

Sample 17 of 20: 247490

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): 247490
Mineral separation required? Yes or No: yes
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN : Yeneena Basin	
1:250k SHEET NAME: Rudall	NUMBER: SF51-10
1:100k SHEET NAME: Throssell	NUMBER: 3253
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94) GDA94	
ZONE: 51	
EASTING: 358847.97	NORTHING: 7552403.02
LATITUDE: -22.127702	LONGITUDE: 121.631389

STRATIGRAPHIC UNIT FORMAL NAME *: Tarcunyah Group (probably Waroongunyah Formation)
STRATIGRAPHIC UNIT INFORMAL NAME:
LITHOLOGY: pale green coloured silt. Muscovite/sericite and rounded to elongate quartz and feldspar grains.

DRILLHOLE ID (if applicable): EIS Encounter Yeneena EPT2193
PROSPECT (if applicable):
DEPTH FROM (metres): 387.25
DEPTH TO (metres): 387.62

* 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?

Either: What is the age of the muscovite fabric in this sample? OR What is the age of exhumation/cooling in this sample?

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

Either age of deformation to produce the axial planar cleavage OR cooling/exhumation.

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):

Mid- to Late-Neoproterozoic

Sample Information

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

Located 52 km S of Nifty mine and 75 km SW of Telfer mine.

Lithological characteristics (rock description):

The sample is a (very) low metamorphic grade silty schist with a sericite-rich matrix amongst rounded to sub-rounded quartz and feldspar granules. At the scale of the drillcore the silt is interlayered with coarse sand and is pale green coloured. Sericite/muscovite defines a fabric, as do elongate grains of quartz and feldspar. Most sericite is fine to very fine-grained (so not sure if this sample will be possible to hand pick muscovite from) but there are rarer coarser grains of muscovite too.

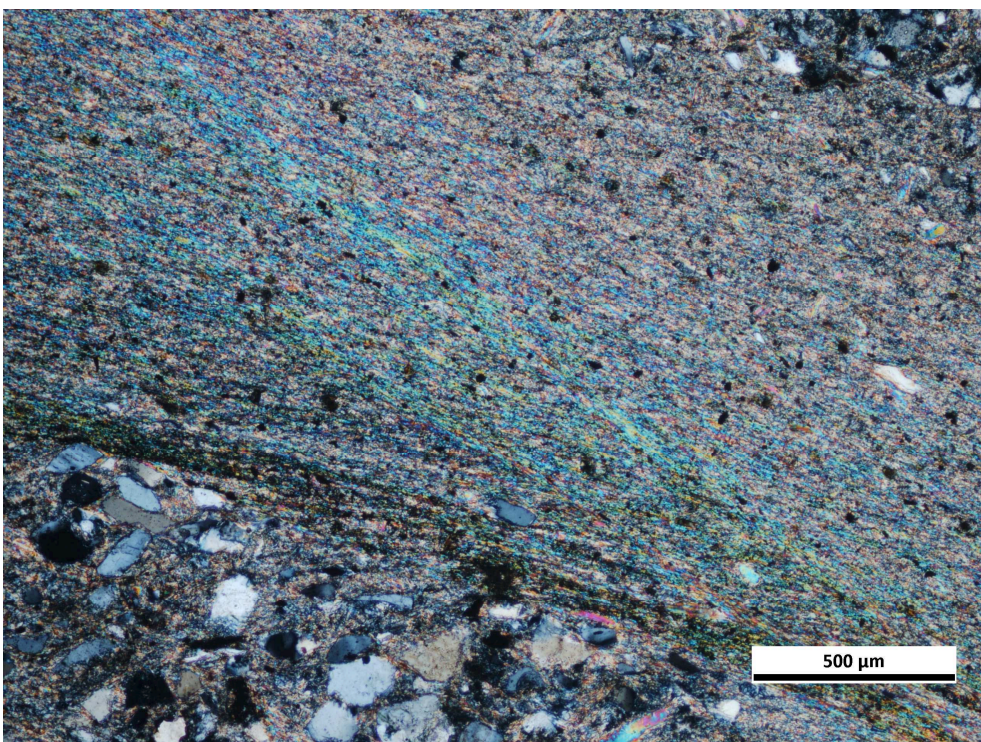
Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):

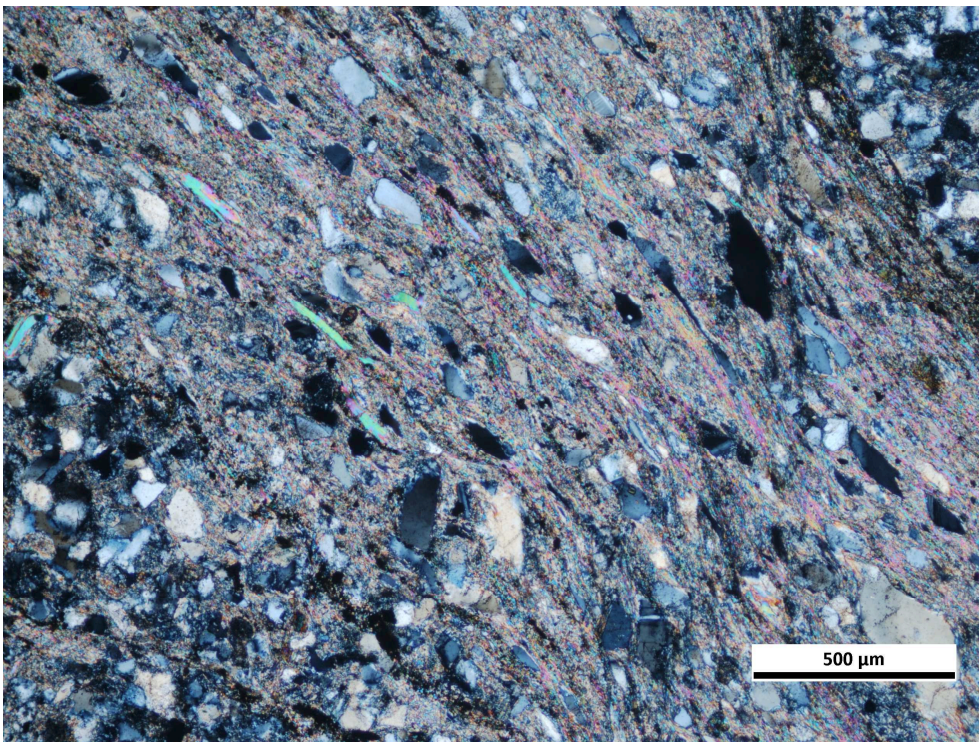
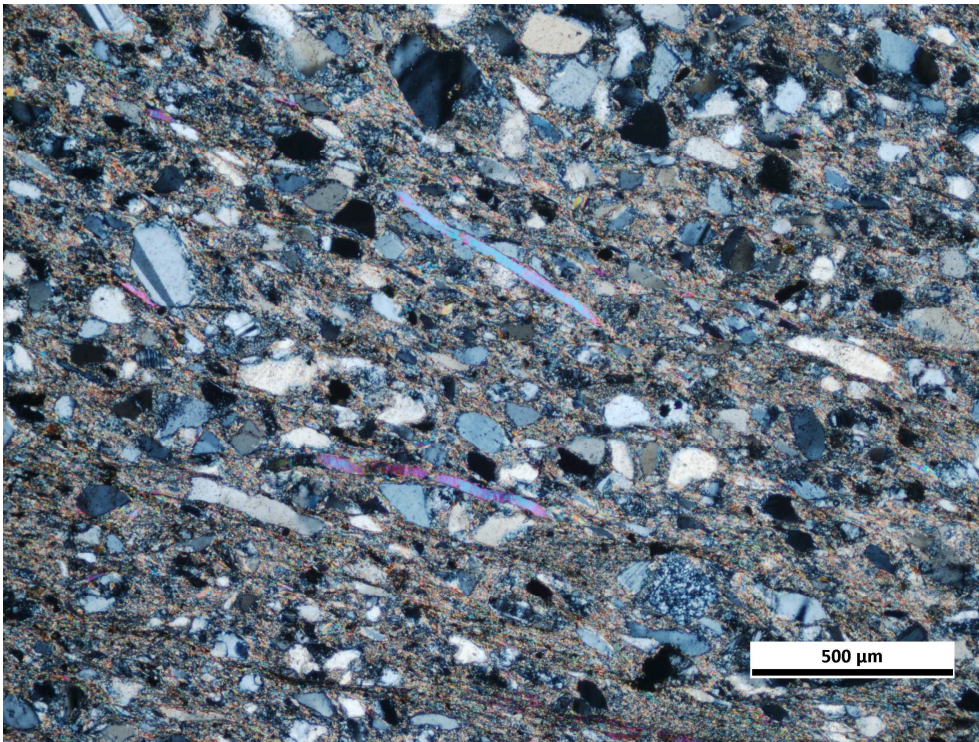
The deformation/foliation age is expected to be Neoproterozoic, corresponding to be one of either the Miles (c. 810 – 650 Ma) or Paterson (c. 550 Ma) Orogenies. Sediments of the Yeneena Basin have a maximum depositional age of c. 831 Ma.

Thin section description (if available):

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





Relevant bibliographic references:

- Gardiner, NJ, Maidment, DW, Kirkland, CL, Bodorkos, S, Smithies, RH and Jeon, H 2018, *Isotopic insight into the Proterozoic crustal evolution of the Rudall Province, Western Australia: Precambrian Research*, v. 313, 31–50.
- Maidment, D, Huston, DL, Maas, R, Czarnota, K, Neumann, N, McIntyre, A and Bagas, L 2008, *The Nifty-Kintyre-Duke Cu-U-Pb-Zn mineralizing events: Links to the evolution of the Yeneena Basin, northwest Paterson Orogen*, in *GSWA 2008 extended abstracts: promoting the prospectivity of Western Australia: Geological Survey of Western Australia: Record 2008/2*, p. 27–29.
- Bagas, L 2004, *The Neoproterozoic Throssell Range and Lamil Groups, northwest Paterson Orogen, Western Australia - a field guide: Geological Survey of Western Australia, Record 2004/15*, 18p.
- Bagas, L and Nelson, DR 2007, *Provenance of Neoproterozoic sedimentary rocks in the northwest Paterson Orogen, Western Australia*, in *Proceedings of the Central Australian Basins Symposium (CABS), Alice Springs, Northern Territory, 16-18 August 2005* edited by TJ Munson, TJ Munson, GJ Ambrose and GJ Ambrose: Northern Territory Geological Survey: Special Publication, p. 1–10.

Bagas, L 2005, Geology of the Lamil 1:100 000 sheet: Geological Survey of Western Australia, 1:100 000 Geological Series Explanatory Notes, 22p.

Chin, RJ, Hickman, AH and Towner, RR (compilers) 1982, Paterson Range, Western Australia (2nd edition): Geological Survey of Western Australia, 1:250 000 Geological Series Explanatory Notes, 27p.