REPORT ON

THE OONAH STANNITE MINE

ZEEHAN TASMANIA

By

B.P. Thomson

10th October 1951

51-109

THE OONAH MINE, ZEEHAN, TASMANIA.

INTRODUCTION

On September 6th and 10th 1951 a brief surface examination of the Oonah Mine was made by K.J. Murray and me. Mr. Basil Douglas, the resident Government geologist at Zeehan, kindly made a skeleton stadia survey for us of the locality with theodolite and staff.

Taylor ?

The leaseholder, Mr. A.S. Robertson, and Mr. Bob Clarke, underground manager of Montana Silver Lead (N.L.), attempted to make the upper workings accessible for us by draining an adit. Caving of the ground during the week end forced them to abandon the attempt.

SUMMARY

Except in creek channels, lodes are poorly exposed if at all and also tributors had picked clean all the stannite in exposed workings. Hence information about the stannite lode was obtained mainly from Mines Department publications and by questioning local men who had worked in the mine.

The stannite lode has been mined to a vertical depth of 422 feet below the shaft collar - which represents 800 feet of backs measured in the plane of the lode. It is believed that nearly all of the exposed payable ore has been mined to this depth, although no diamond drilling was done in the mine to test possible extension in depth of the lode and repetition on the northern side of a fault that intersects the workings.

The mine is now probably water filled to the main adit level 50 feet below the main shaft collar. The main exit point for mine water is at Bell's adit to the south at approximately 70 feet below the main adit level. The main shaft is collapsed and blocked at the collar. The average stannite ore width is 30 inches and the best level, No. 5 at 322 feet, represented 60 to 100 tons of 4.5% Sn ore per foot, measured in the plane of the lode.

CONCLUSION

Apart from a possible, but not probable, ore shoot to the north of the fault, there is apparently no worthwhile tonnage of ore above the 422 feet level.

Exploration would aim at testing by drilling of the main stannite lode below this level. The possibility of intersecting payable lead ore in the lead lode in the hanging wall of the stannite lode can be considered. However, it is likely that the stannite lode will bottom or thin out to unpayable width as it appears to pitch away to the south east from the controlling fault which dips north-north-east.

HISTORY AND LEASE OWNERSHIP

Mining of the Oonah lodes probably commenced in 1890. The Oonah Silver Mining Company mined the main galena lode to the bottom of No. 6 level (422 feet) and ceased operations in 1899. Various tributors then mined out the stannite lode from the surface to the main adit level. In 1905 an English Company, the Oonah Mines Limited, was formed and a smelter erected at Silver Bell, south of Zeehan, to produce a copper-silver matte and a copper-tin alloy. By 1910 much of the stannite ore above the No. 6 level had been mined and it was planned to sink the main shaft another 150 feet to a total depth of 600 feet. No development below the No. 6 level was carried out, however, and shortly afterwards the mine closed down apparently due to the ineffective smelter treatment.

Little or no work has been done on the mine since. A Mr. Munro of Zeehan held the lease for many years and after his decease it was recently acquired by Mr. S.A. Robertson of Wivenhoe, Tasmania.

The area east, south and north of the Oonah is held by Zeehan Mines Proprietary Limited, a subsidiary of Broken Hill South Limited.

PRODUCTION

Complete records of the production of stannite are not available, but the following partial records give some idea of the amount:-

Year	Quarter Ending 31 March Tons	Quarter Ending 30 June Tons	Quarter Ending 30 Sept. Tons	Quarter Ending 31 December Tons
1898			1	
1899				35.5
1900		173.22		
1901		122.5		76) Waller reports
1902	165		469.47 for last year	) 1227 tons from) July 1901
1903	81 (2 mos) 244.55 sold for last 6 months	137	120	119

Year	Quarter Ending 31 March Tons	Quarter Ending 30 June Tons	Quarter Ending 30 Sept. Tons	Quarter Ending 31 December Tons
1904	73	94	112.25	47
1905	26.5			
1906				150 tons stacked
1907			500 tons sent	
1908			to England	
1909		1260	1230 firsts	
			477 seconds	1027
1910	1191	723.5 matte	9157 (567 matte)	369 (matte)

The above figures give a total of 16,862 tons of stannite mined. Allowing for the tonnage of stannite when only matte was reported and when the production was not recorded, the total amount of stannite mined was probably between 20,000 and 25,000 tons.

GENERAL GEOLOGY

The Oonah ore bodies represent a small part of the mineralization in the tin-copper-lead-zinc province extending from the contact of the Heemskirk granite batholith, three miles to the west, to Rosebery district, 10 miles or more to the north east. In the Zeehan district the volcanic and sedimentary rocks range from Cambrian to Devonian age. The mineralization is considered to be associated with the Devonian granite. The host rocks of Oonah ore bodies are Cambrian slates, quartzite, tuffs and spilitic lava (melaphyre). These rocks near the Oonah Mine are tightly folded into a major anticline plunging east-south-east and the rocks are extensively fractured and sheared. The majority of lodes in the locality are of the fissure filling type and the ore shoots appear to be controlled by fracture intersections - viz. faults and lode shears - with limited replacement in the fractures.

MINE GEOLOGY

Structure. A fault, or to use the local term "slide", striking N75°W and dipping north-north-east at 72° marks a crush zone extending without deviation through the mine workings. The actual plane of movement is reported to be shown by a brecciated channel up to two feet wide. The lode fractures appear to be either contemporary or post-fault in age. The main or "galena" lode is gradually bent from a north-south strike going north into the plane of the fault in which it continues as bunchy mineralization. It has not been found on the northern side of the fault.

The stannite lode is of a composite character. G.A. Waller[x] describes eastern and western stannite lodes in the upper levels and the surface workings indicate that two or more stannite lodes occur. The underground development below the No. 3 level appears to have been entirely on the eastern stannite lode. In plan the lode is parallel to the lead lode and is shaped like an elongated "S", formed by a high grade southern limb, a low grade central portion within the fault zone and a northern limb which was stoped only above the No. 3 level. On the Nos. 4, 5 and 6 levels the stannite lode merges into the walls of a sideritic lode up to seven feet wide, containing chalcopyrite, pyrite with a little galena and tetrahedrite. This is shown on the composite plan as the "West Carbonate" lode.

A similar siderite lode shown as the "North Carbonate" strikes N40°E and dips south east at 45° and crosses the fault without displacement as does the west stannite lode at the main adit level, according to Waller[x].

Stannite Lode Dimensions. According to W.H. Twelvetrees and L. Keith Ward[xx] the width and attitude of the stannite lode in detail varies markedly both in plan and section. The southern terminations of the stannite lode diminish to one inch threads of stannite, but widths generally improve as the fault is approached. The best level was the No. 5 (322 feet), which was stoped for 270 feet south of the fault and in places the stannite reached a width of four feet. The average width of the stannite ore throughout the mine is approximately 30 inches. Assuming this width for the No. 5 level, proved ore is of the order of 60 tons per foot measured in the plane of the lode.

On the No. 6 level the north drive exposes about 130 feet of stannite, probably 30 inches wide. This ore may continue for a further 200 feet north to the fault. Whether this ore continues into and through the fault, as was the case in the upper levels, is not known. The available information rather suggests that in depth the ore shoot below the No. 3 level pitches to the south east away from the northerly dipping fault, thus producing a longer ore body in depth, but at the same time tending to escape from the favourable structural environment of the fault. The influence of the north east striking siderite lode may be important, however, in maintaining favourable structural conditions, particularly as it is dipping in the direction of fold pitch of the host rocks.

Lode Mineralogy. Secondary enrichment is absent and primary sulphides are exposed at the surface. In the stannite lodes the sulphides occur as well defined bands of stannite, pyrite and chalcopyrite, with lesser amounts of galena, minor tetrahedrite, bismuthinite and wolfram. Mineragraphic examination by Dr. F.L. Stillwell also showed that cassiterite and arsenopyrite are associated with the stannite[+]. Gangue minerals are mainly quartz and siderite with a little fluorite.

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[x] G.A. Waller, "Report on the Zeehan Silver-Lead Mining Field", p.56.

[xx] W.H. Twelvetrees and L. Keith Ward, "The Ore Bodies of the Zeehan Field". Dept. of Mines Tasmania, Geol. Surv. Bull. No.8, 1910.

[+] W.H. Twelvetrees and L. Keith Ward, p.131 - a small cassiterite pyrite lode is said to be exposed on the surface a short distance east of the mine.

The massive pyrite associated with the stannite is said to assay 0.3% Sn, as does the pyrite in Bruce's and Pastkuchens' lodes in the locality. Clarke's lode on the Silver Queen, half a mile south east of the Oonah, is an extensive pyritic lode from which stannite ore has been produced in the past but as the ground is now held by Zeehan Mines Proprietary Limited, it was not inspected.

Analysis of a stannite specimen from the Oonah mine shows the following composition for the pure mineral -

Sn	23.27%	as sulphide)
	0.64%	as oxide)
Cu	26.77	
Fe	12.11	
Bi	2.27	
Sb	0.50	
As	Tr.	
Zn	0.47	
S	32.10	
SiO_2	1.40	
O	0.4	
	100.278%	

In spite of the banded character of the sulphides in the stannite lode, considerable intergrowth of stannite with pyrite and chalcopyrite has taken place and it is therefore anticipated that concentration by flotation methods would be difficult.

Grade of Stannite Ore. A grab sample of sulphides from a dump on the surface workings assayed 2.8% Sn. This is not representative. The ore as mined apparently averaged approximately 4% Sn. The following information is available -

	1	2	3	4	5	6	7	8	9
Silver, oz. per ton	63.0	22.0	84.0	50.0	63.0	59.6	75.5	60.5	68.0
Copper, per cent	10.7	5.5	11.5	10.3	13.8	12.0	13.5	12.25	11.5
Tin	9.2	4.5		16.0		9.73		8.7	9.0
Arsenic "	4.4								
Bismuth "	Trace	0.4							
		0.45							
Antimony "	"								
Zinc "	N/D	N/D							
Iron "	"	26.0							
		27.0							
Sulphur "	29.75	29.0							
Silica "	23.0	22.0							
		27.0							
Alumina "	2.20	4.0							
		5.0							

Heading 1. Bulk assay of 70 tons of handpicked ore sold in 1903

" 2. Bulk analysis of ore as mined in 1909

" 3 - 9. Assays of parcels of handpicked ore (from 11 to 61 tons each) sold during 1901-03.

(Brendan P. Thomson).

ADDENDUM

An important point which I overlooked is that part, at least, of the stannite lode may pitch in depth into the old tributor's lease 200 feet south of the main shaft. This lease is now included in Broken Hill South ground.

10 October, 1951.

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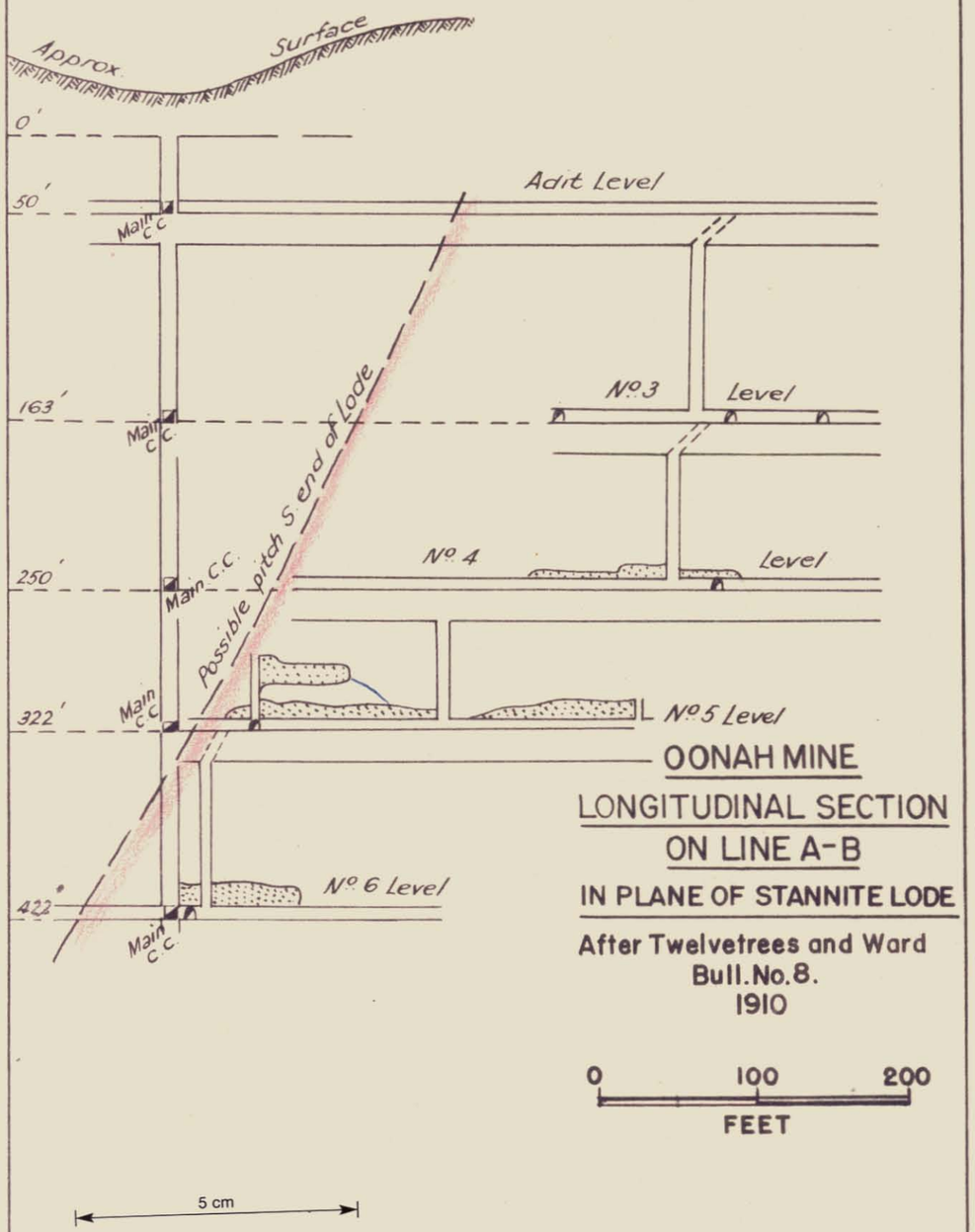
OONAH MINE
COMPOSITE PLAN

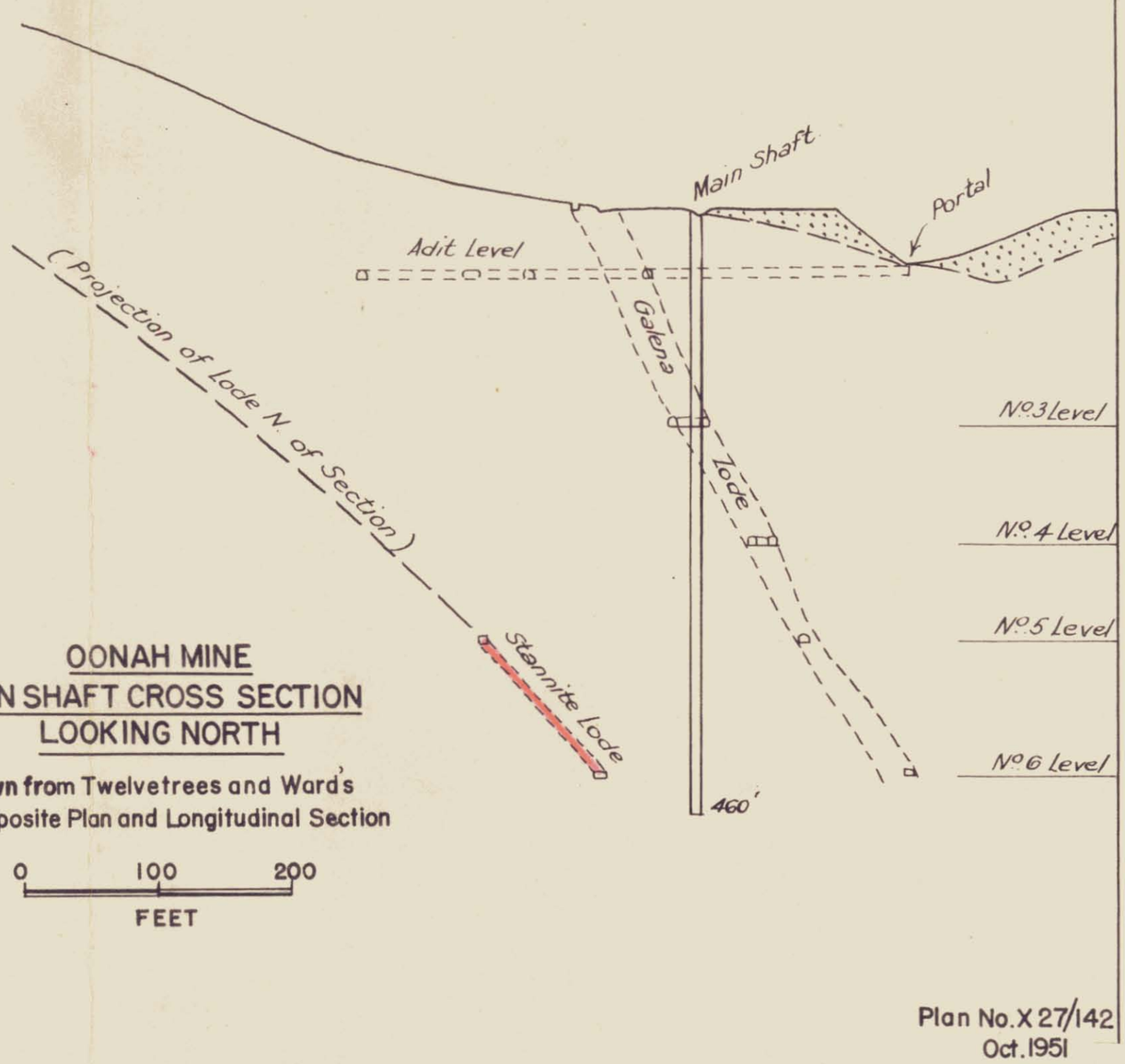
After Twelvetrees and Ward
Bull. No. 8.
1910



OONAH MINE
LONGITUDINAL SECTION
ON LINE A-B
IN PLANE OF STANNITE LODE

After Twelvetrees and Ward
Bull. No. 8.
1910

0 100 200
FEET



OONAH MINE
MAIN SHAFT CROSS SECTION
LOOKING NORTH

Drawn from Twelvetrees and Ward's
Composite Plan and Longitudinal Section

0 100 200
FEET

Plan No. X 27/142
Oct. 1951

51-109

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006

M.11780

SURFACE PLAN OONAH MINE

0 100 200 300

Assumed R.L. Main Shaft Collar 700'

o Sl.(R.L.) Stations located by stadia theodolite
otherpoints by compass and tape

740' Form lines

5 cm

Ridge

840' 820' 800' 780' 760' 740' 720' 700' 680'

B.

C.

D. tightly folded slate and quartzite Old mill site

Adit portal inaccessible

Adit

Hanrahans Shaft 97'

Lease peg

S7 (702·5)

S8 (693·5)

Stope break through

S6 (695·1)

Shaft

Sl.(700')

Shed

S9 (659·1)

Main Adit Portal

S4 (673·1)

S2 (700')

S3 (700')

Adit

Adit

Main Shaft collar collapsed)

Magazine Adit

slumped

traces galena py.

Open Cut

Tributors Surface workings on Stannite lodes

Crush Zone

S5 (776·2)

Adit

Stannite and py. on dump. Grab sample 2·8% Sn.

Stope break through

graphitic slate pyritic seams

57'

stope 2'

Stannite on dump

collapsed stope

Heavy bracken

Road

S10 (680·7')

Steel peg S.11 (662·7')

Crush Zone in slate

Bell's Adit

Datum peg S12 (597·0')

Main exit for mine water

1500N 1000N 500N 00

1500W 1000W 500W

Consolidated Lease Zeehan Mines Pty. Ltd.

Plan No. X27/143 Oct. 1951

524008

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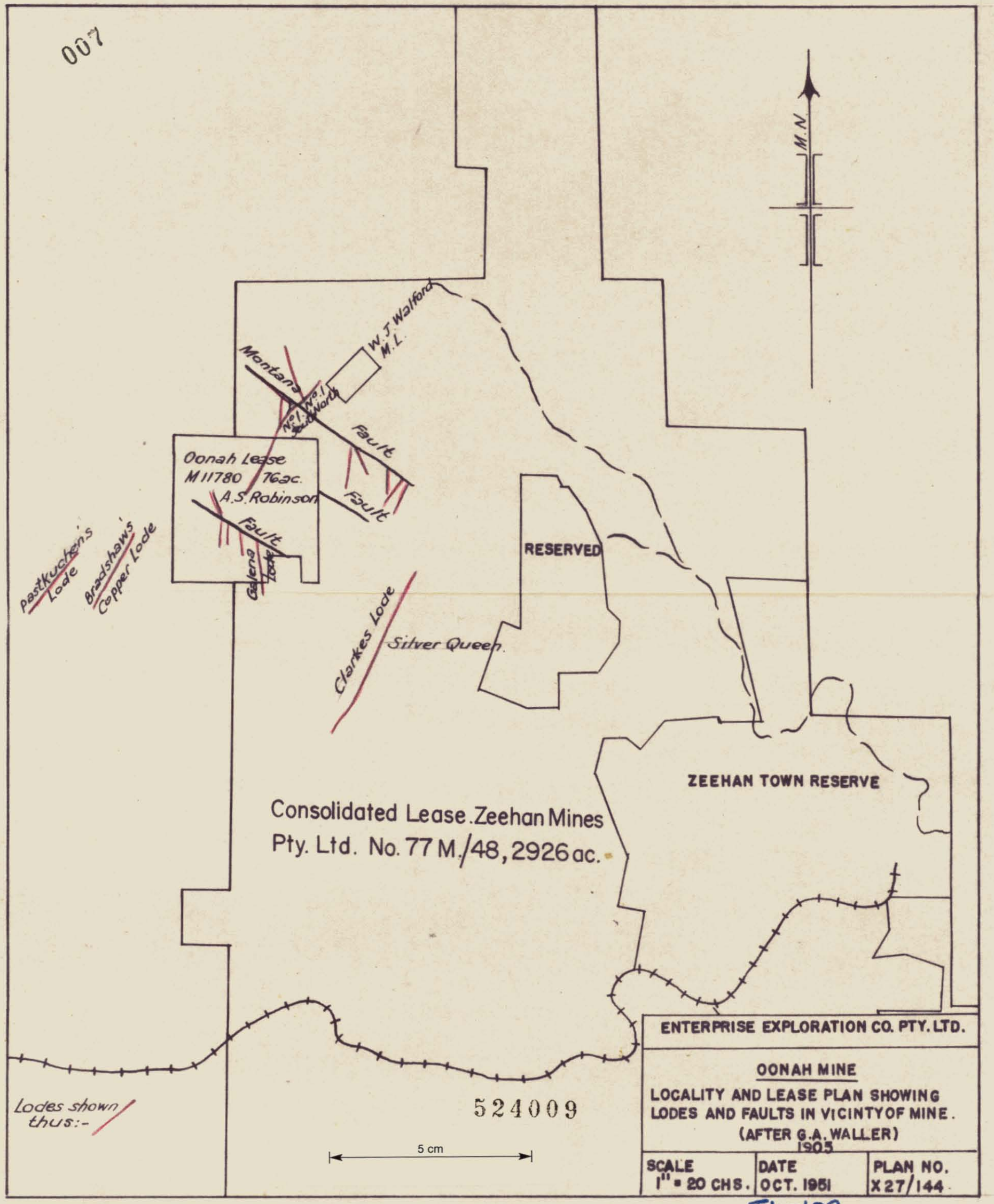

ENTERPRISE EXPLORATION CO. PTY. LTD.

OONAH MINE

LOCALITY AND LEASE PLAN SHOWING LODES AND FAULTS IN VICINTY OF MINE.
(AFTER G.A. WALLER) 1905

SCALE	DATE	PLAN NO.
1" = 20 CHS.	OCT. 1951	X 27/144

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