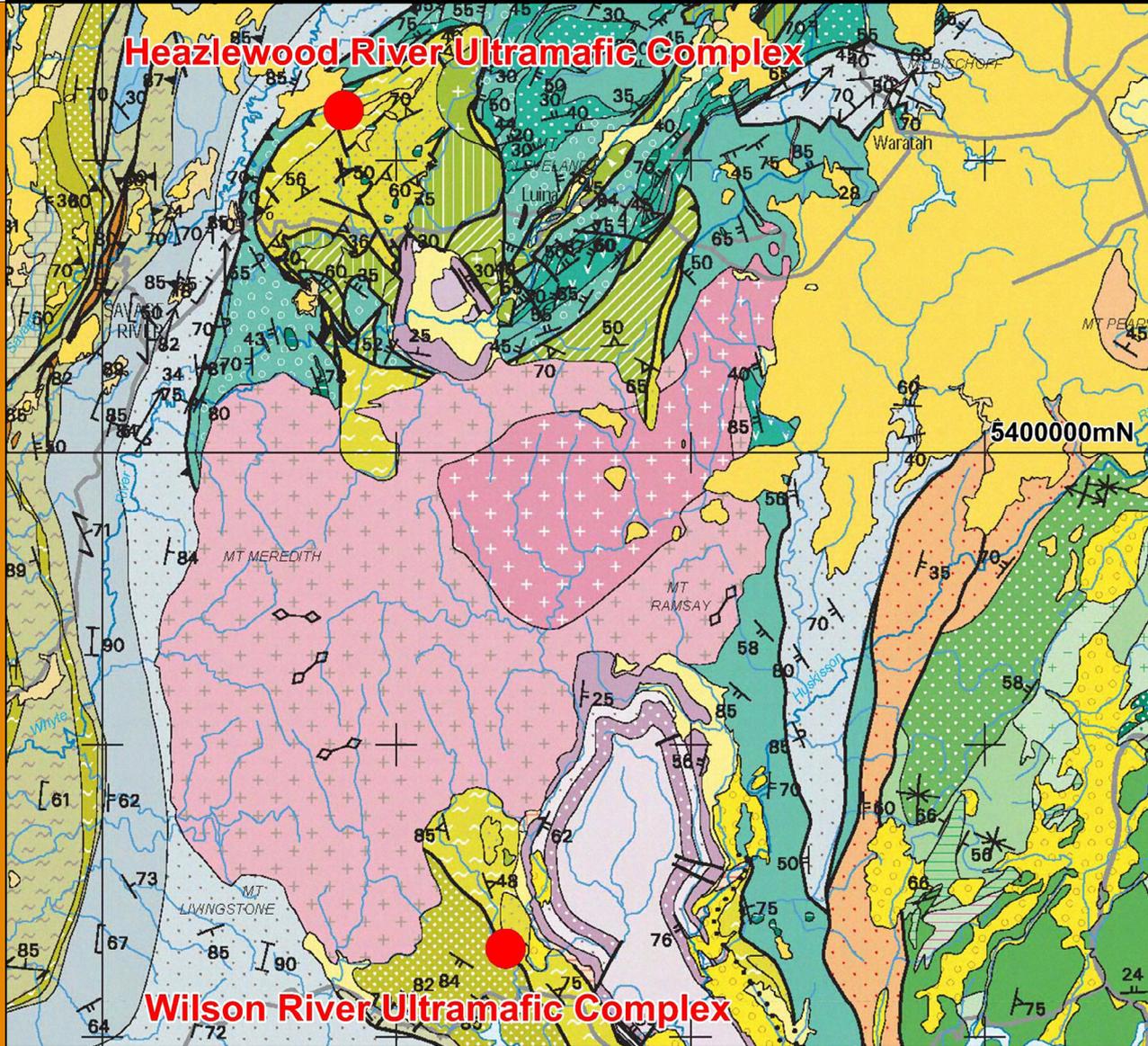




Ar/Ar dating of hornblende mylonites associated with allochthonous ultramafic rocks in Western Tasmania

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REPORT No.: TR38



Geological Survey
Technical Report 38





Mineral Resources Tasmania
Department of State Growth

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Cover: Geological map showing Heazelwood River and Wilson River ultramafic complexes in western Tasmania, including sample locations.

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by R. Berry

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The significance of the hornblende mylonites of Western Tasmania was first discussed by Berry & Crawford (1988). The petrology and geochemistry of these rocks was reported by Mulder et al. (2016) using field numbers as sample names. Some structural details were included in appendix 2 of Mulder et al. (2016).

A radiometric age dating program was initiated on these samples in 1989 with Prof Ian McDougall at RSES. The methods used were the same as described in Berry & McDougall (1986). From the samples reported in Mulder et al. (2016), eight samples were submitted for K/Ar dating. These scattered from 600 to 400 Ma. Four samples were selected for Ar/Ar hornblende dating that were closest to 500 Ma in K/Ar age, assuming these would be the least disturbed.

Table 1. Sample details and Ar/Ar total fusion age for hornblende from four samples of hornblende mylonites.

GDA94 Zone 55					
Harman Creek, Wilson River Complex	Field No.	Easting	Northing	Age (Ma)	2 σ error
71284	W3	363700	5383050	613.3	3.40
71289	W9	363700	5383050	582.4	3.00
Nineteen Mile Creek, Heazlewood River Complex					
71295	H11	358200	5411700	490.3	1.60
71298	H12/2	358200	5411700	457.8	1.60

From these samples, 71284 showed a classic saddle shape age spectrum. The low point on the saddle is 523 Ma which would generally be considered a maximum age. Sample 71289 also gave a saddle shaped pattern with the low step at 536 Ma. Sample 71298 gave a complex spectrum with no obvious interpretation. In contrast sample 71295, from Nineteen Mile Creek, gave an age spectrum that was an argon loss profile with a relatively poor plateau (Figure 1). The inferred age from six steps and 43% of the ^{39}Ar released was 509 ± 2 Ma (95% confidence). The complexity of this profile and the quality of the plateau was not considered good enough to publish alone and no further work was carried out.

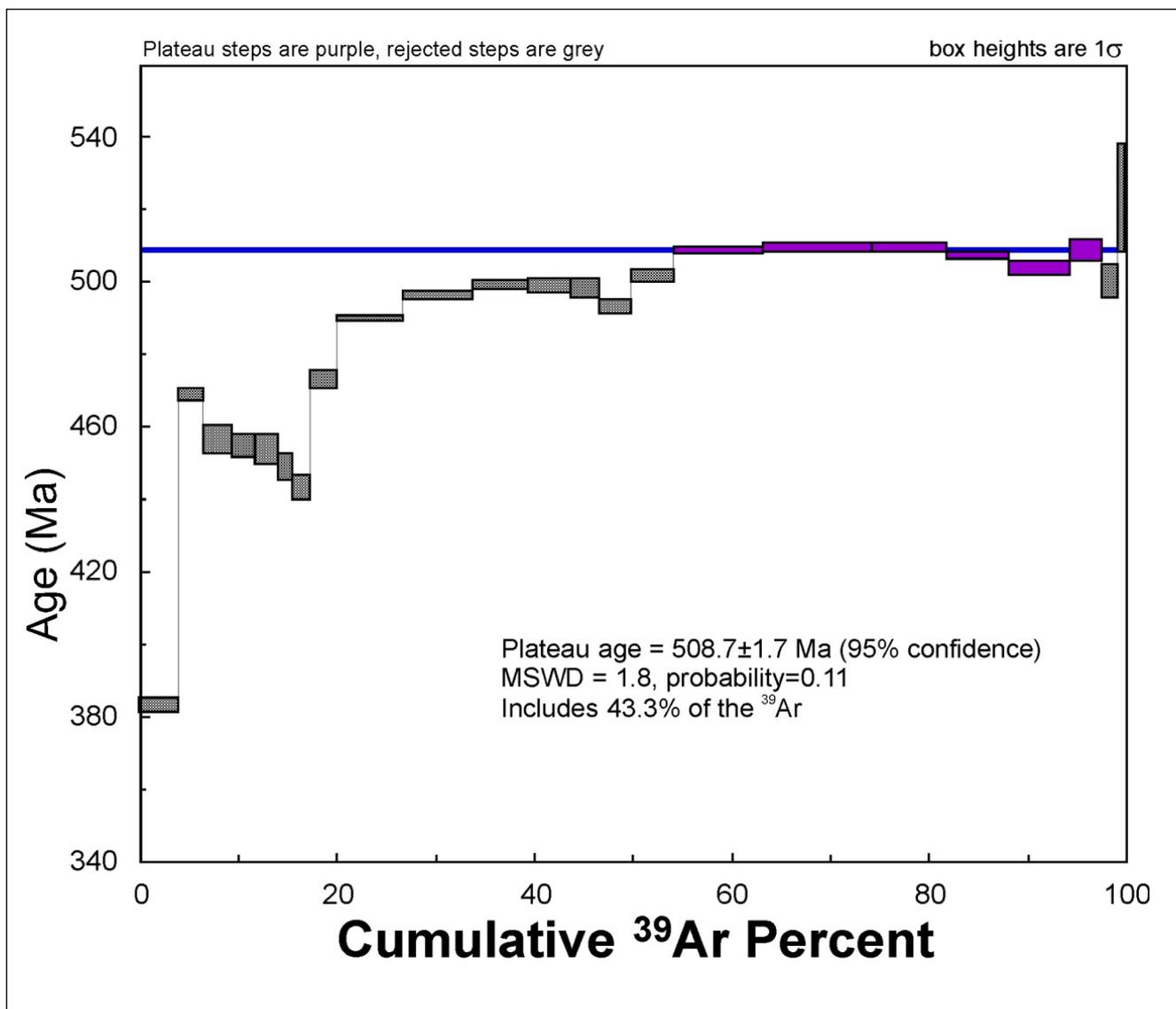


Figure 1. Step heat age spectrum for hornblende from sample 71295.

However, this result fits well with other data available on the metamorphic age of allochthonous units in western Tasmania and may be of use as additional supporting data.

References

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