National Argon Map: an AuScope Initiative
$^{40}Ar/^{39}Ar$ Geochronology Laboratory Sample Submission Form

This form must be completed and returned to Marnie Forster (Marnie.Forster@anu.edu.au) before any work can be commenced in the Argon Laboratories.

Person submitting samples: Nick Roberts
Affiliation: Mineral Resources Tasmania
Project Title: Mid-Cenozoic chronostratigraphy of central and northern Tasmania
Sample Number(s) (including IGSN if one exists): A501215 (MRT Reg. No.)
Mineral separation required? Yes or No: No
Date submitted: 20/07/2021

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Central/NW Tasmania	
1:250k SHEET NAME: Geology of SW Tasmania (2011)	**NUMBER:** SK55-3 Burnie (old series)
1:25k SHEET NAME: Rowallan (not published)	**NUMBER:** 4237
LOCATION METHOD: (GPS: GDA94), as reported by Entura	
ZONE: 55	
EASTING: 431797	**NORTHING:** 5378572
LATITUDE: 41°44'30"S	**LONGITUDE:** 146°10'47"E

STRATIGRAPHIC UNIT FORMAL NAME *:
STRATIGRAPHIC UNIT INFORMAL NAME: Tertiary basalts
LITHOLOGY: Basalt

DRILLHOLE ID (if applicable): RO-BH04/RO-BH04a (MRT ID 92373/92374)
PROSPECT (if applicable):
DEPTH FROM (metres): 293.75
DEPTH TO (metres): 293.95

* Stratigraphic Unit names can be searched and checked within the Australian Stratigraphic Units Database via the following link: https://asud.ga.gov.au/

Dating Objective

What is the geological question $^{40}Ar/^{39}Ar$ analysis will address?
Provide age constraint on an ~480-m-thick, mid-Cenozoic, palaeovalley-fill sequence of basalt flows and continental sediments underlying the western part of Tasmania's Central Plateau at Maggs Mountain.

What type of age(s) are expected? (e.g. magmatic crystallisation, metamorphism, fluid alteration/mineralisation, cooling, shearing etc):
Cooling/emplacement ages of an individual basalt flow near the base of the ~290-m-thick basalt stack that dominates the upper half of the drillhole.

Mineral target(s) for dating:
Groundmass.

Estimated $^{40}Ar/^{39}Ar$ age (e.g. Cenozoic, Mesozoic, Paleozoic, Proterozoic, Archean – provide estimated numerical age range if possible):
Cenozoic. Based on ^{40}K-^{40}Ar and $^{40}Ar/^{39}Ar$ ages of other Tertiary basalt-flow sequences in this part of Tasmania, the age is likely to be between ca. 40 and 20 Ma. Biostratigraphic constraints on sediment sequences in the region provided by pollen/spore assemblages suggest that a late-Eocene to early-Oligocene age is most probable.

Sample Information

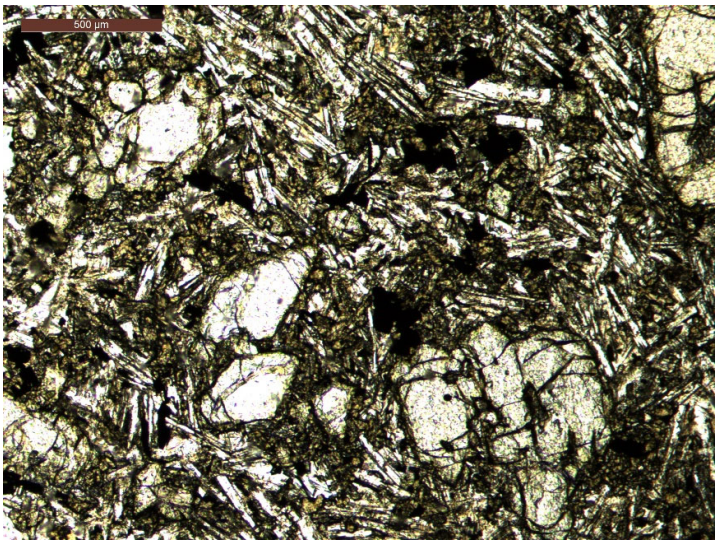
Location description (e.g. a sample of x was collected from y, z km from abc town):
This drillhole is located ~40 km south of the settlement of Wilmot, Tasmania, and ~2 km west of the north end of Lake Rowallan close to Maggs Road. The sample is from 293.75-293.95 m depth, ~280 m below the top of the basalt stack and ~10 m above the base of the basalt stack.

Lithological characteristics (rock description):
Fresh, well crystallised basalt flow (chemically hawaiite).

Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):
The sample is from the lowest flow in a sequence interbedded with and overlying unlithified to very poorly lithified, continental, clastic sediment. The sequence is overlain by ~13 m of late-Cenozoic glacial drift that predates the last glaciation. No previous geochronology has been conducted on this sequence, although six samples from the fine-grained sediments between and below flows of the basalt stack have been submitted for palynological analysis.

Thin section description (if available):
Abundant fresh olivine phenocrysts (mostly 0.5-1 mm), some embayed, lie in a well-crystallised intergranular groundmass of plagioclase laths, 150- 400 (-500) um long, clinopyroxene granules and fairly large (≤ 250 um) equant, irregular to elongate opaque grains, together with some interstitial clear K-feldspar and/or feldspathoid. No alteration or carbonate are noted.

Photograph(s) e.g. field site, hand-specimen, photomicrograph:
These and additional photomicrographs have been provided to laboratory staff at Curtin University.



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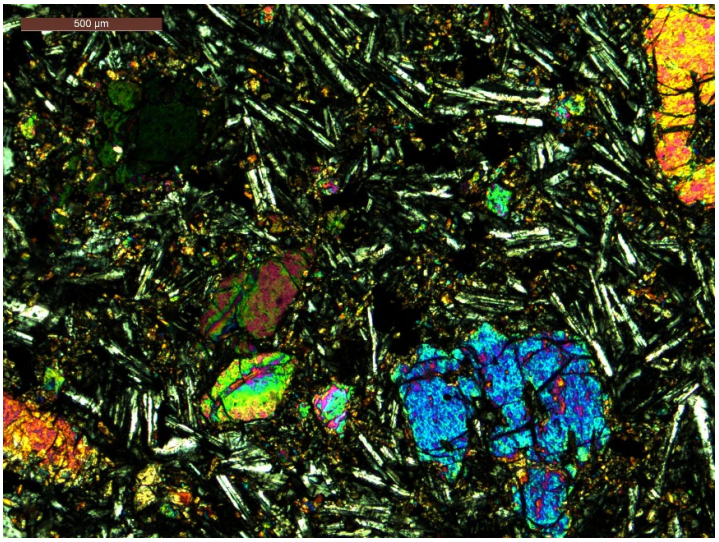

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Relevant bibliographic references:

None.