

SUMMARY

Mineable ore reserves at 30 September, 1978.

	Tonnes	% Sn	% WO ₃	MTU Sn	MTU WO ₃
Aberfoyle	80,150	0.6	0.2	54,100	18,000
Storeys Creek	6,750	-	0.75	-	5,060
Lubwiche	17,900	0.2	0.7	3,600	12,500
Total	114,800	0.5	0.3	57,700	35,560

A detailed tabulation of ore reserves at each property, level-by-level, category-by-category, is attached.

Mineralisation throughout occurs as cassiterite and wolframite in quartz veins ranging in width from a few cm. up to 3 metres. Both vein width and grade of mineralisation can vary widely over short distances along the strike and dip.

Ore reserve tonnage is the result of the aggregation of individual ore reserve blocks, defined for each vein by lateral development and regular intervals along strike.

ORE RESERVE ASSESSMENT

All tonnages are calculated using a density of 2.55 tonnes/m³ for both quartz vein and waste dilution.

AS AT

All grades are derived from visual estimates, along all development openings, of the proportion of mineralisation in the quartz. These estimates are reported as grades achieved and after the appropriate factoring, applied to the ore reserve.

SEPTEMBER 30, 1978.

Sampling and assaying cannot be successfully applied to the sporadic (nuggety) mineralisation.

In decreasing order of confidence, reserves are classified as Measured, Indicated or Inferred.

MEASURED RESERVES - Those whose tonnage and grade can be estimated with a high level of confidence.

INDICATED MINEABLE ORE RESERVES

114,800 TONNES 0.5% Sn 0.3% WO₃

INDICATED RESERVES - Those defined at least in part, by development in quartz veining. Quartz tonnages are calculated from observed vein widths and distances along strike and dip exposed by level and cross development. Indicated ore extends to 6 metres beyond such development for **PRODUCTION ENGINEER** (except that no strike or dip estimates are made to blind level or rise development, respectively), and as shown in the diagram for **MINE MANAGER** mine sites.

SUMMARY

Mineable ore reserves at 30 September, 1978.

	Tonnes	% Sn	% WO ₃	MTU Sn	MTU WO ₃
Aberfoyle	90,150	0.6	0.2	54,100	18,000
Storeys Creek	6,750	-	0.75	-	5,060
Lutwyche	17,900	0.2	0.7	3,600	12,500
Total	114,800	0.5	0.3	57,700	35,560

A detailed tabulation of ore reserves at each property, level-by-level, category-by-category, is attached.

Mineralisation throughout occurs as cassiterite and wolframite in quartz veins ranging in width from a few cm. up to 2 metres. Both vein width and grade of mineralisation can vary widely over short distances along the strike and dip.

Ore reserve tonnages and average grades are those resulting from the aggregation of individual ore reserve blocks, defined for each vein by lateral development and regular intervals along strike.

All tonnages are calculated using a density of 2.56 tonnes/m³ for both quartz vein and waste dilution.

All grades are derived from visual estimates, along all development openings, of the proportion of mineralisation in the quartz. These estimates are reconciled with actual production grades achieved and after the appropriate factoring, applied to the ore reserve.

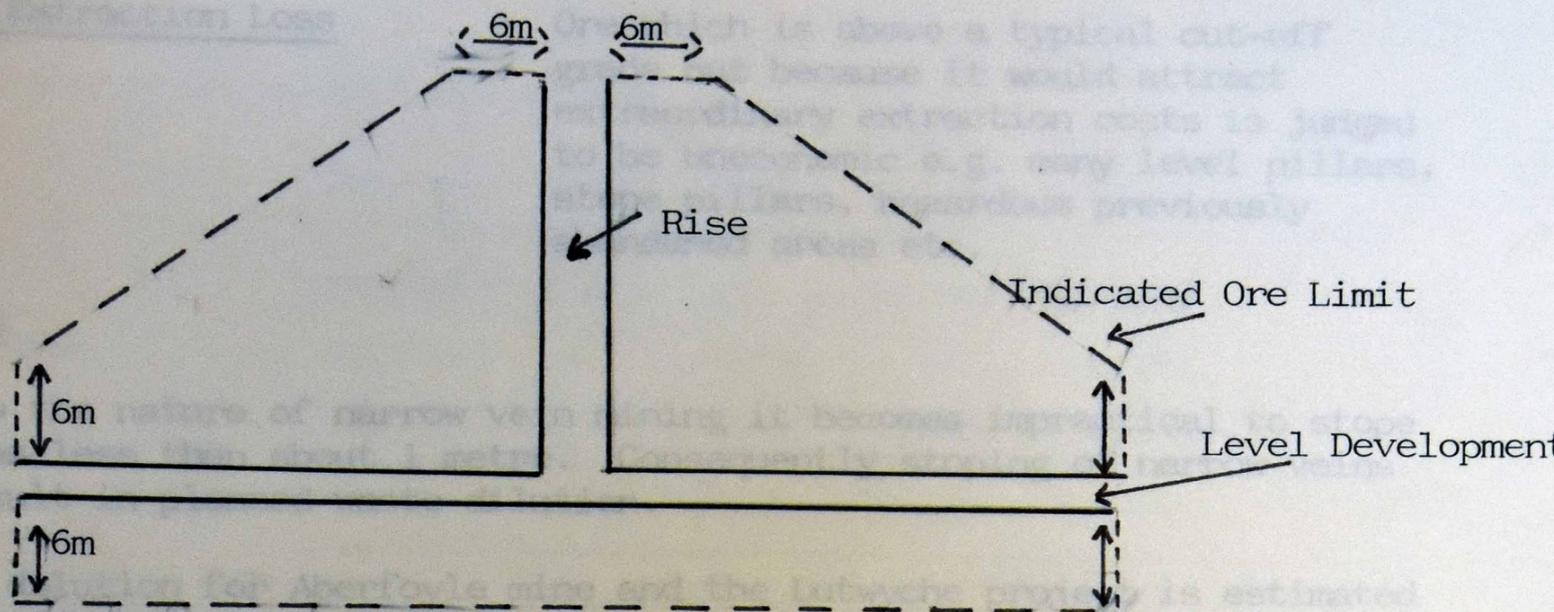
Sampling and assaying cannot be successfully applied to the sporadic (nuggety) mineralisation.

In decreasing order of confidence, reserves are classified as - Measured, Indicated or Inferred.

MEASURED RESERVES - Those whose tonnage and grade can be estimated with a high level of confidence.

Variability of grade and vein width precludes this level of confidence, and hence no reserves are reported to this classification.

INDICATED RESERVES - Those defined at least in part, by development in quartz veining. Quartz tonnages are calculated from observed vein widths and distances along strike and dip exposed by level and rise development. Indicated ore extends to 6 metres beyond such development for blocks developed on one side only (except that no strike or dip extensions are made to blind level or rise development respectively), and as shown in the diagram for blocks developed on two or more sides.



Where circumstances indicate an appropriate level of confidence, data from diamond drill holes, adjacent stoping, crosscutting etc., may be used to extend Indicated ore limits, but only in conjunction with development on at least one side of the block.

INFERRED RESERVES - Those which extend 6 metres beyond Indicated Ore limits unless development information suggests otherwise. Where extensive development and/or diamond drilling information is available, Inferred ore may be judged to extend beyond the 6 metre limit.

Indicated Geological Reserve Categories A, B, C, D.

The Indicated geological reserve is divided into a diluted mineable (at a profit) ore reserve (categories A and B) and a non-mineable geological reserve (categories C and D).

Diluted Mineable Ore Reserve - Ore (diluted) above an appropriate cut-off grade which can be mined at a profit.

Category A - Ore which is developed to either the stope development or production stage.

Category B - Ore which requires significant additional pre-production expenditure.

Non-Mineable Geological Reserve (Cats. C & D)

Sub Ore - Ore which is below typical cut-off grades and which after taking due account of its predicted direct mining costs cannot be mined at a profit.

For fully developed ore, only requiring extraction, the cut-off grade for that particular block of ore may be lowered to reflect the lower direct production costs. This has been done for selected blocks at both the Aberfoyle and Storeys Creek mines.

Planned Extraction Loss

- Ore which is above a typical cut-off grade but because it would attract extraordinary extraction costs is judged to be uneconomic e.g. many level pillars, stope pillars, hazardous previously abandoned areas etc.

Dilution

Owing to the nature of narrow vein mining it becomes impractical to stope at widths less than about 1 metre. Consequently stoping of narrow veins will result in planned waste dilution.

Planned dilution for Aberfoyle mine and the Lutwyche project is estimated as the difference between the average vein width and a 1.2 metre stoping width. No account is taken of waste sorting from the ore stream.

At Storeys Creek where vein widths more nearly approximate the stoping width an historical dilution estimate can be made from production records of vein and stope width, and this estimate is considered to be more accurate than that for Aberfoyle mine. For vein widths in excess of 1.2 metres no dilution is assumed.

Cut-Off Grades

The typical cut-off grade is that grade at which the value of production is equal to the cost of production.

The year-to-date costs, mill recoveries, and metal prices were used as the basis for determining cut off grades as follows :

Total production cost per tonne ore milled		\$88
Mill recoveries	Sn 77%	
	WO ₃ 79%	
Metal prices	Sn \$101/M.T.U.	
	WO ₃ \$126/M.T.U.	
Waste sorted from ore stream	- 7% of ore hoisted, equivalent to a 7% upgrading in head grade.	

Thus, for example, the cut-off grade, for Sn only, becomes

$$\frac{88}{101 \times 0.77 \times 1.07} = 1.06\% \text{ Sn}$$

<u>Ore</u>	<u>Cut-Off Grade</u>
Sn	1.1% Sn
Sn:WO ₃ = 5:1	1.05% C.M.
Sn:WO ₃ = 2:1	1.00% C.M.
WO ₃	0.8% C.M.

For fully developed ore, only requiring extraction, the cut-off grade for that particular block of ore may be lowered to reflect the lesser direct production costs. This has been done for selected blocks at both the Aberfoyle and Storeys Creek mines.

Reconciliation

a) Ore Reserves at 30 September, 1977.

	Tonnes	% Sn	% WO ₃	MTU Sn	MTU WO ₃
Aberfoyle	94,000	0.6	0.2	56,000	18,800
Storeys Creek	15,500	-	0.74	-	11,470
Lutwyche	14,000	0.2	0.6	2,800	8,400
Total	123,500	0.5	0.3	59,200	38,670

b) Ore Reserves at 30 September, 1978.

Aberfoyle	90,150	0.6	0.2	54,100	18,000
Storeys Creek	6,750	-	0.75	-	5,060
Lutwyche	17,900	0.2	0.7	3,600	12,500
Total	114,800	0.5	0.3	57,700	35,560

c) Ore milled during 1978 (1 October, 1977 to 30 September 1978)

Aberfoyle	21,270	not measured			
Storeys Creek	14,550	not measured			
Lutwyche	1,470				
Total	37,290	0.38	0.44	14,170	16,408
Net difference (a-b+c)	+45,990	0.40	0.41	14,170	19,518

Of this difference, 32,700 tonnes is accounted for as a net increase in ore reserves, brought about by development on the level and as rises into and beyond indicated category A and B blocks. The increases represent upgrading of E and C category blocks to A and B, and discovery of new reserves beyond E blocks.

Aberfoyle shows a net loss of 3,850 tonnes. The main decrease, apart from production, resulted from the deletion of 4,100 tonnes in pillars which were declared non recoverable.

Complete reconciliation is difficult, because underground ore sorting is not taken into account. Some 4,100 tonnes of mullock was sorted from ore and hauled as waste during the year ended 30 September, 1978.

Ore Potential

It is significant that 17,900 tonnes of ore from Lutwyche is now included in reserves. Exploration development above 13 L is in progress. Diamond drilling is in progress above and below 13 L to improve definition on all main veins. Once additional ventilation is installed, exploration activity will be increased.

Exploration at Storeys Creek is almost complete with all known target areas having been investigated. The potential for additional ore reserves is low.

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STOREYS CREEK MINE - DILUTED MINEABLE ORE RESERVE STATEMENT - 1ST OCTOBER 1978

LEVEL	INDICATED GEOLOGICAL RESERVES (Categories A,B,C & D)			INFERRED GEOLOGICAL RESERVES	NON-MINEABLE GEOLOGICAL INDICATED RESERVES (QUARTZ TONNES) C + D			UNDILUTED INDICATED MINEABLE RESERVES A + B			PLANNED DILUTION TONNES	INDICATED DILUTED MINEABLE RESERVES A + B		
	QUARTZ TONNES	QUARTZ GRADE		ORE TONNES	SUB-ORE	PLANNED EXTRACTION LOSS	SUB-TOTAL	QUARTZ TONNES	QUARTZ GRADE			ORE TONNES	ORE GRADE	
		% Sn	% WO ₃						% Sn	% WO ₃			% Sn	% WO ₃
ADITS	3650	0.1	0.5	250	Nil	3650	3650	-	-	-	-	-	-	-
1	1400	0.2	0.4	Nil	Nil	1400	1400	-	-	-	-	-	-	-
2	10750	0.1	0.5	350	1000	9750	10750	-	-	-	-	-	-	-
3	6600	0.2	0.5	450	350	6150	6500	100	-	1.2	50	150	-	0.8
4	3150	0.1	0.4	Nil	Nil	3150	3150	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	5100	-	0.5	650	500	4400	4900	200	-	1.4	100	300	-	1.2
7	6450	-	0.5	600	2200	3700	5900	550	-	1.2	200	750	-	0.9
8	10700	-	0.5	1750	5150	5500	10650	50	-	1.0	Nil	50	-	1.0
9	9550	-	0.6	800	2400	6900	9300	250	-	1.1	100	350	-	0.8
11	11200	-	0.6	4150	10300	900	11200	Nil	-	-	-	-	-	-
12	14500	-	0.6	4300	9350	Nil	9350	5150	-	0.7	Nil	5150	-	0.7
	83050	0.04	0.54	13300	31250	45500	76750	6300	-	0.79	450	6750	-	0.75

INDICATED GEOLOGICAL RESERVE (QUARTZ) - NON MINEABLE RESERVE (QUARTZ) = UNDILUTED MINEABLE RESERVE + DILUTION = INDICATED DILUTED MINEABLE RESERVE

83,050 - 76,750 = 6,300 + 450 = 6,750

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LUTWYCHE - DILUTED MINEABLE ORE RESERVE STATEMENT - 1ST OCTOBER 1978.

LEVELS	INDICATED GEOLOGICAL RESERVES (Categories A,B,C & D)			INFERRED GEOLOGICAL RESERVES (Category E)		NON-MINEABLE GEOLOGICAL INDICATED RESERVES (QUARTZ TONNES) C + D			UNDILUTED INDICATED MINEABLE RESERVES A + B			PLANNED DILUTION TONNES	INDICATED DILUTED MINEABLE RESERVES A + B		
	QUARTZ TONNES	QUARTZ	GRADE	ORE TONNES	ORE GRADE	SUB-ORE	PLANNED EXTRACTION LOSS	SUB-TOTAL	QUARTZ TONNES	QUARTZ	GRADE		ORE TONNES	ORE	GRADE
		% Sn	% WO ₃							% Sn	% WO ₃			% Sn	% WO ₃
13	3540	0.6	2.7	2900	0.8	-	-	-	3540	0.6	2.7	9760	13300	0.2	0.7
14	1230	0.7	2.6	4600	0.9	-	-	-	1230	0.7	2.6	3370	4600	0.2	0.7
TOTAL	4770	0.6	2.7	7500	0.9	-	-	-	4770	0.6	2.7	13130	17900	0.2	0.7

INDICATED GEOLOGICAL RESERVE (QUARTZ)	-	NON-MINEABLE RESERVE (QUARTZ)	=	UNDILUTED MINEABLE RESERVE (QUARTZ)	+	DILUTION	=	INDICATED DILUTED MINEABLE RESERVE
4,700	-	N I L	=	4,770	+	13,130	=	17,900

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ABERFOYLE MINE - DILUTED MINEABLE ORE RESERVE STATEMENT - 1ST OCTOBER 1978

LEVEL	INDICATED GEOLOGICAL RESERVES (Categories A,B,C & D)			INFERRED GEOLOGICAL RESERVES (Category E)		NON-MINEABLE GEOLOGICAL INDICATED RESERVES (QUARTZ TONNES) C + D			UNDILUTED INDICATED MINEABLE RESERVES A + B			PLANNED DILUTION TONNES	INDICATED DILUTED MINEABLE RESERVES A + B		
	QUARTZ TONNES	QUARTZ GRADE		ORE TONNES	ORE GRADE	SUB-ORE	PLANNED EXTRACTION LOSS	SUB-TOTAL	QUARTZ TONNES	QUARTZ GRADE			ORE TONNES	ORE GRADE	
		% Sn	% WO ₃							% Sn	% WO ₃			% Sn	% WO ₃
1	3370	2.5	0.6	2250	0.5	1520	550	2070	1300	2.6	0.9	4400	5700	0.6	0.2
2	6220	2.4	0.8	4350	0.7	1290	300	1590	4630	2.4	0.9	16170	20800	0.5	0.2
3	3230	2.8	0.6	4750	0.7	1110	350	1460	1770	3.2	0.8	8080	9850	0.6	0.1
4	6590	3.2	0.7	1300	0.9	1190	1390	2580	4010	3.2	1.0	15490	19500	0.7	0.2
5	8890	2.3	0.5	7700	0.6	5200	1250	6450	2440	2.6	0.7	7960	10400	0.6	0.2
6	7600	2.4	0.9	14000	0.5	3410	790	4200	3400	2.4	1.4	11800	15200	0.5	0.3
7	6670	1.9	0.5	1150	0.4	3080	3590	6670	-	-	-	-	-	-	-
8	8350	1.5	0.9	6400	0.6	5210	3030	8240	110	2.4	1.2	540	650	0.4	0.2
9	5820	1.5	0.9	6000	0.7	1010	3910	4920	900	1.6	1.5	2150	3050	0.5	0.4
10	1480	1.6	1.1	300	0.7	60	70	130	1350	1.5	1.1	3650	5000	0.4	0.3
11	600	1.1	0.8	-	-	110	490	600	-	1.0	-	-	-	-	-
12	1150	2.0	0.6	-	-	-	1150	1150	-	1.1	-	-	-	-	-
TOTAL	59970	2.2	0.7	48200	0.60	23190	16870	40060	19910	2.6	1.0	70240	90150	0.6	0.2

SEPTEMBER 30, 1976

INDICATED GEOLOGICAL RESERVE (QUARTZ) - NON-MINEABLE RESERVE (QUARTZ) = UNDILUTED MINEABLE RESERVE (QUARTZ) + DILUTION = INDICATED DILUTED MINEABLE RESERVE

59,970 - 40,060 = 19,910 + 70,240 = 90,150

INDICATED DILUTED MINEABLE RESERVE 8,750

INDICATED MINEABLE ORE RESERVE
114,800 TONNES