Psammitic schist 228697

Person submitting samples: Catherine Spaggiari / Dave Kelsey	
Affiliation: Geological Survey of Western Australia	
Project Title: Project Manager / Senior Geologist	
Sample Number(s) (including IGSN if one exists): 228697	
Mineral separation required? Yes or No: Yes	
Date submitted: May 2020	

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Kiwirkurra Community / West Arunta Orogen	
1:250k SHEET NAME: Wilson	**NUMBER:** SF 52-9
1:100k SHEET NAME: Top Up Rise	**NUMBER:** 4352
LOCATION METHOD: (GPS: GDA94)	
ZONE: 52	
EASTING: 340071	**NORTHING:** 7499158
LATITUDE: -22.60692	**LONGITUDE:** 127.44404

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

DRILLHOLE ID (if applicable): TUR13DD005	
PROSPECT (if applicable): Top Up Rise	
DEPTH FROM (metres): 357.21	
DEPTH TO (metres): 357.30	

* 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 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:
Muscovite

Estimated $^{40}Ar/^{39}Ar$ 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 Kiwirkurra, in the Gibson Desert. These rocks lie beneath the Canning Basin, and no other information about them is available.

Lithological characteristics (rock description):
Migmatitic biotite + muscovite-bearing psammitic schist. Foliation is undulating and anastomosing and fine-to-coarse (~1 mm to 1 cm) feldspar + quartz-rich layers and patches are common. These feldspar-rich regions are deformed and foliated too. Feldspar is abundantly red-stained, probably hematite alteration.

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 ± 5 Ma and 1872 ± 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):
Strongly foliated muscovite + biotite schist (muscovite much coarser than biotite) with some later chlorite that occurs on biotite and muscovite grain margins. Visible zircon and radiation-damaged biotite. A feldspar + quartz rich vein (interpreted as melt) runs through the sample and contains minor chlorite.

Photograph(s) e.g. field site, hand-specimen, photomicrograph:
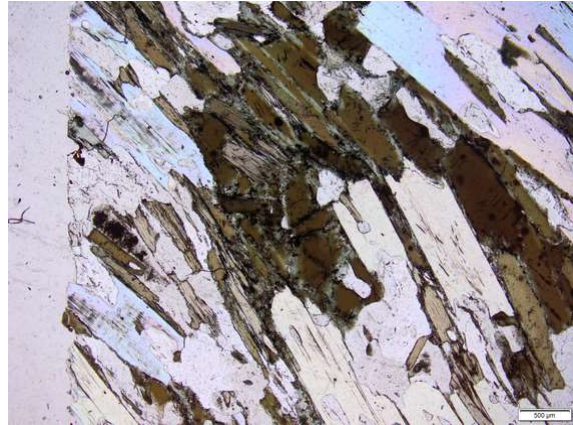
Relevant bibliographic references:
Top up Rise prospect:
Nothing published as yet. There is a company report on the drillcores:
Border Exploration, 2013, Geological Survey of Western Australia, Statutory mineral exploration report A099481, 29p.

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