

TASMANIA

REPORT

OF THE

DIRECTOR OF MINES

FOR

YEAR ENDED 31ST DECEMBER

1955

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



TASMANIA:
L. G. SHEA, GOVERNMENT PRINTER, HOBART.

1956

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TASMANIA



REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart, 1st May, 1956.

SIR,

I HAVE the honour to present my report on the mining industry for the year ended on 31st December, 1955.

The total value of the output of metallic and non-metallic minerals on the basis of Australian prices was £14,364,337, as compared with £13,232,832 for the previous year. Higher prices accounted for the increased value.

It is pleasing to record that during the year there were important rises in both sterling and Australian prices for copper, lead, zinc, tin, silver and tungsten.

There were increases in the production of scheelite, pyrites, osmiridium, limestone, cobalt oxide, granite, iron ore and kaolin, but decreased production of cadmium, copper, dolomite, gold, lead, ochre, silica, silver, tin, wolfram and zinc was recorded.

The average number of men employed in the industry was 7,095, as compared with 7,289 last year.

Aluminium: The Commonwealth-State project for the establishment of an aluminium industry at Bell Bay reached the production stage and was officially opened with the pouring of the first ingot of aluminium on 23rd September, 1955. The plant has not worked to full capacity because of temporary shortage in hydro-electric power supplies.

The industry represents an important factor in the economic and commercial development of the State.

Raw materials, with the exception of limestone, are being imported, and the bauxite deposits in this State, which have been investigated in past years, are being held in reserve.

Uranium: I have pleasure in recording the discovery of torbenite, an ore of uranium, in January, 1955, at the Royal George Mine, near Avoca. The Department has encouraged the search for radio-active ores by the hire of geiger counters, demonstrations and displays and the distribution of literature, but this was the first positive result. The deposit has been examined by officers of this Department and the Bureau of Mineral Resources, but investigational work was retarded pending legal determination as to occupational rights on the area. Matters had not been advanced at the close of the year.

The discovery stimulated prospecting in various parts of the State and many reported discoveries were examined by officers of the Department. Some occurrences were found to merit further attention and advice was tendered relative to future development. Prospecting in the vicinity of Rossarden has resulted in the discovery of pitchblende, a primary ore of uranium, and an extensive programme of exploratory work is being planned by the discoverer.

Representations to the Commonwealth Government for an airborne scintillometer survey of the State were successful and in January, a DC3 aircraft carried out a preliminary reconnaissance. This was followed later by a detailed scintillometer survey by a smaller Auster aircraft in western, northern and eastern portions of the State and maps showing anomalies recorded have been published for the information of prospectors and the mining public. The survey is to be continued.

Geiger counters hired by the Department have been in constant demand and the services of officers are made available to examine discoveries immediately such are reported to the Department.

The Australian Atomic Energy Commission is advised of discoveries, and applications to the Commission for rewards are sponsored by the Department, and an initial reward was made to Mr. W. Pitulej, who made the initial discovery at Royal George. In addition to rewards payable by the Commission, the Government has undertaken to pay a reward of £500 to the discoverer of a deposit of uranium capable of being developed commercially.

LEASES.

As a result of the discovery of uranium there was considerable activity by prospectors and some forty applications for leases were received. Large areas continue to be occupied under special prospectors' licences and private land and Crown land occupied for purposes other than mining has been prospected. The total area applied for as leases during the year was 15,887 acres, as compared with 1,517 acres last year. The area in respect of which leases are held totalled 30,407 acres at the close of the year which represents an increase of 349 acres.

PRODUCTION.

Moina Tungsten Tin Mining Company N.L. commenced the production of tin and tungsten concentrates during the year.

Copper: The Mt. Lyell Mining and Railway Company Limited was the principal producer of copper. The output of ore was 1,588,381 tons and 71 tons of copper precipitate was recovered from mine waters. Copper pyrite concentrate amounting to 38,180 tons and 47,921 tons of iron pyrite concentrates were recovered. Smelter recoveries consisted of 7,640 tons of blister copper containing 7,582 tons of copper, 31,375 oz. of silver and 4,632 oz. of gold. A quantity of 67,420 tons of iron pyrite concentrate was exported to the mainland for acid manufacture. This company commenced the driving of a new tunnel to facilitate the transport of ore from the West Lyell open cut to the ore treatment plant.

Zinc: The Electrolytic Zinc Company of Australasia Ltd., operating on the zinc-lead ore bodies at Rosebery, mined 178,699 tons of ore which were milled for a recovery of 50,689 tons of zinc concentrates, 8336 tons of lead concentrates and 5,878 tons of copper concentrates, containing 24,036.14 tons of zinc, 7,846.63 tons of lead, 503.34 tons of copper, 45.66 tons of cadmium, 941,614.01 oz. of silver and 11,074.69 oz. of gold. The zinc concentrates were treated at Risdon, but the copper and lead concentrates were exported overseas.

A total of 22,690 feet of exploratory diamond drilling was completed by this company during 1955.

The Risdon works of the company produced 75,252 tons of zinc valued at £A7,172,190, 182.6889 tons of cadmium valued at £A276,226 and 17.8028 tons of cobalt oxide valued at £A19,939 from imported calcines; and from Tasmanian ores produced 25,838 tons of zinc, and 40 tons of cadmium.

The company maintained an active policy of mineral exploration and of mine development and exploration. Extensions and additions were made to the mill at Rosebery. At Risdon the major construction and development programme was continued and there were advances in plans for increased production of zinc, sulphuric acid and fertilizers. The production of ammonium sulphate fertilizer for the new plant was delayed due to the additional power required being not yet available from the Hydro-Electric Commission.

Lead: Lead produced totalled 10,558.5369 tons representing a decline of 220.9671 tons.

Operations of the Electrolytic Zinc Company of Australasia Ltd. contributed 7847.630 tons, and the balance of the production was derived from the operations of Zeehan Mines Pty. Ltd. at Zeehan which mined 15,680 tons of ore for a recovery of 2793 tons of concentrates containing 2030.742 tons of lead and 81,375.040 ozs. of silver; Montana Silver Lead Mine at Zeehan which produced 365.2795 tons of silver-lead concentrates containing 213.1863 tons of lead and 24,901.5247 oz. of silver; the Farrell Mining Company Limited at Tullah which produced 752 tons of concentrate from the mining of 4,103 tons of ore containing 451 tons of lead and 47,143 oz. of silver; and miscellaneous small parties in the Zeehan district.

Tin: The output of tin was 852.9845 tons as compared with 946.7509 last year.

The average Australian price was £956 per ton, which represents an increase of £47 per ton. There was an increase of £26 in the average sterling price, which was £746/6/8 per ton.

Aberfoyle Tin N.L., operating on a multiple lode series at Rossarden; Renison Associated Tin Mines, mining and milling tin-pyrite ores at Renison Bell; Brisies Tin N.L., sluicing relatively shallow ground at Derby; Endurance Tin Mining Co. N.L., engaged in sluicing operations at South Mt. Cameron; Goshen Tin Mines, St. Helens; and the Ormuz Tin Mine at Branhholm, each sluicing alluvial ground; the Storeys Creek Tin Mine at Storeys Creek, working on a wolfram-tin lode series; and the Dorset Tin Dredge, treating river flats at South Mt. Cameron, were the principal producers.

Tribute parties, working on an area marked out under the provisions of the Aid to Mining Act 1927 at the site of the old Mt. Bischoff Tin Mine at Waratah, produced 54.736 tons of tin concentrates containing 36.997 tons of metallic tin. Miscellaneous small operators, mainly on tin alluvials in the north-eastern part of the State, were responsible for a production of 61.59154 tons of metallic tin.

Aberfoyle Tin N.L., working on a tin-wolfram lode series at Rossarden, mined and milled 63,314 tons of ore containing 662.849 tons of tin concentrates and 339.004 tons of wolfram concentrates. Metallic tin produced was 454.398 tons. Additional equipment was installed in the concentrating plant during the year.

The Dorset Tin Dredge continued its operations on the alluvial flats flanking the Ringarooma River at South Mt. Cameron. The throughput was 1,271,000 cubic yards containing 142.850 tons of concentrate which yielded 106.834 tons of metallic tin and 403.755 oz. of gold.

Production from the Dorset Dredge was interrupted due to the dredge sinking. Salvage operators were successful, but tin production was suspended for a period of eight weeks.

The Endurance Tin Mine sluiced 339,178 yards of ground for a recovery of 85.069 tons of tin oxide containing 65.113 tons of metallic tin. The Commonwealth Bureau of Mineral Resources is undertaking geophysical work in the vicinity of the mine with the object of defining the course of the ancient deep lead which the company is working.

Brisies Tin N.L., Derby, sluiced 385,980 cubic yards of alluvial ground flanking the Cascade River and recovered 45.317 tons of concentrate containing 32.642 tons of metallic tin.

Renison Associated Tin Mines N.L. produced 66.156 tons of concentrates containing 40.721 tons of metallic tin from the mining and milling of 7,698 tons of tin-pyrite ores at Renison Bell. This company commenced development and production of ore from a new orebody during 1955.

The Mt. Cameron Water Race Board, which supplies water to tin mining in the vicinity of Gladstone, continued to function, but revenue was insufficient to meet operating expenditure.

The Ringarooma and Cascade Water Board, which controls the water system formerly operated by Brisies Consolidated N.L. is faced with progressive deterioration of the Ringarooma section of the race and revenue from the sale of water is insufficient to meet operational costs. Water was supplied to Brisies Tin N.L., the Ormuz Tin Mine and small operators, and supplies have also been diverted for township use and for irrigation.

Tungsten (Scheelite and Wolfram): King Island Scheelite (1947) Ltd. mined and milled 263,731 tons of ore for a recovery of 1431.47 tons of scheelite concentrate.

Work preparatory to the construction of a new dam to assure a reliable water supply was commenced towards the end of the year. New ore loading and transport equipment was placed in commission in the open cut.

To provide against delays in power supply the company also installed new fuel oil unloading equipment and a fuel oil storage tank at Naracoopa. The fuel oil is transported to the storage tanks by road tanker.

Aberfoyle Tin N.L., in addition to its production of tin, recovered 339,004 tons of wolfram concentrate from operations on the tin-wolfram lode series at Rossarden.

At the Storeys Creek Tin Mine 12,862 tons of ore were mined and milled for a recovery of 216,750 tons of wolfram concentrate and 30,350 tons of tin concentrate containing 18,330 tons of metallic tin. The new main shaft came into operation during the year and now serves the mine down to No. 8 level.

Moina Tungsten Tin Mining Co. N.L., which has re-opened the former Shepherd and Murphy Mine, commenced the production of tin and tungsten concentrates in the new mill at Moina. A total of 6,133 tons of ore was mined and treated, and 22,378 tons of wolfram concentrates and 22,296 tons of tin concentrates were recovered.

Gold: There was a fall in the production of gold to 16,112,601 oz. An output of 4,632 oz. resulted from the treatment of copper ores, 11,074,690 from zinc-lead ores, and 405,911 oz. from the dredging of auriferous-tin alluvials. There was no production from reef mining or from alluvial deposits.

Osmiridium: Mining continued to be confined to intermittent working by small parties at Adamsfield. Production was limited to 21,493 oz.

Limestone: The recorded production of limestone continued to increase and 206,138 tons were quarried. The manufacture of carbide and cement absorbed 175,081 tons and the balance of 31,057 tons was used for metallurgical purposes and for agriculture and building. There are widely-spread resources of limestone in the State and increasing demands can be satisfied.

Kaolin: The output of kaolins and clays increased to 9,740 tons and were chiefly used in the manufacture of paper.

Coal: There was an increase in coal production which totalled 299,221 tons, as compared with 264,202 in 1954. The increased production was due mainly to an increase in efficiency; the output per man increasing from 716 tons in 1954 to 794 tons in 1955. The increase in output per man resulted largely from the increasing mechanisation of the mines, the Duncan Mine at Fingal being almost completely mechanised. The increased production of coal was absorbed by the increased requirements of industry.

The Cornwall Coal Co. was the major producer and the output from its three collieries was 185,186 tons. The Cornwall Colliery, St. Marys, contributed 102,151 tons, the Mt. Nicholas Colliery, St. Marys, 40,750, and the Duncan Colliery, Fingal, 42,285 tons.

The Jubilee Coal Mine, St. Marys, produced 24,642 tons, and at Fingal the Fingal Coal Mine mined 21,828 tons and the Tasmanian Coal Company 10,906 tons. The Stanhope Coal Mine at Avoca contributed 7,026 tons. The Merrywood Coal Mine at Avoca continued in underground and open-cut operations and produced a total of 40,365 tons, 15,478 being from open-cut working and 24,887 from underground. At Hamilton the Langloh Mine output was 6,894 tons. Small scale operations continued on the sub-anthracite coal at Sandfly and 1,764 tons were produced. The Illamatha Coal Mine at Spreyton remained in production, but the output was only 610 tons.

During the year a serious underground fire in the main production sections in the Cornwall Colliery rendered it necessary to seal up the workings. Output was maintained by working a double shift in the new tunnel section to the west of the old colliery.

Statistics of production are as follows:—

Commodity	1955	1954	1953	1952	1951	1950	1949	1948
Coal	299,221	264,202	250,000	240,000	230,000	220,000	210,000	200,000
Limestone	206,138	190,000	180,000	170,000	160,000	150,000	140,000	130,000
Kaolin	9,740	8,000	7,000	6,000	5,000	4,000	3,000	2,000
Tungsten	1,431.47	1,300	1,200	1,100	1,000	900	800	700
Gold	16,112,601 oz.	17,000,000	16,000,000	15,000,000	14,000,000	13,000,000	12,000,000	11,000,000
Osmiridium	21,493 oz.	20,000	19,000	18,000	17,000	16,000	15,000	14,000

ASBESTOS.

RETURN showing the Quantity and Value of Asbestos produced from 1899 to 1955 inclusive.

Year	Quantity Tons	Value £
1899-1950	3979.85	17,142
1951-1955	.....	.....
Total	3979.85	£17,142

BISMUTH.

RETURN showing the Quantity and Value of Bismuth produced from 1904 to 1955 inclusive.

Year	Quantity Tons	Value £
1904-1949	83.6320	28,426
1950	.0039	6
1951-1955	.....	.....
Total	83.6359	£28,432

CADMIUM.

The quantity recovered was 45.66 tons valued at £58,809 compared with 49.20 tons valued at £68,639 for 1954.

RETURN showing the Quantity and Value of Cadmium recovered for the years 1924 to 1955.

Year	Quantity Tons	Value £
1924-1951	726.1157	£433,953
1952	42.83	78,129
1953	44.51	70,712
1954	49.20	68,639
1955	45.566	58,809
Total	908.3157	£710,242

BARYTES.

RETURN showing the Quantity and Value of Barytes produced from 1899 to 1955 inclusive.

Year	Quantity Tons	Value £
1899-1950	2196.2	8,138
1951-1955	.....	.....
Total	2196.2	£8,138

COPPER.

The production for the year was 8085.34 tons, valued at £2,852,824.

RETURN showing the Quantity and Value of Copper in Blister Copper, Copper Ores and Zinc Lead Ores during the years 1919 to 1955 inclusive.

Year	In Zinc-Lead Ores		In Blister Copper		In Copper Ores		Total	
	Quantity	Value	Quantity	Value	Q'ty.	Value	Quantity	Value
1919 to 1951 (inclusive)	Tons 3,369.25	£ 357,044	Tons 287,543.475	£ 20,307,737	Tons 404.094	£ 9,491	Tons 291,316.819	£ 20,674,272
1952	319.49	83,398	9,554	2,530,400	.....	.....	9,873.49	2,613,798
1953	395.50	98,759	8,741	2,207,029	.....	.....	9,136.50	2,305,788
1954	535.94	133,185	8,920	2,218,672	.....	.....	9,455.94	2,351,857
1955	503.34	179,065	7,582	2,673,759	.....	.....	8,085.34	2,852,824
TOTAL	5,123.52	851,451	322,340.475	29,937,597	404.094	9,491	327,868.089	30,798,539

The Mount Lyell Mining and Railway Company Limited.
Return for the Calendar Year 1955.

Ore and metal-bearing material smelted:—		Tons (Dry).
Source of Material.		
Concentrates:—From the Company's West Lyell, North Lyell and Lyell Comstock Mines		
.....	1,588,381	
Precipitate	71	
Total	1,588,452	
Source of Material.		
Limestone delivered at works (tons)	4,477	
Silica delivered at works	5,645	
Pyrite concentrate shipped from Regatta Point (tons), approx. value £202,260	67,420	
Blister Copper produced, 7,640 tons, containing:		
Copper (tons)	7,582	Approximate value
Silver (oz.)	31,375	£A3,388,082
Gold (oz.)	4,632	
Average number of men employed—		
Mining Department—At the Com-pany's Royal Tharsis Mine		
.....	11	
Ditto, West Lyell Mine	544	
Miscellaneous	115	
	670	
Reduction Works (including Lake Margaret)	693	
Railway Department—Mount Lyell Railway	100	
Total	1,463	

Copper produced from the inception of the Company to the 31st December, 1955, 482,273 tons.

Silver produced from the inception of the Company to the 31st December, 1955, 15,663,910 oz. (fine).

Gold produced from the inception of the Company to the 31st December, 1955, 541,507 oz. (fine).

Dividends paid during the year, £377,812.

Dividends paid from the inception of the Company to the 31st December, 1955, £8,028,653.

COAL.

RETURN showing the Quantity and Value of Coal raised to 31st December, 1955.

Year	Quantity Tons	Value £
Previous to 1952	5,852,974	4,862,295
1952	247,899	341,561
1953	233,629	445,316
1954	264,202	511,040
1955	299,221	604,803
Total	6,897,925	6,765,015

DOLOMITE.

RETURN showing the Quantity and Value of Dolomite produced from 1899 to 1955 inclusive.

Year	Quantity Tons	Value £
Prior to 1952	1,012.76	3,272
1953	2,565	7,695
1954	2,846.5	8,599
1955	2,266	6,798
Total	8,690.26	26,364

GOLD.

The quantity won was 16,112.601 fine oz. valued at £202,075 as compared with 18,730.745 fine oz. valued at £233,516 for 1954.

RETURN showing the Quantity and Value of Gold won to 31st December, 1955.

Year	Quantity Oz.	Value £
Previous to 1952	2,347,807.934	10,711,368
1952	16,245.649	201,446
1953	16,181.920	200,556
1954	18,730.945	233,516
1955	16,112.601	202,075
Total	2,415,078.849	£11,548,961

GRANITE (RED).

RETURN showing the Quantity and Value of Red Granite produced during the years 1935 to 1955.

Year	Quantity Tons	Value £
1935 to 1951 inclusive	3,443.5	25,451
1952	93	1,387
1953	39	654
1954	55	575
1955	41	690
Total	3,671.5	28,757

IRON PYRITES.

RETURN showing the Quantity and Value of Iron Pyrites produced during the years 1915 to 1955 inclusive.

Year	Quantity Tons	Value £
1915 to 1951 (inclusive)	775,052.973	1,081,040
1952	54,421	143,710
1953	51,559	154,677
1954	51,162	153,486
1955	67,420	202,260
Total	999,614.973	1,735,173

KAOLIN.

RETURN showing the Quantity and Value of Kaolin produced during the years 1940-1955 inclusive.

Year	Quantity Tons	Value £
1940 to 1951 (inclusive)	56,367.25	153,777
1952	8,366	39,182
1953	9,061	41,424
1954	7,948	36,139
1955	9,740	53,034
Total	91,482.25	323,556

LEAD.

The output was 10,558.5369 tons valued at £1,128,950 compared with 10,779.504 tons valued at £1,032,914 for 1954.

RETURN shows the Quantity and Value of Lead included in Silver Lead during the years 1919 to 1955 inclusive.

Year	Quantity Tons	Value £
1919 to 1951 (inclusive)	207,014.310	8,459,353
1952	8,575.566	1,168,758
1953	9,353.045	852,591
1954	10,779.504	1,032,914
1955	10,558.5369	1,128,950
Total	246,280.961	246,280.9619

LIMESTONE.

RETURN showing the Quantity of Limestone produced during the years 1919 to 1955, inclusive.

1919 to 1936 inclusive, 2,108,943 tons, £1,430,674.

Year	Limestone used in the Manufacture of Carbide and Cement.	Limestone used for Metallurgical, Building and Other Purposes.
	Tons	Tons
1937-1951 (inclusive)	1,758,132	2,039,436
1952	147,212	23,811
1953	161,472	20,830
1954	171,768	24,717
1955	175,081	31,057
Total	2,413,665	2,139,851

IRON ORE.

RETURN showing the Quantity and Value of Iron Ore produced to 1955. Production of Hematite, Limonite and Magnetite is included under this heading.

Year	Quantity Tons	Value £
Prior to 1954	59,680.175	52,543
1955	6,582	5,978
Total	66,262.175	58,521

NICKEL.

RETURN showing the Quantity and Value of Nickel produced from 1927 to 1955 inclusive.

Year	Quantity Tons	Value £
1927-1938	222.55	38,850
1939-1955 .....	.....	.....
Total	222.55	£38,850

OCHRE.

RETURN showing the Quantity and Value of Ochre produced during the years 1918 to 1955 inclusive.

Year	Quantity Tons	Value £
1918 to 1951 (inclusive)	1,804.25	3,966
1952	23.5	132
1953	19.5	59
1954	47	141
1955	6	18
Total	1,900.25	£4,316

OSMIRIDIUM.

The quantity of metal won during the year was 21.493 oz., valued at £860, as compared with 15.896 oz., valued at £636, for 1954.

RETURN showing the Quantity and Value of Osmiridium produced during the years 1910 to 1955 inclusive.

Year	Quantity Oz.	Value £
1910 to 1951 (inclusive)	30,803.916	667,699
1952	50.962	2,038
1953	58.831	2,354
1954	15.896	636
1955	21.493	860
Total	30,951.098	673,587

SILVER.

The output was 1,127,791.5037 oz (fine), valued at £363,809, as compared with 1,278,168.659 oz., valued at £390,126, for 1954.

RETURN showing the Quantity and Value of Silver contained in Silver-Lead, Blister Copper, Copper Ore, Zinc-Lead Ore and Gold Ore during the years 1919 to 1955 inclusive.

Year	In Silver Lead		In Blister Copper		In Copper Ore		In Gold Ore		In Zinc Lead Ore		Total	
	Quantity Oz.	Value £	Quantity Oz.	Value £	Quantity Oz.	Value £	Quantity Oz.	Value £	Quantity Oz.	Value £	Quantity Oz.	Value £
1919-1951 ..	15,945,078.435	1,916,290	3,156,962.9	430,590	232	25	44	4	8,296,158.70	1,519,104	27,398,476.035	3,866,013
1952	155,510.118	51,318	30.188	9,353	.....	.....	.....	.....	918,531.77	284,555	1,114,229.888	345,226
1953	202,740.057	49,437	28,701	9,213	.....	.....	.....	.....	971,815.11	311,953	1,203,256.167	370,603
1954	178,081.089	54,309	32,301	9,871	.....	.....	.....	.....	1,067,786.57	325,946	1,278,168.659	390,126
1955	154,802.493	49,514	31.375	10,151	.....	.....	.....	.....	941,614.01	304,144	1,127,791.503	363,809
Total	16,646,212.192	£2,120,868	3,279,527.9	£469,178	232	£25	44	£4	12,195,905.16	£2,745,702	32,121,922.252	£5,335,777

SHALE.

RETURN showing the Quantity and Value of Shale produced during the years 1910-1955 inclusive.

Year	Quantity Tons	Value £
1910-1935	41,572	31,231
1936-1955	.....	.....
Total	41,572	£31,231

SCHEELITE.

RETURN showing the Quantity and Value of Scheelite produced during the years 1917 to 1955 inclusive.

Year	Quantity Tons	Value £
1917 to 1951 (inclusive)	6,797.331	3,643,360
1952	969.59	1,321,664
1953	1,130.139	1,163,585
1954	1,317.420	755,864
1955	1,431.566	1,205,297
Total	11,646.046	£8,089,770

SILICA.

RETURN showing Quantity and Value of Silica produced during the years 1936 to 1955 inclusive.

Year	Quantity Tons	Value £
1936 to 1951 (inclusive)	102,335.75	49,139
1952	9,607.5	7,685
1953	6,189.75	5,430
1954	6,556.5	5,220
1955	6,199.5	6,240
Total	130,889	£73,714

TALC.

RETURN showing the Quantity and Value of Talc produced during the years 1928 to 1955 inclusive.

Year	Quantity Tons	Value £
1928-1948	333.35	1,077
1949-1955	.....	.....
Total	333.35	£1,077

TIN.

The output was 852.9845 tons valued at £635,491 as compared with 946.7059 tons valued at £683,628 for 1954.

RETURN showing the Quantity and Value of Metallic Tin exported from Tasmania from 1873 to 1904 (Compiled from Customs Returns) and Metallic Tin produced during the years 1905 to 1955 inclusive.

Year	Quantity Tons	Value £
1873 to 1879 inclusive	16,429	1,054,923
1879 to 1905 inclusive	56,419.93	7,530,234
1906 to 1951 inclusive	64,324.960	14,832,364
1952	771.186	744,618
1953	788.248	552,452
1954	946.750	683,628
1955	852.984	635,491
Total	140,533.059	£26,033,710

WOLFRAM.

RETURN showing the Quantity and Value of Wolfram produced during the years 1899 to 1955 inclusive.

Year	Quantity Tons	Value £
1899 to 1951 (inclusive)	6,591.816	2,070,088
1952	481.476	719,370
1953	521.853	596,897
1954	581.228	371,281
1955	578.415	495,721
Total	8,754.788	£4,253,357

ZINC.

RETURN showing the Quantity and Value of Zinc produced during the years 1919-1955 inclusive

Year	Quantity Tons	Value £
1919 to 1951	274,238.896	17,592,725
1952	22,396.254	3,292,441
1953	23,680.10	1,763,608
1954	26,079.384	2,032,209
1955	24,036.140	2,203,401
Total	470,430.774	£26,884,384

ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED.

RETURN FOR THE YEAR 1954.

EXTRACTION FROM ORES AND CONCENTRATES: RISDON.

From other than Tasmanian Ores—

Zinc	75,252	tons
Cadmium	182.6889	tons
Cobalt oxide	17.8028	tons

From Tasmanian Ores—

Zinc	25,838	tons
Cadmium	40	tons
Cobalt oxide	0.5682	tons
Lead	1.161	tons
Silver	121.167	oz.

Men Employed—

The average number of men employed was 2,441.

WEST COAST DIVISION.

Ore Mined—

	Tons
From Hercules Mine	23,535
From Rosebery Mine	155,164
Total	178,699

Concentrates Produced—

	Tons
Zinc Concentrates	50,689
Lead Concentrates	8,336
Copper Concentrates	5,878
Total	64,903

Recoverable Quantity in Ores Mined—

Zinc	24,036.14	tons
Lead	7,846.63	tons
Copper	503.34	tons
Cadmium	45.66	tons
Silver	941,614.01	oz.
Gold	11,074.69	oz. (fine)

Average Number of Men Employed—

Hercules Mine	49
Rosebery Mine	553
Total	602

STATISTICS OF PRODUCTION.

RETURN showing the Annual Published Value of Mineral Products for the State of Tasmania from 1880 to 1955 inclusive.

Year	Value £
1880 to 1951 (inclusive)	130,107,314
1952	11,746,606
1953	9,494,075
1954	9,769,278
1955	11,069,444
Total	£172,186,717

QUANTITY AND VALUE OF METALS AND MINERALS PRODUCED.

RETURN showing Quantity and Value of Metals and Minerals Produced in Tasmania as at
31st December, 1955.

Mineral or Metal.	Quantity.	Value with	Value with
		Sterling Metal Prices.	Aust. Metal Prices.
		£	£
Aluminium (tons)	Not available	.....	.....
Antimony (tons)	2·6640	815	1,017
Asbestos (tons)	3,979·8500	17,142	17,142
Barytes (tons)	2,196·2000	8,138	8,138
Bismuth (tons)	83·6359	28,432	29,644
Cadmium (tons)	908·3157	710,242	806,724
Carbide, Cement and Limestone to 1953 (tons)	6,636,670·6	12,970,370	12,970,370
Carbide and Cement from 1954 (tons)	260,493	1,867,449	1,867,449
Coal (tons)	6,897,925	6,765,015	6,765,015
Cobalt Oxide (tons)	7·1746	4,057	4,669
Copper (Blister) to 1918 (now shown under Silver and Copper) (tons)	166,600	13,788,527	13,788,527
Copper Matte (tons)	6,277	133,736	133,736
Copper Ore to 1918 (now shown under Copper) (tons)	41,768·6300	577,873	577,873
Copper (from 1919) (tons)	327,868·0890	30,798,539	36,138,616
Dolomite (tons)	8,690·2600	26,364	26,364
Gold (fine oz.)	2,415,078·8490	11,548,961	12,389,657
Granite (Red) (tons)	3,671·5000	28,757	28,757
Graphite (tons)	39·7500	107	107
Ilmenite (tons)	550	1,256	1,256
Iron Ore (including the production of Hematite, Limonite and Magnetite) (tons)	66,262·1750	58,521	58,521
Iron Pyrites (tons)	999,614·9730	1,735,173	1,735,173
Kaolin (tons)	91,482·2500	323,556	323,556
Lead (from 1919) (tons)	246,280·9619	12,642,566	10,449,434
Limestone from 1954 (tons)	402,623	301,548	301,548
Manganese (tons)	·6000	3	3
Monazite (tons)	32·6	488	607
Nickel (tons)	222·5500	38,850	40,518
Ochre (tons)	1,900·2500	4,316	4,316
Osmiridium (fine oz.)	30,951·0980	673,587	697,017
Rutile (tons)	·5000	18	18
Scheelite (tons)	11,646·0460	8,089,770	11,937,016
Silica (tons)	130,889	73,714	73,714
Shale (tons)	41,572	31,231	31,231
Silver-Lead Ore to 1918 (now under Silver and Lead) (tons)	1,083,897·8210	6,429,291	6,429,291
Silver from 1919 (fine oz.)	32,121,922·2527	5,335,777	6,261,076
Talc (tons)	333·3500	1,077	1,077
Tin (tons)	140,533·0594	26,884,384	27,814,172
Wolfram (tons)	8,754·788	4,253,357	5,417,285
Zinc (tons)	470,430·774	26,033,710	20,077,604
Total	.....	172,186,717	177,208,238

QUANTITY AND VALUE OF MINERALS.

STATISTICS RELATING TO THE MINERAL INDUSTRY FOR THE YEAR ENDED 31ST DECEMBER, 1955.

Mineral	MINING DIVISIONS.					Total Quality.	VALUE.	
	Northern and Southern.	Eastern.	North-Eastern.	North-Western.	Western.		Sterling.	Australian
							£S. available	£A.
Aluminium (tons)	....	....	....	....	....	Not available	....	....
Cadmium (tons)	....	....	....	....	45·660	45·660	58,809	69,039
Coal (tons)	8,658	289,953	....	610	....	299,221	....	604,803
Cobalt Oxide (tons)	....	....	....	....	5682	5682	....	636
Copper (tons)	....	....	....	....	8,085·3400	8,085·3400	2,852,824	3,613,658
Dolomite (tons)	....	....	....	2,266	....	2,266	....	6,798
Gold (fine oz.)	981	....	404·930	....	15,706·690	16,112·601	202,075	251,759
Granite (Red) (tons)	....	41	....	....	....	41	....	690
Iron Ore (tons)	....	....	....	6,582	....	6,582	....	5,978
Kaolin (tons)	4,814	2,662	2,264	....	....	9,740	....	53,034
Lead (tons)	....	....	....	....	10,558·5369	10,558·5369	1,128,950	1,358,716
Limestone (tons)	22,928	....	....	178,733	4,477	206,138	....	154,858
Ochre (tons)	....	....	....	6	....	6	....	18
Osmiridium (fine oz.)	21·493	....	....	....	....	21·493	860	1,504
Pyrites (tons)	....	....	....	....	67,420	67,420	....	202,260
Scheelite (tons)	....	....	....	1,431·566	....	1,431·566	1,205,297	2,370,007
Silica (tons)	....	....	....	554·500	5,645	6,199·500	....	6,240
Silver (fine oz.)	....	....	....	....	1,127,791·503	1,127,791·503	363,809	426,314
Tin (tons)	2·8516	497·5605	259·9720	50·390	42·2104	852·9845	635,491	814,651
Wolfram (tons)	....	556·037	....	22·378	....	578·415	495,721	758,404
Zinc (tons)	....	....	....	....	24,036·140	24,036·140	2,203,401	2,778,078
Total Value with Sterling Metal Prices	....	....	....	....	....	....	....	10,182,552
Total Value with Australian Metal Prices	....	....	....	....	....	....	....	13,477,445
Average Number of Men Employed	3,299	683	201	689	2,223	7,095	....	....
Manufactured Products: Carbide and Cement (tons)	8,127	....	....	115,414	....	123,541	....	886,892

The Electrolytic Zinc Company of Australasia Limited recovered 75,252 tons of Zinc, valued at £7,172,190; 182·6889 tons of Cadmium, valued at £276,226; and 17·8028 tons of Cobalt Oxide, valued at £19,939 from other than Tasmanian Ores and employed an average number of 2,441 men at Risdon.

STATISTICS OF MINING COMPANIES.

RETURN showing the Amounts Paid in Dividends by Mining Companies during the Year ending 31st December, 1955.

Mines	Dividends
Coal	7,050
Copper	377,813
Scheelite	500,000
Wolfram-Tin	405,625
Zinc	1,650,000*
Total	£2,940,488

* This amount represents total dividends out of Tasmanian and ex-Tasmanian profits.

RETURN showing the Mining Companies Registered during the Year ended 31st December, 1955.

Number of Companies	Capital
Nil	Nil

One agent for foreign companies under the Mining Companies (Foreign) Act, 1884, was registered. No syndicates under Part V of the Mining Companies Act, 1884, were registered.

RETURN showing the Total Amount of Rents, Fees, &c., received by the Mines Department during the Year ending 31st December, 1955.

Head of Revenue	Amount
	£ s. d.
Public Works and Services—Mines Department	1,689 4 7
Rent of Auriferous and Mineral Lands	7,738 1 7
Fees, Auriferous and Mineral Lands	1,039 19 2
Survey Fees	3,273 8 10
Fees under the Explosives and Inflammable Liquids Act	5,843 1 9
Total	19,584 15 11

Comparative Statement of Revenue from Mines, being Rents, Fees, Storage of Explosives, &c., (exclusive of Survey Fees), Paid to the Treasury during the Years 1951 to 1955.

Year	Amount
	£ s. d.
1951	11,979 10 1
1952	11,539 17 2
1953	12,272 14 1
1954	11,089 17 5
1955	19,584 15 11

The above Statement does not include Stamp Duties upon Transfer of Leases and Tax payable upon Dividends, from which sources large sums are derived.

RETURN showing the Total Number of Leases and Licences in Force on 31st December, 1955.

Mineral	Number	Number of Sluiceways	Area Acres.
Bauxite	1	.....	129½
Barytes	1	.....	10
Coal	35	.....	7,114
Clay	9	.....	216
Copper	1	.....	33
Granite	4	.....	30
Gold	23	.....	587½
Iron	1	.....	50
Limestone	12	.....	807
Minerals	39	.....	9,312
Nickel	5	.....	249
Osmiridium	1	.....	10
Ochre	2	.....	24
Scheelite	3	.....	281
Silica	3	.....	35
Silver Lead	18	.....	660
Stone	18	.....	1,348
Sand	2	.....	13
Tin	175	.....	6,546
Tin-Wolfram	7	.....	487
Wolfram	2	.....	86
Wolfram-Gold	3	.....	120
Easement Licences	58	.....	664
Water Licences	177	863	1,095½
Total	600	863	30,407½

RETURN showing Total Number and Area of Leases and Licences Issued during the Year ended 31st December, 1955.

Mineral	Leases	Area Acres	Sluiceways
Gold	1	10	.....
Coal	1	600	.....
Clay	1	5	.....
Tin	3	87	.....
Minerals	5	358	.....
Wolfram-Tin	1	80	.....
Water and Easement Licences	10	11	20
Total	22	1,151	20

RETURN showing Total Number and Area of Leases and Licences Applied for during the Year ended 31st December, 1955.

Mineral	Number	Area Acres.	Sluiceways
Copper	9	680	.....
Coal	10	2,588	.....
Clay	1	20	.....
Gravel	1	50	.....
Gold	8	192	.....
Limestone	2	270	.....
Minerals	106	7,719	.....
Osmiridium	3	60	.....
Silver Lead	5	60	.....
Stone	3	2,912	.....
Scheelite	1	69	.....
Tin	31	863	.....
Tin-Wolfram	2	376	.....
Water Licences	15	28	52
Total	197	15,887	52

TABLE showing the Average Annual Sterling Prices for Minerals During Recent Years.

	Average for 1952	Average for 1953	Average for 1954	Average for 1955
Copper—Standard, spot: per ton	£ s. d. 264 14 5	£ s. d. 252 7 4	£ s. d. 246 17 10	£ s. d. 354 16 1
Lead—Soft Foreign: per ton	136 7 8	91 3 1	95 7 11	106 15 8
Spelter: per ton	147 10 3	74 9 6	77 14 4	91 7 10
Tin—Standard, spot per ton	965 11 0	700 16 2	720 7 2	746 6 8
Silver—Standard, spot: per oz.	s. d. 6 2·4	s. d. 6 2·4	s. d. 6 1	s. d. 6 5
Osmiridium, per oz.	£ s. d. 39 19 10	£ s. d. 40 0 0	£ s. d. 40 0 0	£ s. d. 40 0 0
Wolfram, per ton	2,244 13 0	1,656 17 6	841 0 0	1,265 1 6
Gold, per fine oz.	W.O.s. 12 8 0	W.O.s. 12 8 0	12 9 3	W.O.s. 12 15 10

AID TO MINING.

The policy of assistance to mining was maintained under the provisions of the Aid to Mining Act. An amount of £1,175/13/3 was expended in assistance, drilling operations and insurance. Repayments, covering loans, tribute royalties and interest amounted to £1,471/3/1. The amount

standing to the credit of the Mining Trust Fund was £11,541/0/7.

Miscellaneous parties, tributing under the provisions of the Aid to Mining Act, continued as producers at the Mount Bischoff Tin Mine, Waratah. Operations resulted in a recovery of 54·736 tons of concentrates, containing 36·997 tons of metallic tin and royalty payments amounted to £916/13/1.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR THE YEAR ENDED 31st DECEMBER, 1955.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
Balance 31st December, 1955	11,245	10 9	Sustenance Allowance	120	0 0
Repayment of Loans	532	4 0	Assistance	1,043	8 5
Interest	10	1 2	Insurance Premiums	12	4 10
Tribute Royalty	916	13 1			
Insurance	12	4 10	Total Payments	1,175	13 3
			Balance (Excess Receipts over Payments)	11,541	0 7
	£12,716	13 10		£12,716	13 10

DRILLING.

Four drilling plants were in operation consisting of two diamond drills and two percussion plants. Boring was undertaken for coal, gold, pyrite, and copper nickel and for supplies of underground water for pastoral purposes. Foundation testing was also done.

One diamond drilling plant was in operation at Ida Bay to test a coal deposit for the use of a proposed new industry. Two vertical holes were drilled, one to 324 feet and the other to 130 feet. The plant was then transferred to St. Marys where a hole was put down to 380 feet on the lease of the Jubilee Coal Company. Three bores were completed last year at a gold prospect at Mathinna known as O'Briens Mine and this year a further two holes were drilled. Bore No. 4 reached the target depth at 268 feet and Bore No. 5 at 207 feet.

A detailed testing programme was undertaken by another diamond drill on a pyrite deposit at

Port Sorell. Seven holes were completed, the total footage drilled being 1,066 feet. Operations were then transferred to the copper-nickel deposits at the Five-Mile in the vicinity of Zeehan and boring was in progress at the end of the year. One hole had been completed at 111 feet and another had reached a depth of 30 feet.

The two percussion boring plants operated by the Department were in constant demand by hirers. Foundation testing was carried out at Launceston for the Launceston Marine Board, and bores aggregating 342 feet were put down. Boring for supplies of underground water was undertaken in the Smithton, Bothwell, Kempton and Hamilton districts. In the Smithton district 28 bores were completed at depths ranging from 18 feet to 166 feet. The total footage drilled was 1,957 feet. Water was obtained in 19 holes. In the Bothwell, Kempton and Hamilton districts 13 holes were bored, 10 of which produced water. Depths ranged from 30 feet to 309 feet and the aggregate footage totalled 1,801 feet.

DETAILS OF EXPENDITURE ON DRILLING DURING THE YEAR ENDED 31st DECEMBER, 1955.

Plant	Location	Amount Expended.		
		£	s.	d.
Junior Straitline Diamond Drill	Ida Bay	963	4	7
Junior Straitline Diamond Drill	St. Marys	648	2	4
Junior Straitline Diamond Drill	Mathinna	546	17	3
Goldfields No. 10 Diamond Drill	Port Sorell	1,255	19	0
Goldfields No. 10 Diamond Drill	Zeehan	131	0	0
G33 Percussion Drill	Smithton District	2,135	6	5
G33 Percussion Drill	Districts	2,319	0	3
Miscellaneous (including purchase spare tools)		828	4	5
Total		£8,827	14	3

SUBSIDY FOR GOLD PRODUCERS.

Under the provisions of the Gold-Mining Industry Assistance Act 1954, application may be made to the Commonwealth Sub-Treasury for assistance in the form of a subsidy on gold delivered to an approved bank or refiner. Applications may be made in respect to gold produced during the year ending 30th June, 1955, and the year ending 30th June, 1956. Those eligible to claim assistance are—

1. Small producers, i.e., persons, partnerships, syndicates, or companies whose production is 500 oz. or less of fine gold per annum.

Under certain conditions, small producers will be eligible for payment of a subsidy at a flat rate of £1 10/- per fine ounce. The main conditions are—

(a) That the value of the gold delivered must be more than one-half of the total value of the producer's mining output for the year.

(b) That, where the producer receives more than £15/12/6 per fine ounce for his gold on account of dividends arising out of premium sales, the subsidy will be reduced by the amount of the dividends.

The form to be used by small producers in making application is entitled "Application by Small Producer for Payment of Subsidy."

2. Large producers, i.e., those producing more than 500 oz. of fine gold per annum. The payment of a subsidy to large producers is subject to a number of conditions, which include, among others, the receipts from premium sales of gold, profit limitation test, rate of discovery of gold, and the cost of developing gold mines. Subsidy payments will be based on a formula. Intending applicants should familiarise themselves with the provisions of the Act. It is necessary for them in addition to applying for advance payments of subsidy, to submit applications for approval as large producers.

BOARD OF EXAMINERS OF MINE MANAGERS.

An examination for Certificates of Competency as Mine Managers was held at Zeehan on 5th, 6th, and 7th July, 1955, at which four candidates attended. The following candidates were successful, passing in the listed order of merit:—

- 1st. Mr. B. R. Thompson.
- 2nd. Mr. R. R. McGhie.
Mr. R. B. Moffit.

Certificates were issued by the Board without examination to the following applicants who presented Mine Manager's Certificates issued by other Boards of Examiners recognised by the Board:—

- Mr. F. G. Hamilton.
Mr. A. Pearson.
Mr. S. J. Griffiths.
Mr. A. H. Dutton.

LEGISLATION.

No amendments were made to the various Acts administered by this Department, but several Statutory Rules were proclaimed. The Rules were mainly concerned with exempting areas from the provisions of the Mining Act to facilitate investigational work by this Department and the Bureau of Mineral Resources. Large areas previously reserved from occupation were made subject to the Act.

A Rule was proclaimed early in the year to extend the upper limit of loans under the Aid to Mining Act from £300 to £1,000 and a new form of security was designed to more adequately secure loans. An amendment was made to the Explosives Regulations relating to transport of explosives, and the Mines and Works Rules were also amended to further control the use of explosives underground.

DEPARTMENTAL ACTIVITIES.

Geological services of the Department have been in constant demand in undertaking examination of known mineral areas and of potential areas; in advising on sources of underground water; in examining foundation strata on behalf of other departments and authorities; in advising prospectors; in the preparation of geological maps and reports and in making mineralogical examinations of rock and mineral specimens. Boring plant under the Drilling Superintendent has been engaged in diamond drilling and in percussion boring. The chemical and metallurgical laboratories have provided valuable assistance to the mining industry through assays of rocks and minerals, in metallurgical research into recovery problems and in the design and operation of milling plants.

The Regional geological establishment at Lorrinna has engaged in a full programme of geological work, but work at Port Davey has been restricted because of staff shortages. The establishment at Zeehan functioned for a brief period but upon the resignation of the Regional Geologist work was suspended pending a new appointment. Difficulty is being encountered in obtaining the services of a suitably experienced geologist.

The Department has co-operated with the Commonwealth Bureau of Mineral Resources which has undertaken geophysical work on certain areas north-west of Zeehan and at South Mt. Cameron and has made certain investigations of uranium deposits in association with geologists of this Department. In addition, a preliminary airborne magnetometer survey was made of the iron ore deposits at Blythe and Hampshire in the north-western part of the State.

STAFF.

The following represented staff movements:—

Officer	Position	Remarks
Gregory, I. S.	Regional Geologist	Appointed, later resigned
Jackson, A. V.	Senior Field Assistant	Promoted
Haig, N. G.	Senior Field Assistant	Promoted
Mayne, S. J.	Geologist	Appointed
Robertson, G. S.	Inspector of Mines and Explosives	Promoted
Cooley, Miss E. J.	Junior Typist	Appointed
Stuttard, Miss E. L.	Records Clerk	Transfer
Allen, Miss B.	Junior Typist	Appointed
Everard, G.	Mineralogist and Petrologist	Transfer
Blake, F.	Geologist	Promoted
James, P.	Chemist and Assayer	Transfer
Farquhar, P.	Chemist and Assayer	Transfer
D'Emden, Miss J.	Typist	Appointed, later resigned
Kendall, K. T.	Mapping and Engineering Draughtsman in Charge	Promoted
Burrell, T. N.	Field Assistant	Appointed
Johnson, P. M.	Assistant Chief Inspector of Mines and Explosives	Appointed
Cannell, R. E. J.	Mapping and Engineering Draughtsman	Transfer
Evans, K. L.	Drilling Superintendent	Appointed

MINES DRAFTING BRANCH.

Tracings, &c.	39
Number of working plans in use and kept up to date	238
Mineral leases applied for	159
Instructions issued to surveyors	81
Diagrams received from Contract Surveyors	4
Diagrams received from Staff Surveyors	62
Diagrams and consolidated diagrams compiled and drawn	2
Manuscripts brought up to date	6
Manuscripts forwarded to printer	2
Leases drawn	34
Leases transferred	31
Special Prospector's Licences — Areas described and charted	26
Permits to enter charted	66
Photostats forwarded to Northern office	27
Lithographs entered up to date	93
Underground mining plans examined and checked	3

Mapping and Engineering Draftsmen prepared geological maps to be included with field reports, regional maps, base maps, engineering plans and plans of requirements for the Inflammable Liquids Act and Explosives Act. In addition, maps to be included in Departmental publications and a geological series maps were prepared for printing.

APPRECIATION OF SERVICES.

Appreciation is recorded of the services rendered by officers of the Department, including officers of the Mining Drafting Branch, Warden of Mines and Registrars of Mines in the several mining districts.

I have the honour to be,

Sir,

Your obedient servant,

J. G. SYMONS, Director of Mines.

APPENDIX I.

THE GEOLOGICAL SURVEY OF TASMANIA.

H. G. W. KEID, M.Sc. Chief Geologist.

The work of the Geological Survey has been carried on from establishments at Hobart, Lorinna, Zeehan and Port Davey. Throughout 1955 the geological staff was seriously depleted and field work had to be considerably curtailed.

Hobart.

During the year alterations in the staff at Hobart were the appointment of geologist Mr. G. Everard, B.A., A.M. (Aus.) I.M.M., to the position of petrologist and Mineralogist as from 18th March, and the re-appointment of Mr. F. Blake as geologist from 12th May.

Late in the year a re-organisation of the geological staff resulted in the appointment of Terence D. Hughes as senior geologist. The holder of this position is intended to supervise the geological staff stationed at Hobart, including the drilling and drafting sections.

Lorinna Regional Establishment.

At the Lorinna Establishment Mr. I. B. Jennings, B.Sc., A.M. (Aus.), I.M.M., has carried out the duties of Regional Geologist with Mr. S. J. Mayne, B.A., M.Sc., as geologist, and Mr. K. Burns, B.Sc., as assistant geologist

Zeehan Regional Establishment.

At the end of 1954 the position of Regional Geologist at the Zeehan Establishment was vacant but was filled by the appointment of Mr. I. S. Gregory, B.Sc., A.M. (Aus.), I.M.M., on 4th July. Mr. Gregory resigned his position on 26th October and it is now vacant.

Port Davey Regional Establishment.

At Port Davey Mr. Stefanski, M.Sc., has been in charge of operations and has continued his work of reconnaissance and mapping of the area in the vicinity of Bathurst Harbour.

Individual reports of the year's activity have been supplied by:—

Hobart:

The Chief Geologist, Mr. H. G. W. Keid, M.Sc., M. (Aus.) I.M.M.
The Senior Geologist, Mr. T. D. Hughes, B.Sc. Geologist, Mr. F. Blake, A.M. (Aus.) I.M.M.
Petrologist and Mineralogist, Mr. G. Everard, B.A., A.M. (Aus.) I.M.M.

Lorinna:

The Regional Geologist, Mr. I. B. Jennings, B.Sc., A.M. (Aus.) I.M.M.

Port Davey:

The Regional Geologist, Mr. M. Z. Stefanski, M.Sc., A.M. (Aus.) I.M.M.

Reports:

The following reports were prepared during the year:—

Mr. Lutwyche Wolfram Show, Scamander. H. G. W. Keid.
Pyrite Prospect Branch Creek (Third Report). T. D. Hughes.
Permanent Way near Tunbridge. T. D. Hughes.
Hamilton Coal Company. T. D. Hughes.
Landslide to Ringarooma River. T. D. Hughes.
Notes on Coal at Mt. Paul. T. D. Hughes.
Notes on A. Chwalczyk's Uranium Prospect, Storey's Creek. T. D. Hughes.
Proposed Dam Site, Esperance River. T. D. Hughes.
Radio Active Material at the Anchor Mine. T. D. Hughes.
A. G. Hughes' Uranium Prospect, Storeys Creek. T. D. Hughes.
J. Curtain's Scheelite Prospect, King Island. T. D. Hughes.
Notes on Coal Prospect near Dover. T. D. Hughes.
Scheelite Prospect in the Closer Settlement Area, Mr. Stanley, King Island. T. D. Hughes.
Coal Prospect (E. Barber) near Fingal. T. D. Hughes.
Foundations for Nurses' Home, Launceston. T. D. Hughes.
Coal near Mt. Lloyd. T. D. Hughes.
Uranium at the Royal George. T. D. Hughes,

Geophysical Survey of Areas North and West of Zeehan. T. D. Hughes.

Uranium in Tasmania. T. D. Hughes.

Milnes Uranium, "Leona Tin Mine." T. D. Hughes.

Underground Water Possibilities on Lot 3, Bashan Estate, near Waddamana, Mr. R. C. Perry, owner. F. Blake.

Rock Falls on Railway Line, Sisters Hill. F. Blake.

Boring on Scotia-Lochaber Tin Leads, Great Northern Plains, Gladstone District. F. Blake.
The Shepherd and Murphy Mine, Moina. F. Blake.

Notes on Iron Ore Deposits. F. Blake.

The Geology of the Round Hill Silver-Lead Deposits. I. B. Jennings.

REPORTS OF GEOLOGISTS.

H. G. W. KEID, M.Sc., the Chief Geologist, reports:—

Following the discovery of uranium in the State, the known uranium ore deposits were examined. Sampling was done at the Royal George Mine and in other instances advice was given towards future development.

Over the first half of the year, several visits were made to the Ida Bay district in connection with a diamond drilling campaign carried out to determine whether or not coal of economic quantity occurred. Visits were also made to the Mount Nicholas range district in connection with diamond drilling carried out on behalf of the Jubilee Coal Company and drilling proposed by the Cornwall Coal Company.

Gold prospects were examined in the Gladstone area and tin prospects at Gladstone, Rossarden and Ringarooma were visited. The Upper Scamander wolfram field was visited in connection with an application for aid to mining.

Geological assistance was provided for the Montana Silver Lead No Liability at Zeehan.

Surges Bay clay deposits were examined and advice tendered relative to boring to test further reserves.

Surveys of the Smithton and Melton Mowbray districts were made to assess extensions of the underground water supplies. Percussion boring plants operated by the Department are working in these districts.

Annual recreation and long-service leave accounted for the latter half of the year.

The Senior Geologist, Terence D. Hughes, B.Sc., reports:—

The discovery of torbenite at the Royal George Mine in January stimulated the search for uranium minerals in Tasmania and much of my time this year has been occupied with work relating to these minerals. The Department has eleven Austronic and three Philips Geiger counters for hire and, during the year, these were hired by prospectors and others for periods ranging from a week-end to several months. Altogether, nearly 100 persons hired these counters for one or more periods, and the majority had to be instructed in their use and advised on suitable areas and general geology. Many specimens were examined and prospects visited and reports were prepared by me on the following prospects:—

Royal George Mine.
Hughes' Prospect, Storey's Creek.
Anchor Mine.
Chwalczyk's Prospect, Storey's Creek.

At various times during the year officers of the Bureau of Mineral Resources and the Atomic Energy Commission were shown around these and other areas.

A further report was prepared on the Branch Creek pyrite deposits and, as the results of drilling, several tonnages of ore reserves were estimated.

Several visits were paid to Waratah in connection with the tin tributaries in operation there.

Coal deposits were investigated at Mt. Lloyd, Jubilee Mine, Fingal, Dover, Strathblane Area, Stanhope Mine and Mt. Paul, and typewritten reports prepared on these deposits.

A visit was paid to King Island and scheelite deposits investigated near the King Island Scheelite Mine and at J. Curtain's prospect near the centre of the Island.

Dam-sites were reported on at Glenorchy and on the Esperance and Don Rivers.

A survey was conducted in the vicinity of the Endurance Mine in preparation for a geophysical survey, which has since been undertaken by the Bureau of Mineral Resources. A visit was also paid to the Zeehan area, and a report prepared on the progress of the geophysical survey there.

Underground water problems were investigated at Waterhouse, Lindisfarne, Melton Mowbray, Kempton, Bothwell, Ross, Launceston, Dysart, Hamilton and Ellendale.

Flights were made over the Hampshire and Blythe River iron deposits during an airborne magnetometer survey by officers of the Bureau of Mineral Resources.

Several visits were paid to the old O'Briens gold mine near Mathinna where a drilling programme was in progress.

Minor investigations included:—Foundations for railway bridge over Black River; foundations for Nurses' Home, Launceston; causes of slip to Ringarooma River; and examination of railway permanent-way near Tunbridge.

During the latter half of the year I acted as Chief Geologist during the absence of Mr. H. G. W. Keid on long-service leave.

Geologist, Mr. F. Blake, reports:—

After a period of several years spent on other duties in this Department I was again appointed to my former position of Geologist on 12th May, 1955.

Field Work.

The following list includes all field surveys and examinations which were carried out during the year:—

- (1) Survey of tin-tungsten deposits in the vicinity of Shepherd and Murphy Mine, Moina.
- (2) Examination of properties at Hamilton, Hollow Tree and Bashan Plains in connection with boring for underground water.
- (3) Examination of a coal bearing area at Mt. Paul near Coles Bay.
- (4) Investigation of a railway cutting near Montumana to determine the cause of a landslide.
- (5) Surveys to map the position of previous bore holes for underground water at Smithton, Britton's Swamp, Christmas Hills and Montague.
- (6) Geological survey of areas to the south and west of Great Lake to complete the geology of the first of a series of National Map Sheets for publication.

The Petrologist and Mineralogist, Mr. G. Everard, B.A., reports:—

In January an examination was made of the Sorell area with regard to the possibilities of obtaining underground water for farming properties.

An exhibit of fluorescent and radioactive minerals, &c., was prepared and installed in the Show Train, exhibiting State products during the early part of the year.

Owing to the increasing volume of mineralogical, petrological, and mineragraphic work and the necessity for systematic investigation in these fields, I was appointed Mineralogist and Petrologist on the 18th March. Investigations made included:—

D.D.H. core from Copper-Nickel Mine, Zeehan.

O'Brien's Mine D.D.H. core.

Suites of radioactive rocks from Royal George Mine. Radioactive rock and mineral specimens from various prospects at Rossarden.

Branch Creek pyrite prospect D.D.H. core.

Individual specimens to the number of over 100 were examined and determined for the Chief Chemist and Metallurgist, Departmental Geologists, and the general public. Innumerable specimens were examined for radioactivity. Information was obtained and replies prepared to several inquiries of scientific and commercial nature.

In October, in co-operation with geologist F. Blake, a geological survey was made of all previously unmaped areas of the Great Lake Sheet of the Military Map of the

State. Many rock specimens were collected. Further work was undertaken in September in an area of the Central Plateau to the north-west of Arthur Lakes to finalise data for the geological map.

The Regional Geologist, Lorinna, Mr. I. B. Jennings, B.Sc., reports:—

During the year the geological staff at Lorinna was augmented by the appointment of Mr. S. J. Mayne as Geologist, and Mr. K. Burns as Assistant Geologist. Mr. Burns commenced duty at Lorinna on 23rd May, 1955, and Mr. Mayne on 16th June, 1955. Mr. N. G. Haig continued as Senior Field Assistant and late in the year Mr. A. V. Jackson, Senior Field Assistant, was transferred to Lorinna from Zeehan when that establishment temporarily ceased operating.

The early portion of the year was occupied by an exhaustive study of the silver-lead deposits in the vicinity of Round Hill. A detailed stadia survey was conducted in the vicinity of the old workings, together with a general survey of a rather wide area. All accessible workings were mapped in detail and sampled where necessary. Since these ore bodies are structurally controlled, a greater emphasis was placed upon structural interpretation than has been the case in the past. As a result of this it is now considered that the structural relationships of the various ore bodies has been established. A report on the work has been furnished and a programme of diamond drilling recommended to test the conclusions reached and to search for further ore bodies.

This detailed work has established an important structural pattern which may well have very useful implications over a wider area. It is therefore expected to considerably aid the regional mapping of the Middlesex and Sheffield Quadrangles.

The regional mapping is at present directed towards completing the Sheffield Quadrangle as soon as possible and a great deal of progress has been made in this direction. However, a number of fundamental problems of structure and stratigraphy still remain and are at present the subject of closer study.

Mr. Burns has spent the greater part of his time mapping the Barrington-Sprent-Preston areas. By means of careful mapping of the tertiary basalt boundaries he has been able to reconstruct a good deal of the pre-tertiary drainage system. Concurrently he has mapped large areas of Mesozoic and Paleozoic rocks and the regional structure in these rocks is becoming evident. A fair amount of work has been directed towards establishing the stratigraphy and petrology of the Dundas Group but much work still remains to be done on these rocks.

Mr. Mayne has been employed almost exclusively mapping basalt areas in the Sheffield-Railton-Paradise and Nook areas. This work has been largely completed and a start made in mapping the pre-tertiary rocks throughout these areas. As contour maps become available the pre-tertiary drainage system of the area will be investigated.

In addition to the above work some time has been occupied in mapping Dundas and June Group rocks in the Beulah-Kimberley region. The stratigraphy and structure of the June Group rocks is well in hand but many problems still exist before the structure and stratigraphy of the Dundas Group can be satisfactorily established.

During the year a number of prospects have been examined and advice and mineral determinations made for the various parties engaged. A number of small copper deposits in the area were examined for signs of radioactive minerals but with negative results.

The Regional Geologist, Port Davey, Mr. M. Z. Stefanski, M.Sc., reports:—

During the year 1955 further preliminary examinations were made of areas extending south-west from the Bathurst Harbour base.

Detailed mapping of the geology of the areas east of the base to Moulter's Cove and southward as far as Cox's Bight has been completed.

The known tin-bearing areas have been examined and details recorded.

During the year base maps have been prepared from aerial photographs.

APPENDIX II.

REPORT OF CHIEF CHEMIST AND METALLURGIST.

The Chief Chemist and Metallurgist, W. St. C. Manson, reports:—

Analyses were made of ores, minerals, rocks, ferrous and non-ferrous alloys, clays, coal, water, mill and research products associated with ore dressing investigations. Ore dressing research and associated mill operations and advice thereon continued to be a major activity.

Number of determinations made during 1955:—

Ore Types.	Number.
Aluminium	24
Antimony	46
Arsenic	6
Bismuth	49
Calcium	202
Cadmium	15
Carbon in steel	244
Chromium in steel	104
Coal Analyses	97
Copper	98
Gold	124
Ignition loss	7
Insolubles	70
Iron	58
Lead	194
Magnesia	25
Manganese	106
Moisture	67
Molybdenum	34
Nickel	31
Phosphorus	106
Potassium	17
Qualitative Tests	936
Radioactive Tests	194
Rare Earth Metals	4
Sizings	29
Silicon	113
Silver	192
Sodium	19
Sulphur	273
Tin	469
Titanium	24
Tungsten	316
Uncommon Elements	16
Uranium	68
Water Analyses	4
Zinc	89
Miscellaneous	157
TOTAL	4,627

Ore dressing investigations completed during the year were as follows:—

Zinc-Wolfram	3
Cassiterite-Wolfram	1
Magnetite-Wolfram	1
Scheelite-Molybdenite-Bismuth- inite	2
Wolfram-Cassiterite-Siderite	1
Limesand-Quartz	1
Cassiterite-Ilmenite Rutile	1
Mill Survey	1
TOTAL	11

ORE DRESSING INVESTIGATIONS.

Storey's Creek Tin Mining Co.

R 280-R 281-R 282.

The company requested investigations into the reduction of the zinc content of their wolfram concentrates produced by gravity concentration and finally separated from associated cassiterite, &c., by electro-magnetic separation. It was stated that zinc was a penalty in wolfram concentrates if it amounted to nought point one per cent or more. The zinc is present as marmatite.

In a sample labelled "fine concentrate" (R 280) and which was all minus 60 mesh B.S. screen size and contained 32.7 per cent of the minus 200 mesh size flotation of the marmatite was successful using copper sulphate and amyl xanthate. In this test the zinc content was reduced from 0.13 per cent to 0.04 per cent.

Coarse concentrates (R 282) were too coarse for froth flotation, and alternatives were investigated to avoid ball mill grinding of the readily slimed wolfram. Sizing of the coarse concentrate was 64.5 per cent plus 10 mesh and minus 10 plus 22 mesh 34.7 per cent.

Specimens of wolfram and marmatite (R 280) were obtained from the company and separation of the marmatite and wolfram was investigated by chemical means. The most useful chemical treatment found was concentrated hydrochloric acid at room temperature. By such treatment 80 to 90 per cent of the marmatite could be brought into solution in 24 hours without measurable effect on coarse wolfram. Tests with the coarse concentrate resulted in a reduction of the zinc from 0.2 per cent to 0.04 per cent. Table flotation could be used to treat medium sized concentrates. Bulk flotation has the advantage that it also removes other sulphide impurities, some of which represent penalties in realization.

R 289. Mill Survey.

A mill survey was undertaken to provide data for examination of the efficiency of current treatment methods preparatory to undertaking a mill design flow sheet for a new mill of approximately double the capacity of the existing mill. Ore is crushed finally through rolls to minus $\frac{3}{8}$ -inch size and is then screened by trommels into five fractions.

The first three fractions are concentrated in three three-compartment Harz jigs and the last two fractions are concentrated on tables. Jig middlings are roll crushed and returned to the jigs.

Jig tailings contained 0.05 per cent to 0.07 per cent of tungstic oxide from feeds of 1.32, 1.32 and 2.51 per cent and thus indicated high removal of wolfram. The quantities of the middlings were measured and samples examined which showed the quantities of valuable minerals present and indicated methods of recovery.

A previous examination of mill jig middlings (R 178/1947) indicated a grind to minus 16 mesh B.S. sizing for liberation and concentration of the wolfram and cassiterite. The ore contains wolfram and cassiterite as separate coarse aggregates with no noticeable intergrowth. Wolfram predominates over cassiterite and the ratio normally is about 6 : 1. High recoveries are obtained by coarse crushing and gravity concentration.

The new mill design will generally follow a similar method of treatment to the existing mill treatment.

Moina Tungsten-Tin Mining Co.

R 283.

A mill magnetic wolfram product was submitted to determine whether the tin content could be reduced by further magnetic separation. The sample contained 70.8 per cent of tungstic oxide and 3.2 per cent of tin.

Retreatment resulted in a magnetic product containing 72.6 per cent of tungstic oxide and 1.14 per cent of tin, rejecting 65 per cent of the tin in a non-magnetic product assaying 73 per cent of tin and 6.9 per cent of tungstic oxide. Plus 10 and 22 mesh fractions contained composite particles of wolfram and cassiterite which would require crushing to allow of magnetic separation.

The non-magnetic product contained some scheelite.

R 284.

A mill product produced by table concentration containing appreciable magnetite and wolfram was submitted for investigation of separation by wet magnetic method. This product is treated in the mill after drying on a revolving permanent magnet for the purpose of rejecting magnetite prior to high intensity magnetic separation of wolfram and cassiterite. High feed rates and agglomeration incidental to drying had apparently been the causes of appreciable losses in the reject magnetite product.

Wet magnetic tests were performed with a Dings-Crockett wet 4-inch belt alnico separator at feed rates ranging from 48 to 78 lbs. per hour. Wet magnetic separation resulted in practically no loss of wolfram in the magnetite product even with feed rates of 20 lbs. per inch belt width per hour. The mill product contained 25.9 per cent of tungstic oxide. The treatment described resulted in rejection of 12.7 per cent of the magnetite with the loss of only 0.5 per cent of the wolfram.

R 285 and R 285A.

A non-magnetic mill product containing cassiterite, scheelite, bismuthinite, pyrite and a trace of molybdenite was submitted for separation of the minerals by flotation.

Flotation of scheelite from cassiterite. Flotation of scheelite has been successfully applied commercially, but no previous work is known on selective flotation of scheelite from cassiterite. Reagents which floated scheelite also floated cassiterite so that virtually no separation was obtained. With these same reagents under controlled conditions of alkalinity and depressant it was found possible to obtain good separation of the two minerals. The sample for test contained 60.05 per cent of tin, 4.45 per cent of tungstic oxide, 1.55 per cent of bismuth, 2.08 per cent of sulphur and a trace of molybdenite. The first object was to produce a sale grade tin concentrate and secondly to produce a scheelite concentrate and thirdly to produce a bismuth concentrate.

Production of a tin concentrate after separate sulphide and scheelite flotation resulted in a recovery of 98 per cent of the tin with assay values of tin 68 per cent and tungstic oxide 0.77 per cent.

First a mixed Bi-Fe-Mo sulphide float was produced with soda ash, amyl xanthate and frother M200. After cleaning the concentrate the bismuth content amounted to 25.9 per cent with a recovery of 96.4 per cent. Scheelite flotation with high sodium silicate and Oleine at pH value of 10 resulted in a cleaner concentrate containing 63.5 per cent of tungstic oxide with a recovery of 82.6 per cent. This concentrate contained 4.42 per cent of tin which amounted to 0.4 per cent distribution. The molybdenum content of the ore was only 0.08 per cent and too low for production of a molybdenum concentrate.

A.C. 708 and Oleine were both good promoters for scheelite, and the high degree of selectivity obtained was by the use of soda ash in the grinding circuit followed by an unusually high quantity of sodium silicate in the flotation cell. Seven pounds per ton of this reagent effectively depressed the cassiterite and allowed flotation of the scheelite. Overgrinding of the scheelite resulted in non-flotation of the slimed mineral, and best results were obtained by minimum production of slimes by stage ball mill grinding and sizing by wet screening instead of hydraulic classification. Mesh of grind of 85 B.S. was found to be satisfactory, and probably a somewhat coarser grind would be advantageous. Additions of the promoters were found to require special technique incorporating feeding to the base of the cell and adequate agitation to produce maximum contacts with particularly the granular scheelite. These insoluble oily promoters when they rise to the surface of the flotation cell can completely inhibit froth formation and flotation. Other conditions of flotation were a pulp of 25 per cent solids with a temperature range from 15 to 20 degrees centigrade.

Aberfoyle Tin Mining Co.

R 286.

A sample of magnetic residues containing 10.7 per cent of tin and 13.3 per cent of tungstic oxide and appreci-

able siderite was submitted for tests to separate the economic minerals, cassiterite and wolfram. It was stated that the values could not be further separated by high intensity magnetic separation. Sizing of the sample shows a minus 60 mesh product with 49.4 per cent minus 200 mesh size. The sample was screened and various fractions treated in a Rapid Magnetic separator with but minor degree of separation. Treatment with acids for removal of siderite was investigated. The quantity, strength and temperature of the acid and time of digestion were found to be important, and best results were obtained by treatment of one part of residue with five parts of 20 per cent sulphuric acid for five hours at a temperature commencing at 40°C. and finishing at 63°C.

After acid treatment, finest slime was removed by hydraulic classification otherwise subsequent magnetic separation was not effective. Eighty-seven per cent of the cassiterite was recovered as a non-magnetic product assaying 62.5 per cent of tin and 2.8 per cent of tungstic oxide and 83 per cent of the wolfram reported as a magnetic product assaying 68.6 per cent of tungstic oxide and 1.65 per cent of tin.

Limesand-Jerusalem Plains, North-East Coast.

A sample of dune limesand was submitted to tests to determine possibilities of beneficiation for use as agricultural limesand. The sand consists mostly of quartz with the calcium carbonate present as finely ground fragments, chiefly of small bivalve shells. Ninety per cent of the material was minus 60 mesh B.S. size with only 1.5 per cent minus 200 mesh size. Specific gravities of the quartz and limesand were determined, and the maximum difference found was less than 0.05 which indicated that no useful beneficiation could be anticipated by any gravity separation process.

Very little variation in lime content was noted before and after attrition grinding and this means offered no prospect of upgrading the sand. Selective flotation was investigated and resulted in satisfactory increase in grade with high recovery. The raw material contained 30.6 per cent of calcium carbonate. Best flotation results produced a concentrate containing 84.7 per cent of calcium carbonate, with a recovery of 96.7 per cent. Sodium silicate was found to be necessary to depress the quartz, and the quantity used was 2.5 lbs. per ton of feed. Promoter was A.C. 708 by multi-stage additions to a total 1.86 lbs. per ton of feed.

Dorset Dredge.

R 288.

A sample of discard from bore test operations was examined for identification of the heavy minerals. Half the sample consisted of magnetic black minerals and the non-magnetic material contained 22 per cent of tin with less than 1 per cent of rutile. The sample contained a small quantity of monazite.

APPENDIX III.

REPORT OF THE CHIEF INSPECTOR OF MINES.

The Chief Inspector of Mines (Mr. J. G. Symons, B.E., M. (Aus.) I.M.M.) reports:—

MINES AND WORKS REGULATION ACT.

Employment.

The average number of men employed in mining, metallurgical and quarrying operations was 7,095, a decrease of 194 as compared with 7,289 for the previous year.

Accidents.

The total number of accidents registered under Section 23 of the Act was 100, compared with 75 last year, and these are dissected in the appended tables.

Of these 38 occurred underground, 27 above ground and 31 in various works. Fatalities on the surface were three; one each by a runaway railway truck and a power shovel in locomotion and one electrocution resulting from mistaken signals. An underground fatality was caused by a fall of ground.

Inspection.

Regular inspections had the object of requiring and maintaining a high standard of safety and hygiene to ensure the optimum conditions of health and freedom from accidents of employees.

The Inspector of Mines, Queenstown, retired in March and his duties were assumed by the Inspectors, Upper Burnie and Hobart, during the remainder of the year. In September, appointment was made to an inspectorate based on Hobart, and the staff maintained at normal strength. Reports from the inspectors are appended.

Amendments to Rules.

During the year amendments were made to General Rule 20 of Part II, by the addition of paragraphs XXIII and XXIV relating to underground blasting, and to General Rule 12 of Part III, relating to storage of explosives in collieries.

INCIDENCE OF ACCIDENTS.

Section A—Metalliferous Mines—

Place and Cause of Accident.	Number of Persons Killed.	Number of Persons Injured (incapacitated for over 14 days).
1. Below Ground: :		
(a) Explosions .....	.....	3
(b) Falls of Ground	1	6
(c) Falling down Shafts, &c. ....	.....	1
(d) Other Causes .....	.....	18
2. Above Ground:		
(a) Machinery in Motion	2	6
(b) Other Causes	1	19
3. Batteries, Ore-dressing, Smelting and other Metallurgical works, &c. ....	.....	31
Total Metalliferous Mines (A)	4	84

Section B—Coal Mines—

4. Below Ground:		
(a) Mine Explosions (fire, damp, &c.) .....	.....	.....
(b) Explosives (dynamite, &c.) .....	.....	.....
(c) Falls of Earth .....	.....	2
(d) Other Causes .....	.....	8
5. Above Ground:		
(a) Machinery in Motion .....	.....	1
(b) Other Causes .....	.....	1
Total Coal Mines (B)	.....	12
Total All Mines (A and B)	4	96

TABLE SHOWING RATE PER THOUSAND KILLED AND INJURED, 1955.

Mining Division	Average Number of Men Employed	Number of Accidents	Number of Persons		Average per 1,000			
			Killed	Injured	Killed and Injured	Killed and Injured		
Northern and Southern	3,299	27	....	27	27	8.184	....	8.184
North-Eastern	201	2	....	2	2	9.950	....	9.950
Eastern	683	20	....	20	20	29.282	....	29.282
North-Western	689	14	2	12	14	20.319	2.902	17.417
Western	2,223	35	2	35	37	16.644	.900	15.744
TOTAL	7,095	98	4	96	100	14.094	.563	13.531

COMPARATIVE TABLE OF STATISTICS OF ACCIDENTS IN AND ABOUT THE MINES OF TASMANIA FROM 1st JULY, 1892, TO 31st DECEMBER, 1955.

Period	Number of Miners Employed	Number of Accidents	Number of Persons		Total Killed and Injured	Average per 1,000 Killed and Injured	Average per 1,000		
			Killed	Injured			Killed	Injured	
1 July, 1892, to 31 Dec., 1930 *									
1 Jan., 1931 to 31 "	1931	4391	38	8	35	43	9.792	1.821	7.970
" 1932	1932	4605	71	4	67	71	15.418	0.868	14.549
" 1933	1933	4510	77	7	71	78	17.295	1.552	15.742
" 1934	1934	4843	108	4	105	109	22.506	0.826	21.680
" 1935	1935	5409	142	1	141	142	26.252	0.184	26.067
" 1936	1936	5432	97	4	96	100	18.409	0.736	17.673
" 1937	1937	5876	107	5	103	108	18.379	0.850	17.529
" 1938	1938	5891	103	2	102	104	17.654	0.339	17.315
" 1939	1939	5928	87	2	87	89	15.013	0.337	14.676
" 1940	1940	6000	103	2	102	104	17.333	0.333	17.060
" 1941	1941	5856	85	5	85	90	15.368	0.853	14.515
" 1942	1942	5572	89	4	86	90	16.152	0.718	15.434
" 1943	1943	5535	73	6	67	73	13.188	1.084	12.104
" 1944	1944	5439	73	4	71	75	13.789	0.735	13.054
" 1945	1945	5178	46	2	44	46	8.883	0.386	8.497
" 1946	1946	5255	63	1	62	63	11.989	0.19	11.798
" 1947	1947	5316	74	....	74	74	13.920	....	13.920
" 1948	1948	5399	67	3	64	67	12.409	0.555	11.854
" 1949	1949	5659	65	1	64	65	11.484	0.176	11.308
" 1950	1950	5892	62	2	62	64	10.862	0.339	10.524
" 1951	1951	5928	49	2	50	52	8.772	0.337	8.335
" 1952	1952	6820	62	1	61	62	9.091	0.147	8.944
" 1953	1953	7370	73	6	67	73	9.892	0.801	9.091
" 1954	1954	7289	75	3	72	75	10.289	0.411	9.877
" 1955	1955	7095	98	4	96	100	14.094	0.563	13.531

* See Report of Director of Mines—1954.

APPENDIX IV.

REPORT OF THE CHIEF INSPECTOR OF EXPLOSIVES.

The Chief Inspector of Explosives (Mr. J. G. Symons, B.E., M. (Aust.) I.M.M.) reports:—

Explosives Act, 1916.

The following quantities of explosives were imported during the year through the ports of Hobart, Launceston, Devonport, Burnie, Regatta Point and Currie:—

Monobel	33,000 lb.
Gelignite	1,280,750 lb.
Quarigel	703,250 lb.
Semigel	390,350 lb.
Plastergel	16,000 lb.
Blasting Powder	8,500 lb.
Ligdyn	5,100 lb.
Ajax	135,050 lb.
Plastic Cordtex	702,000 ft.
Fuse igniters	44,600
Detonators, ordinary	700,000
Detonators, electric	273,400

Precautions were taken to ensure that all nitro-compounds were in good chemical and physical condition at the date of importation. All nitro-compounds were of Polar manufacture. Bulk packed nitro-compounds were permitted for importation into the State, but the use of bulk packaging was limited to consumers using more than 500 pounds per week.

Large and remotely situated tunnelling and mining projects made it desirable to bring the transport of explosives more into line with modern practices, and legislation was introduced whereby the Chief Inspector now can issue a permit for a motor vehicle to carry more than the former maximum of 2,000 lb. of explosives per load.

There were three explosives accidents, none of them fatal. Three persons were injured when a series of shots in an underground working place went off about 10 seconds after lighting the fuse. One person was injured when a hangfire exploded while he was inspecting the hole about 30 minutes after lighting the fuse. One person suffered a broken leg when struck by a flying stone while blasting rocks from a ski trail.

Inflammable Liquids Act 1929.

There was continued activity in the installation of petrol pumps, and several hundred applications for new installations and additions or changes to existing service stations were dealt with. A coin-operated self-service petrol pump was approved for use in the State, and operated throughout the year.

Tank vessels inspected while unloading at Hobart, Bell Bay, and Devonport numbered 27. Storage facilities at the Self's Point ocean terminal were increased, and two oil companies are now operating there.

A new 10-inch wharf line was, at the end of the year, under construction at Devonport and is expected to be ready for use early in the new year.

The general handling and storage of inflammable liquids in depots and compounds was kept under surveillance and several new compounds were built in accordance with Departmental requirements.

An explosion of petrol vapours occurred in an underground telephone culvert in a city street. The explosion was set off by a workman using a blow torch while effecting repairs to the telephone cables, and the explosion blew off manhole covers for a distance of three blocks from the point of ignition. No person was injured.

An extensive search for leaks was made at a nearby service station, but the source of the petrol could not be definitely found, and it was assumed that leakage from around the fillpoints had seeped into the culvert.

APPENDIX V.

REPORTS OF THE INSPECTORS OF MINES AND EXPLOSIVES.

Report on Queenstown-Zeehan Mining Area, 1955.

Since the retirement of Mr. K. A. Rae, the inspection duties have been carried out mainly by Mr. Egan from Burnie, with some assistance from Mr. Robertson, of Hobart.

EMPLOYMENT.

The average number of persons employed in mining and metallurgical operations was 1,546 compared to 1,588 last year. Only 79 of this total were engaged in underground mining.

ACCIDENTS.

Twelve accidents were recorded under the provisions of the Mines and Works Regulation Act. Of these, two were fatal. One resulted in the death of an electrician due to misunderstanding of visual signals. In the other case, children released the brakes of stationary railway trucks resulting in a derailment in which a child was killed. No accident occurred underground.

SAFETY.

Inspections disclosed reasonable conditions in regard to safety and health of men employed.

VENTILATION.

No serious trouble was experienced during the year and generally satisfactory conditions were maintained.

HEALTH AND SANITATION.

Sanitary conditions affecting health and comfort of employees were satisfactory.

INFLAMMABLE LIQUIDS ACT.

Routine inspections were made of storage premises and installations.

EXPLOSIVES ACT.

Eight shipments of explosives were supervised in trans-shipment from Regatta Point to Queenstown. They comprised:— Gelnite 258,000 lb.; Quarigel 479,800 lb.; Semigel 288,400 lb.; and 348,000 feet of Plastic Cordtex.

PRODUCTION AND DEVELOPMENT.

*Silver-Lead.**Zeehan Mines Pty. Ltd.*

An average of 67 men were employed at the Oceana Mine, 34 being underground. The mill treated 15,680 tons of ore to produce 2,030 tons of lead, valued at £S216,599, and 81,375 oz. of silver, valued at £S26,132.

A total of 621 feet of development headings was driven during the year, including 106 feet in a ventilation rise and 32 feet in the main shaft. The balance of 483 feet was driven on the 150, 420 and 450 feet levels which were extended north and south.

Montana Silver-Lead N.L.

This company treated 6,220 tons of ore yielding 213 tons of lead, valued at £S22,760, and 24,901 oz. of silver, valued at £S7,758, by employment of 13 men, six of whom worked underground.

Development work consisted of driving 80 feet south-west on the 150 foot level and 76 feet north on the 200 foot level. This latter level is not connected to the shaft being opened out from a winze between the 150 and 300 feet levels.

No. 2 Argent (H. Maine and A. Fairburn).

This party recovered 2,766 tons of lead, valued at £S288, and 284 oz. of silver, valued at £S88, from a small hand-picked parcel.

W. J. Hodge (Dundas).

This miner produced 3.8 tons of lead, valued at £S401, and 342 oz. of silver, valued at £S109, from dump pickings at the Comet Mine.

A. S. Clark (Zeehan).

This miner produced 3.6 tons of lead, valued at £S390, and 233 oz. of silver, valued at £S76.

W. J. Clark (Zeehan).

This miner produced 5.8 tons of lead, valued at £S650, and 523 oz. of silver, valued at £S171.

Zinc.

W. J. Clark's parcel also contained 2.5 tons of metallic zinc, valued at £S246.

*Tin.**W. J. Hodge (Dundas).*

Grand Prize Mine treated 289 tons for 1,324 tons of metallic tin, valued at £S968.

Razorback Mine treated 40 tons for 0.165 tons of metallic tin, valued at £S120.

During the year this two-man party ceased operations at the "Grand Prize" returning to the "Razorback" some two miles south.

Copper.

The Mt. Lyell Mining and Railway Company Limited mined 1,588,381 tons of ore from West Lyell. No underground ore was mined, but 71 tons of copper precipitates were obtained from mine waters.

Development of open-cut workings involved the removal of 1,825,251 tons of waste material. Ore mined was 7,809 tons less than last year's total, but waste material was 500,322 tons higher.

At the reduction works the mill operated for 349 days treating 1,588,483 tons of ore for 34,180 tons of copper concentrate and 47,921 tons of pyritic concentrate.

The Smelters operated 215½ days treating 32,327 tons of concentrates, of which 71 tons were copper precipitates.

The resultant 7,640 tons of blister copper contained 7,582 tons of copper, valued at £S263,759; 31,375 oz. of silver, valued at £S10,150; and 4,632 oz. of gold, valued at £S58,081.

Pyrite shipped from accumulated reserves was 67,420 tons, valued at £S202,260 — 19,499 above the year's production.

During the year a start was made on the development of No. 2 Tunnel, with its portal close to the North Lyell Tunnel, to serve the future West Lyell expansion.

In addition to the foregoing mining operations, the company mined 4,477 tons of limestone and 5,645 tons of silica for use as fluxes and reagents in metallurgical operations.

Average employment figures were 1,425 surface and 38 underground.

*Copper-Nickel.**North Curni (Montana Silver-Lead N.L.).*

In this area diamond drilling was commenced to test a geophysical anomaly. The first hole entered copper-nickel ore at 123 feet and was still in ore at 137 feet at the end of the year.

Inspector L. F. Egan, A.M. (Aust.) I.M.M., Upper Burnie, reports:—

EMPLOYMENT.

Of an average of 1,049 men employed in the industry during the year, surface work absorbed 649 and 400 were engaged in underground operations.

MINES AND WORKS REGULATIONS ACT.

Accidents.

A total of 25 accidents (10 surface, 15 underground), each involving absence from work for 14 working days or longer, was reported under the provisions of the Act. The sole fatal accident occurred when a power shovel attendant operating dog clutches at the rear of the machine on a slope was run over when both clutches became disengaged at the same time.

An unusual accident occurred when a miner's arm was pierced by a tamping rod blown out of a compressed air line. The sight of one eye was lost when struck by a rock fragment flying from a gun used for fixing bolts in concrete. In this case protective goggles were not being worn as recommended by the maker.

Injuries resulted on five occasions from crushing by machinery and the remaining accidents were miscellaneous in nature.

Ventilation.

Throughout the year careful watch has been kept to maintain the required standard of ventilation in the various working places, and remedial action has been taken where necessary.

Installation on one mine of an auxiliary ventilating unit to supplement the existing system was proceeded with during the year. Good progress was made but the project was not completed.

On another mine conditions arising from the dry crushing of ore were the subject of much experiment with a view to reduction of the dust content of the air in the building. As a result of investigations made by a company official on a visit to the United States a new approach is to be made to dust control in the section.

The practice in vogue on the larger mines of rising along pilot diamond drill holes has resulted in vastly improved ventilation in all such raises. Compressed air water sprays have also done much to improve conditions in headings.

Health and Sanitation.

Special attention has been directed during inspections to matters affecting the health of employees. Change houses, crib places, latrines and first-aid rooms were inspected regularly to ensure that satisfactory standards of comfort and cleanliness were maintained. Wet and muddy conditions underfoot have been guarded against wherever possible, although where surface fill has been sluiced into stopes difficulty has been had in keeping levels dry.

Workers' (Occupational Diseases) Relief Fund Act.

Three applications for compensation were dealt with during the year, clinical and X-ray examination having been arranged in each case. The first applicant had had 17½ years of underground mining, but left the industry in 1930. He was found to be suffering from silicosis in the anteprietary stage and assessed at 20 per cent of full incapacitation. The other applicants, one of 25 years and the other of 50 years experience in mining, were found to be free from disease within the meaning of the Act.

Throughout the year initial and biennial examinations were arranged for employees from records of employment and examinations which were kept on all mines.

Explosives Act.

The most important change during the year was the introduction into Tasmania of bulk packed explosives for the sole use of companies requiring more than 500 lb. per week. In some instances repacking into small parcels has been necessary on some mines for issue to the miners.

Controls were exercised over the landing, conveyance and storage of explosives. No accidents occurred during the year. On King Island, where the Harbourmaster supervises the landing, a motor vehicle with a capacity of five tons was approved for service.

Inflammable Liquids Act.

Routine inspections were made of storage premises and installations. One case of irregular storage was encountered, but this was rectified immediately, and no action was deemed necessary against the party concerned.

Aid to Mining.

No applications for assistance under the Aid to Mining Act were received, but as in other years opportunity was taken wherever possible to examine new prospects. In addition, advice was made available to miners on methods of working and safety. In many instances samples were collected and submitted to the department's laboratory for determination. To assist uranium seekers prospects were checked for suspected radioactivity with a Geiger counter. Apart from increased counts due to mass effects nothing of interest was disclosed.

OPERATIONS AND PRODUCTION.

Cadmium.

Production was 45.66 tons, valued at £558,809. The metal is a by-product from the refining of zinc concentrates produced by the Electrolytic Zinc Company of Australasia Limited at Rosebery.

Copper.

The Electrolytic Zinc Company continued as the sole producer in the district, the containing concentrates being shipped to the U.S.A.

Production was 503.34 tons, compared with 535.94 tons in 1954. The average price of copper per ton increased during the year from £S341 in the first quarter to £S382 in the last, compared to a range of £S229-278 in the previous year.

Gold.

This occurs as a minor constituent in the Electrolytic Zinc Company's flotation concentrates obtained from their lead-zinc ores at Rosebery. The product contained 11,074.69 fine oz., valued at £S138,898.737. This represents a fall of 1,458.33 oz. below the previous year's production.

Red Ochre.

A small parcel of six tons, valued at £18, was produced from the deposit at Spalford.

Quartz.

The purity of Mawbanna quartz makes it suitable as a moulding flux for which the production of 12 tons was purchased by a foundry for £47.

Beach Pebbles.

Production from Ulverstone beaches increased from 387.5 tons in 1954 to 542.5 tons, valued at £1,627.5 in the year now reviewed. The pebbles are used in grinding media. An average of one man was employed.

Lime Sands.

These are principally used as a fertilizer, but a quantity of 114 tons was shipped to Risdon as a metallurgical reagent. Total production was 5,016 tons, valued at £6,250.5. An average of five men was employed.

Dolomite.

An appreciable fall of 580 tons in production to 2,266 tons, valued at £6,798, was recorded for the year. An average of four men was employed.

Brickworks.

Employment in the brick industry remained static at an average of 14.

Scheelite.

The whole production was obtained from King Island, sales being 1,431.566 tons of concentrates, valued at £S1,205,296.

King Island Scheelite (1947) Limited.—This company milled 264,952 tons of ore and removed 1,621,000 tons of overburden in open cut operations which were extended downwards to 20 feet below sea level. Sales were 1,431.470 tons of scheelite concentrates, valued at £S1,205,240.6.

Development consisting of 1,225 feet of diamond drilling was carried out and ore reserve estimations envisage mining down to a depth of 110 feet below sea level. Additions to plant and equipment included a grader and heavy roller, a 2½-yard shovel, mobile radio-telephone, and bulk oil storage at the port of Naracoopa. Prospecting included investigation of some outside tenements near Grassy and Wickham.

Miscellaneous.—A prospector at Naracoopa produced 0.096 tons of scheelite concentrate, valued at £S55.4.

Interview River.—Prospecting in this area was carried on by four men during the first quarter of the year.

Silver-Lead.

Mt. Farrell Mining Company Ltd.—This company was the sole producer of silver-lead in the district, and a very serious decline in output occurred of both ore and metals. Production was 752 tons of concentrates obtained from the milling of 4,103 tons of ore, and containing 451 tons of lead, valued at £S47,992.615, and 47,143 oz. of silver valued at £S15,180.152. This represents reductions of 29 per cent in ore milled and 42 per cent in combined value of lead and silver produced, on the previous year's quantities. The average number of men employed was reduced by 18 per cent, from 57 to 47.

The auxiliary shaft was sunk 100 feet and No. 9 level was extended 109 feet north, short of the ore zone. Unrewarded work was carried out on the footwall lode south on Nos. 5 and 6 levels and ore cut out in No. 7 level stope in the same section. Prospecting of surface indications east of the present workings is contemplated.

Tin.

The concentrates produced in the region contained 77.718 tons of metallic tin, valued at £S59,139.104, and were derived from the Renison Bell and Mt. Bischoff districts.

Renison Associated Tin Mines N.L.—Development of the Battery-Dunn's Workings ore body was continued. This has now been opened up for a length of 60 to 80 feet and for 160 feet on the dip of 45 degrees, wherein values on the upper level were 1.7% Sn., and, taken in conjunction with nearby geophysical anomalies, is regarded as a discovery of great importance. The work of connecting the South Montana workings to the transport system was not completed.

The treatment of 7,698 tons of ore yielded 66·156 tons of concentrates containing 40·721 tons of metallic tin, valued at £S30,962·605. An average of 26 men was employed. A marked fall in the production occurred during the first three-quarters of the year, and this was not offset by a recovery staged in the last quarter.

Mt. Bischoff Tin Mine.—The Harrington-Kenworthy Tribute Party mined 4,472 tons of ore compared to 7,870 tons in the previous year. However, the higher grade of 0·73 per cent Sn, enabled a production of the same order to be obtained, viz., 48·337 tons of concentrates containing 32·729 tons of metallic tin, valued at £S24,934·843. Employment was afforded to an average of 16 men during the year, eight of whom worked underground.

H. T. Brooke, West Bischoff.—Two men worked on these leases for short periods to produce 0·253 tons of concentrates containing 0·167 tons of metallic tin, valued at £S130·544.

North Valley-Waratah.—V. Campton & Son retreated 981 tons of the old Mt. Bischoff mill tailings for a recovery of 2·138 tons of concentrate. The metallic tin content was 1·482 tons, valued at £S1,132·483.

Waratah Creek.—J. Housego operated a tailings retreatment plant in this creek below the power station. Production was 1·496 tons of concentrate containing 0·975 tons of metallic tin, valued at £S736·318.

Miscellaneous-Waratah.—Desultory fossicking around Mt. Bischoff yielded 2·508 tons of concentrates containing 1·644 tons of metallic tin, valued at £S1,242·311. The number of prospectors engaged ranged from two to six and work was confined to the Shovel and Thompson's Lodes, Wheel Section and the Sixty Mill Site.

Lead-Zinc.

Electrolytic Zinc Company of Australasia Limited.—Treatment of 178,699 tons of ore from the Rosebery and Hercules Mines yielded 50,689 tons of zinc concentrate, 8,336 tons of lead concentrate and 5,878 tons of copper concentrate. The total value of these concentrates, which also contained gold, silver and cadmium amounted to £S3,724,236·187.

Details of the metallic content are as follows:—

		Valued at £S
Lead	7,846·79 tons	839,858·769
Zinc	24,036·14 tons	2,203,400·418
Silver	941,614·01 fine oz.	304,143·470
Cadmium	45·66 tons	58,810·080
Copper	503·34 tons	179,064·714
Gold	11,074·69 fine oz.	138,898·736

Work was continued on No. 8 Level for No. 2 hoist chamber, and a main ventilation fan was put into operation on No. 8 Level with beneficial results. In development the shaft at Rosebery was sunk 108 feet and advances totalling 7,649 feet were made in drives, X-cuts and rises at Rosebery and Hercules. Diamond drilling consisted of 22,690 feet of boring of which 1,634 feet was in prospecting. On No. 12 Level a X-cut was driven 800 feet east to provide a diamond drill chamber. The average number of men employed was 602 of whom 250 were underground.

Inspector R. J. Muir, A.S.T.C., A.M. (Aust.) I.M.M., Launceston, reports:—

EMPLOYMENT.

The average number of men employed in mining and allied industries, other than coal mining, was 1,414 compared with 1,471 for the previous year. This decrease was due largely to the completion of construction work in some of the larger organisations. The supply of labour was almost sufficient to meet all requirements, and was much more satisfactory than in previous years.

Accidents.

Twenty accidents were registered, each involving more than 14 working days loss of employment. Of the accidents, ten occurred on the surface and ten underground.

The most serious of the underground accidents resulted in fatal injuries to one man when rock fell from the foot-wall of a leading stope. Falls or rock were also responsible for three of the other underground accidents, and three were caused by persons slipping whilst walking or carrying tools. The remainder were of a miscellaneous nature.

Of the surface accidents, three were connected with machinery, four were due to persons slipping, one by a fall of clay in a quarry, another due to cement being blown into the eyes, and the last was in relation to the use of explosives. In the more serious cases fracture of a bone resulted, and the first joint of a finger was amputated.

SAFETY.

Regular inspection of mines and works were carried out with particular attention to the larger organisations to promote and maintain a good standard of safe working conditions.

At one of the larger mines the brakes on a winding engine were delayed in their action, and this was investigated in collaboration with the Inspector of Machinery. Instructions were given in connection with the operation of this machinery in an endeavour to prevent a recurrence.

A dredge sank during the operation and it is considered that an overload of sand, from the tailing being dug at the time, caused the dredge to roll, which in turn, caused the sand to aggravate the roll, and the dredge settled in the pond. The dredge has been refloated and fitted with several indicators and warning devices to give early indication of any tilting of the pontoon.

The numerous details of surface and underground mining practice were regularly checked, particularly in reference to batter and working faces, shaft equipment, ladderways and storage and handling of explosives, with a view to maintaining and improving the standard of safety in operations.

HEALTH AND SANITATION.

The health of employees and the maintenance of cleanliness was kept under surveillance, particularly in change-houses, crib-houses, latrines, &c. First-aid supplies were also inspected and were generally found to comply with the regulations.

The ventilation of underground mines was satisfactory, with the exception of one mine relying on natural ventilation during the summer. Ventilation on one of the levels became unsatisfactory. However, the completion of a rise to another level, to give a better circulation of air, rectified this.

The Workers' (Occupational Diseases) Relief Fund Board assisted in its activities and the expansion of the activities to various works increased the time spent on this work. The regular checking of the health of mining and allied employees is considered most essential.

EXPLOSIVES.

Personal supervision was given to the importation of explosives at Launceston and in no cases were any of the explosives found to be defective.

Samples were obtained from a number of shipments of fireworks and forwarded to the Chief Inspector for checking in compliance with the regulations.

One accident connected with the use of explosives was reported, in which a man placed a charge in a hole in compacted earth, and after considering a misfire had occurred, returned before the hole exploded. The explosives and fuse in use were examined and found to be in good condition, and it is thought the man misjudged the interval for the burning of the fuse. He suffered superficial injuries and concussion.

Inspections were carried out of licensed magazines and, where necessary, alterations were made to comply with the requirements.

MACHINERY.

With the full co-operation of the Inspectors of Machinery, matters relating to the safe operation of machinery were dealt with and inspections carried out in particular in relation to guarding moving parts, &c., to maintain a satisfactory standard of safety.

No large installations of machinery took place in the division, minor units being installed and existing equipment serviced and replaced where required.

INFLAMMABLE LIQUIDS.

Supervision was carried out of the unloading of tanker ships at Bell Bay. With the increase in road transport, both private and commercial, there is an enormous expansion in the use of inflammable liquids, with the attendant increased storage facilities required. Comprehensive inspection of all storage was not possible, but from observations it was considered that the storage of inflammable liquid generally complied with requirements.

AID TO MINING.

Reports were compiled in connection with applications for assistance under the Aid to Mining Act, and on other matters in connection with mining generally.

Advice was also given to various operators where it was considered the efficiency of their operations could be improved, and generally so far as it was possible an endeavour was made to improve all matters connected with the Mining Industry of the State.

OPERATIONS AND PRODUCTION.

Tin.

The production was slightly lower than the previous year, but generally production of various operators was about the same; the price fluctuated during the year, but increased slightly to be in the vicinity of £800 sterling per ton of metallic tin at the close of the year.

Production in the region was 770·783 tons of metallic tin.

W.X.X. Mine, Moorina.

This mine was taken over by Weldborough Tin Mines who, after reconditioning the plant, commenced sluicing during the latter half of the year. An average of seven men was employed and produced concentrates containing 7·587 tons of metallic tin, valued at £S5,878·416.

Miscellaneous, Moorina.

In this area an average of four men worked, and from their combined sluicing operations they produced tin concentrate containing 3·759 tons of metallic tin, valued at £S2,874·180.

Weldborough Tin Mines, Weldborough.

This syndicate carried out sluicing in the vicinity of Main Creek and some prospecting and preliminary work in the vicinity of Weldborough, but its main activity was at the W.X.X. Mine. From its Weldborough operations concentrates produced contained 0·644 tons of metallic tin, valued at £S459·655.

Miscellaneous, Weldborough.

The production of the smaller mines of this area was concentrate containing 0·877 tons of metallic tin, valued at £S659·854, and this was produced by an average of five men.

Miscellaneous, Lottah, Goshen and Goulds Country.

An average of three men engaged in part time mining in these old mining districts, and between them they produced concentrates containing 0·172 tons of metallic tin, valued at £S130·524.

Goshen Tin Mines, St. Helens.

Operating two faces in the vicinity of the Golden Fleece Rivulet, a total of 74,050 cubic yards of material was sluiced to recover tin concentrates containing 10·76 tons of metallic tin, valued at £S8,165·76. This operation required an average of eight men.

Bell Creek Mine, St. Helens.

Mr. W. Colin Kirwan operated this mine when water was available for sluicing, and approximately 5,000 cubic yards of ground were sluiced for a recovery of 0·270 tons of metallic tin in concentrate form, valued at £S216.

Miscellaneous, St. Helens and Scamander.

The total average employment in the smaller mines was only two men, and they produced as concentrates 0·601 tons of metallic tin, valued at £S452·234.

Aberfoyle Tin. N.L., Rossarden.

Production at this mine was maintained and 62,314 tons of ore were mined and treated. The tin concentrate recovered contained 454·398 tons of metallic tin, valued at £S335,616·246. Tungsten production is shown separately. No new development work was carried out below No. 13 Level, but a vigorous development programme was pursued in the upper levels. This consisted of 5,670 feet of rising, X-cutting, winzing and driving, together with 8,587 feet of diamond drilling.

New plant installed consisted of an acid leaching plant for dissolving away the siderite from the fine-grained wolfram to improve the concentrate grade. The mine gave employment to an average of 225 men.

Storey's Creek Tin Mining Co. N.L.

This mine is reviewed under wolfram, but tin concentrates were produced containing 18·33 tons of metallic tin, valued at £S13,529·838.

Miscellaneous, Gipps Creek and Avoca.

Tin production from the small producers of this area was concentrates containing 0·012 tons of metallic tin.

Miscellaneous, Scottsdale.

Production was mainly from the vicinity of Mount Stornach, and the concentrates produced by the average of two men employed contained 0·109 tons of metallic tin, valued at £S81·054.

Miscellaneous, Ringarooma.

A total of 0·384 tons of metallic tin, valued at £S287·897, was produced in the form of concentrates by an average of four men operating the small mines in this area.

Walsh & Co., Branxholm.

The activities of this syndicate were confined to its workings in the vicinity of Black Creek, where 25,900 cubic yards of alluvial ground was sluiced for a recovery of concentrates containing 3·767 tons of metallic tin, valued at £S2,834·376. An average of four men was employed.

Ormuz Mine, Branxholm.

Owing to the shortage of sluicing water in the early part of the year, and excessive rains in the latter part, Edwards Bros. handled only 5,000 cubic yards of ground, but also removed 5,000 cubic yards of overburden. Their production was correspondingly low, amounting to 2·643 tons of metallic tin in concentrate form, valued at £1,916·774. Employment averaged three men.

Miscellaneous, Branxholm.

Operating at Black Creek and Ruby Flat, six men found employment at the smaller alluvial mines and produced concentrates containing 2·533 tons of metallic tin, valued at £S1,943·591.

Briseis Tin N.L., Derby.

Of the 37 men employed, the majority were engaged at the Cascade Face, working up the bed of the Cascade River, and a second face was opened up near the old Briseis Consolidated tin-shed. A considerable amount of previously handled material was retreated at both faces, and in all, 385,980 cubic yards were treated to recover tin concentrates containing 32·642 tons of metallic tin, valued at £S24,042·805.

This mine continued to carry out management and maintenance of the Ringarooma-Cascade Water System by arrangement with the Board.

Miscellaneous, Derby.

Operating in the bed of the Ringarooma River below the township, an average of seven men recovered concentrates containing 3·18 tons of metallic tin, valued at £S2,420·8.

Miscellaneous, Herrick and Winnaleah.

In the smaller mines of this area, three men were engaged in the production of tin concentrates which contained 0·975 tons of metallic tin, valued at £S742·196.

Banca Mine, Winnaleah.

Two men treated 4,508 cubic yards of alluvial ground and recovered 0·876 tons of metallic tin in the form of concentrates, valued at £S645·355.

Miscellaneous, Pioneer and South Mount Cameron.

From largely along the Wynifred River the smaller producers, averaging eight, recovered a total of 9·541 tons of metallic tin in concentrates, valued at £S7,384·238.

Dorset Dredge, South Mount Cameron.

This dredge operated throughout the year apart from the period when it was out of commission due to sinking. Approximately eight weeks were spent on refloating and reconditioning the dredge and equipment. However, overall production for the year was practically the same as the previous year.

The dredging of 1,271,000 cubic yards returned tin concentrates containing 106·834 tons of metallic tin, valued at £S78,907·067, together with some alluvial gold which is shown separately.

Employment was found for an average of 52 men, including those engaged in prospecting operations at the Ringarooma Marshes.

Endurance Tin Mining Co. Ltd., South Mount Cameron.

Early in the year the barge carrying the two gravel pumps was transferred to the northern end of the Clifton Workings. Production for the year was from this end, 339,178 cubic yards of ground being sluiced, elevated, and treated for the recovery of concentrates which contained 65·113 tons of metallic tin, valued at £S49,287·656.

The 51 men employed included those operating the mine and the hydro-electric power station at Moorina, and those engaged in digging clay for paper manufacture, which is shown separately.

Mount Cameron Water Race, Gladstone.

This race, which is operated by a Government Board, sold all its water on a contract basis and the production is shown under the respective mines. The greater part of the tin production from the Gladstone area is dependant upon this race.

Star Hill Syndicate, Gladstone.

This is the largest producer of the Gladstone area, and uses water from the Mount Cameron Water Race, which is pumped to the working face with electric power, the pumping also supplying the necessary pressure for sluicing. Operating on two faces and employing five men, 133,000 cubic yards of ground were treated for a recovery of concentrates containing 22,954 tons of metallic tin, valued at £S17,685-419.

Miscellaneous, Gladstone.

The production of the eleven smaller operators in the area amounted to concentrates containing 8,329 tons of metallic tin, valued at £S6,342-651.

Strait Islands.

Very little activity took place in mining on either Flinders or Cape Barren Islands. One small parcel of concentrates from Cape Barren Island which was sold contained 0-014 tons of metallic tin.

Moina Tungsten-Tin N.L., Moina.

This mine, previously known as the Shepherd and Murphy Mine, and now operated by the Moina Tungsten-Tin Mining Co. N.L., came into production again during the year and mined and treated 7,933 tons of ore.

The tin production in concentrate form was 13,393 tons of metallic tin and was valued at £S10,428-272. An average of 38 men was employed for the year. Tungsten was also produced and is shown separately.

Below No. 3 Level, the deepest in the mine, 68 feet of winzings was carried out; other development work consisted of 488 feet of driving and rising, and 320 feet of exploratory diamond drilling. At the concentrating plant a new magnetic separator was installed, together with other equipment already received, in order to bring the mine and plant into production.

Wolfram.

Production of wolfram did not alter materially, and although the price of tungsten did improve during the year, this did not affect the two major producers, who are selling their production under contract. Wolfram concentrate production amounted to 578,415 tons.

Aberfoyle Mine, Rossarden.

Wolfram production amounted to 339,004 tons of wolfram concentrates containing 217,873 tons of tungsten oxide, valued at £S278,505-874.

Storeys Creek Mine, Storeys Creek.

Production was maintained at a steady rate at this mine. An inclined winze was sunk on the lode formation 190 feet to No. 8 Level horizon, but no developmental work was carried out there. The developmental work consisted of 800 feet of driving on No. 7 Level, and 500 feet of rising from Nos. 7 to 6 Levels, and the new vertical service shaft was completed to No. 7 Level and put into operation. Of the 12,862 tons of ore mined and treated the larger proportion came from development openings. In the treatment of the ore tin and wolfram concentrates were produced, the wolfram portion amounting to 216,750 tons containing 155,63 tons of tungstic oxide, valued at £S197,338-835. In improving conditions at the mine, new steel lockers were installed for street clothes in the change-house, and some additional housing accommodation was completed for employees. An average of 74 men was employed.

Miscellaneous, Gipps Creek and Avoca.

A small quantity of 0-283 tons of wolfram concentrates, valued at £S243-372, was produced by small mines.

Moina Mine, Moina.

Reviewed under tin, wolfram production amounted to 22,378 tons of wolfram concentrates containing 15,054 tons of tungstic oxide, valued at £S19,632-632.

Gold.

Production for the year decreased by 82,814 oz., but as practically all the gold is obtained in conjunction with alluvial tin mining, this decrease is not an indication of mining activity. Total production for the year was 405,911 fine oz.

Dorset Dredge, South Mount Cameron.

Alluvial gold is contained in the tin concentrates and the amount extracted was 403,755 fine oz., valued at £S5,067-712.

Miscellaneous.

Alluvial workings at the Lisle Goldfield produced 0-981 fine oz. and 1-175 fine oz. was produced from the Gladstone area.

Limestone.

Mining of limestone was maintained for the manufacture of ground limestone, road metal, and burnt lime for agricultural and building purposes, and amounted to 18,886 tons. Limestone was also quarried for cement manufacture.

Melrose Agricultural Lime Quarries, Eugenana.

Experiments have been conducted showing that this limestone is suitable for road construction. For this purpose stone has been quarried in addition to that pulverised for agricultural purposes. In all, 13,785 tons of limestone were quarried and crushed by the 23 men employed.

Railton Lime Works, Railton.

Limestone is burnt at these works and also pulverised for agricultural purposes, and the year's production was 2,797 tons of limestone.

Beaconsfield Lime Products, Flowery Gully.

In all, 1,684 tons of limestone were quarried for various purposes and this gave employment to four men.

A. R. Beams, Flowery Gully.

Two men were employed quarrying and burning 620 tons of limestone for building purposes.

*Cement.**Goliath Portland Cement Co., Railton.*

Production of cement and asbestos cement sheets was maintained, and in these activities 157,135 tons of limestone and 6,476 tons of iron ore were quarried and treated. During the year two new Leyland Hippo 12-ton trucks were received for quarry use, and extensions were made to the garage. A new Hough front-end loader was purchased for general work, also a 5-ton Bedford truck for general use at the asbestos sheet factory.

A new vacuum pick-up pad was installed in the asbestos sheet plant for handling the wet sheets, and new curing chambers were built for conditioning the sheets. The average employment for the year was 245.

Clay.

The Endurance Mine at South Mount Cameron mined and dispatched 2,264 tons of high-grade white clay to the Associated Pulp and Paper Manufacturers' mills at Burnie, and Kirwan Bros., at St. Helens, forwarded 2,622 tons of similar material. This kaolin is used in the manufacture of high-grade writing paper.

At Luck Bros. Brick Works, Dulverton, for the manufacture of bricks, 4,423 tons of clay were mined.

*Inspector D. Besford, M. (Aust.) I.M.M., reports:—**EMPLOYMENT.*

The average number of persons employed in mines, works, and quarries operating under the Mines and Works Regulation Act was 3,078, a decrease of 2 per cent.

ACCIDENTS.

Thirty-three accidents, resulting in non-fatal injuries to a like number of persons, were registered under the provisions of the Act, twenty-three were associated with surface operations and ten occurred underground.

Of the ten underground accidents, only one was due to a fall of roof. The miner involved in the incident was preparing to clear away loose material lying on the floor of his working place preparatory to erecting a support when a stone fell from the roof and inflicted fractures to the forearm and lower leg.

One miner received a severe electric shock while handling a portable electric drill at the face. The workman transported the machine into the face on a small trolley. When he attempted to lift the machine off the trolley he felt a slight shock. He then asked his mate to touch the machine and see if he could feel anything, but his mate did not feel any shock when he complied with the request. This may have been due to the fact that he was wearing rubber boots. The workman then changed into rubber boots and lifted the machine off the trolley and carried it a few feet into the face in order to bore a number of shot-holes. When he reached the face, he stooped down to pick up the steel drill whilst holding the machine with his left hand, and as he touched the drill lying on the floor he received a severe shock which threw him to the ground and inflicted injuries to his shoulder where he fell.

Investigations disclosed that the earth wire in the supply cable had become broken, providing an open earth circuit and isolating the earth leakage protection; and when a second fault developed due to a breakdown in the insulation, one of the phase wires coming into contact with the earth wire, the pressure was thus transmitted to the framework of the machine through the earth wire. When the workman made contact with the steel drill which was lying on the floor he completed the circuit and the current passed from the machine to earth via his arms and the upper portion of his body.

The accident emphasises the necessity of reporting any leakage in electrical equipment no matter how slight, and the avoidance of touching such equipment until it has been examined and certified safe by an electrician.

SAFETY.

Attention has been directed to the safe working of mines, works and quarries.

All coal mines were regularly tested for the presence of inflammable gas and it is pleasing to report that no gas was found.

As pointed out previously, only one underground accident was caused by a fall of stone, which is an indication of the attention which has been given to safety.

The barring down of loose ground and the maintenance of safe batters at quarry faces were under regular surveillance and no serious accident occurred in any of the quarries operating in my district.

Inspections were regularly carried out in connection with metallurgical and other works, special attention being directed to the nuisance created by the emission of harmful dust and fumes. When conditions were considered unsatisfactory, instructions were issued for remedial measures to be carried out so that workmen were not exposed to danger.

VENTILLATION.

Underground air currents were regularly measured by means of the anemometer to ensure an adequate amount of air for safe working conditions at the face.

Wet and dry bulb temperatures were regularly recorded in the underground working places, and these were found to be below the prescribed maximum temperatures. The highest dry bulb temperature recorded during the year was 70 degrees Fahrenheit with a corresponding wet bulb temperature of 69 degrees.

The ventilation of one section of a mine became difficult due to falls in the return air way and this section was abandoned.

HEALTH AND SANITATION.

Matters affecting health and sanitation have been given due attention and any observed deficiencies were quickly remedied.

EXPLOSIVES.

Attention has been given to the storage and use of explosives. Magazines were regularly inspected, and were generally found to be satisfactory, and any faults discovered were immediately rectified. Sites for new storage magazines were inspected and new magazines were examined prior to licensing.

INFLAMMABLE LIQUIDS.

Many applications for permission to store inflammable liquids were received and dealt with. These installations were later inspected and were generally found to comply with the requirements. Existing installations were inspected to ensure compliance with the provisions of the Act.

MACHINERY.

Underground machinery was regularly examined and was generally found to be satisfactory. When found faulty the machinery was speedily adjusted.

Tests disclosed some faulty electrical equipment which had to be renewed.

One man received an electric shock when handling an electric drilling machine inside the mine. An investigation was carried out and recommendations made to prevent a recurrence.

GENERAL.

An underground fire occurred on a section of the main endless rope haulage road at the Cornwall Colliery. The fire was discovered when the workmen engaged on the afternoon shift were returning out of the machine section at about 10 p.m. These workmen encountered smoke and fumes along the haulage road, and had to retreat and leave the mine by the second means of egress.

An investigation disclosed that the fire was burning in the vicinity of the junction of the main heading and the eastern section about half a mile from the entrance to the mine and was chiefly confined to the timber in the drive.

The openings had to be sealed off in order to smother the fire and this work was completed without any serious accident.

It was not possible to establish the cause of the fire but enquiries revealed that there were no live electric cables in the vicinity which could have caused the ignition.

After the mine remained sealed for several weeks, it was decided to carry out an investigation to ascertain whether the fire was extinguished. The ventilating fan was started and tests were carried out on the air exhausted from the workings. These tests showed that the air contained carbon monoxide and further tests, after running the fan for 24 hours, showed no appreciable fall in the CO content. The manager, under-manager and myself then entered the mine by the second entry and were able to advance about a mile to within a few hundred yards of the seat of the fire before we encountered a large fall which blocked the main heading. After further testing it was decided to re-seal the tunnel for a further period to try to extinguish the fire.

An investigation was carried out at the request of the Hydro-Electric Commission upon the conditions at one of the tunnelling projects. The investigation included a Konimeter and ventilation survey and a report was duly forwarded.

OPERATIONS AND PRODUCTION.

Total production of coal was 299,221 tons, valued at £604,803 at the mine bins. The average number of persons directly employed at the mines was 363.

The output was again a record and was 35,019 tons greater than the previous year, which was also a record. The increase represents 13 per cent in production for an increase of less than 2 per cent in the number of employees.

The largest increase was again from the Merrywood Coal Mine, where an increase of 10,845 tons was recorded, about equally divided between the open cut and underground activities.

The Tasmanian Coal Mine at Fingal increased production by 9,390 tons and the Duncan Coal Mine, also at Fingal, recorded an increase of 8,295 tons.

Reduced production was recorded from the Langlosh Coal Mine at Hamilton where 1,764 tons less coal was produced, a reduction of 20 per cent.

Based on quarterly averages the production from underground activities per person employed was 794 tons per year, compared with 716 tons for the previous year. The production per person employed underground was 1,054 tons, compared with 968 tons for the previous year.

Power restrictions caused reduction in the production of zinc and cadmium at the Risdon Works, and of calcium carbide at Electra. Reduced carbide production required a reduced output of limestone from the Ida Bay quarry.

Fingal-Mount Nicholas-Dalmayne Coalfield.

The total production from this coalfield was 242,562 tons, which was 26,214 tons greater than that produced from the field during the previous year. Increased production was recorded from all coal mines with the exception of the Fingal.

Cornwall Colliery.

This colliery produced 102,151 tons valued at £194,087 at the mine bins. An average of 127 persons was employed at the mine.

The production was 7,406 tons greater than the previous year and on average six less persons were employed.

A fire occurred in the old tunnel on the 14th July which caused cessation of work in the sections affected, as the openings had to be sealed off to prevent air reaching the affected area in order to smother the fire. The workmen were later employed in the new tunnel section by working an additional shift. This afternoon shift continued during the year and will continue until additional places can be developed in another area.

The arc-wall machine, and several electric winches and boring machines were lost as a result of the fire, and it is not possible to say whether these will be recovered later, but it is proposed to open up a new section to the east of the affected area, and those workings may penetrate into the sealed area at some future date.

The Continuous Miner worked on the right hand side of the new tunnel section, but difficult roof conditions hampered production from this unit.

There was no pillar extraction work during the year, all coal production being obtained from the solid places.

Mount Nicholas Colliery.

This colliery produced 40,750 tons, valued at £77,426 at the mine bins, and employed an average of 57 persons.

The output was again a record and exceeded last year's record by about 399 tons and three less persons were employed, so that the production per man year showed an appreciable increase.

Operations continued on the same lines as in the previous year, with machines operating in the 4ft. 9in. section, and grunching and hand-filling in the 6ft. section. Faulting caused difficulties in both sections of the mine.

Jubilee Colliery.

Output from this colliery increased by 875 tons to 24,642 tons, valued at £56,446 at the mine bins, and an average of 44 persons was employed.

Although the output increased, the production per man dropped by 40 tons per year as the average number of employees increased slightly also.

Conditions inside the mine became very difficult and falls of roof in the main roads eventually caused abandonment of sections inside the mine. Places were opened up further outbye for production. A section is being developed on the east side of the main heading where conditions are becoming more settled, but the main haulage road is not in good shape in some sections and may eventually cause difficulty in transport.

Work is being carried out to expose the seam to the west of the existing workings in order to work this by open-cut methods, but difficulty has been experienced in removing the overburden due to the existence of large boulders and excessive water. It is proposed to put a tunnel into the seam in this vicinity in order to test the seam conditions, and if these are suitable the area will be developed.

Duncan Colliery.

The production from this Colliery reached the record figure of 42,285 tons, valued at £80,341, and an average of 46 persons was employed. The corresponding figures for the previous year were 33,990 tons, valued at £60,332, and 39 persons.

The increase in production was due to the introduction of machines into the mine during the latter half of the year. Prior to the introduction of machines the whole of the output was obtained by grunching and hand-filling; but a large proportion of the production is now cut by an arc-wall coal cutting machine and loaded by machine. The underground machinery includes two shuttle cars and special haulage equipment which was introduced into the second tunnel to deal with the production from the mechanised section. Very wet conditions are causing difficulty in the use of the rubber-tired shuttle-cars and if their use is to be a success, efforts must be made to drain the roads.

Fingal Colliery.

A slight reduction in the production from this colliery caused output to fall to 21,828 tons, valued at £50,660, and an average of 16 persons was employed at the mine.

Production was obtained from the same places as in the previous year, no new developmental work having been carried out.

Tasmania Coal Mine.

This coal mine, which commenced operations during the September quarter of last year, continued production during the year and produced 10,906 tons, valued at £25,203, and employed an average of 11 persons. Difficult conditions were encountered due to faulting which caused excessive grades, and also produced water accumulations at the face, but the production per man year was very satisfactory, reaching nearly 950 tons against an average for the State of 794 tons.

Efforts are to be made to negotiate the downthrow fault which was encountered in the main heading, by driving through in right back heading where the dip is slightly less.

Avoca Coalfield.

Stanhope Colliery.

Production from this colliery was 7,026 tons, valued at £17,774, and an average of 15 persons was employed. The output was 212 tons less than last year, but one less person was employed.

No developmental work was carried out and the mine continued to operate on the extraction of pillars near the outlet. Some boring was carried out without proving any workable area of coal.

Merrywood Colliery.

The colliery produced 40,365 tons, valued at £70,741 at the mine bins, and employed an average of 22 persons. Open-cut operations accounted for 15,478 tons and underground production was 24,887 tons, the corresponding figures for the previous year being 10,080 tons open-cut and 19,440 tons underground.

Production was again a record and was 37 per cent more than the previous year, which was also a record. The output per man/year from underground activities was the highest in the State, reaching 1,470 tons, which was about 27 per cent greater than the previous year. The output per underground employee was also the highest in the State.

Underground production continued on the same pattern as previously, being obtained from solid places by grunching and hand-filling methods. The thickness of the seam remained constant and there was no serious upsets due to faulting, although roof troubles developed in one place due to minor faulting.

Overburden removal continued with "Tournadozer" and "Tournepull." This latter machine commenced operating at the beginning of the year and greatly facilitated the handling of the overburden, which was becoming very difficult for the single machine.

Upper Derwent Coalfield.

Langloh Colliery.

Production from this colliery declined to 6,894 tons, valued at £26,225 at the mine bins, and an average of 19 persons was employed at the mine. The corresponding figures for the previous year were 8,658 tons, valued at £33,685, and 21 persons.

Difficulties due to roof collapse caused some stoppages at the mine, which were the chief cause of the reduced output. The road to the working faces is becoming difficult to maintain because the roof directly above the seam will not stand for long periods without breaking, and the effective life of the timber is limited. The long wheeling road also retards output, and the possibility of developing another outlet to replace the existing road is being investigated.

Sandfly Coalfield.

Sandfly Colliery.

Production from this colliery increased to 1,764 tons, valued at £4,283, and an average of three persons were employed.

The demand for this coal increased as a result of the fall in the output from the Langloh Mine. The coal is used in the lime burning kiln at the Carbide Works and is proving satisfactory. The coal is also used for burning lime at the Granton works and a small demand still exists for hop drying.

Water caused some difficulties, as the workings are advancing down the full dip causing it to accumulate.

Mersey Coalfield.

Illamatha Colliery.

The output from this small colliery declined to 610 tons, valued at £2,617, and only two men were employed.

Operations continued on the same pattern as in the previous year, the output being produced from a seam less than two feet thick which is much faulted and very wet.

ORE TREATMENT.

The Electrolytic Zinc Company.

This company processed 199,714 tons of calcines at the Risdon works and produced 101,090 tons of zinc, valued at £9,634,920; 222.7 tons of cadmium, valued at £336,706; and 18.37 tons of cobalt oxide, valued at £20,575.

The throughput of calcines declined by 13,314 tons, chiefly due to the power restrictions imposed for a short period during the year.

Difficulties were experienced with the operation of the residue treatment plant, but it is expected that this unit will eventually prove satisfactory.

The new ammonium sulphate fertilizer plant was made ready for operation and is awaiting the necessary power to commence production.

Superphosphate production increased slightly to 80,000 tons for the year, as this section of the works was not affected by power restrictions.

The average number of employees declined to 2,441 compared with an average of 2,513 for the previous year.

CARBIDE AND LIMESTONE.

The Australian Commonwealth Carbide Company.

This company produced 8,127 tons of calcium carbide, valued at £425,236, and employed an average of 148 persons. The corresponding figures for the previous year were 8,866 tons of carbide, valued at £468,213, and 144 persons.

The reduction was chiefly due to power restrictions imposed during the year. No new developments occurred and operations continued as in the previous year, carbon black being produced as usual. The production of limestone from the quarry at Ida Bay was reduced in conformity with the reduced output of carbide, but stock piling at the works allowed operations to continue at the quarry. The production of limestone was 17,946 tons, valued at £32,679, and an average of 28 persons was employed in the production and transport to the loading wharf.

Australian Newsprint Mills Ltd.

The output of limestone from the Junee quarry declined to 2,678 tons, valued at £3,043, and an average of three

persons was employed there. The corresponding figures for the previous year were 6,903 tons, valued at £8,506, and an average of five persons. The large reduction in the production of limestone from this quarry was due to supplies to the Electrolytic Zinc Company having been discontinued.

OSMIRIDIUM.

The production of osmiridium from Adamsfield increased to 21.49 oz., valued at £1,504, and an average of four persons was employed in production.

Production continued from alluvial workings on the same lines as in the previous year, but work is being carried out on the re-opening of the old Blythe Shaft, which was abandoned many years ago, in order to test the ground below the level last worked.

GRANITE.

The red granite quarry at Coles Bay was worked for only two quarters, producing 41 tons, valued at £690, and employing two persons. The quarry is now under new ownership and the production is expected to increase.

TIN.

Coles Bay.—One miner, W. Mundy, produced 0.1505 tons of metallic tin from this district, valued at £S120.

Cox's Bight.—On this field, ground sluicing continued on leases held by C. D. King and A. T. Hancock. Total production was 2.8436 tons of metallic tin, valued at £S2,130.

KAOLIN.

Non-Metallic Minerals Pty. Ltd.

Production of kaolin from the open cut operations at Surges Bay increased to 4,814 tons, valued at £37,816, and an average of nine persons was employed. The corresponding figures for the previous year were 2,245 tons, valued at £19,528, and six persons.

The production was the highest recorded from this area, and was forwarded for use in the paper industry at Burnie.

REPORT OF THE MOUNT CAMERON WATER-RACE BOARD FOR THE YEAR ENDED 31st DECEMBER, 1955.

SIR,

WE HAVE the honour to submit the report of the Mount Cameron Water-Race Board for the year ended 31st December, 1955.

Production of tin-oxide from all activities serviced by the race system, was 39.4066 tons, as compared with 29.1450 for the previous year, representing an increase of 10.2616.

No water was supplied under the royalty scale of payment and all producers worked under the Fixed or Cash Scale.

Revenue was £886 2s. 6d. as compared with £1,201 5s. 1d. for the last year.

Expenditure was £2,325 11s. 11d. as against £2,335 18s. 3d. for the previous year.

The operational loss was £1,439 9s. 5d. as compared with £1,134 13s. 2d. for last year. Expenditure was almost the same as last year, but the amount of revenue actually received at the end of the year declined by £315 2s. 7d. Revenue earned from sale of water during 1955, but which was not actually received until after 31st December, 1955, was £162 15s.

A total of 1,752 sluice-heads of water was supplied as compared with 1,227 last year, but 1,606 sluice-heads were supplied as night water for which half rates only are payable. This represents the principal reason for the decline in revenue.

During the year water was supplied to the township of Gladstone under a water scheme constructed by the Gladstone Progress Association and revenue accrued to the Board from all domestic users. The Government provided a contribution of £25 towards the scheme through the Department of Mines.

Races, syphons, flumes, culverts and dams were maintained in good order, but certain sections of the race require to be cleaned. Renewal of portion of the structure supporting the syphon over the Little Mussel Roe River is necessary, and the matter of renewal of the flood-gate and wooden by-wash in the Chum Race is to be investigated. Expenditure on these necessary works during 1956 will increase the operating loss, but under the existing conditions no significant increase in revenue can be expected.

We have the honour to be

Sir,

Your obedient servants,

J. G. SYMONS, Chairman.

H. KEITH TURNER, Member.

B. DUNN, Member.

The Hon. the Minister for Mines,
Hobart.

STATISTICS FOR THE YEAR ENDED 31st DECEMBER, 1955.

Registered Rainfall:

Great Mussel Roe	49 inches 39 points.
Little Mussel Roe	48 inches 15 points.

Revenue.

Revenue for the sale of water for mining purposes was £1,201 5s. 1d. representing a decrease of £302 12s. 10d.

Expenditure.

Expenditure was £2,325 11s. 11d. representing a decrease of £10 6s. 4d.

Water Services:

Average number of claims supplied per week, 2.3,
Greatest number of claims supplied in any week, 3.

Total number of sluiceheads supplies:—

Fixed or cash scale, 1,752.
Royalty or credit sale, nil.

Production and Employment.

Tin-oxide produced:—

	tons	cwts.	qrs.	lbs.
Under fixed scale	39	8	...	15
Under Royalty scale	...	...	...	...
Total	39	8	...	15

Average number of men employed per week, 7.

Statement of Receipts and Payments of the Mt. Cameron Water Race Suspense Account for the Year Ended 31st December, 1955.

<i>Receipts.</i>		<i>Payments.</i>	
	£ s. d.		£ s. d.
Sale of Water—		Salary and wages	2,152 18 0
Fixed scale	731 2 6	Pay-roll tax	53 16 10
Domestic purposes	117 0 0	Car allowance—Manager	58 6 8
Hire of pipes	38 0 0	Insurance	31 5 0
	£886 2 6	Tools and general requisites	25 12 4
Balance (excess payments over receipts)		Miscellaneous	3 13 1
Loss, 1955	1,439 9 5		
	£2,325 11 11		£2,325 11 11

REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD FOR THE YEAR ENDED 31st DECEMBER, 1955.

SIR,

WE HAVE the honour to submit the report of the Ringarooma and Cascade Water Board for the year ended 31st December, 1955.

The Cascade Section remained in use by Briseis Tin N.L. on a basis of rental at the rate of £211 per annum, and responsibility for maintenance of the system to the satisfaction of the Board.

Briseis Tin N.L. maintained the Ringarooma Race on a cost plus supervision basis, but small revenue from users of water and high costs of maintaining the system resulted in a deficit of £5,280 6s. 4d. for the year.

The Cascade Section has been maintained in good order. The Ringarooma Race continues to deteriorate and large capital expenditure would be necessary for its complete rehabilitation. The Valley and Black Creek Syphons are beyond repair and can no longer be used. Consideration of the question of renewal has been deferred until such time as mining activities may warrant expenditure thereon and the section of race between the Black Creek Syphon and Derby has been abandoned. It has been decided to repair leaking races by the use of concrete, and this procedure is being adopted within reasonable limits of expenditure. Race cleaning over a length of fifteen miles is necessary but the work cannot be undertaken with existing staff and has been deferred for later consideration.

A claim by a landowner for damage resulting from a landslide caused by a leak in the Ringarooma Race has been fully investigated and the amount is being settled by agreement.

Several applications for the use of water for irrigation purposes have been considered by the Board and have been approved subject to mining and township requirements being satisfied. An annual licence fee, together with a charge based on the size of pipes connected to the Race, has been fixed.

The Board is conscious of the fact that there are insufficient existing sources of revenue to meet operational expenditure on the Race system in its present deteriorated state, but every effort has been made to maintain expenditure at a minimum and methods of increasing possible revenue are under constant attention.

We have the honour to be Sir,
Your obedient Servants,

J. G. SYMONS, Chairman.
H. K. TURNER, Member.
N. P. EDWARDS, Member.

The Hon. the Minister for Mines,
Hobart.

APPENDIX OF GEOLOGICAL REPORTS TO ACCOMPANY THE REPORT OF THE DIRECTOR OF MINES

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TABLED BEFORE BOTH HOUSES OF PARLIAMENT BUT NOT PRINTED
AS A PARLIAMENTARY PAPER.

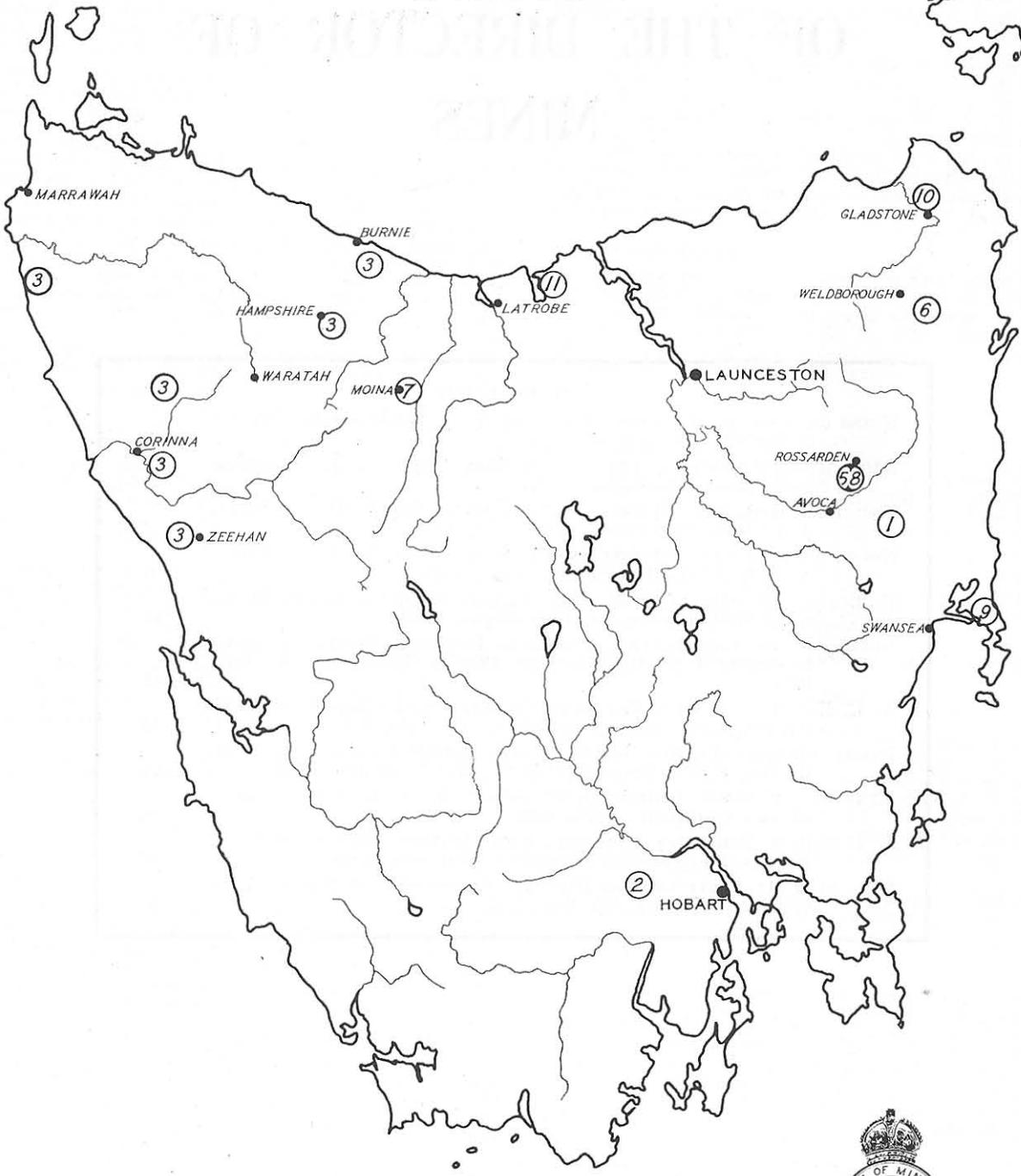


TASMANIA

REPORT LOCALITY MAP



SCALE
0 8 16 24 32 MILES



- 1 URANIUM AT ROYAL GEORGE MINE
- 2 COAL NEAR MT LLOYD
- 3 NOTES ON IRON ORE DEPOSITS IN TASMANIA
- 4 J. CURTAINS SCHEELITE PROSPECT - KING IS.
- 5 A.E. HUGHES URANIUM PROSPECT - STOREYS CK.
- 6 RADIO-ACTIVE MATERIAL AT THE ANCHOR MINE
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- 9 NOTES ON COAL AT MT PAUL
- 10 BORING ON SCOTIA-LOCHABER TIN LEADS - GT NORTHERN PLAINS - GLADSTONE DISTRICT.
- 11 PYRITE PROSPECT - BRANCH CK. (3RD. REPORT)

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NOTES ON COAL AT MT. PAUL.

REPORT BY T. D. HUGHES, B.Sc., (SENIOR GEOLOGIST),
31st August, 1955.

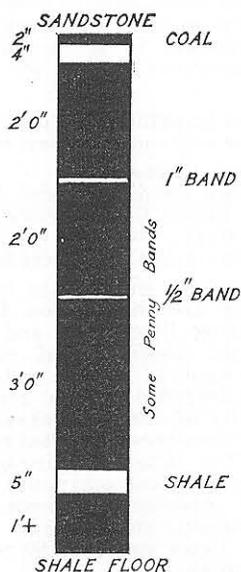
As the coal prospects in the Dover area are disappointing as far as a supply for the proposed Rayon Works is concerned, it was decided to investigate known deposits in other suitable areas.

A very favourable impression was gained by examination of this deposit and it appeared far superior both in width of seam and extent than any seen in the south.

At the moment, the coal could be carted to the Coles Bay Jetty in a distance of seven miles, six along the main Coles Bay Road and one in from there to the adit. However, this distance could be considerably shortened and the jetty could be reached within five miles. Roads could be constructed with great ease in this country. The jetty would need some minor repairs and, of course, a suitable ship would be necessary.

The coal seam is impressive but little development has been attempted. The adit has been driven in the coal for a stated 600 feet. At the time of our visit, there was water after 200 feet, but the adit is easily drained by means of a hand pump and syphon.

The seam may be measured in a cuddy about fifty feet from the entrance as follows:—



The adit is driven in a northerly direction with the floor the 5-in. shale band, and the roof in coal about the 1-in. band. A sample taken from near the face by Inspector D. Besford in 1948 showed, over 5-ft. 11-in. of coal and minor bands, the following analysis:—

Moisture at 105°C.	0.6
Volatile Carb. Matter	25.5
Fixed Carbon	51.6
Ash	22.3
Sulphur	0.46
Calorific Value	11,300 B.Th.U's

The extent of the coal measures in this area is considerable to the north, east, and west of the adit. A fault cuts them off to the south; to the east is another fault 30 chains away; to the north the coal measures pass under a dolerite sill, 20 chains away from the adit mouth.

The coal could be mined by a series of adits along the outcrop on the southern side of Mt. Paul, but the possibility of open cut mining to the east of the present adit should not be overlooked. A short boring campaign in this area would determine whether an economic seam existed at a suitable distance below the surface. The presence of a marsh on a shelf of the eastern slopes of the mountain suggests that there is shale and therefore possibly coal not far below the surface.

The following points are favourable for the development of this field:—

1. A wide seam with a good sandstone roof can be inspected.
2. Although the ash is not low, it is not higher than that in the majority of coal mined in Tasmania and the calorific value is higher than the average. This is based on the most recent sample taken by this Department and earlier samples have been poorer.

3. Faulting is almost absent in the 600 feet of the tunnel.
4. An extensive area of the coal measures can be traced on the surface.
5. Mining by adits can be readily accomplished.
6. Water will not be a trouble in the workings.
7. The possibilities of open cut mining should not be overlooked.
8. The climate and surrounding countryside are both delightful.
9. The land haulage of the coal should not exceed five miles.
10. Roads can be easily constructed and the area is practically free of undergrowth though there is a plentiful supply of mine timber in the trees.

Possible disadvantages may be:—

1. A suitable ship would have to be provided for transport of the coal.
2. It is not known how the ash reacts on fusion. A sample will be obtained and experiments carried out in the Department's laboratory.

RADIO-ACTIVE MATERIAL AT THE ANCHOR MINE.

REPORT BY T. D. HUGHES, B.Sc. (SENIOR GEOLOGIST),
1955.

The Anchor is an abandoned tin mine from which 2,358 tons of tin have been produced the last mining being carried out in 1950. To reach the mine a steep winding road descends from the defunct township of Lottah for about two miles. Lottah is about four miles from Goulds Country or 13 from St. Helens on the road between Gould's Country and Weldborough in the north-eastern part of Tasmania.

The tin here occurs in a granite, sometimes concentrated in fairly horizontal "floors" or vertical "pipes," but often disseminated erratically through the granite. There are two types of granite here the tin-bearing variety and a more porphyritic barren granite into which the former has been intruded. The ore has been mostly obtained from a whole series of open cuts and often the porphyritic granite has to be removed as overburden. According to Thomas where the junction of the two granites is fairly horizontal tin is apt to be concentrated as a "floor" at the top of the tin granite, and the contact is a very sharp one marked by the presence of a darker band, a few inches thick, due to the concentration of mica.

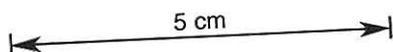
It is in just such a band that the highest count was obtained, a count of over 1000 c.p.m. on a PRM 200 counter. In the haulage face, one of the easterly faces, the contact between the two granites is marked by a distinct joint plane which dips to the south (200°) at 7° and at one place on this, a small cave-like adit has been put in. In this cave can be seen the black micaceous band between the two granites and at a spot in the southern part it is three to four inches wide and gives the highest count. In other parts, this band forms the roof and consists of quartz, mica, and chalcopyrite, oxidising to the green carbonate.

Two samples were taken from this adit: (1) was over three inches of the band itself; and (2) from the granite from four feet just below and one foot above the band. These samples were sent to the Bureau of Miners Resources for investigation and a radiometric assay showed that the equivalent uranium content of (1) was 0.22% U₃O₈, and (2) 0.02% U₃O₈. The report further stated: "In each case, absorption tests indicate that activity is essentially due to uranium, and that the actual uranium content may be rather higher than the value obtained by radiometric assay." It was not possible to identify the uranium mineral from the sample forwarded and a further sample will be obtained.

Meantime, it is interesting to note that the assay indicates a uranium content of almost ore grade. It is a pity that the actual mica seam is so narrow but further prospecting may reveal a widening.

References:

1. 1928. Geological Survey Bulletin No. 38: *The Blue Tier Tinfield* by Reid and Henderson.
2. 1943. Typewritten report: *Tin Deposits of Blue Tier District*, by Thomas.



THE SHEPHERD AND MURPHY MINE—MOINA.

REPORT BY F. BLAKE, A.M.I.M.M. (GEOLOGIST),
20th July, 1955.

Situation and Access:

The mine is now operated by Moina Tungsten Tin Mining Company No Liability, and is situated south-east and adjoining the former township of Moina.

The greater part of the mine is located on two adjoining mineral leases, Nos. 10795/M and 53M/51, each of 20 acres in extent. Other adjoining mining tenements held by the company total 197 acres, and water rights are attached to Bismuth and Brampton Creeks. A portion of the workings extends into unleased Crown land to the south-east of Section No. 10795/M.

Only one residence, including the post office and store, now remains on the old Moina Town Reserve and the existing settlement is clustered in vicinity of the mine.

Access to the mine is gained by motor road from Sheffield, via Wilmot, in a distance of 24 miles. At 11 miles south of Wilmot, on the Cradle Mt. road, a branch road reaches the mine in $1\frac{1}{2}$ miles.

Previous References:

The following list includes all previous departmental publications, and an unpublished report, containing references to the Shepherd and Murphy Mine:—

Publications:

1893. Montgomery, A.: *Report on the Mineral Discoveries in the Neighbourhood of Bell Mount.*

1897. Smith, J. Harcourt: *Report on the Shepherd and Murphy Tin Mine, Bell Mount.*

1898. Smith, J. Harcourt: *Report on the Bell Mount and Middlesex Mineral Fields.*

1901. Waller, G. A.: *Report on the Mineral Districts of Bell Mount, Dove River, Five-Mile Rise, &c.*

1913. Twelvetees, W. H.: *The Middlesex and Mt. Claude Mining Field* (Tasmanian Geological Survey Bulletin No. 14).

1916. Hills, Loftus: *Middlesex and Mt. Claude Districts* (Tasmanian Geological Survey, Mineral Resources No. 1, Part II.).

1919. Reid, A. M.: *The Mining Fields of Moina Mt. Claude and Lorinna* (Tasmanian Geological Survey Bulletin No. 29).

1938: Nye, P. B., and Blake, F.: *The Geology and Mineral Resources of Tasmania* (Geological Survey Bulletin No. 44).

Unpublished Report:

1943. Keid, H. G. W.: *Report on the Moina Mineral District.*

Plans:

A surface map showing the general geology, together with the vein system, and a mine detail plan with longitudinal sections accompany this report.

History:

The ore deposits of the Shepherd and Murphy Mine were discovered in 1893 by Thomas Shepherd and Thomas Murphy. During the early stages of prospecting and mine development, production was intermittent but from 1907 to 1918 regular production of tin, wolfram, and bismuth was maintained. Prior to 1914, mining was confined to the lodes above No. 3 adit, but by 1915 the main shaft had been sunk below that level to a depth of 171 feet. From this period up to 1919, Nos. 4 and 6 Lodes, together with the north-west branch of the latter, were developed from the shaft levels the greater part of the stoping being carried out on No. 6 Lode. In 1919 a bushfire destroyed the milling plant and the mine closed down.

The erection of a new mill, commenced in 1921 by the Shepherd and Murphy Syndicate Limited, was completed in the following year by the New Shepherd and Murphy Mining Company. The latter company milled some 2,000 tons of ore, principally from broken material in stopes above No. 3 adit and from surface dumps, for a return of approximately 22 tons of "Firsts" and a quantity of "Seconds" concentrate. The shaft levels were not unwatered and operations ceased in 1924.

In the years between 1933 and 1950, J. P. Godwin carried out intermittent sluicing operations on alluvial and detrital deposits together with the treatment of limited quantities of ore by hand jigging methods,

The present holders of the mining tenements, Moina Tungsten Tin Mining Co. N.L., completed the unwatering of the mine by September 1953, and the new mill and concentrating plant was still in course of erection at that stage. Records show that by the end of 1954 the company had treated 2,500 tons of ore.

Physiography:

The Mine occupies high ground rising southerly from Iris River Valley at an altitude of about 2,000 feet above sea level. The area is dissected by Bismuth Creek on the east and Brampton Creek to the west, both flowing north-easterly to join Iris River in a distance of one mile. Bismuth Creek has cut a deep channel through basalt flows to expose underlying sedimentary rocks on the denuded sides of the valley. The ore bodies are contained in the sedimentary rocks and the rugged topography has thus assisted in the prospecting and mining of the lodes to depths of several hundred feet by means of adits. The lowest adit occurs at an altitude of 2,160 feet above sea level and the hill surface rises 340 feet in a distance of 1,500 feet to the highest outcrop of the veins worked in the mine.

Geology:

The oldest rocks in the mine area are those in which the ore bodies are contained. They are of Ordovician age and comprise sedimentary beds of quartzites conformably succeeded by altered limestones. These rocks are largely covered by Tertiary basalt. In places the basalt flows conceal alluvial deposits of a former stream system. Devonian granite outcrops outside the area to the east of the mine.

Ordovician.—Stratigraphically these rocks belong to the Junee Group the sequence of which is as follows:—

Gordon River Limestones;
Caroline Creek Sandstones and Shales;
West Coast Range Conglomerate (sandstones and conglomerates);
Jukes Breccias and Conglomerate.

Two formations of the group have been recognised in this district. They are the Gordon River Limestones, principally comprising limestones, and the West Coast Range Conglomerate, consisting of conglomerates and sandstones. As a result of contact metamorphism of the surrounding rocks intruded by the granite mass, sandstones in the vicinity of the mine were transformed into quartzites and the limestones converted to garnet-pyroxene rocks or skarn. The latter is principally composed of garnet, epidote, pyroxene and magnetite, with vesuvianite, fluorite and other subordinate compounds. Unaltered limestones are exposed, below basalt covering, in the bottom of Bismuth Creek valley at 50 chains downstream from Moina road crossing.

In the mine locality, to the west of Bismuth Creek fault, garnet rocks conformably overlie quartzites. They strike generally north and south and dip to the west, at angles from 30° to 50°. Owing to the restricted outcrops, due largely to the basalt cover and combined with the influence of faulting, the rock structure could not be satisfactorily determined. However, the strike and dip measurements suggest the presence of a west dipping limb of a meridional trending drag fold.

On the east side of the main fault quartzites predominate and occur opposite both quartzites and garnet rocks. However, towards the south-east a small area of garnet rock again appears and is here in contact with quartzites, occurring on the opposite side of the fault line. Quartzite beds are repeated on the hillside to the north-east of this exposure of garnet rocks, where they strike N.W.-S.E. and dip to the south-west in the correct sequence below the altered limestones.

Devonian.—The Junee Group of rocks was intruded in Devonian times by a granite which now outcrops some 3½ miles to the east of the mine. From the affect of contact metamorphism on the local sedimentary rocks, it appears likely that granite extends below the area at no great depth.

Tertiary.—Basalt flows extruded during the Tertiary period covered a large portion of the former land surface. These rocks have been greatly denuded and now occur over the northern and western parts of the area. The basalt covers the western extension of the ore-bodies at the surface.

The basalt has filled the former valleys and covered early Tertiary alluvial deposits formed along the course of the previous stream system. Remnants of the alluvial deposits in the form of a sub-basaltic lead, are revealed at several places in the underground workings and to a greater extent in a surface cut,

Tectonics.—Tangential compression forces during the Tabberabbean orogeny of the Devonian period brought about extensive folding of the Ordovician strata. The axes of the principal folds developed generally along N.W.-S.E. Lines. Between these main folds minor drag folding occurred with axes trending from N.E. to N. Tension in the rocks caused by the folding movements was relieved by fracturing in the form of tension fractures.

Contemporaneous with the folding a period of granite activity occurred accompanied by metallogenesis. Mineralising gases and solutions emanating from the granite intrusion were deposited in the tension gashes to form the quartz veins of the area.

Faulting.—A steeply-dipping thrust fault traverses the valley of Bismuth Creek. Its course can be distinguished on the air photographs and it is also indicated by the mapping where younger altered limestones have been displaced as a result of movement along the fault, and occur opposite older quartzite beds. The fault strikes on a general bearing of 315° and the displacement of the strata indicates a heave of at least 1,200 feet.

The best exposure of the fault is seen in cuttings along Cradle Mt. road, half a mile to the south-east of the mine and north of the crossing of Bismuth Creek. Here it dips at a high angle to the north-east along a wide brecciated zone. Beds on the footwall side show upward drag as opposed to downward drag on the hanging wall side.

Wolfram-bearing veins formed at the same period as those at the Shepherd and Murphy Mine are dislocated by the fault movement. The fault is therefore shown to be of post-mineralisation age.

A series of small faults have been revealed in the mine workings. The veins are dislocated by the faults to only a minor degree, with displacements from three feet to a maximum of 10 feet. The dip of the fault planes vary from vertical to 45° to the north. These faults occur more frequently about the junction of the quartzites with the overlying garnet rocks. Little difficulty has been experienced in locating the continuation of the veins in the vicinity of the faults during mining operations.

The Ore Bodies:

The lodes of the Shepherd and Murphy area are essentially quartz fillings of tension fractures.

They consist predominantly of quartz with fluorite, mica, topaz, calcite, beryl and laumontite as accessory gangue minerals. The contained minerals of economic importance comprise cassiterite, wolfram and bismuthenite. Other subordinate metallic minerals include scheelite, pyrite, sphalerite, chalcopyrite, magnetite, molybdenite, and galena. Bismuth and bismutite also occur near the surface.

In the mine four parallel E.-W. lodes have been developed. In order, from south to north, they are Nos. 2, 4, 5, and 6. Also included is N.-W. Branch Lode a vein deviating in a north-westerly direction from No. 6 Lode, towards the western extremity.

The parallel lodes dip steeply at about 85° to the south, while the N.W. Branch Lode is nearly vertical, but has a tendency to dip towards the N.E.

The lodes traverse the contained quartzites and garnet rocks at almost right angles to the strike of the strata. They pass from one rock type to another without great change. There is a tendency for the lodes to split into small veins which with few exceptions, again unite further along the strike. This splitting is more general in the quartzites. The ore occurs sporadically in the lodes in the form of bunches and small blebs. Larger patches containing cassiterite, wolfram and bismuthenite occur infrequently, usually with those minerals independently. Some minor mineralisation of the wall rock for a few feet on either side of the lodes is an occasional feature and often takes the form of bismuthenite or sphalerite.

The following table details distances between the lodes, average vein width, and lengths over which they have been mined:—

Lode.	Distance from No. 2 Lode. Feet.	Average Width. Inches.	Length Mined. Feet.
No. 2	—	10	820
No. 4	165	15	1,300
No. 5	285	8	450
No. 6	755	20	910
N.W. Branch	755	15	470

The lateral extensions of these lodes have not been reached in the mine. They are limited towards the east by the post mineral fault following the course of Bismuth Creek which is expected to have dislocated any veins coming within its influence to a major degree. Further extensions to the west will be determined by driving underground as the covering basalt in that direction largely eliminates climates prospecting from the surface.

The Mine Workings:

From the surface down to a depth of 340 feet the lodes have been worked by way of four adits. Below No. 3 Adit which is the lowest they have been developed to a further depth of 150 feet in two levels from a main shaft.

Vertical distances between the various levels worked are:—

Surface to No. 1 Adit	100 feet
No. 1 Adit to No. 4 Creek Drive	90 feet
No. 4 Creek Drive to No. 3 Adit (No. 1 Shaft Level)	150 feet
No. 3 Adit to No. 2 Level Main, Shaft	75 feet
No. 2 Level to No. 3 Level Main Shaft	75 feet

Above No. 3 Adit the lodes have been almost completely stoped out to the surface and, with the exception of some small blocks of ore, the reserves in these upper levels are inconsiderable.

Mining and development by the present company is confined to the levels operated from the Main Shaft below No. 1 Level. At No. 3 Level drives have been extended east and west on Nos. 6, 4 and 2 Lodes, and westerly on N.W. Branch Lode. Stoping is now principally carried out on these lodes from No. 3 Level.

The reserves of ore developed between Nos. 1 and 3 Levels are not large and at the present rate of extraction, will be depleted in a comparatively short time.

Since the commencement of the present operations the mining and treatment of the ores has indicated that the overall grade of the lodes is tending to decline towards the bottom level and this is reported to be particularly noticeable at the extremities of the drives.

Samples of "run of mine" ore taken between November, 1954, and February, 1955, and assayed at the Mines Department gave the following results:—

No. 6 Lode.	Sn		WO ₃		MOS ₂		Bi	
	%	%	%	%	%	%	%	
West Drive, No. 3 Level	0.39	0.23	Tr	Tr	0.13	Tr	Tr	Tr
" " " "	0.33	0.89	0.13	Tr	0.08	Tr	Tr	Tr
" " " "	0.15	0.39	0.08	Tr	0.13	Tr	Tr	Tr
" " " "	0.01	0.50	0.13	Tr	—	Tr	Tr	Tr
" " " "	0.22	0.50	—	Tr	—	Tr	Tr	Tr
" " " "	0.34	0.90	—	Tr	—	Tr	Tr	Tr
" " " "	0.65	0.65	0.1	Tr	—	Tr	Tr	Tr
West Drive, No. 2 Level	0.08	0.30	0.08	Tr	—	Tr	Tr	Tr
East Drive, No. 3 Level	0.21	Nil	0.08	Tr	—	Tr	Tr	Tr
" " " "	0.08	0.18	0.11	Tr	—	Tr	Tr	Tr
" " " "	0.18	0.34	—	Tr	—	Tr	Tr	Tr
East Drive, No. 2 Level	0.25	0.15	0.08	Tr	—	Tr	Tr	Tr
" " " "	Nil	0.15	0.07	Tr	—	Tr	Tr	Tr
" " " "	0.08	0.24	0.06	Tr	—	Tr	Tr	Tr
" " " "	2.72	4.39	0.16	Tr	—	Tr	Tr	Tr

N.W. Branch Lode.	Sn		WO ₃		MOS ₂		Bi	
	%	%	%	%	%	%	%	
No. 3 Level	0.5	0.56	0.01	Tr	0.02	Tr	Tr	Tr
" " " "	0.21	0.97	0.02	Tr	0.02	Tr	Tr	Tr
" " " "	0.29	0.64	0.02	Tr	0.02	Tr	Tr	Tr
" " " "	0.19	0.43	Tr	Tr	0.03	Tr	Tr	Tr
" " " "	0.15	Nil	0.03	Tr	—	Tr	Tr	Tr
" " " "	Tr	0.11	—	Tr	—	Tr	Tr	Tr
" " " "	Tr	Nil	—	Tr	—	Tr	Tr	Tr
" " " "	0.12	0.45	—	Tr	—	Tr	Tr	Tr
" " " "	Tr	Nil	—	Tr	—	Tr	Tr	Tr
" " " "	0.11	Nil	—	Tr	—	Tr	Tr	Tr
" " " "	0.69	Nil	—	Tr	—	Tr	Tr	Tr
" " " "	0.12	0.20	—	Tr	—	Tr	Tr	Tr
" " " "	0.27	Nil	—	Tr	—	Tr	Tr	Tr
" " " "	0.12	Nil	—	Tr	—	Tr	Tr	Tr
" " " "	0.18	1.55	—	Tr	—	Tr	Tr	Tr
No. 2 Level	Tr	0.33	—	Tr	—	Tr	Tr	Tr
" " " "	0.11	Nil	Nil	Tr	Tr	Tr	Tr	Tr
" " " "	0.19	Tr	Tr	Tr	Tr	Tr	Tr	Tr

No. 4 Lode.	Sn	WO ₃	MOS ₂	Bi
	%	%	%	%
West Drive, No. 3 Level	0.21	0.15	0.03	Nil
" " " "	0.59	0.09	0.06	Nil
" " " "	2.63	1.39	0.03	Nil
" " " "	0.25	0.52	0.03	Nil
" " " "	0.75	0.19	0.02	Nil
" " " "	0.18	6.84	Tr	Tr
East Drive, No. 3 Level	0.76	0.11	Tr	Tr
" " " "	0.50	0.10	0.02	Nil
" " " "	0.81	0.52	0.02	Nil
" " " "	Nil	Nil	0.02	Nil
" " " "	0.11	Nil	0.07	Nil
" " " "	0.21	1.23	Tr	Tr
" " " "	0.24	0.60	0.11	Nil
" " " "	0.06	0.35	0.04	0.1
" " " "	0.11	Nil	—	—

No. 5 Lode.	Sn	WO ₃	MOS ₂	Bi
	%	%	%	%
West Drive, No. 3 Level	Nil	Nil	0.05	0.01
" " " "	Tr	Nil	Tr	Tr
East Drive, No. 3 Level	0.22	Nil	—	—
" " " "	Tr	Nil	Tr	Nil

Other Prospects:

Godwin's Adit.—This is situated in the north-eastern part of Section 10795/M, about 180 feet north-east from the mouth of No. 2 Adit.

An eight-inch quartz vein, showing wolfram and molybdenite, has been cut at the entrance with a strike of 263° and steep dip to the south. This is also visible in a small creek bed 25 feet further west.

The adit extends south-easterly for 78 feet and has cut five mineralised veins carrying wolfram and traces of tin and molybdenite over widths varying from two to seven inches. The first four veins strike a little south of west, while the fifth, towards the end of the opening, is nearly north and south.

In short drives to the east and west, at 48 feet from the portal, one of the veins is exposed over a width of seven inches with a steep dip to the south. It has been stoped nine feet overhead in the east drive, and near the face it junctions with the north-south trending vein. The latter is again exposed at 66 feet in the adit where it has been followed for ten feet southerly and stoped overhead to 15 feet.

With the one exception, the veins disclosed in Godwin's Adit have a general east-west trend in conformity with the principal lodes of the Shepherd and Murphy Mine. They occur north of No. 6 lode and may possibly extend west and parallel thereto. They represent a promising prospect for further development and this can be undertaken from No. 3 Level in the mine. The level of Godwin's Adit is 208 feet above the latter and a cross-cut north from the end of the east drive on No. 6 Lode would expect to penetrate the vein system in a distance of 220 feet, providing the veins extend to that depth.

In the north-west corner of Section 10795/M, at 200 feet north-west of the Main Shaft, the top of a wolfram bearing vein has been cut in a surface drain. The vein is partly exposed over a length of 10 feet and appears to trend in a general east-west direction, with a width of about four inches of quartz. It was not found in No. 3 Adit cross-cut, about 20 feet west of the outcrop and 60 feet below the surface.

Nos. 1 and 3 Lodes were located during the early prospecting of the area and are not now open for inspection. They occur along east-west tension fractures located 150 feet south and 60 feet north of No. 2 Lode, near the eastern worked portion of the latter. Old collapsed trenches along the strike serve to indicate the general position and trend of these veins. The deposits evidently proved to be of only minor importance as there is no record of them being worked in the mine.

Two north-west trending veins are located on Section 53M/51. These are situated on either side and in the vicinity of Bismuth Creek fault. The more northerly vein has not been prospected, but is exposed in the bed of Bismuth Creek. It is here 10 inches wide and outcrops for a distance of 25 feet along the strike bearing 302°.

The other occurrence, 70 feet north of Godwin's Adit, is indicated by a line of underhand stopes 15 feet in depth and bearing 305° over a distance of 40 feet. Further work would be required to establish the value and continuity of this deposit.

On the steep hillside east of Bismuth Creek, opposite the mouth of No. 4 Creek Drive, several quartz veins carrying a little tin and wolfram were cut in a series of trenches during early prospecting operations. The trenches are now largely collapsed and little can be seen at present. The veins are distributed, with general north-westerly trends, on either side of the main fault and are likely to have been largely dislocated by the fault movement. Much more development would be required to prove the value and continuity of these occurrences and it is doubtful whether the expense involved would be warranted.

Production:

Production statistics prior to 1907 are not available, and those for 1919 are incomplete.

Mines Department records show the following total production from 1907 to 1918, inclusive:—

Ore Milled.	Tin.	Wolfram.	Bismuth.	
Tons.	Cons. Tons.	Met. Tons.	Cons. Tons.	Met. Tons.
72,884	689.645	434.472	276.58	65.941

Alluvial Deposits:

Alluvial and detrital tin, wolfram, and bismuth deposits, formed along the course of Bismuth Creek and the small tributaries, have been worked in the past by ground sluicing methods. These deposits were generally narrow and shallow, and are now more or less exhausted.

Under cover of basalt flows, towards the western part of the mine area, the presence of a deep alluvial lead is indicated. In the south-east part of Section 10795/M alluvial tin workings, consisting of a large open cut, discloses remnants of this lead. The section shows 15 feet of weathered and broken basalt underlain by 25 feet of alluvial drift, dipping to the west and overlying quartzite bedrock. Silification has taken place in parts of the upper layers of drift near the contact with the overlying basalt. A layer of wash, about one foot in thickness, and which is reported to carry the tin values, rests on the bedrock.

At different periods, unsuccessful attempts have been made, by means of adits, shafts, and open cuts, to penetrate the lead below the basalt along the eastern edge.

In the underground workings of the Shepherd and Murphy Mine, sub-basaltic alluvial drifts were encountered at different levels in the following places:—

No. 4 Creek Drive—West end of No. 4 Lode. One foot of tin-bearing wash below 4-5 feet of sandy drift.

No. 4 Creek Drive—No. 5 Lode, 90 feet west of cross-cut and 40 feet above. Also at end of drive.

No. 3 Adit—125 feet above west drive on No. 4 Lode.

No. 3 Adit—In rise, 114 feet above east drive on No. 5 Lode. Eight inches of tin-bearing wash.

No. 3 Adit—West end of drive on N.W. Branch Lode.

From the little information available this lead would appear to extend in a general north-westerly direction from the surface exposure in the open cut workings to a position above the underground workings on N.W. Branch Lode. In this locality the basalt cover is probably 100 feet in thickness. Any further extension to the north-west would take the lead below the basalt exposed downstream from the road crossing of Bismuth Creek. The width of the lead has not been established and the thickness of the tin-bearing wash where encountered in the workings, is not more than one foot.

The high costs entailed in attempting to prove substantial quantities of payable material in this lead, coupled with the difficult task of mining below the basalt covering, largely excludes consideration of the working of these alluvial deposits under present economic conditions.

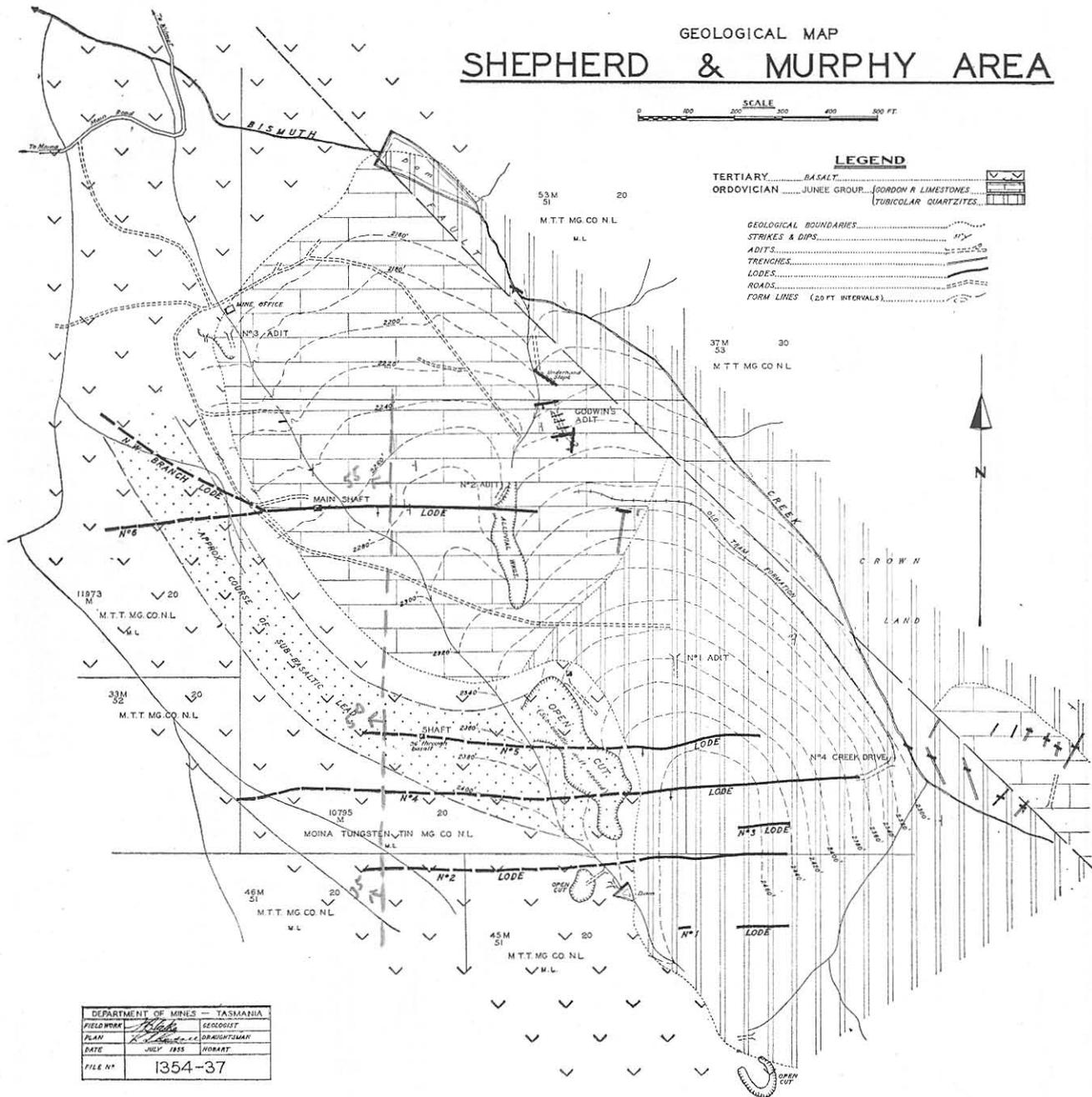
Conclusions and recommendations:

Proved ore reserves of an economic grade above the bottom level in the Shepherd and Murphy Mine are comparatively small and are expected to be depleted in a short period at the present rate of extraction. At this level, the lodes are contracting and the values decreasing laterally in either direction.

Following the recent development and mining of the four lodes and the branch lode at the lower levels of the mine by the present company, it has become apparent that to maintain economic production over an extended period development must be undertaken below No. 3 Level on the lodes already worked in the mine and other promising mineralised veins in the area.

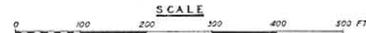
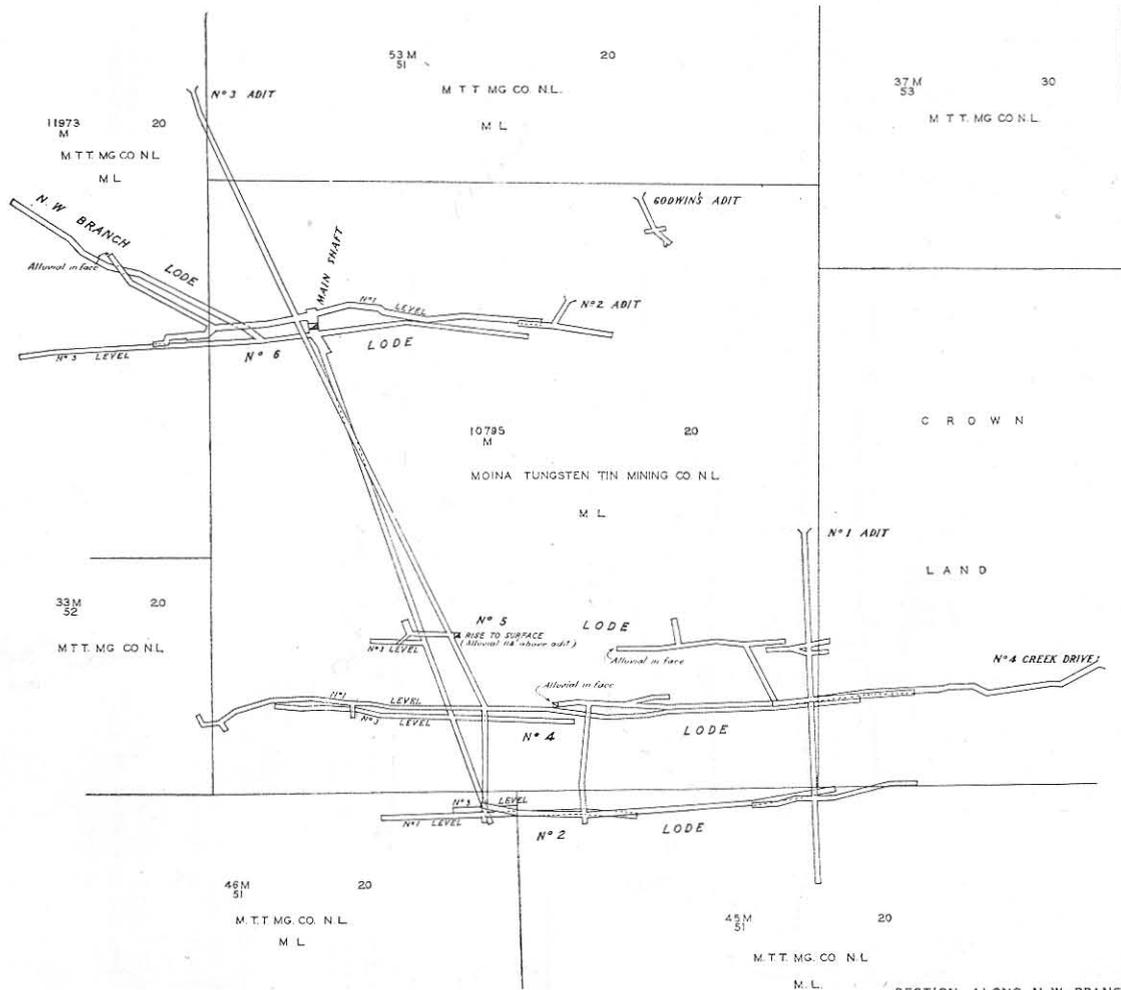
To test the economic value of these deposits at greater depth it is recommended that:—

- (1) Winzes be sunk from No. 3 Level on the lodes already worked in the mine, commencing with No. 6 Lode adjacent to the Main Shaft.
- (2) The mineralised veins exposed near the surface at Godwin's Adit be tested at No. 3 Level in the mine by cross-cutting north from end of east drive on No. 6 Lode.

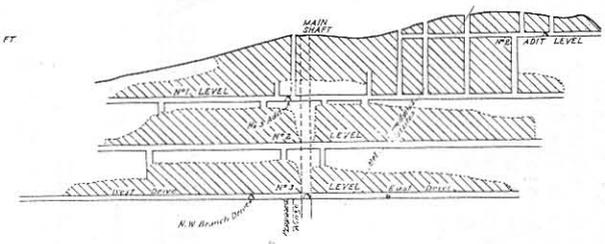


SHEPHERD & MURPHY MINE — MOINA

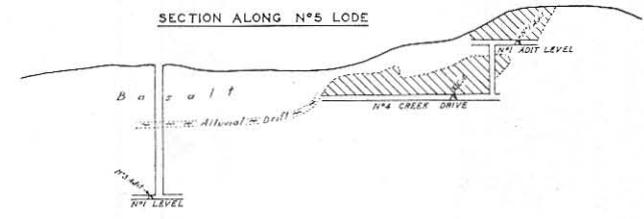
UNDERGROUND PLAN



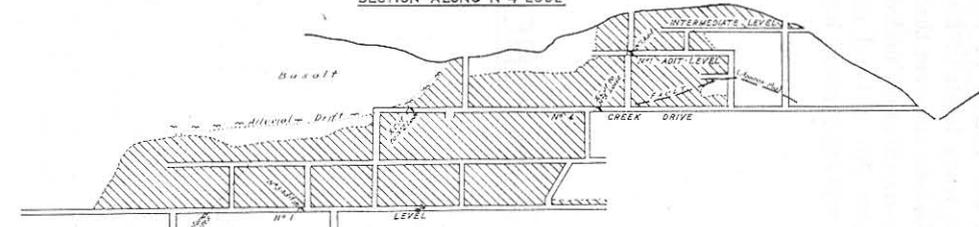
SECTION ALONG N°6 LODE



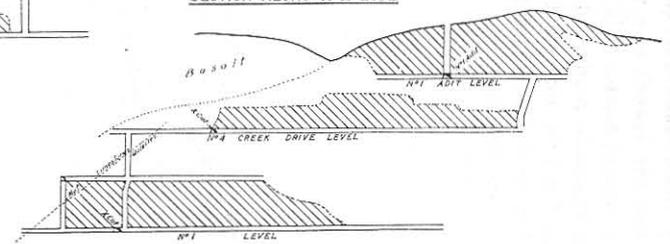
SECTION ALONG N°5 LODE



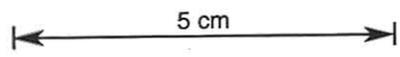
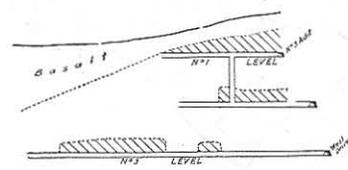
SECTION ALONG N°4 LODE



SECTION ALONG N°2 LODE



SECTION ALONG N.W. BRANCH LODE



DEPARTMENT OF MINES — TASMANIA	
FIELD WORK	GEOLOGIST
PLAN	DRAUGHTSMAN
DATE	HOBART
FILE NO	1353-37

NOTES ON IRON ORE DEPOSITS IN TASMANIA.

COMPILED BY F. BLAKE, A.M.I.M.M. (GEOLOGIST),
30th June, 1955.

1. BLYTHE RIVER HEMATITE DEPOSIT.

(a) Location and Access:

Situated on both banks of Blythe River, about five miles from its mouth, and some seven miles south-south-east from Burnie. Access is by motor road to within a short distance of the deposits.

(b) Literature:

Published Reports.

1894. A. Montgomery: *Deposit of Iron Ore at Blythe River*. (Secretary for Mines Report, 1893-4.)

1901. W. H. Twelvetrees: *Blythe River Iron Ore Deposit*. (Secretary for Mines Report, 1901.)

1919. W. H. Twelvetrees: *Mineral Resources No. 6, The Iron Ore Deposits of Tasmania*.

1919. Boyd, Gibson, and Young. (Commonwealth Parliamentary Papers, House of Representatives, No. 164.)

Typescript Reports (Unpublished).

1937. Nye, P. B.: *Blythe River Iron Deposits*.

1939. W. G. Woolnough (Commonwealth Geological Adviser): *Examination of Iron Ore Deposits in Tasmania*.

(c) The Deposit:

This occurs in one main zone with a length of 65 chains over a width of 30 to 60 feet. It is known to occur from river level to a point 700 feet higher. The ore body consists of a zone of crushed and sheared quartzite, through which are scattered small disconnected lenses, containing hematite with varying proportions of silica.

(d) Development:

The area was leased for nearly 20 years by the Blythe River Iron Mines Limited, but very little mining development was done to test the deposit. Mining works consist of five short adits, two small open cuts, and a small number of trenches.

(e) Quality:

A sampling campaign of the outcropping ore bodies and available underground works was undertaken by Messrs. Boyd, Gibson, and Young for the Commonwealth Government in 1919. In all, 192 samples, together with a number of composite samples, were prepared and assayed. They concluded that it might be possible in places, to mine ore of an average grade of 12% silica, but the gross quantity of this would be comparatively small and the mining and selecting costs prohibitive.

Nye concluded that the "quality or grade of the ore is certainly a doubtful point and it may be said that the proportion of high-grade ore marketable in the deposit is small."

Average results of the better grade ore indicate an iron content of 63 per cent and a silica content of seven per cent. Some of the more siliceous material assayed 44.63% iron and 32.8% silica.

(f) Quantity:

Increased knowledge of these deposits led to a continued decrease in the estimates of quantity, viz.:

Montgomery, 1894	30,000,000 tons
Twelvetrees, 1901	17,291,000 tons
Boyd, Gibson, and Young, 1919	8,834,000 tons
Nye, 1937	7,000,000 tons

Nye considered it "doubtful whether the deposit contains sufficient marketable ore to render it of economic importance". Woolnough concluded that there was "no justification for the belief that a major iron ore deposit exists in this locality".

2. TENTH LEGION MAGNETITE DEPOSITS.

(a) Location and Access:

This ironfield is situated five miles west of Zeehan at the foot of Mt. Agnew. Access is gained by way of the Zeehan-Trial Harbour road for four miles and then by foot track for a further distance of two miles.

(b) Literature:

References to the deposits are made in the following departmental reports:—

Published Reports.

1903. G. A. Waller: *Report on the Iron and Zinc-lead Ore Deposits of the Comstock District*.

1910. W. H. Twelvetrees and L. K. Ward: *The Ore-Bodies of the Zeehan Field*. (Geological Survey Bulletin No. 8.)

1916. L. L. Waterhouse: *The South Heemskirk Tin Field*. (Geological Survey Bulletin No. 21.) Typescript Report (Unpublished).

1940. F. Blake: *Report on Magnetite Deposits in Comstock District*.

(c) The Deposits:

The iron deposits consist principally of magnetite, with minor amounts of hematite and limonite. At least eleven small lenses occur in an area one mile in length by half a mile wide. The largest lens, the Tenth Legion, extends for 1,700 feet with a width of 240 feet.

(d) Development:

The area was held by Australian Iron and Steel Limited for about fifteen years and, during this period, seventeen adits were driven to test the various deposits.

(e) Quality:

A series of 42 samples, representing sections across four lenses, indicates that the ore is generally of high quality and consists essentially of iron (61.4-66.5%), with inconsiderable amounts of impurities in the form of silica (0.46-4.2%), manganese (0.5-1.76%), phosphoric acid (0.03-0.05%), titanic oxide (0.03-0.06%), alumina (0.71-1.91%), lime (trace-0.7%), magnesium oxide (0.73-2.3%), and sulphur (0.02-0.32%).

(f) Quantity:

A total of 2,719,730 tons of high-grade ore has been proved to exist above adit level in seven of the lenses. In addition, considerable quantities of probable ore exist, both in the developed lenses below adit levels, and in the several small undeveloped bodies.

3. RIO TINTO MAGNETITE DEPOSITS.

(a) Location and Access:

This iron-field is situated sixteen miles west of Waratah in the vicinity of the upper reaches of Savage River. Access is obtained by way of the Waratah Highway, for a distance of 21 miles from Waratah towards Corinna. From this point a pack track penetrates the field in a distance of six miles.

(b) Literature:

Published Reports.

1903. W. H. Twelvetrees: *Report on Mineral Fields between Waratah and Long Plains*.

1919. W. H. Twelvetrees and A. M. Reid: *The Iron Ore Deposits of Tasmania*. (Mineral Resources No. 6.)

Typescript Report (Unpublished).

1939. W. G. Woolnough (Commonwealth Geological Adviser): *Report on Examination of Iron Ore Deposits in Tasmania*.

(c) The Deposits:

These consist of five principal, disconnected, lenticular bodies and several associated smaller bodies, extending along a zone over a distance of three miles. The two largest lenses extend for 2,000 feet with widths of 100 feet and 50 feet, respectively. Others are 1,000 feet and 800 feet long and are 40 to 60 feet in thickness.

At the outcrop, along the ridge tops, the ore consists principally of magnetite and subordinately of hematite and limonite. In excavations, at comparatively shallow depths below the surface, a considerable amount of pyrites has been detected in association with the iron oxides. It is considered that the ore bodies have been oxidised at the outcrop to form an enriched magnetite ore near the surface.

(d) Development:

Very little mining development has been undertaken on these ore-bodies apart from surface trenching on the outcrops. Only a few shallow shafts and adits have been excavated and some of these are not available for examination.

(e) Quality:

Analyses of samples taken from surface outcrops only available. These cannot be taken as representative of the ore bodies as a whole or the grade at depth.

In the 17 samples treated, iron ranges from 63.1-69.5%, silica 0.38-1.73%, alumina 0.02-0.38%, phosphoric acid nil-0.38%, sulphur, 0.01-3.66%, and manganese dioxide 2.37% (one sample).

(f) Quantity:

In 1919 Reid estimated that the deposits, to a vertical depth of 300 feet, contained 20,000,000 tons of probable high-grade ore.

This estimate must be treated with reserve as more recent knowledge indicates that pyrites is prevalent at no great depth below the outcrops.

4. MEREDITH RANGE DEPOSITS.

(a) Location and Access:

Situated at the western base of Meredith Range and Mt. Livingstone. Access is gained by way of Waratah Highway to a point 32 miles from Waratah, towards Corinna. From this locality the Rocky River track trends south-westerly to the area.

(b) Literature:

The following unpublished report is the only one on the area:—

1924. A. M. Reid: *Preliminary Report on the Occurrence of Iron Ore at Meredith, Paradise, Rocky and Whyte Rivers.*

(c) The Deposits:

Iron deposits in the form of numerous lenses (possibly nine) occur along a north-south belt of country, six miles long and half a mile wide, crossing the Meredith, Paradise, Rocky, and Whyte Rivers. Actual dimensions of the lenses have not been determined. Iron minerals composing the deposits are magnetite, hematite, and pyrite. Of these minerals magnetite only is of any economic value as an ore of iron. It occurs in direct association with the other minerals as a rule in distinct lenses and not appreciably contaminated by pyrite or other minerals of an injurious character.

(d) Development:

No surface or underground works have been undertaken on the deposits, except in places where pyritic bodies are known to occur.

(e) Quality:

No determination of the general grade of the ore can be attempted.

The following summary of analyses of samples at several places along the outcrops indicates the grade of ore at surface:—

Ferrous oxide, 7.2-22.57%.
 Ferric oxide, 53.85-87.52%.
 Silica, 1.0-29.36%.
 Alumina, 1.78-6.04%.
 Iron sulphide, 0.02-3.33%.

(f) Quantity:

Estimates of quantity have not been attempted for the deposits as a whole, but the following figures convey an idea of the amount of ore available:—

Name of Ore-body.	Actual Reserve.	Potential Reserve.	Possible Reserve.
	(tons)	(tons)	
Meredith River	} 428,570	1,285,710	Very considerable
Duffer Creek			
Finlay Creek			
Tandy Creek	—	—	Considerable
South Branch	—	92,000	Considerable
Paradise River	—	—	Very considerable
Camp Prospect	—	—	Very considerable
Cataract Creek	—	—	Considerable
Rocky River	} 471,430	522,000	Considerable
Nolan Creek			
Rocky River Association .....				—	149,000	—
	900,000	2,048,710	

5. HAMPSHIRE MAGNETITE DEPOSITS.

(a) Location and Access:

These deposits lie 4½ miles south-east of Hampshire Siding on Emu Bay Railway, which is about 16 miles south of Burnie. From the siding two miles of constructed road is followed by four miles of bush track to the vicinity of the deposits.

(b) The Deposits:

Within an area of 90 acres, eleven or more narrow lenses of magnetite with subordinate limonite and hematite occur. As the thickness and extent of individual lenses have not been determined, estimates of quantity have not been possible. Underground exploration has not been undertaken and only a few surface cuts are available for inspection.

Analyses of surface material show the following ranges:—

Fe₂O₃, 70.38-95.5%.
 FeO, 1.05-22.63%.
 MnO, 0.5-1.58%.
 MgO, 0.07-0.57%.
 SiO₂, 1.0-2.2%.
 Al₂O₃, 1.22-4.6%.

6. NELSON RIVER IRON DEPOSIT.

(a) Location and Access:

Nelson River is situated on the West Coast, fifteen miles south of Marrawah. Access is by jeep track in a distance of 19 miles.

(b) The Deposit:

This consists of a tabular body of magnetite and hematite extending for 2,000 feet with an average width of 20 feet. With the exception of some superficial trenching at surface, the only mine opening is a short adit driven 40 feet below the outcrop, which penetrated the iron body for a distance of four feet. Quartz veins traverse the lode at frequent intervals.

The following figures indicate the range in ore grade at surface:—

Fe, 48.9-65.7%.
 SiO₂, 1.44-24.0%.
 Mn, 0.03-0.12%.
 P₂O₅, 0.01-0.08%.
 S, 0.01-0.03%.

SUMMARY.

Information on six potential iron ore fields have been compiled. Of these the Tenth Legion deposit near Zeehan is the only one for which a moderate reserve of marketable iron ore has been proved to exist by recognised standards. For the remaining five deposits some large quantities of iron ore have been quoted with certain reservations. As these deposits have not been penetrated below the surface to any appreciable extent by prospecting methods the quantities of iron ore indicated should be treated with reserve until such time as the general grade and continuity of the ore bodies are satisfactorily tested.

BORING ON SCOTIA—LOCHABER TIN LEADS GREAT NORTHERN PLAIN, GLADSTONE DISTRICT.

COMPILED BY F. BLAKE, A.M.I.M.M. (GEOLOGIST),
 10th August, 1955.

General Statement:

During the years 1935 to 1944, an extensive prospecting campaign was carried out by the Department of Mines on tin-bearing deep leads at the Great Northern Plain near Gladstone.

Using two power boring plants, 855 holes were sunk to an average depth of 91 feet and aggregated 78,153 feet of boring in a linear distance of three miles.

The leads had been indicated previously by scout boring at several periods in the past and also in the workings of the Scotia and Lochaber alluvial mines.

Situation and Access:

Gladstone is a small tin-mining centre in North-Eastern Tasmania. It is situated in Ringarooma River Valley, about 10 miles upstream from the mouth. The township is reached within 14 miles by road from the North-Eastern railway terminus at Herrick.

The Great Northern Plain commences on the northern side of Ringarooma River from Gladstone, and extends north-westerly towards Ringarooma Bay. Access to the area from the township is gained by way of Cape Portland road for 1½ miles and then westerly along an un-made road which crosses the plain.

Topography:

The area is drained by Ringarooma River, following a winding course, in a general north-western direction from Gladstone to Ringarooma Bay in Bass Strait. Great Northern Plain, skirting the river above the right bank, is an open undulating tract of country moderately dissected by several short streams. The Ringarooma River at Gladstone is 134 feet above sea level and the area bored rises to a height of 290 feet in the southern part and again falls to 140 feet towards the north-west.

In the latter locality indeterminate drainage is prevalent where swampy conditions occur in the vicinity of Stinking Creek.

A branch of the Mt. Cameron Water Race (Govt.) passes from east to west through the southern part of the area.

Geology:

Silurian—The bedrocks in the locality consist of a thickly-bedded series of slates and quartzites referred to the Mathinna Group of Silurian Age. Along the Great Northern Plain these rocks are covered by Tertiary alluvial deposits, but they outcrop in adjacent areas along Cape Portland road to the east, Ringarooma River in the south and on the hills north of Stinking Creek.

Tertiary—The alluvial deposits underlying Great Northern Plain were formed in Lower Tertiary times after the establishment of an early drainage system. Stream gravels, containing tin ore, were deposited in narrow valleys along the ancient watercourses. A period of land subsidence followed and these gravels were buried beneath a considerable thickness of other sediments deposited by the streams and a system of deep leads formed. Towards the end of the period of depression the land surface was very little above sea level and this subsidence caused an invasion by the sea, to form a large estuary. The later stream sediments, together with the contained tin, were largely redistributed by the estuary waters and inter-mixed with sea sand in the final stage.

Tracing the Leads:

Plans—Plans and sections have been drawn to illustrate the following features:—

- (1) Overall plan of the area bored—Scale 5 chains to 1 inch.
 - (a) Surface contours at 10-foot vertical intervals;
 - (b) Position of numbered bores shown as coloured circles;
 - (c) Various colours indicate average tin content of individual bores in oz. per cubic yard of 70% concentrate, viz.: Red, over 8 oz.; Green, 4-8 oz.; Yellow, 2-4 oz.; Blue, under 2 oz.; Brown, trace;
 - (d) Position of lead gutters, traced with red lines.
- (2) Ten detail sheets—Scale 1 chain to 1 inch.
 - (a) Surface and sub-surface contours at 10 feet vertical intervals;
 - (b) General values of bores indicated by coloured circles, similar to the overall plan;
 - (c) Bore numbers, surface levels, depth to bedrock and average tin content shown for each hole;
 - (d) Outline of selected areas along lead gutters over which the tin content of the ground was computed.
- (3) Six section sheets.
 - (a) Sections through a large number of bores indicate in different colours the various types of sediment passed through from surface to bedrock;

(b) Average tin values for entire bores are given;

(c) The positions within the holes and the values of the greater tin concentrations are indicated.

Scotia Lead—This lead has been traced northerly in a system of close boring, from the vicinity of the old Scotia workings, over a length of 54 chains. For half a mile further to the north-west, limited scout boring has not been sufficient to define the old channel, but it has again been traced for a length of 15 chains before it junctions with Lochaber Lead to the south of abandoned Mineral Section 9706/M.

Lochaber Lead—The general line of this lead is indicated by irregularly spaced lines of boring commencing 25 chains north-west of the old Lochaber Mine. From here the lead courses westerly for 49 chains to join the Scotia Lead.

Scoloch Lead—This is the northerly continuation of the combined Scotia and Lochaber leads and is traced by the boring, and shown by sub-surface contours on the detail plans, over a length of 105 chains.

For a further distance of 95 chains to the north-west irregularly spaced lines of bores, carrying some tin values, suggest the probable continuation of the lead in that direction.

Economic Value of the Leads:

The tin content of possible economic value is confined to narrow gutters ranging in width from 1½ chains to 4 chains. The richer concentrations are contained in basal beds, from 10 to 30 feet in thickness, overlying the slate and sandstone bedrock. Only a little tin occurs in the upper 50-80 feet of the deposit.

The basal beds consist of gravels and coarse grits, while the superincumbent material, extending to surface, is largely composed of siliceous sands and grits, inter-mixed with lesser quantities of clay.

The average depth of sediments along the gutters is 110 feet and, with the exception of a thin cemented zone occurring near the surface in a few places, the deposit as a whole is unconsolidated.

Over the total area tested, a length of four miles of lead has been indicated by the boring. At several localities, where close boring has been undertaken, it has been possible to tabulate data in relation to six blocks of ground covering portions of the narrow gutters, along an aggregate length of 1½ miles.

In calculating the volume and value of the ground the blocks were considered as having vertical sides and no allowance was made for any batter which would be required in mining the deposit.

The outline of the blocks and particulars of individual bore holes are shown on the detail plans, but the following table represents the overall results of these areas.

Block No.	No. of Holes.	Total Depths.		Area.	Average Depth.	Volume.	Tin Oxide.		Width.	
		Feet.	Sq. Yards.				Feet.	Cub. Yards.	Oz Per Cub. Yard.	70% Concentrate Tons.	Min. Chains.	Max. Chains.
1	25	2,199	10,745	88.00	315,000	7.04	61.87	1.5	4	
2	46	4,723	16,940	102.67	579,687	7.30	118.07	1.5	3.5	
3	25	3,017	34,364	120.68	1,384,525	9.00	347.68	1.5	3	
4	10	1,052	7,260	105.20	258,964	10.48	75.72	1.75	2	
5	57	6,744	31,944	118.31	1,259,871	6.68	234.82	1.5	3	
6	22	2,574	15,004	117.01	585,156	6.95	113.47	1.5	2	
Total Results, 1-6, inclusive	185	20,309	116,257	109.78	4,383,203	7.78	951.63			

CONCLUSION.

Resulting from this boring campaign tin-bearing deep leads have been traced over the major part of four miles in length. The richer tin concentrations are confined to narrow gutters ranging from 1½ to 4 chains

wide and occur in the bottom 30 feet of sediments, which average 110 feet in thickness.

Of the total length of partly tested leads, about one-third has proved to contain 4,383,203 cubic yards of alluvial material averaging 7.78 oz. of tin oxide per cubic yard, equivalent to 951.63 tons of 70% tin oxide concentrate.

NOTES ON A. CHWALCZYK'S URANIUM
PROSPECT—STOREYS CREEK.

REPORT BY T. D. HUGHES, B.Sc. (SENIOR GEOLOGIST),
26th July, 1955.

This prospect is situated on the banks of Storeys Creek, about one and a half miles south-south-west of the bridge on the Rossarden road. Access is best gained by following an old water race which starts from Storeys Creek a few chains below the bridge and closely parallels the Creek as far as the prospect.

The country, although very broken and falling steeply on both sides of the creek is practically free of undergrowth and easily traversed.

The country rock is granite. Well to the north of the prospect, the intruded meta sediments, slates, and quartzites of the Mathinna Group, outcrop, while on the tops of hills, in this general locality, remnants of Permian (post-mineral) sediments remain.

In hand specimen the granites near the prospect are coarse-grained pinkish rocks showing abundant pink orthoclase crystals and both light and dark quartz. However, in this general coarse-grained rock are areas of very fine-grained material containing, apparently, the same minerals. In the prospect itself the rock is of similar appearance but appears to have undergone some sort of alteration due to shearing. Shear planes are well developed in a general horizontal direction and in some of these may be seen incrustations of torbernite and a yellowish powdery substance that may be carnotite.

A thin section of the rock (48U5) has been examined by G. Everard, who reports:—

“Medium to coarse-grained weathered rock with large grains of black and colourless quartz. There are also large altered crystals of feldspar. The rock shows a coarse foliation.

In thin section the feldspars are seen to have undergone extensive alteration and the quartz grains are cracked, corroded and embayed.

Perthite is the most prominent mineral. Crystals are about 1 centimetre long and show simple twinning as well as the perthitic structure. The potash feldspar is the more altered, being nearly opaque. Small groups of rounded and irregular quartz grains, with simultaneous extinction, occur enclosed in the feldspar. These appear to be due to subsequent alteration.

Albite is common in smaller oblong crystals showing lamellar and some pericline twinning. It is partly sericitised.

Biotite and biotite-muscovite intergrowths are present, but not in great amount. Some pleochroic haloes may be seen in the biotite.

Many minute inclusions, among which are zircon and monazite, occur in the quartz.

The rock is a granite which has undergone alteration and, possibly, contact metamorphism.”

A small hole has been put in on this altered zone, but so far its dimensions are quite small—a few feet either way—and the extent of the zone cannot yet be determined.

Several samples have been taken of this material. A sample sent to the Bureau of Mineral Resources showed on radiometric assay an equivalent U₃O₈ percentage of 0.17 with a ratio between U_b and U_g of 0.81. Absorption tests indicate that activity is not entirely due to uranium and that some thorium may be present. Further details of fluorimetric assay, &c., are now awaited from the Bureau.

During a recent visit of Mr. L. Noakes, of the Bureau, further samples were taken and field assays by him showed:—

	Uranium Beta.	Uranium Gamma.	Ratio.
1. Large sample	0.129	0.16	0.81
2. Selected piece	0.16	0.20	0.84

Further tests will be made on these samples by officers of the Bureau.

Now it may be that the further opening-up of the material in this fractured and sheared zone will reveal radio-active minerals in appreciable amount but I think that at this stage a note of warning should be given, and another possibility considered. That is, that the formation of torbernite and possibly other uranium minerals on the fracture planes is due to precipitation from ground waters and that the radio-active material disseminated in minute quantities throughout the granite mass has been first dissolved by ground waters and later precipitated in more concentrated form in the channel ways of the shear

zone. If this has been so then the uranium content of the material will diminish rather than increase away from the surface.

It is difficult to recommend any extensive development at this stage and even a boring campaign seems rather premature. It may be that further tests of the material by the Bureau will add to our knowledge of the problem. At this stage, however, all that would be recommended is the extension of the small pit on the creek bank. Unfortunately, it is so close to the creek that water may be a problem and some sort of pump may have to be installed.

A. E. HUGHES' URANIUM PROSPECT—
STOREYS CREEK.

REPORT BY T. D. HUGHES, B.Sc. (SENIOR GEOLOGIST),
11th July, 1955.

This prospect is situated two miles south of Rossarden, on the Banks of Storey's Creek. It is best reached by travelling by car from Avoca to the outskirts of Rossarden and then following an old water race along the eastern bank of Storeys Creek until it leaves the creek and runs over a small saddle. A diagonal path is then made across country to the creek. The countryside in this area is easily traversed and practically bare of undergrowth.

The only rock outcropping in the area is granite. In Hughes' lease it is well exposed along the creek banks. The granite is mainly coarse grained with prominent orthoclase feldspar crystals giving the rock a reddish appearance. Plagioclase feldspar is subordinate and in places is altering to green pinitite. Biotite is very sparse and sometimes the quartz has a dark appearance. In places however is a fine-grained variety of granite with occasional xenoliths. In the creek bed the granite contains a series of narrow quartz veins striking at 25°.

The prospect is situated within fifty feet of and on the western bank of Storeys Creek. Here the creek, which falls very rapidly between Rossarden and Avoca, is 700 feet above the latter town and 1350 feet above sea-level. Early prospectors had put a small cut into the hillside and pieces of rock on the dump show plentiful galena and sphalerite. A thin section of the rock has been cut by G. Everard who describes it as follows:—

“Coarse grained greenish gray rock, exhibiting light and dark coloured, subhedral quartz in a siliceous ground-mass. Appreciable amounts of galena and sphalerite can be seen.

The quartz occurs as irregular grains somewhat corroded and embayed, and in larger masses with wavy extinction, and micaceous inclusions lineally arranged. These larger masses appear to be altered feldspar in which a micropertthitic structure is preserved. In the granular quartz hexagonal outlines of original crystals are preserved in lines of vesicles. There may be many parallel lines of vesicles. Minute hexagonal crystals are common in these grains, and the extinction of the grains is wavy on a very minute scale.

All the quartz contains minute esicles in lines and patches. The vesicles are liquid filled, with mobile bubbles.

Mica is pale greenish brown and is pleochroic in the larger plates; but most of it is in small masses of plates and in radiating structures. Reaction rims and aureoles of mica about quartz are common.

Galena and sphalerite may enclose small hexagons of clear quartz.

There are a few veins of quartz.

Zircon crystals are present, but rare.

The whole rock is disseminated with inclusions too minute for identification.

The rock is a greisen showing alteration silicification and recrystallation.”

Not very much of the greisen can be seen in outcrop. Three samples were taken: at the pit (I); twelve feet south-east, (II); and 30 feet south-east (III), of the pit. Jointing is well developed at this particular locality and a main direction is 340° with a dip to the west at 80°. Greisenisation has apparently taken place along these joint planes. The lateral extent of this cannot be established without uncovering the bed rock but a certain limitation can already be seen by the normal granite outcropping 50 feet to the east in Storeys Creek and 20 feet to the west up the hill. A few hundred feet to the south along the line of strike in a big cliff face there is no sign of greisenisation.

The average count of the granites in this locality is 250 to 300 c.p.m. as registered on a PRM 200 Counter. At locality (i) the count was 800, at (ii) 1100, and at (iii) 800 c.p.m. A chip sample from area (ii) was forwarded to the South Australian Department of Mines for radiometric assay and identification of the uranium mineral. The result showed only 0.03% U_3O_8 and a report stated:—

“This sample was found to be a sericitized quartz-felspathic granular rock containing sphalerite and galena in considerable amounts.

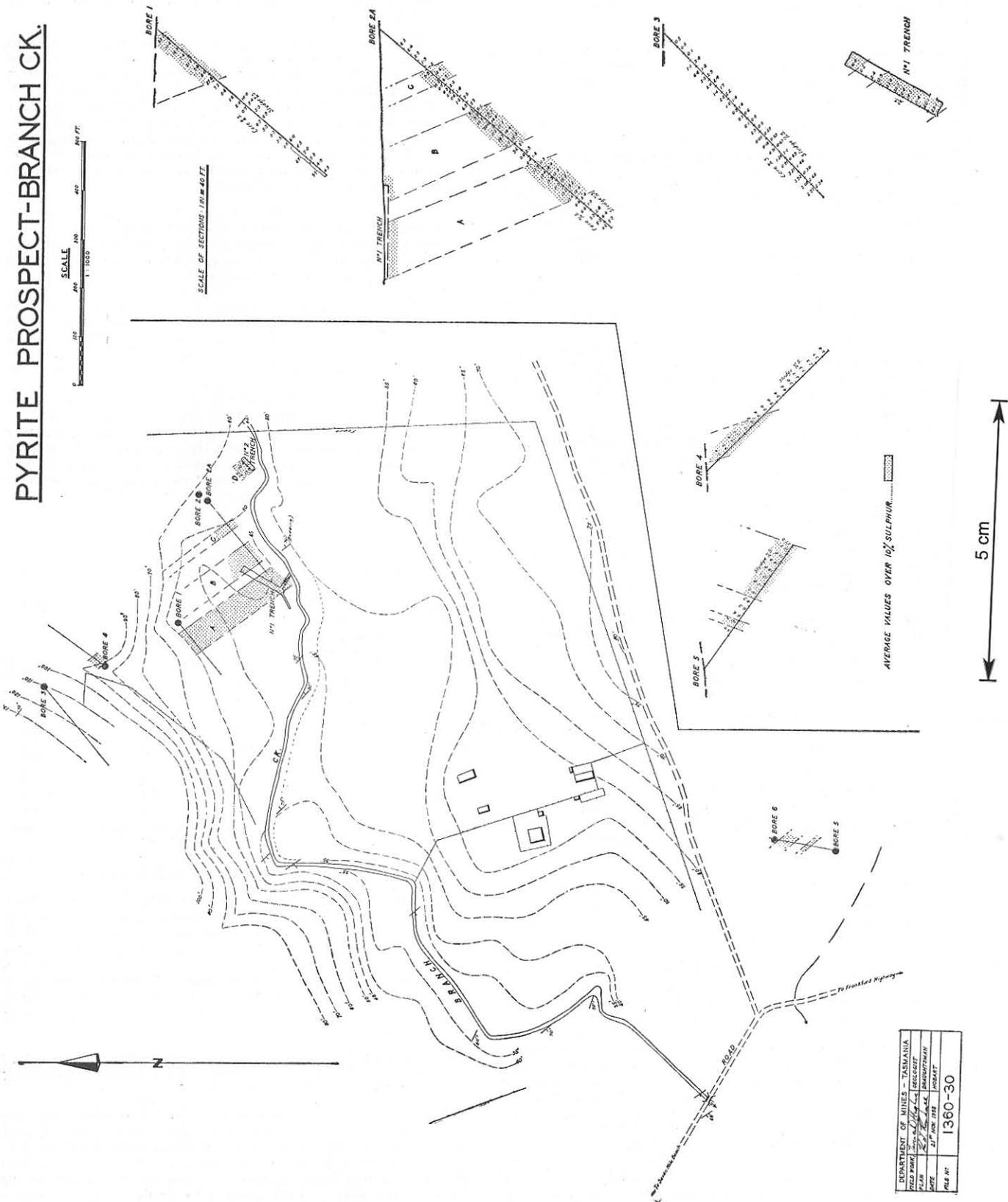
Sphalerite contains oriented exsolution lamellae of chalcopyrite.

Sections of the rock were autoradiographed but no evidence of radioactivity was recorded in the specimens

examined. The rock was shown to have weak radioactivity by radiometric assay, but the traces of mineral causing this are not readily isolated.”

This result is very disappointing, and on the result of the sample sent, does not seem to encourage any further work on this prospect. On the other hand, the area is mineralised and, in Tasmania, the localities showing greisenisation of the granite, have proved the most favourable for uranium mineralisation.

If any further work is to be done, it should be of limited extent and aimed at exposing by means of one trench a section of bedrock across the greisenisation (that is on the bearing of 70°) in the vicinity of sample (ii).



PYRITE PROSPECT BRANCH CREEK
(THIRD REPORT).

REPORT BY T. D. HUGHES, B.Sc. (SENIOR GEOLOGIST),
21st November, 1955.

Since the first inspection of the pyrite prospect at Branch Creek in October, 1953, several visits have been made to the locality and two previous reports furnished (26.11.53 and 9.3.54). The first report recommended that some costeening should be carried out and sites were selected for this. As the result of samples taken from the two trenches, further recommendations were made. Firstly, that a bulk sample should be broken from the trench and certain gravity and flotation tests carried out to estimate possible recovery; and secondly, that a planned diamond drilling campaign be commenced. Drilling began at this site on 7.12.54 and by 26.9.55 five holes had been completed and certain valuable data collected.

Before discussing the results of this drilling it would be wise to quote from two previous reports. The 1953 report is a general description of the deposits and is quoted almost in full:—

“These outcrops occur within a few chains of the Seven Mile Beach-road at a point three miles from the Frankford Highway. This road leaves the highway at the 16-mile peg from Devonport so that the distance from the deposits to the Devonport Wharf would be about 20 miles. A small arm of tidal water runs eastward from the East Arm of Port Sorell almost to the road at this point and it may be possible to construct a wharf for vessels of shallow draft within half a mile of the deposit.

The pyrite occurs in a series of well bedded slates and allied rocks, which outcrop over a width of 1,600 feet across the strike, mainly in the creek bed. These rocks, which in places are intensely sheared, belong to the Carbine Group, that is they occupy a position somewhere between the top of the Pre-Cambrian and the base of the Cambrian; and they form part of the western leg of a large anticline in which there is a great thickness of Pre-Cambrian schists underlying this Carbine Group. At the immediate base of the slates, however, are some fairly narrow beds of the grey-blue, very siliceous quartzites which may be seen outcropping to the east of the slates. These latter rocks then have a strike to the west of north averaging about 310° in this locality, although the general strike of the country is more nearly 330°. As they form the western limb of an anticline they usually dip to the west but minor folding is apparent and in one place along the creek the dip is easterly. The degree of metamorphism varies from place to place according to the composition of the beds and although narrow bands of, on the one hand schistose rock and, on the other of shaley rock, do occur, the general description of the rock is a black slate, containing much carbonaceous matter.

The first thing to make clear is that the pyrite is not the result of mineralization but is an original constituent of the rock. These black slates have been laid down in deep still water under extremely unaerobic conditions and the association of pyrite with this type of rock is very common. Indeed, the black colour in this type of sediment is often partly due to the presence of very fine grained iron sulphides though in the main, of course, it is caused by carbonaceous matter.

As the pyrite occurs as a bedded deposit, there should not be any doubts of the quantities of the parent rock available. On the other hand, because of its original nature, the percentage of pyrite in the individual beds will vary very much from place to place and careful sampling will be necessary to determine whether any part of the deposit is of economic value. Four samples were taken during the present examination, rather at random, but where the eye showed the most pyrite occurring. However, it is rather dangerous to go by the look of the sample as some of the pyrite is in such a finely divided condition as to be invisible. The results of this sampling showed that, although the percentage of sulphur in the various samples differed enormously from place to place, there was sufficient sulphur present to warrant further intensive sampling.

The hill behind the creek rises fairly steeply and after a certain amount of clearing of soil, &c., the slate could probably be mined by open-cut methods.

It is, therefore, recommended that the company concerned investigate these slates more carefully. Trenches should be cut to the north side of the creek until solid rock is encountered. The recommended position of these trenches is shown on the attached plan. They should be at right angles to the strike of the beds and approximately parallel to the creek bed and in length of the order of 150 feet.

When these trenches are cut, channel samples of the beds can be taken.”

The 1954 report is a description of, and the result of sampling the rocks exposed in the trenches. Relevant details may be quoted as follows:—

“The company have now cut one trench of 100 by 15 feet and commenced a second one. These trenches are on the north side of the creek and have been cut approximately at right angles to the strike of the rocks.

The first trench is 25 feet from the creek and is cut for 101 feet on a bearing of 28°, the average strike of the rocks being 315°. At the north-eastern end of the trench the over-burden of soil and creek alluvium is six feet, of which the bottom two feet consists of a heavy wash cemented by iron oxide into a solid material that required shooting. Twenty feet of the trench, at the south-western end, do not contain this cemented wash and the over-burden is four feet of normal alluvium.

The second trench is closer to the creek and the operators have difficulty in keeping out water. At the northern end, is eight feet of over-burden, mainly detrital material; but cemented wash occurs overlying the slates at the southern end.

The rock types exposed in the trenches consist mainly of slates, but narrow beds of quartzites up to two inches in thickness occur here and there. Black slate is the commonest variety but grey slates do occur interbedded with the black. In general, the black has greater percentages of pyrite than the grey. Both varieties are very soft, almost clay-like in places, where exposed in the trench near the surface, although harder beds do occur. Small irregular seams and bunches of both calcite and quartz traverse the slates but rather infrequently. At 24 and 63 feet in the first trench are bands of a foot in thickness carrying much fine white clayey material.

Sample No.	From ft.	To ft.	Length ft.	% S
1	0	9	9	23.1
2	9	18	9	20.1
3	18	27	7	11.4
	(excluding 24-26 ft.)			
4	27	37	10	14.5
5	37	40	3	0.8
6	40	50	10	20.7
7	50	58	8	22.8
8	61	67	6	13.9
9	67	76	9	2.4
10	76	89	13	0.2
11	89	101	12	10.8
12*	0	14	14	10.4
13*	14	28	14†	19.9

* Trench 2. † Intermittent Sample.

An explanation of this table is as follows:—

Column 2 shows the horizontal length of the sample and, as the beds are very steeply dipping, it is not much greater than the actual width of the beds sampled. Samples 1 to 11 are from trench 1 and samples 12 and 13 from trench 2; measurements are from the southern end of trench 1 and the northern end of trench 2. Sample 13 is not a true channel sample as the slates were only exposed intermittently here.”

The report then went on to recommend the breaking of a bulk sample from the trench for Laboratory Sampling and after this a drilling campaign.

The results of the laboratory investigations are the subject of a separate report by the Chief Chemist and Metallurgist. The results of drilling may now be discussed. Four holes were put down in the vicinity of the trenches to test beds exposed in these at depth and along their strike and a fifth bore was drilled some distance from these beds. Samples were taken at approximately

nine feet lengths. Unfortunately, the slates are very soft and do not core well. Those beds rich in pyrite (and low in silica) particularly did not yield much core. For this reason sludge samples, as well as core samples, were sometimes assayed.

Details—

No. 1 Bore			Direction 230°	Inclination 50°
Footage	%Sulphur (in core)	%Sulphur (in sludge)		
0-7	(Surface Wash)			
7-16	22.1			
16-25	11.4			
25-34	12.9			
34-43	7.4	14.6		
43-52	21.7			
52-61	9.8			
61-70	8.0			
70-79	23.8			
79-88	7.2			
88-97	0.8			
97-106	1.2			
106-115	2.0	10.0		
115-124	0.7	5.4		
124-133		5.3		
133-142	4.7	6.9		
142-151	5.3			
151-160	5.7			
160-169	3.3			
169-178	1.5	6.0		
178-187		4.5		
187-196		5.0		
196-205		5.3		
205-214		4.9		
214-224		4.3		
178-202	2.7			
202-204	3.7			

No. 2A Bore			Direction 230°	Inclination 50°
Footage	%Sulphur (in core)	%Sulphur (in sludge)		
0-22	Surface			
22-31		4.3		
31-40		2.4		
40-49		2.3		
49-58		1.9		
58-67		7.5		
61-69	9.9			
67-76		10.6		
76-81	15.3			
76-85		6.5		
81-85	0.7			
85-94		2.5		
85-92	0.3			
92-96	0.7			
94-103		1.8		
96-101	0.5			
101-109	1.2			
103-112		3.5		
109-119	6.5			
112-121		5.7		
119-124	6.3			
121-130		8.6		
124-133	9.9			
130-139		16.0		
133-136	16.6			
136-138	20.0	15.3		
139-148		14.0		
148-157	11.2	17.5		
157-166	28.5	18.4		
166-175	11.7	15.3		
175-184	3.2	3.1		
184-193	0.8	2.3		
193-202	0.4	1.6		
202-211	12.9	11.3		
211-220	17.4	16.4		
220-229	19.3	12.9	15	
229-238	11.9	10.2		
238-247	13.2	13.2		
247-256	15.6	12.4		
256-265	0.6	2.4		
265-274	0.8	1.9		
274-283	3.9	2.8		
283-292	5.3	4.4		
292-301	4.2	5.7		

No. 3 Bore			Direction 230°	Inclination 45°
Footage	%Sulphur (in core)	%Sulphur (in sludge)		
0-11	Surface Wash			
11-20		0.5		
20-29		0.5		
29-38		0.1		
38-47	1.1	3.8		
47-56	6.8	1.2		
56-65	3.5	2.9		
65-74	2.0	2.4		
74-83	1.4	1.7		
83-92	2.5	2.2		
92-101	1.0	1.4		
101-110	0.9	1.4		
110-119	0.1	0.6		
119-128	0.1	0.5		
128-137	2.3	0.5		
137-146	0.07	0.27		
146-155	0.18	0.39		
155-164	0.31	0.67		
164-173	1.24	1.1		
173-182	0.91	0.89		
182-191	2.21	1.48		
191-200	3.99	0.30		
200-209	3.05	2.62		
209-218	2.97	2.34		
218-227	2.17			

No. 4 Bore			Direction 35°	Inclination 45°
Footage	%Sulphur (in core)	%Sulphur (in sludge)		
0-17	Surface Soil and Clay			
17-26	11.4			
26-35	9.5			
35-44	14.4	12.5		
44-53	10.7			
53-62	13.7			
62-71	15.2			
71-80	9.4			
80-89	5.0			
89-98	5.0			
98-107	3.4			
107-116	4.2			
116-125	3.0			
125-134	2.7			
134-143	3.3			
143-152	2.3			
152-161	3.5			
161-170	2.6			

No. 5 Bore			Direction 10°	Inclination 35°
Footage	%Sulphur (in core)	%Sulphur (in sludge)		
0-26	Surface Soil and Clay			
26-40	Decomposed Slate			
40-49	5.7			
49-58	10.9			
58-67	6.6			
67-76	6.3			
76-85	4.7			
85-94	10.5			
94-103	12.8			
103-112	13.1			
112-121	18.8	15		
121-130	14.8			
130-139	15.0			
139-148	15.7			
148-150	27.5			

In the surface trench, contiguous slate beds with a width of 60 feet showed 17.5 per cent of Sulphur; above these 20 feet of slates were low in sulphur and above again 12 feet showed 10 per cent Sulphur. The trench ended here, still in Sulphur values. No. 2 trench showed about 15 per cent of Sulphur over 28 feet but the samples taken in this trench were not in a continuous channel.

No. 2A Bore has proved that these values continue at depth. A glance at the attached plan and sections will show the relationship. The beds marked "A" exposed in the trench with a value of 17.5 per cent were cut in the bore from 202 to 256 feet and here averaged 15 per cent. The beds (B) in the north-eastern part of the trench were cut in the bore from 124 to 175 feet and averaged 15.3 per cent Sulphur. Another lot of beds (C) from 61 to 81 feet in the bore averaged over 10 per cent Sulphur. The beds (D) in No. 2 trench were apparently not

intersected in the bore. Thus in this area with the aid of one bore and two trenches, four distinct beds of slate, averaging over 10 per cent Sulphur, have been revealed. The widths of these beds are of the order of 50 feet, 50 feet, 20 feet, and 25 feet. Between the first two beds are 20 feet of low grade slates. The dip of the beds is 70° to the north-east.

No. 1 Bore has been placed to intersect the "A" beds, which were cut from 7 to 79 feet and averaged about 15 per cent with a width of 60 feet. This bore is too far to the south-west to intersect any of the other beds. No. 4 Bore on the other hand has missed "A" and intersected either "B" or "C". From 17 (surface) to 71 feet the sulphur content averaged 12.5 per cent, but samples were taken of sludge only and actual values may be higher. As this bore was sunk in the same direction as the dip of beds, the width of these latter proved is only 70 feet and the values occur only across 25 feet.

Bore No. 3 did not intersect any beds containing more than 6.8 per cent Sulphur although it crossed a width of beds of 200 feet.

In the first report the opinion was expressed that the mineralization of the black slates was syngenetic, that is, that the pyrite was original, and that therefore no great variation in sulphur content would be expected in individual beds (except of course where a facies change occurs). No evidence obtained since then has caused this opinion to change. It can be seen from the plan, however, that number 3 bore is so sited that if the normal strike of the beds were continued, at least one formation carrying over 10 per cent Sulphur should have been encountered. It has been suggested that the strike has swung rapidly to the east. This may be so, as, during major folding, the incompetent weak slate beds would tend to be folded and distorted in all directions about the solid quartzite beds just to the east. However, the break is more likely caused by a fault which has thrown the higher value beds either to the east or west. The diminution in values in No. 3 Bore is not due to the lensing out of the Sulphur values to the north but rather to the fact that, due to structural factors, the beds containing over 10 per cent Sulphur found in Bores 1, 2A, and 4 have not been intersected in Bore 3.

Bore No. 5, situated in another part of the area, has proved beds 60 feet in thickness containing 15 per cent Sulphur. These values were first intersected at 85 feet in the bore and at 150 feet, when the bore finished, the slates still carried plentiful pyrite. No lateral extent of these slates has been tested for sulphur content and it would appear that (if no faulting has occurred in between) the extension of these particular beds in Branch Creek have been eroded away at the surface.

No. 6 Bore was only put down 47 feet and was still in decomposed slate and apparently not below the zone of oxidation.

No. 2 Bore was abandoned at 50 feet and No. 2A commenced close by.

Reserves.

For some time in Australia, some sort of standard nomenclature on ore reserves has been sought. It has been found, however, that there are nearly as many ways of classifying ore reserves as there are mines and such names as "probable", "inferred", "existing", "measured", reserves have overlapping meanings.

On the assumption that individual beds of slates in this locality contain amounts of pyrite of the same order, then the potential reserves of rock containing over 10 per cent Sulphur are enormous. These slates do not outcrop freely on the surface and the few small outcrops in the area are of course oxidised at the surface, so that the only pyritic slates that can be seen naturally are in the creek bed, where water prevents their oxidation. A sample taken from a small outcrop about half a mile south of the creek showed in analysis 25 per cent of iron, suggesting that before oxidation the pyrite percentage must have been high.

Of these potential reserves then, those more or less proved by drilling are but a small fraction. In the vicinity of the trenches are three and possibly four beds containing more than 10 per cent Sulphur and of from 20 to 60 feet in thickness. If the two larger beds were considered of merit for an open cut proposition, then the width of the cut would be of the order of 200 feet. In the centre of this cut would be 20 feet of low grade material and, as the dip of the beds is about 70°, on the hanging wall side there would be a certain amount of overburden, the thickness of which would increase with

the depth of the cut. Suppose the cut were taken to 200 feet in depth and the length 400 feet which so far has been partly proved. A cut of these dimensions, assuming that "ore" was over 10 per cent Sulphur and thus conditioning the width of the ore beds to 100 feet, would yield eight million cubic feet, or about three-quarters of a million tons of ore. However, as has been pointed out, of the possible pyrite beds, this is only one segment that has been proved.

URANIUM AT ROYAL GEORGE MINE.

REPORT BY T. D. HUGHES, B.Sc. (SENIOR GEOLOGIST),
April, 1955.

On the 17th January, 1955, the first authentic discovery in Tasmania of a uranium mineral was made at the old Royal George Mine, 10 miles from Avoca in the central east of the State. The finder was Mr. V. Pitulej, a gentleman who for several years has been assiduous in his search for minerals throughout the northern part of Tasmania. The mineral found is torbernite, an hydrated phosphate of uranium and copper, and it has been noted in several places in the large open cut of the old mine.

Location and Access.

A car can be driven to within a few yards of the open cut, which is half a mile south of the village of Royal George, which is ten miles south-east of Avoca and near the south bank of the St. Pauls River. Avoca is on the main road and railway line to St. Marys and is distant 50 miles from Launceston.

Topography.

The St. Pauls River has carved out a wide valley through first dolerite, then Triassic and Permian sediments and finally granite, until it has almost reached the stage of maturity and meanders rather slowly through wide meadows. Fringing the Tertiary and Recent river flats are rounded gently sloping hills and ridges of granite topped here and there by Permian remnants, while beyond these the country rises more steeply with first Permian and then Triassic sediments capped by dolerite forming St. Pauls Dome (3368') to the North and Snow Hill (3175') to the South.

The top of the Royal George open cut is about 200 feet above the general plain level.

Previous Literature.

Early geologists who visited and reported on the area where Thureau (1881), Montgomery (1893) and Twelvetrees (1899). At this time, little development or even prospecting had been done at the site of the present opencut, and the name St. Pauls Tine Mine seems to refer more to exploratory workings to the south (as shown on the attached plan) although it also covered the northern area.

In 1929 Reid and Henderson prepared a Bulletin on the Avoca District and a full description of the Royal George and St. Pauls Mines are included in this.

History.

Tin was first discovered in the Royal George Area in the eighties of last century, but very little was done to develop the deposits until the formation of the Royal George Tin Mining Company in 1911. In 1922 the Company came to an end, but during the eleven years they had produced most of the 900 tons of tin oxide, said to have come from the Mine. Although some interest has been shown since 1922, no actual production has taken place.

Towards the end of 1954, Mr. A. E. Ringwood on behalf of a Melbourne syndicate became interested in the property as a potential tin producer and a few months later, torbernite was discovered in the open cut by Mr. V. Pitulej.

Several applications for leases and prospecting areas, &c., covering the cut and surrounding areas are now before the Warden's Court at Launceston and the legal position is by no means clear.

Geology.

The only rock seen in the workings or outcropping nearabouts is a granite of Devonian age but this granite although of one origin, exhibits many different forms. The normal rock is a fairly coarse grained typical tin granite with well developed crystals of quartz, biotite and the feldspars,

In the cut itself a rather curious type occurs. It consists mainly of a fine grained granite but here and there are large crystals of both quartz and feldspar and curious nodules of a few inches in diameter consisting of finely crystalline quartz and tourmaline. Jointing, very regular in strike and dip, (the strike is 320° and the dip to the S.W. at 75°) is well developed in this rock and, on either side of the joint planes, the rock has been altered to a greisen consisting mainly of quartz and mica.

In the northern part of the cut, the hanging wall consists of a rock that has been called pegmatite as it appears to consist of large crystals of quartz and feldspar. Microscopic examination, however, shows the presence of mica and tourmaline. The field name has been retained.

As an appendix to this report a description of the different rock types by Petrologist G. Everard is appended.

Workings.

Although all the workings below the open cut are now inaccessible, a good record of them can be obtained from the Mine Plans and from Reids Bulletin (Geological Survey Bulletin No. 40).

The open cut itself is nearly eight hundred feet in length and averages eighty feet wide. The floor of it is most irregular, islands have been left and much has fallen in and as the surface itself rises in the centre, there is no regular depth, but 40 feet would be an average figure. The adit level is about 20 feet below the floor of the cut. The adit itself runs almost due south for 150 feet when it comes out in an open stope, north-west of the main cut. It then continues beneath the open cut for almost its entire length. The lower level was reached by an underlay shaft (at 50°) in a south-easterly direction and was about 70 feet below adit level. From the shaft (on the footwall side of the lode) a cross cut 60 feet in length connected with the main drive 620 feet long.

In both levels at about 400 feet along the main drive another ore body appeared to join the main vein and the drives were widened to nearly forty feet, gradually narrowing again to their ends. A horse of country was left between the two makes of ore. Most of the ground was stoped between the two levels but no development seems to have taken place below No. 2 level nor has any attempt been made to locate parallel formations by cross cutting.

Sampling.

Most of the sampling was carried out by the Chief Geologist, Mr. H. G. W. Keid. It was of course realised that nothing very much would be left to sample in the open cut as all the ore would have been removed and only unpayable stone left. However, some of the porphyry and greisen material remained in the hanging wall side near the centre of the cut, and it was felt that a systematic sampling of this remnant might establish some sort of relationship between the rock types and the tin, uranium and copper percentages. Chip samples were also taken of pegmatite showing some torbernite in the north-western part of the workings and of porphyritic material in the foot wall side. The positions of the samples are shown in the accompanying plan. Samples 1 to 23 are generally at right angles to the strike of the joint planes and represent a continuous channel sample. The material is alternate bands of greisen (round the joint planes) and softer quartz feldspar porphyry with quartz-tourmaline nodules. Samples 24 and 25 are chip samples from larger distances but not altogether at right angles to the joint planes. Sample H10 is from pegmatite showing splashes of torbernite H12 is a chip sample from a large block of porphyry partially greisenised that has yielded most of the torbernite specimens, and H11 and H14 from porphyry on the foot wall side of the cut.

Details of the samples are as follows:—

Sample No.	Width	Material	Radiometric Assay Content by Equivalent Uranium U308	Cu.	Sn.
	ft. in.				
1	2 3	Porphyry (K1 of Appendix)	.003	Trace	Trace
2	1 4	Porphyry	.002	Trace	Nil
3	0 4	Porphyry and Greisen	.004	.01	Nil
4	1 2	Porphyry	.003	Trace	Nil
5	1 4	Porphyry and Greisen	.02	.01	.33
6	1 2	Porphyry with Quartz-tourmaline Nodule (K6)	.025	.02	.13
7	2 4	Porphyry and Greisen	.006	.01	.11
8	1 5	Porphyry	.003	.03	Nil
9	1 2	Greisen	.004	.02	.25
10	0 10	Porphyry	.004	Trace	Nil
11	1 5	Greisen with large quartz and tourmaline crystals (K11)	.004	Trace	.45
12	1 6	Porphyry and Greisen	.006	.02	.31
13	0 8	Greisen	.008	Trace	.34
14	0 8	Porphyry with tourmaline (K14)	.005	Trace	Nil
15	1 7	Greisen and Porphyry	.007	Trace	Trace
16	1 3	Greisen	.006	.02	.13
17	2 2	Greisen	.01	.01	.44
18	2 3	Porphyry showing torbernite	.07	.02	Nil
19	2 5	Porphyry	.015	.01	Nil
20	1 6	Greisen	.04	.03	.75
21	2 0	Greisen and Porphyry (K21)	.02	Trace	.12
22	2 0	Greisen—some torbernite	.03	Trace	.10
23	2 0	Greisen	.035	Trace	.12
24	Chip 8' ±	Greisen and Porphyry	.03	.01	.26
25	Chip 5' ±	Greisen and Porphyry	.03	.03	Nil
H10	Chip	Pegmatite with torbernite	.015	.01	Nil
H11	Chip	Porphyry and Greisen (Hanging Wall)	.03	.01	Nil
H12	Chip	Porphyry (Foot-wall)	.04	.03	Nil
H14	Chip	Porphyry (Foot-wall)	.015	Trace	.4

Mineralization.

The results of this sampling are very interesting. Before discussing them it might be as well to speculate on the sequence of events leading to the deposition of the tin, and uranium minerals. It is obvious that some portions of the magma cooled much quicker than others. The portion represented by the pegmatite in the hanging wall of the ore-body cooled quite slowly and the portion which is now the porphyry was also cooling slowly forming large crystals of feldspar and quartz when suddenly something happened to cause the rate of crystallization to accelerate. Perhaps this part of the intrusion had assimilated large blocks of sediments and indeed a

possible origin of the quartz-tourmaline nodules is xenolithic.

The next stage was the development of a remarkably even and well developed set of joint planes, striking at 320° and dipping to the south west at 75° . These are varying distances apart but average about 3 feet.

Up these joint planes ascended hot solutions and gases rich in silica, fluorine, &c., from the yet unconsolidated portion of the magma, soaking into the porphyry on either side of the joint planes like ink into blotting paper and changing the porphyry to greisen so that a view of a section across the planes today shows a banded effect with nearly half the porphyry greisenised.

Up these joint planes, too, came the metallic minerals of tin, copper and uranium. Now in considering the mineral, torbernite, which occurs at this mine. It is necessary to remember that not only is it a uranium mineral but also that it has much greater powers of migration in ground water solution than most other minerals. This is well illustrated by the results of the sampling. If the table is studied it can be seen that the tin values follow fairly closely the greisenisation of the porphyry, that is, where the material in column 3 is marked greisen, the tin values are highest. This is what might be expected; but if the uranium values are compared with the material, no such regularity can be noted and indeed the uranium values in the porphyry are higher. It will also be noticed that the uranium occurs in barren pegmatite (H10). At this particular spot in the cut plentiful bright green crystals can be seen splashing the rock, but the U_3O_8 content is quite low (.015%) showing that the material is confined mainly to joint planes and open faces and is not disseminated throughout the rock.

The percentage of copper in the various samples should also be noted. The theoretical amount of copper in torbernite is less than one-seventh the U_3O_8 content so that most of the copper in these samples must be in a different form, and quite a lot of the green material is probably not torbernite but malachite.

When the primary uranium mineral is located it will probably be found that the tin and uranium mineralization closely follow each other and occur in the greisenised portion of the porphyry and not in the pegmatite.

Oxidation and Erosion.

These two subjects are of great importance to the present investigation. Firstly, how much of the granite has been eroded? The introduction of mineral solutions to the granite mass, when it was far below the then surface, would be concentrated near the top of that mass and the more granite that has been eroded the less chance of the tin and uranium bearing material persisting to any great depth. Now erosion of the granite has occurred in two widely separated periods. Firstly, from the end of the Devonian, right through the Carboniferous, erosion was taking place of the Silurian sediments overlying the granite and finally of the granite itself. Beds of Silurian sediments may be seen at Roy Hill not a great distance from here which seems to show that the erosion did not extend far into the granite. From Tertiary times again the Valley of the St. Pauls has been forming and deep erosion has occurred in both dolerite and Permian and Triassic sediments. However, that erosion barely reached the granite and Permian sediments top a hill just east of the open cut. Thus it appears that probably during the first great erosional period little of the granite was removed and certainly during the second, erosion did not penetrate deeply into the rock.

The second problem is to ascertain the depth of the oxidised zone or how far below the surface may we expect to find a primary uranium mineral. Unfortunately, all the workings below the open cut are inaccessible but Reid in his bulletin states that in the shaft workings pyrite, chalcopyrite and tourmaline are abundant ore components. The possibility must be considered that the zone of oxidation of the uranium minerals extends below that of the copper and iron, but I would expect the primary minerals to be encountered at not more than 300 feet from the surface.

Other Workings.

About a mile south west of the open cut is a series of workings, shafts, pits and trenches which was once known as the St. Pauls Tin Mine and which is referred to as Bailey's Lode in Reid's Bulletin. The main shaft (said to be 60 feet in depth) is now inaccessible but material on the dump, a greisen-like rock, showed small patches of torbernite and gave readings of 1000 on an Austronic PRM Counter.

The workings seem to follow a fairly vertical 12" vein of blue quartz tourmaline which courses almost east and west. This vein, however, apparently was poor in tin and certainly gives little increase in count. The greenish greisen, which is apparently in the northern wall, but may be in both, did carry tin and also has a percentage of U_3O_8 .

Although not as promising as the Royal George occurrence there is evidence of the uranium here and if an investigation were undertaken I should think that the first step would be to pump out the shaft.

Conclusions and Recommendations.

There is sufficient evidence to show that in the open cut of the old Royal George Mine, there exists, fairly widely dispersed, the secondary uranium mineral torbenite. Now before too much optimism is expressed, two factors must be considered.

1. None of the samples taken show stone of ore grade.
2. No primary uranium mineral has yet been detected and torbernite is a notorious "wanderer".

However, there appear to be a sufficient showing of uranium to warrant further investigation and the first step is to discover the primary uranium mineral and its lateral extent. The uranium mineralization at depth should follow closely that of the tin; that is the greisenised portion of the quartz felspar porphyry below the open cut should first be tested. This has been stoped out to shaft level so that any bore must be designed to intersect the formation below this and also it must intersect the greisen below the oxidised zone. The accompanying plan shows the recommended positions, direction and angle of the first two bores designed to intersect the formation from 250 to 500 feet.

What must not be forgotten is that this was once a tin mine and could be again and that the uranium need after all be but a by-product.

APPENDIX

PETROLOGICAL REPORT BY G. EVERARD, B.A., A.M.I.M.M.,
MINERALOGIST AND PETROLOGIST.

The following descriptions apply to rocks collected at the Royal George Mines by Chief Geologist, H. G. W. Keid, and Geologist T. D. Hughes.

K1.—Porphyritic rock, containing large crystals of quartz and felspar in a medium of fine-grained ground mass.

In thin section in ordinary light the rock is a mosaic of clear quartz, cloudy felspar, yellowish, brownish and colourless mica and various grains of different minerals stained with iron oxides.

Under crossed nicols the larger felspar crystals show simple twinning; but are extensively albitised. The albite can be readily recognised by its fresh appearance.

Quartz occurs in two characteristic ways; firstly as irregular grains somewhat embayed and corroded and secondly as inclusions in felspar, groups of inclusions extinguishing together.

Mica is in irregular plates, often ragged and showing signs of alteration. The colour varies from brown to pale yellow but all varieties are distinctly pleochroic. The mottled character of many of the patches of mica suggests metamict products, but may be due to other causes.

Most of the areas stained with iron oxides have a very fine grained structure and appear to consist of secondary silica and sericite. They can easily be distinguished by colour from the altered felspar.

The rock is a granite porphyry which has undergone some alteration.

K6.—Medium grained rock consisting chiefly of light coloured granular quartz and black tourmaline.

In thin section the rock is an aggregate of inter-locking quartz grains with interstitial tourmaline and white mica. The mica has a radiating structure. Much of the mica is stained brown with iron from disseminated iron ore minerals, and the tourmaline similarly by oxidation of the iron in its composition.

The rock is a tourmaline granite.

K11.—Medium grained light coloured rock, weathered and stained by iron oxides.

In thin section the rock appears as a mosaic of quartz grains, with a fine grained felted mass of muscovite filling the interstices. The muscovite sometimes shows radiating structure and occasionally appears as books rather larger than the quartz grains.

The rock is greisen.

K14.—Light grey rock of medium grain with phenocrysts of quartz and kaolinised felspar.

In thin section the rock appears as an even grained mosaic of clear quartz, semi opaque kaolinised felspars with traces of simple twinning. Well crystallised pale

coloured pleochroic mica is prominent, but many crystals have been altered in whole or part to give a scaly aggregate. There is also interstitial quartz-sericite material. A little interstitial tourmaline is present.

The rock is a granite porphyry showing the beginnings of pneumatolytic alteration.

K21.—In thin section the rock consists of groups of interlocking grains of quartz, the interstices being filled with a fine felted mass of sericitic mica. Skeletal crystals of feldspar and muscovite indicate the process of sericitisation.

The rock is a greisen and differs from H1 in the almost complete alteration of the mica.

H1.—Light greenish grey rock containing quartz and mica.

In thin section the quartz is seen to be in interlocking grains, some showing hexagonal section, the interstices being filled by a pale brownish-yellow mica which is quite distinctly pleochroic.

Small irregular masses and grains of opaque iron ore minerals are disseminated through the rock, more particularly associated with the mica. There is a little of some translucent mineral which appears to have been formed by alteration from the iron ore. This mineral is green in transmitted light and purple in reflected light.

The rock is greisen.

H9.—Leucocratic rock of porphyritic texture.

In thin section the feldspar phenocrysts with simple twinning, and cloudy with alteration products, show evidence of albitisation. In the large crystals are wavy areas with lamellar twinning. There are also groups of rounded quartz grains with simultaneous extinction, as inclusions.

Quartz, generally, is in rounded grains, embayed and irregular.

Mica is in irregular masses sometimes with intense pleochroic haloes. In the same crystalline masses the mineral may be brown pleochroic as in biotite or relatively colourless.

In reflected light the rock is largely white and opaque with a few black opaque grains.

The rock is a slightly altered granite porphyry.

H11.—Leucocratic medium, even grained rock. Visible minerals are feldspar in creamy somewhat lath like crystals, quartz in dark glassy grains, biotite, and a black vitreous mineral.

In thin section the rock is holocrystalline allotriomorphic-granular, even the feldspars showing very little of crystal outline.

Quartz.—irregular, equi-dimensional grains with the periphery sometimes corroded and embayed. In some instances groups of scattered grains in large feldspar crystals extinguish together.

Feldspar:—Plagioclase—largest crystals in the section, partly altered and containing many inclusions.

Albite—rather small, fresh crystals shown multiple twinning—often inclusions in other minerals.

Orthoclase.—less common, large lathlike crystals much latered, but showing simple twinning.

Mica.—ragged books—pleochroic-white to yellow. A few opaque inclusions with pleochroic haloes. Also some included small crystals of albite.

Tourmaline—rare interstitial patches, grey-blue pleochroic.

The rock is a fine grained granite slightly affected by pneumatolytic action.

H10.—Leucocratic coarse, even grained rock consisting of feldspar and quartz. Black glassy schorlite tends to be associated with the quartz, and makes it appear dark. In thin section the texture is hypidiomorphic.

Feldspar is of three types—

Plagioclase in large twinned crystals, not greatly altered. Orthoclase, showing simple or no twinning; but smoky with alteration products, and closing well formed albite crystals. The orthoclase also is in part intergrown with albite, to give an irregular wavy structure. The albite can be distinguished by slightly higher polarisation colours and multiple twinning.

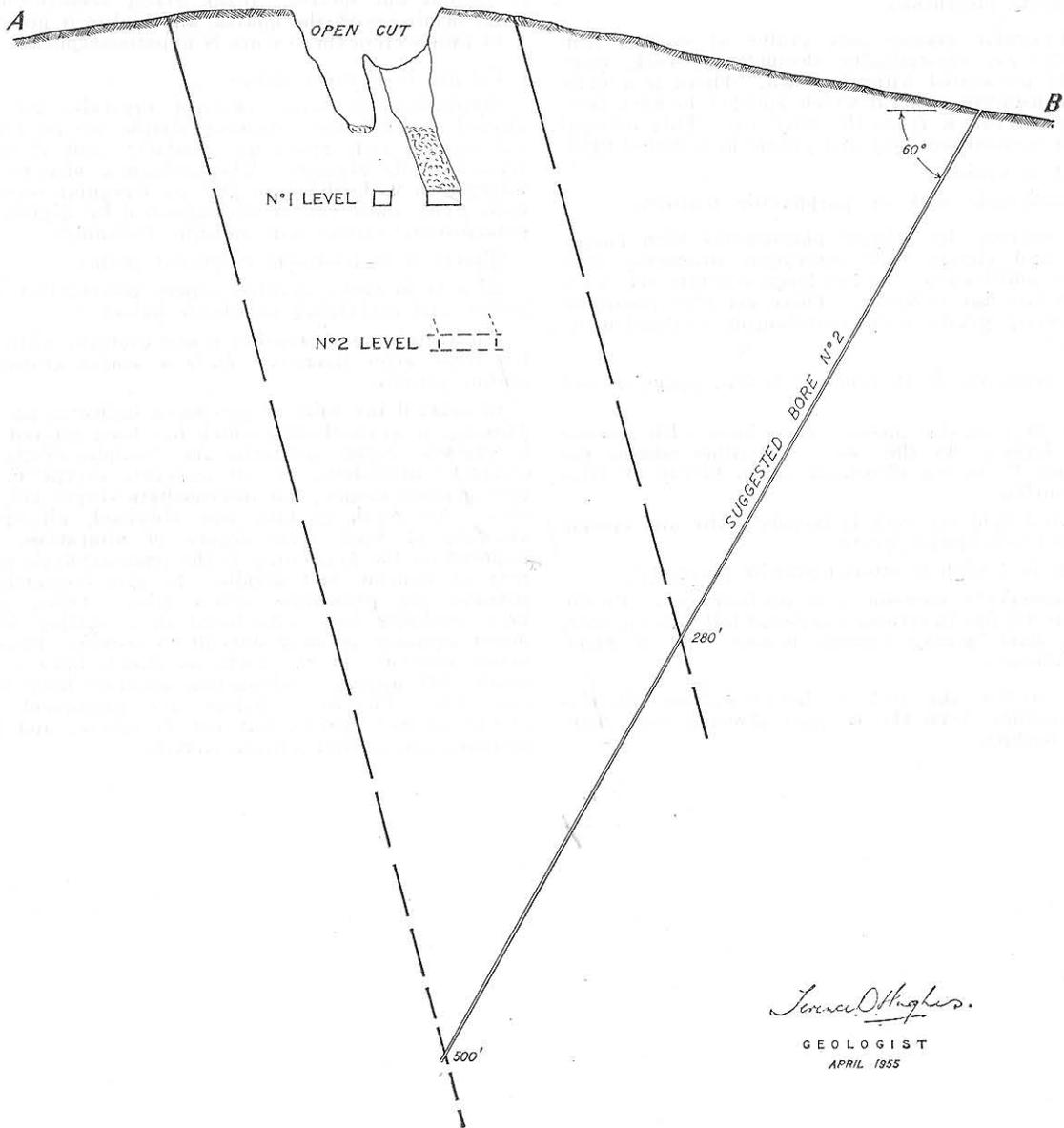
Quartz is in irregular fractured grains.

Mica is in books showing strong pleochroism white to yellow and containing pleochroic haloes.

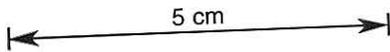
The rock is much weathered and contains white opaque leucoxene after ilmenite. It is a coarse grained tourmaline granite.

In general the suite of specimens indicates an original granite, or granodiorite, which has been altered in part to greisen. Some specimens are examples of the almost complete breakdown of all minerals except quartz to give greisen proper; but intermediate stages are typified also. No fresh granite was obtained, all specimens showing at least some degree of alteration. Superimposed on the greisen is the pneumatolytic introduction of fluorine and alkalis, to give tourmaline and perhaps the pleochroic yellow mica. Other minerals have probably been introduced in a similar way, but direct evidence is more difficult to obtain. Thus radioactive elements in the rock, no doubt, have a similar origin, but primary radio-active minerals have not been identified. Pleochroic haloes are prominent in the biotite of one granite but not in others, and in that instance are around minute zircons.

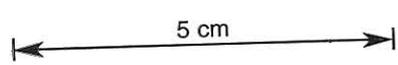
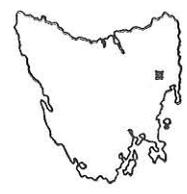
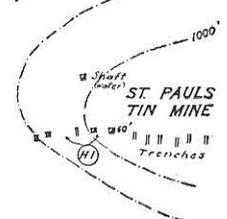
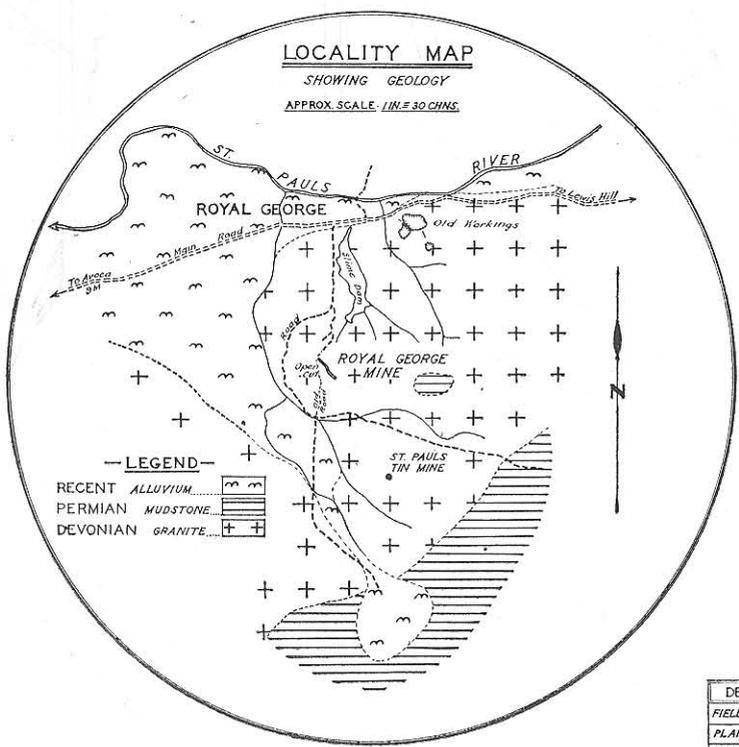
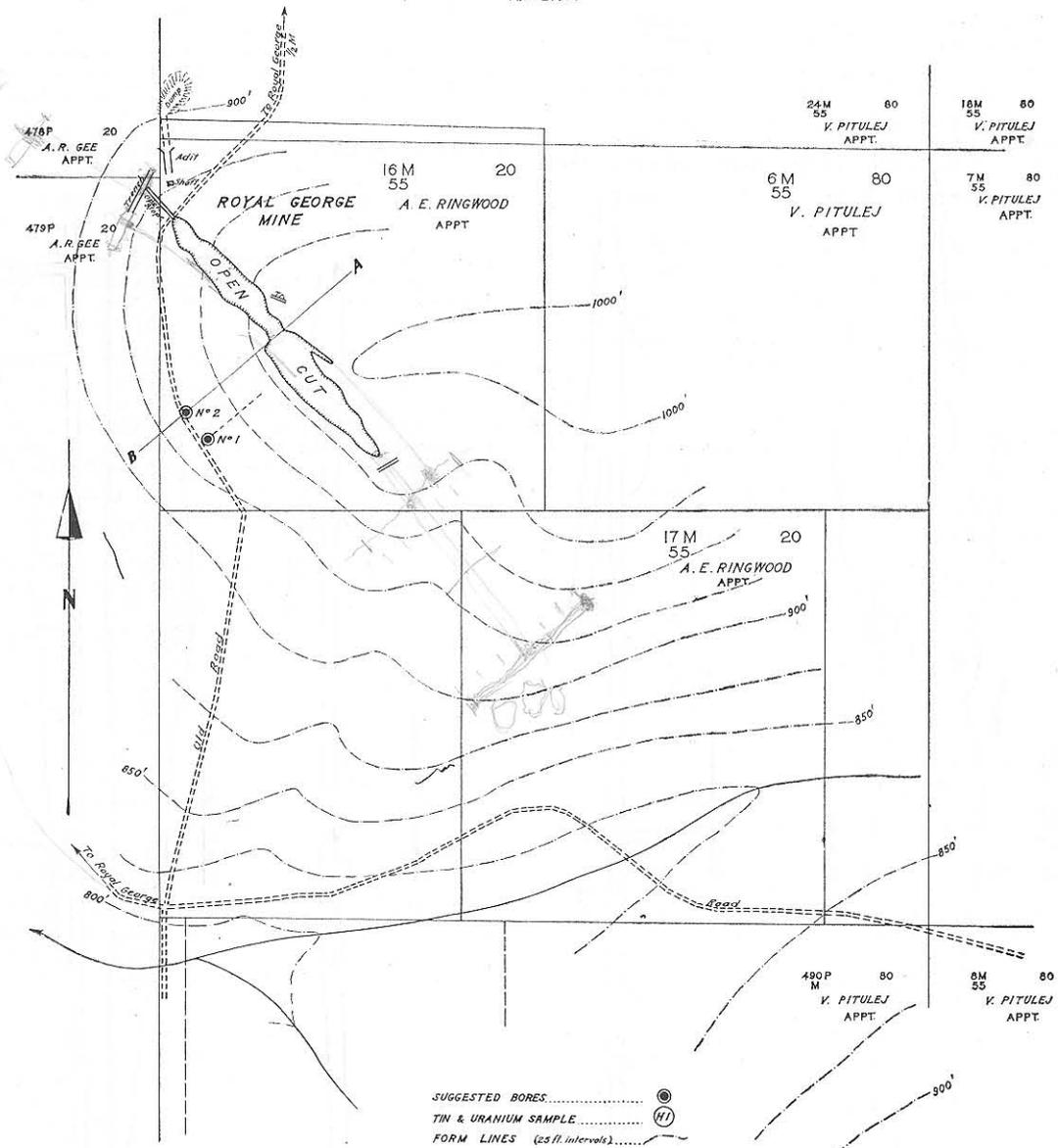
SECTION AB — ROYAL GEORGE AREA



Jesse D. Hughes.
GEOLOGIST
APRIL 1955

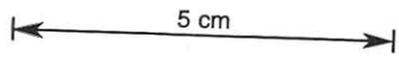
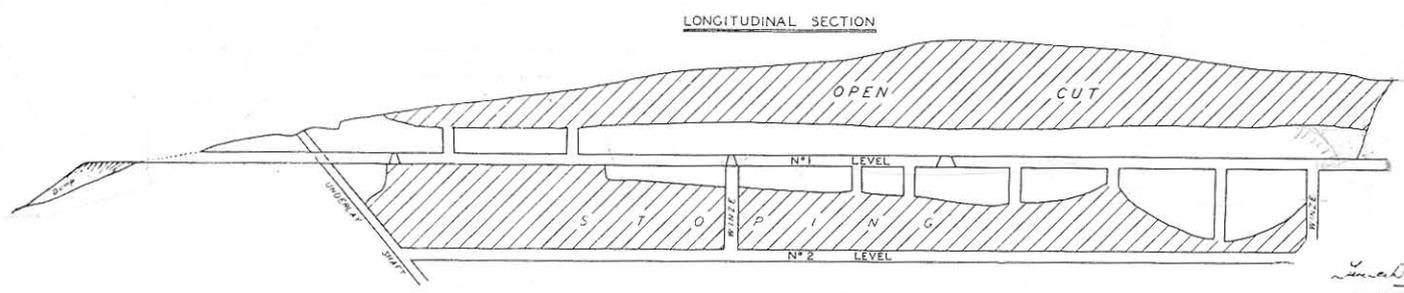
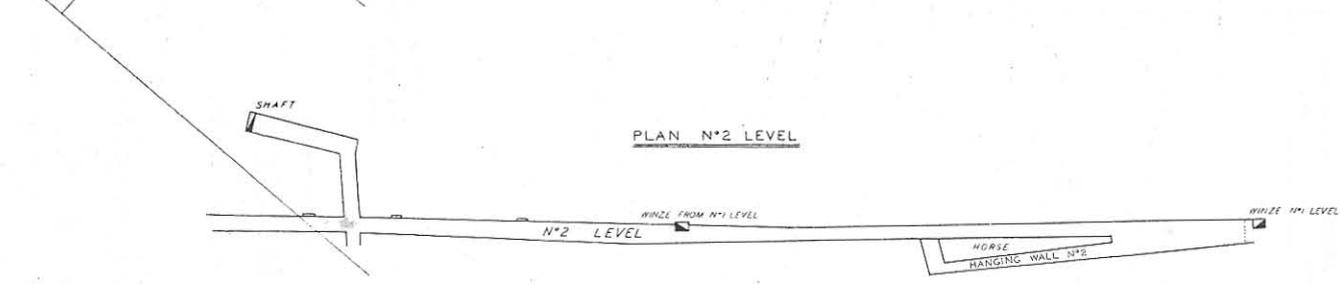
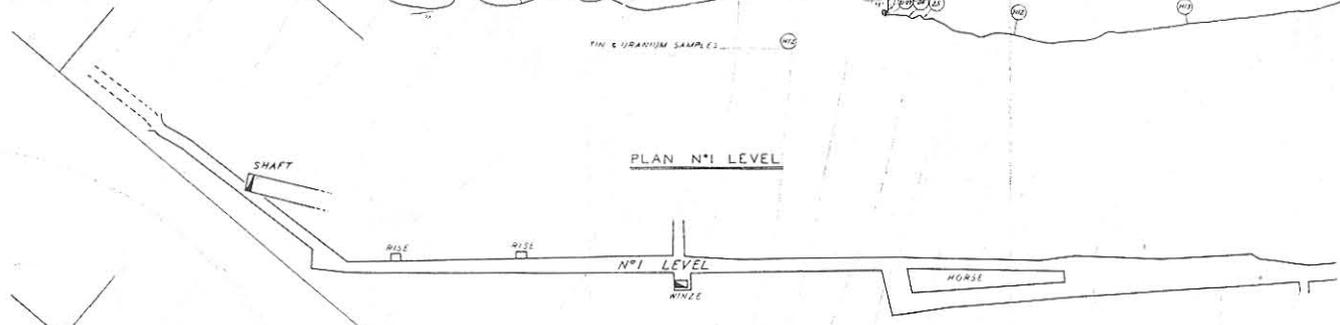
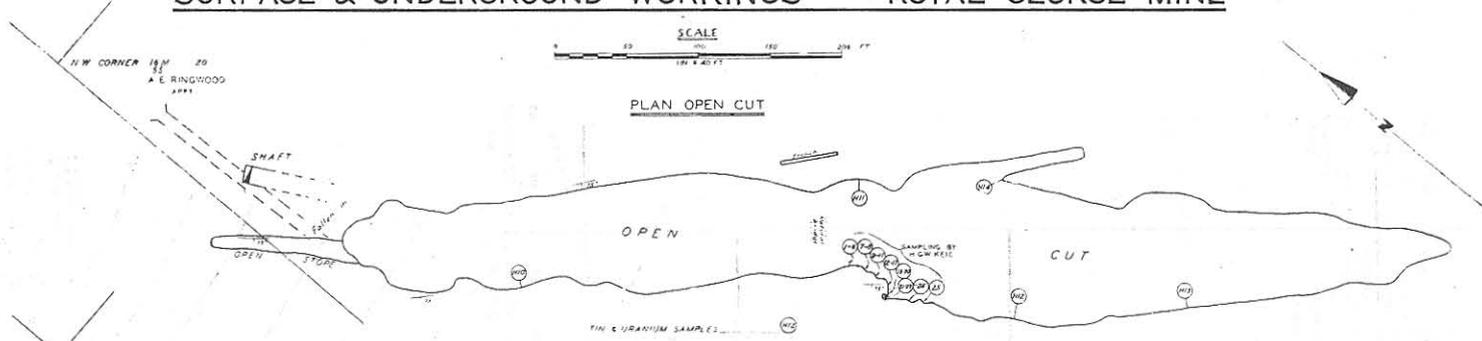


ROYAL GEORGE AREA



DEPARTMENT OF MINES — TASMANIA		
FIELD WORK	<i>James O'Connell</i>	GEOLOGIST
PLAN	<i>R. S. Bond</i>	DRAUGHTSMAN
APPROVED		DIRECTOR OF MINES
DATE	APRIL 1955	HOBART

SURFACE & UNDERGROUND WORKINGS — ROYAL GEORGE MINE



DEPARTMENT OF MINES — T-3
1345-55

W. G. Hest
GEOLOGIST
APRIL 1951

APP. 300000 JAVON

J. CURTAINS SCHEELITE PROSPECT, KING IS.

REPORT BY T. D. HUGHES, B.Sc. (Senior Geologist),
30th June, 1955.

This scheelite prospect is situated in the parish of Reekara, near the centre of King Island. A report was prepared on this prospect in 1951 and since then a certain amount of exploration has been carried out, principally by the King Island Scheelite Company.

It will be recalled that the country here is a flat featureless plain with sandy cover and no outcrop and that scheelite had been reported in, and seen on, the dump of a water-filled shaft, "Shaft C", as well as examined in a shallow shaft, "Shaft A". Since then the following exploration has been carried out.

1. Shaft C was unwatered and examined, particularly the eastern crosscut where the scheelite lode had been reported.

2. Shaft A was deepened to 22 feet and short drives put out south-east and north-west along the tourmaline formation.

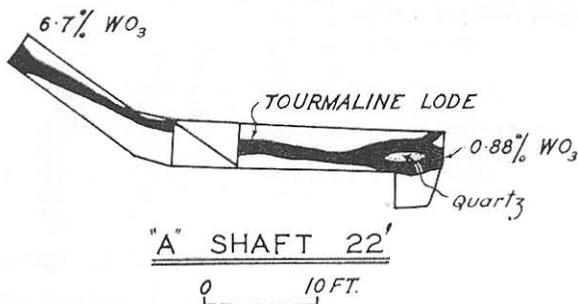
3. Two bores were put down in the vicinity of Shaft A to intersect the formation exposed in the shaft at approximately 100 feet below the surface. The results of this work seemed to have been disappointing and the Company has, for the time being at any rate, suspended prospecting operations in this area. Part of the results of this prospecting (in Shaft A) could be seen, but the remainder is based on Company information as follows:

1. The examination of the eastern crosscut of Shaft C failed to reveal promising scheelite and although analyses showed some tungsten values, the Company did not consider them high enough to warrant further development in this area.

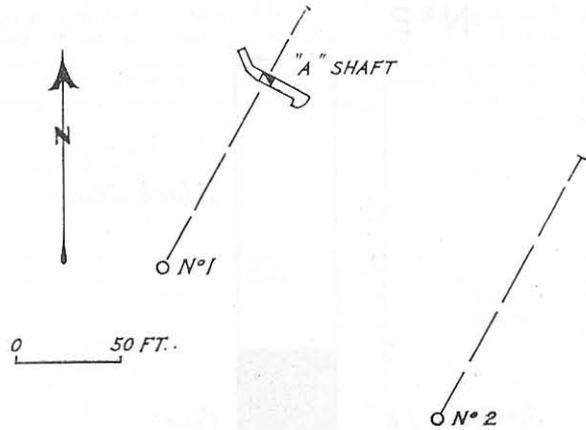
2. Shaft A and the short drives from it at the 22 foot level could be examined. The workings are so close to the surface that the rock, a micaceous schist, is so weathered that it is in effect a clay. The tourmaline lode, although it does contain some quartz, is, in the main, quite soft and material from it can be washed in a dish. This lode is striking at 120° one side of the shaft and 325° on the other. It is practically vertical but nowhere of constant width, varying from .27 inches to 3 inches and at one point cutting out altogether. The scheelite, as seen by the ultra-violet lamp, is splashed quite irregularly through the tourmaline formation. A sample was taken from the end of each drive and the great divergence in results shows that the sampling of any small portion of the formation is quite useless, but of course it does show that appreciable scheelite is present here. It is interesting to note that some tin also occurs in this formation.

	% WO ₃	% SN
End of east drive (over 27")	0.88	Trace
End of west drive (over 15")	6.70	0.64

The scheelite in these drives glows under the lamp with a bluish-white colour showing that there is little molybdenum with it in contrast to that seen in the upper part of the shaft.



3. The results of the boring were disappointing. No. 1 bore was designed to intersect the formation at 100 feet below the shaft collar and the No. 2 at the same depth and 150 feet to the south-east. Neither appeared to strike any definite tourmaline formation, although it should be remembered that this material is very soft and may have failed to core. Small tungsten values were obtained almost throughout the bores,



This sketch shows the bores in relation to the shaft. Both are at an inclination of 45° in a direction of 30°.

The results of this later prospecting has been rather disappointing although the presence of scheelite in sensible quantities has been established in this area. The most promising locality to further investigate is the tourmaline formation in Shaft A. Unfortunately, formations of this nature in schistose rocks are not noted for their regularity of width and they may possibly cut out altogether. I should not advise any further boring on this formation but rather if more work is to be done, the deepening of Shaft A so that the actual formation can be followed down.

It is unfortunate that regional prospecting is so difficult, because of lack of outcrop, but I should think that vigorous prospecting in the direction of Mt. Counsel, where granite is reported to outcrop, may lead to the discovery of other scheelite deposits.

COAL NEAR MT. LLOYD (2nd Report).

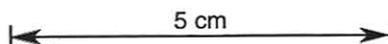
REPORT BY T. D. HUGHES, B.Sc. (Senior Geologist),
5th May, 1955.

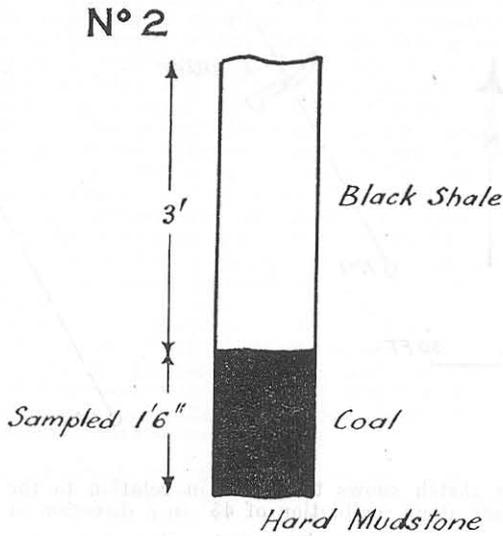
Early in 1952 a visit was made to the Mt. Lloyd area in company with Mr. L. Teakle of New Norfolk to examine some coal seams that he had prospected. Although the coal was found to be of narrow width, in a rather inaccessible position and in one case of poor quality, it did belong to the normal coal measures of the Triassic and warranted further prospecting to determine whether seams of greater width and closer to existing roads could be found. During the past three years Mr. Teakle has undertaken extensive prospecting in the area, and opened up coal seams within half a mile of the existing road. The Mt. Lloyd area is about eight miles south-west of New Norfolk, which is 22 miles by road from Hobart.

Several narrow seams have been exposed by small pits and, in one case, an adit 40 feet in length, about two miles north-east of the previous prospecting. At this stage it is not possible to accurately correlate the various exposures, but it would appear that there are two seams within 15 feet of each other and a third 65 feet below. The two upper seams were sampled from small cuts, and it is assumed that the adit has been put in on the lower of these seams. A third sample was taken from a hole into which water seeps. This seam was stated to be 3' 6" in width but it was only possible to sample 2' 10". Details of these samples are as follows:—

N° 1

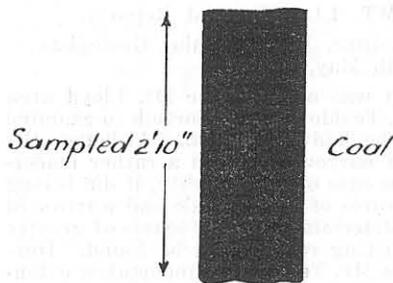
Sample	Moisture	4.6%
Soft Clay Sampled 2' 11"	V.C.M.	15.9%
	F.C.	50.5%
	Ash	29.0%
	Sulphur	0.28%
	Calorific Value	9480 B.Th.U's
1/2" Band	Sp. Gr.	1.54





Moisture	3.3%
V.C.M.	19.0%
F.C.	55.5%
Ash	22.2%
Sulphur	0.5%
Calorific Value	10950 B.Th.U's
Sp. Gr.	1.50

N° 3



Moisture	3.1%
V.C.M.	18.3%
F.C.	50.8%
Ash	27.8%
Sulphur	0.32%
Calorific Value	10090 B.Th.U's
Sp. Gr.	1.53

The coal seams are fairly flatly bedded, that in the adit having a dip of 5° to the south.

From surface indications, there does not seem to be a great deal of faulting and the dolerite intrusion appears to be in the form of a sill, well above the seams investigated. This area is much more accessible than the one seen earlier. A motor road, rough but passable, passes within half a mile, and four to five hundred feet below the outcrops.

In attempting to correlate these seams with those known and mined in other parts of Tasmania, the two nearest coalfields at Sandfly and Hamilton may be considered. The Sandfly coalfield is 17 miles south-east and the Hamilton field 20 miles north-west of Mt. Lloyd.

At Sandfly if the correlation made by the authors of "The Coal Resources of Tasmania", of the seams found in the various bores and workings is correct, then these seams vary very much in thickness in quite a small area.

All the seams are narrow and contain numerous bands of clay. They may be divided into three groups—the upper seams, Alpha and Beta, the latter of which was worked in the early days; the centre group, 300 feet below, some of which are now worked; and the lower group, 25 feet below these, which are too narrow to work. Samples taken from the various seams show values of the order of:—

	V.C.M.	F.C.	Ash
Beta	23%	49%	24%
Delta	8%	63%	26%
Eta	13%	62%	21%

At Hamilton the seams named Alpha to Delta are all close together and apparently parts of all have been worked. A general analysis of the coal produced shows 56% F.C., 22% V.C.M., and 18% ash. There are several narrow seams below this group.

It thus appears difficult to correlate the seams at Hamilton and Sandfly but it is possible that the seams worked at Hamilton correspond with the centre group at Sandfly and that the upper seams have been removed by erosion.

The coal at Mt. Lloyd approximates closest to the Sandfly deposits and the seams described as 1, 2, and 3 may correspond to the Gamma, Delta and Eta seams at Sandfly. Certainly both coals are low volatiles and the two top seams in each case are close together.

If these correlations are accepted, then it would appear that the best seams at Mt. Lloyd are those already seen and it is doubtful if they are wide enough for economic working. However, such assumptions are highly dangerous in dealing with areas so far apart and numerous bores put down in both the Hamilton and Sandfly areas show that no persistence in uniformity of width or distance apart of seams can be expected even within the narrow limits proved by the bores.

Mr. Teakle has strenuously and systematically prospected this area over a number of years and it is felt that no useful purpose could be served by further surface prospecting. There is only one way that the economic potentialities of the area can be assessed and that is by boring. If a boring campaign is instituted the first bore should be put in just above the adit, thus taking in the three known seams, and extended to a depth of the order of 300 feet, or until the felspathic sandstones have been passed through.

It seems that of the coal revealed by surface prospecting the only deterrent is the width of the seams. The quality at outcrop is quite fair, mining by adits should present no great difficulties, there does not appear to be over much faulting and a formed road within half a mile of the outcrop leads in fifteen miles not only to hop-growing areas, where low volatile coal is used, but also to a large industrial undertaking using several hundred tons of coal per week.

