October 1981.

These figures exclude the housing construction workforce, which while it functioned comprised 60 men.

ZIRCON

There was no production of Zircon during 1980-81.

2. NON-METALLIC MINERALS**CLAY****QUANTITY AND VALUE OF PRODUCTION**

<i>Year</i>	<i>m³</i>	<i>Value \$</i>	<i>Year</i>	<i>m³</i>	<i>Value \$</i>
1958 to 1976	2 005 988	6 036 964	1979	92 671	324 281
1977	87 931	284 910	1980*	37 517	187 585
1978	85 167	292 399	1980-81	88 982	444 910
			Total	2 398 256	7 571 049

* January to June.

DETAILS OF PRODUCTION

<i>Company</i>	<i>Clay m³</i>	<i>Value \$</i>	<i>No of Persons</i>	<i>Product</i>
Agrippe Pottery Pty Ltd	....	....	3	Pipes and Pots
Clifton Brick (Tas) Pty Ltd, Longford	31 165	155 825	27	Bricks
Goliath Portland Cement Co., Railton	14 289	71 445	*	Cement
Grierson, M. A., Dodges Ferry†	13 107	65 535	1	Bricks
Hazell Bros, Kingston†	9 261	46 305	1	Bricks
Hobart Brick Co., Granton	12 519	62 595	35	Bricks
Hobart Brick Co., Kingston	766	3 830	1	Bricks
Hobart Brick Co., Oyster Cove	1 439	7 195	1	Bricks
Humes Ltd, Hamilton	....	....	4	Pipes
Zolati and Sons, Dulverton	6 436	32 180	22	Bricks

* Reported under Limestone.

† Suppliers to Hobart Brick Company.

DOLOMITE**QUANTITY AND VALUE OF PRODUCTION**

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
Prior to 1977	73 769	484 129	1979	18 313	216 739
1977	8 617	97 489	1980*	8 369	99 084
1978	10 284	119 438	1980-81	9 872	134 247
			Total	129 224	1 151 126

* January to June.

CIRCULAR HEAD DOLOMITE AND TRADING CO. PTY LTD, SMITHTON

This company sold 9 872 tonnes of crushed dolomite, value \$134 247 and 3 134 m³ of dolomite screenings valued at \$40 415. Capital expenditure was \$13 427. On average, nine men were employed with no accidents, or loss of time through injury, being experienced.

KAOLIN**QUANTITY AND VALUE OF PRODUCTION**

<i>Year</i>	<i>Tonnes</i>			<i>Value \$</i>								
Prior to 1977	124 452	1 910 326	1979	....	....	....	....	17 513	1 454 203
1977	11 039	1 028 645	1980*	....	....	....	....	8 964	694 972
1978	13 281	1 174 763	1980-81	....	....	....	....	22 411	1 803 078
						Total	....	....	....	....	197 660	8 065 987

* January to June.

A.P.P.M. LTD, TONGANAH

Mining south of the Tasman Highway has been completed and all plant feed is now obtained from the No. 3 pit North of the Tasman Highway. All tailings are now pumped into the No. 2 pit.

A new hydraulic excavator was purchased to replace the dragline previously employed at the mine face.

The mine employed 18 men throughout the year.

LIMESTONE**QUANTITY, VALUE OF PRODUCTION AND USAGE**

<i>Year</i>	<i>Manufacture of cement</i>		<i>Manufacture of carbide</i>		<i>Chemical and metallurgical</i>		<i>Agricultural and other</i>		<i>Totals</i>		
	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	<i>Tonnes</i>	<i>\$</i>	
To 1976	9 213 169	15 425 524	959 493	4 105 949	4 748 014	7 660 062	1 123 775	2 925 711	16 044 451	30 117 246
1977	490 514	1 471 542	20 308	304 620	82 131	812 499	65 552	348 532	658 505	2 937 193
1978	515 717	1 547 151	29 876	448 140	89 575	913 400	81 848	468 493	717 016	3 377 184
1979	559 564	1 678 692	29 160	437 400	88 371	904 078	70 764	415 679	747 859	3 435 849
1980*	268 083	804 249	21 671	325 065	44 947	466 304	38 552	208 292	373 253	1 803 910
1980-81	557 995	1 673 985	21 001	315 015	99 509	1 053 654	62 494	388 718	740 999	3 431 372
Totals		11 605 042	22 601 143	1 081 509	5 936 189	5 152 547	11 809 997	1 442 985	4 755 425	19 282 083	45 102 754

* January to June.

BEAMS BROTHERS PTY LTD, FLOWERY GULLY

A new grizzly feeder was added to the crushing plant.

BENDERS SPREADING SERVICES, IDA BAY

The company was forced to reduce its limestone production from September 1980 due to the reduced demand from Electrona Carbide Industries but continued to supply only for metallurgical and agricultural purposes.

ELECTRONA CARBIDE INDUSTRIES, ELECTRONA

Marketing problems caused the plant to be placed on a care and maintenance footing in September 1980 and only the acetylene black plant continued in operation.

Production for the year was 6 390 tonnes of carbide and 406.3 tonnes of acetylene black.

GOLIATH PORTLAND CEMENT CO. PTY LTD, RAILTON

The installation of the Pyroclon precalcination pre-heater system plus all ancillary equipment associated with same was completed. A new 35 tonne dump truck was obtained from the quarry plus a bulldozer.

The workforce fell from 299 to 291 during the period.

MOLE CREEK LIMESTONE LTD, MOLE CREEK

Modifications of plant included the installation of a new secondary rock hopper of 25 tonne capacity, a conveyor belt from the hopper to the main kiln feed conveyor and a new crib room in the quarry.

A new loader was purchased and a dam was constructed to settle run off water from the overburden dump.

RAILTON LIME PTY LTD, RAILTON

No changes were reported for the period.

WRIGHT STEPHENSON PTY LTD, PULBEENA

This company produced and sold 13 966 tonnes of lime sand valued at \$109 945 with an average employment of two men. Delivery and spreading generally being carried out by contractors.

PEBBLES
QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
Prior to 1977	19 742	347 945	1979	1 515	47 390
1977	1 819	30 399	1980*	993	31 539
1978	1 486	48 095	1980-81	2 078	66 245
			Total	27 003	571 612

* January to June.

MINERAL SUPPLIES, ULVERSTONE

The collection of pebbles for grinding was continued on the beaches in the Ulverstone area. The output was 1 029 tonnes, valued at \$61 000. An average of 6 persons were employed.

SILICA
QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
1936-1976	393 460	992 807	1979	8 397	47 800
1977	13 453	81 930	1980*	5 175	29 770
1978	8 366	43 991	1980-81	10 490	60 760
			Total	439 341	1 257 058

* January to June.

3. CONSTRUCTION MATERIALS**BUILDING STONE****Freestone**

One thousand one hundred and ninety-one cubic metres of freestone were quarried at a value of \$285 777.

Red Granite

No red granite was produced during the year.

COLES BAY GRANITE PTY LTD

No production of red granite was carried out at the Coles Bay quarry as the economic viability of the project was under review.

Building Stone (Other)

A total of 16 tonnes was produced at a value of \$3 300.

CRUSHED AND BROKEN STONE

Basalt

A total of 558 173 cubic metres of basalt was quarried, the value of production was \$5 588 875.

TALISKER BLUE METALS, LAUNCESTON

No major changes were reported.

The workforce remained steady at 6 men.

READYMIX QUARRY, BRIDGEWATER

Production of crushed and broken basalt continued at a reduced rate due to the recession in the construction industry. A second bench was started in the quarry floor.

Dolerite

A total of 217 105 cubic metres of dolerite valued at \$2 171 050 was quarried during the year.

LAUNCESTON QUARRIES

No major alterations were made to the quarry or plant.

The workforce was maintained at 10 men throughout the year.

PIONEER QUARRY, FLAGSTAFF GULLY

Production of crushed and broken dolerite at the quarry continued although at a reduced rate due to the recession in the construction industry. A reconditioned El-Jay 54 sand cone crusher was installed to increase production of quarry dust.

Limestone

A total of 12 731 cubic metres valued at \$127 310 was produced.

Sandstone

A total of 3 755 cubic metres valued at \$38 400 was produced.

Other Stone

A total of 737 029 cubic metres valued at \$7 375 587 was produced.

GRAVEL

Production of gravel amounted to 1 307 185 cubic metres valued at \$7 864 585 the majority of which was used in public roads in all parts of the State.

SAND

Production of sand comprised 210 844 cubic metres at a value of \$1 068 525.

OTHER ROAD-MAKING MATERIAL

Production 57 222 cubic metres valued at \$287 570.

4. FUEL MINERALS**COAL****QUANTITY AND VALUE OF PRODUCTION**

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
Prior to 1977	824 553	31 184 907	1979	237 380	3 202 108
1977	198 966	2 152 381	1980*	154 682	2 366 903
1978	223 957	2 527 033	1980-81	304 727	5 628 889
			Total	11 944 265	47 062 221

* January to June.

CORNWALL COAL COMPANY N.L., FINGAL

P. Allan, Mining Engineer, Hobart, reports —

DUNCAN COLLIERY, FINGAL

Total production was 252 954 tonnes from all development work and pillar extraction.

At the beginning of the year all work was concentrated in the north-east corner of the lease where the intent was to mine out to surface and establish an alternative access while developing an additional pillar section. The area proved unworkable and uneconomic due to dolerite intrusions and major splits in the seam, while the main headings suffered from serious heave discouraging all hope of being practical as haul and travelling roads. Towards the end of the year development was abandoned with only one unit left in the section to remove pillars so long as it was practicable. It is essential however to maintain close monitoring of the heaving area to ensure the safe removal of all equipment before closure. It should be possible to obtain about 75 per cent of the possible pillar extraction before the final withdrawal.

The second unit was moved into the south-western corner of the mine and began developing south into an area indicated by Department of Mines drilling as having some potential and with the added intention of breaking out on the outcrop for alternative access. The 800 m so far driven have been in very poor conditions predominantly in shale while there remains some 250 m to be driven to the outcrop. Present indications are however that it should be possible to obtain a successful break-out.

BLACKWOOD COLLIERY

Total production was 58 757 tonnes from development headings.

At the beginning of the year six men were establishing the three portals for development into the Blue Seam at Mt Nicholas and near the old mining town of Cornwall from which the company originally derived its name and where it first operated.

By the end of the year, working on a single shift basis there are 19 men, a surface workshop, change-house and office building, substation and surface mounted fan installation.

Underground development is now 350 m in on four headings using a Joy 12CM continuous miner in conjunction with two 22SC AC/DC shuttle cars. A Domino 4-wheel drive FEL is used for clean-up work and in conjunction with a trailer, for material transport. Coal is delivered out of the mine by a 1-067 m conveyor to a 450 tonne raw coal bin and from the mine to the washery by road transport, a distance of some 14 km.

The initial headings close to the outcrop were in poor ground requiring close support, the concrete portals being followed by steel RSJs until firmer ground was reached. Main support is now by W straps and roof bolts using full resin anchorage with approximately 0.5 m of poor quality coal left at the roof. The coal has increased in hardness progressively with the advancing headings making cutting slow.

DUNCAN COAL WASHERY

This now serves two collieries, the Duncan and the Blackwood, and has had a difficult time handling the poor material from the Duncan No. 1 Section along with the close-to-outcrop material from Blackwood and has had to resort to a 3-shift system. The Enviroclear thickener added to the plant last year has proven its worth in enabling the washery to handle the material thrust upon it during the last eight months.

EXPLORATION

At one time it was considered mining the lower East Fingal Seam at the Duncan colliery but four holes drilled underground to intersect the seam have shown both quality and quantity to be uneconomical.

The company's exploration area was increased south of the Duncan colliery by obtaining a large area previously held by the Department of Mines as exempt from the Mining Act and work is yet to start.

D. FENTON, AVOCA-FENHOPE COLLIERY

This interesting development of a small coal mine has been steadily progressing throughout the year in the vicinity of the old Stanhope coal area to the north of Avoca. A large block of coal left behind by the previous colliers has been driven into by Mr Don Fenton with a demonstration of determination, ingenuity and timbering ability which is now rarely encountered in the industry. The Fenton name has long been associated with coal mining in the Fingal Valley, the present operator's father and grandfather having been engaged in many of the original Mt Nicholas coal ventures from the early years of the century, one of the main seams in the area perpetuating their name. It is encouraging to see that the old independent mining spirit still survives and we will be watching Mr Fenton's efforts with interest.

PEAT
QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>	<i>Year</i>	<i>Tonnes</i>	<i>Value \$</i>
Prior to 1977	5 616	180 395	1979	410	78 775
1977	330	45 788	1980*	815	155 400
1978	3 098	65 170	1980-81	702	132 864
			Total	10 971	650 392

* January to June.

COLLINS DEVELOPMENT PTY LTD

This company produced and processed 702 tonnes of peat valued at \$132 864.

5. FOREIGN ORES

The total value of the metallurgical products of four large works treating foreign ores imported into Tasmania was \$345 618 137.

ALUMINIUM**COMALCO ALUMINIUM (BELL BAY) LTD, BELL BAY**

The following additions and improvements to operations were carried out during the period:—

- The addition of 108 cells to the No. 4 potline
- A computer control system for aluminium reduction cells
- Improvements and extensions to the medical centre
- Curries River dam reticulation scheme
- Replacement of electrical switchgear at the substation 11
- Increased furnace capacity at the No. 4 DC station
- The installation of an in-line filter degasser unit to improve can stock alloy production
- The rolling block production capacity increased at the DC 4 station
- The installation of pressurised injection system for the oil-fired carbon baking furnaces.

The size of the workforce was 1 320.

Two hundred and eighteen thousand eight hundred and twenty-five tonnes of alumina were imported during the year producing 114 437 tonnes of aluminium.

FERRO-MANGANESE, FERRO-SILICON AND SILICO-MANGANESE

TASMANIAN ELECTRO-METALLURGICAL CO. PTY LTD, BELL BAY

During the year a total of 62 677 tonnes of manganese ore was imported from Groote Eylandt. Seventy-six thousand nine hundred and forty-nine tonnes of manganese alloys for the steel industry were produced.

TITANIUM DIOXIDE

TIOXIDE AUSTRALIA PTY LTD, HEYBRIDGE

Western Australian ilmenite was treated at the Heybridge plant for the production of titanium dioxide. Market demand locally remained firm with favourable prices, however intense competition and over supply in the export field led to price cutting at sub-economic levels.

Capital expenditure for the year was 4·001 million dollars, major items were —

- (1) increased and improved processing facilities and services;
- (2) environmental projects — especially plant drainage modifications;
- (3) energy and saving projects;
- (4) general cost saving projects.

Company employment showed a slight decrease during the year to 384 persons (387 in 1980). Terminations for this period totalled 28 giving a turnover rate of 6·1 per cent.

Modifications to operations included the construction of additional steam generating and process plant and the commencement of a modified drainage system to reduce the incidence of sea discolouration. Planning is proceeding to replace some of the current usage of fuel oil with L.P. gas.

ZINC, CADMIUM, COBALT OXIDE AND SUPERPHOSPHATE

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, RISDON

This company, reviewed under Zinc, produced zinc from concentrates imported from the Broken Hill together with small quantities of cadmium and cobalt oxide as by-products.

The sulphuric acid derived from roasting the concentrates was used in making superphosphate fertilisers from phosphate rock imported from Nauru, Ocean and Christmas Islands.

GEOLOGICAL SURVEY BRANCH

REPORT OF CHIEF GEOLOGIST, I. B. JENNINGS, B.Sc.(Hons), A.M.Aust.I.M.M.

Progress has been maintained in the systematic regional geological mapping of the State. In all, twelve sheets are at present in various stages of mapping, two were published during the year and a further five are being drafted for publication. Following an assessment of the needs of the mining and exploration industries a start has been made on the preparation of 1:50 000 geological sheets of Macquarie Harbour and Lyell.

The intensive coal exploration program in the vicinity of Fingal has continued and a report is in the course of preparation. Reports were prepared on aspects of the silica and limestone resources of the State but the geologist concerned with this field of enquiry resigned in May and the Survey now remains deficient in that area of study. Further mapping continued in the Murchison quadrangle and a report was prepared and published on the economically important Mt Read Volcanics. After a thorough investigation new procedures were established to process, assess and store reports of exploration companies.

Due to the dry summer numerous requests for advice on underground water supplies have been received from most settled parts of the State. In addition a start has been made on the systematic assessment of the underground water of the Lower Midlands. This has taken the form of a gravity survey which should provide structural information on the rock distribution. It is anticipated that data collection for this survey will take about one year. Advice has been provided as required on a range of foundation and land stability problems. The continuing recognition of fairly widespread, but minor, damage to houses resulting from the action of expansive soils is of concern but the professional services currently available to the Survey do not at present allow an in depth study of this matter.

In geophysics the main field of activity was in gravity surveys which were conducted at Que River, Zeehan, Boobyalla and in the Lower Midlands. These surveys were for economic resource assessment (Que River and Zeehan) groundwater assessment (Lower Midlands) and stratigraphic purposes (Boobyalla). Seismic refraction surveys were conducted to assist in engineering geology applications whilst a seismic reflection survey was made of portion of the coalfield south of Fingal. The latter data awaits funds for further processing by contractors. Aeromagnetic surveys were completed over the Fingal coalfields and have been commenced over a large portion of the mineralised areas of the West Coast. The latter survey is financed from Commonwealth funds provided under the Callaghan scheme of Federal assistance to Tasmania.

The geochemist continued investigations into aspects of gold mineralisation in the State concentrating chiefly on methods of gold exploration using trace amounts of gold in vegetation. Petrological and mineralogical services to the public, industry and the Department continued and of particular interest was the development of methods to identify durable sandstones for building restoration. A petrological investigation was made of economically important skarn rocks in the vicinity of Mt Heemskirk.

Detailed planning of the laboratory layout and other facilities in the new Mines Department headquarters under construction at Rosny Park have proceeded in conjunction with the architects and the Public Offices Committee. Senior Geologist Dr N. Farmer has been seconded for the time being to represent the Department on a sub-committee whose duty it is to supervise all aspects of building and furnishing of the new building.

REGIONAL GEOLOGY

Supervising Geologist E. Williams reports —

1:50 000 Map Series —

Maria and Kingborough Sheets have been published.

Huntley, Smithton, Sorell, Blue Tier and St Valentines Sheets are being drafted for publication.

Snow Hill Sheet: Senior Geologist A. B. Gulline continued mapping.

Dover Sheet: Senior Geologist N. Farmer continued mapping.

Interlaken Sheet: Geologist S. Forsyth continued mapping.

Pedder Sheet: Geologists N. J. Turner and C. Calver continued mapping.

Eddystone Sheet: Geologist P. W. Baillie continued mapping.

St Marys Sheet: Geologists N. J. Turner and C. Calver continued mapping.

Corinna Sheet: Geologist A. V. Brown continued mapping.
 Ben Lomond Sheet: Geologist P. G. Lennox continued mapping.
 St Helens Sheet: Geologists M. P. McClenaghan and P. R. Williams commenced mapping.
 Macquarie Harbour Sheet: Geologist M. P. McClenaghan commenced mapping.
 Lyell Sheet: Geologists P. R. Williams and P. W. Baillie commenced mapping.
 Schouten Sheet: Geologist K. D. Corbett commenced mapping.
 Notes for the 1-mile Sheffield, Mackintosh and Frankford Sheets have been published.
 Notes for the 1:50 000 Ringarooma-Boobyalla Sheets are in press.
 Reports for the 1:50 000 Strahan, Oatlands and Kingborough Sheets are being prepared.

ECONOMIC GEOLOGY

Acting Supervising Geologist D. J. Jennings reports —

The staff of the section comprised a supervising geologist, two senior geologists, five geologists and one assistant. Geologist T. G. Summons resigned from the Department in May 1981.

The following activities were carried out:—

Metallic Minerals

(D. J. Jennings: P. L. F. Collins)

- (1) Continuation of the investigation into detrital tin deposits mainly in the north-east of the State, including the continued drilling of the Musselroe River flats.
- (2) Examination of mineral prospects and small mines throughout the State, including investigations of the Oakleigh Creek mine (Forth Valley) and the All Nations mine (Moina).
- (3) Liaison and discussion with mining industry personnel and advice to prospectors.

Fuel Minerals — Coal Investigation

(V. M. Threader: C. A. Bacon: R. H. Castleden)

- (1) Continuation of the exploratory diamond drilling program in the Fingal Valley area, with the completion and logging of 23 holes and sampling of coal seams.
- (2) Preparation of isoash and isopach maps of coal seams and interseam sediments, graphic logs of seams (at 1:25) and complete holes (at 1:500) for a report on the Government coal exploration at Fingal.
- (3) Preparation of a report on the coal reserve in the Duncan Seam in the Fingal exempt area.
- (4) Discussions with company geologists, field visits to coal exploration areas and underground investigations at the Duncan and Cornwall collieries.

Non-Metallic Minerals

(T. G. Summons: R. H. Castleden)

Investigations on silica, limestone and chromite and reports produced on —

refractory raw materials in Tasmania,
 silica in Tasmania,
 production of crushed basalt, dolerite and limestone in the Hobart and Launceston areas,
 limestone in the Lune River area, and
 the Hogs Back silica deposit at Hastings.

Construction Materials

(V. M. Threader)

Investigations and assessments of sand resources at Native Point, and King Island beach shingle; reports produced on a sand deposit on the Coles Bay road, and sand and gravel reserves in the Flowerdale ballast pit.

The Construction Materials Register was maintained by P. Ruzicka.

General

(K. D. Corbett: P. L. F. Collins and others)

- (1) Field mapping and compilation continued in the Murchison Quadrangle.
- (2) Preparation of a report on the stratigraphy and mineralisation in the Mt Read Volcanics.
- (3) Participation in a project on the radiometric dating of the Mt Read Volcanics.
- (4) Participation in a gamma-ray spectrometer and magnetic susceptibility survey of Tasmanian granitoids.
- (5) Completion of a report on the genesis of the Cleveland tin deposit.
- (6) Study of the sulphur isotopes of the Chester massive pyrite deposit.
- (7) Involvement in the development of a system for evaluation, assessment and indexing of company reports on exploration licence areas, and subsequent routine evaluation of reports.
- (8) Continued liaison, discussion and correspondence with mining company personnel, the public, other Government Departments, organisations, Municipal Councils, etc.
- (9) Representation at the Geological Society of Australia Coal Geology Group symposium in New South Wales in September 1980 and a symposium on volcanic and sedimentary rocks in Canberra in December 1980.

ENGINEERING GEOLOGY

Supervising Geologist P. C. Stevenson reports —

The section consists of a Supervising Geologist, two Senior Geologists and four Geologists, one of whom, Mr A. T. Moon, has been detached to the University of Tasmania to take a higher degree course in soil mechanics.

GROUNDWATER

A dry summer produced a great deal of work in water supply duties. Bore sites were examined at Opossum Bay, Dover, North Bruny, Westbury, Allans Rivulet, Magra, Tasman Peninsula, Patersonia, Low Head, Tea Tree, Kaoota, Kettering, Collinsvale, Cressy, Barrington, Murdunna, Dorans Road and Nunamara. In addition more extensive water surveys were made at Mt William National Park, Tomahawk, Bridport Golf Club, Bakers Beach Strahan, Eaglehawk Neck and Port Arthur, and the A.P.P.M. Mill at Burnie. Detailed work covering several weeks was executed at Dodges Ferry and Carlton, and was continued at Swansea (for the town supply) and at Royal Hobart Golf Club.

A major regional groundwater study was begun in the Lower Midlands from Hamilton to Oatlands and from Brighton to St Peters Pass. This has been based on an extensive gravity survey which continues to elucidate the complicated rock structure revealed by post-regional mapping. Drilling will begin soon.

A project to obtain clean seawater for oyster culture was an unusual task at Bicheno, and the routine maintenance of bore index cards took two man-weeks. A study of hard-rock boreholes has begun at last, and committee work has started on the planning of a national conference on 'Water in Fractured Rocks 1982'. The Technical Committee on Underground Water has now become the Groundwater Committee and a meeting was held in Griffith, New South Wales, in March.

FOUNDATION WORK

Foundation studies for dams and installations has generated some work for a dam at Guide River, a gas tank at George Town, a factory in the industrial estate at Legana, a sawmill at Exeter, a dam at Gunns Plains, and a reservoir at Springfield. Of smaller dimension but no less vital is the damage to houses caused by soil shrinkage and advice was given at Blackmans Bay, Sorell, Sandy Bay and Clifton. A survey station has been displaced by soil movement at Evandale and some advice on reinstatement was offered to the Department of Lands.

SLOPE STABILITY

Landslide work has been, as usual, demanding. Short visits were paid to areas at Ulverstone, Spreyton, Hillwood, Ambleside, Karoola, Buckland and elsewhere in the Tamar Valley, and reports written. Detailed geological work at St Helens has continued and costs have been obtained for some remedial work. The mine at Savage River was visited and was the subject of some discussion with Dr D. R. Piteau and the mine management. The A.N.R. diversion at Latrobe previously investigated, was revisited.

The Forestry Commission has been given reports on road and erosion problems at Fingal and elsewhere and more work of this kind and an environmental guideline study has been done.

A move to recycling of urban land has been aided by work on the stability of old quarry faces below which houses are to be built at Poets Road, Hobart.

A very difficult area at Punchbowl has been studied with the owner's engineers and an acceptable compromise layout is within sight, and a school site at Lilydale has been investigated.

A computer-assisted landslide zoning system has been developed and has attracted international attention, but is not yet fully in use.

An interdepartmental committee on soil conservation has been brought into existence and useful co-operation is possible.

GENERAL

A landfill site at Prospect is being examined to prevent leakage of pollutants and the Seven Mile Beach conservation area committee has used our groundwater advice.

Some thought has been given to the details and effects of charging for services, and this will be implemented in the near future.

Several geologists have taken part-time courses in soil mechanics at the University of Tasmania, and an exhibit was manned at the Hamilton show, but attracted disappointingly little attention.

GEOPHYSICS

Acting Geophysicist R. G. Richardson reports —

REGIONAL PROJECTS

Interpretation of the major features of the gravity map of Tasmania has shown a close correlation between the distribution of granites and the shape of the State. The granites are more widespread and closely related than was expected.

Seismic reflection traverses in the Boobyalla area show a steep-sided basin containing a number of palaeo stream-channels and a variety of sedimentary facies. Test drilling is planned in these channels.

A regional gravity survey in the Zeehan area is nearing completion and represents the start of a unified gravity coverage of the West Coast mineral fields. It will allow a regional structural interpretation and form the basis for future detailed exploration surveys.

Approximately 3 000 line kilometres of a 12 000 line kilometre aeromagnetic survey of the mineralised West Coast has been flown. When flying is completed coverage will extend north from the mouth of the Gordon River to Savage River and west from Mt Romulus to the coast. The project is supported by Commonwealth Callaghan funding.

ENGINEERING GEOLOGY AND GROUNDWATER

Most geophysical surveys related to foundation engineering or groundwater projects continue to be undertaken by the Engineering Geology Section with minor specialist assistance. In particular assistance was provided with re-interpretation of Winnaleah resistivity soundings and location of Hunter Island, under the Jones and Company buildings, Hobart, using a detailed gravity survey.

A seismic reflection traverse was fired along the Bridgewater causeway to measure the depth to which fill had sunk in the soft river sediments. Once processing problems were resolved a satisfactory reflection was produced. A series of seismic refraction surveys are being used to measure sand thicknesses on the St Helens Bar and to locate any potential bedrock channels.

A regional gravity survey of the Lower Midlands is being conducted in conjunction with the Engineering Geology Section. The survey will provide structural control for a drilling program to determine the deep groundwater resources of the area. Nearly 500 stations were installed with the use of a helicopter and field work should be completed in late December.

ORE DEPOSITS

A detailed gravity survey of the Que River Mine area showed the gravity method to be a viable exploration tool even in rugged terrains. A suitable survey at an early stage in prospect evaluation can indicate mineral tonnage and delineate main ore zones. Although extensive processing of the data is not essential gradient and derivative techniques enhance the structural resolution of the method.

The final version of the guide to known geophysical survey coverages of all methods has been prepared. The Department's open-file indexing system should remove the need for further guides.

OTHER DEPOSITS

The coal resources survey in central east Tasmania has been finalised. Data from the two level aeromagnetic survey, which provides the first verification of continuation techniques used in Australia, has been combined with quantitative interpretation of the gravity data to produce a reliable drilling guide. Three seismic reflection traverses were completed and data from the first two of these has been partially processed. The presence of a high-velocity dolerite surface layer required the development of new processing techniques and funds were exhausted before final sections were produced.

A minor sand reserve assessment survey was undertaken at Moulting Lagoon.

COMPUTING

A replacement for the internal computing facility was made operational early in the year and two courses given to familiarise users with the operating system. Programming facilities remain restricted but the use of FORTRAN allows program interchange and standardisation. A tape drive has been ordered to assist in data exchange.

External processing was severely restricted by funding and only the Que River mine data reduction was completed. Computing will remain unsatisfactory until sufficient funds are made available to process fully on external machines or to purchase a stand-alone system for gravity and magnetic processing.

Programming and software maintenance of various accounting procedures was commenced.

Geophysicist Dr D. E. Leaman resigned from the Geological Survey Branch from 30 June 1981, to enter private consulting. Dr Leaman was a highly skilled hard working officer whose services to the Survey will be greatly missed.

GEOCHEMISTRY

Geochemist, W. E. Baker reports —

The geochemical laboratory has been plagued with plant failures during the year. The original AA-4 atomic absorption spectrophotometer developed several faults which caused many delays in the processing of samples. The instrument failed completely in September 1980 and orders were placed for a new plant in November. Delivery of a Varian AA-875 was made in February and minor problems delayed operation of this plant until May.

Despite these problems study of the gold distribution in the Lisle Goldfield continued at a reduced rate. Some 700 plant samples were analysed for gold and the regional cover of the area is now 70 per cent complete. Detailed investigations of anomalous areas will be undertaken when the new laboratory facilities enable full-scale production to be achieved.

Preliminary study of gold in soils and the separation of organic matter from river water have commenced. These studies will provide a basis for extension of the work on gold and a more general regional study of some western Tasmanian areas.

MINERALOGY AND PETROLOGY

D. C. Green, Mineralogist and Petrologist reports —

In the past year there has been a small, but consistent, demand for identification of mineral and rock samples by members of the public. It is noted that enquiries from prospectors have become more sophisticated as exploration techniques develop. This requires more use of X-ray diffraction and microprobe analyses to aid identification of indicator minerals. A steady increase in the number of requests from schools is indicative of increased public awareness of the Tasmanian mineral resource base.

Alteration assemblages associated with mineralised areas of the Mt Read Volcanics are being studied using optical, electron microprobe and stable isotope patterns in order to develop models that should aid exploration. Mr J. Everard has completed his study of the tin-boron-iron-thorium bearing skarns adjacent to the northern margin of the Heemskirk Granite. His report will be of value in assessment of acid-soluble tin prospects and in metallurgical treatment of these complex ores.

The technique developed for rapid identification of potentially unstable montmorillonoid clays in Triassic sandstones has been widely applied to assessment of stone for building reconstruction. A technique for production of fused rock beads for rapid chemical analysis has been developed and currently is being assessed by comparison with standard rock samples analysed by more classical methods. Over two hundred fibre samples have been submitted for asbestos identification.

A report on the heat productivity of Tasmanian granitic rocks based on a field gamma-ray spectrometer survey conducted jointly by this Department and the Bureau of Mineral Resources is in preparation. A site has been selected for a test drill hole to assess the geothermal potential of the rocks.

Mr Woolley continues to provide important technical support, particularly in X-ray diffraction characterisation of clays, and in operation of stable isotope equipment established as a joint facility at the University of Tasmania, pending relocation in new offices at Bellerive. The range of stable isotope techniques available to officers of the Department is now comparable to that in major geological centres in the Northern Hemisphere. Results from these facilities have assisted in the appraisal of sulphide deposits and in characterisation of groundwater samples. Planning of petrological and mineralogical services for the new laboratories at Rosny Park is well advanced.

PALAEONTOLOGY

Palaeontologist, M. J. Clarke reports —

Good progress has been maintained in several areas. Well preserved faunas have been collected from Smithton, the Huskisson River, Lake Margaret, Linda Valley, Forestier Peninsula, Nugent-Wattle Hill, Mt Dromedary, Snug Rivulet, Pawleena and Cygnet.

The fauna from near Smithton Airport is particularly interesting. Individual specimens are considerably fragmented, but preservation is otherwise reasonably good. A variety of polymerid and agnostid trilobites (including probably *Pseudagnostus*) are present, together with several dendroid graptolites. A Late Cambrian age significantly younger than Christmas Hills is indicated. The Huskisson River faunas are exceptionally well-preserved with *Glyptagnostus* and *Pseudagnostus idalis* Opik occurring in three localities. An early Late Cambrian *Glyptagnostus reticulatus* Zone age is indicated and requires a substantial revision of the Huskisson Dundas Group section as previously understood. Higher in the core of the Huskisson syncline well preserved Middle Silurian (Wenlockian) brachiopod and trilobite faunas occur in abundance. Well-preserved *Billingsella* occurs at the northern end of Lake Margaret, and

indicates a Late Cambrian (Franconian) age for the siliceous clastic sequence. Thus part of the siliceous clastic sequence is co-eval with the greywacke turbidite sequences of the Dundas Trough. Faunas from the 'Fenestella Shale' at Linda Valley are disappointing. Bryozoa occur in profusion, but brachiopods are rare and poorly preserved. Leptaenids indicate an age no older than Middle Ordovician.

Specimens of *Streptorhynchus* from Green Point at Cygnet are well preserved, but their cleansing and preparation is more difficult than usual. The specimens require repeated treatment with strong acids and other oxidising agents to remove adherent pyrite and chlorite caused by an adjacent syenite intrusion. Bernacchian faunas with abundant *Canocrinella farleyensis* (Etheridge and Dun) occur at Pawleena. The lower parts of the Permian sequence in the coastal sections of Forestier Peninsula are strongly reminiscent of the sequences on Maria Island. Well preserved *Anidanthus*, *Canocrinella* and *Euryphllum* and other fossils occur abundantly, immediately above a thin freshwater interval.

The drafting of the text and diagrams has commenced on 'The Carboniferous of Tasmania', an invited contribution to 'The Carboniferous of the World'. This volume is due for publication in 1983 and is sponsored by the International Union of Geological Sciences, and will be edited by W. H. C. Ramsbottom, R. H. Wagner and H. Winkler. Current palynological correlations (Balme, 1980) favour a higher placement of the Carboniferous-Permian boundary than previously envisaged. Accepting this placement of the boundary necessitates the inclusion of a significantly greater part of the glacial and glacio-marine sequence in Tasmania in the Late Carboniferous. As a corollary, the cold water *Eurydesma* fauna made its appearance in pre-Permian times. The drafting of a series of palaeogeographic maps for the Late Palaeozoic of Tasmania has also been commenced in collaboration with Dr M. R. Banks, University of Tasmania.

Other activities have included the identification of fossil assemblages for schools and other members of the general public, assistance with work experience programs, and several meetings with the architects over the details of the Rosny Park Laboratories.

CARTOGRAPHIC SECTION

Senior Draughtsman D. M. Hardy reports —

The following progress was made on colour map production:—

1:50 000 Series

Kingborough Sheet (88): printed in 11 colours.

Smithton Sheet (21): Drafting proceeding.

Huntley (sheet 73): Drafting proceeding.

A special area map, Longford Basin Hydrology (1:100 000), was printed in five colours.

During the year a considerable number of 1:500 bore log sections and 1:25 coal seam sections were drafted, along with many isopach maps. These were associated with the drilling program being carried out in the Fingal Exempt Area. In all approximately 220 geophysical, geological and engineering plans and diagrams for technical reports, Geological Survey Bulletins and normal field services were produced.

SURVEYING

Surveyor G. Benn reports —

The following surveys were carried out during the year:—

- (1) Continuation of surveying and levelling of diamond drill holes and associated tracks at Fingal;
- (2) Landslips at: Penguin (Groom's Slip) and East Devonport (Brooke Street);
- (3) Further survey work at Wynyard-Flowerdale gravel quarries;
- (4) Continuation of surveying at Lune River limestone quarry;
- (5) Surveys at Five Mile Beach and Seven Mile Beach, Hobart; All Nations mine, Moina; St Helens Point Road, St Helens;
- (6) Surveying of boreholes at Gladstone, Garfield Creek and Bridge Run, and Boobyalla Plains;
- (7) Further survey work at Northern Chromite, Beaconsfield;
- (8) Plans produced of all surveys.

PUBLICATIONS

Publications Officer E. L. Martin reports —

PUBLICATIONS

The following publications were printed:—

- Geological Survey Explanatory Report, 1 Mile Series. Sheet 44. Mackintosh, by P. L. F. Collins, A. B. Gulline and E. Williams.
- Geological Survey Explanatory Report, 1 Mile Series. Sheet 38. Frankford, by A. B. Gulline.
- Geological Survey Explanatory Report, 1:250 000 Series. Sheet SK-55/3. Burnie, by E. Williams and N. J. Turner (reprint).
- Geological Survey Bulletin 60. Gravity survey of the East Coast coalfields, by D. E. Leaman and R. G. Richardson.
- Occurrences of gemstones in Tasmania (revised edition).
- Petroleum (Submerged Lands) Act 1967. Directions.
- Underground Water Supply Paper 7. The geology and groundwater resources of the Coal River Basin, by D. E. Leaman (reprint).

The following publications were in preparation:—

- Geological Survey Bulletin 59. Groundwater resources of the Longford Tertiary Basin.
- Geological Survey Bulletin 61. Geology of the Ringarooma-Boobyalla area.
- Tasmania: Mineral resources and mining industry (revised edition).

MICROFICHE EDITIONS

The following new microfiche editions were produced during the year:—

- Geological Survey Bulletin 2. The Mathinna goldfield, Part III, by W. H. Twelvetrees. (Parts I and II, which were separately published are also included.)
- Geological Survey Mineral Resources 1. Tungsten and molybdenum, by C. L. Hills and L. L. Waterhouse.
- Technical Reports 18.
- Technical Reports 19.

There has been a small but steady demand for the microfiche currently available. Filming of the following was completed by the end of June 1981:—

- Geological Survey Bulletin 32. Osmiridium in Tasmania.
- Geological Survey Bulletin 36. The Dundas mining field.
- Geological Survey Bulletin 39. The osmiridium deposits of the Adamsfield district.
- Geological Survey Bulletin 42. Lefroy and Back Creek goldfields.
- Geological Survey Bulletin 43. Mathinna and Tower Hill goldfields.
- Geological Survey Bulletin 54. A Century of tin mining at Mt Bischoff.
- Geological Survey Bulletin 55. The Blue Tier Batholith.
- Geological Survey Mineral Resources 7. The coal resources of Tasmania.
- Geological Survey Paper 1. Gravity survey of the Tamar region, Northern Tasmania.
- Geological Survey Paper 2. Gravity survey of north-eastern Tasmania.
- Geological Survey Record 11. Mineralogy of the mines and prospects of the Zeehan field.
- Unpublished Reports 1978.

DATA BASES AND COMPUTING

All parts of the Reports of the Director Mines are now entered on computer file with the commands needed for the output program. The final text is then assembled from the individual sections.

The transfer of bibliographic files from the PDP-11 to the Perkin Elmer computer was completed and several files were extended. New FORTRAN edit and search programs were written.

The files now comprise —

Unpublished Reports 1971-1981.

Oredressing Investigations 1979-1981.

Geological articles in the Papers and Proceedings of the Royal Society of Tasmania 1920-1980.

Articles on Tasmanian geology and palaeontology in the Journal of the Geological Society of Australia and Alcheringa 1975-1980.

FORTTRAN programs were written for the production of ternary diagrams on the COMLOT DP-8 plotter (with a listing of input data on the printer) and for the transformation of grid references or co-ordinates from ANG to AMG and vice versa.

The Publications Officer continued to serve as Tasmanian representative on the Australian Earth Sciences Information System Advisory Committee.

PHOTOGRAPHY

About 550 colour slides were received, mainly of Fingal DDH core. Photographs were taken of construction progress at the Eastern Shore building sites. Other photographic work was concerned with the preparation of material for publication and for departmental reports.

LIST OF UNPUBLISHED REPORTS

<i>No.</i>	<i>Title</i>	<i>Author</i>	<i>Date</i>
1980/22	The stability of a building allotment at Orana Place, Riverside	D. J. Sloane	15.7.80
1980/23	Refractory raw materials in Tasmania	T. G. Summons	28.7.80
1980/24	Geological investigation of a proposed development at Rannoch Crescent, East Devonport	R. C. Donaldson	23.7.80
1980/25	Groundwater investigation at Bridport golf course	W. R. Moore	2.8.80
1980/26	Petrography of Triassic acid pyroclastic rocks and rhyolite near Bicheno	J. L. Everard	18.8.80
1980/27	Barium-bearing heulandite from DDH 55, Fingal	D. C. Green	22.8.80
1980/28	Sand resources at Native Point, Perth	V. M. Threader	22.8.80
1980/29	Geological map of the Snug Tier area	N. Farmer	27.8.80
1980/30	Groundwater investigations at Milford for the Tasmania Golf Club	W. C. Cromer	29.8.80
1980/31	Further investigations at a proposed cemetery site, Kingston	W. C. Cromer	12.9.80
1980/32	Feasibility refraction survey, Moulting Lagoon Sand Reserve	D. E. Leaman	23.9.80
1980/33	Geological traverse along the Hydro-Electric Commission's Pieman Road, from LPD 45.5 km to the Stanley River (LPD 20.2 km)	A. V. Brown	26.9.80
1980/34	Bridgewater Causeway seismic reflection survey	R. G. Richardson D. E. Leaman	30.9.80
1980/35	Further test pits at the Guide River dam site	W. L. Matthews A. T. Moon	7.10.80
1980/36	Tasmania — the gravity field and its interpretation	D. E. Leaman R. G. Richardson J. E. Shirley	8.10.80
1980/37	Preliminary palynological investigation of Boobyalla DDH1, 1977–1979, north-east groundwater investigation	S. M. Forsyth	23.12.80
1980/38	Composite geological profile across Tasmania	N. J. Turner	23.12.80
1980/39	Review of resistivity sounding interpretation — Winnaleah area	D. E. Leaman	9.10.80
1980/40	Groundwater investigations at Swanwick near Coles Bay	W. C. Cromer	30.10.80
1980/41	Applied geophysics in Tasmania — summary of surveys	D. E. Leaman	11.11.80
1980/42	Some aspects of the geology of the Mt Lindsay-Dundas area, western Tasmania	A. V. Brown	11.11.80
1980/43	Investigation of proposed reservoir site, Lauderdale	R. C. Donaldson W. C. Cromer	6.11.80
1980/44	Interim report on the slope stability of C. S. Burgess and Forrest Estate subdivisions at Rostella Road, Dilston	W. R. Moore	13.11.80
1980/45	A seismic reflection traverse on the Seymour coalfield	R. G. Richardson D. E. Leaman	20.11.80
1980/46	Magnetic survey, Fingal Tier region	D. E. Leaman R. G. Richardson	17.12.80
1980/47	Fossil faunas in Eldon Group correlates within the Huskisson Syncline	M. J. Clarke A. V. Brown	27.11.80
1980/48	Groundwater prospects at Trefoil Island	P. C. Stevenson	2.12.80
1980/49	Geophysical exploration of the East Coast coalfields, Tasmania: a summary	D. E. Leaman	8.12.80
1980/50	Seismic reflection surveys, Clifton Beach, southern Tasmania	D. E. Leaman R. G. Richardson	11.12.80
1980/51	Radiometric survey, Fingal Tier	D. E. Leaman	19.12.80
1981/01	Investigation of an urban allotment, Braddons Lookout Road, Leith	R. C. Donaldson	9.1.81
1981/02	Geological investigation of a past quarry site, Poets Road, West Hobart	A. T. Moon	12.1.81
1981/03	Groundwater investigations at Seven Mile Beach for the Royal Hobart Golf Club	W. C. Cromer	29.1.81
1981/04	List of Unpublished Reports 1971–1980	E. L. Martin	5.2.81
1981/05	A gravity survey of the Henry Jones Building, Old Wharf, Hobart	R. G. Richardson	16.2.81
1981/06	Fingal Tier seismic reflection traverses 1 and 2	R. G. Richardson D. E. Leaman	16.2.81
1981/07	West Coast gravity tie stations, 1981	R. G. Richardson	17.2.81
1981/08	A seismic reflection traverse, Boobyalla Plains, north-east Tasmania	R. G. Richardson	26.2.81
1981/09	Foundation conditions at the Matpine sawmill, Exeter	D. J. Sloane	26.2.81
1981/10	Report on the Department of Mines coal exploration program at Fingal, Vol. 1	V. M. Threader R. H. Castleden C. A. Bacon	30.3.81
1981/11	Preliminary groundwater investigation at Carlton Beach	R. C. Donaldson	9.3.81
1981/12	Silica in Tasmania	T. G. Summons	18.3.81
1981/13	Production of crushed basalt, dolerite and limestone in the Hobart and Launceston areas, 1960–1980	T. G. Summons	18.3.81
1981/14	Exploratory diamond drilling at the All Nations mine, Moina	P. L. F. Collins	19.3.81
1981/15	An appraisal of possible groundwater use for gas absorption at the A.P.P.M. mill, Burnie	W. R. Moore	25.3.81
1981/16	Revised interpretation: gravity survey of the Henry Jones building, Old Wharf, Hobart	D. E. Leaman R. G. Richardson	27.3.81
1981/17	Inspection of proposed dam site near Gunns Plains	W. L. Matthews	31.3.81
1981/18	A landslide on Repulse Road, north of Maydena	W. L. Matthews	7.4.81
1981/19	Proposed landslide zoning of Wulf's farm, Browns Hill, Underwood	W. R. Moore	10.4.81

<i>No.</i>	<i>Title</i>	<i>Author</i>	<i>Date</i>
1981/20	Programs for calculation of the gravitational and magnetic anomaly of 3 dimensional bodies	R. G. Richardson	13.4.81
1981/21	FORTTRAN programs for the vertical continuation of gravity data	R. G. Richardson	15.4.81
1981/22	Distribution of major granitoid bodies in the Blue Tier Quadrangle	M. P. McClenaghan	
		P. R. Williams	5.5.81
1981/23	FORTTRAN programs for 3 dimensional gravity modelling	R. G. Richardson	6.5.81
1981/24	Gravity survey of the Que River deposit, western Tasmania	D. E. Leaman	
		R. G. Richardson	11.5.81
1981/25	A guide to the Mineral Industry Unpublished Report Data Sheet	P. L. F. Collins	18.5.81
1981/26	Clay fraction mineralogy of Triassic sandstones from Port Arthur and comparison with other rocks for building restoration	D. C. Green	
		R. N. Woolley	24.4.81
1981/27	A sulphur isotope study of the Chester massive pyrite deposit, western Tasmania	P. L. F. Collins	19.5.81
1981/28	Summary of limestone investigations in the Lune River area	T. G. Summons	19.5.81
1981/29	The Hogs Back silica deposit, Hastings, southern Tasmania	T. G. Summons	19.5.81
1981/30	Groundwater investigation, Mount William National Park, north-eastern Tasmania	W. R. Moore	25.5.81
1981/31	The processing of reports on mineral exploration activity	P. L. F. Collins	4.6.81
1981/32	Progress report — St Helens sand bar	D. E. Leaman	10.6.81
1981/33	Geological inspection of the Back Creek slate mine	N. J. Turner	15.6.81
1981/34	FORTTRAN program for performing gravity reduction	R. G. Richardson	17.6.81
1981/35	Guide to the use of the DELTA plotting programs	E. L. Martin	25.6.81
1981/36	A sand resource on the Coles Bay Road	V. M. Threader	26.6.81

LIBRARY

Librarian Margaret Ellis reports —

There was a complete change in the Department of Mines Library staff during the year. Jean Murrell, B.A., Dip.Lib., and Juliet Scaife, A.L.A.A. shared the position of Librarian from March 1980 until August 1980, when the permanent appointee, Margaret Ellis, B.A., A.L.A.A. took up duties.

The temporary library assistant, Jacinta Lesek resigned in December 1980; the position was filled on a permanent basis from January 1981 by Janet Clover.

Due to severe financial constraints and the rising cost of journals, the purchase of monographs was restricted. Consequently almost all of the money allocated to library resources was spent on maintaining journal subscriptions.

The main task undertaken by the library staff in 1980–81 was the planning of the library for the new building on the eastern shore. A spacious L-shaped room was provided for the library equipped with a large work room.

A major task was the drawing up of a comprehensive list of furniture and other equipment needed for the new library. This involved contacting various suppliers and visiting other libraries, often accompanied by Department of Mines staff or members of the Public Offices Committee.

The following services were provided to all staff requesting them:—

- Display of current journal issues.
- Circulation of journal issues.
- Compilation of bibliographies.
- Inter-library loans.
- Literature searches.
- Circulation of lists of new additions.
- Dissemination of copies of contents pages.

The librarian attended a DIALOG course at the State Library at the end of May 1981 and was able to conduct one computerised literature search before the end of the financial year.

CHEMICAL AND METALLURGICAL BRANCH

REPORT OF THE CHIEF CHEMIST AND METALLURGIST, H. K. WELLINGTON, B.E., F.S.A.S.M., M.Aust.I.M.M.

The number of samples registered was 4 740, the largest number since 1973, the determinations made 8 825 and the number of determinations per sample falling to the lowest since 1973 indicating a return to more exploration samples rather than complete rock analyses.

No complete rock analyses were reported although considerable work has been done in this field using the Philips PW 1400 XRF which was commissioned in August. However, considerable programming to allow a large output of complete rock analyses has been done.

Exploration for tin, notably in north east Tasmania, has raised the number of tin determinations well above all others which at 3 157 is the largest number since 1973. Gold and zinc were also at high levels whilst silver determinations were at a record level.

Work on the proximate analysis of coal has terminated until space and specialised equipment for doing this work to current specifications can be procured.

TYPE AND NUMBER OF TESTS

<i>Type of Test</i>	<i>Number</i>	<i>Type of Test</i>	<i>Number</i>
I. QUANTITATIVE—		B. Miscellaneous	
A. Elements —		Acid acceptance	2
Aluminium	35	Ash	117
Antimony	5	Combined water	16
Arsenic	226	Cyanide	41
Barium	8	Insoluble (HCl)	10
Bismuth	109	Loss on ignition	6
Cadmium	1	Moisture	101
Calcium	105	Specific energy	34
Carbon (including		Volatiles	46
CO ₂)	60		373
Cerium	1	C. Waters, etc.—	
Chromium	205	Complete analysis	295
Cobalt	8	Partial analysis	221
Copper	208	Deposit gauges	52
Fluorine	1		568
Gold	506		7 921
Iron (ferric)	198		58
Iron (ferrous)	2	II. QUALITATIVE	58
Lead	92	III. CLAY AND CERAMIC	
Lithium	22	Clay properties (liquid	
Magnesium	53	and plastic	
Manganese	108	limits,	
Molybdenum	106	shrinkage)	140
Nickel	10	Firing of bricks	1
Phosphorus	28	Melting point	3
Platinum	1	Sedimentation sizings	8
Potassium	44	Survey of Clifton	
Silicon	43	Brick	
Silver	346	production*	120
Sodium	34		272
Sulphur	336	IV. METALLURGICAL	
Tin	3 157	Amalgam retorting	4
Tantalum	2	Heavy liquid	
Thorium	21	separation	3
Titanium	146	Jig	1
Tungsten	129	Magnetic separation	128
Uranium	22	Pan	4
Vanadium	24	Sizings	430
Zinc	508	Table	1
Zirconium	70	Water tests	3
	6 980		574
			574
		Total	8 825

* This survey was requested by Clifton Brick and involves about a third of the work that used to be done in the annual survey of the State brick production which used to be reported as an 'R' project.

RESEARCH INVESTIGATIONS

Tin	....	....	....	....	5	Zinc	....	....	....	....	1
Gold	....	....	....	....	3	Beach sands	....	....	....	....	1
Coal	....	....	....	....	2	Mica	....	....	....	....	1
Tungsten	....	....	....	....	1	Fluorite	....	....	....	....	1
Iron	....	....	....	....	1	Misc.	....	....	....	....	2
Aluminium	....	....	....	....	1						
						Total	....	....	....	....	19

SUMMARY OF INVESTIGATIONS

TIN

R788 — WEBB AND CREIGHTON, CAPE BARREN ISLAND SANDS

Samples of beach and river sands plus products from concentration operations were submitted for appraisal. The main heavy minerals present were cassiterite and ilmenite. While it was possible by gravity methods to produce a 50 per cent Sn concentrate high intensity magnetic separation is required to raise the tin content higher.

R793 — M. LAAN AND LANGFORD, SPECIMEN HILL, BALFOUR

Samples of plant feed, mill products and from tailings dumps were submitted by Department geologist D. J. Jennings for evaluation.

Test work showed it would not pay to rework the tailings. Advice was given on plant operation to enhance the present recovery.

R796 — D. M. BLACKBERRY, LEASE 101M/77, WYNIFORD RIVER

A sample of middling material was submitted by the Inspector of Mines, J. Dempster for upgrading. The sample assayed 4.3 per cent Sn, 0.83 per cent WO_3 and 20.0 per cent Fe.

Using high intensity magnetic separation and further gravity concentration a saleable tin concentrate can be made but the presence of ilmenite precludes tungsten concentration. Most of the tin and tungsten are in the -600 + 150 μ m size fraction.

R799 — C. G. CARINS, ARTHUR RIVER SEDIMENTS

Three samples of different sands occurring some distance from an existing Arthur River sand treatment plant were submitted for examination. They assayed around 0.5 per cent Sn and appeared to be tailings (probably from the old Mt Bischoff mill). Less than half the tin could be recovered in concentrates assaying around 30 per cent Sn.

R800 — W. F. BAKER, SURFACE SAMPLES FROM SPL 781, BALFOUR

Six large samples were submitted for examination. Five contained very little tin (700 g/t Sn being the highest). The sixth assayed at 0.37 per cent Sn but as it would require ball milling, sulphide flotation, and tabling to recover the tin such a plant was considered beyond the resources of the operator.

GOLD

R790 — DIRECTOR OF MINES, MATHINNA TAILINGS DUMP

In 1948 this Department sampled this dump thoroughly and in R201 established the recoverable gold by cyanidation from 'Area 1', which contained some 70 000 t. Since then various samples from the dump have been examined but their exact location has not been given.

During a geological investigation in the area P. Mitchell, a geologist employed by A. C. A. Howe, Australia Pty Ltd, took two samples which he located on T. D. Hughes' plan of 1948 as at N-17 in Area I and O-22 in Area II.

In N-17 sample mostly slime, assayed 3.1 g/t Au and the O-22 (sand) 2.4 g/t Au. Cyanide leaching recovered 86 per cent of the gold from the slime sample and 63 per cent from the sand. Upon grinding finer 72 per cent of the gold was recovered from the sand. Sulphide flotation may have application in any recovery process.

R792 — B.M.I. MINING, MIDDLE ARM TAILINGS, BEACONSFIELD

Under the supervision of C. Harris of Mitchell Cotts Projects (Australia) Pty Ltd the Middle Arm tailings were sampled and tested for gold recovery.

The borehole samples were composited to represent three areas; fine, medium and coarse grained areas of the tailings. These samples assayed 3.3, 2.6 and 2.3 g/t Au respectively.

The test work on each sample covered sizing and gold distribution, and cyanidation with leaching time and gold reprecipitation studies. On a composite sample sulphide flotation, cyanidation of the flotation tailings and calcining of the sulphide concentrates were studied.

Sulphide flotation would not enhance a treatment process. Gold recovery is best from the fine material. Somewhat more than half the gold in the tailings can be dissolved in a cyanide solution.

R806 — S. GUY, EXAMINATION OF A GOLD CONCENTRATE FROM LEASE 35M/71 AT LISLE

A gold concentrate stated to have been made from 35 m³ of alluvium was submitted for examination.

Main heavy minerals present in the concentrate were magnetite, ilmenite, zircon and cassiterite this latter in relatively coarse grains.

The recovered head grade of gold was 0.4 g/m³ and the fineness of the gold 924. Over 99 per cent of the gold could be recovered by amalgamation.

COAL**R786 — A STUDY OF DUNCAN MINE COAL, FINGAL**

A parcel of three tons of run-of-mine coal was extensively examined to establish its behaviour following discussions at A.C.I.R.L.

Heavy liquid separation at a range of sizes, water treatment and detailed analysis (ultimate, proximate, ash analyses, etc.) were done.

No clear relationships between tests on fine and coarse coal emerged. However, it was noted that run-of-mine coal left in a stockpile showed much more rapid breakdown of shale than coal; subsequent screening yielded a coarse product much lower in ash.

R809 — CORNWALL COAL CO. N.L., HEATING FINGAL COAL

When Fingal coal is used as a fuel in iron pellet kilns there is an emission of yellow smoke due to volatile emission and decomposition. The company requested tests to establish at what temperature this occurred.

Tests in a nitrogen atmosphere indicate volatile emission begins at about 400 degrees C. Dropping coal into an oxidising furnace space indicated 850 degrees C was needed to produce smoke.

TUNGSTEN**R795 — CENTRAL TASMANIAN TUNGSTEN, MT OAKLEIGH MILL**

The Department's senior metallurgist visited the Company's mill to assess performance. He sampled various products which were examined in this laboratory and comments made accordingly.

IRON**R802 — SAVAGE RIVER MINES AND INDUSTRIAL AND MINING INVESTIGATIONS PTY LTD SAVAGE RIVER IRON ORES, IRON AND MAGNETIC CONTENT DETERMINATIONS**

During negotiations between Savage River Mines and Industrial and Mining Investigations Pty Ltd regarding the composition of the northern ore body it became apparent that work done in this laboratory and work done at Savage River did not yield the same results for the same material.

This investigation was done in two parts. Firstly iron assays were done. These showed that although this laboratory made no correction for the presence of vanadium in its iron assay this could easily be made from the information available but it amounted to only a part of the discrepancy.

Secondly the Davis tube magnetic test was examined. Neither laboratory used the Pickands Mather standard procedure. Savage River Mines used a coarser grind related to their mill performance while this laboratory used a much finer grind which has been suggested to it by Pickands Mather during the initial work on Savage River.

ALUMINIUM

R804 — COMALCO (BELL BAY) LTD, CASTING SHOP DROSS

A sample of casting shop dross which is used in the sodium aluminate plant was submitted for testing so that design of a new solid/liquid separator in this plant could proceed.

Tests indicated screening would do the job with the Company taking up with the manufacturers the best type to install.

ZINC

R794 — ELECTROLYTIC ZINC CO., RISDON, GRINDABILITY OF CALCINES

The Company wished to know the relative grindabilities of a calcine material in an existing grinding circuit and that of materials it proposed to treat in a modified circuit.

Grindability tests were done at room temperature on each product and the grindabilities related according to Bond's equation. The grindability of the materials for the modified circuit was also determined at the circuit operating temperature namely 90 degrees C without finding a significant difference from room temperature.

BEACH SANDS

R798 — LOVEGROVE AND HOWELL, WEST DOUBLE SANDY POINT AREA

The sample of beach sand submitted was found to contain 0.13 per cent Sn, 13 per cent zircon, 5 per cent rutile, 52 per cent ilmenite, 10 per cent quartz and some garnet.

Magnetic separation and gravity concentration should allow the ilmenite to be removed, a tin concentrate to be produced and a mixed zircon/rutile product which could be separated electrostatically although this was not done.

MICA

R787 — H. K. TURNER AND ASSOCIATES, MICACEOUS MATERIAL, KING ISLAND

Mr Turner submitted a sample of commercial ground mica for comparison with mica concentrate produced from King Island material in R736 Test N2 F4C.

Sizing and minerographic examinations showed some differences between the products but the significance of these differences is not known.

FLUORITE

R782 — COMALCO EXPLORATION PTY LTD, MOINA WRIGGLITE

In R758 the objective was to recover the scheelite and cassiterite present in the wrigglite. In this project Comalco asked that the fluorite be recovered from products made in that investigation.

Accordingly the vanner tailing from that project was investigated to recover the fluorite. Using three stages of flotation a 61.4 per cent CaF₂ concentrate containing 64.2 per cent of the fluorine in the tailing was produced.

MISCELLANEOUS

R680 — PART VI. OXIDATION OF MINE WASTES

Results from six years of testing have been circulated to participating companies.

R791 — DIRECTOR OF MINES, DUST SAMPLING

In order to study the dust in a metallurgical plant the Departments of Health Services and Mines co-operated in a dust sampling campaign. It involved placing a gravimetric dust sampler at points in the plant for measured lengths of time.

Results soon showed that the sampler was picking up little dust from what appeared to be very dusty places. Watch glasses set alongside the sampler collected much more dust.

Laboratory tests using the dusts involved confirmed the plant results namely that the dust was coarser than the sampler could accept.

MINES AND EXPLOSIVES BRANCH

**REPORT OF THE DEPUTY STATE MINING ENGINEER AND DEPUTY CHIEF INSPECTOR OF
MINES AND EXPLOSIVES, H. MURCHIE, B.Sc., D.R.T.C. M.Aust.I.M.M.**

THE MINES INSPECTION ACT 1968

EMPLOYMENT

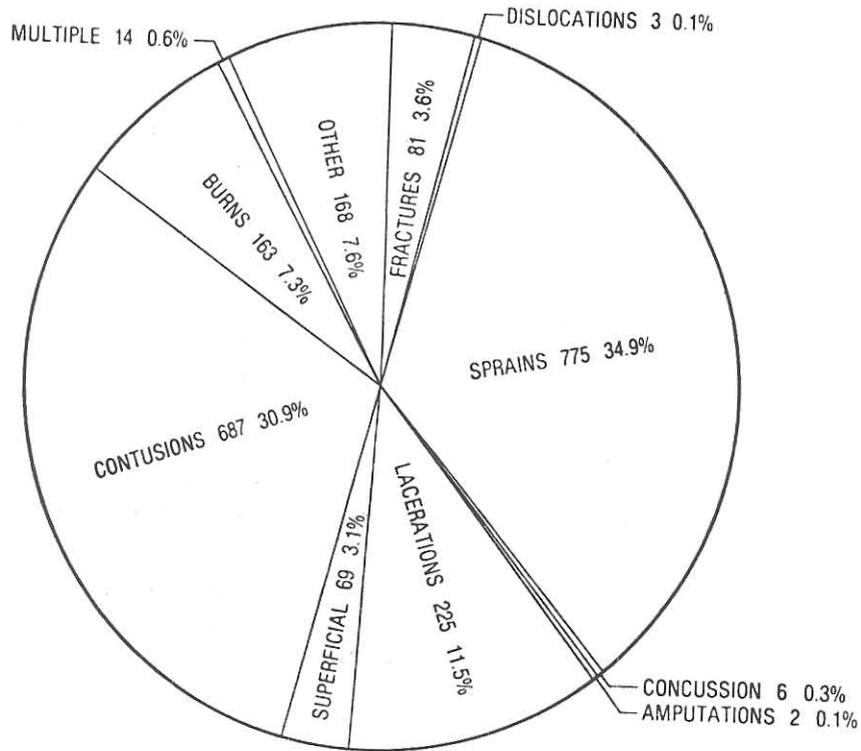
The average number of persons employed in the mining, metallurgical and quarrying industry during the year was 9 224, a decrease of 214 persons from the previous year.

ACCIDENTS

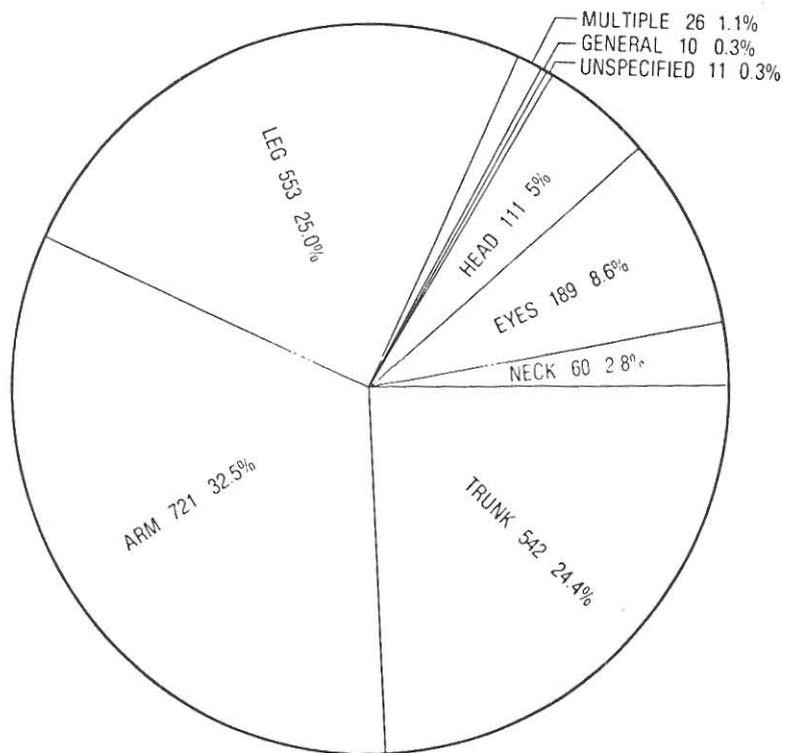
Accidents continue to be reported and recorded in accordance with Australian Standard AS 1885 'Recording and Measuring Work Injury Experience' however, there are some areas which do not report and these are mainly small alluvial mines that are owner operated and persons employed in exploration activities.

With the intervention of an interim half-year in the first half of 1980 to alter our reporting period, comparison can only be made with the last full year recorded which was 1979. That year showed an increasing trend which has apparently stabilised despite an overall increase in employees and man hours exposure in the interim.

It is certainly clear that alterations to the compensation legislation has had a lasting effect on the accident scene and recent court decisions on the amount of compensation payable in specific instances is causing serious concern to the industry and its insurers.

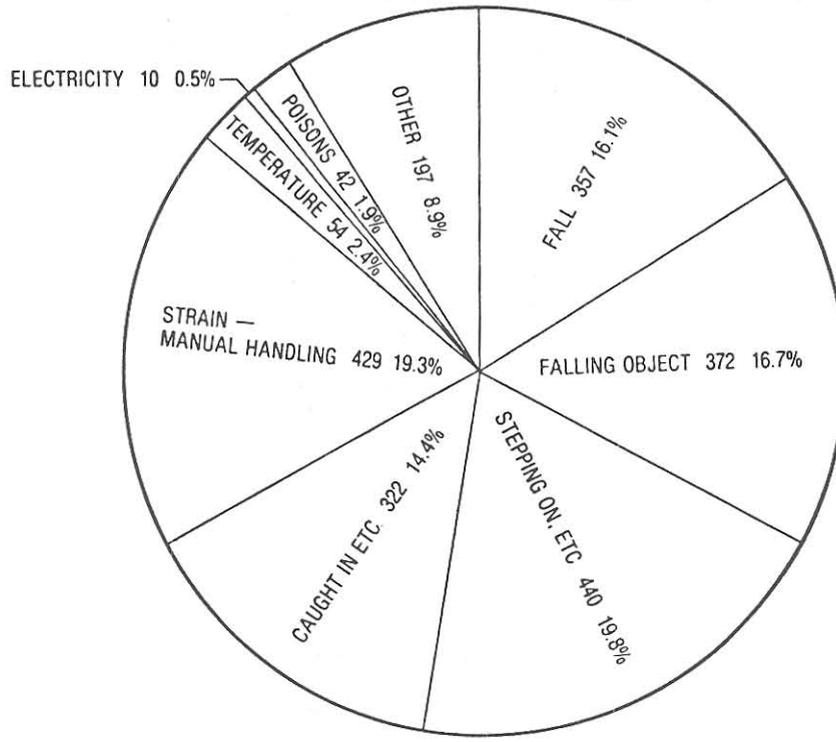


Nature of injury

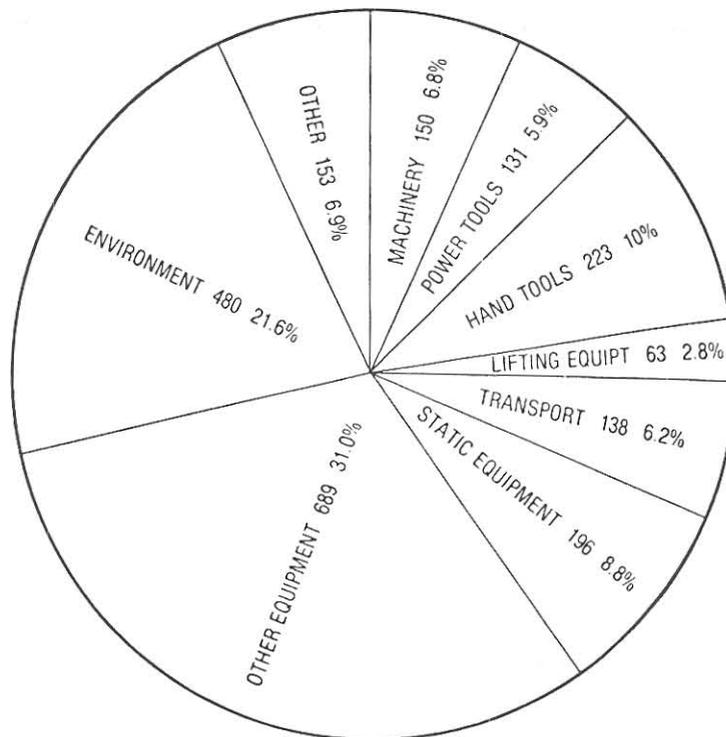


Location of injury

5 cm



Type of incident



Agency of injury

5 cm

ACCIDENT STATISTICS (AS 1885)

<i>Employer</i>	<i>Man hours exposure</i>	<i>No. of injuries</i>	<i>Frequency rate</i>	<i>Days lost</i>	<i>Incidence Rate (%)</i>	<i>Mean Duration (days)</i>	<i>Average No. of Employees</i>
Amdex Endurance	125 048	15	119.9	80	25	5	61
Central Tasmanian Tungsten	45 232	5	110.4	47	25	9	20
Cleveland Tin	557 272	72	129.2	1 015	27	14	267
E.Z., Rosebery	1 973 852	663	335.9	7 846	55	12	1 203
King Island Scheelite	923 270	169	183.0	1 933	35	11	481
Mt Lyell	1 406 001	191	135.8	1 742	26	9	746
Northern Chromite	17 733	3	169.2	25	33	8	9
Que River	243 446	24	98.6	509	24	21	102
Renison	1 083 936	128	118.1	1 275	23	10	552
Rossarden Mines	361 620	72	199.1	628	37	9	194
Savage River	977 489	82	83.9	614	19	7	441
Tasminex	45 650	3	65.7	18	14	6	22
Thiess Bros (Bastyan Dam)	19 117	7	366.2	43	58	6	12
All mines	7 779 666	1 434	184.3	15 775	35	11	4 110
A.P.P.M.	32 329	4	123.7	28	20	7	20
Comalco	2 860 160	209	73.1	3 562	16	17	1 335
Electrona	197 383	68	344.5	1 106	64	16	106
E.Z., Risdon	3 837 004	361	94.1	4 832	10	13	2 027
Goliath Cement	613 832	15	24.4	89	5	6	294
Mole Creek	28 934	7	241.9	104	16	15	19
Port Latta	453 802	16	35.3	159	6	10	214
Temco	917 871	32	34.9	367	6	11	362
Tioxide Aust.	811 135	19	23.4	126	5	7	455
Ceramics	172 873	19	109.9	123	23	6	84
All works	9 945 323	750	75.4	10 496	15	14	4 916
Collieries	228 277	29	127.0	532	22	18	131
Quarries	143 870	8	55.6	66	12	8	67
Totals	18 097 136	2 221	122.7	28 869	24	12	9 224

DESCRIPTION OF SERIOUS AND FATAL ACCIDENTS

FATAL

- J. C. Sawyer, Cleveland Tin: Fell from crusher bin during demolition operations.
- R. E. Davis, Cleveland Tin: Truck tyre exploded while wheel hub was being removed.
- R. M. Walters, Renison Limited: Struck by fall of rock.

SERIOUS

- R. Long, Tioxide: Eye burns — fell into a tank of acidic sludge.
- J. Broomhall, Savage River Mines, Savage River: Crush injuries — falling rock struck shovel.
- B. Davis, Savage River Mines, Savage River: Fracture right wrist — fell from a beam.
- C. L. Peachey, Benders, Rosebery Mine: Multiple injuries — drill and victim fell from bench.
- A. Duvnjak, Que River: Rock fell on hand, part of hand amputated.
- D. Vukic, Que River: Rock fell on foot, multiple injuries to left foot.
- R. Gangell, Cleveland Tin: Lifting water pump, injury to back.
- N. Trebilco, Cleveland Tin: Fell, tripping over an air hose, injury to hip.
- G. Barker, Cleveland Tin: Truck tyre exploded in workshop, head injury.
- R. Bryce, Mount Lyell: Fell stepping from one large rock to another, shoulder injury.
- T. M. Stringer, Mount Lyell: Climbed rise in harness from non-functioning Alimak raise climber, injury to back.
- G. Ball, Mount Lyell: Rock fell onto staging he was standing on, fracture of spine.
- J. Spark, Comalco Ltd: Trapped while tightening bolt under run-out table, fractured forearm.
- C. Hall, Comalco Ltd: Fell 3.5 m from ladder, fractured pelvis.
- J. Stegeman, Comalco Ltd: Toppling anode rod, fractured foot.
- V. Chellis, Comalco Ltd: Falling crucible lid, fractured foot.
- S. Brown, Comalco Ltd: Run over by mobile crane, fractured leg.
- T. V. Evans, Mole Creek Limestone: Fell through roof of hydrate plant, fractured pelvis.
- A. Todd, Temco Ltd: Raking slag, severe burns to foot.
- L. Brown, Temco Ltd: Caught in sample roll crusher, amputated index finger.
- N. McDermott, King Island Scheelite: Caught between sidewall and jumbo, fractured leg.
- S. Hodgeman, King Island Scheelite: Falling rock, fractured foot.
- A. Ruru, King Island Scheelite: Loader overturned, fractured leg.
- J. Ackerley, E.Z. Rosebery: Struck by bull hose, fractured leg.
- B. Woodhall, E.Z. Rosebery: Fall of rock, multiple injuries arm and leg.
- S. Simuric, E.Z. Rosebery: Struck by bogger, fractured foot.
- C. Peachey, E.Z. Rosebery: 'Airtrac' fell over quarry, multiple injuries.
- D. Crane, E.Z. Rosebery: Rock from ore chute, fractured leg.

DANGEROUS GOODS

THE DANGEROUS GOODS ACT 1976

Mr M. E. Curtain: Assistant Chief Inspector of Explosives
Mr G. Jobson: Senior Inspector of Explosives

SOUTHERN DISTRICT —

Mr R. A. Pickett: Inspector of Explosives
Mr E. J. Garlick: Inspector of Explosives
Mr C. G. Gardner: Inspector of Explosives
Mr J. C. Goodrick: Magazine Keeper

NORTHERN DISTRICT —

Mr D. R. Bonham: Inspector of Explosives
Mr S. Smith: Magazine Keeper

NORTH-WEST DISTRICT —

Mr H. E. T. Medwin: Inspector of Explosives
Mr G. Hunt: Inspector of Explosives

Mr M. E. Curtain reports that the section has experienced a year of change, with an increasing involvement in the whole range of Dangerous Goods. This has required the present staff to extend the scope of their work skills with the help of in-service training. It will be necessary to increase in-service training to cope with the expected expansion in the use of Dangerous Goods.

LIQUID PETROLEUM GAS

During the year 10 300 tonnes of L.P. gas were imported through the ports of Bell Bay and Hobart.

The Department, with the help of private industry, through the L.P. Gas Safety Committee, has continued to monitor the installation of the smaller storage systems, i.e. less than 91 kilograms, as well as maintaining a close supervision of licensed premises. This program included the safe handling of L.P. gas in —

- (a) Caravans and campervans;
- (b) Marine craft;
- (c) Barbeque and camping equipment;
- (d) Pottery kilns; and
- (e) Procedures for decanting into smaller cylinders.

There was an increase in the number of vehicles being converted to run on L.P. gas and this has been reflected in an increase in authorised installers as well as dispensing outlets.

DANGEROUS GOODS

The Section has experienced an increase in applications for the approval of premises for the storage of dangerous goods especially those of Class 2 gases, such as chlorine, ammonia and oxygen.

The Section has also assisted the Education Department by advising schools on the storage of dangerous goods in laboratories and by helping to prepare guidelines for the safe storage and disposal of chemicals. A further service is rendered by collecting and removing for disposal old, unsafe or dangerous chemicals.

TRANSPORT

Discussions continued with the Transport Commission concerning the control of transporting dangerous goods by road within the State.

The Transport Commission, with the co-operation of the Department, intends to implement an inspection system before the end of 1981. Operators of vehicles conveying dangerous goods above a prescribed quantity will be required to hold an annual permit. The permit will be re-issued on condition that the vehicle passes an inspection every twelve months. In addition random roadside checks will be carried out by transport inspectors.

During the year the Commonwealth Government gazetted 'The Australian Code for the Transport of Dangerous Goods by Road and Rail'. This code will be used as the principal guideline for the transport and packaging of dangerous goods in Tasmania.

Discussions and lectures were delivered to various associations and firms concerning dangerous goods, particularly with regard to the Hazchem Code and Emergency Panel Placards.

MANUFACTURING OF DANGEROUS GOODS

Interest was shown by a number of people with regard to experimental distillation of ethanol from sugar beet for use as a fuel blend, the Federal Government having initiated the scheme as part of its energy conservation program. Originally there were ten enquiries but to date only one licence has been issued to manufacture and store ethanol on an experimental basis.

SALE OF FIREWORKS

Investigations were conducted into the sale and use of fireworks following a number of complaints from the community and Tasmania Police, and as a request from the Minister of Mines.

GENERAL

- (a) A list is being produced regarding the type of dangerous goods being imported, stored, manufactured and conveyed within the State.
- (b) A large quantity of dangerous chemicals and explosives was collected and disposed of by the Section.
- (c) Numerous complaints concerning all classes of dangerous goods were investigated.
- (d) Considerable time was spent in analysing and commenting on draft codes and guidelines regarding all aspects of dangerous goods.

OCCUPATIONAL HEALTH

Lectures were given to associations and Government Departments on occupational health and toxic substances. In addition assistance and advice were given to a number of firms and Departments concerning the precautions required when handling dangerous chemicals.

COMMITTEES

The Section participated and represented the Department on a number of committees and at several seminars during the year —

- (a) L.P. Gas Safety Committee;
- (b) L.P. Gas Task Force (Commonwealth);
- (c) A.T.A.C.'s Advisory Committee for the Transport of Dangerous Goods;
- (d) Standards Association of Australia ME/17 Flammable and Combustible Liquids;
- (e) Standards Association of Australia ME/15 Liquefied Petroleum Gas;
- (f) Standards Association of Australia CH/9 Safe Handling of Chemicals;
- (g) Hazchem Committee;
- (h) Building Regulations Board;
- (i) Autogas Seminars;
- (j) Chlorine and Ammonia Seminars;
- (k) Hazardous Goods — Australian Maritime College.

INCIDENTS AND ACCIDENTS

Thirty-two incidents and accidents were investigated and these included —

Class 1 (Explosives)

- (a) A telephone booth was wrecked by unlawful use of explosives.
- (b) Fireworks being tested by an importer/retailer caused a fire at his premises.
- (c) Children accidentally caused a grass fire when using fireworks.

Class 2.1 (Flammable Gas)

- (a) A minor L.P. gas leak occurred from the valve equipment of a 2.2 kl tank at a college.
- (b) Minor damage occurred from a fire involving L.P. gas at a National Park Reserve.
- (c) A hazardous situation existed when liquid withdrawal cylinders were connected to a normal L.P. gas vapour system at a hospital.
- (d) A serious L.P. gas leak developed from a cracked non-return valve on a tank installation.
- (e) Damage occurred to a vehicle and L.P. gas cylinders when the vehicle caught alight in a main city street. Quick action by the fire brigade prevented a serious incident.
- (f) A person was accidentally burnt on the arms when he incorrectly lit an L.P. gas burner.
- (g) A potential hazard was discovered when a number of flame failure devices were found to be defective on two L.P. gas fired pottery kilns.
- (h) An L.P. gas fire occurred in a service department of a shop when a cylinder was turned on and the gas cloud ignited after a delay in ignition.
- (i) A serious L.P. gas leak occurred from an L.P. gas road tanker on the North-West Coast.
- (j) L.P. gas was twice deliberately discharged from the liquid withdrawal valve of a 190 kg cylinder at a restaurant.
- (k) A fire occurred at a factory after an L.P. gas portable heater was knocked over, breaking the control valve.
- (l) L.P. gas cylinders and solvents were involved in a major factory fire which destroyed the premises.

Class 2.3 (Poison Gas)

A serious anhydrous ammonia leak forced the evacuation of employees from a factory and caused considerable problems for firemen after a valve could not be turned off.

Class 3 (Flammable Liquids)

- (a) A fire badly damaged a degreasing unit after spilt solvent ignited.
- (b) An incident occurred when petrol was mixed with a fishing boat's diesel fuel due to carelessness.
- (c) A major fire occurred at a fibreglass factory involving resins, acetone and methylethylketone peroxide.
- (d) A serious fire caused considerable damage to a building and equipment when spilt solvents ignited.
- (e) An incident happened when petrol was inadvertently mixed with a tank of home heating kerosene due to carelessness.

Class 8 (Corrosives)

- (a) A spillage occurred when hydrochloric acid containers broke in a warehouse.
- (b) Leaking pipelines were the cause of a sulphuric acid spillage on the North-West Coast.

IMPORTS OF FLAMMABLE LIQUIDS

Product (tonnes)	Bell Bay	Burnie	Devonport	Hobart	Total
Aviation gasoline	7 331	....	....	12 699	20 030
Kerosene —					
Aviation	3 268	....	....	3 062	6 330
Lighting	....	....	1 471	598	2 069
Power	220	3 762	....	11 640	15 622
Motor Spirit —					
Regular	10 699	7 957	6 175	14 540	39 371
Premium	69 790	30 515	54 155	104 228	258 688
L.P. Gas	5 749	....	....	4 589	10 338
Distillate	41 071	47 642	34 653	52 935	176 301
Fuel oil	1 328	17 150	24 708	28 111	71 297
Total	139 456	107 026	121 162	232 402	600 046
Number of Tankships	26	11	13	21	71

Licences to Keep	3 070
Plans Approved	393
Magazine Licences	70
Import Licences	29
Other Licences —	
Convey	26
Sell Fireworks	362
Total No. Approved Installers Autogas	24
Vehicles Converted to Autogas	67
Accidents and Incidents	32
Shotfirers' Permits	56
Exemptions Granted	1
L.P. Gas Start Work Notices (S.W.N.) —	
S.W.N. received	954
Number Inspected	686
Sub-standard Installations for Repair	40
Non-licensed Installations (N.L.I.)	774
N.L.I. Inspected	494
Sub-standard Installations for Repair	28

IMPORTS OF EXPLOSIVES

Blasting explosives (kg)	881 650
Detonators	89 175
Detonating cord (m)	500
Explosives shipments	19
A.N. for use as an explosive (t)	3 360
Fireworks —	
Display (shipments)	6
General (shipments)	7

SPECIAL INVESTIGATIONS

Mr P. Allan, Mining Engineer, Hobart reports —

DIESEL ENGINES UNDERGROUND

A slight stabilisation of the industry enabled some equipment replacement during the first half of the year. This was not sustained and conditions in the industry worsened markedly in the second half of the year and show little sign of improvement.

Engine approvals granted during the year included —

Caterpillar 3304 PCT in an Eimco 913 LHD;
 Caterpillar 3304 NA in an Eimco 913 LHD;
 Caterpillar 3208 in a Norling Personnel Carrier;
 Caterpillar 3408 TC in an Eimco 920 C LHD;
 Caterpillar 3306 PCT in a Horwood Bagshaw LHD (amended);
 Deutz F6L 912W in a Gardner Denver 2-boom jumbo;
 Daihatsu DG in a Daihatsu 55 P;
 Ford 2514E in a G. & O. service vehicle;
 Isuzu C 190 in an Isuzu 4-wheel drive;
 Perkins 4-248 in a Domino Minesmobile;
 Toyota H in a Toyota Landcruiser;
 Volvo D50B in an Atlas Copco 'Boomer'.

INVESTIGATIONS

Our vibration and building damage investigation service continued with enquiries covering the following:—

Launceston City Council — Traffic vibration damage, Westbury Road;
 Department of Mines — Quarry blasting, Readymix, Remount Road, Launceston;
 Department of Mines — Quarry blasting, Talisker Quarry, Launceston;
 Department of Main Roads — Restored cottage, Australian Maritime College, Launceston;
 Department of Main Roads — Vibrating roller limits, Arthur Highway;
 Department of Main Roads — Pile driving, Launceston Church Grammar School;
 Department of Main Roads — Traffic vibrations, National Heritage Building, Mole Creek;
 Department of Main Roads — Blasting parameters, Southern Outlet, Launceston;
 Department of Main Roads — Vibrating roller limits, Black Snake Hotel, Granton;
 Commonwealth Savings Bank — House damage, Karoola Road, Lindisfarne;
 T.G.I.O.— House damage, Douglas Street, New Town.

MECHANICAL INSPECTION

W. C. Hodgson, M.I.E. (Aust.), Hobart reports —

MECHANICAL INSPECTIONS

Inspections were carried out at —

Beaconsfield Mine; Goliath Portland Cement; Mole Creek Limestone; Oakleigh Creek Mine;
 Clifton Brickworks; Aberfoyle Tin N.L.; Storeys Creek N.L.; E.Z. Risdon; Commonwealth
 Industrial Gases; Comalco; Que River Mine; Mount Lyell Mine; Cleveland Tin N.L.; E.Z.
 Rosebery; Hercules Mine; Tioxide; King Island Scheelite; Savage River Mine; Port Latta.

The following new proposals and designs were examined for approval:—

ABERFOYLE MINE

Escape capsule, hoisting machinery, headframe, and raisebored escapeway.

LUTWYCHE MINE

Preliminary proposals for a new shaft complex.

BEACONSFIELD

Preliminary shaft sinking and de-watering equipment proposals.

Preliminary shaft layout and conveyances proposals.

ASEA hoist and means of automatic operation proposals.

'STAG' crane mounting proposals for servicing shaft pre-sink.

COMALCO

Re-design of 45 tonne No. 3 Potline cranes to reduce stress concentrations and fatigue cracking.
Two-tonne 6 metre span crane.

E.Z., ROSEBERY

New mill extension to double milling capacity, including five new cranes, conveyor system, crushing and storage equipment.

QUE RIVER MINE

Shaft furnishing, skip and cage installation and commissioning, SELDA arrestor commissioning.
Raisebore escapeway, winch gear, and headframe, and capsule.

TIOXIDE

Double micronising plant cranes and lift.

N.W. ACID

Demolition proposals for 120 m stack.

E.Z., RISDON

Preliminary proposals for wharf extension and two 25-tonne gantry cranes.

DANGEROUS GOODS EXAMINATION FOR APPROVAL

Renzo Landi automatic fill limiting valve for L.P. gas driven vehicles.

Datsun 200B L.P. gas conversion.

Liquid oxygen tank mounted on diesel Ford chassis.

Four-tonne L.P. gas tank truck for C.I.G.

Two-tonne L.P. gas tank truck for C.I.G.

Transportable containers for explosives for I.C.I.

Thirty-seven thousand litre petrol tanker design for Fruehauf.

CERTIFICATES OF COMPETENCY

Sixty-seven persons were examined for certification for cranes and mine winding engines and nine approvals were issued to persons to convert vehicles to L.P. gas operation.

DRILLING**R. Billingham, Mining Engineer, Hobart reports —****DIAMOND DRILLING**

The major projects during the year were the continuation of the coal exploration program in the area of the Fingal Tiers exempt from the Mining Act and the hire of drilling rigs and crews on contract to exploration companies.

Five drilling rigs operated at Fingal, including two new rigs, a truck mounted Longyear 44 and a skid mounted Longyear 38. The new rigs were purchased to replace the old Edeco and Joy rigs on important deep-hole drilling work. The drilling rate on the exempt area was reduced considerably in the second half of the year when the eastern portion of the area was released and taken up as an Exploration Licence by Goliath. A total of 19 holes were completed and 8 454 metres drilled.

Contract drilling was carried out for Santos in the north-east using the Keystone 55 churn drill, Northern Chromite at Beaconsfield for chromite, Shell at St Marys for coal and Victor Petroleum at Woodbury for coal. Other contract site investigation drilling was carried out throughout the State for various companies and for the Department of Main Roads.

The increase in contract drilling was the result of overall increased exploration activity throughout Tasmania and the shortage of contract drilling companies with suitable rigs available. The total depth drilled on contract was 3 714.3 metres and results were generally highly satisfactory.

With the additional purchase of a new diesel engined Gemco 210D to replace the 210A, the Drilling Section is now equipped for almost any possible type of drilling and it is anticipated that contract work will continue at a similar rate to that carried out in 1980-81.

The total depth drilled, 14 353.2 metres, represents an increase of 38 per cent compared with 1979, and 72 per cent compared with 1978. Working costs over the period have remained reasonably constant, thus showing the value of the new equipment purchased during 1980 and 1981.

DRILLING DETAILS 1980-1981

<i>Location</i>	<i>Purpose</i>	<i>Drill</i>	<i>No. of holes</i>	<i>Total depth (m)</i>
<i>Diamond —</i>				
Fingal	Coal investigation	Edeco	1	475.80
Fingal	Coal investigation	Longyear 38 No. 2	3	759.10
Fingal	Coal investigation	Longyear 44 No. 1	4	1 557.00
Fingal	Coal investigation	Joy 30HD	3	1 317.10
Fingal	Coal investigation	Longyear 44 No. 2	1	502.00
Fingal	Coal investigation	Longyear 38 No. 1	6	2 127.00
Fingal	Coal investigation	Warman 1000	7	1 716.00
St Marys	Coal investigation	Longyear 44 No. 2	3	432.50
St Marys	Coal investigation	Longyear 44 No. 1	4	652.00
Woodbury	Coal investigation	Warman 1000	5	347.00
Woodbury	Coal investigation	Mayhew 1000	4	306.20
Oakleigh Creek	Mineral investigation	Joy 30HD	1	218.10
Rossarden	Shaft pilot hole	Longyear 38 No. 1	1	41.10
Moina	Mineral investigation	F20C	2	414.80
Lune River	Limestone investigation	F20C	2	174.50
Lune River	Limestone investigation	Mayhew 1000	4	624.00
Battery Point	Site investigation	Mayhew 1000	4	35.90
		Total	55	11 700.10
<i>Churn Drill —</i>				
Beaconsfield	Mineral investigation	Keystone 55	24	298.10
Gladstone	Mineral investigation	Keystone 55	62	636.80
Boobyalla	Mineral investigation	Keystone 55	31	620.50
Karoola	Water bore	Keystone 55	1	15.00
		Total	118	1 570.44
<i>Rotary/Percussion —</i>				
Woodbury	Coal investigation	Warman 1000	2	141.00
Wynyard	Gravel investigation	Mayhew 1000	58	595.00
		Total	60	736.00
<i>Diamond/Auger —</i>				
Hobart	Foundation holes	F20C	6	51.40
Deloraine	Bridge foundation	Gemco 210A	5	52.80
Cam River	Road investigation	Gemco 210A	4	57.80
Derwent River	Bridge foundation	Gemco 210A	1	19.60
Bridgewater	Road investigation	Gemco 210A	2	33.50
Ulverstone	Landslip investigation	Gemco 210A	4	30.10
Granton	Road investigation	Gemco 210A	1	9.10
Wynyard	Gravel investigation	Gemco 210A	2	11.80
Beauty Point	Landslip investigation	Gemco 210A	1	15.60
Launceston	Road investigation	Gemco 210A	2	14.00
Burnie	Bridge foundation	Gemco 210D	12	51.00
		Total	40	346.71

SUMMARY OF DRILLING

<i>Drill Type</i>	<i>No. of drills operating</i>	<i>Depth drilled (m)</i>
Diamond	6	11 700.1
Churn	1	1 570.4
Rotary/Percussion	1	736.0
Diamond/Auger	1	346.7
	9	14 353.2

NORTH-WESTERN DISTRICT**E. C. LEYLAND, A.W.A.S.M., M.Aust.I.M.M.****T. E. EVANS, A.R.S.M., B.Sc. (Eng.), F.I.M.M., C.Eng.****R. N. HAMPSON, A.C.S.M., M.I.M.M., M.S.A.I.M.M., C.Eng.****GENERAL**

There has been an increase in the number of industrial disputes now loosely categorised as 'safety issues', all investigated. In one such issue safety was involved, but no complaint had been received by the Inspectorate prior to the industrial action being taken. An increasing amount of time is being expended in interviews with solicitors and court appearances associated with common law claims following industrial accidents. A one day seminar in 'loss control for the mining industry' was attended in Launceston.

Ground control, slope stability, partial failure in large pillar blasts and the provision of adequate ventilation in development areas being advanced by diesel equipment, have been the major problems experienced during the year on the West Coast mines. A new method of transport of bulk watergel explosives was successfully introduced by I.C.I. to the mines with the provision of a new truck and 'stackainers'.

INCIDENTS

A C.I.G. L.P. gas tanker developed a leak at the depot in Camdale and the gas cargo was successfully exhausted to atmosphere.

A small leak having developed in the marine effluent pipeline from Tioxide Ltd, the plant was shut down and a section of line replaced using divers.

During the demolition of the plant at N.W. Acid the gas tower prematurely fell, fouling the two southern stays of the smokestack. Sufficient pressure was applied to the stays for the stack to develop a set between the lower and upper stays when the gas tower was finally removed. An unplanned and dangerous attempt to collapse the smokestack was prevented in time, and the damaged section patched until properly controlled demolition took place on Friday, 23 July 1981.

NORTH-EASTERN DISTRICT**J. W. DEMPSTER, A.C.S.M., F.I.M.M., M.Aust.I.M.M., F.I.Q., C.Eng.**

The economic viability of low grade alluvial tin deposits was adversely affected by the fall in the price of the metal during the latter six months of the period, resulting in the closure of a few operations.

Prospecting was carried out for gold in the Mathinna and Lefroy districts in spite of the lower metal price prevailing during the period. Amax Iron Ore Corporation continued with their attempt to re-enter the old Hart Shaft of the Tasmania Gold Mine at Beaconsfield.

In spite of the fall in the price of aluminium Comalco Aluminium (Bell Bay) Ltd continued operations at full capacity as did the Tasmanian Electro Metallurgical Company Pty Ltd.

Operations by Northern Chromite Ltd were placed on a care and maintenance basis during the period.

SOUTHERN DISTRICT**R. C. THOMAS, A.C.S.M., M.I.M.M., M.Aust.I.M.M., C.Eng.****P. ALLAN, B.Sc., A.H.-W.C., M.I.E. (Aust.), M.Aust.I.M.M., F.I.Q.****R. BILLINGHAM, B.Sc., A.R.S.M., A.M.Aust.I.M.M., M.I.Q.**

The Department dealt with complaints from the public involving blasting operations and alleged damage to buildings.

There was a continuing interest in exploration for coal in the area and several prospects are promising enough to warrant the continuation of the exploration programs.

REPORT OF THE MOUNT CAMERON WATER RACE BOARD

FOR THE YEAR ENDED 30 JUNE 1981

THE MINISTER FOR MINES

We submit the report of the Mount Cameron Water Race Board for the year ended 30 June 1981.

Following the retirement of Mr J. G. Symons, his position as Chairman of the Board was taken by Mr H. Murchie, the new Director of Mines.

There was an increase of over 160 per cent from the proceeds of the sale of water. However, this was offset by increased wages and maintenance costs resulting in a slightly reduced operating loss.

At a meeting held at Gladstone on 29 June the Chairman reported that the Parliamentary Standing Committee of Public Accounts was questioning the financial viability of the Water Board. In view of this a review had been made of the charges to the Ringarooma Council and to operating mines using the race water. The following proposals were made and accepted:—

- (1) The charge for domestic water supplied to the Ringarooma Council be increased from \$8.00 to \$16.00 per connection per annum.

Although this is a 100 per cent increase it is not considered that the proposed charge is unreasonable. It will result in domestic water users meeting a fairer proportion of the total charges of the race.

- (2) Water charges payable by operating mines are to be increased from \$8.00 to \$10.50 per sluichead.
- (3) Mr T. Green, one of the channel keepers is to be employed on a casual basis for six months only in each year. The Manager is to obtain the prior authority of the Board for any additional period.

Three mines have been taking water from the system during the year. These are the Musselroe mine, the Star Hill mine and the mine operated by Andrew Duncan Pty Ltd.

Scrubbing and cleaning of the races has continued and a concrete bywash has been installed on the Chum Creek race. A concrete bywash has also been installed on the Musselroe mine intake.

H. MURCHIE, Chairman.
S. EVERETT, Member.
V. WOOD, Member.

MOUNT CAMERON WATER RACE SUSPENSE ACCOUNT

Statement of Receipts and Payments for the Year Ended 30 June 1981

<i>Receipts for the year ended 30 June</i>	1980	1981	<i>Payments for the year ended 30 June</i>	1980	1981
	\$	\$		\$	\$
Proceeds from sale of water—					
Fixed scale	3 264.00	8 776.00	Wages and pay-roll tax	31 071.32	35 349.13
Domestic	248.00	496.00	Car allowance	500.00	500.00
Balance—loss	28 354.31	27 875.62	Maintenance	294.99	1 298.49
	\$31 866.31	\$37 147.62		\$31 866.31	\$37 147.62

MOUNT CAMERON WATER RACE
Statistics for the Year Ended 30 June 1981

		<i>Registered Rainfall (mm)</i>		<i>Production</i>		<i>Tonnes</i>	
		<i>1980</i>	<i>1981</i>			<i>1980</i>	<i>1981</i>
Great Musselroe	....	1 069.90	901.10	Tin oxide produced—			
Little Musselroe	....	991.00	804.90	Fixed scale	....	21.05	33.40
				Royalty scale	....	....	....
<i>Water Services</i>				<i>Employment</i>			
Average number of claims supplied per week	....	1	3	Average per week—			
Greatest number of claims supplied in any one week	....	2	3	Fixed scale	....	6	10
Sluiceheads supplied—				Royalty scale	....	....	....
Fixed scale	....	416	993				
Royalty scale	....	....	....	

REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD

FOR THE YEAR ENDED 30 JUNE 1981

THE MINISTER FOR MINES

We submit the report of the Ringarooma and Cascade Water Race Board for the year ended 30 June 1981.

Following the retirement of Mr J. G. Symons, his position as Chairman of the Board was taken by Mr H. Murchie, the new Director of Mines.

A new swing bridge was constructed at the Cascade Dam, road works were carried out on both external and secondary valves were made operable. The flood gate was lifted and excess timber removed from the bywash.

H. MURCHIE, Chairman.
S. EVERETT, Member.
N. P. EDWARDS, Member.

RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT

Statement of Receipts and Payments for the Year Ended 30 June 1981

<i>Receipts for the year ended 30 June</i>	1980	1981	<i>Payments for the year ended 30 June</i>	1980	1981
	\$	\$		\$	\$
Balance (loss) 	1 641.54	2 095.89	Inspection fees 	150.00	150.00
			Interest on capital cost 	1 491.54	1 545.89
	\$1 641.54	\$2 095.89		\$1 641.54	\$2 095.89