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# REPORT OF THE DIRECTOR OF MINES 1981-1982





The new Department of Mines offices and laboratories at Rosny Park  
viewed from the north-west.



1983

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PARLIAMENT OF TASMANIA

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# DIRECTOR OF MINES

## REPORT FOR THE YEAR ENDED 30 JUNE 1982

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

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By Authority:

A. B. CAUDELL, Government Printer, Tasmania

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## REPORT OF THE DIRECTOR OF MINES

Department of Mines,  
Hobart, 20 December 1982

THE MINISTER FOR MINES

SIR,

I present my report on the mining industry for the year ended 30 June 1982.

The value of metals and minerals produced from Tasmanian ores based on Australian metal prices was \$372 923 295. This represents an increase of eight per cent on the figure of \$344 392 266 for the corresponding period of 1980-1981.

In addition metallurgical production from ores and concentrates imported into the State was \$342 977 814 compared with \$345 618 137 for the corresponding period of the previous year. This was a decrease of approximately one per cent.

There was reduced production of chromite, cobalt oxide, copper, iron ore pellets, silver and tungsten as tungstic oxide. However, this was offset by increases in cadmium, gold, iron oxide, lead, manganese dioxide, tin and zinc.

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

	1980-1981		1981-1982	
	Quantity	Value \$ million	Quantity	Value \$ million
Copper (tonnes) .....	23 593	39.6	20 830	30.4
Gold (kilograms) .....	1 248	18.9	1 676	18.9
Iron ore pellets (tonnes) .....	2 202 665	44.8	1 994 263	42.3
Lead (tonnes) .....	12 710	8.6	23 976	15.8
Silver (kilograms) .....	36 214	15.4	71 232	16.7
Tin (tonnes) .....	7 026	92.8	6 981	98.8
Tungsten as tungstic oxide (tonnes) .....	3 111	39.0	2 465	27.8
Zinc (tonnes) .....	41 270	30.1	65 122	55.6
Coal (tonnes) .....	304 727	5.7	395 347	9.2

### DEVELOPMENTS

#### RENISON LIMITED

In July 1981 approvals were granted for a merger of Consolidated Goldfields Australia Ltd with Renison Ltd, the Mount Lyell Mining and Railway Co. Ltd and Associated Minerals Consolidated Ltd. The new company is to be known as Renison Goldfields Consolidated Ltd.

A detailed study conducted by the company confirmed the feasibility of a thermal upgrading plant at Renison to improve tin recovery. The thermal upgrading process pyrometallurgically upgrades low grade tin concentrate to a high grade tin oxide in a specially designed furnace. The only waste product is a granulated slag that has potential use for roadbuilding.

Unfortunately, a combination of uncertain tin prices, continuing production restrictions as a result of International Tin Council's controls and the effect of industrial disputes on the Company's earnings have resulted in a deferment of this project.

#### MOUNT LYELL MINING AND RAILWAY COMPANY LTD

Mining operations at Mt Lyell were mainly in Prince Lyell Mine which supplied about 93 per cent of the ore production. A major program of development and servicing work continued underground. A new underground workshop was commissioned in March 1982. It is now used for the maintenance of all

underground mobile plant, with the exception of the haulage fleet. Construction of a major underground pump station, costing over \$3 million has progressed satisfactorily. The first pump is scheduled for commissioning in July 1983. An expanded mine lease exploration program has recently been undertaken. This information will provide a better assessment of the full ore potential of the mine.

#### **KING ISLAND SCHEELITE PTY LTD**

Reduced demand for alloy steel, difficult market conditions due to reduced world economic activity and release of a large consignment of ore by the General Services Administration of the U.S. Government created problems for King Island Scheelite Pty Ltd. To avoid accumulation of product stocks, output was cut by 30 per cent. The artificial scheelite plant continued production of both artificial scheelite and molybdenum concentrate.

#### **ABERFOYLE LTD — QUE RIVER MINE**

Deliveries of ore from Que River to Electrolytic Zinc Company's concentrator at Rosebery commenced in February 1981. The rate of delivery was less than scheduled until September when the mill expansion at Rosebery was completed. Minor delays in reaching full mine production during the last quarter of the year and a three week strike at Rosebery continued to restrict deliveries until January 1982. Since then production and ore deliveries have reached the target level of about 4 000 tonnes per week at planned grades.

#### **ABERFOYLE LTD — CLEVELAND TIN MINE**

At Cleveland the grade control measures instituted in February have been successful. This has been achieved by a more selective mining program and stricter control of feed to the plant. Costs have also been reduced by a reduction of 15 per cent in the work force.

Exploration of the Foley zone has continued to determine the extent of the tungsten-tin-molybdenum mineralisation.

#### **ABERFOYLE LTD — ZEEHAN**

This company's expenditure on exploration and development has continued at a high level. Mineralisation occurs in three separate bodies designated Queen Hill, Severn and Montana. All three are relatively close together near the town boundary and could be mined by underground methods through a common shaft. Recent drilling at Zeehan has continued to improve the prospect.

#### **ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LTD**

The major project for the year was the extension of the capacity of the Bobadil residue dam. The level of the dam wall was raised four metres to increase the holding area to 38 hectares, more than doubling its previous holding capacity. This dam takes the waste from the concentrating mill. Cost of the project was \$4.2 million.

At Risdon work has continued on a program of monitoring all discharges and their effects on the environment.

As a result of falling metal prices, cost saving measures were introduced at both Rosebery and Risdon.

#### **SAVAGE RIVER MINES**

In October 1981 shareholders of Savage River Mines exercised an option to purchase the northern deposit from the late Mr E. R. Hudson. This purchase will provide enough iron ore to extend the life of the mine into the 1990's. However, rising fuel costs have made iron ore pellets increasingly expensive. The final outcome will therefore depend on the Japanese steel mills which buy the mine's pellets. Savage River is now the only mine supplying iron ore pellets to Japan.

### **CORNWALL COAL COMPANY N.L.**

This company, which was taken over by Goliath Portland Cement Co. in 1979, has continued to expand production from its Duncan and Blackwood mines.

In addition to providing Goliath with its total requirements, Cornwall also supplies Australian Newsprint Mills at Boyer with coal for its furnaces and Associated Pulp and Paper Mills Ltd at Burnie.

### **AMAX IRON ORE CORPORATION**

This company in conjunction with Allstate Tasmania Pty Ltd continued with the dewatering and exploration of the Tasmania Gold Mine at Beaconsfield. In the course of its work the company has gone to considerable trouble to preserve the old mine buildings.

Recent drilling in the Hart Shaft showed that the shaft was blocked to the 90 metre level. From there to the 420 metre level the shaft appeared to be clear and in good order.

## **STATE OF THE INDUSTRY**

It has been a difficult year for the mining and metallurgical industry with every indication of more difficult times to come, as we slide into the worst economic slump in over 50 years. The value of production is marginally up on last year, but grave problems are being faced due to over-supply, lower prices, high cost factors, and imminent tin quotas. This is in sympathy with international metal markets and is largely beyond our control. The industry has responded by taking firm measures to reduce costs and to survive, until the recovery comes — as it surely must. These measures include —

### **CENTRAL TASMANIAN TUNGSTEN**

This mine closed in October 1981 when it ran out of ore reserves. Thirty employees were retrenched. Some exploration drilling was done with the assistance of the Department of Mines Drilling Branch. However, no new reserves were discovered. The plant and equipment was auctioned and the lease rehabilitated.

### **ROSSARDEN MINE**

Rossarden mine was closed in March 1982 when it ran out of viable reserves. Both the ore bodies at Storeys Creek and Rossarden have been nearing exhaustion in recent years, and in spite of vigorous exploration no new ore bodies or extensions of the existing ones were discovered. One hundred and thirty jobs have been lost and the company, despite an investment of over \$3 million, has been unable to save the mine.

### **CLEVELAND TIN**

Cut back its workforce by retrenching 36 employees in March 1982 in an effort to contain costs and continue production.

### **PIONEER TIN MINE**

Closed in April 1982 and 40 employees were retrenched. The adjoining mine at South Mount Cameron will close in September 1982 after a final tin clean up and a further 16 jobs will be lost.

### **KING ISLAND SCHEELITE**

Retrenched 100 employees in June 1982 and closed the mine for one month in an effort to improve cash flow. Production was cut by 30 per cent.

**AMAX**

Amax closed the Beaconsfield project in June 1982. They had spent \$3 million attempting to re-open the old shaft as part of a major exploration program. Department of Mines drilling in the 1960's had indicated good gold values at depth below the old workings which had flooded and been abandoned early this century. Twelve jobs were lost. Renison Goldfields have agreed to enter into a joint venture agreement and will be continuing the exploration program.

**TEMCO**

Temco announced in May 1982 that the No. 1 furnace would close down and 63 men would be retrenched due to poor market demand for their products.

Mining is a finite operation and all mines are eventually exhausted and close down. Our future lies with vigorous exploration to discover new mines and maintain and strengthen the industry. I am happy to report that strong exploration programs continue throughout the State. Government can encourage exploration in many ways and a set of new guidelines will be implemented under your authority from 1 July 1982, in which we will seek to —

- (1) Extend the period in which a licence is granted from six months to one year, and thus enable fuller programs to be achieved.
- (2) The period of tenure will be limited to 10 years except in special circumstances. This will encourage a more rapid turnover in areas and encourage more explorers to seek licences.
- (3) The size of the licence will be limited, and provision will be made for the areas to be reduced during the search period.
- (4) The fees will increase annually on an expanding scale providing that work at the later stage of the licence is more expensive than in the early stages.
- (5) Minimum expenditure commitments will be applied to ensure that work is actually done on the ground. We do not see joint venture negotiations or head office expenses as worthwhile exploration.
- (6) Reports must meet a minimum geological standard. All reports eventually become available in our open file system and are available for future researchers. We seek to build up a worthwhile record system.
- (7) Performance deposits are required to ensure that all our requirements are met. Failure to meet commitments can result in forfeiture of the licence.
- (8) The Minister will give consideration to issuing retention licences in cases where mineral deposits have been discovered, but due to reasons beyond the licence holder's control, a mine cannot be developed in the immediate future. Such licences will be renewed and reviewed annually.

A matter of grave concern, is the obsession by some to stop mineral exploration and mining within the State. In the past decade attitudes have changed, and mining and exploration can be, and is, operated under strict environmental control. It would be more productive, if objectors provided input to planning controls, rather than obstructing and frustrating the administration of the Mining Act. This Department seeks to communicate and consult with all who have an interest in the controlled development of our natural resources. The recent example of mineral exploration guidelines for exploration in national parks and conservation areas is a case of co-operation between this Department and the National Parks and Wildlife Service, Forestry Commission, Department of the Environment, and South-West Tasmania Committee. I believe more co-operation and communication within government departments and less regulation is the pathway to progress.

In summary, the way ahead is quite clear. Our mineral resources are extensive, varied and have world ranking. We must make every effort to ensure they are developed for the benefit of the State and all Tasmanians.

**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 1.66 million tonnes of ore to produce 68 686 tonnes of copper concentrate containing 17 860 tonnes of copper, 2 289 kilograms of silver and 418 kilograms of gold. The concentrates are shipped by road, rail and sea through Burnie to Port Kembla and Japan.

The Electrolytic Zinc Company produced 2 289 tonnes of copper in concentrates and Cleveland Tin N.L. 681 tonnes.

## IRON ORE

Savage River Mines produced 1.99 million tonnes of pellets at the Port Latta plant from ore mined at Savage River.

The northern magnetite deposits were acquired and developmental work was commenced.

## TIN

Total production was 6 981 tonnes of tin metal in 14 936 tonnes of concentrate.

Renison Limited, the major producer, produced 10 968 tonnes of concentrate which contained 5 355 tonnes of tin in concentrates.

Mechanised cut and fill stoping was again the only mining method employed.

A significant advance was made in the North Bassett hanging wall exploration drive, planned to allow deeper detailed drilling of the North Bassett ore zone.

Total expenditure on exploration during the year was \$3.4 million.

At the Cleveland mine 1 302 tonnes of tin were obtained from 3 518 tonnes of concentrate.

Rossarden Mines Limited continued production at Aberfoyle and Storeys Creek mines. At the Aberfoyle mill 157.2 tonnes of concentrate were produced which contained 112.6 tonnes of tin. The operations were closed in April 1982.

Hydraulic mining by Amdex Mining Limited at the Pioneer and Endurance mines produced 124 tonnes of tin contained in 165 tonnes of concentrate. The Pioneer mine was closed in April 1982.

## 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 358 191 tonnes of ore to produce 216 633 metric ton units of  $WO_3$ . Mine development proceeded normally.

Tasminex treated 126 823 tonnes of ore to produce 316 tonnes of concentrate. This was all produced from the Kara No. 1 orebody.

Production of tungsten as wolfram by Rossarden Mines Limited was 89.6 tonnes in concentrates from the Aberfoyle and Storeys Creek mines. A contribution of 28.2 tonnes of concentrates from 6 587 tonnes of ore from the Oakleigh Creek Mine was made by Central Tasmanian Tungsten Pty Ltd.

## ZINC

The Electrolytic Zinc Company at Rosebery milled 597 899 tonnes of ore to produce three concentrates containing 65 122 tonnes of zinc, 23 976 tonnes of lead, 2 289 tonnes of copper, 68 484 kilograms of silver and 1 258 kilograms of gold.

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

## METAL PRICES

The following table shows the average Australian metal prices:—

<i>Commodity</i>	<i>Unit</i>	<i>1979-80</i>	<i>1980-81</i>	<i>1981-82</i>
		\$	\$	\$
Copper	tonne	1 975-00	1 698-25	1 460-00
Gold	kilogram	14 014-55	15 524-38	11 198-00
Lead	tonne	1 041-50	679-17	654-00
Silver	kilogram	563-63	421-73	234-80
Tin	tonne	15 413-08	13 457-25	14 259-00
Tungstic oxide	unit	124-60	125-14	111-95
Zinc	tonne	725-25	725-25	849-58

## GENERAL

There has been little change from the depressed metal prices which were experienced during 1980-1981. The major cause again seems to have been the economic recession which affected the major Western countries. This has led to an over-supply situation for most metals and reduced speculative activity in precious metals.

## COPPER

The Australian price in July 1981 was \$1 480 per tonne. It increased to \$1 580 per tonne in August but this was the high point for the year. The price declined to \$1 440 by November and then fluctuated up to \$1 480 between then and May 1982. The low price for the year was in June 1982 when it dropped to \$1 240 per tonne.

The London Metal Exchange (L.M.E.) price showed much the same pattern as the Australian price. It was £897 in July 1981 and rose to £981 in August mainly due to speculative buying; this was the maximum for the year. The price varied from then on due to currency fluctuations or industrial problems. By the end of the year it had slipped to £740.

## TIN

The Australian price was \$13 551 per tonne in July 1981. The price rose gradually until January 1982 when it had reached \$15 639. It declined from that point until by July it had reached \$13 412.

The market was sensitive to the presence of the General Services Administration (G.S.A.) of the United States Government. The G.S.A. continued to make tin available from the stockpile and by February 1982 had sold 8 635 tonnes. This meant that 21 365 tonnes is still to be sold by the G.S.A.

The L.M.E. price was subject to a good deal of manipulation during this period. It was suggested that the unnamed buying group which drove the price up was in fact a group of the Malaysian producers. They had expressed strong dissatisfaction with the actions of the consumer members of the International Tin Conference. It would seem that they set out to show that they could achieve their aim of price increase independently.

The price was £7 125 in July 1981 and rose to a high point of £8 651 in February. It then slumped dramatically to £7 066 in March and by June had reached £6 308. The 6th International Tin Agreement was to commence as from 1 July 1982, as were export controls. It was anticipated that the price would rise gradually and the market would become less volatile.

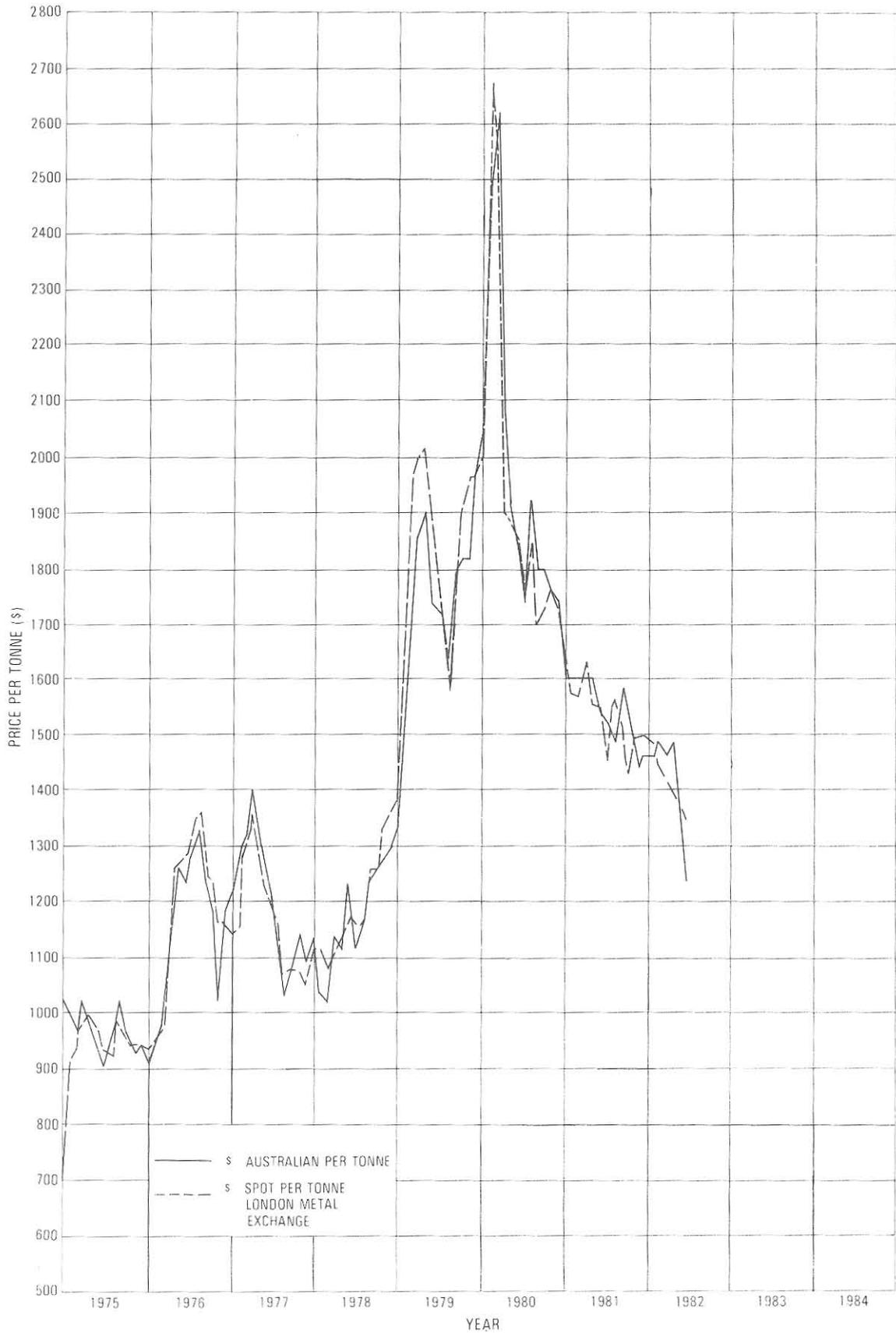
## TUNGSTEN

The price declined throughout the year from a high of \$129-29 per metric ton unit in July 1981 to \$106-17 in December. It rose to \$115-27 in January, slumped to \$96-88 in April, and had eased back to \$109-30 in July. These prices were lower than the previous year and therefore represent a dramatic reduction in real terms.

The Soviet Union has not been a substantial purchaser for some time and this has produced an over-supply situation in both Europe and the Far East. It is unlikely that there will be much change until the recession is over and/or the Soviet Union enters the market as a purchaser again.

### COPPER PRICES

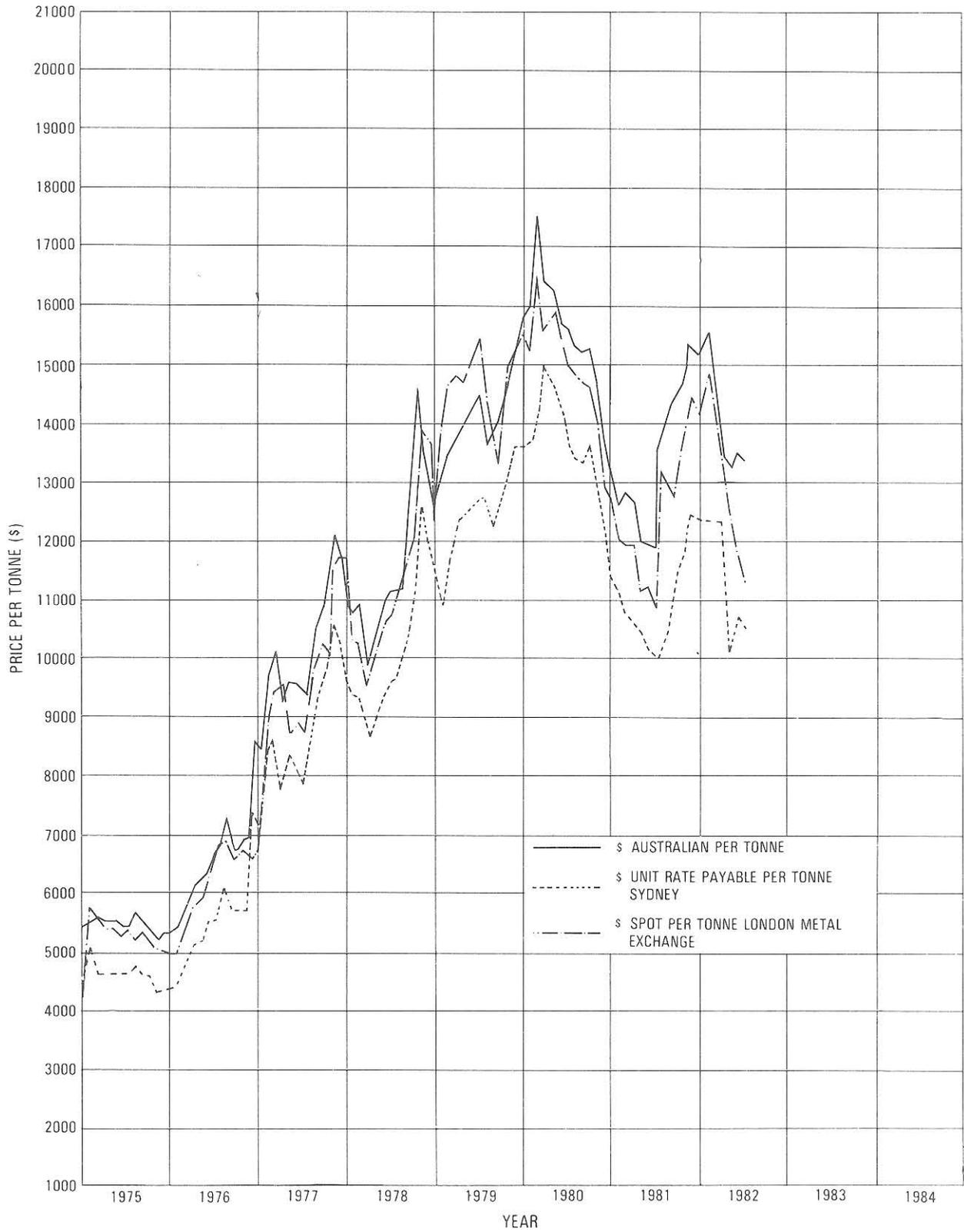
MONTHLY AVERAGES, JANUARY 1975-JUNE 1982



5 cm

### TIN PRICES

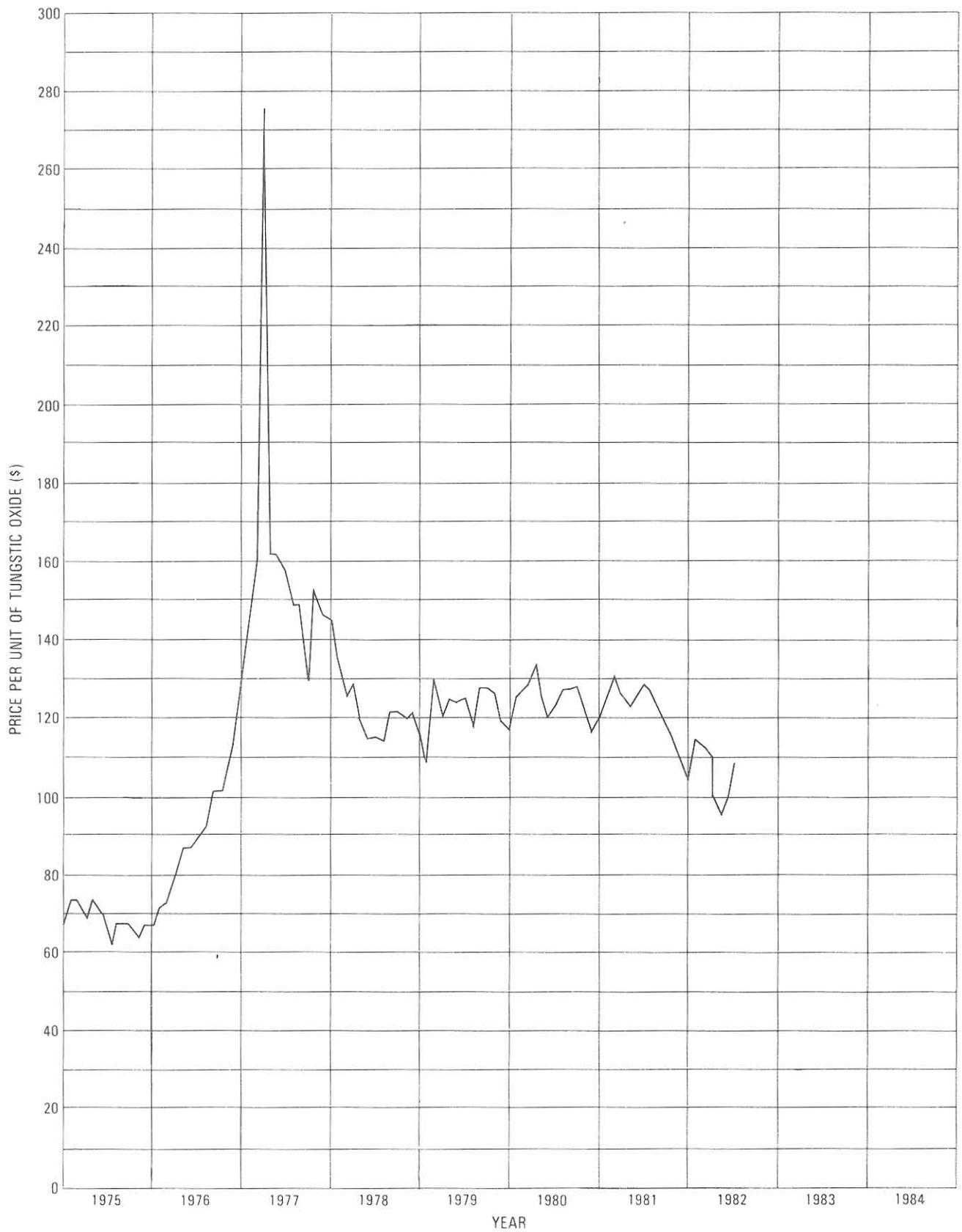
MONTHLY AVERAGES, JANUARY 1975-JUNE 1982



5 cm

### TUNGSTEN PRICES

MONTHLY AVERAGES, JANUARY 1975-JUNE 1982



5 cm

## ZINC

The Australian price fluctuated within \$800-\$900 range during the year. In July 1981 it was \$826 per tonne and the high price for the year was \$889 which was reached in October. The price had dropped to \$824 by June 1982.

The L.M.E. price followed the same pattern although it peaked earlier in August. The price then was £524 and it declined from then to the end of the year when it had reached £393.

## EXPLORATION

There was a reduction in the number of applications received for exploration licences during the year. Forty-five applications were received compared with sixty-seven for 1980-1981. Twenty of the applications were for coal, oil and shale and twenty-five were for other minerals.

At the end of June there were 117 current licences for exploration. Expenditure on exploration for the year totalled \$12 167 041 compared with \$11 354 367 for 1980-1981.

In April an advice sheet was prepared for private land owners whose property was affected by an application for an exploration licence. This included brief information on exploration licences, the right of entry by licence holders and procedure for lodging an objection to an application for a licence.

A review of the general conditions governing exploration licences was completed during the year. New guidelines were issued to all licence holders. These were prepared after consultation with the various companies holding licences in the State. The new conditions take effect from 1 July 1982.

The main objective of the Department was to encourage more active exploration within licence areas.

The moratorium imposed on South-West Tasmania on 19 September 1978 continued to apply during the year. However, there is general agreement between the departments concerned regarding the guidelines to be observed when exploration is permitted to commence.

## COAL

The Cornwall Coal Company N.L. continued as the only coal producer in the State, operating from both the Duncan and Blackwood mines. Total output for the year was 395 347 tonnes. This was an increase of 90 620 tonnes, or nearly 30 per cent, compared with the previous year's figure. The average number of employees increased from 130 to 145 of whom 81 were employed underground.

The Blackwood mine produced almost one-third of the company's total production with a complement of 19 men. The main heading has now reached 760 metres from the entrance.

The Duncan mine produced nearly 265 000 tonnes and gave employment to 80 men. Development commenced to the north from the north-east headings in an attempt to get through disturbed ground. Successful development through this area should open up a large area of good coal behind old workings.

Three shifts were needed at the washery to treat all the coal.

The Shell Company of Australia Ltd relinquished Exploration Licence 18/77 at Avoca after having held the area for four years. However, active exploration was continued by Shell in its joint venture with Industrial and Mining Investigations Pty Ltd on Exploration Licence 5/61 on the East Coast. This licence covers the promising Mt Nicholas coal field as well as the prospective Seymour-Dalmaine-Douglas River areas.

Victor Petroleum and Resources Ltd in a joint venture with North-West Bay Company Pty Ltd has marked out leases in the Woodbury area but has encountered problems with private landowners.

Other areas being explored for coal include an area near Hamilton surrounding the old Langloh mine where Capricorn Mining hold Exploration Licence 27/79 and the old Catamaran mine area being explored by Marathon Petroleum under Exploration Licence 6/79.

## OIL

The following table shows details of permits issued under the Petroleum (Submerged Lands) Act 1967 which were current at 30 June 1982:—

<i>Title</i>	<i>Holder</i>	<i>Blocks</i>	<i>Expiry Date</i>
T/5P	Hematite Petroleum Pty Ltd	.... 16	16.7.84
T/6P	Hematite Petroleum Pty Ltd	.... 32	16.7.84
T/12P	Amoco Australia Petroleum Company and Tasman Oil Inc.	60	4.4.85
T/13P	Otter Exploration N.L.	.... .... 224	4.4.85
T/14P	Cue Minerals N.L.	.... .... 42	9.1.86
T/15P	Weaver Oil and Gas Corp. Aust.	272	19.2.86
T/16P	Weaver Oil and Gas Corp. Aust.	32	19.7.86
T/17P	Van Dieman's Land Resources N.L. and Others	.... .... 16	7.8.86
T/18P	Bass Strait Oil and Gas N.L. and Others	.... .... 118	22.7.86
T/19P	Perthshire Petroleum Ltd	.... .... 243	27.3.87
T/20P	Van Diemen's Land Resources N.L. and Others	.... .... 75	17.11.87

With the assistance of the Bureau of Mineral Resources, the offshore areas round the West, South and East coasts of Tasmania were divided into four prospective areas.

Invitations for applications were gazetted on 4 November 1981. Data packages were requested from several Australian companies in addition to requests from Canada, U.S.A. and Singapore. The Department of National Development and Energy agreed to publicise the areas through the Australian Information Services. Unfortunately no applications were received by the closing date of 4 February 1982.

The following brief details give an indication of the work carried out by permit holders during the year:—

T/5P. Pipa No. 1 well was drilled in May 1982 using the semi-submersible 'Southern Cross'.

T/12P. This permit was transferred from Amoco Australia Petroleum Co. and Tasman Oil Co. to Amoco Australian Petroleum Co., Tasman Oil Co. and Anschutz Overseas Corporation. Ongoing interpretation of geological and geophysical data continued in preparation for drilling of exploration well Cape Sorell No. 1. The Diamond M Epoch was contracted for the work and materials ordered.

T/13P. Arrangements were made for further seismic work in the second half of 1982.

T/14P. A seismic survey was carried out in April/May 1982.

T/15P and T/16P. Further seismic survey work was carried out in February/March 1982. Approval was given for deferment of well drilling till Year 4 of the permits.

T/18P. A seismic survey was carried out in April 1982 using the survey vessel MV Lady Vilma.

T/19P. A seismic survey was carried out in February 1982 using the vessel 'Western Odyssey'.

T/21P. An application by Cue Minerals and Others for four blocks was withdrawn.

As production from known fields is expected to decline after the mid-1980's the Federal Government has introduced certain policies to encourage petroleum exploration and development. These have included removal of the production levy from new oil discoveries, taxation concessions and foreign investment guidelines.

Progress has also been made by the Commonwealth and the States towards amending offshore petroleum legislation. It is hoped this will come into effect later in 1982.

## LEGISLATION

Appendix III to the Mining Regulations 1930 was rescinded and a new appendix substituted. This amended fees, rents and royalties payable under the regulations. Notification was made in the Tasmanian Government Gazette of 18 November 1981 as per Statutory Rule 1981, No. 286.

The Petroleum (Submerged Lands) Act 1982 and the Coastal and Other Waters (Application of State Laws) Act 1982 were passed by both Houses in June 1982.

These provide for Commonwealth laws to apply to the resources of the lands beneath the waters beyond the three mile territorial sea and the laws of each State to the adjacent land under the territorial sea.

This legislation is to be proclaimed by the Commonwealth and all States on the same day. This has yet to be done.

### AUSTRALIAN MINERALS AND ENERGY COUNCIL

The Council met only once during the year in Perth on 30 October 1981.

Important matters discussed included —

- (1) Market prospects for the coal, iron ore, bauxite/alumina and aluminium industries. Council was confident about the long term growth prospects for these industries, especially steaming coal and alumina/aluminium.
- (2) Resource development, including infrastructure arrangements.
- (3) Potential impact of the Commonwealth's Heritage Act on mining developments.
- (4) Uranium export.
- (5) Raw materials processing.
- (6) Current oil supply situation.
- (7) National Petroleum Advisory Committee report.
- (8) The Council established a Standing Committee of officials to facilitate the introduction of offshore arrangements and ensure administration of the Commonwealth/State legislation in a uniform manner.
- (9) L.P.G. marketing and subsidy arrangements.
- (10) National Energy Conservation.

The Standing Committee met on three occasions and agreed to a number of procedures involving a uniform approach on —

- (a) Administrative and accounting arrangements.
- (b) Transition of titles.
- (c) Guide to the Petroleum (Submerged Lands) Act.
- (d) Uniform offshore operating codes.
- (e) Farm-out and transfer proposals.

### REVENUE

REVENUE COLLECTED DURING THE YEAR ENDED 30 JUNE 1982

<i>Heads of Revenue</i>	\$
Mines Department (Drilling) .....	374 835
Drilling on E.L. 17/81 (Cornwall Coal Co.) .....	91 955
Rent and Fees of Auriferous and Mineral Lands .....	577 365
Iron Ore Royalty .....	336 295
Mineral Royalties .....	1 873 360
Survey Fees .....	1 600
Fees under the Dangerous Goods Act .....	48 584
Geological Services .....	3 213
	3 307 207

COMPARATIVE STATEMENT OF REVENUE FROM MINES BEING RENTS, FEES, STORAGE OF  
EXPLOSIVES, ETC., PAID TO THE TREASURY DURING THE YEARS 1976-77 TO 1981-82

Year	\$	Year	\$
1976-1977	1 866 370	1979-1980	5 837 682
1977-1978	2 455 353	1980-1981	4 471 877
1978-1979	2 621 380	1981-1982	3 307 207

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 was 30 cents per cubic metre until November 1981, when a rate of 70 cents per cubic metre applied.

The amount of royalty collected in the period was \$1 873 360 comprising \$37 560 from the mining of sand and gravel and \$1 835 800 from other mining operations.

One company elected to pay royalty on proceeds and another to pay on profits.

**LEASES AND LICENCES**  
NUMBER AND AREA OF NEW LEASES AND LICENCES ISSUED  
DURING THE YEAR ENDED 30 JUNE 1982

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>
Gemstones	1	25
Gold	2	101
Iron Ore	2	1 270
Stone	13	1 781
Tin	15	1 664
	38	4 841

TOTAL NUMBER OF LEASES AND LICENCES IN FORCE  
ON 30 JUNE 1982

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Bauxite	5	183	...
Clay	16	318	...
Coal	9	3 469	...
Copper	6	1 294	...
Crocoite	1	4	...
Dolomite	4	126	...
Gemstone	4	47	...
Gold	59	2 972	...
Granite	4	12	...
Iron ore	12	3 528	...
Kaolin	1	346	...
Limestone	10	1 243	...
Marble	1	8	...
Minerals	38	6 653	...
Osmiridium and chromite	2	184	...
Peat	1	72	...
Sand and gravel	104	8 385	...
Silica	10	728	...
Slate	1	84	...
Stone	116	8 178	...
Silver, lead and zinc	17	892	...
Tin	355	16 957	...
Uranium	1	81	...
Wolfram and tin	10	199	...
Water	85	...	908
Easements	91	1 924	...
Total	963	57 807	908

NUMBER AND AREA OF LEASES AND LICENCES APPLIED  
FOR DURING THE YEAR ENDED 30 JUNE 1982

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Coal	10	1 620	....
Gold	7	124	....
Gravel and sand	7	675	....
Minerals	4	564	....
Shellgrit	1	2	....
Silver, lead and zinc	1	28	....
Stone	12	1 124	....
Tin	25	839	....
Easements	3	23	....
Water	1	....	4
<b>Total</b>	<b>71</b>	<b>4 999</b>	<b>4</b>

TOTAL NUMBER OF ALL TYPES OF PROSPECTING RIGHTS HELD  
AS AT 30 JUNE 1982

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Permits to enter and search on private land, including owners' consents	9	16 726 ha
Exploration licences	111	44 641 km <sup>2</sup>
Special Prospectors' licences	5	136 km <sup>2</sup>
Miners' Rights	4	1 ha
Prospectors' licences	23	505 ha
Authorities to prospect under the Aid to Mining Act 1927	3	1 409 ha
Permits to explore for petroleum under the Petroleum (Submerged Lands) Act 1967	11	1 071 blocks

### MINES DRAFTING SECTION

A new aid was introduced in the Drafting Section in 1981-1982: a computer print-out facility for all mining tenements (i.e. mineral lease/licence, miners rights, owners rights and prospecting licences) in Tasmania. An important facet is the print-out of mining tenement information within a co-ordinated area. This is now used in association with all E.L. and S.P.L. applications.

Considerable progress has been made in microfilming during the year and includes the filming of 1 046 plans received under the Mines Inspection Act. Security up-dates for March and September totalled 235. One hundred and seventy-seven mine plans (originals) were filmed mainly to establish their filming quality. The results were pleasing and further filming is on program. Other filming included up-dates on the E.L. series, the air photo indices and the underground plan inventory.

All subject-to-survey diagrams have been filmed and are on 16 mm microfiche. Diazo prints received from the Microfilm Bureau included 1 507 copy cards and 474 microfiche. Most of the latter have been sold to mining companies. We have also purchased 35 rolls of film of original purchase grants which has resulted in a reduction of search time when checking mineral rights on private property.

Two new series 1:20 000 mining tenement maps produced during the year include Lefroy-Back Creek and Lune River. On program for completion by December 1982 are: Mt Arthur, Monarch, Lanka, Gladstone and Blue Tier.

A new format for the 1:20 000 series is to be introduced, which will double the chart size (10 000 m × 20 000 m). The actual boundaries of the charts will now conform to the Lands Department 1:25 000 series and will allow conformity in sheet names. The 1:25 000 scale cannot be adopted as it does not allow for nomenclature of very small lease/licence areas. The new series will reduce the material and filming costs and production time will also be reduced.

Members of staff responsible for the complete production of mining tenement charts are now doing a field check just prior to proof stage. This helps clear up any obscurities in the base materials. It also gives the draftsman an insight into the area just mapped and allows him to liaise with the mining public with a first-hand knowledge of the area.

Working charts and transparencies now total 570. The slight increase is a result of 1:25 000 Lands Department series transparencies being introduced into areas where only old Land District chart cover existed. Sixty-nine applications for mineral leases on Crown Land were recorded with a further 25 over private lands. Charts and descriptions were issued for 44 Exploration Licences.

There were 34 diagrams drawn subject-to-survey with a further 10 prepared from survey. Lease document diagrams were prepared from these plans.

Dyelines for office use and sale to the public totalled 3 100. Photostat copies for sale and office use totalled 136 588.

This section received 700 applications for purchased land transfers from legal firms throughout Tasmania for searching and recording mining details.

Other areas of endeavour by this section included —

- (1) The introduction and updating of air-photo indices.
- (2) Researching mining activity for Forest and Crown Land leases.
- (3) The continuing mapping program of all lands affecting the Mining Act and including National Parks, State Forests, Reserves, Hydro, etc.
- (4) Preparing plans, schedules and charts for areas exempted from the Mining Act.
- (5) Locating and reporting of Department of the Environment scheduled premises requirements.
- (6) The maintenance, etc., of a dyeline machine and Minolta copy machine.
- (7) Answering public enquiries and researching historical mining information.
- (8) Liaison with other Departments where mapping affects mining activities.
- (9) Title searching requirements for mining on private property.
- (10) Recording, charting and preparation of descriptions for all Offshore Petroleum Permits.

#### COURT OF MINES

*Tasmanian Wilderness Society v. North West Bay Co. Pty Ltd.* Objection to exploration licence 43/80, Central Tasmania. The Warden of Mines stated that the objectors did not come within the ambit of section 15C (3) of the Mining Act 1929 in that they were unable to establish that they possessed any estate or interest in the land subject of the application, and in consequence were not competent to object.

*Bendall's Mining Company Pty Ltd v. Tasmanian Mineral Developments Pty Ltd.* Forfeiture of leases 11M/66 and 12M/66. The leases were forfeited by the Warden of Mines.

*Mining and Forestry Export-Import Pty Ltd v. Collins Development Pty Ltd.* Forfeiture of lease 56M/66. The lease was surrendered prior to the hearing.

*A. J. Gregg v. H. J. Stacpoole.* Objection to Exploration Licence 29/81, Waterhouse. The objection was withdrawn.

*Seventy-three objectors v. Amoco Minerals Australia Co.* Objection to Exploration Licence 27/81, Cygnet. The application for the exploration licence was withdrawn by the defendant.

*Cape Barren Community Council Incorporated v. Messrs Minos, Mullen, J. & B. Fennestra, Do, Outrim and Cox.* Objection to lease applications 44M/81-49M/81. The applications for leases were withdrawn by the defendants.

*Trustees of the property of the Roman Catholic Church v. J. R. Wall.* Objection to lease application 1060P/M. The objection was dismissed by the Warden of Mines.

*S. R. Warren v. T. L. & K. P. Mahnken.* Compensation agreement for lease application 1062P/M. The case did not proceed.

*D. L. Nichols and C. B. Marriott v. L. M. McRae (deceased).* Forfeiture of mineral leases 5M/63, 12M/63, 36M/75, 50M/74, 51M/74 and licences 5W/64 and 11W/69. The defendant was fined \$50 per lease in lieu of forfeiture.

*P. R. H. Willson and N. R. Cooper v. Qintex Limited.* Forfeiture of Mineral Lease 61M/74. Adjourned sine die by Warden.

*Tasmanian Conservation Trust Incorporated v. Seltrust Mining Corporation.* Objection to Exploration Licence 48/81, Rossarden. The objection was withdrawn by the plaintiff.

*Thirty-one objectors v. North West Bay Co. Pty Ltd.* Objection to lease applications 1070P/M-1078P/M. Warden adjourned case.

*S. Josic v. North Valley N.L.* Caveat against lease 42M/77. Warden extended caveat. Case 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>	<i>Date</i>	<i>Mine</i>
279/81	Adrian Maxwell Heath Lang	24.7.81	Renison
280/81	Matthew John Daly	1.9.81	King Island Scheelite
281/81	Wojciech Grun	3.11.81	King Island Scheelite
282/81	Rudolf Josef Otten	10.11.81	Que River
283/82	Peter George Matthews	24.3.82	Mt Lyell
284/82	Bryce Frederick Atkinson	26.3.82	Mt Lyell
285/82	Peter Geoffry Carter	19.5.82	Que River
286/82	John Grant Brock	29.6.82	Cleveland

#### VALUE OF TASMANIAN MINERALS IN RECENT YEARS WITH AUSTRALIAN METAL PRICES

<i>Year</i>	<i>\$</i>	<i>Year</i>	<i>\$</i>
1972-1973	133 238 921	1977-1978	291 496 400
1973-1974	164 699 058	1978-1979	322 919 534
1974-1975	173 297 481	1979-1980	372 810 760
1975-1976	190 490 321	1980-1981	344 392 266
1976-1977	277 266 070	1981-1982	372 923 295

## MINERAL PRODUCTION SINCE 1880

QUANTITY AND VALUE OF PRODUCTION AS AT 30 JUNE 1982

<i>Commodity</i>	<i>Unit</i>	<i>Total Quantity</i>	<i>Total Value</i>
<b>METALLIC MINERALS</b>			
			\$
Antimony	(tonne)	3	2 034
Bismuth	(kilogram)	110 080	503 385
Cadmium	(tonne)	3 407	13 293 560
Chromite	(tonne)	2 687	259 083
Cobalt oxide	(kilogram)	132 178	1 017 036
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)	822 451	608 557 836
Crocoite	(specimens only)	....	53 159
Gold	(kilogram)	105 506	139 425 380
Ilmenite	(tonne)	558	2 512
Iron ore pellets	(tonne)	29 903 701	478 125 716
Iron oxide (including hematite, limonite and magnetite)	(tonne)	323 891	1 935 912
Lead (from 1919)	(tonne)	605 657	151 621 807
Manganese	(tonne)	1	6
Manganese dioxide (from 1957)	(tonne)	12 438	451 980
Mercury	(kilogram)	7 697	90 251
Molybdenum	(tonne)	62	237 696
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)	57 261	287 476 572
Silica for silicon alloy production	(tonne)	348 169	7 488 324
Silicon as silicon alloys	(tonne)	414 889	100 925 536
Silver-lead ore to 1918 (now shown under Silver and Lead)	(tonne)	1 101 295	12 858 582
Silver (from 1919)	(kilogram)	2 347 357	156 171 645
Sulphur as sulphuric acid	(mono tonne)	4 341 667	82 211 502
Tin	(tonne)	242 848	795 254 067
Wolfram (concentrates)	(tonne)	22 414	50 790 458
Zinc	(tonne)	1 647 240	568 562 872
Zinc sulphate (from 1957)	(tonne)	3 251	324 177
Zircon (concentrates)	(tonne)	39 001	5 039 899
<b>NON-METALLIC MINERALS</b>			
Asbestos	(tonne)	4 044	34 284
Barite	(tonne)	2 240	16 478
Clay (from 1958) —			
Brick	(metre <sup>3</sup> )	1 845 715	5 412 784
Tile	(metre <sup>3</sup> )	71 310	182 009
Other	(metre <sup>3</sup> )	584 700	2 548 098
Dolomite	(tonne)	142 856	1 353 623
Graphite	(tonne)	41	214
Kaolin	(tonne)	216 084	9 716 377
Limestone —			
Agricultural and other	(tonne)	1 505 057	5 179 508
Carbide	(tonne)	1 081 509	5 936 189
Cement	(tonne)	12 272 056	24 602 185
Chemical and metallurgical	(tonne)	5 246 240	12 603 594
Ochre	(tonne)	2 949	23 483
Pebbles (from 1957)	(tonne)	29 375	649 492
Sand (moulding)	(tonne)	864	9 550
Silica	(tonne)	451 276	1 326 414
Talc	(tonne)	338	2 154
<b>FUEL MINERALS</b>			
Coal	(tonne)	12 339 612	56 257 958
Shale	(tonne)	42 239	62 462
Peat	(tonne)	11 536	801 220

**MINERAL PRODUCTION SINCE 1880 — continued**  
 QUANTITY AND VALUE OF PRODUCTION AS AT 30 JUNE 1982 — continued

<i>Commodity</i>	<i>Unit</i>	<i>Total Quantity</i>	<i>Total Value</i>
<b>CONSTRUCTION MATERIALS</b>			<b>\$</b>
Building stone —			
Freestone	(metre <sup>3</sup> )	17 088	997 281
Granite	(metre <sup>3</sup> )	67 839	346 722
Other stone	(metre <sup>3</sup> )	14 697	134 688
Crushed and broken stone (from 1958) —			
Basalt	(metre <sup>3</sup> )	5 795 535	39 186 267
Dolerite	(metre <sup>3</sup> )	10 694 117	55 923 757
Limestone	(metre <sup>3</sup> )	481 510	2 404 273
Sandstone	(metre <sup>3</sup> )	69 216	383 908
Other	(metre <sup>3</sup> )	5 736 352	35 842 815
Gravel (from 1958)	(metre <sup>3</sup> )	27 065 567	79 091 989
Sand (from 1958)	(metre <sup>3</sup> )	3 415 802	12 747 941
Other road-making material	(metre <sup>3</sup> )	3 756 897	9 228 888
			<b>\$3 874 698 055</b>

## STATISTICS RELATING TO THE MINERAL INDUSTRY

Commodity	Unit	Year ended 30 June 1981		Year ended 30 June 1982	
		Total Quantity	Value	Total Quantity	Value
<b>METALLIC MINERALS</b>			\$		\$
Cadmium	(tonne)	106	462 800	154	468 044
Chromite	(tonne)	566	63 236	....	....
Cobalt oxide	(kilogram)	2 097	78 088	2 393	64 405
Copper	(tonne)	23 593	39 583 214	20 830	30 373 126
Crocoite	(specimens only)	....	2 280	500	4 692
Gold	(kilogram)	1 248	18 836 569	1 676	18 867 913
Iron ore pellets	(tonne)	2 202 665	44 755 534	1 994 263	42 301 052
Iron oxide	(tonne)	20 600	211 210	25 490	272 000
Lead	(tonne)	12 710	8 536 777	23 976	15 798 934
Manganese dioxide	(tonne)	285	9 549	410	14 342
Molybdenum	(tonne)	20	76 324	17	64 524
Silica for silicon alloy production	(tonne)	26 239	655 975	32 961	824 025
Silicon as silicon alloys	(tonne)	46 213	16 161 235	58 414	22 195 770
Silver	(kilogram)	36 214	15 417 902	71 232	16 654 659
Sulphur —					
Sulphuric acid from zinc concentrates	(mono tonne)	56 820	1 345 666	120 660	4 360 993
Tin	(tonne)	7 026	92 826 175	6 981	98 834 194
Tungsten as tungstic oxide	(tonne)	3 111	38 958 309	2 465	27 811 348
Zinc	(tonne)	41 270	30 148 419	65 122	55 642 155
VALUE OF METALLIC MINERALS		....	\$308 129 262	....	\$334 552 176
<b>NON-METALLIC MINERALS</b>					
Clay —					
Brick	(metre <sup>3</sup> )	74 693	373 465	75 887	389 152
Other	(metre <sup>3</sup> )	14 289	71 445	27 582	182 690
Dolomite	(tonne)	9 872	134 247	13 632	202 497
Kaolin	(tonne)	22 411	1 803 078	18 424	1 650 390
Limestone —					
Agricultural	(tonne)	50 453	357 633	50 830	386 946
Carbide	(tonne)	21 001	315 015	....	....
Cement	(tonne)	557 995	1 673 985	667 014	2 001 042
Chemical and metallurgical	(tonne)	99 509	1 053 654	93 693	793 597
Other	(tonne)	12 041	31 085	11 242	37 136
Pebbles	(tonne)	2 078	66 245	2 372	77 880
Silica	(tonne)	10 490	60 760	11 935	69 356
VALUE OF NON-METALLIC MINERALS		....	\$5 940 612	....	\$5 790 686
<b>FUEL MINERALS</b>					
Coal	(tonne)	304 727	5 628 899	395 347	9 195 727
Peat	(tonne)	702	132 864	565	142 828
VALUE OF FUEL MINERALS		....	\$5 761 763	....	\$9 338 555
<b>CONSTRUCTION MATERIALS</b>					
Building stone —					
Freestone	(metre <sup>3</sup> )	1 191	28 577	260	21 360
Granite	(metre <sup>3</sup> )	1 370	6 850	....	....
Granite (red)	(metre <sup>3</sup> )	....	....	200	2 000
Other	(metre <sup>3</sup> )	16	3 300	....	....

STATISTICS RELATING TO THE MINERAL INDUSTRY — *continued*

Commodity	Unit	Year ended 30 June 1981		Year ended 30 June 1982	
		Total Quantity	Value	Total Quantity	Value
Crushed and broken stone —			\$		\$
Basalt ....	(metre <sup>3</sup> )	558 173	5 588 875	515 730	5 427 636
Dolerite ....	(metre <sup>3</sup> )	217 105	2 171 050	323 667	3 295 058
Limestone ....	(metre <sup>3</sup> )	12 731	127 310	16 233	162 870
Sandstone ....	(metre <sup>3</sup> )	3 755	38 400	15 135	153 830
Other ....	(metre <sup>3</sup> )	737 029	7 375 587	605 138	6 051 380
Gravel ....	(metre <sup>3</sup> )	1 307 185	7 864 585	1 131 313	6 737 890
Sand ....	(metre <sup>3</sup> )	210 844	1 068 525	166 954	1 004 903
Other road-making materials ....	(metre <sup>3</sup> )	57 222	287 570	76 646	384 951
VALUE OF CONSTRUCTION MATERIALS			\$24 560 629		\$23 241 878
TOTAL VALUE WITH AUSTRALIAN METAL PRICES			\$344 392 266		\$372 923 295
METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES			\$345 618 137		\$342 977 814
VALUE OF MINING AND METALLURGICAL PRODUCTION			\$690 010 403		\$715 901 109
AVERAGE NUMBER OF EMPLOYEES			\$9 798		\$9 422

## 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 or sold.

No assistance was made available during 1981–1982.

## STAFF MOVEMENTS

Name	Position	Remarks
Bartkus, E. J.	Electrical Engineer	Deceased 5.1.82
Billingham, R.	Senior Mining Engineer	Promoted 26.11.81
Castleden, R. H.	Geologist	Resigned 28.8.82
Cromer, W. C.	Geologist	Resigned 16.10.81
Dickens, G. J.	Draftsman	Commenced 1.10.81
Geard, L. A.	Laboratory Assistant	Retired 4.1.82
Hopkins, P. N.	Clerk	Promoted 17.9.81
Murchie, H.	Director of Mines	Promoted 1.7.81
Noldart, A. J.	Supervising Geologist	Retired 27.5.82
Polya, D. A.	Geologist	Commenced 1.1.82
Richardson, R. G.	Geophysicist	Promoted 5.11.81
Thomas, R. C.	Deputy State Mining Engineer	Promoted 3.9.81
Vass, A. I.	Clerk	Promoted 20.9.81
Whitehead, E. J.	Clerk	Promoted 7.1.82
Williams, P. R.	Geologist	Resigned 31.5.82

## OBITUARY

### E. J. BARTKUS

It is with regret that I record the death of our Electrical Engineer, 'Eddie' Bartkus on 5 January 1982, after an illness which he had endured with great fortitude.

The Department of Mines created the position of Electrical Engineer in 1975 to cope with the increased work load in the electrical engineering field. Eddie was the first incumbent in this position and, up to his death, built up a reputation as a conscientious electrical engineer, well liked by his colleagues in the Department and by the staff of the mines and metallurgical plants around the State.

Eddie made positive contributions to the understanding of static electricity and its effect on detonators, as well as contributing to the preparation of legislation concerning the use of electricity in mines. He also had a great love of tinkering with electrical appliances to the benefit of past and present members of the Department as well as being an enthusiastic radio 'ham'. He is sadly missed by his colleagues.

## SCHOLARSHIPS

No new scholarships were granted. D. A. J. Polya completed his studies for the Bachelor of Science (Hons) degree with First Class Honours. He commenced duty with the Department on 4 January 1982.

## OVERSEAS VISIT

The only overseas visit made during the year under review was to New Zealand. Mr I. B. Jennings attended the Chief Geologists' Conference held in Christchurch from 20 to 27 February 1982.

## CONCLUSION

Appreciation is recorded of the services rendered by the officers of the Department, Wardens of Mines, Registrars of Mines and police officers who act as collectors of revenue for the Department throughout the State.

A detailed review of operations and production, and the reports of the Geological Survey Branch, the Chemical and Metallurgical Branch, the Mines and Explosives Branch, the Mount Cameron Water Race Board and the Ringarooma and Cascade Water Board follow.

H. MURCHIE, Director of Mines.

## OPERATIONS AND PRODUCTION

### 1. METALLIC MINERALS

#### CADMIUM

##### QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value (\$)	Year	Tonnes	Value (\$)
1927-1977	2 793	10 565 346	1980*	68	442 000
1978	145	594 500	1980-1981	106	462 800
1979	141	760 870	1981-1982	154	468 044
			Total	3 407	\$13 293 560

\* 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

Year	Tonnes	Value (\$)	Year	Tonnes	Value (\$)
1978	684	61 312	1980-1981	567	63 236
1979	1 006	89 420	1981-1982	....	....
1980*	432	45 115	Total	2 689	\$259 083

\* January to June.

### NORTHERN CHROMITE PTY LTD, BEACONSFIELD

The Barnes Hill mine was closed down, all plant and equipment was dismantled and removed from the lease. The mining area and old slimes dam were rehabilitated by contouring the ground which was then seeded with a mixture of grasses. The recently constructed new slimes dam and the mine water supply dam have been retained for possible future use should a mine be opened on the Rifle Range or other portions of the lease.

#### COBALT OXIDE

The source of the 2.393 tonnes of cobalt oxide of value \$64 405 was the same as that of cadmium.

#### COPPER

##### SOURCE QUANTITY AND VALUE OF PRODUCTION

Year	From tin ores		From lead-zinc ores		In blister copper		From copper ores		Totals	
	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$
1919-1977	6 729	7 515 219	36 115	33 103 033	501 143	208 564 870	181 350	204 493 052	725 337	453 676 174
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
1980-1981	401	659 976	2 045	3 415 383	....	....	21 147	35 507 855	23 593	39 583 214
1981-1982	681	993 370	2 289	3 345 554	....	....	17 860	26 034 202	20 830	30 373 126
Totals	8 942	\$11 016 374	46 266	\$49 420 864	501 143	\$208 564 870	266 100	\$339 555 728	822 451	\$608 557 836

\* January to June.

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN

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

PRODUCTION

Production for the year ended 30 June was as follows:—

Tonnage of ore hauled from the mine—

<i>Source</i>	<i>Tonnes</i>
Prince Lyell and 'A' Lens	1 538 099
Cape Horn	119 048
Crown 12 West	9 415
Total mine	1 666 562
Grade of ore hauled (% copper)	1.16
Ore treated at the concentrator (tonnes)	1 667 682
Copper concentrate produced (tonnes)	68 686
Containing—	
copper— 17 860 tonnes;	
silver— 2 748 330 grams; and	
gold— 419 051 grams	
Gross value of production	\$29 769 000

Output fell short of that of the previous year. A work stoppage of three weeks duration in November 1981 caused by an industrial dispute adversely affected the tonnage of ore produced from the mine. Additionally, the lower than average block grade of the ore situated at the northern end of the Prince Lyell 20 Series, from whence the bulk of the output for the year came, adversely affected the copper content of the ore produced.

Once again, all the ore produced came from underground sources, approximately 87 per cent originating from stoping with the balance coming from mine development.

Stoping was almost entirely undertaken by means of the open-stoping method. The exception was in the Crown 12 West, where sublevel caving was employed.

Production commenced during the year from stopes on the 105 m Level at Cape Horn and from stopes 37 and 35 at Prince Lyell; the first of the 30 Series to come into production. The 'A' Lens 201/202 crown pillar was fired in September 1981 and the Prince Lyell 21/22 crown and rib pillars were fired in November 1981.

The Prince Lyell 21/22 pillars comprised 627 300 tonnes of ore and their firing, which utilised 175 tonnes of explosives, was the largest yet undertaken at Mt Lyell.

MINE DEVELOPMENT

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

<i>Mine Area</i>	<i>Drives and Crosscuts (metres)</i>	<i>Raises (metres)</i>	<i>Total (metres)</i>
Prince Lyell and 'A' Lens— 20 and 30 Series	3 638	602	4 240
Prince Lyell No. 1 Shaft area	335	30	365
Main Decline extension	482	....	482
Cape Horn	1 170	150	1 320
Crown Twelve West	153	5	158
Total mine	5 778	787	6 565

The amount of effort applied to mine development was approximately the same as it was during 1980-1981, but a lower achievement resulted. This was in part due to the three-weeks work stoppage in November 1981 but poor ground conditions in a number of headings also contributed.

Progress in the Main Decline was particularly hampered by bad ground. In October 1981 when the face reached the No. 2 Fault, the last 150 metres of the decline then developed had to be abandoned and the heading turned on to a different course.

Mine ventilation markedly benefitted when in early June 1982 the extension of the Southern Exhaust Airway between the 92 m and 195 m levels broke through at full size. A duplicate drive to the Southern Exhaust Airway on the 92 m level was being mined at year end.

Six raises, totalling 463 metres in length, were bored during the year by the company's raiseborer, which also bored a 280 mm diameter hole between 200 m and 10 m horizons to accommodate a diesel-fuel line. Raises totalling 324 metres were developed over the same period of time by conventional means.

Good progress was made with developing the new pumping facility at the 17 and 18 levels, Prince Lyell No. 1 Shaft.

#### EXPLORATION

Expenditure for the year on exploration within the mineral lease amounted to \$650 194.

The search for large low-grade deposits of the Mount Lyell type carried on until January 1982 when a policy change was effected and exploration was re-directed towards locating high-grade ore.

Turam geophysical surveys were undertaken in the North Lyell, Glen Lyell and Copper Estates areas. Diamond drilling was carried out at Glen Lyell, Western Tharsis and Anaconda.

#### REPORTED ORE RESERVES AS AT 30 JUNE 1982

<i>Mine</i>	<i>Ore (tonnes)</i>	<i>Copper (%)</i>	<i>Silver (g/tonne)</i>	<i>Gold (g/tonne)</i>
<b>PROVED ORE</b>				
Prince Lyell	5 033 900	1.40	3.0	0.4
Cape Horn	1 113 400	1.98	3.4	0.6
'A' Lens	269 000	1.35	1.5	0.2
<b>TOTAL</b>	<b>6 416 300</b>	<b>1.50</b>	<b>2.8</b>	<b>0.35</b>
<b>PROBABLE ORE</b>				
Prince Lyell	15 470 000	1.45	3.0	0.4
Western Tharsis	1 630 000	1.33	1.4	0.3
Royal Tharsis	810 000	2.49	1.5	0.2
'A' and Intermediate Lenses	1 390 000	1.39	1.5	0.2
Crown 3	1 190 000	1.67	4.0	0.4
Crown 12 West	8 000	8.75	30.2	0.2
<b>TOTAL</b>	<b>20 498 000</b>	<b>1.49</b>	<b>2.8</b>	<b>0.4</b>

Over the year, 1 442 400 tonnes were mined from reserves, including 9 400 tonnes from Crown 12 West.

The figures for ore reserves have been revised in the light of new drill hole information and their direct comparison to earlier figures would therefore produce meaningless results.

Projections from exposures of ore by development and diamond drilling indicate the existence of 'Possible Ore', as follows:—

Mine	Ore (tonnes)	Copper (%)	Silver (g/tonne)	Gold (g/tonne)
POSSIBLE ORE (NOT RESERVES)				
Western Tharsis	630 000	0.9	1.0	0.1
Royal Tharsis	70 000	2.0	1.5	0.2
North Lyell	100 000	6.0	30.0	0.1
Cape Horn	370 000	1.1	3.0	0.4
Prince Lyell	24 700 000	1.3	3.0	0.4
'A' and Intermediate Lenses	1 400 000	1.2	1.5	0.2
TOTAL	27 270 000	1.3	3.0	0.4

### MILLING

No major alterations were made to installed plant in 1981–1982, which was the first full year of operation of the new grinding circuit.

In the grinding section, the chrome-molybdenum steel wear lining in the primary mill reached end of life at 4 465 hours of use and was replaced in August 1981 by a lining of Skega rubber. At year end, this rubber lining had operated for 5 000 hours and significant advantage over steel linings from a life and cost point of view was indicated through its use.

In the flotation circuit, copper recovery was down slightly on the previous year despite finer grinding being carried out. The textural change in the ore related to a higher pyrite content which while noted in 1980–1981 was more pronounced in 1981–1982.

Use of a filter aid to maintain acceptable filter-cake moisture levels was found necessary throughout the year. Alternative products were tested, but Aerodri 100 remained the standard.

### CAPITAL EXPENDITURE

Expenditure on capital items was as follows:—

	\$	\$
Plant Items —		
Underground trackless equipment	736 000	
Vehicle replacements	161 000	
Surface buildings and works	58 000	
Miscellaneous	98 000	
		1 053 000
Underground Installations		375 000
Mine Development —		
Southern Exhaust Airway	128 000	
Main Decline extension	556 000	
No. 1 Shaft pump station	1 260 000	
		1 944 000
Total		\$3 372 000

Underground-equipment purchases included one Eimco 918 LHD machine, one Atlas Copco Boomer H125 development jumbo and one bulldozer for road maintenance work. Underground installations included completion of the 30 Series Workshop, installation of the south hangingwall feeder on 14 Level and the purchase of a reciprocating plate feeder for installation at the south footwall orepass on 14 Level.

### MANPOWER

Including contractors' personnel, the average number of persons employed over the year was 742.

**CLEVELAND TIN N.L., LUINA**

This company, reviewed under Tin, produced 31 885 tonnes of copper concentrates containing 631 tonnes of copper valued at \$993 370.

**ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY**

This company, reviewed under Zinc, produced 4 484 tonnes of copper valued at \$3 345 554.

**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 1977	98 923	68 193 980	1980*	641	10 873 565
1978	1 618	8 768 832	1980-1981	1 248	18 836 569
1979	1 490	13 884 521	1981-1982	1 676	18 867 913
			<b>Total</b>	<b>105 506</b>	<b>\$139 425 380</b>

\* January to June.

**THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN**

This company recovered 418 kilograms from sludge in the electrolytic copper refinery valued at \$4 668 464.

**ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY**

Concentrates produced by this company contained 1 258 kilograms valued at \$14 198 330.

**AMAX IRON ORE CORPORATION (MINERALS EXPLORATION DIVISION)**

Harts Shaft recovery operation was halted at a depth of 55 metres below the shaft collar and a permanent concrete shaft lining and steel support sets were installed to a depth of 38 metres below this collar.

**LEFROY AND MATHINNA GOLDFIELDS**

There was no further progress either in prospecting, mining or treatment during the year.

**LISLE GOLDFIELD**

Small scale mining and prospecting were carried out during the year.

**IRON ORE (PELLETS)****SAVAGE RIVER MINES, SAVAGE RIVER AND PORT LATTA**

<i>Production</i>	<i>Tonnes</i>
Savage River —	
All material	13 357 432
Rock to waste	8 421 680
Crude ore	4 935 752
Concentrate produced	2 021 301
Concentrate pumped	2 020 551
Port Latta —	
Pellets produced	1 994 263
Pellets shipped	2 062 637
Pellet inventory	133 686
Concentrate sold	231
Local pellet sales	3 527

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

## MINING

Pit operations were concentrated on the mining of the second slice of the East Wall to final outline, and by the end of the year this work was down to the 15th bench. The bulk of the ore supply was obtained from the East Wall, with the mining of the first slice of benches 18 and 19, in the north end only, supplying the balance. The pit floor is now at 19 bench in the north end, 18 bench in the south and the central core is at the 17 bench horizon. In view of the relative thinness of the ore in this zone and stability problems, consideration is being given to maintaining the central core as a buttress pillar.

The horizontal drain-hole program continued with the completion of drilling on the 13th bench of the East Wall. A review of the dewatering and depressurisation program indicated that it should be modified for the 16th bench. It was decided that improved results may be obtained with a series of shorter, more closely spaced holes confined to the known problem areas. Pre-pinning in zones of fractured ground is now standard practice. A large slope failure on the Evans/OCB fault complex extended from 14 bench up to the main southern haulage road. The slope was reformed, the road moved east, the crest reinforced with rock pins and rails, and the drainage in the area improved.

The engineering and economic appraisal of the proposed tailings dam-waste rock dump in the Main Creek Valley was completed and initial foundation work for the dam started. As the pit deepens the siting and construction of large waste dumps on the lease is presenting an increasing problem. This is due to the local topography and the past utilisation of the relatively level areas close to the pit. Development of the Northern Deposit has begun with the construction of a haul road and a crossing over the Savage River. It is planned that this access will be completed early in 1983 and that production should start in May 1983. No details are yet available, due to the limited drilling undertaken, to assess the extent to which ore reserves have been increased by the acquisition of the Northern leases.

## MILLING

The coal feed systems were extended to the last two remaining furnaces and realised the predicted improvement in capacity and product. Energy conservation and cost reduction have been the main thrusts of operating improvements for the past year. The initial part of the program was an energy audit to establish potential areas of waste heat recouplement and utilisation. Two stages of that program have been initiated —

- (1) Chunkbreaker cooling water is now utilised to heat the filter feed pulp.
- (2) Design is in progress to recover waste heat from the top gas scrubber system to further heat the pulp feed to the filters.

Intermediate shaft air inlets had been fitted to four furnace lines with work in progress on the fifth furnace at the end of the year. These modifications have indicated that maximum power demand in future years will be reduced by 1.5 MW, and that maximum plant capacity could reach 3.2 million tonnes per year but, the preferable option, of using four furnaces on line at any one time, will be adopted to achieve production targets. The distillate fired hot water boiler is being replaced with an electric unit of 350 kW capacity.

The product spillage sump has been relocated outside the pellet plant with fines being removed from the sump by front end loader. Following drying, the fines are re-introduced to the pulp feed.

To service the balling conveyor systems a new scissor lift platform has been purchased and, in replacing standard scaffolding and ladders, has resulted in safer, tidier and more expeditious operations.

Pellets were shipped on 26 vessels averaging 79 332 tonnes per shipment. Four direct shipments of furnace oil were received totalling 28 813 tonnes. Bentonite imported totalled 17 460 tonnes, in two shipments.

**CAPITAL EXPENDITURE**

The main areas of capital expenditure were —

*Savage River* —

- Northern deposit acquisition and development.
- Purchase of one new Caterpillar 245 excavator.
- Slope dewatering and stabilisation.
- Purchase and erection of a new large diesel storage tank.
- Plant corrosion control.
- Townsite maintenance.

*Port Latta* —

- Structural steel and corrosion protection programs continued for the maintenance of major assets.
- Installation of intermediate shaft air addition to all furnaces was effected.
- Wave protection of the electrical distribution centre on the off-shore loading system was installed.
- The coal feed to all furnaces was completed as a fully integrated system.

In addition at Savage River the 33/11 truck fleet's engines were replaced with new G.M. series 92 engines.

Employment remained at the level of the previous year. A six week industrial dispute in April and May 1982 seriously affected production and development.

There was a fatal accident at Savage River when an employee fell into the central well of the tailings thickener.

**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 1978	238 830	1 108 242	1980*	8 400	84 000
1978	14 325	105 800	1980-1981	20 600	211 210
1979	16 246	154 660	1981-1982	25 490	272 000
			Total	323 891	\$1 935 912

\* January to June.

A. Pearson continued to mine hematite at the Iron Cliffs mine, and supplied a cement works with 25 490 tonnes of hematite valued at \$272 000.

**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 1978	528 472	93 704 368	1980*	7 217	6 867 850
1978	16 907	9 573 050	1980-1981	12 710	8 536 777
1979	16 375	17 140 828	1981-1982	23 976	15 798 934
			Total	605 657	\$151 621 807

\* January to June.

**ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY**

This company, reviewed under Zinc, produced 28 204 tonnes of lead concentrates and the total content of lead in the lead, zinc and copper concentrates was 30 803 tonnes.

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

Production of mineral samples of crocoite realised \$5 700 with stock on hand being valued at \$20 000. An attempt to work the lode previously discovered underground, higher up the hill by a small open-cut was abandoned when the specimens were found to be of poor grade. Underhand stoping was continued on good grade specimen material. Two men worked the lease with demand for good grade strong.

**RED LEAD AREA**

Production of specimen crocoite realised \$12 200 with stock on hand assessed as being worth \$2 000. The open-cut was extended along the strike of the lodes and, although the crocoite was of poorer quality than that of the Adelaide Mine, specimen material continued to be visible in the face.

**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 410 tonnes was valued at \$14 342.

**MERCURY**

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 45 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 32 961 tonnes of silica valued at \$824 025.

## 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 58 414 tonnes of silico-manganese valued at \$22 195 770. 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 71 232 kilograms of silver was produced for a value of \$16 654 659 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.

## QUANTITY AND VALUE OF PRODUCTION

Year	Kilograms	Value \$	Year	Kilograms	Value \$
Prior to 1978	2 081 523	74 986 171	1980*	27 227	19 979 634
1978	68 456	10 475 642	1980-1981	36 214	15 417 902
1979	62 705	18 657 637	1981-1982	71 232	16 654 659
			Total	2 347 357	\$156 171 645

\* January to June.

## SULPHUR

Sulphuric Acid is produced in the roasting of the zinc concentrates from the West Coast mines of the Electrolytic Zinc Company of Australasia Limited at their Risdon plant.

## SULPHUR AS SULPHURIC ACID: SOURCE, QUANTITY AND VALUE OF PRODUCTION

Year	From zinc concentrates		From pyrite concentrates			Totals	
	Mono tonnes	\$	Pyrite Tonnes	Acid		Mono tonnes	\$
				Mono tonnes	\$		
1957-1977	1 181 335	16 782 685	1 661 030	2 387 651	44 415 211	3 568 986	61 197 896
1978	109 626	2 590 668	201 419	242 438	6 723 816	352 064	9 314 484
1979	87 695	2 025 134	41 018	101 932	2 962 946	189 627	4 988 080
1980*	53 510	1 004 383	Production ceased			53 510	1 004 383
1980-1981	56 820	1 345 666	....	....	....	56 820	1 345 666
1981-1982	120 660	4 360 993	....	....	....	120 660	4 360 993
Totals	1 609 646	\$28 109 529	1 903 467	2 732 021	\$54 101 973	4 341 667	\$82 211 502

\* January to June.

TIN  
QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1873-1977	211 672	371 692 916	1980*	3 282	52 867 430
1978	7 271	84 521 356	1980-1981	7 027	92 826 175
1979	6 617	94 511 996	1981-1982	6 981	98 834 194
			Total	242 850	\$795 254 067

\* January to June.

**ABERFOYLE EXPLORATION PTY LTD**

Work continued on the Queen Hill consolidated lease 36M/81 during the year, the main emphasis being on diamond drilling. Associated Diamond Drillers supplied 3 Mindrill 10L Rigs and drilled a total of 17 holes for a penetration of 5 524 metres. The distribution of these holes was —

Severn orebody — 8 holes.

Montana orebody — 8 holes.

Golf Course orebody — 1 hole.

All cores were logged, photographed and split by resident geologists.

Five men (excluding the drill crews) were employed full-time on the lease. Expenditure was \$721 000.

Samples of ore both bulk and from the core, were tested at Aberfoyle's C.M.S. laboratory at Wivenhoe.

**AMDEX MINING LIMITED****ENDURANCE MINE**

Tin production for the year came from the No. 1 mine, the Riverside mine and the Clifton mine. By the end of the year only the Clifton mine remained in production.

**PIONEER MINE**

This mine was closed down during the latter half of the period under review, when the plant and equipment were placed on a care and maintenance basis.

The Amdex workforce was reduced from 57 to 17 during the year.

**BALFOUR FIELD****BALFOUR TIN MINES**

P. Laan treated 13 000 cubic metres to produce 19.6 tonnes of 65 per cent concentrate valued at \$141 800. Five persons were employed on the leases during the year. A Finlay Hydrascreen screening plant was leased, a Caterpillar 930 wheeled loader was purchased, and a tin separating plant is under construction.

**S. TATLOW**

Three men worked on this underground prospect during the year. Thirteen cubic metres of ore were treated to yield 4.0 tonnes of 50 per cent concentrate (included in this parcel was 0.24 tonnes of specimen stone averaging 29.8 per cent). Extensive experimentation was conducted in an attempt to improve both the recovery and the grade of the concentrate. A twin cell flotation unit was acquired and the ball mill modified and elevated to assist with gravity feed to the table.

**CLEVELAND TIN LIMITED, LUINA**

T. Evans, Mining Engineer, Burnie reports —

Over the twelve months 331 474 tonnes of ore were mined, but depressed metal prices resulted in the Company reducing the strength of its workforce in March 1982 which had the effect of lowering the level of production for the year.

Over the same period however, 412 810 tonnes of material were treated at the concentrator with the supplementary feed being obtained from existing stockpiles of ore and H.M.S. float material.

The concentrator feed had an average grade of 0.54 per cent tin as cassiterite and 0.26 per cent copper, producing concentrate containing 130 207 metric-tonne units of tin and 681.2 tonnes of copper.

The ore hauled from the mine was obtained 79 per cent from stoping and 21 per cent from mine development from the following sources:—

								<i>tonnes</i>
Hall's lenses	....	....	....	....	....	....	....	245 026
Henry's lenses	....	....	....	....	....	....	....	67 558
B-South lenses	....	....	....	....	....	....	....	9 152
Khaki lenses	....	....	....	....	....	....	....	8 938

Waste rock amounting to 101 675 tonnes was also hauled from the mine during the period.

### STOPING

During the year, 183 618 tonnes of ore were broken in stopes and 36 938 metres of stoping holes were bored, 12 209 metres of which were of down holes, 115 mm in diameter. Strike retreat sublevel open stoping was phased out and open stoping by benching with downholes became the method usually employed.

Bored reserves, at 424 604 tonnes, remained substantially as they were at the end of the previous year.

Stringent grade control measures were introduced underground in March 1982 and were kept in force throughout the remainder of the year.

### MINE DEVELOPMENT

The mine development achieved during the year was as follows:—

								<i>Metres Advanced</i>
Decline	....	....	....	....	....	....	....	557
Drives and crosscuts	....	....	....	....	....	....	....	1 419
Raises in ore	....	....	....	....	....	....	....	143
Raises in waste	....	....	....	....	....	....	....	85
Total	....	....	....	....	....	....	....	2 204

Advance of the Main Decline continued to just below the 26 Level at the end of the year. In addition, some subsidiary declining was carried out to gain access to the Hall's orebody on 21 Level.

Development activity reduced in March 1982 as a consequence of labour retrenchments and remained at a low level for the remainder of the year.

### DIAMOND DRILLING

Diamond drilling activity continued at approximately the same level as for the previous year. The amount achieved was as follows:—

								<i>Metres Drilled</i>
Production assistance	....	....	....	....	....	....	....	6 096
Underground exploration	....	....	....	....	....	....	....	3 664
Total	....	....	....	....	....	....	....	9 760

Production-assistance drilling continued at an intensified rate from surface as well as 17, 18, 20 and 21 levels with a view to defining the limits of Henry's Lenses and from 11 Level with a view to outlining the Upper Battery Lens. Underground-exploration drilling was carried out aimed at establishing the presence of deep Hall's ore at the north end of the mine and at evaluating the Foley's Zone of predominantly tungsten mineralisation in the deep central footwall.

Surface-exploration activity was meanwhile deferred because of the large amount of underground work undertaken.

#### ORE RESERVES

As at 1 June 1982 the mineable ore reserves were reported as 1 200 000 tonnes with a grade of 0.74 per cent tin as cassiterite and 0.32 per cent copper.

#### METALLURGICAL PERFORMANCE AND DEVELOPMENTS

Tin and copper recoveries both increased marginally overall (from 61.8 per cent for 1980-1981 to 62.4 per cent for 1981-1982 and from 53.3 per cent for 1980-1981 to 58.3 per cent for 1981-1982, respectively). Both recoveries however improved markedly from March 1982 onwards, when the concentrator treated material of better head grade.

Tin recovery also improved as a result of adding more scavenging cells to the flotation circuit and introducing more effective reagents.

A more consistent concentrate grade was obtained by replacing the vanners in the treatment circuit with spiral concentrators, shaking tables and tin flotation.

#### CAPITAL EXPENDITURE

Expenditure on capital items during the year was —

	\$
Replacements (net of disposals) ....	154 000
Increasing/maintaining production ....	326 000
Welfare/environment/safety ....	36 000
Exploration ....	144 000
Development ....	519 000
<b>Total</b> ....	<b>\$1 179 000</b>

This is the first time that exploration and development have been capitalised.

#### MANPOWER

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

Staff — all departments ....	63
Award —	
Mining ....	46
Milling ....	52
Engineering ....	79
Other ....	16
<b>Total</b> ....	<b>256</b>

The workforce strength was reduced in March 1982 by means of retrenchments. At 30 June 1982, the employee level was 230.

## **CONSOLIDATED EASTERN TIN, COLES BAY**

Production for the period was only 87 kilograms of concentrate. The mine changed ownership during the year and considerable preparatory work was carried out to allow increased production. New jigs were purchased.

## **MINOPS PTY LTD AND APOLLO INTERNATIONAL MINERALS N.L.**

### **ST DIZIER TIN PROSPECT**

Exploration at St Dizier is being undertaken on consolidated M.L. 44/82 in conjunction with Renison Goldfields Consolidated Limited, who act as managers for the venture. Diamond drilling of a skarn horizon, located within sediments near the contact with the Heemskirk Granite, continued with the aim of delineating associated tin mineralisation. Five holes were completed during the year, a total of 1 704 metres. Much investigative effort was directed to analytical and petrographical understanding of a complex mineral assemblage. Tin is present in the ore averaging about 0.5 per cent Sn, as cassiterite and the magnesium hydroxide, schoenfliesite. Further metallurgical test work was undertaken with results to date indicating that simple gravity flotation processes will not realise satisfactory recoveries and that fuming may be necessary.

Expenditure on the lease totalled \$175 526. Reserves are assessed as 5 million tonnes at an average grade of 0.5 per cent Sn.

### **OONAH BASEMETAL PROSPECT**

The joint venture (C.R.A. Exploration Pty Ltd, 70 per cent) continued the drilling program with eight holes, a total of 1 444 metres, to test the black shale horizon to the north and south of the old Oonah mine. Results were disappointing with only limited sulphides and minor tin mineralisation being encountered. Further work will be directed to assessing the potential of the Oonah quartzites to the north-west of the old mine site.

Expenditure on the lease was \$127 262.

### **RAZORBACK MINE**

Following a surface Crone pulse electromagnetic geophysical survey and geochemical soil sampling to define anomalous geophysical locations nominated by an earlier DIGHEM aerial survey, two diamond drill holes were completed. Neither hole showed economic mineralisation. Another hole drilled to test anomalies within the sediments to the south-west of the Razorback open-cut located only minor sulphide mineralisation.

Expenditure was \$170 287.

### **GODKIN TIN PROSPECT**

The partners continued the diamond drilling program on M.L. 62M/75. Five holes were completed for a total depth of 1 546 metres. Tin mineralisation was intersected in each hole with occurrences being associated with pyrrhotite and quartz, and controlled by fracturing. Hole spacings were such that interpretation, by stratigraphy and mineralisation between holes, posed problems. Accordingly, further geological mapping will be undertaken with closer spaced drilling.

Expenditure was \$147 885.

### **GRAND PRIZE MINE**

The managers of the exploration on these leases (Renison Limited) report that south of the Renison mining lease a core drilling program at Grand Prize yielded encouraging results and further drilling is planned.

**NORTH HEEMSKIRK FIELD**

R. S. Laffer treated 9 670 cubic metres to produce 9.7 tonnes of 62 per cent concentrate valued at \$66 856. The area being worked was completed in December and rehabilitation was completed in February. Construction of a new plant on the new leases was completed in September 1982. Three men were employed on the leases throughout the year.

**RENISON LIMITED, RENISON BELL**

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

**PRODUCTION**

A total of 642 909 tonnes of ore was hauled from the mine during the year. The sources of this ore were as follows:—

<i>Orebody</i>	<i>Tonnes</i>
Penzance	120 452
Colebrook	113 484
North Stebbins	81 914
Melba	90 175
South Stebbins	15 948
Murchison	20 037
Ring	96 558
Argent	454
Howard	35 125
Dreadnought	5 585
Sligo	1 260
Bassett	9 114
Federal	51 396
Sundry places	1 407
	642 909

**CONCENTRATOR PLANT**

Ore treated (tonnes)	642 852
Ore grade(% Sn)	1.16
Concentrate produced (net dry tonnes)	10 521
Tin metal in concentrate (tonnes)	5 152
Overall metal recovery (%)	71.64

**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	....	116.7	116.7
North Bassett	62.6	182.0	244.6
South Bassett	6.3	....	6.3
Sligo	12.0	4.7	16.7
North Stebbins	283.2	2.8	286.0
Colebrook	15.8	72.7	88.5
Penzance	165.6	75.5	241.1
Howard	14.3	206.5	220.8
South Stebbins	27.6	548.5	576.1
Murchison	12.2	76.0	88.2
Dreadnought	54.1	196.4	250.5
Ring	238.0	284.1	522.1
Argent	4.0	120.1	124.1
Federal	10.3	13.5	23.8
	906.0	1 899.5	2 805.5
<i>Raising</i>	107.5	218.6	326.1
Total Development	1 013.5	2 118.1	3 131.6

Top priority was again given to the development of the No. 3 Decline System, which when complete will service mining of the North Stebbins and South Stebbins orebodies. Two sill drives on ore were completed in the North Stebbins orebody. Elsewhere in the mine, significant advance was made in development of the Ring orebody, the Renison decline and the North Bassett hangingwall exploration drive. In addition, access was gained to the upper level of a proposed stoping block in the Argent orebody.

The advance in the Renison decline amounted to 73.7 metres. At the end of the year the face was 533 metres below surface, or 327 metres below sea level.

The North Bassett hangingwall exploration drive, which is being developed to serve as a return airway to the proposed No. 7 Northern Upcast Ventilation System as well as for exploration purposes, passed through water-bearing country during the year and several grout-injection campaigns have had to be carried out to stem water inflows. Approximately thirty tonnes of cement grout have so far been injected.

### STOPING

Stoping continued to be carried out by mechanised cut and fill; waste rock from development and heavy-media reject were used for the fill.

The Ring orebody continued to be a production source but faulting prevented the production target for the year being achieved. Federal ore from two stopes was mined during the second half of the year to make good the potential deficit.

### MILLING

Overall plant availability decreased from 81.8 per cent for 1980–1981 to 78.6 per cent for 1981–1982, industrial disputes being mainly blamed for the decrease.

Metallurgical performance was satisfactory, having improved progressively during the year as the teething troubles associated with the expansion of the plant were overcome and a number of operating improvements were made. The tin recovery of 71.6 per cent was the second highest ever achieved by Renison Limited and the concentrate grade of 48.6 per cent tin was the highest since the introduction of cassiterite flotation in 1970.

Research activity was maintained at a high level, with top priority being given to work on the development and improvement of computerised process control. Evaluation testwork on Renison ores and on samples of materials from areas outside the mineral lease was also carried out on a priority basis.

### EXPLORATION AND ORE RESERVES

Exploration in the Renison mine area continued to be directed towards defining extensions to known ore zones and towards discovering additional Renison-type orebodies on both the Renison mineral lease and the E.L. 42/71 area, which adjoins the lease to the south and west. As a result of this work, the Renison mine geological ore reserves were increased to 17.1 million tonnes at 1.1 per cent Sn.

Details of the ore reserves as at June 1982 are as follows:—

Ore Type	Proved		Probable		Total	
	Tonnes 000's	Grade % Sn	Tonnes 000's	Grade % Sn	Tonnes 000's	Grade % Sn
Stratabound	3 065	1.4	4 035	1.2	7 100	1.3
Stratabound/Fault	260	1.0	3 530	1.0	3 790	1.0
Fault	2 130	0.8	3 570	0.9	5 700	0.8
Fracture (Melba)	510	1.1	.....	.....	510	1.1
Totals	5 965	1.1	11 135	1.0	17 100	1.1

**CAPITAL EXPENDITURE**

Expenditure on capital items over the twelve month period ended 30 June 1982 was as follows:—

	\$
Community projects	492 070
Expansion program	23 820
Thermal upgrading plant	978 917
Lease buildings and services	894 521
Underground equipment	307 101
Mill plant and equipment	50 042
Instruments, laboratory and workshop equipment	63 196
Office equipment	93 511
Motor equipment	566 891
Mine development	272 050
	\$4 044 957

**COMMUNITY PROJECTS**

Expenditure on Community Projects included \$257 056 paid towards the building of seven new houses at Zeehan and \$205 680 for replacement domestic oil heaters.

**THERMAL UPGRADING PLANT**

The amount shown against this item was spent on engineering design work.

**LEASE BUILDINGS AND SERVICES**

Accounting for the bulk of the expenditure against this item were the following:—

	\$
Mine model facilities	23 144
Core logging shed	53 728
Tailings dam extension	499 778
Argent Dam pipeline upgrade	191 104
Compressor and transformer location	63 719

**UNDERGROUND EQUIPMENT**

Two mine-exhaust fans were installed during the year. One, with a capacity of 165 cubic metres/second, was installed at surface on the No. 4 Southern Upcast System. The second, with a capacity of 95 cubic metres/second, was installed in No. 5 Adit on the No. 8 Ring Upcast System. The total installed mine ventilation capacity was thereby increased to 500 cubic metres/second.

In addition, improvements were effected to the mine drainage system and work commenced on the establishment of a 11 kV distribution system underground. A second rising main, placed in boreholes, was installed between the 1950 pump station and surface. Cable laying for the new 11 kV distribution system commenced underground.

**MOBILE EQUIPMENT**

The mine production haulage fleet was increased to nine Caterpillar 769 trucks with the purchase from Gunpowder Copper Limited of a 769B truck. A new Caterpillar 980C loader, a small bulldozer and a tractor were also purchased.

**MANPOWER AND SAFETY**

At 30 June 1982 the workforce, including staff and award workers, was as follows:—

Mining	123
Metallurgical	159
Engineering	178
Administration	43
Geology	16
Employee relations	26
<b>Total</b>	<b>545</b>

The turnover of permanent Award employees during the year was 26.1 per cent. This again is the lowest figure for labour turnover on record.

**ROSSARDEN MINES LTD**

All underground operations at both the Rossarden mine and the Storeys Creek mine were closed down during the latter half of the period under review following unsuccessful attempts to delineate sufficient economically viable ore reserves.

Milling of the old jig tailings continued after the closure of the mining operations.

The workforce was reduced from 151 to 34 during the period.

**SMALL PRODUCERS**

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

**BRANXHOLM - DERBY - RINGAROOMA**

<i>Name of Producer</i>	<i>Tin Concentrates Tonnes</i>	<i>Contained Tin Metal Tonnes</i>	<i>Value \$</i>
Banks, K.	1.104	0.068	974
Barnett, L. M.	0.231	0.154	2 239
Betts, H. E.	0.042	0.027	392
Johnson, N.	1.530	0.977	14 201
Johnson, N. C. and V. A.	6.001	3.949	56 330
Johnston, I.	0.105	0.075	1 129
Jones, E.	5.210	3.670	52 626
Kerrison, D.	0.046	0.029	403
Kerrison, K.	4.445	2.923	42 641
Mutual Mining	0.392	0.243	3 431
Oliver, P.	0.050	0.031	414
Phildes Mining	4.120	2.856	40 265
Quillerat, E.	0.182	0.088	1 279
Rainbow, W.	1.362	0.964	13 190
Reynolds, D. and T.	0.752	0.554	8 062
Taipan Tin	0.226	0.144	2 121
Yaxley, T.	0.251	0.176	2 588

## 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	2-529	1-806	26 161
Blackberry, D. M.	3-932	2-730	37 636
Curtis, K.	0-118	0-059	831
Kerrison, M. J.	0-052	0-037	538
Lawry, D.	0-424	0-299	4 304
Lawry, R. C.	3-758	2-642	37 330
McDonald, W.	0-036	0-017	256
Moore, N.	6-658	4-745	67 093
Mott, J.	0-050	0-036	542
Reynolds, M.	2-516	1-847	26 271
Summers, I.	0-487	0-330	4 282
Wilcox and Standage	0-107	0-063	922
Wood, C. V.	8-375	6-166	86 602
Wood, V.	11-084	8-082	115 343
Worbey, R.	4-672	3-432	48 333

## EAST COAST

<i>Name of Producer</i>	<i>Tin Concentrates Tonnes</i>	<i>Contained Tin Metal Tonnes</i>	<i>Value \$</i>
Dwyer, D. B.	0-047	0-030	452
Dwyer and Reynolds	0-053	0-039	567
Fitzallen, G. L.	0-048	0-035	527
Fitzallen, T. H.	0-048	0-035	527
Franks, W.	0-825	0-574	8 259
Packwell Mining	0-839	0-627	9 439
Reynolds, J. P.	0-104	0-072	1 049

## 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>
Glozier, M.	0-186	0-127	2 126
Josic, S.	0-108	0-033	497
Kenworthy, D.	0-293	0-177	2 524
King, C. D.	2-694	2-020	29 335
Laan, M.	1-182	0-832	11 902
Laan, P.	16-531	10-434	148 652
Laffer, R.	13-612	8-128	116 866
Machen, Gale and Phillips	0-146	0-064	963
Ralph and Guy	5-694	4-046	58 832
Smith, A. R.	0-066	6-042	621
Willson, P. R. H.	4-290	3-197	45 776

## TITANIUM

Titanium as titanium dioxide is reported under Foreign Ores.

## TUNGSTEN (SCHEELITE)

## QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes (Concentrates)	Tonnes (WO <sub>3</sub> )	Value \$
1917 to 1977	42 781	11 619	149 041 839
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
1980-1981	3 536	2 771	34 707 138
1981-1982	3 238	2 356	26 552 010
Total	58 143	23 038	\$287 476 572

## KING ISLAND SCHEELITE, GRASSY

## PRODUCTION STATISTICS

Ore Mined (tonnes) —		
Dolphin Mine	215 913	
Bold Head Mine	144 795	
Total	360 708	
Mill throughput (tonnes)	343 275	
Average head grade (%WO <sub>3</sub> )	0.76	
Gravity concentrates (tonnes)	2 007	
Artificial scheelite concentrates (tonnes)	915	
Total concentrates (tonnes)	2 922	
Tungstic oxide (MTUs)	216 634	
Concentrate grade (%WO <sub>3</sub> )	74.17	
Recovery (%)	83.08	
Molybdenum concentrates (tonnes)	44.93	

Number of persons employed as at 30 June 1982.

	Males	Females	Total
Surface	250	20	270
Underground	62	...	62
	312	20	332

R. Billingham, Senior Mining Engineer, Hobart reports —

During the year the price of scheelite dropped from \$132 to \$98 per unit and, due to poor sales, the stock of concentrates increased rapidly. Steps were taken to reduce costs and production, which unfortunately included the retrenchment of 104 employees and the temporary closure of the mine during May and June. The total number of employees at the end of the year was 332 compared with 486 at the end of 1980-1981. Budget mine ore production was also reduced from 400 000 to 300 000 tonnes per annum.

**MINING****Dolphin Mine**

Development advances made were —

	m
Main Decline and decline by-pass	167
Level drives	1 080
Ramps	332
Raise boring	12
Hand raising	98
<b>Total</b>	<b>1 689</b>

Generally advances were in line with scheduled requirements. The Main Decline was halted in poor ground at 286 m below sea level and no further advance has been scheduled. A decline by-pass, to provide a second access for production purposes to the lower stoping areas was started. Considerable development was carried out in the Lower Wedge ore body to open up the proposed long hole stopes and extensive cable bolt support requirement in this area delayed start-up of production. Stoping, mainly in the post-pillar cut and fill stopes, produced 171 605 tonnes of ore with the Upper Central and Lower Pit stopes being the most productive. Additional support work in the Upper Wedge stope permitted the removal of the sill pillar and the stope was broken through to -75 level.

In the Lower Wedge ore body, where the ore steepens sharply adjacent to the Decline Fault, preliminary development of strike drives and crosscuts was almost completed on four levels. Slot raises were put up between the -240 m, -225 m, and -200 m levels and the first blasts were carried out in the long hole stope W62. Some 3 200 tonnes of high grade ore were extracted from this open stope using a remote controlled loader.

Monitoring of mine stability continued and the Rock Mechanics section liaised with C.S.I.R.O. and independent consultants. Levelling devices, inclusion cells, tape and multi-point extensometers were installed. No abnormal movement or water inflow was recorded.

**Bold Head Mine**

Development advances made were —

	m
Main Decline	44
Waste development	524
Stope development	746
Hand raising	323
<b>Total</b>	<b>1 637</b>

Meterage advanced was in line with requirements except that no raise boring was carried out because of the curtailment of operations. Decline advance was also interrupted to allow for re-assessment of geological information ahead of the advancing face. The main sources of ore were again the fault block and C1 and C2 lenses. The P70 Cavo cut and fill stope was completed up to O54 and mining in that stope has ceased. Extraction of ore in D Lens was also completed. Development in waste in M52 to a proposed ventilation raise position was temporarily stopped because of the reduced operations at the mine. By the end of the year a single shift only was being worked.

**MILLING**

Mill throughput at 343 275 tonnes was 62 366 tonnes below original budget due to the production cuts in December, April, May and June. Mill availability was very good and recovery at 83.08 per cent satisfactory. The main threat to good recovery was dirty circuit water because of the low level of the freshwater dam.

By April, the crushing section had been reduced to a single shift, 5 day week operation and was able to supply sufficient tonnage to the grinding section. Minor changes continued to be made in the gravity section. These included redirection of the regrind spiral concentrates to the middlings tables and spirals, and the commissioning of fine size screens. Problems were experienced in the flotation section due to shortages of some reagents.

In the artificial scheelite plant calculated plant recovery was 96.88 per cent. Although the heat loss problem in the autoclaves has not yet been solved, the autoclave leaching section had an availability of 83.4 per cent. Both tungsten and molybdenum precipitation sections operated well.

#### MINE MAINTENANCE

The continuation of the planned maintenance/overhaul program of underground mobile equipment ensured high mechanical availability and helped contain costs. In addition to the normal mill maintenance, a complete overhaul was carried out to the crusher apron feeder.

Overhauls were carried out to three of the Mirrlees generators in the powerhouse. Energy generation fell by 8.4 per cent to 37 650 000 kWh due to the close-down of the mine for one month.

#### SAFETY

There was one fatal accident during the year when M. L. Robins was fatally injured in a rock fall in the Central Stope.

#### TASMINEX N.L., KARA MINE

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

#### PRODUCTION

	Tonnes
Ore treated	126 823
Concentrate (65% WO <sub>3</sub> )	286.2
Concentrate (25% WO <sub>3</sub> )	29.7
Magnetite (+60% Fe)	63 400

During this twelve month period production has been entirely from the Kara No. 1 orebody in the main pit and has been the first attempt to mine the main ore zone, as indicated by the diamond drilling undertaken prior to the start of mining. Previous mining had been concentrated on the extraction of sporadic offshoots, which generally occurred in the overlying weathered zone of the main ore and determined by visual observation. There has been a consequent improvement in the grade of the mill feed, but the ratio of overburden to ore has increased and presented its own problems. Whereas in the past the overburden was bulldozed to one side, with the increasing depth of the main ore and the accumulated dumps in the pit, provision for dumping outside the pit and the consequent increased haulage has added to mining costs.

#### EXPLORATION AND RESERVES

McIntyre Mines (Australia) Pty Ltd continued their exploration activities on E.L. 17/68 and consolidated mining lease 105M/77. In particular, infill diamond drilling in the Kara No. 1 and Kara North orebodies appears to indicate a slight increase in mineable ore reserves but the results are still being assessed. The Kara North orebody is now estimated to contain 378 540 tonnes (geological reserves) with an average grade of 1.02 per cent WO<sub>3</sub>.

**CAPITAL EXPENDITURE**

The total capital expenditure for the twelve month period was \$568 700 with the major items being —

	\$
International hydraulic excavator ....	125 000
International 520 front-end loader ....	89 600
Tamrock hydraulic drill rig ....	120 000
'Rapid' magnetic separator ....	45 000

**MILLING**

The ore was treated by primary and secondary crushing, grinding in a ball mill, wet drum magnetic separation, jigging and concentrating on Wilfley tables. This concentrate was then further upgraded by high-intensity dry magnetic separation. All the scheelite concentrate, including the low grade, was sold and shipped to Europe while the magnetite was stockpiled pending possible future sale. Design was finalised and site clearing carried out for the construction of new large capacity tailings dam, but work was delayed by the onset of winter. Following recommendations by the Central Metallurgical Services Division of Aberfoyle Limited a number of minor improvements were made in the concentrating plant with further modifications planned as time and money permit.

**SAFETY**

The concentrator operated on three eight-hour shifts per day, five days per week, with maintenance and repairs being carried out at weekends. The open pit was worked one eight-hour shift per day, five days per week. The total labour force averaged 27 men of whom 23 were directly employed by Tasminex N.L.

**TUNGSTEN (WOLFRAM)**  
QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes (Concentrates)	Tonnes (WO <sub>3</sub> )	Value \$
1899 to 1977	21 554	2 586	41 431 365
1978	196	140	1 691 781
1979	126	111	1 362 604
1980 (January to June)	88	63	794 199
1980-1981	475	339	4 251 171
1981-1982	152	110	1 259 338
Total	22 591	3 349	\$50 790 458

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

On 24 July 1981 the mine and plant were put on a care and maintenance basis, following the retrenchment of most of the workforce, and, in an effort to delineate further reserves, two deep diamond drill holes were drilled. The results obtained from these holes did not provide sufficient encouragement to warrant further drilling or a continuation of operations and accordingly, on 26 May 1982, the mining, milling and surface equipment, and installations were sold at a public auction.

During the care and maintenance program two men operated the plant full-time with casual labour being employed for specific jobs. Initially the 'high grade ore' stockpile was first depleted, results obtained being —

Mill throughput (tonnes) ....	1 011
Clean concentrate recovered (tonnes) ....	5.25
Average grade recovered as clean concentrate (kg/tonne) ....	5.19

From October 1981 to March 1982 low grade stockpiled ore (mainly from mine development) and the tailings sand from the 1980 tailings dump were treated. The average grade recovered as clean concentrate was 2.2 kg/tonne.

Total plant operating records from 1980 to 1982 were —

Mill throughput (tonnes) ....	37 263
Clean concentrate recovered (tonnes) ....	139-575
Sales (tonnes) ....	139-476
Per cent WO <sub>3</sub> ....	72-370

Following the auction sale all equipment was removed from the lease by mid-June. Rehabilitation of the area included —

- (1) The burial of all scrap metal and wastes into the tailings dam.
- (2) The covering of the tailings dam walls with sand and the planting of vegetation.
- (3) The contouring of the natural surface around the mill foundations.
- (4) All access to the underground workings was restricted by locked steel gates.

This program was completed by the end of July 1982.

### ZINC QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1919 to 1977	1 393 267	384 655 165	1980*	26 432	19 070 688
1978	61 753	35 078 116	1980-1981	41 270	30 148 419
1979	59 396	43 968 329	1981-1982	65 122	55 642 155
			Total	1 647 240	\$568 562 872

\* January to June.

### ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

#### RISDON: EXTRACTION FROM CONCENTRATES

	Tonnes
From other than Tasmanian ore —	
Zinc	126 534
Cadmium	412
Cobalt oxide	23-48
Superphosphate	79 142
From Tasmanian ore —	
Zinc	65 122
Cadmium	154
Manufactured products —	
Aluminium sulphate	1 273
Ammonium sulphate	....

#### WEST COAST DIVISION

	Tonnes
Concentrate produced —	
Zinc concentrate	159 125
Lead concentrate	28 217
Copper concentrate	31 999
Recoverable quantity in ore mined —	
Zinc	65 122
Lead	28 204
Copper	2 289
Cadmium	154
Cobalt oxide	2-393
Silver	68-484
Gold	1-258
Manganese dioxide	410

### RISDON WORKS

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

Design and construction of modifications and additions to lines and pumps for the handling of pure solution.

Design and construction of equipment to increase the capacity of filter press pumps and pipelines.

Design and construction of plant to reclaim and re-pulp jarosite.

Investigation, design and construction of a pilot plant for experimenting with purification processes.

Continuation of the design and construction of modifications for the treatment of Elura mine concentrates.

Design and installation of a replacement air compressor.

Ongoing design and construction for modifications and additions in the wharf area associated with the intended erection of two gantry cranes for material and container handling.

Preliminary works being carried out on the wharf include piling a number of octagonal hollow steel piles through holes cut in the existing deck. Some of the piles were driven off-line due to geological conditions and were then wedged into line. While surveying for error, a surveyor was trapped between a pile and the wharf deck when the wedging was removed suffering injuries which proved fatal.

### WEST COAST MINES

R. Billingham, Senior Mining Engineer, Hobart reports —

#### DEVELOPMENT

At the Rosebery mine a total of 5 181 m of driving and crosscutting and 753 m of raising was advanced during the year. Development activity centred mainly on the 16 and 17 levels for the bulk stopes and in the Decline section.

At the Hercules mine 352 m of driving and cross-cutting and 99 m of raising were advanced. Development of 7 level continued. A total of 9 674 m of diamond drilling was carried out for planning and services in the mining areas.

#### PRODUCTION

Operations were centred on Rosebery and Hercules mines, with Farrell mine remaining on a care and maintenance basis. Of the total of 571 308 tonnes mined, 504 523 tonnes came from the Rosebery mine and 66 785 tonnes from the Hercules mine. Most of the Rosebery ore came from the bulk stopes on 16 and 17 levels. Production was affected by several industrial disputes.

#### ORE RESERVES

Ore reserves as at 30 June 1982 —

Rosebery, 7 370 900 tonnes; Hercules, 384 300 tonnes; Farrell, 71 000 tonnes.

Overall ore reserve grades were —

Pb, 5.0 per cent; Zn, 15.6 per cent; Cu, 0.80 per cent; Fe, 14.0 per cent; Ag, 135 grams/tonne;  
Au, 3.0 grams/tonne.

**MILLING**

The mill expansions to permit increased throughput and the milling of Que River ore were completed. A total of 182 705 tonnes of Que River ore was trucked to Rosebery for treatment to allow the milling of a grand total of 759 654 tonnes.

Milling results were —

	<i>Tonnes</i>	<i>Zn %</i>	<i>Pb %</i>	<i>Cu %</i>	<i>Ag (g/t)</i>	<i>Au (g/t)</i>
Ore mined (West Coast Mines) ....	571 308	10.4	3.3	0.72	113	2.6

Concentrate production and metal contents were —

	<i>Total (tonnes)</i>	<i>Zinc (tonnes)</i>	<i>Lead (tonnes)</i>	<i>Copper (tonnes)</i>	<i>Silver (kg)</i>	<i>Gold (kg)</i>
Copper Concentrate ....	31 985	3 845	8 281	3 899	56 006	1 314
Lead Concentrate ....	28 204	3 692	17 117	130	18 558	69
Zinc Concentrate ....	146 877	76 670	5 405	455	12 399	205

**EMPLOYMENT**

Mining ....	585
Engineering ....	304
Treatment ....	86
Other ....	140
<b>Total</b> ....	<b>1 115</b>

**CAPITAL EXPENDITURE**

Major capital expenditure during the year was for —

Purchase of mining equipment including one HB4KE electric loader, a Tamrock electro-hydraulic drill rig and Robbins raise bore equipment.

Completion of the mill expansion project.

**EXPLORATION****READ-ROSEBERY LEASES**

A total of 95.3 km of grid was cut during the year, most of which was covered by a magnetometer survey. Thirteen diamond drill holes were relogged.

**MT BLACK E.L. 1/62**

Colebrook Hill: Existing grid lines were extended to the south and east and then geologically mapped, soil sampled and covered with a magnetometer survey. Every second line of the southern extension was surveyed with dipole-dipole I.P. and V.L.F.E.M. Test pitting was carried out on seven soil geochemistry anomalies and all known mine workings were located, mapped and sampled.

Natone-Ring River: Four point eight km of new tracks were constructed and the North-East Dundas tram was upgraded for four wheel drive access. Thirty-eight point three six km of grid and 1.9 km of access line were cut, geologically mapped, soil sampled and covered with a ground magnetometer survey.

Dobsons Creek Grid: A 1.8 km drill track was constructed and a drill hole was completed to 161.4 m. No significant mineralisation was intersected.

Murchison River Grid: A hole drilled to 197.7 m intersected thin bands of sub-economic tin mineralisation.

#### **BULGOBAC E.L. 12/72**

A total of 35.85 km of grid lines was completed at Boco which was geologically mapped and surveyed with dipole-dipole I.P. and ground magnetics. Soil samples were taken over selected areas and the stream sampling and geological mapping program was completed in the northern and western areas.

#### **STERLING VALLEY E.L. 4/73**

Two drill holes totalling 647.5 m were completed and a further 16.5 km of grid cut. The lines were geologically mapped, soil sampled and covered by a ground magnetometer survey.

#### **MONTEZUMA PART E.L. 15/76**

A 40 km grid was cut and three lines soil sampled. A small stream sediment sampling program and a Dighem aerial E.M. survey were completed.

#### **SMITHTON E.L. 52/80**

Three aeromagnetic anomalies were located on the ground and examined. Work included 5.1 km of gridding, mapping and ground magnetic surveys. Selected lines were soil sampled and a photogeological interpretation was completed.

#### **SANDY CAPE E.L. 56/80**

A photogeological interpretation was completed and three aeromagnetic anomalies located on the ground and examined. Work included 15.9 km of gridding, mapping and ground magnetics. Selected lines were soil sampled and a stream sediment survey was commenced.

#### **MISERY FLAT E.L. 51/80**

A photogeological study of the area was completed.

#### **S.P.L. 806**

A photogeological study of the area was completed.

#### **QUE RIVER MINING PTY LTD**

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

#### **PRODUCTION**

During the year ended 30 June 1982, 183 462 wet tonnes of ore and 52 771 wet tonnes of waste rock were either hoisted up the shaft or hauled up the decline from the mine by truck. During the same time, 188 789 wet tonnes of ore were hauled by contractors' road transport from Que River to the Rosebery concentrator of the Electrolytic Zinc Company and the ore stockpile at Que River was reduced by 14 534 wet tonnes.

At the end of the year 21 050 wet tonnes of ore were held on the Que River stockpile.

**MINE DEVELOPMENT**

Over the year, the following amount of mine development was achieved:—

<i>Development Type</i>	<i>Metres Advanced</i>
Decline    ... ..	440
Drives and crosscuts    ... ..	1 551
Raises    ... ..	91
Total    ... ..	2 082

The decline from surface was advanced to the 3 Level and development of that level together with a sub-level just above it driven to near completion. Development of 4, 5 and 6 Levels from the shaft also progressed while a sub-decline was developed from the 6 Level up to the 5 Level as well as down to the shaft sump.

All the raising accomplished during the year was undertaken by raiseboring machine.

**STOPING**

Stoping was carried out between the 2 and 1 levels, between the 2 Level and surface in the case of one stope, and between the 6 and 5 levels. Throughout the mine, benching by means of 165 mm diameter downholes followed by blasting and backfilling was the stoping method employed. Over the year, 13 763 meters of stoping holes were bored and 6 218 tonnes of backfill were placed.

For stoping the central (and wider) portion of the orebody below 2 Level, a standard stope length of 20 metres is being employed and stopes are being mined in a primary and secondary sequence. The two stopes mined during the year between the 6 and 5 levels were primary stopes.

Backfilling of stopes is carried out after mining and broken-ore drawing is complete. Waste rock from surface dumps has been the material most used over the year for the purpose, but gravel from a Tullah gravel pit operated by Que River had started arriving at the mine and was being used to fill just before the end of the year. In primary stopes, the fill is cement consolidated to facilitate the mining of adjacent secondary stopes at a later date.

**DIAMOND DRILLING**

During the year 4 584 metres of diamond drilling were completed, all being designed to produce information for assisting with production.

**ORE RESERVES**

As at 17 November 1981, ore reserves were reported at 2 400 000 tonnes containing 0.4 per cent copper, 7.7 per cent lead, 13.3 per cent zinc, 205 gram/tonne silver and 3.5 gram/tonne gold.

**EXPLORATION**

No field exploration was carried out during the year.

A research project has been started in association with the C.S.I.R.O. aimed at gaining a better understanding of the Que River orebodies and their geological setting and consequently to establish the most suitable method of exploration for mineralisation of the Que River type. Approximately \$15 000 were spent during the year on this project.

## CAPITAL EXPENDITURE

Total capital expenditure from the start of the project to 30 June 1982 was as follows:—

	\$
Underground capital works	10 893 100
Surface capital works	4 487 600
Town and community capital works	4 485 200
<b>Total</b>	<b>\$19 865 900</b>

More housing underwent erection during the year at Waratah, where all the accommodation supplied by Que River Mining for its employees is now situated.

## MANPOWER

Employment of the development contractors was terminated towards the end of October 1981 and since then all operations have been undertaken by a permanent workforce. At the end of June 1982, this permanent workforce comprised 35 staff and 40 award employees directly employed by Que River Mining, and 31 contractors employees. The contractors and their employees were engaged on maintenance work.

## ZIRCON

There was no production of Zircon during 1981-1982.

## 2. NON-METALLIC MINERALS

## CLAY

## QUANTITY AND VALUE OF PRODUCTION

Year	<i>m</i> <sup>3</sup>	Value \$	Year	<i>m</i> <sup>3</sup>	Value \$
1958 to 1977	2 093 919	6 321 874	1980*	37 517	187 584
1978	85 167	292 399	1980-1981	88 982	444 910
1979	92 671	324 281	1981-1982	103 469	571 842
			<b>Total</b>	<b>2 501 725</b>	<b>\$8 142 890</b>

\* January to June.

## DETAILS OF PRODUCTION

Company	Clay <i>m</i> <sup>3</sup>	Value \$	No of Persons	Product
Agrippe Pottery Pty Ltd	....	....	2	Pipes and Pots
Clifton Brick (Tas) Pty Ltd, Longford	29 617	153 050	27	Bricks
Goliath Portland Cement Co., Railton	27 582	182 690	*	Cement
Grierson, M. A., Dodges Ferry†	15 209	80 794	1	Bricks
Hazell Bros, Kingston†	10 377	51 885	1	Bricks
Hobart Brick Co., Granton	13 097	65 485	29	Bricks
Hobart Brick Co., Kingston	222	1 110	1	Bricks
Hobart Brick Co., Oyster Cove	2 847	14 238	1	Bricks
Zolati & Sons, Dulverton	4 518	22 590	15	Bricks

\* Reported under Limestone.

† Suppliers to Hobart Brick Company.

The market for building bricks was generally depressed during the year.

**CLIFTON BRICK (TAS.) PTY LTD, LONGFORD**

A new sizing screen was installed in the clay preparation section of the plant.

The workforce remained steady at 28 employees.

**ZOLATI & SONS PTY LTD, DULVERTON**

No alterations to the operations were reported.

The workforce decreased from 18 to 11 during the period.

**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 1978	82 386	581 618	1980*	8 369	99 084
1978	10 284	119 438	1980-1981	9 872	134 247
1979	18 313	216 739	1981-1982	13 632	202 497
			Total	142 856	\$1 353 623

\* January to June.

**CIRCULAR HEAD DOLOMITE AND TRADING CO. PTY LTD, SMITHTON**

This company sold 13 632 tonnes of crushed dolomite, value \$202 497 and 2 312 cubic metres of dolomite screenings valued at \$30 465. Expenditure was \$7 050 with a further \$14 000 being expended to increase storage shed capabilities. Employment averaged ten men.

**KAOLIN**

## 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 1978	135 491	2 938 971	1980*	8 964	694 972
1978	13 281	1 174 763	1980-1981	22 411	1 803 078
1979	17 513	1 454 203	1981-1982	18 424	1 650 390
			Total	216 084	\$9 716 377

\* January to June.

**A.P.P.M. LTD, TONGANAH**

No alterations to mining or treatment were reported. About 1 000 trees were planted on the old tailings areas.

During the year the workforce was reduced by one to 17 employees.

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

Year	Manufacture of cement		Manufacture of carbide		Chemical and metallurgical		Agricultural and other		Totals	
	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$
To 1977	9 703 683	16 897 066	979 801	4 410 569	4 830 145	8 472 561	1 189 327	3 274 243	16 702 956	33 054 439
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
1980-1981	557 995	1 673 985	21 001	315 015	99 509	1 053 654	62 494	388 718	740 999	3 431 372
1981-1982	667 014	2 001 042	....	....	93 693	793 597	62 072	424 082	822 779	3 218 721
Totals	12 272 056	\$24 602 185	1 081 509	\$5 936 189	5 246 240	\$12 603 594	1 505 057	\$5 179 507	20 104 862	\$48 321 475

\* January to June.

**BEAMS BROTHERS PTY LTD, FLOWERY GULLY**

Only minor modifications were made to the plant.

**BENDERS SPREADING SERVICES, IDA BAY**

Throughout the year the company has been on subsistence production for metallurgical and agricultural supplies only, as there has been no demand for carbide production. Some diversification into earthmoving contracting has maintained a reasonable level of employment and utilisation of capital equipment.

**ELECTRONA CARBIDE INDUSTRIES, ELECTRONA**

The plant was held on a care and maintenance basis for the whole year, production being confined to 694.5 tonnes of acetylene carbon black. An average of 29 employees were maintained as a continuing workforce.

**GOLIATH PORTLAND CEMENT CO. PTY LTD, RAILTON**

No new installations or alterations to the plant or quarry were carried out. Production increased following the commissioning of the Pyroclon process in the previous year.

The workforce fell from 291 to 286 during the period under review.

**MOLE CREEK LIMESTONE LTD, MOLE CREEK**

No major alterations to the plant or operations were reported.

The workforce remained at 18 throughout the year.

**RAILTON LIME PTY LTD, RAILTON**

No changes were reported.

**WRIGHT STEPHENSON PTY LTD, PULBEENA**

This company produced and sold 5 076 tonnes of lime sand valued at \$40 557 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 1978	20 931	378 343	1980*	993	31 539
1978	1 486	48 095	1980-1981	2 078	66 245
1979	1 515	47 390	1981-1982	2 372	77 880
			Total	29 375	\$649 492

\* January to June.

**MINERAL SUPPLIES, ULVERSTONE**

The collection of pebbles for grinding was continued on the beaches in the Ulverstone area. The output was 1 220 tonnes, valued at \$75 000. An average of six persons was 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>
1936-1977	406 913	1 074 737	1980*	5 175	29 770
1978	8 366	43 991	1980-1981	10 490	60 760
1979	8 397	47 800	1981-1982	11 935	69 356
			Total	451 276	\$1 326 414

\* January to June.

**INDUSTRIAL SANDS PTY LTD, EAGLE POINT**

Modifications were made during the period to the feed drying unit.

The workforce was reduced from six to three during the period.

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

Two hundred and sixty cubic metres of freestone were quarried at a value of \$21 360.

**Red Granite**

Two hundred cubic metres of red granite were produced at a value of \$2 000.

**Building Stone (Other)****TURQUOISE BLUFF SLATE QUARRY, WEYMOUTH**

Decorative slate was extracted on a small scale while attempts were made to obtain markets both in Tasmania and interstate.

**CRUSHED AND BROKEN STONE****Basalt**

A total of 515 730 cubic metres of basalt was quarried, the value of production was \$5 427 636.

**TALISKER BLUE METALS, LAUNCESTON**

No major changes were reported during the period.

The workforce was reduced from 8 to 7 men.

**BMG QUARRIES, BRIDGEWATER**

During the year the takeover of Readymix operations in Tasmania by BMI Ltd was completed and the company name changed to BMG Resources Limited. Production totalled some 551 000 tonnes of crushed and broken material.

**Dolerite**

A total of 323 667 cubic metres of dolerite valued at \$3 295 058 was quarried during the year.

**READYMIX, LAUNCESTON QUARRIES, REMOUNT ROAD, LAUNCESTON**

Operations continued without alteration or change during the year.

The workforce remained steady at 12 men throughout the year.

**PIONEER QUARRY, FLAGSTAFF GULLY**

Production of crushed and broken dolerite at the quarry continued at a reduced rate; 104 800 cubic metres were produced.

**Limestone**

A total of 16 233 cubic metres valued at \$162 870 was produced.

**Sandstone**

A total of 15 135 cubic metres valued at \$153 830 was produced.

**Other Stone**

A total of 605 138 cubic metres valued at \$6 051 380 was produced.

**GRAVEL**

Production of gravel amounted to 1 131 313 cubic metres valued at \$6 737 890 the majority of which was used on public roads in all parts of the State.

**READYMIX, FLOWERY GULLY QUARTZITE QUARRY, BEACONSFIELD**

No changes were recorded. The workforce remained steady with five plant and quarry operators.

**SAND**

Production of sand comprised 166 954 cubic metres at a value of \$1 004 903.

**OTHER ROAD-MAKING MATERIALS**

Production was 76 646 cubic metres valued at \$384 951.

## 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 1978	11 023 519	33 337 288	1980*	154 682	2 366 903
1978	223 957	2 527 033	1980-1981	304 727	5 628 899
1979	237 380	3 202 108	1981-1982	395 347	9 195 727
			Total	12 339 612	\$56 257 958

\* January to June.

#### CORNWALL COAL COMPANY N.L., FINGAL

##### DUNCAN COLLIERY, FINGAL

Total production was 264 962 tonnes despite operating problems. Pillar extraction in the North East workings continued where possible with serious floor heave along headings adjacent to and including the No. 6 belt. While this has resulted in the alienation of some 100 000 tonnes of mineable coal, good roof conditions over the remainder have allowed production to be maintained. Work started in developing to the north of the present workings through disturbed ground to gain access to a large area of good coal which was left behind old workings and advance has been slow but steady.

To the south of the workings development through very poor quality coal was continued and a break-out made on the outcrop. The availability of the additional access and the consequent increase in ventilation has allowed this development to turn east, away from the worst of the seam conditions. The seams are now steadily increasing in thickness and quality.

Mine equipment has been increased by 2 Joy 12CM Continuous Miners and two Joy 22SC shuttle cars while the surface facilities have been upgraded by the installation of a new 400 tonne raw coal bin for truck loading and the addition of a new 25 tonne semi-trailer.

##### BLACKWOOD COLLIERY

Total production for the year was 130 385 tonnes. The mine can still be regarded in the development stage and has now reached 760 metres from the entrance on a five heading development. Some minor faulting, up to 2 metres, has been encountered and three development headings driven to the left of the main were stopped by a large fault intersection after 200 metres.

Roof conditions have generally been reasonable and are routinely bolted and W-strapped but coal quality has been variable with about one metre of very high ash content being taken when maintaining the overall extraction height of 3.5 metres.

New equipment purchased included a Domino PET personnel and material carrier along with a 150 HP Drive-head and associated conveyor equipment for panel development.

On surface, all travelling surfaces have now been sealed and other areas planted with lawns and trees to improve the appearance.

##### DUNCAN WASHERY

With the steadily increasing throughput which this year reached 395 347 tonnes much of which has been quite poor quality, the washery has operated continuously on a three-shift basis. The overall yield of 64.72 per cent reflects the quality of the production obtained from development work on the Duncan Colliery. Major items of new plant included a 6 cubic yard front-end loader, new classifying and de-watering screens and a new road weighbridge and belt weightometer.

The company's total sales for the year were 263 375 tonnes with a total workforce of 141.

**D. FENTON, AVOCA — FENHOPE COLLIERY**

Mr Fenton has continued with his development and having driven on dip for some 40 m to assure himself of continuity and quality has developed a timbered heading on strike in preparation for a first panel. He has completed his 'power house' and established ventilation while an area has been prepared at the top of the winze for the installation of a cable winch.

Outside the portal, work is progressing on the bridge to the intended bins while some 700 tonnes of raw coal have been stacked for possible sales. Mr Fenton continues to work unaided but with enviable attention to detail.

**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 1978	5 946	226 183	1980*	815	155 400
1978	3 098	65 170	1980-1981	702	132 864
1979	410	78 775	1981-1982	565	142 828
			Total	11 536	\$801 220

\* January to June.

**COLLINS DEVELOPMENT PTY LTD**

This company produced and processed 565 tonnes of peat valued at \$142 828.

**5. FOREIGN ORES**

The total value of the metallurgical products of four large works treating foreign ores imported into Tasmania was \$342 977 814.

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

J. W. Dempster, Mining Engineer, Launceston reports —

Major capital works and alterations reported for the period under review were as follows:—

	\$
Completed extension to No. 4 potline by additional 108 cells and support facilities	785 148
Convert No. 1 potline buildings to storage	140 680
Conversion of Alumina buildings to storage for bulk coke	83 020
Conveyor and instrumentation installed to automatically detect flaws in billets for high quality gas cylinders	53 000
Construction of new sodium aluminate plant to produce sodium aluminate for pollution control systems	252 348
Provision of heated and filtered air distribution to Accounts Department Office	87 959
Installation of sewage pits pump stations and rising mains to reduce pollution of North Drain	177 097
New saw to cut scrap for remelt furnace	251 495
HDC machine purchased to produce sections in long lengths	226 038
New crib rooms built for Machine Shop, South Side and CAPCO furnace area	129 980

The workforce was reduced from 1 332 to 1 267 during the period under review.

### FERRO-MANGANESE, FERRO-SILICON AND SILICO-MANGANESE

#### TASMANIAN ELECTRO-METALLURGICAL CO. PTY LTD, BELL BAY

J. W. Dempster, Mining Engineer, Launceston reports —

During the year a total of 43 934 tonnes of manganese ore was imported from Groote Eylandt. Fifty-one thousand eight hundred and eighty-one tonnes of manganese alloys for the steel industry were produced.

The following new plant and equipment were installed during the period under review:—

Finished Products Handling Plant Nos 1, 2, and 3. An additional conveyor and screen were installed to further screen a particular sized product.

Laboratory. A 365 m<sup>2</sup> (nominal) instrument workshop was constructed to service electronic and instrumentation related aspects of the plant. This replaced existing facilities.

No. 1 Amenities Building. A 25 m<sup>2</sup> (nominal) extension to the crib room section of this building was constructed.

Mobile Equipment. A Hyster H80C forklift was added to the fleet.

No. 3 Furnace. A radio control system was installed on the tapping hall crane at No. 3 furnace. Overtravel protection facilities are currently being fitted prior to having the system put into service.

The workforce was reduced from 457 to 415 during the period under review.

### TITANIUM DIOXIDE

#### TIOXIDE AUSTRALIA PTY LTD, HEYBRIDGE

E. C. Leyland, Senior Mining Engineer, Burnie reports that West Australian ilmenite was treated at the Burnie plant for the production of titanium dioxide pigments. Market demand locally was erratic with the price remaining favourable; however, overseas demand which, at the start of the year under review, was nil, improved towards the end.

The production and sale of 'FerriClear' reached 300 tonnes for the year, with high expectation of increased markets expected to be realised, when the product is approved by the Health Authorities.

#### CAPITAL EXPENDITURE

Capital expenditure for the year was 1.847 million dollars, a 50 per cent decrease on the figure for 1981.

Major items were —

- (1) Completion of a new drainage collection system to minimise sea discoloration.
- (2) Energy saving projects, including the conversion to L.P.G. of the calciners.
- (3) General cost saving projects.

#### EMPLOYMENT

Company employment showed a slight decrease during the year to 382. Terminations for this period totalled 29 giving a turnover rate of 7.6 per cent. The average employment for the year of 452 includes all contractors.

### ZINC, CADMIUM, COBALT OXIDE AND SUPERPHOSPHATE

#### ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, RISDON

This company, reviewed under Zinc, produced zinc from concentrates imported from 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

The most notable event of the year was the move to the new Department of Mines headquarters at Rosny Park. For many years the Geological Survey has been housed in an unsatisfactory manner with Sections often separated from the remainder of the Survey. The new building provides first class accommodation for the whole Department and includes most up to date laboratory facilities, ample library space, and excellent office accommodation. Geologist Dr N. Farmer provided an important input into the planning process and his work has ensured that the building accurately matches the requirements of the Department.

The physical process of moving the Survey staff, its records, plans, library, and rock, mineral and fossil collection proved to be a major undertaking which consumed several weeks of time for the individuals concerned. By the end of the year most of the moving had been completed but further time is needed to finalise the sorting of library material and rock collections. The laboratory commissioning, whilst not complete, is well advanced.

Good progress was made with regional mapping but some concern is felt at the rate of colour map production. Due to financial constraints and pressure on drafting services only one 1:50 000 map sheet was printed during the year. An analysis of mapping progress and the rate at which maps become outdated indicates that the Survey should aim at printing three new sheets per year.

As noted in the report of the Acting Supervising Geologist of the Economic Geology Section that group has suffered from staff shortages due to resignations and the failure to replace officers. Nevertheless the Section has undertaken a number of initiatives the benefits of which are becoming apparent, particularly in the area of advice on policy matters.

The Groundwater and Engineering Geology Section has been hard pressed to keep abreast of demands for advice on underground water, due to the continuing drought over the eastern portion of the State. In spite of this a great mass of data has been collected for the gravity survey of the Lower Midlands and a significant portion of it has been processed. It is anticipated that initial stratigraphic drilling for the Lower Midlands groundwater survey will be commenced shortly.

The Geophysicist has had a particularly busy year as the position of Assistant Geophysicist remained vacant after the promotion of that officer to the position of Geophysicist. It is apparent that the computing facilities available to the Survey are currently inadequate to cope with the demand for processing geophysical data and insufficient funds are available to pay for processing by outside organisations. A request has been made to upgrade the existing computer in order to allow in-house processing of all Survey material.

Reports of the other officers and sections of the Survey are appended and all show significant advances during the year.

Supervising Geologist A. J. Noldart and Geologists R. Castleden, Dr P. R. Williams and W. C. Cromer resigned during the year and former cadet geologist D. Polya was appointed.

### REGIONAL GEOLOGY SECTION

#### Supervising Geologist E. Williams reports —

##### 1:50 000 Geological Map Series —

Pedder (8112S). The sheet was completed in March by Geologists C. R. Calver and N. J. Turner. Smithton (7916S) was completed in November by Geologists P. W. Baillie and A. V. Brown. Corinna-Zeehan (7914N-S). A. V. Brown continued work in these areas.

Lyell (8013N). Geologists P. W. Baillie, J. Everard and Dr P. R. Williams continued work in this sheet.

Macquarie Harbour (7813S). Geologist Dr M. P. McClenaghan continued work on this sheet. St Marys (8514N). This sheet was completed in November by Geologists C. R. Calver and N. J. Turner.

Ben Lomond (8414N). Geologist C. R. Calver continued the work on this sheet.

Snow Hills (8414S). Senior Geologist A. B. Gulline continued his work in this area.

St Helens (8515S). Geologists Dr M. P. McClenaghan and Dr P. R. Williams continued their mapping on this sheet.

Interlaken (8313N). Geologist S. M. Forsyth continued his work in this area.

Dover (8311S). Senior Geologist Dr N. Farmer continued mapping this sheet.

Explanatory notes are being prepared for the following sheets:— Strahan, Oatlands, Sorell, Maria and Kingborough.

Dr P. R. Williams resigned his position as Geologist in June.

## ECONOMIC GEOLOGY

### Acting Supervising Geologist D. J. Jennings reports —

The section currently consists of two Senior Geologists and four Geologists.

The section remained understaffed with a retirement in early 1981, a second in late 1981, and a third in 1982. The replacement of the Supervising Geologist of the section is not immediately assured.

A Senior Geologist acted in a supervisory capacity from early September 1981 during a period of upgrading of section services, greater involvement in departmental administrative policy and further innovations and reappraisal. However additional projects and problems associated with staff shortages, economic stringency in government, a downturn in the mining industry, etc., compounded to produce an extremely demanding situation. Workload notwithstanding, morale in the section is high and team achievement substantial.

The Economic Geology Section became involved in a range of issues demanding in time for research, development and preparation, which were shared by different groups within the section. These included a submission to the Senate Select Committee on Southwest Tasmania, objections to nomination of places to the Register of the National Estate, suggested revisions to the schedule of conditions for Mineral Leases, changes to conditions relating to Exploration Licences, a review of nomenclature used in the assessment and statement of coal reserves, an assessment of factors involved in the closure of the Rossarden mine, Economic Geology Section corporate plan, program budgeting component statement, problems involved with access to the Interview River prospect, a cabinet submission in relation to the Flowerdale gravel resource and a data package on exploration in the Department of Mines Exempt Area S.R. 32/81.

Additionally a range of reports in response to queries and requirements, and related more directly to specific mineral resources were prepared. These included a brief on dolomite resources in Tasmania, a summary review of tin in Tasmania, a report on radiometric dating of the Mt Read Volcanics, reports on the drilling program at All Nations mine and a report on the statewide gamma-ray spectrometer survey.

A substantial report on the highly prospective Mt Read Volcanics about Mt Sedgwick and Lake Dora, in the Murchison and Lyell Quadrangles, is nearing completion with maps prepared for drafting. A major report is also imminent on the Department of Mines drilling program to explore the coal reserves of the Fingal area. Information is being amassed for a tin-tungsten resource survey and a silver-lead-zinc resource survey with literature studies, field examination of mineral deposits, investigations of old mines and new prospects, and petrographic and mineralogic studies of deposits and minerals (e.g. silver mineralisation from Howards Anomaly, Tyndall Range).

Visits were made or investigations undertaken in the Mt Cameron area, Great Northern Plains, Melaleuca area, All Nations mine, Oakleigh Creek mine, Cleveland mine (CO<sub>2</sub> discharge), Rossarden mine, Wart Hill area, Fingal Valley, Fingal Tiers, East Coast and sites of metallic, non-metallic, coal and oil-shale interest statewide. Geological mapping was completed in the Sedgwick-Lake Dora area, and little field work now remains for completion on the Schouten-Swansea Quadrangle. Preliminary work for a revised Tasmanian Coal Resources Bulletin has commenced.

An interdepartmental field excursion to the Pieman Road area to examine bushfire effects and a volcanics workshop in Victoria were attended and a palaeobotany course (University of Tasmania) is being attended.

Routine work involving visits to and by company personnel, investigations of exploration programs, and assessments of company reports and queries by the public occupy a substantial proportion of the section's time.

## ENGINEERING GEOLOGY

### Supervising Geologist P. C. Stevenson reports —

#### STAFF

The section has consisted of a Supervising Geologist, two Senior Geologists and four Geologists. Geologist A. T. Moon has been away for this period taking an M.Sc. course at the University of Tasmania, and Geologist W. C. Cromer resigned in October. Geologist D. A. Polya joined the section in January.

#### GROUNDWATER

A particular continuing study has been made of the influence of rock fracturing on yield and quality in different rock types. A major groundwater study of the Lower Midlands has begun and well over half of the 2 500 gravity stations have been observed. Medium scale surveys have been made at Mt William, the Royal Hobart Golf Club, Tasmania Golf Club and Cadbury's, Claremont and minor borehole work at Epping, Campania, Murdunna, Deloraine, Ross, South Arm, Pipers River, the Channel and Huon areas, Binalong Bay, Ansons Bay, Scottsdale Golf Club and Bicheno Golf Club.

Two geologists attended the A.W.R.C. Groundwater School in August.

Specialised work on saline waters affecting orchards was done at Legana, a project on rock/water interaction geochemistry was begun and a water bore computer data base is being set up.

The Second Groundwater Committee meeting of the A.W.R.C. was attended in Brisbane in March.

#### STABILITY

Slope stability has been a continuing concern with most work in the North West Tamar, Lilydale and St Helens. A major subdivision was designed at Punchbowl on the basis of our geomorphic mapping and analysis. The Forestry Commission has taken advice on the siting of forestry roads and some regional work has been undertaken on the Central Plateau. A study tour of active slide areas was made in company with Dr Brian Cousins of the University of Tasmania. Because of continuing movement, regular monitoring has continued at Lawrence Vale. Subdivisions have been examined at Norwood and Evandale.

#### DAM SITE

A dam site has been examined at Cygnet for a town supply and work continues.

#### FOUNDATIONS

Some work was done at Port Arthur where salinity of foundation clays was measured. A pipeline route of 23 km was examined seismically for the Metropolitan Water Board and some advice given on house damage to the Building Industry Contractors' Registration Board. A seismic survey and some rock face stability work were required for a reservoir tank at Lauderdale and an extensive survey was made of a sanitary land fill site at Prospect. House cracking was reported on at Blackmans Bay, Legana and at Risdon Vale.

#### GENERAL

A series of lectures and field demonstrations formed part of the Geology for Engineers course at the University. A lunch time lecture to a legal society was given on landslide zoning, and a visiting speaker on Urban Development Geomechanics was Dr David Bell of the University of Christchurch.

Preparations have been made for the A.W.R.C. Conference on Groundwater in Fractured Rocks which is to be held in September. Contributions were made to an AMDEL Study on Sandstones for Building. A land capability study of rural and urban areas in the South East in conjunction with the University of Tasmania and the Department of Agriculture is planned and some initial field work has been done.

## GEOPHYSICS

### Geophysicist R. G. Richardson reports —

#### REGIONAL PROJECTS

Flying of an aeromagnetic survey over part of the mineralised West Coast has been completed. The coverage extends from the coast east to 395 km E and from 5 300 km N, north to 5 422 km N. The project was supported by the Commonwealth Callaghan funding. The survey is the first uniform coverage in the area and has been recognised as a major achievement by mineral exploration companies. An extension of the coverage is being investigated.

The data have been received and made available at a number of scales. There has been a strong demand for copies. A preliminary interpretation of the data is being undertaken in conjunction with the Economic Geology and Regional Geology Sections and has shown a number of features requiring further investigation. A detailed interpretation of the data requires further processing.

The regional gravity survey of the Zeehan area has been suspended to allow full use of resources in the Midlands Survey. Results to date have been encouraging and the data have been requested by several companies.

#### 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. Advice was given to the Hydro-Electric Commission about down-hole techniques to provide load bearing information at the Lower Pieman dam site.

The regional gravity survey of the Midlands, which is being conducted in conjunction with the Engineering Geology Section, is proceeding. The survey will provide structural control for a deep groundwater drilling program. Over 2 000 stations have been installed and the data for the area completed have been partly processed. Preliminary contour maps are available.

#### ORE DEPOSITS

No surveys were undertaken during the year but a number of mineral exploration companies were advised on particular methods and techniques. Regular reviews of company performance were made.

#### OTHER DEPOSITS

Further test processing of the seismic reflection traverses in the Fingal area showed that much of the signal loss on stacking resulted from slight lateral velocity variations. As funds are made available further tests will be performed to produce a workable stacking technique.

Partial cataloguing of the Department's holding of offshore exploration data, in conjunction with the library, allowed easier retrieval of information for companies taking a renewed interest in the oil potential of offshore Tasmania. Cataloguing is continuing.

#### COMPUTER

Use of the minicomputer is approaching saturation during office hours. The addition of a tape drive and the development of a selection of programs for specific requirements has allowed many small jobs to be transferred to this machine. Many of the programs have been purchased by the mining industry. The tape drive has allowed data exchange and a Tasmanian gravity file is being created.

External processing was severely restricted by funding and only a partial reduction of the Midlands groundwater data was performed. Large scale computing requirements remained unsatisfied.

Programming and maintenance of accounting procedures continued. A suite of programs for creating and maintaining a Mining Lease data base was written and commissioned.

## GEOCHEMISTRY

### Geochemist, Dr W. E. Baker reports —

For approximately half the report period the Geochemical Section continued to work from the Derwent Park location under unsatisfactory conditions and further faults developed with the atomic absorption system. The laboratory has now been moved to the new facilities at Rosny Park and it is anticipated that when fully commissioned these laboratories will provide a good up to date base for geochemical work.

Coverage of the Lisle gold field is now 90 per cent complete at a regional sampling spread and it remains to investigate several anomalous areas in more detail.

Extensive investigation of solvent extraction systems with a view to their application as a means of sampling soil organics in water have not had a high degree of success. It is likely that a slower, but more effective means of sampling by use of synthetic resins will have to be developed if the organics are to be used as a means of gaining mineral exploration data.

Examination of 30 company reports has been undertaken for the purposes of compiling report verification and evaluation sheets.

The last four months of the period have been occupied in the closing of the Derwent Park location and the removal of equipment to the Rosny Park site.

## MINERALOGY AND PETROLOGY

### Mineralogist and Petrologist Dr D. C. Green reports —

The major development in the past year has been the transfer of laboratory equipment and functions to the new building at Rosny Park. Laboratory facilities for thin and polished-section preparation, rock crushing and X-ray diffraction analysis are now fully operational. Installation of a new rock sectioning machine has increased the output of thin sections and greatly improved their quality. Over 150 thin and polished sections are now made each month. The Departmental collection of catalogued rocks and minerals has been moved into a much more satisfactory storage area and a retrieval program initiated. Enquiries for mineral and rock identification from members of the public have continued at the same level as previous years.

The geothermal test drill hole at Coles Bay is suspended at 454 m due to other drilling commitments but will be completed by the end of 1982. Specific petrological and mineralogical topics include the alteration mineralogy associated with base metal deposits on the West Coast, the origin of carbon dioxide discharges from drill holes at Luina, continued work on the characterisation of sandstones for restoration of historic buildings and a considerable amount of fibre identification for other government departments.

Stable isotope facilities located at the University have been extended with the completion of an extraction line for oxygen from silicate and oxide minerals. Several collaborative projects using this equipment have attracted substantial support from external funding bodies, notably the Australian Research Grants Committee. As funds and availability of technical assistance permit, some of the work on groundwater tracing and carbonate palaeotemperatures will be transferred to the Rosny Park laboratories.

## PALAEONTOLOGY

### Palaeontologist, M. J. Clarke reports —

Good progress has been maintained. Considerable effort was involved in the packing and relocation of the substantial palaeontological collections to the new Rosny Park laboratories. Overall working and storage facilities are now excellent.

Field work was more limited than in previous years but collections of Permian fossils from the Hobart, Kingborough and Lyell (Mt Sedgwick) Quadrangles, and Cambrian fossils from the Corinna (Huskisson River) Quadrangle were made.

The Mt Nassau (Granton) borehole has greatly clarified certain anomalies concerning the Hobart Permian section. Dr E. M. Truswell, Bureau of Mineral Resources, Canberra, is currently processing samples from this hole and from the Douglas River borehole. Hopefully a valuable synthesis of the palynological and marine invertebrate faunas will emerge.

Some progress has been made on the preparation and description of material from the *Tasmanites* Shale at Latrobe. This is the oldest (Late Carboniferous) marine *Eurydesma* fauna in Tasmania (and probably Australia).

Material from the Friendly Beaches and Bicheno No. 10 boreholes has been provided to Dr C. P. Rao, University of Tasmania, for oxygen isotope and other sedimentological studies.

Various Permian sections in south-east Tasmania were shown to Dr R. E. Wass, University of Sydney, and Dr J. M. Dickins, Bureau of Mineral Resources, Canberra.

The manuscript 'The Late Carboniferous of Tasmania' was completed. This paper will appear in 'The Carboniferous of the World', a commemorative volume to be published by the Sub-commission on Carboniferous Stratigraphy, International Union of Geological Sciences in 1983.

The text and illustrations on Permian brachiopods were prepared, and many other specimens provided for the book on Tasmanian fossils being compiled by Dr M. R. Banks, University of Tasmania.

### CARTOGRAPHIC DRAUGHTING

Senior Draughtsman D. M. Hardy reports —

#### COLOUR MAP PRODUCTION

1:50 000 Geological Map Series —

The Smithton Sheet has been completed. Drafting of the Huntley and Sorell Sheets is proceeding.

1:25 000 Special Sheet —

Drafting of the Mt Dundas-Mt Ramsay Area Sheet is proceeding.

#### OTHER WORK

The coal work for the Fingal Exempt Area continued. The 1:25 coal seam sections are still being drafted and the isopach maps are being updated.

During the year approximately 150 geophysical, geological and engineering plans and diagrams for unpublished reports, Geological Survey Bulletins and normal field services were produced.

### SURVEYING

Surveyor G. Benn reports —

The following surveys were carried out during the year:—

Continuation of surveying and levelling of diamond drill holes and associated tracks at Fingal.

Monitoring of landslip movement at —

East Devonport — Brooke Street slip,

Launceston — Lawrence Vale Road slip.

Continuation of surveying of boreholes at Gladstone-Boobyalla Plains.

Surveying on a lease, 'Rajah', at Pioneer.

Surveying of boreholes at Coles Bay and Bicheno.

Survey grid laid out at Cygnet for a proposed dam site.

Plans were produced of all surveys.

## PUBLICATIONS SECTION

**Publications Officer E. L. Martin reports —**

### PUBLICATIONS

The following publications were printed:—

- Geological Survey Explanatory Report, 1:50 000 Series. Sheet 92. Davey, by P. R. Williams.
- Geological Survey Paper 4, Distribution and characterisation of granitoid intrusions in the Blue Tier area, by M. P. McClenaghan and P. R. Williams.
- Mines News Nos 4-7.
- Tasmania: Mineral resources and mining industry (revd ed.).

The preparation of the following publications was completed by the end of the period:—

- Geological Survey Bulletin 59. Groundwater resources of the Longford Tertiary Basin.
- Geological Survey Bulletin 61. Geology of the Ringarooma-Boobyalla area.

### MICROFICHE EDITIONS

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

- 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.

### UNPUBLISHED REPORTS

Forty-one reports were produced during the year. The inclusion of lists of reports in the departmental newsletter 'Mines News' and in the A.E.S.I.S. data base has resulted in an increased number of requests from mining companies for copies of reports.

### DATA BASES AND COMPUTING

The existing data bases were maintained and extended, and search requests fulfilled.

A general purpose FORTRAN program was written for the production of graphs on the COMLOT DP-8 plotter.

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

### PHOTOGRAPHY

About 300 colour slides were added to the departmental collection, including about 200 received from the Tasmanian Division of the Geological Society of Australia and which illustrate 'Geological Monuments in Tasmania' issued by the Division in 1979. The remaining slides illustrate subjects in the Tamar Valley, including sections along the Bell Bay railway line; Oatlands Quadrangle; Cleveland; Groom's Slip, Penguin; Greens Beach; the Fingal Tier area; Nine Mile Beach and Newlands quarry, Lune River.

## LIST OF UNPUBLISHED REPORTS — JULY 1981-JUNE 1982

<i>No.</i>	<i>Title</i>	<i>Author</i>	<i>Date</i>
1981/37	FORTRAN program for the drift correction of gravity data	R. G. Richardson	
		D. E. Leaman	16.7.81
1981/38	Progress report on exploratory drilling at the All Nations mine, Moina	P. L. F. Collins	22.7.81
1981/39	Sand and gravel reserves in the Flowerdale ballast pit	V. M. Threader	11.8.81
1981/40	Chromite investigations at Beaconsfield	R. H. Castleden	18.8.81
1981/41	A gamma-ray spectrometer and magnetic susceptibility survey of Tasmanian granitoids	P. L. F. Collins B. W. Wyatt A. N. Yeates	20.8.81
1981/42	Preliminary geological investigations at a proposed sanitary landfill site near Prospect	W. C. Cromer	24.8.81
1981/43	Proposal for further radiometric dating of the St Marys porphyrite and other granitoids in the St Marys district, eastern Tasmania	N. J. Turner	26.5.81
1981/44	Bulk sampling of diamond drill core All Nations mine, Moina	P. L. F. Collins	10.9.81
1981/45	Groundwater potential at Cadbury-Schweppes, Claremont, and the prospects for deep drilling	W. R. Moore	28.9.81
1981/46	A guide to the mineral deposit data sheet	P. L. F. Collins	29.9.81
1981/47	A new Late Cambrian fossil locality from the Smithton Quadrangle	P. W. Baillie	15.10.81
1981/48	Pyrite mineralisation in limestone at Lune River	T. G. Summons P. L. F. Collins D. C. Green	20.10.81
1981/49	A revised FORTRAN program for the drift correction of gravity data	R. G. Richardson	30.10.81
1981/50	A whole-rock geochemical data-base system	P. R. Williams	9.11.81
1981/51	Further drilling for groundwater, Mt William National Park	W. R. Moore	11.11.81
1981/52	Slope stability of Lot 1, R. & C. S. Adams subdivision, Windermere	W. R. Moore	4.12.81
1981/53	The Mt Read Volcanics and associated rocks in the Lake Margaret Road-East Queen River area, Queenstown	K. D. Corbett	26.11.81
1981/54	Stable isotope investigation of groundwater at Seven Mile Beach	D. C. Green	2.12.81
1982/01	An occurrence of ferritungstite at Interview River	P. L. F. Collins	5.1.82
1982/02	Groundwater assessment, Scottsdale Golf Course	W. R. Moore	12.2.82
1982/03	FORTRAN programs for the transfer of data to or from the Perkin-Elmer 6/16 minicomputer	R. G. Richardson	19.2.82
1982/04	A FORTRAN program for the drift correction of gravity data (revision 2)	R. G. Richardson	19.2.82
1982/05	A FORTRAN program for plotting areally distributed gravity (or other) data	R. G. Richardson	26.2.82
1982/06	Groundwater investigation at Gardners Bay, Cygnet	D. J. Sloane	4.3.82
1982/07	Geological investigation at Linden sandstone quarry, New Norfolk	V. M. Threader	15.3.82
1982/08	FORTRAN programs for verifying the areal distribution of data points	R. G. Richardson	29.3.82
1982/09	A FORTRAN program for selecting data from inside or outside a specified area	R. G. Richardson	29.3.82
1982/10	Preliminary review of the Eocambrian-Cambrian basaltic association and tectonic setting within western and north-western Tasmania	A. V. Brown H. M. Waldron	6.4.82
1982/11	Structural geology of the Mt Bischoff Precambrian rocks	P. R. Williams	30.4.82
1982/12	Dolomite in Tasmania — a brief summary	K. C. Corbett	13.5.82
1982/13	A FORTRAN program for plotting straight-line cross sections	R. G. Richardson	6.5.82
1982/14	A FORTRAN program for selecting data from inside or outside a specified area (revision 1)	R. G. Richardson	17.5.82
1982/15	A FORTRAN program for calculating elevation differences from barometric pressure readings	R. G. Richardson	17.5.82
1982/16	Reconnaissance seismic survey at a proposed reservoir site, Lanena Street, Warrane	R. C. Donaldson W. R. Moore	19.5.82
1982/17	Slope stability at West's block, Cluan Tier	D. J. Sloane	24.5.82
1982/18	FORTRAN program for sorting areally distributed data to minimise plotting time	R. G. Richardson	26.5.82
1982/19	DSKCPY — a disc copying utility for the Department of Mines Perkin-Elmer minicomputer	R. G. Richardson	27.5.82
1982/20	Supplementary report on sandstones from Linden sandstone quarry, New Norfolk	D. C. Green	27.5.82
1982/21	Slope stability investigation of a proposed subdivision near Station Road, Norwood	W. L. Matthews	2.6.82
1982/22	Slope stability investigation of G. E. Archer's proposed subdivision at Windermere	W. R. Moore	23.6.82
1982/23	A review of Tasmania's tin resources and their mineralogy	P. L. F. Collins D. J. Jennings	23.6.82
1982/24	Slope stability investigation of land near Second River, North Lilydale	W. R. Moore	29.6.82

## LIBRARY

### Librarian Margaret Ellis reports —

During May the library moved into the Department's new premises in Rosny Park. The generous allocation of space allows the hitherto dispersed collections to be gathered in to what is now an impressive library. Staff packed and unpacked over 1 500 cartons of monographs and serials as well as the open file company reports and offshore exploration reports.

### STAFF

There were no changes in library staff during the year, the librarian being Margaret Ellis and the assistant Janet Clover.

### COLLECTION

Due to severe financial constraints, new purchases were restricted. Many of the additions to the library stock were donations or acquired as a result of the gifts and exchange program. Additions to the library were 64 monographs and six serial titles. These additions bring the library stock of monographs and serials to 2 148 monographs and 837 serial titles.

### REFERENCE AND INFORMATION

During the year, 502 items (excluding 115 journal titles circulated regularly) were loaned to staff. This is a reduction on previous years' loans and is due mainly to the separation from the rest of the staff during the move to the new premises.

Of the total of 1 539 reference queries received by the library during the year, 1 080 were readily answerable, while 459 involved literature searches. In addition 13 computer searches were carried out for staff.

The library had 509 users from outside the department and more than 1 800 open file company reports and offshore reports were consulted during the year.

### TECHNICAL SERVICES

The main task undertaken in this area during the year was the indexing and collating of open-file offshore petroleum exploration reports covering the West, South and East Coasts of Tasmania. Work is continuing on the retrospective indexing of the offshore reports covering the Bass Basin area as well as the indexing of closed file offshore petroleum exploration reports.

## 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.

While the number of samples registered, 2 606, was lower than normal the number of determinations made (12 848) was a record. This figure is not quite true as it includes some complete rock analysis work that has been carried through from the previous year and completed in this year. Even so the 206 complete rock analyses done this year is a record for a two year period and reflects the larger output capacity from the Philips PW 1400 XRF.

Tin was again the determination to head the list (2 198) followed by iron (1 044) including ferrous (430). The following nine elements were determined in record numbers this year: aluminium, barium, niobium, potassium, rubidium, sodium, strontium, tantalum and yttrium.

The analysis of deposit gauge material terminated in November 1981 as it is all now being done by the Department of the Environment. A fourth section has been added to the Quantitative Analysis table, namely Industrial Liquors as these have now reached a significant level. This heading covers plating and related baths and other liquors submitted for periodic checking.

There was a marked falling off of incoming work in the last two months of the year. This has allowed progress on deferred work such as the classical chemistry in rock analyses and report writing.

#### TYPE AND NUMBER OF TESTS

<i>Type of Test</i>	<i>Number</i>	<i>Type of Test</i>	<i>Number</i>
<b>I. QUANTITATIVE —</b>		<b>B. Miscellaneous</b>	
<b>A. Elements —</b>		Ash ....	2
Aluminium ....	268	Coating thickness .....	1
Antimony ....	49	Combined water ....	57
Arsenic ....	302	Dissolved silica	
Barium ....	121	(building stone)	2
Bismuth ....	133	Insoluble ....	5
Calcium ....	290	Loss on ignition ....	247
Carbon (including		Moisture ....	61
CO <sub>2</sub> ) ....	61	Reduction in alka-	
Chlorine ....	1	linity (building	
Chromium ....	207	stone) ....	2
Cobalt ....	137	Specific energy ....	14
Copper ....	246	Volatiles ....	2
Fluorine ....	2		393
Gallium ....	38	<b>C. Waters, etc.—</b>	
Gold ....	215	Complete analysis	377
Iron (ferric) ....	614	Partial analysis ....	419
Iron (ferrous) ....	430	Deposit gauges ....	16
Lead ....	237		812
Magnesium ....	261	<b>D. Industrial liquors —</b>	
Manganese ....	217	Acid acceptance	
Mercury ....	5	value ....	5
Molybdenum ....	211	Acid titration ....	19
Nickel ....	215	Alkalinity ....	4
Niobium ....	290	Cleaner concentration	4
Phosphorus ....	7	Chlorine ....	3
Potassium ....	206	Chromium ....	18
Rubidium ....	221	Deoxidiser titration	4
Scandium ....	42	Iron ....	3
Silicon ....	280	Monoethanolamyl	3
Silver ....	113	Nitrogen ....	1
Sodium ....	207	Reaction products	
Strontium ....	206	titration ....	4
Sulphur ....	499		68
Tin ....	2 198		11 543
Tantalum ....	156	<b>II. QUALITATIVE</b> ....	
Thorium ....	44		8
Titanium ....	343	<b>III. CLAY AND CERAMIC</b>	
Tungsten ....	261	Liquid limit tests ....	40
Uranium ....	45	Brickmaking tests	6
Vanadium ....	82	Fretting brickwork	
Yttrium ....	221	examination ....	1
Zinc ....	248		47
Zirconium ....	341		47
	10 270		11 598

<i>Type of Test</i>	<i>Number</i>	<i>Type of Test</i>	<i>Number</i>
<b>IV. METALLURGICAL</b>		Panning	1
Amalgamation ....	1	Retained water test	75
Crushing and grinding	14	Settling test	1
Density ....	75	Sizings (incl. cyclosizing)	276
Examination ....	13		
Gold (alluvial) ....	526		1 250
Magnetic separation	268		
		Total	12 848

### RESEARCH INVESTIGATIONS

Cobalt ....	1	Tungsten ....	2
Non-metallics ....	2	Miscellaneous ....	2
Tin ....	7		
		Total	14

### SUMMARY OF INVESTIGATIONS

#### COBALT

##### **R784 PART II — MACQUARIE HARBOUR SEDIMENTS: ABERDARE INC.**

Magnetic separation of pyritic concentrates produced in R690 failed to show any cobalt concentration in any cyclosizer fraction or magnetic fraction.

#### NON-METALLICS

##### **R783 — ZEOLITES FROM BASALT AT GADS HILL: COMMONWEALTH ALUMINIUM CORPORATION LTD**

The brecciated basalt received contained 21 per cent chabazite, the only significant zeolite present. Grinding to pass 170  $\mu$ m followed by gravity and magnetic separation showed a high grade chabazite concentrate was possible but recovery would depend on the grade of product sought.

##### **R817 — AN ASSESSMENT OF QUARTZ SAND AT SCOTTSDALE: R. F. BUCKINGHAM**

In order to resolve claims that this quartz sand could be used for glass making and also was worth working for chromium and titanium minerals the Mines Inspector had a sample submitted for examination. The sand would not be suitable for speciality glass manufacture nor would it be a source of chromite.

#### TIN

##### **R803, R807 & R813 — MT BISCHOFF: METALS EXPLORATION/C.R.A.**

These projects were written up by Kevin O'Keefe of Metals Exploration as a single report. Since then translation into a flowsheet has required additional work.

##### **R805 — MT PELICAN, BRANXHOLM: AURIC EXPLORATION**

Following examination of a concentrate sample the Mines Inspector advised Auric on sampling the tailings. Consequently three samples representing three lines of bore holes were submitted. These samples varied greatly in head value. While it was possible to recover about half of the contained tin with a jig the operation would need to be very carefully controlled because of the low grade.

**R808 — GREAT NORTHERN PLAINS: SANTOS LIMITED**

When Santos expressed interest in the recovery of rutile and zircon as well as cassiterite and gold the opportunity was taken to write up as a project details of the procedure used as such work had not been done on samples from this area before.

**R810 — WELD HILL TIN CONCENTRATE: P. M. GROSE**

A pan concentrate assaying 5 per cent Sn was submitted for upgrading. From information supplied the head assay of the material panned would have been around 600 g/t Sn.

By sizing and gravity concentration a product containing 55 per cent Sn was made. Magnetic separation produced a tin concentrate assaying 70 per cent Sn and containing 95 per cent of the tin in the rougher concentrate supplied.

**R812 — GREAT NORTHERN PLAINS: SANTOS LIMITED**

In R808 the samples received were concentrates made in the field. For this project all the material from a drill hole bored close to another hole was submitted for concentration in this laboratory. The tin recoveries from both holes followed each other fairly closely with slightly better recoveries from the laboratory concentration. The zircon and rutile recoveries were significantly better in the laboratory concentration.

**TUNGSTEN****R820 — KARA MILL TAILING: TASMINEX N.L.**

Following a recommendation from Aberfoyle Central Metallurgical Services, Tasminex submitted a sample of mill tailing for appraisal for possible spiral concentration.

Examination showed a very large size distribution with free scheelite present only below 300  $\mu$ m. Removal of the coarser material with screens and desliming would be necessary for successful spiral concentration.

**R821 — KARA MILL TAILING: TASMINEX N.L.**

Following R820 three spiral tests were conducted. After magnetic separation and sizing it should be possible to recover with spirals 40 per cent of the tungsten in the tailings as a saleable product.

**MISCELLANEOUS****R815 — SMELTER WASTE MATERIALS: TEMCO, BELL BAY**

Samples of coarse and fine waste materials were submitted to see if coke could be recovered from them. Test work showed nut coke could be recovered by jigging and fine coke by flotation. Larger scale pilot testing would be necessary before considering a plant design.

**R680 — OXIDATION OF MINE TAILINGS**

Progress report No. 7 was issued to participating companies.

## **MINES AND EXPLOSIVES BRANCH**

### **REPORT OF THE DEPUTY STATE MINING ENGINEER AND DEPUTY CHIEF INSPECTOR OF MINES AND EXPLOSIVES, R. C. THOMAS, A.C.S.M., M.Aus.I.M.M., C.Eng.**

#### **THE MINES INSPECTION ACT 1968**

##### **GENERAL**

During the year the mining industry experienced a downturn in activity as the result of falling world metal prices, continuing inflation and a strengthening Australian dollar. The quarrying industry continued to experience difficult trading conditions as the building industry remained in a depressed state.

The prevailing economic situation, combined with poor ore grades, limited reserves and low productivity, resulted in the closure of four mines (Storeys Creek, Rossarden, Pioneer and Oakleigh Creek) with the loss of about 200 jobs.

Work was also suspended on the rehabilitation of Hart's Shaft at the old Tasmania gold mine at Beaconsfield although negotiations are proceeding on a diamond drilling program.

The operations of other mines have been curtailed with the loss of a further 137 jobs. King Island Scheelite shut down operations for one month.

The outlook for 1982-1983 appears to be gloomy and further retrenchments or temporary shutdowns cannot be ruled out despite the improvements in mining practices and productivity over the last few years.

##### **EMPLOYMENT**

For the purpose of accident statistics the average number of persons employed in the mining, metallurgical and quarrying industry during the year was 8 956, a decrease of 268 from the previous year.

##### **ACCIDENTS**

Accidents continue to be reported and recorded in accordance with Australian Standard AS1885 '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 or persons employed in exploration activities. Although the number of reportable accidents and days lost fell during the period as compared with 1981-1982 the incidence, frequency rate and mean duration rate remained almost the same.

Five fatal accidents occurred during the year, an increase of two compared with the previous period.

## 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	96 318	18	186.9	227	40.0	12.6	45
Cleveland Tin	588 962	68	115.5	878	26.4	12.9	258
E.Z., Rosebery	2 107 900	639	303.2	8 235	56.2	12.9	1 138
King Island Scheelite	755 458	78	103.3	708	18.1	9.1	430
Mt Lyell	1 326 423	249	187.7	3 074	33.6	12.4	742
Northern Chromite	4 042	....	0.0	....	0.0	0.0	2
Que River	225 537	40	177.4	457	34.8	11.4	115
Renison	982 914	128	130.2	1 407	24.5	11.0	522
Rossarden Mines	224 838	46	204.6	582	38.3	12.7	120
Savage River	852 356	78	91.5	794	17.9	10.2	435
Tasminex	47 952	....	0.0	....	0.0	0.0	23
<b>All mines</b>	<b>7 212 700</b>	<b>1 344</b>	<b>186.3</b>	<b>16 362</b>	<b>35.1</b>	<b>12.2</b>	<b>3 830</b>
A.P.P.M.	30 193	3	99.4	36	17.6	12.0	17
Comalco	2 731 977	258	94.4	4 306	19.6	16.7	1 319
Electrona Carbide	58 243	7	120.2	151	24.1	21.6	29
E.Z., Risdon	3 799 445	338	89.0	4 044	16.5	12.0	2 052
Goliath Cement	563 153	12	21.3	81	4.1	6.8	291
Mole Creek	27 453	1	36.4	3	5.6	3.0	18
Port Latta	393 810	23	58.4	255	10.9	11.1	211
Temco	915 376	44	48.1	320	9.6	7.3	459
Tioxide Aust.	800 991	19	23.7	119	4.2	6.3	452
Ceramics	160 801	12	74.6	41	15.4	3.4	78
<b>All works</b>	<b>9 481 442</b>	<b>717</b>	<b>75.6</b>	<b>9 536</b>	<b>14.6</b>	<b>13.3</b>	<b>4 926</b>
Collieries	270 663	47	173.7	406	33.3	8.6	141
Quarries	122 704	8	65.2	96	13.6	12.0	59
<b>Totals</b>	<b>17 087 509</b>	<b>2 116</b>	<b>123.8</b>	<b>26 400</b>	<b>23.6</b>	<b>12.5</b>	<b>8 956</b>

## DESCRIPTION OF SERIOUS AND FATAL ACCIDENTS

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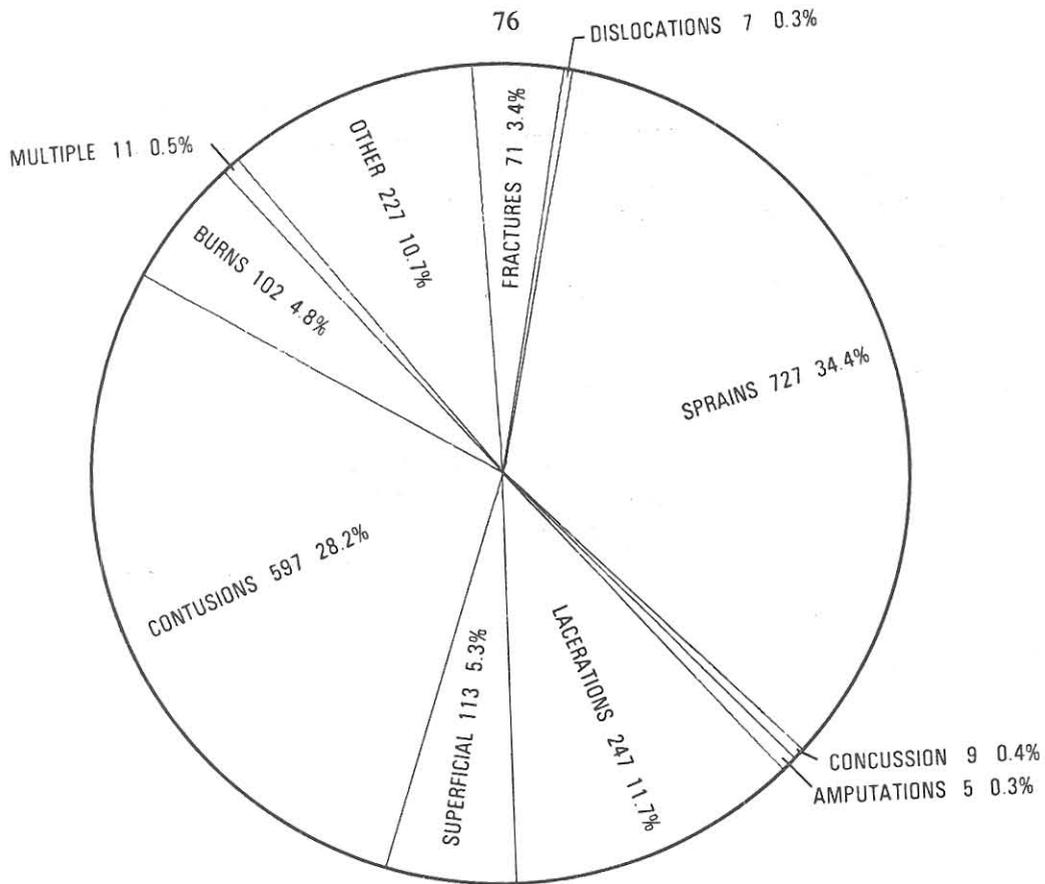
### FATAL

- W. L. Redman — E.Z. Co., Rosebery: Buried by rush from ore pass.
- M. Robins — King Island Scheelite: Crushed by fall of ground.
- T. W. Maloney — E. Z. Co., Risdon: Crushed by pile.
- J. R. Clarke — Renison Ltd: Crushed between truck and sidewall.
- P. F. Rushton — Savage River: Fell into central well of thickener.

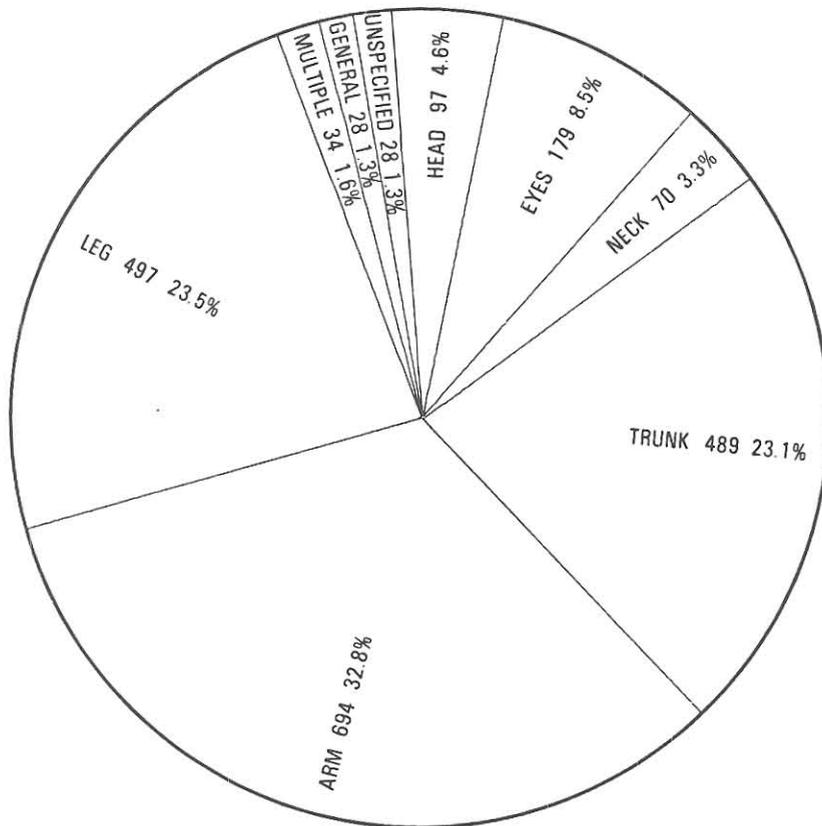
### SERIOUS

- N. Trebilco — Cleveland Tin: Struck by LHD when it fell of chock; fractured spine.
- W. A. McMahon — Mt Lyell: Struck by falling pipe-line; fractured foot.
- S. Rampton — Mt Lyell: Fell from drill rig; injured back.
- G. F. Clarke and L. W. Eastley — Renison Ltd: Exposed to hydrogen sulphide emission.
- P. F. Hall — Renison Ltd: Hand trapped between drill rods; amputated finger.
- W. S. Oates — Renison Ltd: Rock fall; fractured foot.
- J. Mereszka — Savage River: Struck hand with hammer; fractured hand.
- S. C. Sweeney — Rossarden Mines: Explosion while drilling; head and neck lacerations, permanent eye damage.
- R. L. Robinson — Comalco: Explosion from wet mould; burns to back.
- K. McLean — Comalco: Falling anode rod; two toes fractured.
- A. Lord — Goliath: Fell 4.5 metres from ball mill; fractured wrist.
- G. Taylor — Goliath: Tightening clamp screw on incoming live power line; arc burns to face and hand.
- R. Bennett — Goliath: Pipe fell while being painted; fractured toe.

(No. 6)

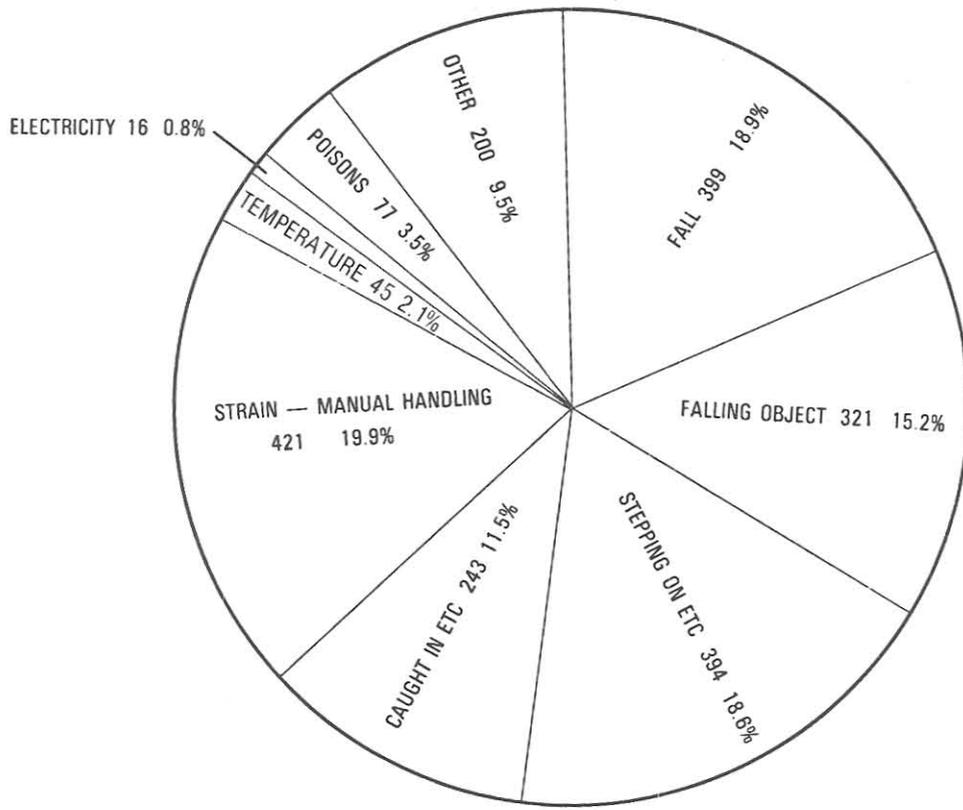


Nature of injury

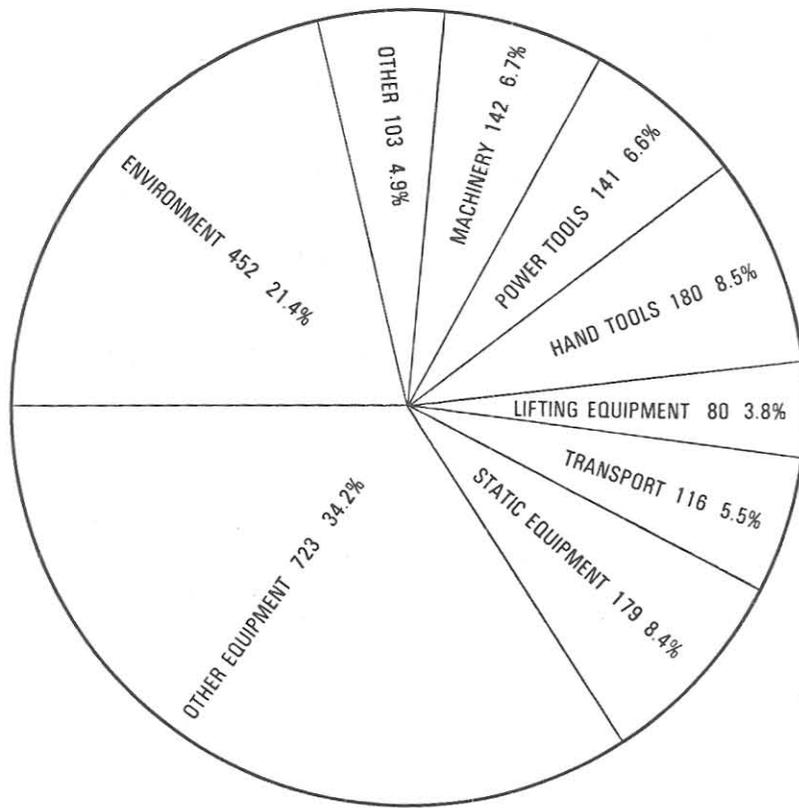


Location of injury

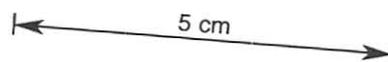
5 cm



Type of incident



Agency of injury



## SPECIAL INVESTIGATIONS

**P. Allan, Mining Engineer, Hobart reports —**

### DIESEL ENGINES UNDERGROUND

With no improvement in the overall financial situation of the industry throughout the year the previously noted downturn in the acquirement of new engines continued.

Engines approved either fully or temporarily throughout the year included —

- Toyota H in a Toyota Landcruiser.
- Caterpillar D3304T in a Caterpillar 120G grader.
- Caterpillar D3306TA in a DJB D330.
- Caterpillar D3304NA in a Wagner UT45A.
- Caterpillar 3306T in an HB12 loader.
- Deutz F4L 912W in a Tamrock 2-Boom Jumbo.
- Caterpillar 3304 PCT in an Eimco 913 LHD.
- Caterpillar 3408 TC/AC in a Wigtruck 631D.
- Isuzu C196 in an Isuzu General Purpose.
- MWM D914-4 in a Domino PET.

### INVESTIGATIONS

Vibration and building damage investigations covered the following:—

- Department of Main Roads — Vibratory roller effects on housing, Sorell.
- Department of Main Roads — Vibratory roller effects on housing, Abbotsfield Road.
- Department of Main Roads — Vibratory roller effects, Pawleena Road and Arthur Highway.
- Department of Main Roads — Vibratory roller effects, Chigwell — Northern Outlet.
- Department of Main Roads — Vibratory roller effects, Box Hill Road.
- Department of Main Roads — Building inspection and tests, 16 Kembrae Place, Launceston.
- Department of Main Roads — Building inspection and tests, Kingsley Flats, Longford.
- Insurance Assessor — Building inspection, 279-283 Nelson Road, Mt Nelson.
- Department of Mines — Vibration tests, Goliath limestone quarry, Railton.
- Private complaint — 7 Caswell Street, Launceston.
- Private complaint — 9 Caswell Street, Launceston.

In addition this year our building investigation service was the subject of close examination by the Ombudsman as the result of a complaint lodged by a member of the public dissatisfied with the results of an investigation carried out by us on his behalf. The Ombudsman put considerable time and personal effort into studying our methods and approach and expressed himself as more than satisfied that no grounds for complaint existed.

## MECHANICAL INSPECTION

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

Inspections were carried out at —

- Beaconsfield Mine; Cleveland Tin N.L.; Comalco; Devonport L.P.G. Terminal; E.Z., Risdon;
- E.Z., Rosebery; Goliath Portland Cement Co.; Mt Lyell Mine; Port Latta; Que River Mine;
- Renison Ltd; Savage River Mines; Southern Cross Offshore Drill Rig; TEMCO; Tioxide.

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

### MT LYELL

New cage for the Prince Lyell Shaft — designed by Consolidated Goldfields of South Africa Ltd.

### NORTH WEST ACID

Procedure for demolition of smoke stack — designed by Smith, Sale and Burbury.

**E.Z. ROSEBERY**

New vehicles: Horwood Bagshaw HB12, and Wagner UT45A.

No. 2 shaft — hoist rope changing stage — designed by E.Z. Co.

Auxiliary winding engine proposed modifications — designed by G.E.C. (Aust.).

**QUE RIVER**

Winding engine brake modifications — designed by Hardcastle and Richards.

New headsheaves — designed by G.H.H. of West Germany.

New Eimco 913 loader.

Shaft inspection platform — designed by Hardcastle and Richards.

**TASMANIAN CARBIDE**

Pre-stressing cables for electrodes, and furnace re-lining proposals.

**KING ISLAND SCHEELITE**

Twenty tonne crane for cement transfer station — designed by DEMAG.

**PORT LATTA**

Coal handling plant and crane — designed by Savage River Mines.

**TEMCO**

One thousand seven hundred and fifty kW induction furnace — designed by B.H.P., Newcastle.

**TIOXIDE**

L.P. Gas Bulk Storage equipment — designed by C.E.M., Victoria.

**LAUNCESTON GAS**

Eighteen tonne L.P. gas tank vehicle.

**I.C.I.**

Thirty thousand tonne bulk storage tank for caustic soda — designed by I.C.I.

**REPCO**

Hydrochloric acid storage tank — designed by R. Gee Enterprises.

**EVANS DEAKIN**

Mobile underground service work platform — designed by Evans Deakin.

**MOBIL**

Nine thousand litre L.P. gas road tanker.

**MISCELLANEOUS**

Annual inspection procedures for tank vehicles carrying L.P. gas and petroleum products are now finalised and will be implemented in the coming year.

Six approvals were issued to persons to convert vehicles to L.P. gas operation.

**MINE CAGE SAFETY BRAKE**

Efforts towards getting this device developed continue to be unsuccessful.

**L.P. GAS BULK STORAGE**

A system for placing L.P. gas storage tanks under water was proposed and circulated to all States.

The primary objects are to increase intrinsic safety by —

- (1) Eliminating any possibility of fire engulfment of the storage tank.
- (2) Reducing exposure to vandalism.

A number of other advantages are also envisaged, including easier leak detection and landscaping.

Thirty-eight candidates were examined for certificates of competency to drive cranes and mine winding engines.

**DRILLING****R. Billingham, Mining Engineer, Hobart****DRILLING SECTION**

For the seventh consecutive year the total depth drilled by the section increased whilst unit costs remained constant. The total depth drilled was 15 497 metres, an increase of 8 per cent over 1980–1981.

The major feature of the year's operations was the continued demand for contract drilling from mineral exploration companies, particularly in the first eight months of the year. This was again due to the high exploration activity throughout Tasmania and the shortage of suitable rigs available from commercial contract drillers. Ten thousand nine hundred metres were drilled on contract, representing 70.3 per cent of the total drilling.

The departmental coal exploration at Fingal was brought to an end and no further holes are planned on the area exempt from the Mining Act. Other departmental work included the start of a deep geothermal project hole in granite at Coles Bay, stratigraphic holes at Granton and Stanley and several groundwater investigation holes in the North-East.

Contract drilling carried out included that for Santos on the Great Northern Plains, for Shell at St Marys and Douglas River, for Central Tasmanian Tungsten at Oakleigh Creek and for Aberfoyle on the West Coast. Water bores were also drilled on contract with the Warman 1000 throughout the North-East. Site investigation work was undertaken for the Department of Main Roads, mainly along the route of the proposed upgraded Bass Highway.

The Warman 1000 multipurpose hydraulic truck mounted rig proved its value by completing over 4 000 metres of drilling for coal, water, mineral and stratigraphic investigations. This was completed using diamond rotary and down-the-hole hammer drilling and was equivalent to 87 per cent of the total depth drilled by the section in 1974–1975.

## DRILLING DETAILS 1981-1982

<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	Longyear 38 No. 2	3	968.3
Fingal	Coal investigation	Longyear 44 No. 1	2	733.5
Fingal	Coal investigation	Longyear 38 No. 1	1	256.9
Fingal	Coal investigation	Longyear 44 No. 2	1	263.0
Woodbury	Coal investigation	Warman 1000	3	173.0
Woodbury	Coal investigation	Mayhew 1000	4	204.5
St Marys	Coal investigation	Warman 1000	24	1 067.2
St Marys	Coal investigation	Longyear 44 No. 1	1	283.9
St Marys	Coal investigation	Longyear 44 No. 2	30	853.0
Mt Nicholas	Coal investigation	Longyear 44 No. 2	5	287.7
Douglas River	Coal investigation	Longyear 44 No. 1	4	970.8
Mt Youngbuck	Mineral investigation	Longyear 38 No. 2	2	229.3
Oakleigh Creek	Mineral investigation	Joy 30HD	3	336.3
Rossarden	Shaft pilot hole	Longyear 38 No. 1	1	449.0
Coles Bay	Geothermal investigation	Longyear 44 No. 2	1	459.0
Boobyalla	Stratigraphic investigation	Warman 1000	1	322.0
Boobyalla	Stratigraphic investigation	Longyear 38 No. 1	1	61.0
Stanly	Stratigraphic investigation	Longyear 38 No. 2	1	500.3
Granton	Stratigraphic investigation	Edeco	1	551.0
Sandfly	Road investigation	F20C	6	102.8
Mt Cameron	Water investigation	Gemco 210D	4	318.7
Winnaleah	Water investigation	Gemco 210D	1	104.5
Derwent River	Bridge investigation	Mayhew 1000	5	46.7
		Total	105	9 542.4
<i>Churn Drill —</i>				
Gladstone	Water bore	Keystone 55	1	12.0
Great Northern Plains	Tin investigation	Keystone No. 1	20	381.5
Great Northern Plains	Tin investigation	Keystone No. 2	71	1 564.0
		Total	92	1 957.5
<i>Rotary/ Down-the-hole-Hammer —</i>				
St Marys	Coal investigation	Mayhew 1000	27	688.0
St Marys	Coal investigation	Warman 1000	39	1 276.0
Seven Mile Beach	Water bores	Mayhew 1000	20	137.0
St Helens	Mineral investigation	Warman 1000	10	286.4
Epping Forest	Water bores	Warman 1000	2	36.0
North-East	Water bores	Warman 1000	21	896.0
		Total	119	3 319.4
<i>Diamond/Auger —</i>				
Plenty	Sandstone investigation	Gemco 210A	4	50.8
Claremont	Bridge foundations	F20C	11	90.8
Risdon	Site investigation	F20C	3	16.0
Port Arthur	Site investigation	Gemco 210A	12	29.3
Oatlands	Road investigation	Gemco 210A	3	19.0
Smithton	Site investigation	Gemco 210D	7	42.3
Derby	Mineral investigation	Gemco 210D	7	86.9
Forth River	Bridge foundation	Gemco 210D	7	91.0
Punchbowl	Landslip investigation	Gemco 210D	1	46.0
Launceston	Road investigation	Gemco 210D	5	31.1
Deloraine	Road investigation	Gemco 210D	1	8.6
Braddons Hill	Road investigation	Gemco 210D	4	49.5
Turners Beach	Road investigation	Gemco 210D	4	26.7
Burnie	Road investigation	Gemco 210D	7	38.3
Stubbs Hill	Road investigation	Gemco 210D	4	51.0
		Total	80	677.3

SUMMARY OF DRILLING

<i>Drill Type</i>	<i>No. of drilling crews</i>	<i>No. of holes</i>	<i>Depth drilled (m)</i>
Diamond	5	10	9 542.4
Churn	1	92	1 957.5
Rotary/Down-the-hole-Hammer	2	119	3 319.4
Diamond/Auger	1	80	677.3
	9	301	15 496.6

### NORTH-WESTERN DISTRICT

**E. C. LEYLAND, A.W.A.S.M., M.Aus.I.M.M.**

**T. E. EVANS, A.R.S.M., B.Sc. (Eng.), F.I.M.M., C.Eng.**

#### GENERAL

The mining industry is experiencing an increasing number of misfires and partial firings with the growing use of water gel explosives. Investigations are being made into reported incidents to enable the development of better blasting practices involving the use of this type of explosive.

The design and construction of a 'reinforced earth' buttress to protect facilities below and to arrest potential slip from above, has proved very effective to date at Savage River.

The semi-submersible drill ship 'Southern Cross' drilled the Pipipa I hole in the Bass Strait early in 1982.

Extensions carried out to the magazine at Heybridge have increased the storage capacity and provided a safer access for the road transport of stock supplies.

#### INCIDENTS

Bush fires resulted in the destruction of the magazines on the Lower Pieman dam site and the consequent loss of twenty tonnes of explosives. From a survey of the damage it is considered that any explosion was confined to detonators.

### NORTH-EASTERN DISTRICT

**J. W. DEMPSTER, A.C.S.M., F.I.M.M., M.Aus.I.M.M., F.I.Q., C.Eng.**

The worldwide economic downturn that had already adversely affected the mining and associated industries in most parts of the world by the end of 1981 had a dramatic effect in the North-Eastern District of the State during the latter half of the year under review.

During this period the following mining/prospecting operations were closed down. The Amdex tin mine at Pioneer, the Allstate/Amax Hart's shaft re-entry operation at the old Tasmania gold mine, Beaconsfield, the Northern Chromite mine near Beaconsfield and the underground operations at the Rossarden and Storeys Creek tin and wolfram mines. TEMCO Ltd, Bell Bay also announced the closure of their No. 1 Furnace and sinter plant at the end of June 1982.

Small scale alluvial tin mining operations continued during the year albeit on a reduced scale.

### SOUTHERN DISTRICT

**R. BILLINGHAM, B.Sc., A.R.S.M., A.M.Aus.I.M.M., M.I.Q.**

**P. ALLAN, B.Sc., A.H.-W.C., M.I.E. (Aus.), M.Aus.I.M.M., F.I.Q.**

The Department continued to deal with complaints involving blasting operations and alleged damage to buildings, the latter mainly from road works so that much of the work this year has been in co-operation with the Department of Main Roads. Coal exploration and assessment continued apace although interest in brown coal deposits appear to be on the wane while some of the activities into black coal have approached the feasibility stage. The general interest from industry for coal as an alternative to oil continues to grow and at this stage there is an indication for slight steady growth in the market.

The move by the Department from Davey Street, Hobart offices to the new complex at Rosny Park was completed in April with the minimum of interference to the continuing activities of the Department.

## 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

The section has maintained a high degree of activity during the year. A total of 2 768 inspections were carried out concerning the importing, manufacture, transport, storage and use of dangerous goods.

### STORAGE OF DANGEROUS GOODS

Licences to keep dangerous goods decreased mainly due to the rationalisation in the retailing of petroleum products.

The construction of a major L.P. gas terminal was started at Devonport for Boral Gas. A large L.P. gas storage installation for industrial use was constructed and commissioned during the year and other proposals for the storage of L.P. gas in industrial premises are under consideration. The Section continued to advise industry and other Government departments and instrumentalities concerning the keeping and handling of all classes of dangerous goods.

### USE OF DANGEROUS GOODS

With the growth of L.P. gas fuelled systems in caravans, campervans, camping equipment, barbecues and pottery kilns the Department has become aware of some unsafe practices by the users of the equipment. With the help of the Tasmanian Film Corporation and a sponsor from industry it is intended to produce a film to help the general public in the safe use of L.P. gas. The officers of the Section have assisted by vetting the script drafts.

There has been an increase in the use of L.P. gas in motor vehicles. At 30 June 1982 there were 40 approved installers and 15 autogas outlets throughout the State.

### TRANSPORT OF DANGEROUS GOODS

Transport Tasmania, with the co-operation of the Department, implemented in February 1982 a yearly inspection system for vehicles conveying dangerous goods.

Initially the system applies to vehicles, carrying petrol, kerosene and L.P. gas in bulk above a prescribed quantity. A permit is issued for each vehicle and this will be re-issued on the condition that the vehicle passes an annual inspection.

In addition random roadside checks are being carried out by Inspectors of Transport Tasmania.

### MANUFACTURE OF DANGEROUS GOODS

Only one licence has been issued to manufacture ethanol from sugar beet on an experimental pilot plant basis. A seminar was held during the year on the prospects of ethanol production in Tasmania.

### IMPORTS OF DANGEROUS GOODS

Imports of Flammable Liquid decreased by nearly 17 000 tonnes although the number of tankship discharges remained constant at 71.

Importation of Class 1:1D explosives and ammonium nitrate decreased during the year although there was an increase in Class 1:1B explosives and other blasting accessories. Importation of shop fireworks remained at the same levels as in previous years.

### SALE OF DANGEROUS GOODS

There was an increase in the issue of licences to sell explosives which includes fireworks and safety cartridges although the stocks of fireworks imported for sale were slightly down on previous years.

The keeping and sale of fireworks was again firmly supervised by the Department assisted by the Tasmania Police.

### GENERAL

A large quantity of dangerous chemicals and explosives was collected and disposed of by the Section.

Numerous complaints concerning all classes of dangerous goods were investigated.

Draft codes and guidelines were examined.

Lectures and demonstrations were presented to technical colleges, schools, associations and statutory authorities.

### OCCUPATIONAL HEALTH

Assistance and advice was given to a number of firms and Departments concerning toxic chemicals.

### COMMITTEES

The Section was represented on the following committees:—

L.P. Gas Safety Committee.

L.P. Gas Task Force (Commonwealth).

ATAC's Advisory Committee for the Transport of Dangerous Goods by Road and Rail.

ATAC's Competent Authorities Committee for the Transport of Dangerous Goods by Road and Rail.

SAA ME/15 Liquefied Petroleum Gas.

SAA ME/17 Flammable and Combustible Liquids.

SAA CH/9 Safe Handling and Storage of Chemicals.

Building Regulations Board.

### INCIDENTS AND ACCIDENTS

Twenty-three incidents and accidents involving Dangerous Goods were investigated by the Section and these were —

#### Class 1 (Explosives)

Explosives were used to destroy a section of a retailer's premises.

Bushfires caused severe damage at a West Coast site, destroying magazines and large quantities of explosives and detonators.

A flare was accidentally discharged in a retail store injuring a customer.

**Class 2.1 (Flammable Gas)**

A stone obstruction under the filling valve seat caused a major gas leak from a factory L.P. gas tank. People were evacuated from the factory until the problem was rectified and the area declared safe.

Two people died from asphyxiation when L.P. gas equipment was used in a closed, non-ventilated tent.

An L.P. gas explosion injured and hospitalised two men who were incorrectly decanting L.P. gas in a caravan.

An explosion occurred in a caravan due to build up of L.P. gas from a gas stove. The owner left the gas on too long before igniting the system, he was slightly injured.

A faulty regulator caused an L.P. gas leak from 2 × 45 kg domestic cylinders before the installation was isolated.

A truck conveying 30 cylinders of hydrogen and 30 cylinders of nitrogen overturned on the Midland Highway when a blowout occurred in the front tyre of the vehicle. Fourteen cylinder valves were damaged and one cylinder vented its contents.

An acetylene plant was damaged after a build-up of acetylene gas ignited from the heat of reaction during manufacture.

**Class 2.3 (Poison Gas)**

A large quantity of ammonia gas leaked from a drum container causing a dangerous situation at a factory before the situation was brought under control. Employees were evacuated from the premises during the incident.

**Class 3 (Flammable Liquids)**

Leaking petrol from a pump dispenser ignited at a service station causing slight damage. The ignition was due to an electrical short caused by wiring deterioration.

A fibreglass factory using flammable liquids, resins, oxidising agents and adhesives was destroyed.

A garage was destroyed by fire when a spark ignited petrol vapour on a country property. The separation distance from the petrol storage to the garage did not comply with the required distances.

A spillage of 600-800 litres of petrol occurred at a Hobart petroleum depot due to incorrect handling procedures.

A semi-trailer conveying motor spirit on the East Tamar Highway left the road and became bogged. A minor spillage of petrol occurred during the transfer of product.

A heating oil tanker rolled downhill while discharging product. It struck an H.E.C. pole and brought down power lines. Wheel chocks were not used.

A heating oil tanker rolled over its chocks on a steep hill, crashed through a boundary fence and came to rest upside down between two houses. The area was isolated and the product transferred to another tanker.

A petrol spillage in the Maypole Rivulet, Hobart, was investigated.

A flue gas explosion involving two boilers occurred at a Commonwealth building. Investigations carried out with the Department of Labour and Industry determined that fuel oil and carbonisation of the burners was the cause.

An explosion which caused considerable damage in a boiler room of a high rise building was investigated with Department of Labour and Industry officers. There were three possible causes of the explosion indicated by this initial inspection and these were —

- (a) A flammable mixture igniting within the flue;
- (b) Insufficient pre-purge period; or
- (c) Obstruction under the seat of the solenoid valve in the fuel supply line.

Investigations are continuing.

A flammable liquid tanker was involved in an accident caused by another vehicle. No damage occurred to the tank or fittings.

### Class 8 (Corrosives)

Two tonnes of concentrated sulphuric acid leaked from a demountable tank on a road tank vehicle. The leakage was due to a weld failure in the tank structure.

### DANGEROUS GOODS STATISTICS

#### 1. Licences, permits, approvals issued for the import, manufacture, storage, use or sale of Dangerous Goods

Licences to keep dangerous goods	2 363
Licences to sell explosives (including fireworks and safety cartridges)	459
Magazine Licences	103
Import Licences	35
Licences to convey	21
Licences to manufacture	4
Exemptions Granted	3
Plans Approved	377
L.P. Gas Start Work Notices received	939
L.P. Gas Start Work Notices installations inspected	691
L.P. gas sub-standard installations for repair	48
Total No. approved installers autogas	40
Vehicles converted to autogas during the period	78
Autogas outlets (unchanged)	15
Shotfirers' permits issued	56

#### 2. Imports of Class 2.1 and Class 3 Flammable Liquids

Product (tonnes)	Bell Bay	Burnie	Devonport	Hobart	Total
Aviation gasoline	2 768	....	....	19 168	21 936
L.P. Gas	7 044	....	....	4 395	11 439
Motor Spirit —					
Regular	6 101	4 002	5 674	12 565	28 342
Premium	67 216	28 155	52 213	121 296	268 880
Kerosene —					
Aviation	3 556	....	....	11 002	14 558
Lighting and power	1 432	....	1 179	3 698	6 309
Distillate	37 217	28 647	41 550	42 892	150 306
Fuel oil	4 665	13 659	22 678	40 313	81 315
<b>Total</b>	<b>129 999</b>	<b>74 463</b>	<b>123 294</b>	<b>255 329</b>	<b>583 085</b>
Number of Tankships	23	9	16	23	71





## REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD

FOR THE YEAR ENDED 30 JUNE 1982

THE MINISTER FOR MINES

We submit the report of the Ringarooma and Cascade Water Race Board for the year ended 30 June 1982.

On 31 July 1981 Mr S. Everett resigned as a member of the Board. His position was been filled by Mr K. R. Davey.

An inspection of the Cascade River, from the Ringarooma River confluence up to the Derby Town water supply intake, was made by Mr N. Petrie, manager of the Mt Cameron Water Race, and Mr J. Dempster, Mining Engineer — North-Eastern District, in January 1982.

It is proposed that Mr Petrie and his staff construct rock dams to reduce the outflow from the Cascade dam but still provide three sluiceheads for the Derby township.

H. MURCHIE, Chairman.  
N. P. EDWARDS, Member.  
K. R. DAVEY, Member.

### RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT

*Statement of Receipts and Payments for the Year Ended 30 June 1982*

<i>Receipts</i>	1981	1982	<i>Payments</i>	1981	1982
	\$	\$		\$	\$
Balance (loss)     ....	2 096	1 676	Inspection fees     ....	550	....
			Interest on capital cost     ....	1 546	1 676
	<u>\$2 096</u>	<u>\$1 676</u>		<u>\$2 096</u>	<u>\$1 676</u>



TASMANIA DEPARTMENT OF MINES · ROSNY PARK · 7018