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): R010174 (MRT Reg No.); SHB4 (field number)
Mineral separation required? Yes or No: No
Date submitted: 20/07/2021

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Central northern Tasmania	
1:250k SHEET NAME: Geology of NW Tasmania (2020)	**NUMBER:** SK55-3 Burnie (old series)
1:25k SHEET NAME: Sheffield	**NUMBER:** 4441
LOCATION METHOD: 1:25000 topographic map, converted to GDA coordinates	
ZONE: 55	
EASTING: 454312	**NORTHING:** 5418683
LATITUDE: 41°22'55"S	**LONGITUDE:** 146°27'13"E

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

DRILLHOLE ID (if applicable):
PROSPECT (if applicable):
DEPTH FROM (metres):
DEPTH TO (metres):

* 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?

The sample near the top of a thick (~100 m) local basalt sequence, and together with R010173, will define the age of duration of volcanism in a poorly dated part of the Tasmanian Cenozoic.

What type of age(s) are expected? (e.g. magmatic crystallisation, metamorphism, fluid alteration/mineralisation, cooling, shearing etc):

Cooling/emplacement age.

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.

Sample Information

Location description (e.g. a sample of x was collected from y, z km from abc town):

This surface sample is from 4.7 km southeast of Railton, Tasmania, along Sunnyside Road at an elevation of 280 m asl.

Lithological characteristics (rock description):

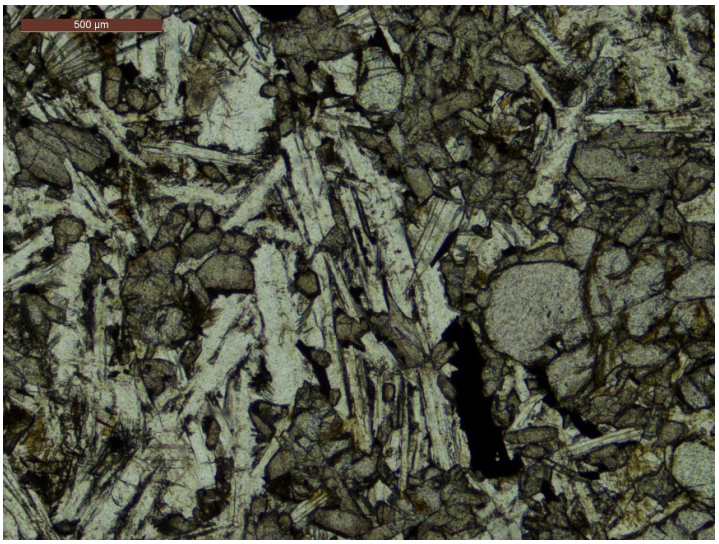
Hawaiite.

Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):
This sample probably overlies the nearby olivine nephelinite sample R010173 (submitted in the same batch) and is expected to be younger than that sample.

Thin section description (if available):
This coarse-grained holocrystalline basalt has an intergranular texture. Euhedral to subhedral olivine phenocrysts (≤ 2.5 mm, grading to groundmass) are 90-95% unaltered, with minor brown iddingsite alteration along some fractures and rims.
The groundmass consists of randomly oriented plagioclase laths (typically 0.5 - 1.5 mm long x 50 - 150um wide), olivine granules and weakly coloured augite granules (<700 um but mostly 50 - 300um) with mauve titaniferous rims. Opaque minerals are fairly abundant as angular, equant or elongate (<500 um) grains. Minor (<1%) biotite is present as minute (20 – 50 um) orange-red pleochroic splinters. Acicular (typically ~200 um x <5 um) apatite is an accessory phase. There are a very minor interstitial patches of poorly crystalline material rich in opaque dust.

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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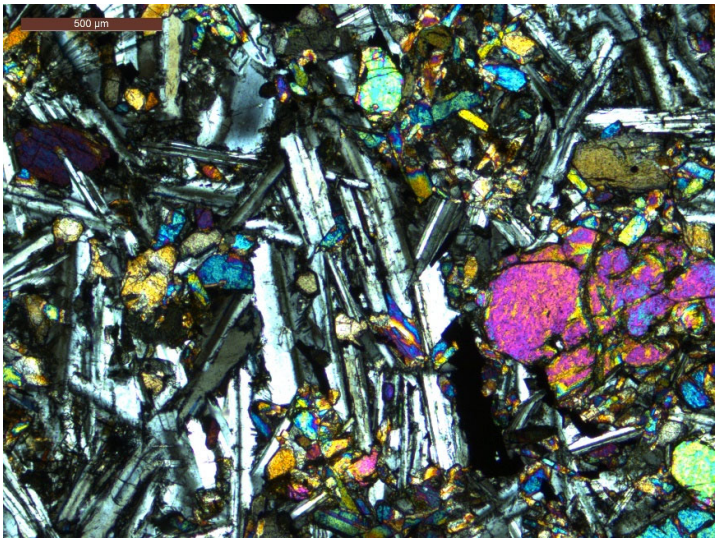

R010174_SHB4_x5_XN

Relevant bibliographic references:

None.