GSWA 225452: Monzogranite, Buldania Rocks, Yilgarn Craton, BULDANIA

Person submitting samples: Raphael Quentin de Gromard
Affiliation: Geological Survey of Western Australia
Project Title: Evolution of crustal structures in an inverted orogen, the east Albany–Fraser Orogen, Western Australia
Sample Number(s) (including IGSN if one exists): 225452
Mineral separation required? Yes or No:
Date submitted:

GEOGRAPHIC AREA/ PROVINCE/ BASIN : southern Western Australia/east Albany–Fraser Orogen	
1:250k SHEET NAME: NORSEMAN	**NUMBER:** SI51-02
1:100k SHEET NAME: BULDANIA	**NUMBER:** 3333
LOCATION METHOD: (GPS: WGS84 / AGD66 / AGD84 / GDA94)	
ZONE: 51	
EASTING: 408755	**NORTHING:** 6450627
LATITUDE: -32.076942	**LONGITUDE:** 122.0332

STRATIGRAPHIC UNIT FORMAL NAME *:
STRATIGRAPHIC UNIT INFORMAL NAME: Yilgarn Craton granites
LITHOLOGY: Monzogranite

HOLE ID (if applicable):
PECT (if applicable):
H FROM (metres):
H 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?

Quantifying the extent of the thermal overprint of the Biranup and Albany–Fraser Orogenies over the Yilgarn Craton.

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

Neoarchean cooling age post-magmatic crystallization age, alternatively Paleoproterozoic or Mesoproterozoic cooling age if affected by thermal overprint related to the Biranup and/or Albany–Fraser Orogenies.

Mineral target(s) for dating:

Biotite + hornblende

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

Archean: c. 2700 Ma or Paleoproterozoic: c. 1710–1620 Ma (Biranup Orogeny) or Mesoproterozoic: c. 1330–1140 Ma (Albany–Fraser Orogeny)

Sample Information

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

A sample of biotite-hornblende monzogranite was collected from Buldania Rocks, Yilgarn Craton, 26 km northeast of Norseman, WA.

Lithological characteristics (rock description):

Massive, medium- coarse-grained, mesocratic, K-Feldspar phyric (euhedral feldspar up to 3 cm), biotite-hornblende monzogranite containing minor mafic xenoliths up to 30 cm.

Relative age constraints (pertinent geological relationships with surrounding rock units and any previous geochronology):
A metarhyolite sample collected 7.5 km northeast of sample GSWA 225452 yielded a U-Pb zircon age of igneous crystallization of 2679 ± 8 Ma (GSWA 179684).
Two metamonzogranite samples collected 18.5 and 21 km southeast of sample GSWA 225452 yielded a U-Pb zircon age of igneous crystallization of 2670 ± 13 Ma (GSWA 225447) and 2649 ± 9 Ma (GSWA 225448) respectively.

Thin section description (if available):

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

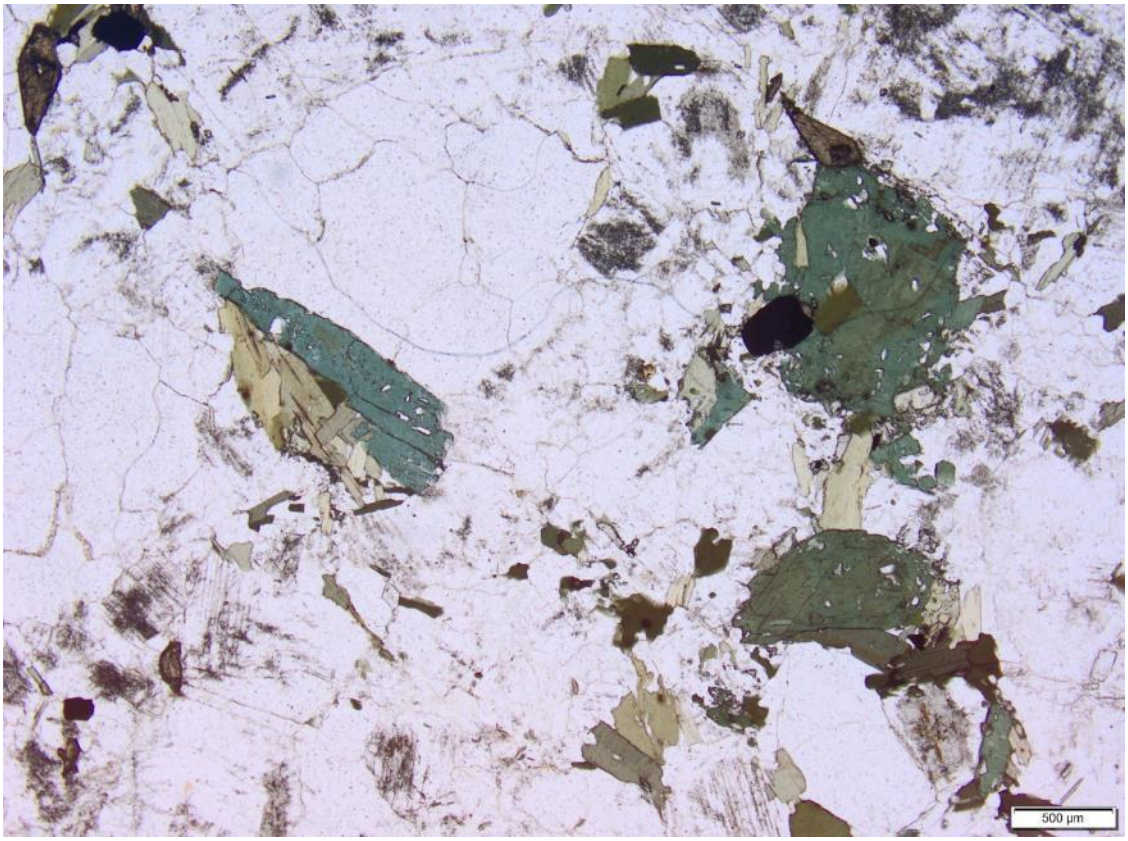

Figure 20. Representative view of bi-hbl-ttn-mt-ep-quartzofeldspathic meta(monzo)granite – PPL (GSWA 225452)

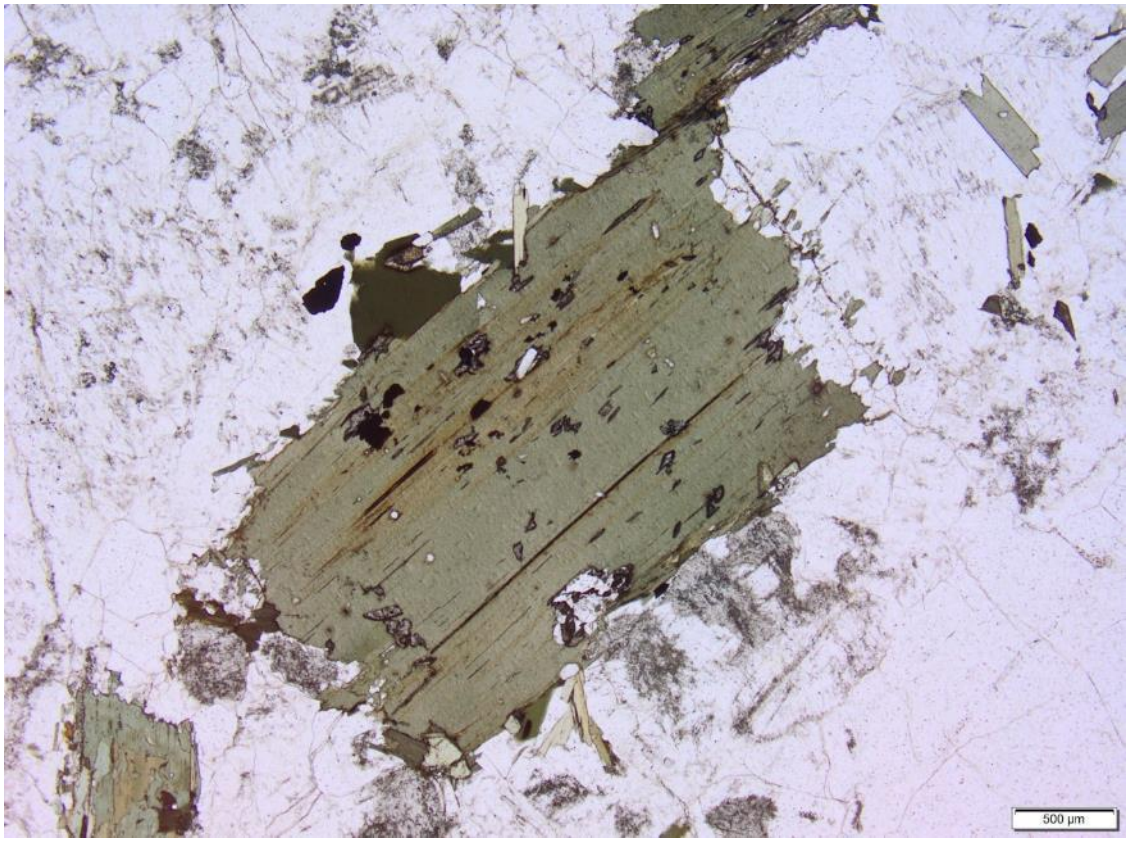

Figure 21. Large Bi porphyroblast containing ttn and mt inclusions in ttn-mt-bearing quartzofeldspathic groundmass - PPL (GSWA 225452)

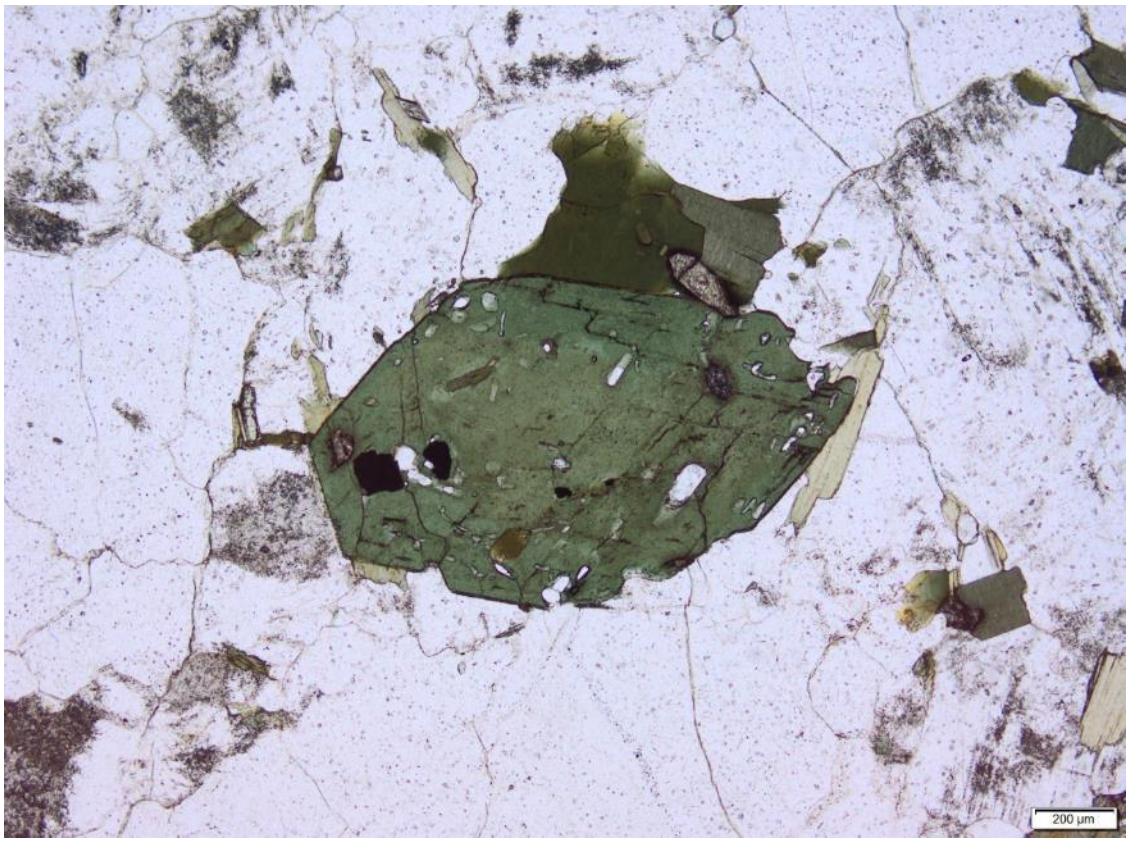

Figure 22. Subhedral Hb containing ttn and zircon and overgrowing Bi in quartzofeldspathic groundmass - PPL (GSWA 225452)