

# 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> Ian T Graham
<b>Affiliation:</b> UNSW Sydney
<b>Project Title:</b> Geology, Petrology and Gem Minerals of the Anakie Gemfields, central Queensland
<b>Sample Number(s) (including IGSN if one exists):</b> NRSP-5
<b>Mineral separation required? Yes or No:</b> No
<b>Date submitted:</b>

<b>GEOGRAPHIC AREA/ PROVINCE/ BASIN :</b> Anakie Inlier	
<b>1:250k SHEET NAME:</b> Emerald	<b>NUMBER:</b> SE-55-15
<b>1:100k SHEET NAME:</b> Rubyvale	<b>NUMBER:</b> 8451
<b>LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)</b> GDA-94	
<b>ZONE:</b>	
<b>EASTING:</b> 147.73563E	<b>NORTHING:</b> 23.43195S
<b>LATITUDE:</b>	<b>LONGITUDE:</b>

<b>STRATIGRAPHIC UNIT FORMAL NAME *:</b> Hoy Basalt Province
<b>STRATIGRAPHIC UNIT INFORMAL NAME:</b>
<b>LITHOLOGY:</b> Porphyritic olivine basalt.

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

\* 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?** This sample is from a small pug unusually rich in megacrysts and xenocrysts. It also contains a corundum. Historically, surrounding this plug, the grade of sapphire mined in gravels and volcanoclastic material was unusually high. Dating of this plug will help constrain the timing that corundum was elevated to the surface and timing of a rapid eruption from mantle depth.

**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:** NONE (whole rock)

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

### Sample Information

**Location description (e.g. a sample of x was collected from y, z km from abc town):** Collected from a small pug located 3.7km SE of Rubyvale.

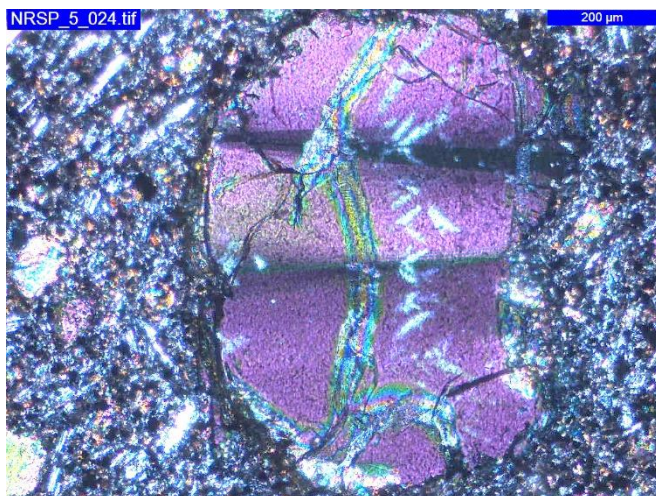
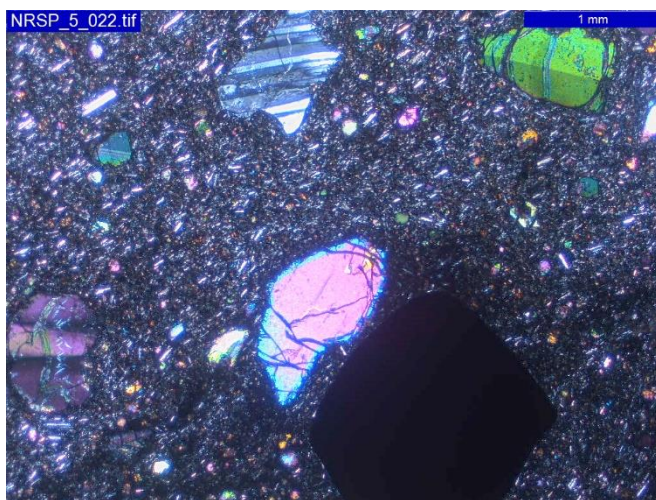
**Lithological characteristics (rock description):** A mid-grey fine grain basalt unusually rich in xenocrysts. Spinel is up to 1cm in size.

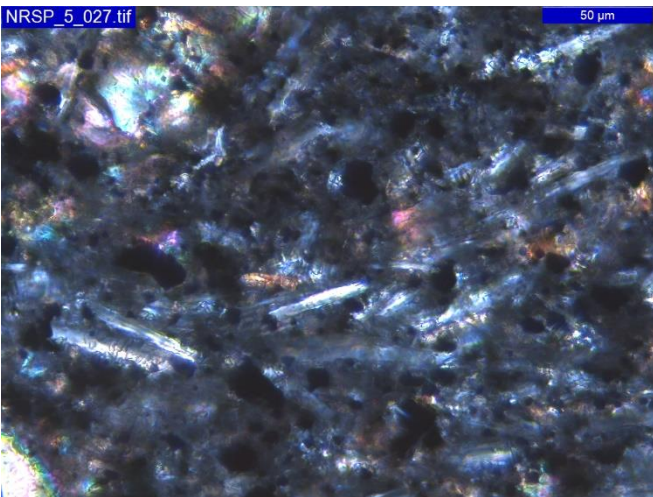
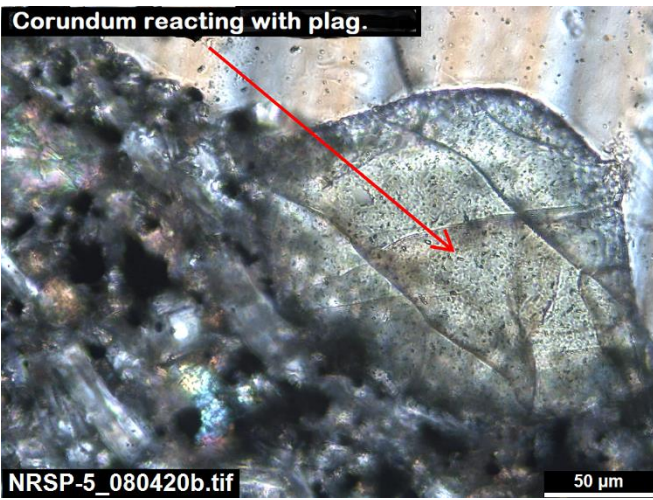
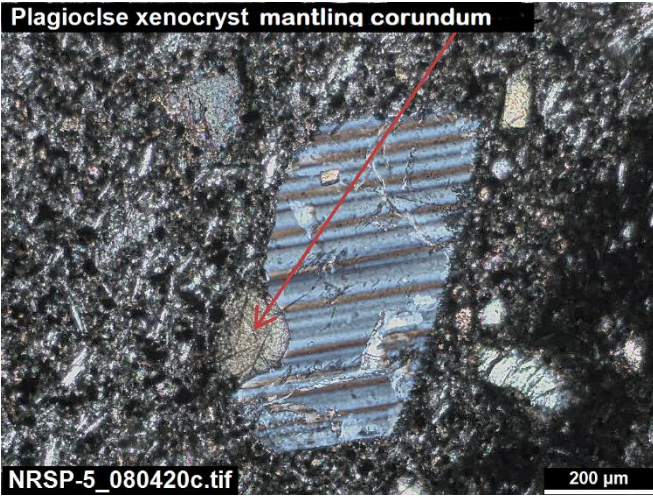
**Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):** This small pug intrudes pre-Devonian Anakie Metamorphic schists.

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

Porphyritic olivine basalt with large xenocrysts of plagioclase and mantle olivine, with the latter displaying deformation twinning. Phenocrysts of spinel are common. The groundmass displays flow structure and comprises microcrystalline laths of plagioclase, clinopyroxene, opaques and altered glass.

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





**Relevant bibliographic references:**