

National Argon Map: an AuScope Initiative

$^{40}\text{Ar}/^{39}\text{Ar}$ 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.

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| Person submitting samples: Anthony Reid |
| Affiliation: Senior Principal Geoscientist, Geological Survey of South Australia |
| Project Title: Dating of mineralisation-related alteration in the Olympic Cu-Au Province, Gawler Craton |
| Sample Number(s) (including IGSN if one exists): 1707876 |
| Mineral separation required? Yes or No: Y |
| Date submitted: 20/03/2020 |

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| GEOGRAPHIC AREA/ PROVINCE/ BASIN : Curnamona Province | |
| 1:250k SHEET NAME: OLARY | NUMBER: |
| 1:100k SHEET NAME: Olary | NUMBER: |
| LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94) GDA2020 | |
| ZONE: 52 | |
| EASTING: 385177.95 | NORTHING: 6503524.51 |
| LATITUDE: -31.5976533 | LONGITUDE: 139.7896739 |

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| STRATIGRAPHIC UNIT FORMAL NAME *: Bimbowrie Suite |
| STRATIGRAPHIC UNIT INFORMAL NAME: NA |
| LITHOLOGY: two mica granite |

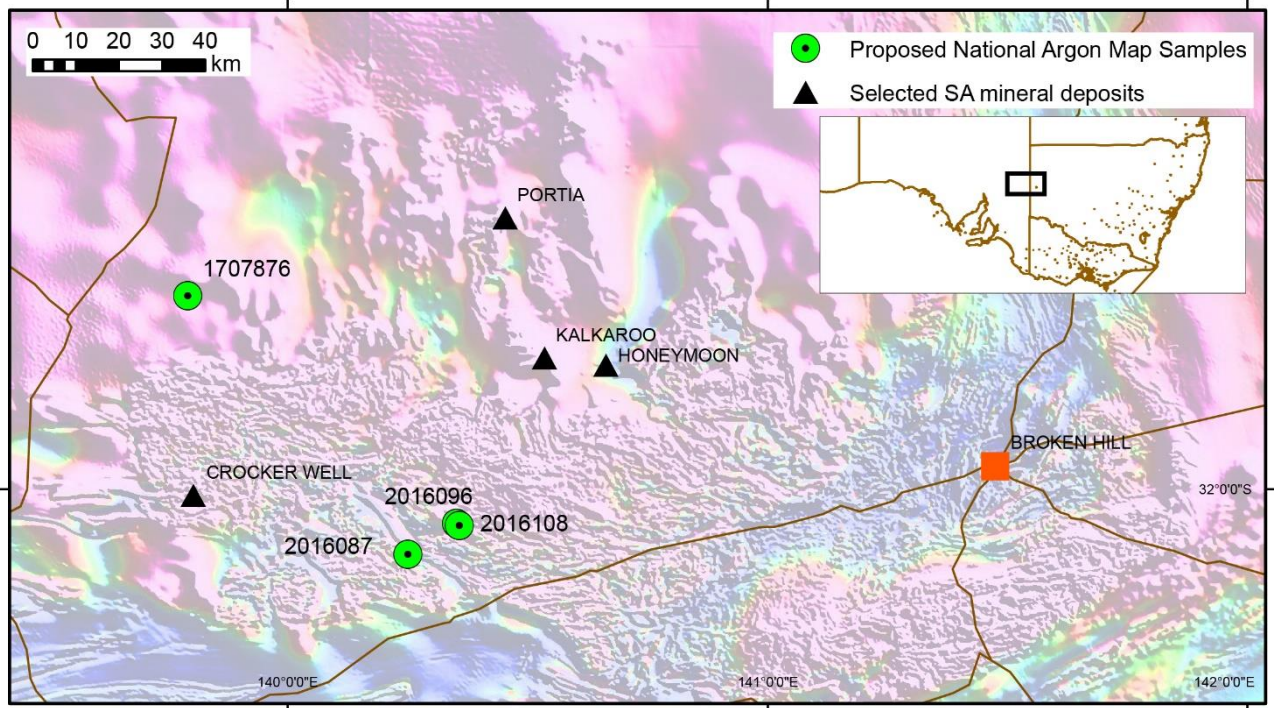
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|---|
| DRILLHOLE ID (if applicable): Frome 12 |
| PROSPECT (if applicable): |
| DEPTH FROM (metres): 1513 |
| DEPTH TO (metres): 1519 |

* 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 $^{40}\text{Ar}/^{39}\text{Ar}$ analysis will address?

The Curnamona Province is host to one of the world's largest mineral deposits at Broken Hill and has prospectivity for IOCG mineral systems as witnessed by deposits such as Kalkaroo and Portia. There is however, very little argon geochronology from the Curnamona Province, in particularly the South Australian portion of the region. The samples selected are from the Bimbowrie region and from a regional drill hole that will assist with gaining baseline information on the thermal evolution of the Curnamona Province.



Location map of Curnamona Province samples. Backgroundlayer is national Total Magnetic Intensity image, Geoscience Australia.

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

Cooling age

Mineral target(s) for dating:

Biotite, muscovite

Estimated $^{40}\text{Ar}/^{39}\text{Ar}$ age (e.g. Cenozoic, Mesozoic, Paleozoic, Proterozoic, Archean – provide estimated numerical age range if possible):

Mesoproterozoic

Sample Information

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

Granite within the Bimbowrie region.

Lithological characteristics (rock description):

Sample 1707876 is a medium grained two mica granite from the drill hole Frome 12. The drill hole is located on the western edge of the Benagerie Ridge in the central Curnamona Province. The granite contains both muscovite and biotite that are suitable for $^{40}\text{Ar}/^{39}\text{Ar}$ dating.

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

This granite has been dated at 1594 ± 8 Ma (Jagodzinski and Fricke, 2010) and is part of the Bimbowrie Suite.

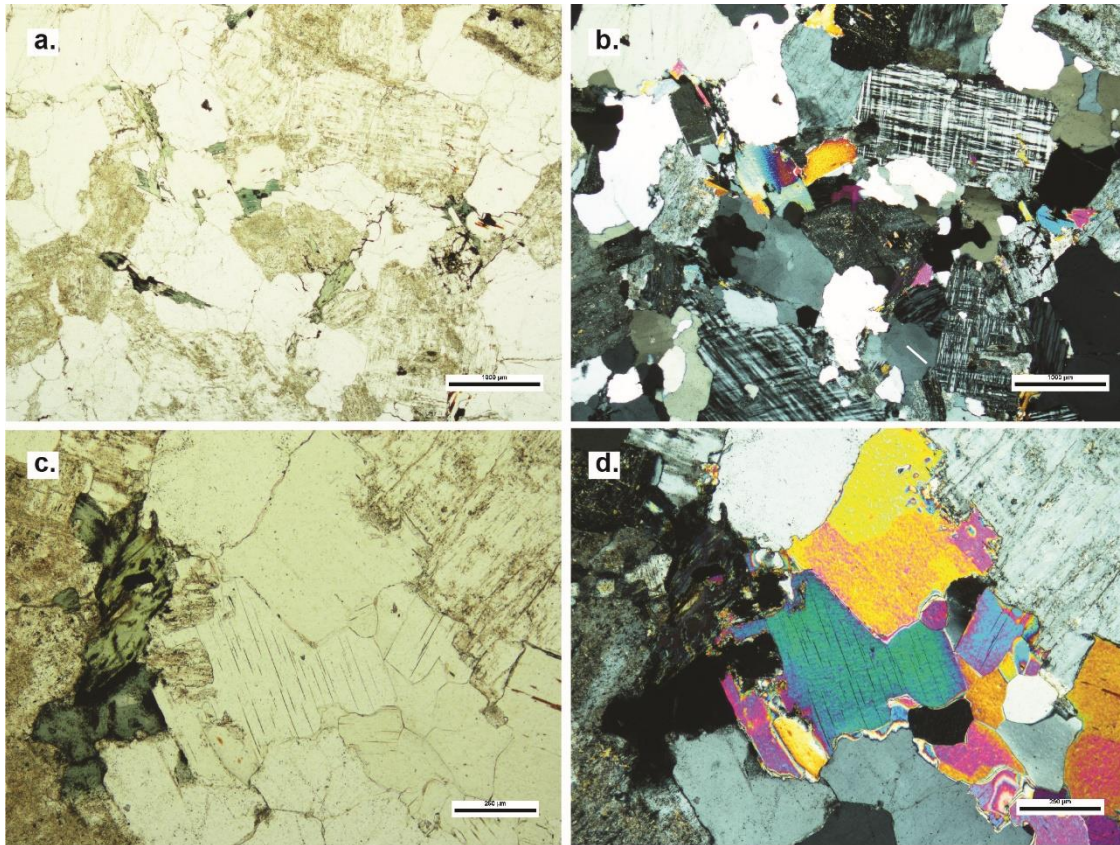
Thin section description (if available):

Granite has an equigranular granoblastic texture and comprises K-feldspar (microcline), plagioclase and quartz with muscovite and biotite laths. The plagioclase is moderately sericite altered and biotite is green in colour and is likely variably chlorite altered.

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



Photograph of sample 1707876.



Photomicrographs of sample 2016087. a. Plain polarised light. b. Cross polars. c. Plain polarised light. d. Cross polars.

Relevant bibliographic references:

Jagodzinski, E.A., Fricke, C.E., 2010. Compilation of new SHRIMP U-Pb geochronological data for the southern Curnamona Province, South Australia, 2010. South Australia. Department of Primary Industries and Resources. Report Book 2010/00014.

<https://sarigbasis.pir.sa.gov.au/WebtopEw/ws/samref/sarig1/image/DDD/RB201000014.pdf>