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BUREAU OF MINERAL RESOURCES
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RECORDS:

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Geological Report on the Wymah wolfram area.

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RECORD 1942/15
GEOLOGICAL REPORT ON THE UYNIAH VOLCANIC AREA.

(1) LOCATION: The Uyniah reefs are situated in fairly rugged mountainous country, between 1,500 and 2,000 feet above sea level, about 25 miles easterly from Albany. Access to the area is along the Hume Highway for 21 miles, then 15 miles of good gravel road, 1 mile through private property, fairly flat, and finally $\frac{1}{2}$ mile up a steep narrow road cut in the side of the creek valley. Alternative road to Albany via the Victorian side of the Hume Reservoir is 6 miles shorter but necessitates crossing the river near Uyniah by ferry. This crossing is also involved in transporting ore from Uyniah to the State Battery at Cranya, about 10 miles from the Uyniah reefs. The Hume Reservoir, present elevation of water level about 590 feet, is 4 miles from the mine by road. Nearest railway stations are Fable Top, 9 miles north of Albany in New South Wales, and Bullah in Victoria.

The Woolindinn reef only is on cleared country, in private property; all other reefs are on the slopes of thickly timbered ridges. Rock exposures are good throughout; outcrops are plentiful and the presence of reefs is marked by white quartz floaters on the hill slopes and in the gullies below.

Water supply in the area depends upon concrete storage dams which have been built in the various creeks. A spring with a very small flow exists at the head of the creek which passes the mine, referred to in this report as Uyniah Creek, and the seepage maintains a continuous flow for some distance along Appletree Creek, which was measured at 250 gallons per hour. Conservative estimates of the capacities of the various dams are:

Appletree - 18,000 gallons - elevation above sea level - 1427 feet
Woolindinn - 15,000 " " " " " - 1852 "

A smaller dam on Uyniah Creek above the old battery site is badly breached, due apparently to inadequate foundations.

The accompanying plan, scale 1 inch = 200 feet, shows the position of the reefs, most of the lenses involved, roads, creeks, and approximate contours, also two cross sections through the Uyniah Mine and a longitudinal section of the Woolindinn. Uyniah longitudinal section, scale 1" = 40', is on a separate plan.

(2) GENERAL GEOLOGY: The whole of the area mapped consists of granite. Where typically exposed it is a medium grained biotite granite but it varies greatly in character, pegmatitic phases being extremely common. Pegmatite does not appear to occur as definite dykes, but is developed locally in the granite in small patches or areas of considerable extent, particularly in the neighbourhood of the quartz reefs. Coarse feldspar and mica crystals, both muscovite and biotite, quartz and tourmaline are common. Graphitic granite was also noticed. Closely associated with the mineralization is the development of a fine-grained dark siliceous phase along the walls of the reefs. This selvage material grades into normal or pegmatitic granite on one side and is usually adjacent to the quartz of the reef on the other. It seems to be the result of interaction with the wall rock of siliceous solutions preceding or accompanying mineralization and was not definitely observed in separate dyke form. A small inclusion of slate in the granite was found in the lower adit.

(3) ECONOMIC GEOLOGY:

General - Several different reef systems exist; the principal ones are referred to as the Uyniah Nos. 1 and 2, the Williams Reef, the Appletree and the Woolindinn. The Monach area to the east was not examined. Ore has been extracted from the Uyniah and from the Woolindinn, the other reefs being opened up on the surface only. In several other places on the lower small quartz stringers have been exposed, but not of sufficient size to be worth considering.

The reefs, except Uyniah No. 1, occupy fairly straight fissures about 500 feet in length, striking from east-west to east-southeast - west-northwest. The strike of the Uyniah, Williams and Appletree reefs more or less parallels the contour of the hillside, while the Woolindinn outcrop is at right angles to it. Dips are steep to the north, about 80°. Width of the reefs does not exceed 5 feet except in

the section of the Wymah reefs that has been stoped, and varies considerably owing to local bulges. They are strongest about the centre, tailing off in thickness at the end to less than 1 foot, and small stringers of quartz can usually be located farther along the strike. The reef material consists of massive quartz with sometimes a little mica and a certain amount of ochreous staining. The wolfram occurs as long bladed crystals 1 inch or more in length. Molybdenite was seen and bismuth is apparently present in considerable quantity. The best wolfram shoots appear to occur centrally, where the reefs are widest, and it is usually difficult to find wolfram where the thickness of the quartz is less than 1 foot. From the pegmatitic associations (refer W. Lindgren, Mineral Deposits, p. 754) and from the fact that the fissures probably originated partly at least as cooling cracks in the granite mass, it is not considered likely that they will be very persistent in depth. This opinion is also expressed by Mr. Lloyd of the New South Wales Geological Survey, as a result of his experience elsewhere in New South Wales. Values in the reefs should show no relation to the depth from the surface, as secondary enrichment processes are negligible.

Wymah Reefs - This area was worked by the Wymah Wolfram Company in 1918-1919. An adit driven from the hillside cut the first lode at 36 feet, 25 feet below the surface; and the second at 95 feet, at 55 feet depth. Both lodes were driven on, and stoped above the level, the returns being 1950 tons valued at £2,450 in 1918; and 1570 tons valued at £4,813 (£2,166 wolfram, the remainder bismuth), in 1919. Work was commenced on a lower adit, to cut the lode 120 feet below the main adit and this drive had advanced 68 feet when the drop in price of wolfram, combined with other factors, caused the cessation of operations and the winding up of the Company.

Wymah No. 2 Reef - is exposed fairly continuously for a length of nearly 600 feet; it attains maximum width at the west end, the section that has been stoped out from the main adit. In the cross-cut the mineralised formation is 11 feet wide, but this includes horses of granite, while the outer portion consists of barren silicified material, mineralised quartz carrying wolfram being confined to the centre of the lode. The foot wall is a definite fissure which continues down while the mineralisation retreats from it (refer to cross section). According to Williams, a local miner, the lode cuts out immediately below the level in the cross-cut on a floor which dips flatly up to the east. This floor could not be observed, and may be a fault or a natural pinching out of the lode.

Exposure on the surface is not continuous just east of the stoped section but the lode in the long straight east-west fissure farther east is undoubtedly a continuation of the Wymah No. 2. It varies from one to three feet in thickness, pinches out at the eastern end, dips very steeply north, and has been gouged out from the surface for a few feet only. It is not known whether this section finishes at a shallow depth like the western end, but until proved it should not be relied on for any great reserves of ore.

Wymah No. 1 Reef - is not so persistent as the others on the field, its overall length being less than 300 feet. On the other hand it has developed several conspicuous bulges, gives off stringers frequently into the walls, and at the west end forms a complex pattern of multiple and cross reefs which pinch out rapidly. The width varies up to 5 feet or more, with the best wolfram values apparently in the centre of the thickest portions.

If the tonnage figures given in the reports on the operations of the Wymah Wolfram Company are reasonably accurate, the average wolfram value recovered from the ore treated in 1918 was .7% concentrates, presumably about 60% WO₃, and in 1919, .82% that is, .42% and .49% WO₃ respectively. This corresponds at present prices to about £2.10. 0 per ton. of ore. According to Mr. Coldham, probable losses in the mill would increase the actual wolfram content of the ore to at least double these figures. Bismuth values would, of course, be in addition. In order to furnish the tonnage mined in 1918-1919, the Wymah Nos. 1 and 2 reefs must have been pretty thoroughly stoped out above the level and not much ore sorting could have taken place. This is confirmed by Williams, and therefore furnishes a reliable estimate of the grade of the ore in bulk.

Confirmation to some extent of the values comes from a sample taken previously by Mr. Knight from the jig tailings dump at the old battery site. The sample was a composite taken from the bottom of numerous holes a few inches deep made all over the dump and returned .43 WO₃. (This dump was accurately measured and found to contain 360-400 tons.)

William Reef - This reef shows at its best in a 14 foot shaft 800 feet or so up the hillside east-northeast from the Wymah adit. A strong 2 foot lode dips practically vertically, but contains little visible wolfram. Potholes have imperfectly exposed quartz leaders up to 18 inches thick more or less along the strike for 400 feet. A fault was noticed cutting off the reef at the most westerly exposure. This reef as at present exposed does not appear to be sufficiently consistent along the strike to contribute large quantities of ore even if the values could be shown to be present.

Appletree Reef - The main Appletree Reef is the longest on the field, quartz being exposed for 1100 feet or more, though for a considerable length at each end it consists only of narrow stringers, probably not always continuous. The central portion is more or less opened up by shallow pits and shows a width of one foot or more for over 500 feet, reaching nearly 3 feet in one or two places, and probably averaging 15 to 18 inches. Dip as usual is steep to the north and strike west-northwest - east-southeast. Though by no means high-grade, more wolfram was noticeable here than at the other reefs, possibly because practically no mining has been done whereas at Wymah and Woolindina anything obvious containing payable values has been removed. A small parallel shewing higher up the hill does not appear to be of sufficient dimensions to be attractive.

Woolindina Reef - About the time that production was being obtained from the Wymah reefs, ore was being extracted in a small way from the Woolindina, some 50 tons being recorded, probably picked ore, estimated to contain 1½% wolfram. Blamuth was also present, as at Wymah. The general dimensions of the Woolindina are similar to Appletree and Wymah No. 1, the outcrop extending some 500 feet from the top of the ridge to about half way down it. Three adits have been driven on the lode and most of the ore treated has come from just above the top one. In the bottom adit the reef is first 6 to 9 inches wide dipping 70° to the north. Just above the adit, in a shaft 45 feet along, a bulge increases the width to 3 feet, but this is very local in character and the reef continues, 12 inches or less in width, with the dip varying from 70° to vertical. Not far past the shaft the dip turns over to the south and ultimately decreases to 45° south, where the reef plays out on a flat fault, which strikes southeast - northwest and dips southwest about 25°. This fault, which appears to be pre-ore, probably marks the bottom of the reef and in fact in the drive the reef shows no commercial ore for some distance before the fault. For this reason the ore which can be obtained from the Woolindina is likely to be very limited. Granite underneath the fault is very coarsely pegmatitic with large flakes of muscovite.

(4) PROSPECTS AND RECOMMENDATIONS:

Wymah No. 1 - In the absence of information on the level, particularly with regard to the behaviour lower down of the complex west end reef system, it is difficult to form an estimate of ore dimensions. From the amount that has been extracted and the length of reef developed, the best that can be expected could be about 4,000 tons per 100 feet. It is an open question whether it would be better to prove this section by continuing the lower adit another 300 feet to cut the lode channel or whether to sink on the lode from the present adit level. The bottom adit is 120 feet lower and could provide easy access for driving on the lode, if found, as well as a means of mining the ore between the two levels, so if carried out in conjunction with other work on the lodes would probably be preferable. Limited tonnages apparently remain above the adit level at the west end.

Wymah No. 2 - Apparently no ore is to be obtained below the adit level at the west end, the widest portion of the reef. The long eastern extension, if it should continue in depth at surface dimensions should provide some 3,000 tons of ore per 100 feet of depth, but in view of the

behaviour of the western portion, no reliance can be placed upon this, and the reef should be tested in depth either by winzing in one of the widest places at the surface, or by picking up the east drive on the lode in the main adit and extending along the reef or reef fissure. This would give backs increasing eastward from 50 feet to 140 feet, and provide a sounder basis for estimating the behaviour of the lode below the level.

Williams Reef - This line, on account of lack of continuity and doubt as to the values, does not appear promising as at present exposed, but should be opened up more on the surface to give a better idea of tonnage and wolfram content.

Appletree - The Appletree line gives the best immediate promise of appreciable amounts of ore. Per 100 feet depth it should furnish 4,500 tons or possibly more if the eastern extension should open up well. An adit about 250 feet in length from the east side of the gully to the lode would give 80 feet average backs, or it might be preferable to put one or two winzes down on the best exposures, about 80 and 300 feet east of the gully (refer to plan).

Woolindina - The 50 tons of ore mined from this reef are said to have averaged 1 1/2% wolfram. Further production is limited by the reef playing out along the fault at shallow depth (refer to longitudinal section) to probably not more than 1,250 tons. This has the advantage of being easily obtainable by adits from the hillside, three of which are already in existence.

(5) CONCLUSIONS: From the foregoing figures the following estimate of the total ore obtainable for 100 feet depth is compiled. Tonnage factor used is 14 cubic feet per ton.

a. Reasonably certain -

Wymah No. 1.	4,000 or 5,000 above bottom adit level
Appletree	4,500 and possibly more
Woolindina	<u>1,250 (complete)</u>
	<u>9,750</u> - 9,750

b. Doubtful -

Wymah No. 2	3,000
Williams (say)	<u>1,500</u>
	<u>4,500</u> - 4,500

TOTAL -- 14,250 Tons.

Until proving along the lines suggested above has demonstrated the behaviour in depth of the Wymah and Appletree reefs no estimate can be given of further possible ore and even acceptance of the above figures for the first 100 feet is not without risk. Furthermore, no information is obtainable upon values apart from that presented with regard to the Wymah and Woolindina reefs, and steps should be taken immediately to obtain large representative bulk samples of ore from the exposures on each of the five reefs and to run trials to ascertain the recoverable grade of wolfram.

N. H. Fisher

N.H. Fisher,
Chief Geologist. *per*

C. L. Knight

C.L. Knight,
Geologist.

A graphical scale bar labeled "SCALE OF FEET" with markings at 0, 100, 200, 400, 600, and 800 feet. The bar is divided into segments by vertical lines, with the first segment (0 to 100) filled with a checkered pattern.

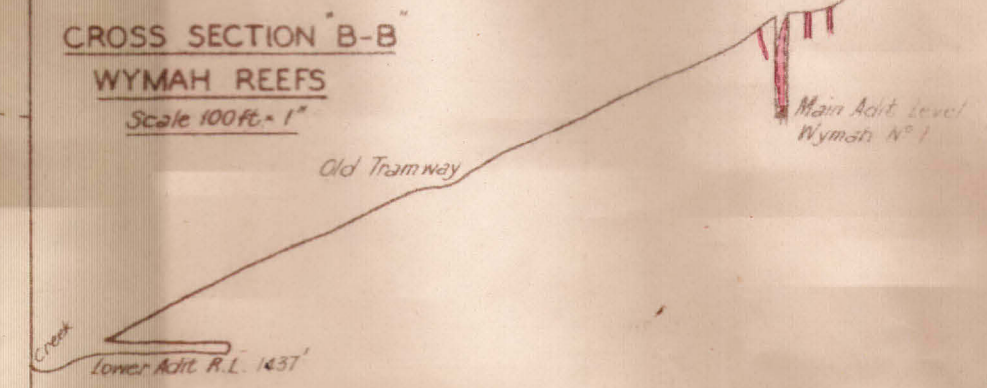
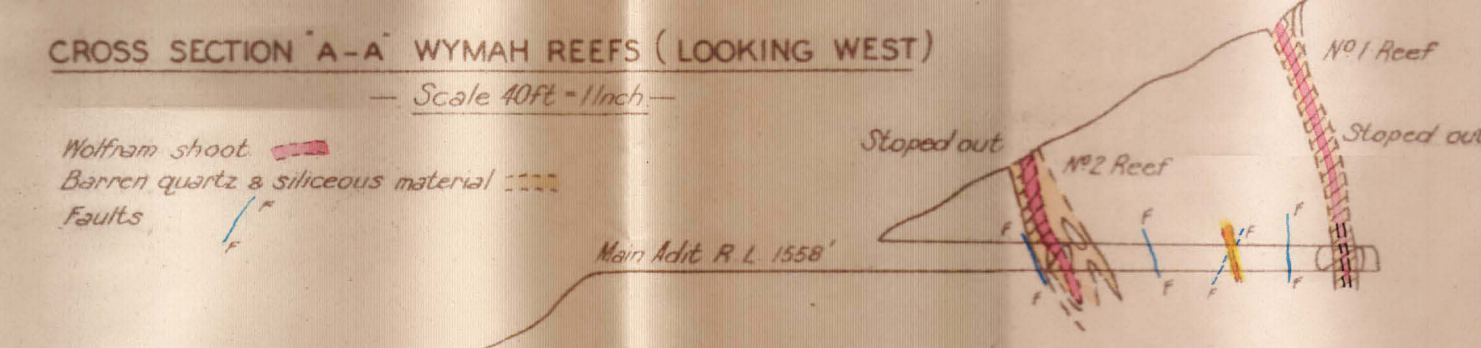
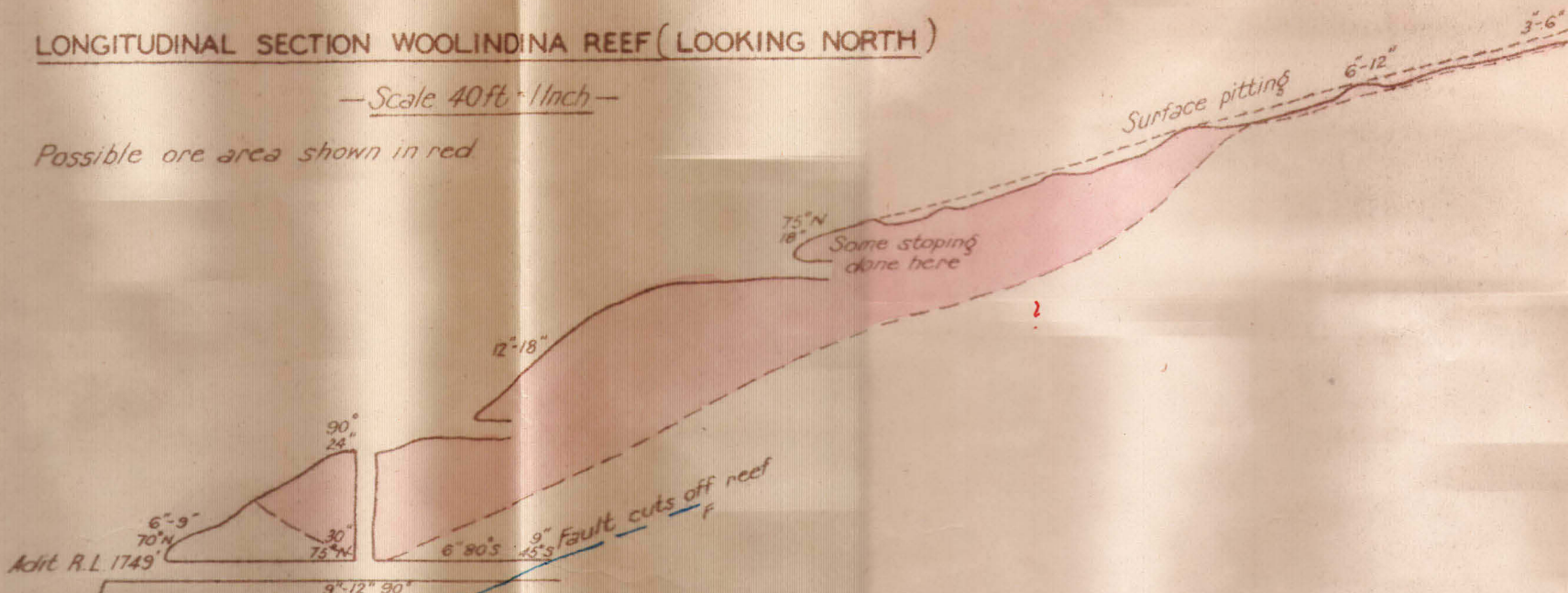
LEGEND

QUARTZ REEFS —————

REEFS UNCERTAIN F

FAULTS /

STOPED AREAS [|||||]



— LONGITUDINAL SECTION —
— WYMAH NOS. 1 & 2 REEFS —
FORESHORTENED HORIZONTALLY & VERTICALLY

