Sample 9 of 20: 115692

Person submitting samples: Dave Kelsey
Affiliation: Geological Survey of Western Australia
Project Title: Tectonism and Exhumation of the Paterson Orogen and East Pilbara Craton margin
Sample Number(s) (including IGSN if one exists): 115692
Mineral separation required? Yes or No: yes
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Rudall Province	
1:250k SHEET NAME: Rudall	**NUMBER:** SF51-10
1:100k SHEET NAME: Connaughton	**NUMBER:** 3452
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94) GDA94	
ZONE: 51	
EASTING: *452386.42*	**NORTHING:** *7493394.45*
LATITUDE: *-22.66586000*	**LONGITUDE:** *122.53653000*

STRATIGRAPHIC UNIT FORMAL NAME *:
STRATIGRAPHIC UNIT INFORMAL NAME: Talbot Zone metasedimentary unit
LITHOLOGY: crenulated muscovite–biotite schist

DRILLHOLE ID (if applicable):
PROSPECT (if applicable):
DEPTH FROM (metres):
DEPTH TO (metres):

* 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?
What is the cooling/exhumation age from this sample?

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

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):
Mid- to Late-Neoproterozoic

Sample Information

Location description (e.g. a sample of x was collected from y, z km from abc town):
WAROX database (field observations) site *RHS115692*.

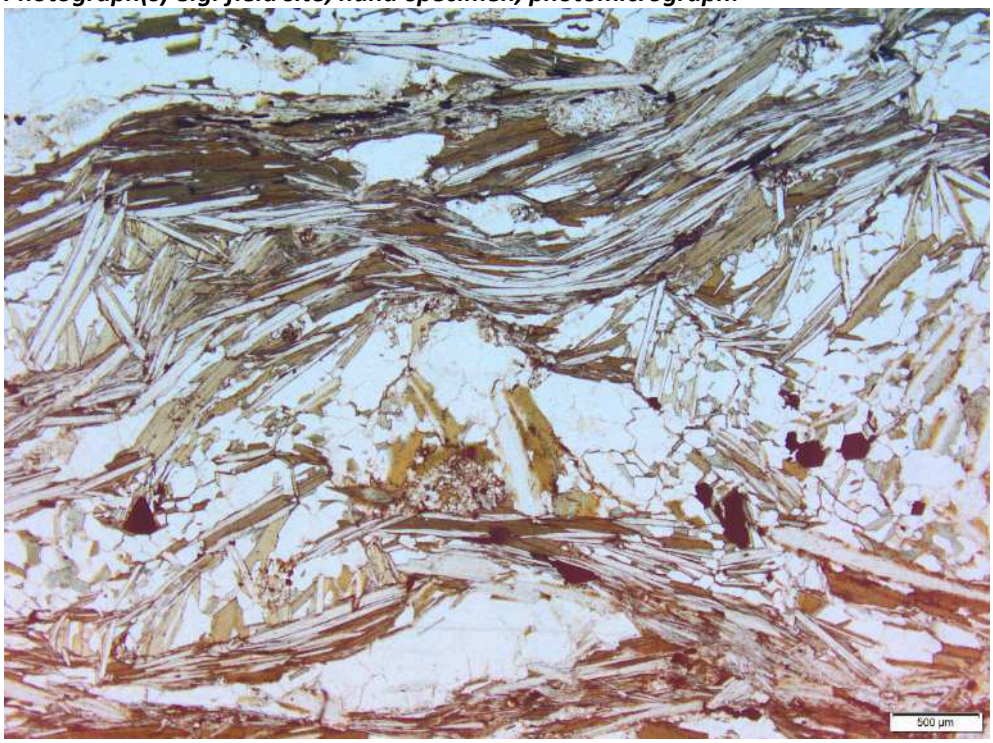
Lithological characteristics (rock description):
Quartz–muscovite–biotite–feldspar schist with crenulation cleavage. Interlayered with 115693. Biotite and muscovite are abundant and moderately coarse-grained. Significantly finer grains of muscovite occur less commonly, and are typically unoriented with respect to the local orientation of much coarser muscovite. Chlorite is rare and occurs as isolated, anhedral to subhedral grains as well as intergrown with anhedral-shaped biotite. Chlorite is more common in low strain zones (away from mica-rich foliae). The timing of chlorite may be late. Feldspar is minor-to-moderately altered. Foliation is anastomosing (including wrapping around felsic sigmoids) but mostly a crenulation is not evident, though there are local regions where crenulation is visible. Fe – Ti oxide is common and tends to be located in mica-rich regions, and has euhedral to anhedral shape. Quartz and feldspar

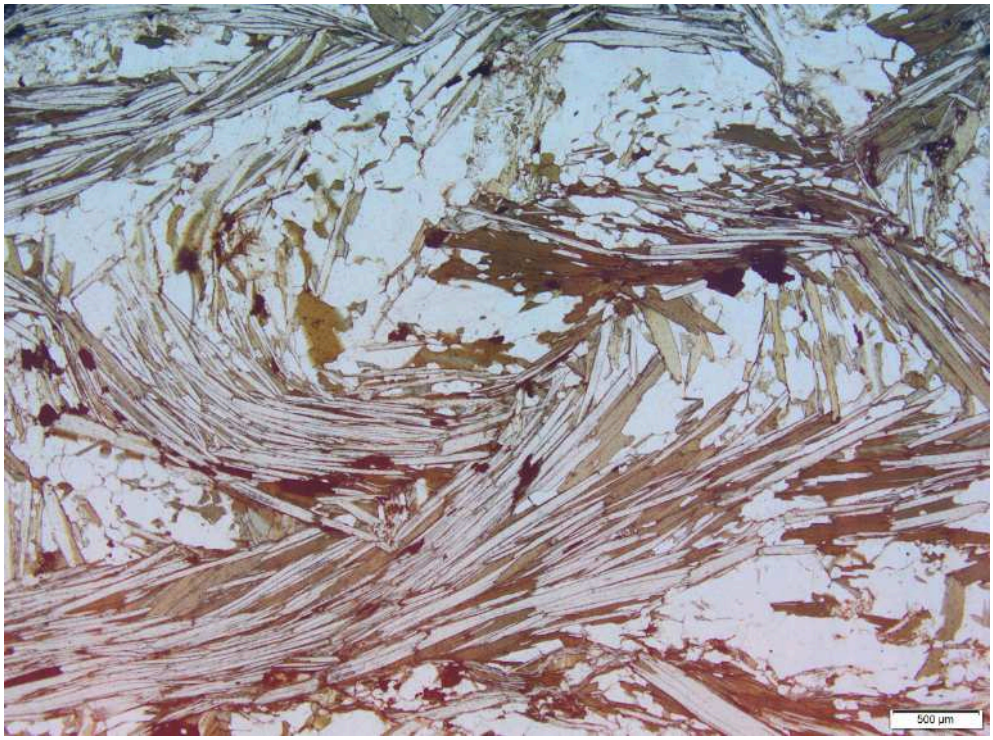
have an inequigranular–polygonal to inequigranular–interlobate shape. Feldspar is typically coarser-grained than quartz.

Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):
The maximum and minimum depositional ages of the Talbot Zone metasedimentary unit are c. 2500 and 1760 Ma, respectively. The c. 1760 Ma Kalkan Supersuite intrudes the metasediments and so provides the lower age constraint. Cooling/exhumation age is expected to be Neoproterozoic, corresponding to the Miles (c. 810 – 650 Ma) or Paterson (c. 550 Ma) Orogenies.

Thin section description (if available):

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





Relevant bibliographic references:

Bagas, L, Williams, IR and Hickman, AH 2000, Rudall, Western Australia: Geological Survey of Western Australia, 1:250 000 Geological Series Explanatory Notes, 50p.
Bagas, L and Smithies, RH 1998, Geology of the Connaughton 1:100 000 sheet: Geological Survey of Western Australia, 1:100 000 Geological Series Explanatory Notes, 38p.