

## Psammitic schist 243010

<b>Person submitting samples:</b> Catherine Spaggiari / Dave Kelsey
<b>Affiliation:</b> Geological Survey of Western Australia
<b>Project Title:</b> Project Manager / Senior Geologist
<b>Sample Number(s) (including IGSN if one exists):</b> 243010
<b>Mineral separation required? Yes or No:</b> Yes
<b>Date submitted:</b> May 2020

<b>GEOGRAPHIC AREA/ PROVINCE/ BASIN :</b> Kiwirikurra Community / West Arunta Orogen	
<b>1:250k SHEET NAME:</b> Wilson	<b>NUMBER:</b> SF 52-9
<b>1:100k SHEET NAME:</b> Top Up Rise	<b>NUMBER:</b> 4352
<b>LOCATION METHOD: (GPS: GDA94)</b>	
<b>ZONE:</b> 52	
<b>EASTING:</b> 338397	<b>NORTHING:</b> 7503072
<b>LATITUDE:</b> -22.57142	<b>LONGITUDE:</b> 127.42816

<b>STRATIGRAPHIC UNIT FORMAL NAME *:</b> No formal names as yet for the Top up Rise samples
<b>STRATIGRAPHIC UNIT INFORMAL NAME:</b> TBC, based on new U-Pb data in progress and geochemistry.
<b>LITHOLOGY:</b> Psammitic schist

<b>DRILLHOLE ID (if applicable):</b> TUR13DD004
<b>PROSPECT (if applicable):</b> Top Up Rise
<b>DEPTH FROM (metres):</b> 346.22
<b>DEPTH TO (metres):</b> 349.28

\* 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 ages of metamorphism and deformation events; to compare to the Mundrabilla Shear Zone samples.

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

Age or cooling age of deformation related to foliation growth.

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

White mica

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

Younger than c. 1870 Ma; likely younger than c. 1610 Ma.

### Sample Information

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

Top up Rise samples come from the Top up Rise prospect drillcores, which were drilled approximately 41 km northwest of Kiwirikurra, in the Gibson Desert. These rocks lie beneath the Canning Basin, and no other information about them is available.

**Lithological characteristics (rock description):**

Fine- to medium-grained, strongly foliated to mylonitic schist. Orange K-feldspar porphyroclasts are present locally, strung out in the foliation. Muscovite and biotite are present too. In some muscovite-rich layers muscovite is up to 1 cm in size. The rock has a bluish-grey colour that is familiar to this rock type in this hole. Must be calcareous in composition as it contains epidote and clinozoisite.

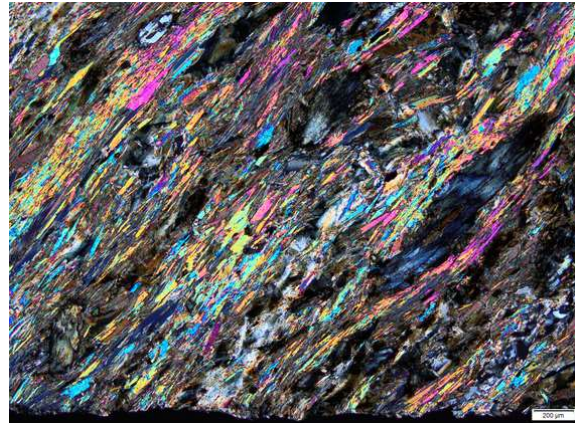
**Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):**

SHRIMP U-Pb dating is in progress. Preliminary data indicates  $1880 \pm 5$  Ma and  $1872 \pm 5$  Ma for magmatic crystallization of a granite protolith to granite gneiss, and c. 1610 Ma for high grade metamorphism.

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

Muscovite + epidote + ?allanite + chlorite + zoisite + biotite schist. The matrix of the rock comprises quartz, fine-grained muscovite/sericite (much of which could be replaced feldspar) and partially altered feldspar (commonly with internal zoning visible). Coarse muscovite is rarer but does occur. Fabric is defined by muscovite + qz + fsp interlayering as well as in some layers by biotite + chlorite + muscovite. Layers with biotite and chlorite commonly feature a lot of unoriented muscovite and lesser unoriented biotite and chlorite. Ep-Czo and Zo occur heterogeneously though the sample, mostly concentrated in the chlorite + muscovite + biotite rich layers. Zo doesn't tend to occur with Ep/Czo. Some zoisite grains have a darker brown core which may well be allanite (see photo). Ep/czo are mostly anhedrally-shaped grains, whereas zoisite is usually more euhedral.

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



***Relevant bibliographic references:***

**Top up Rise prospect:**

Nothing published as yet. There is a company report on the drillcores:

Border Exploration, 2013, Geological Survey of Western Australia, Statutory mineral exploration report A099481, 29p.

**Relevant information:**

JA Hollis, CL Kirkland, CV Spaggiari, IM Tyler, PW Haines, MTD Wingate, EA Belousova, and RC Murphy, 2013, Zircon U-Pb-Hf isotope evidence for links between the Warumpi and Aileron Provinces, West Arunta Region: Geological Survey of Western Australia Record 2013/9, 30p.

Spaggiari, CV, Haines, PW, Tyler, IM, Allen, HJ, de Souza Kovacs, N and Maidment, D 2016, Webb, WA Sheet SF 52-10 (2nd edition): Geological Survey of Western Australia, 1:250 000 Geological Series.

Haines, PW, de Souza Kovacs, N, Spaggiari, CV, Eacott, G, Allen, HJ, Tyler, IM, Maidment, DW, and Murdie, RE 2018, MacDonald, WA Sheet SF 52-14 (2nd edition): Geological Survey of Western Australia, 1:250 000 Geological Series