

Psammitic gneiss 228613

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): 228613
Mineral separation required? Yes or No: Yes
Date submitted: May 2020

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Kiwirikurra 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: 337513	NORTHING: 7499769
LATITUDE: -22.60116	LONGITUDE: 127.41922

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 gneiss

DRILLHOLE ID (if applicable): TUR13DD001
PROSPECT (if applicable): Top Up Rise
DEPTH FROM (metres): 221.58
DEPTH TO (metres): 221.68

* 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. Muscovite and biotite define the foliation.

Mineral target(s) for dating:

Muscovite

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):

Quartz-rich, muscovite-bearing metasedimentary gneiss. Thin (at most ~2-3 mm) layers of aggregates of muscovite occur widely spaced in a muscovite-quartz (and lesser biotite and feldspar) gneiss. The muscovite aggregates define the foliation.

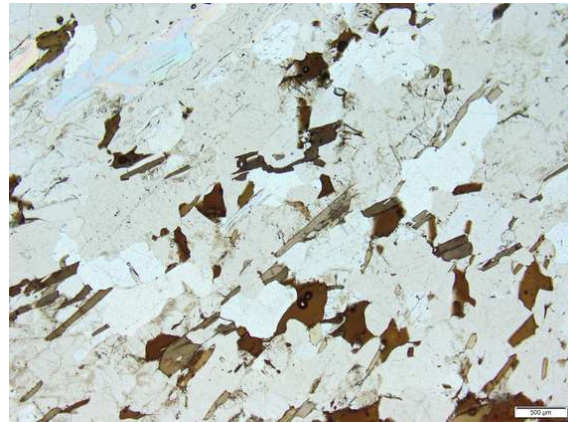
Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):

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):

Biotite and muscovite define the foliation. Muscovite is nearly entirely confined to occurring as aggregates in thin discontinuous lenses (at most 2 mm wide) that occur sporadically in the rock, whereas biotite occurs dispersed evenly through the rock and is not confined to discrete layers. Other minerals present are quartz and feldspar. The rock is quite fresh, feldspar has only very minor alteration. Radiation damage halos around visible/large accessory mineral grains occur in biotite. Quartz features well-developed subgrains.

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