

# National Argon Map: an AuScope Initiative

## <sup>40</sup>Ar/<sup>39</sup>Ar Geochronology Laboratory Sample Submission Form

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

<b>Person submitting samples:</b> Joshua Shea
<b>Affiliation:</b> Macquarie University
<b>Project Title:</b> Geochronology of the eastern Australia leucitite suite
<b>Sample Number(s) (including IGSN if one exists):</b> 1701
<b>Mineral separation required? Yes or No:</b> No
<b>Date submitted:</b> 15/02/2021

<b>GEOGRAPHIC AREA/ PROVINCE/ BASIN :</b> Lachlan Orogen	
<b>1:250k SHEET NAME:</b> Cargelligo	<b>NUMBER:</b> SI/55-6
<b>1:100k SHEET NAME:</b> Rankins Springs	<b>NUMBER:</b> 8230
<b>LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94):</b> WGS 84	
<b>ZONE:</b> N/A	
<b>EASTING:</b> N/A	<b>NORTHING:</b> N/A
<b>LATITUDE:</b> -33.795067	<b>LONGITUDE:</b> 146.085167

<b>STRATIGRAPHIC UNIT FORMAL NAME *:</b> Tullibigeal Leucitite
<b>STRATIGRAPHIC UNIT INFORMAL NAME:</b> Flagstaff Hill Leucitite
<b>LITHOLOGY:</b> Leucitite

<b>DRILLHOLE ID (if applicable):</b> n/a
<b>PROSPECT (if applicable):</b> n/a
<b>DEPTH FROM (metres):</b> n/a
<b>DEPTH TO (metres):</b> n/a

\* 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 <sup>40</sup>Ar/<sup>39</sup>Ar analysis will address?**

Updating legacy ages <sup>40</sup>K/<sup>40</sup>Ar ages with <sup>40</sup>Ar/<sup>39</sup>Ar ages, and comparing Rb-Sr ages with updated Ar ages to assess Ar loss. We hope to see if assess if the magmatic event was longer lived or to confirm it was a short lived event with preferred Ar ages.

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

Magmatic crystallisation

**Mineral target(s) for dating:**

Leucite groundmass

**Estimated <sup>40</sup>Ar/<sup>39</sup>Ar age (e.g. Cenozoic, Mesozoic, Paleozoic, Proterozoic, Archean – provide estimated numerical age range if possible):**

Miocene (Cohen *et al.* 2008)

### Sample Information

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

Taken from an outcrop on the side of the road, at the co-ordinates given above, which provided a fresh sample.

**Lithological characteristics (rock description):**

Aphanitic mafic rock with a blue hue.

**Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):**

n/a

**Thin section description (if available):**

n/a

**Photograph(s) e.g. field site, hand-specimen, photomicrograph:**

n/a

**Relevant bibliographic references:**

Cohen, B. E., Knesel, K. M., Vasconcelos, P. M., Thiede, D. S. & Hergt, J. M. 2008.  $^{40}\text{Ar}/^{39}\text{Ar}$  constraints on the timing and origin of Miocene leucitite volcanism in southeastern Australia. *Australian Journal of Earth Sciences*, 55, 407-418.