

Gold-Antimony occurrences in Victoria


AIG Victoria Minerals Roundup



18 June 2026

OFFICIAL

RESOURCES VICTORIA



We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it.

We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

Resources Victoria is committed to genuinely partnering with Victorian Traditional Owners and Victoria's Aboriginal community to progress their aspirations.

Acknowledgements



Cameron Cairns, Steven Boger, Sam Waugh, Simon Travers, Ross Cayley
Colin Marson, David Higgins, Tom Andrews, Alan Carroll, Rochelle Jardine



Zsanett Pintér, Nick Farmer

Michael R. Verrall, Steve Peacock, Tobias U. Schlegel, Gabriel Valentim
Berni, Jacob Walmsley, Chris Ryan



Robert Creaser



Reference

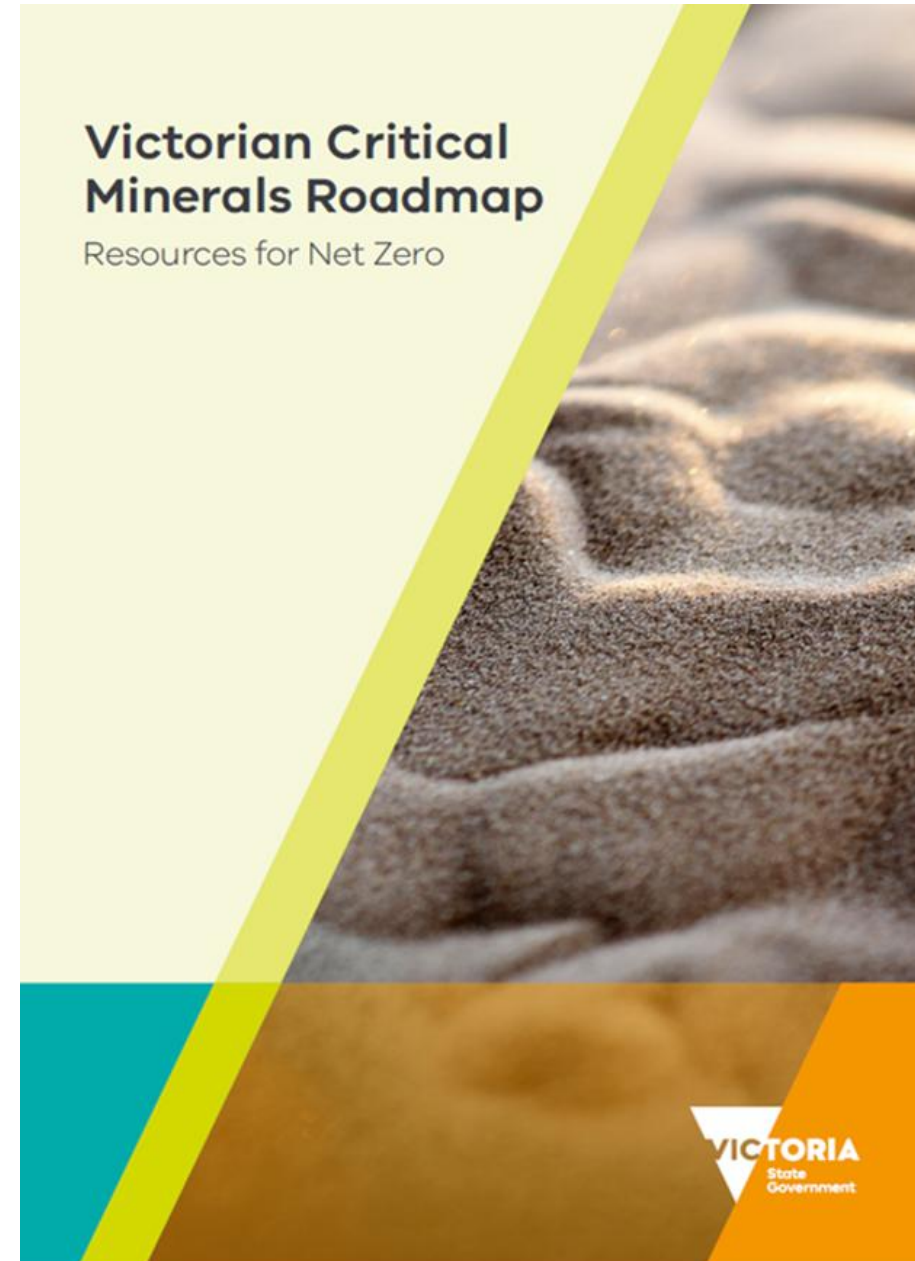
Cairns C.P., Boger S.D., Waugh S.A.F., Pintér Z., Travers S.J., Farmer N., Cayley R.A. & Creaser R.A. 2026, Gold-Antimony occurrences in Victoria, AIG Victoria Minerals Roundup, Ballarat.

The Victorian Critical Minerals Roadmap

Our vision

A world-leading ethical critical minerals sector that:

- ✓ Has timely approvals for development
- ✓ Delivers significant economic benefits for regional communities
- ✓ Is environmentally responsible
- ✓ Creates opportunities for future downstream industries
- ✓ Forms strong and lasting partnerships with local communities and Traditional Owners



[Download here](#)

The Victorian Critical Minerals Roadmap



Theme 1: Mapping the opportunities

Identify and promote new critical minerals opportunities using modern geoscience data and knowledge.



Theme 2: A modern regulatory regime

Establish a Victorian Critical Minerals Coordination Office to engage industry on processes and standards and reduce approvals timelines.



Theme 3: Critical minerals production and processing

Investigate potential economic and national supply security benefits from downstream processing facilities in Victoria.



Theme 4: Sharing the benefits of Victoria's minerals

Investigate benefit sharing models for local communities and Traditional Owners, balancing the interests of stakeholders to optimise social, environmental and economic outcomes.

Sediment-hosted copper potential of middle Devonian to early Carboniferous rocks of the Howitt Province, east-central Victoria

S.D. Boger, S. Schmid, R.A. Cayley & S.A.F. Waugh

Victoria's Critical Minerals and Strategic Materials
Report 1

An evaluation of rare earth elements, phosphorus, vanadium and rhenium in sediment starved stratigraphy in Victoria

T.M. Andrews & R.A. Cayley
Victoria's Critical Minerals and Strategic Materials
Report 2

An evaluation of high-purity alumina and rare earth elements in select clay occurrences of central Victoria

T.M. Andrews & R.A. Cayley
Victoria's Critical Minerals and Strategic Materials
Report 3

Critical minerals geoscientific database

T.M. Andrews
Victoria's Critical Minerals and Strategic Materials
Report 4

GEOLOGICAL SURVEY OF VICTORIA

Re-Os geochronology of Victorian mineral occurrences

S.A.F. Waugh, R.A. Creaser, C.P. Cairns, R.J. Duncan & R.A. Cayley
Victoria's Critical Minerals and Strategic Materials
Report 5

U-Pb cassiterite, scheelite and wolframite ages from Victorian tin and tungsten occurrences

S.A.F. Waugh, C.S. Holm-Denham, N.E. Wintzen & C.P. Cairns
Victoria's Critical Minerals and Strategic Materials
Report 6

Dyke-hosted copper-nickel-platinum group element mineralisation in Victoria

S.D. Boger, T.U. Schlegel & R.D. Keays
Victoria's Critical Minerals and Strategic Materials
Report 7

An evaluation of zirconium, niobium and rare earth elements in alkaline silicate igneous rocks in Victoria

T.M. Andrews, Z. Pinter, R.A. Cayley & S.D. Boger
Victoria's Critical Minerals and Strategic Materials
Report 8

Baseline soil geochemistry of northwest Victoria

A.P. Martin, A.G. Campbell, N. Reid, R.L. Thorne, S.J. Travers, S.S. Herley, C.D. O'Neill, H.M. Laursen & K. Fensholt
Victoria's Critical Minerals and Strategic Materials
Report 10

Baseline groundwater geochemistry of northwest Victoria

A.G. Campbell, A.P. Martin, N. Reid, C.P. Riley, C.D. O'Neill, R.L. Thorne, S.S. Herley, S.J. Travers, B. Mahon & T. Pinchard
Victoria's Critical Minerals and Strategic Materials
Report 11

GEOLOGICAL SURVEY OF VICTORIA



GEOLOGICAL SURVEY OF VICTORIA



GEOLOGICAL SURVEY OF VICTORIA



Mineralisation and textures of select gold-antimony occurrences from the Melbourne Zone, central Victoria

C.P. Cairns, S.D. Boger, S.A.F. Waugh, Z. Pinter, S.J. Travers, N. Farmer & R.A. Cayley

Victoria's Critical Minerals and Strategic Materials

Report 9

GEOLOGICAL SURVEY OF VICTORIA



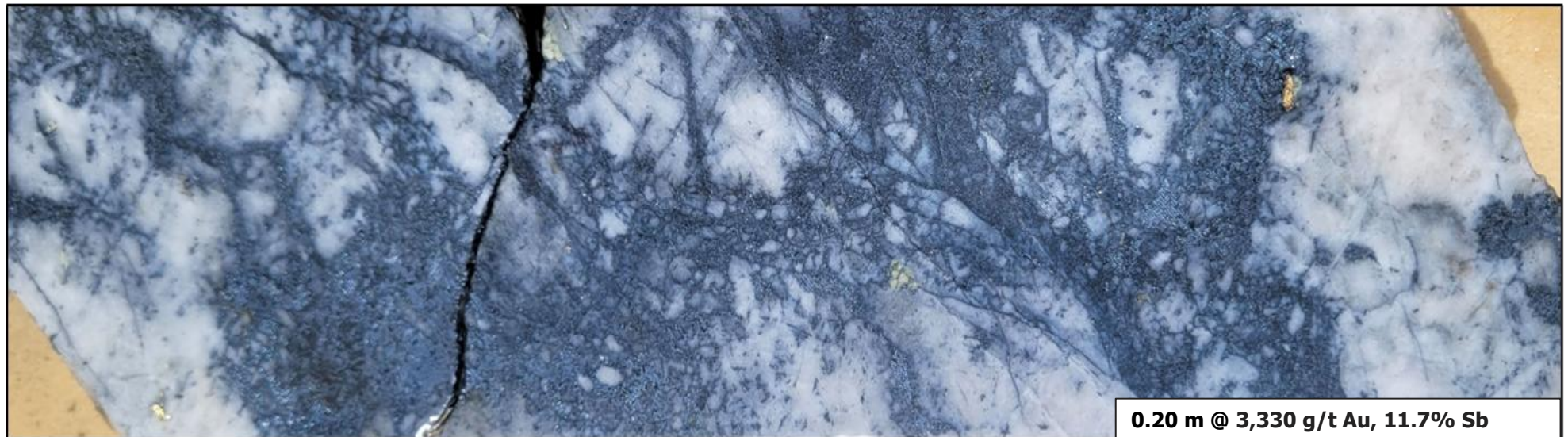
OFFICIAL

Report series

Why gold-antimony?

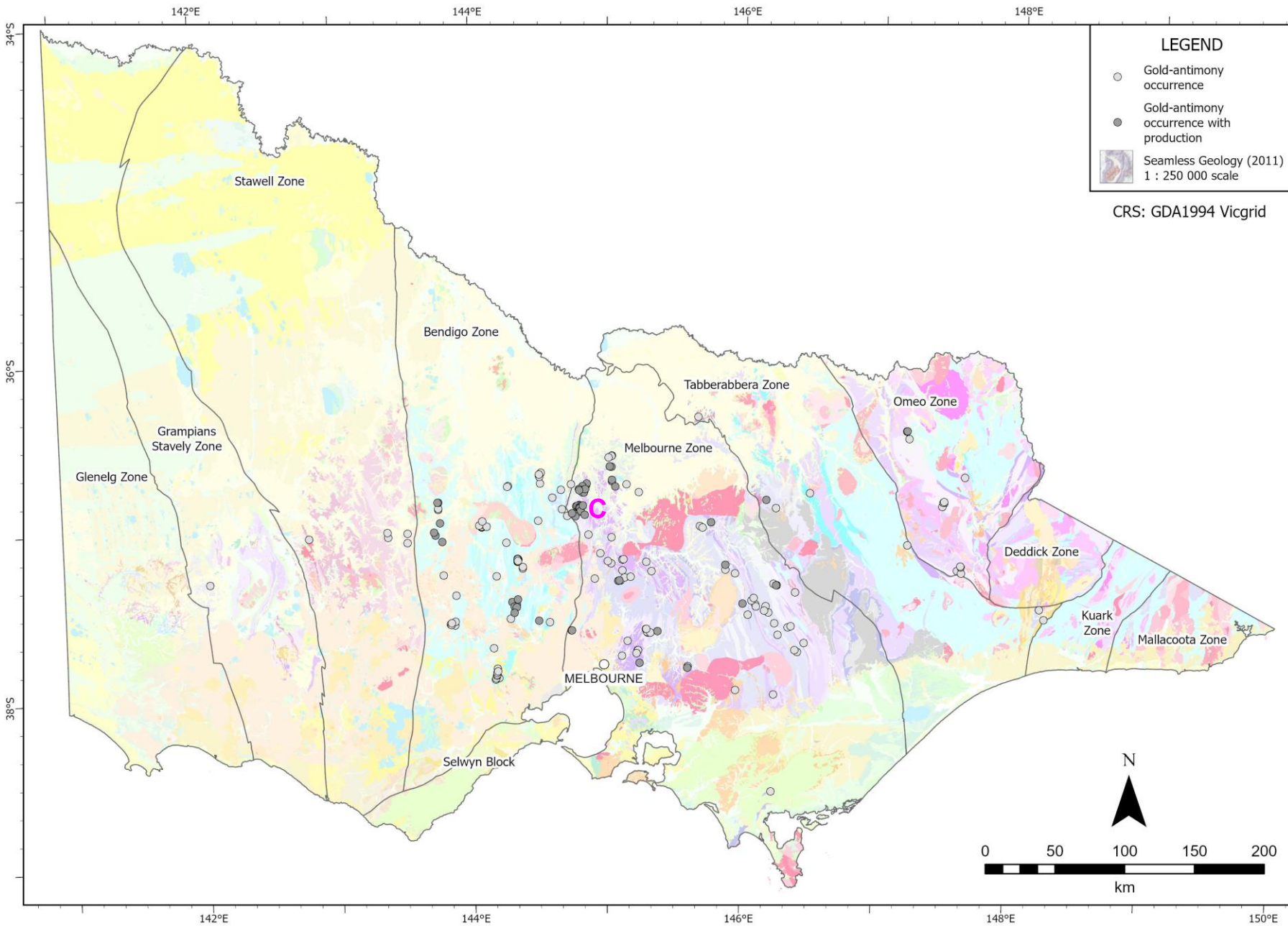


Costerfield, True Blue, [TB031](#), 525.5m



Sunday Creek, Rising Sun, [SDDSC144](#), 776.6m

Victoria's gold-antimony occurrences



Discovery: 1853

Occurrences: **344**

246 added

272 georeferenced

First ore: 1854

Production centres: 126

Total production (end 2025):
>2.15Mt antimony ore
~107,000t antimony metal/con*

Largest deposit:

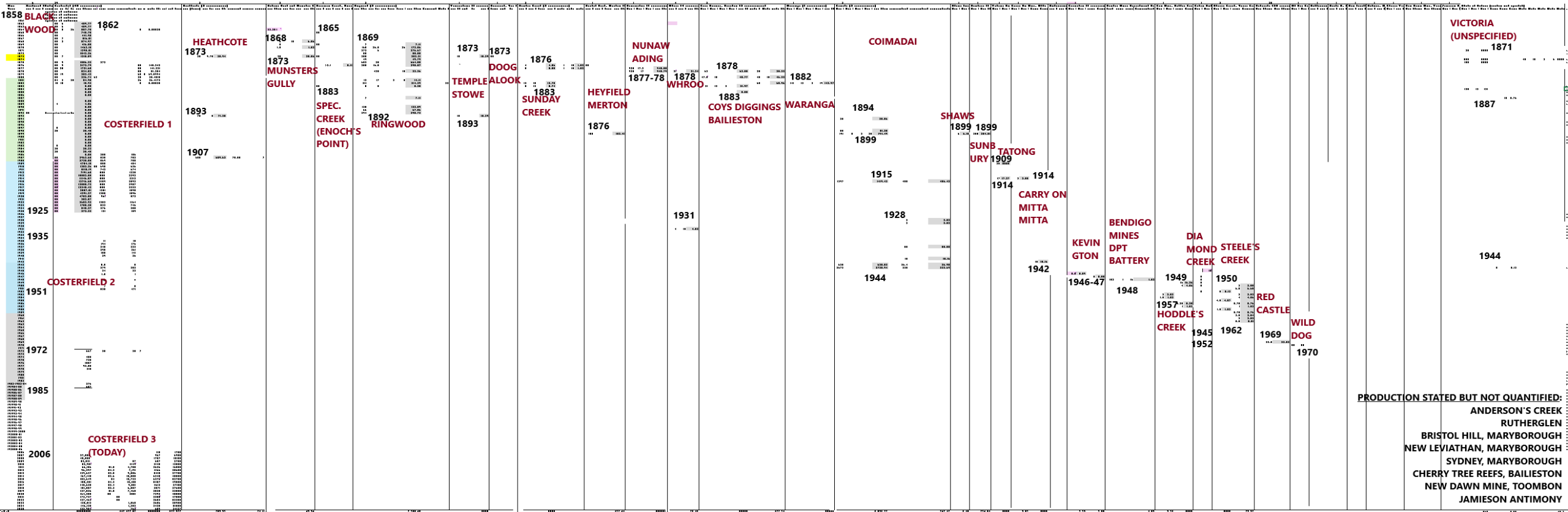
C Costerfield (ca. 2Moz AuEq)

1,093,000Moz Au

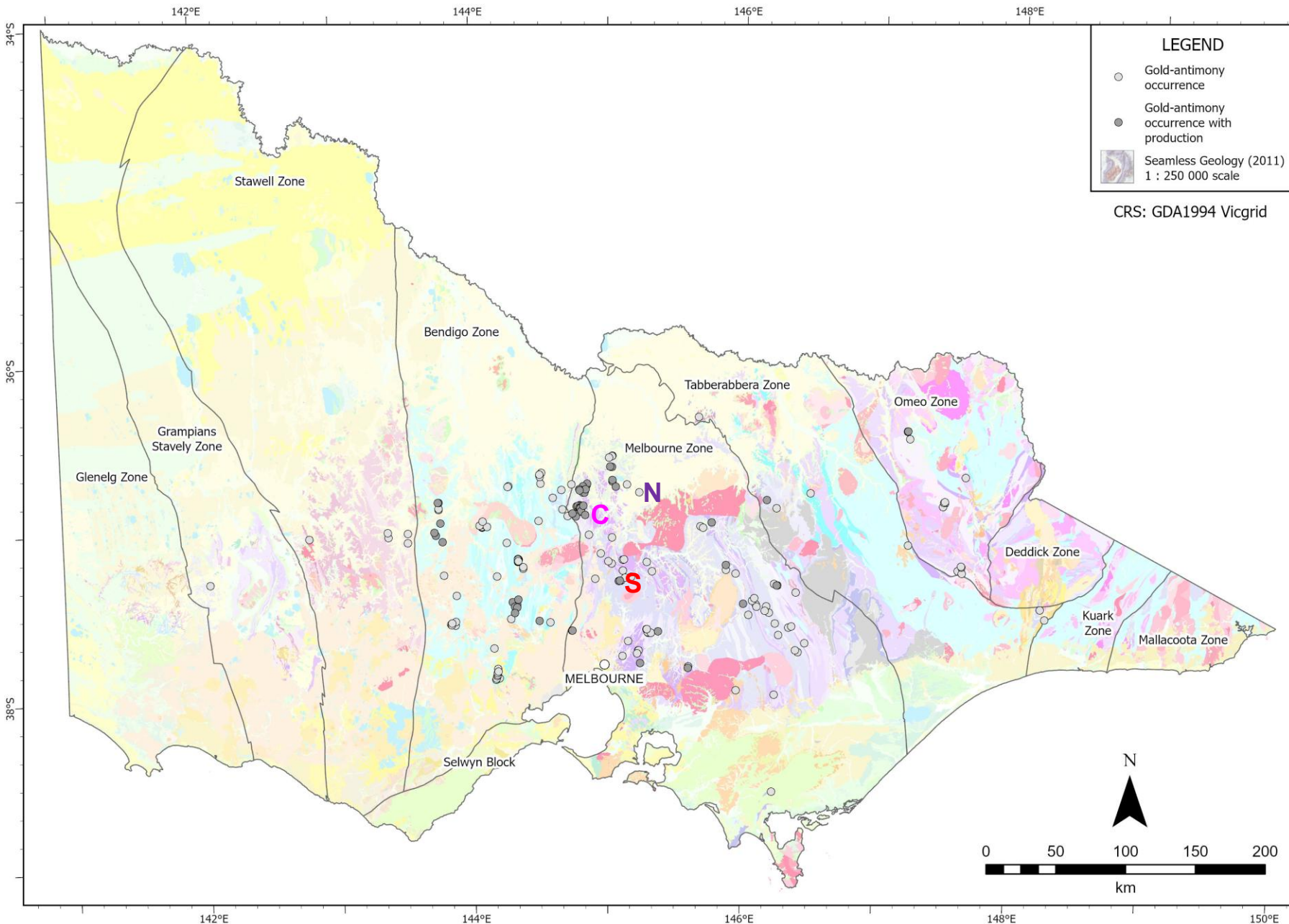
111,000t Sb

95% of ore tonnes since 2006

Victoria's antimony production timeline



Victoria's gold-antimony occurrences – production



Sunday Creek

41kOz Au

27t ore for 3t Sb metal over 4 discontinuous years (1876-1883)

Mineral exploration target

8.1 – 9.6Mt: 6.4-8.3g/t Au, 0.8-0.9% Sb for 2.6Moz Au and 88.2kt Sb

Nagambie

148koz Au

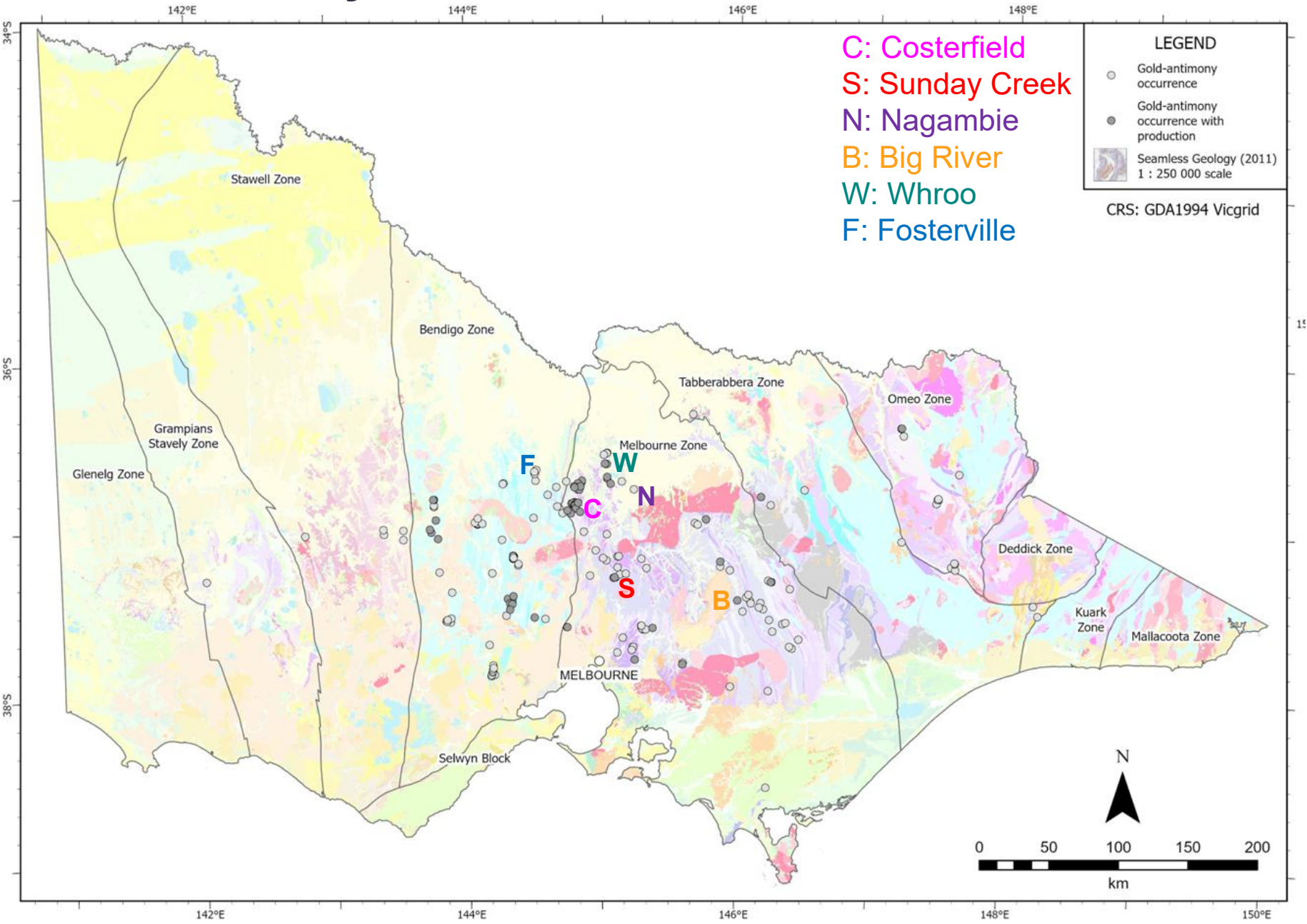
No antimony production.

Antimony recognised in the pit
2006 drill hole beneath the West Pit:
7.2g/t Au and Sb 12.3%

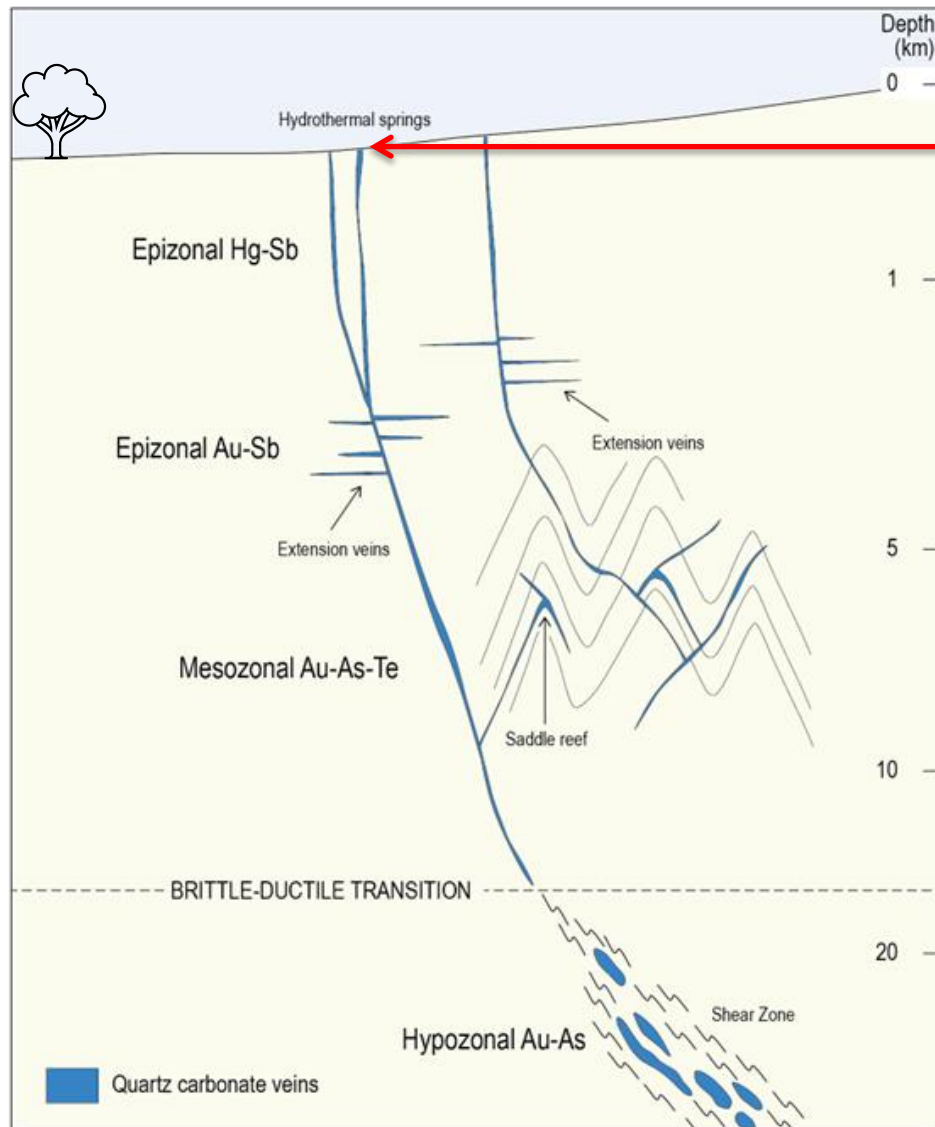
Inferred mineral resource

0.54Mt: 3.3g/t Au, 3.9% Sb for 58koz Au and 20.8kt Sb

Gold-Antimony occurrences



Temperature



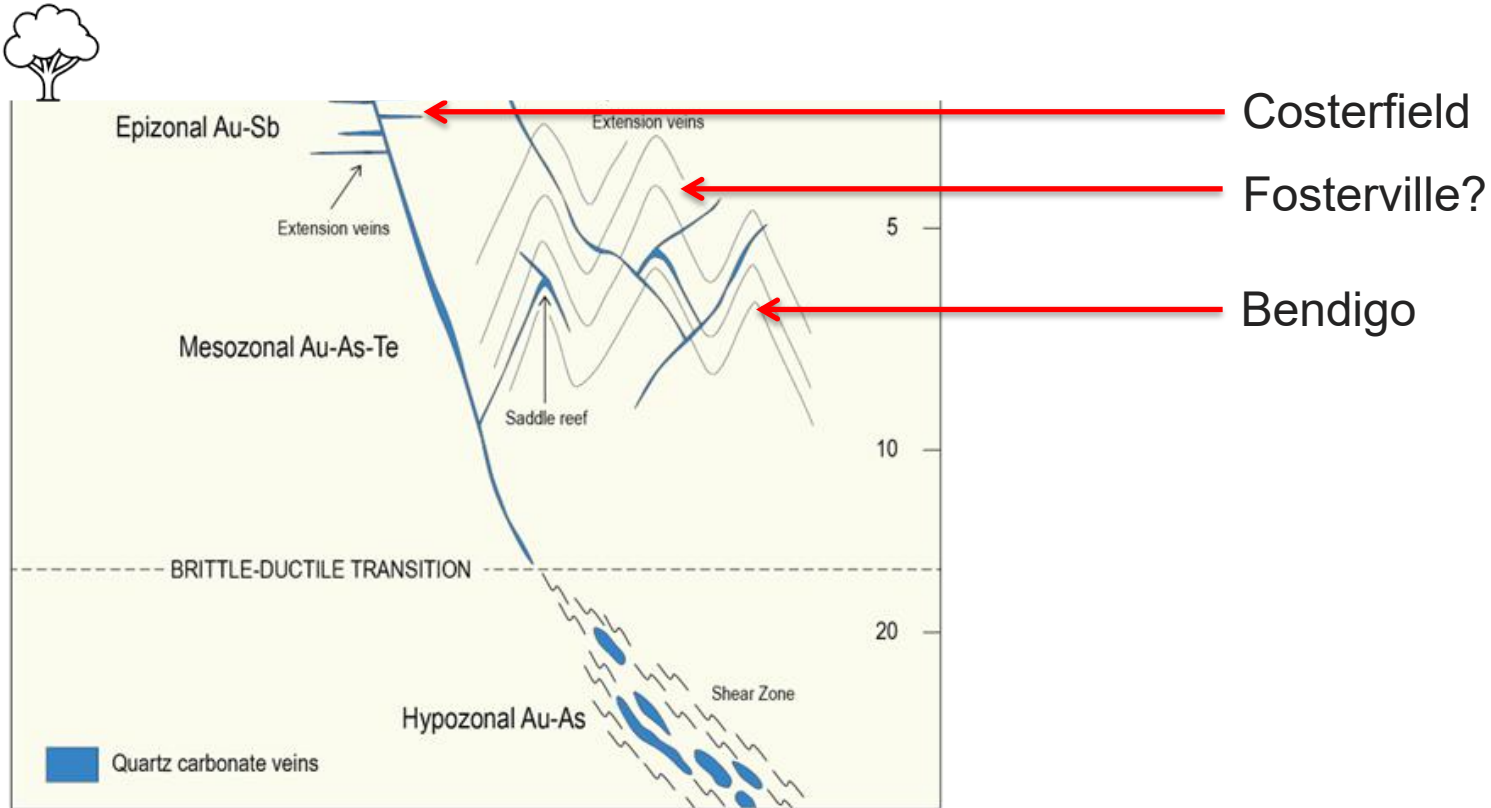
Schematic representation of crustal depth and structural style of orogenic Au-As-Te-Sb-Hg deposits (after Cox et al., 1991; Groves et al., 1998).



Champagne Pool, Waiotapu geothermal field, Taupo Volcanic Zone, New Zealand

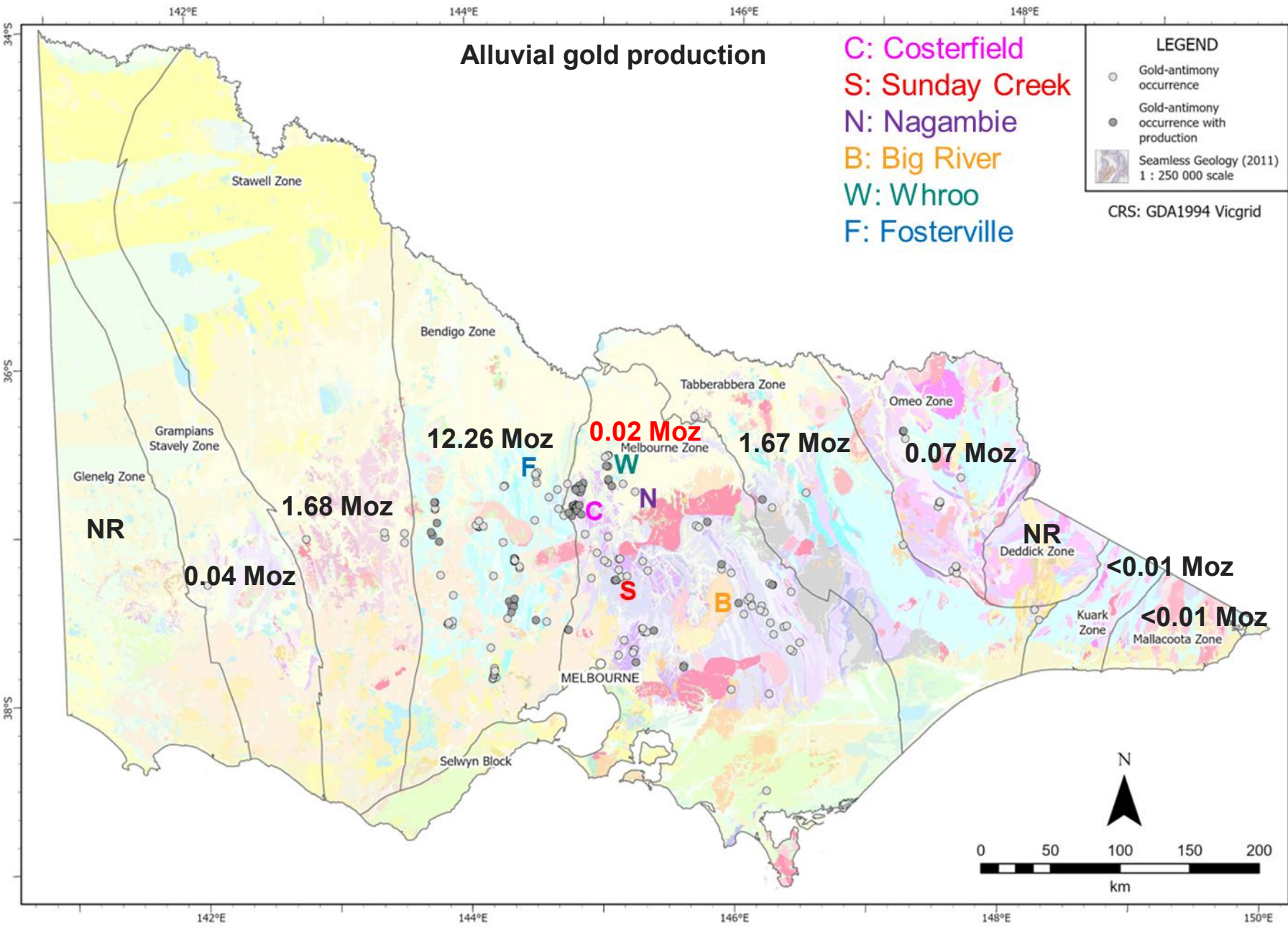


Depth and temperature



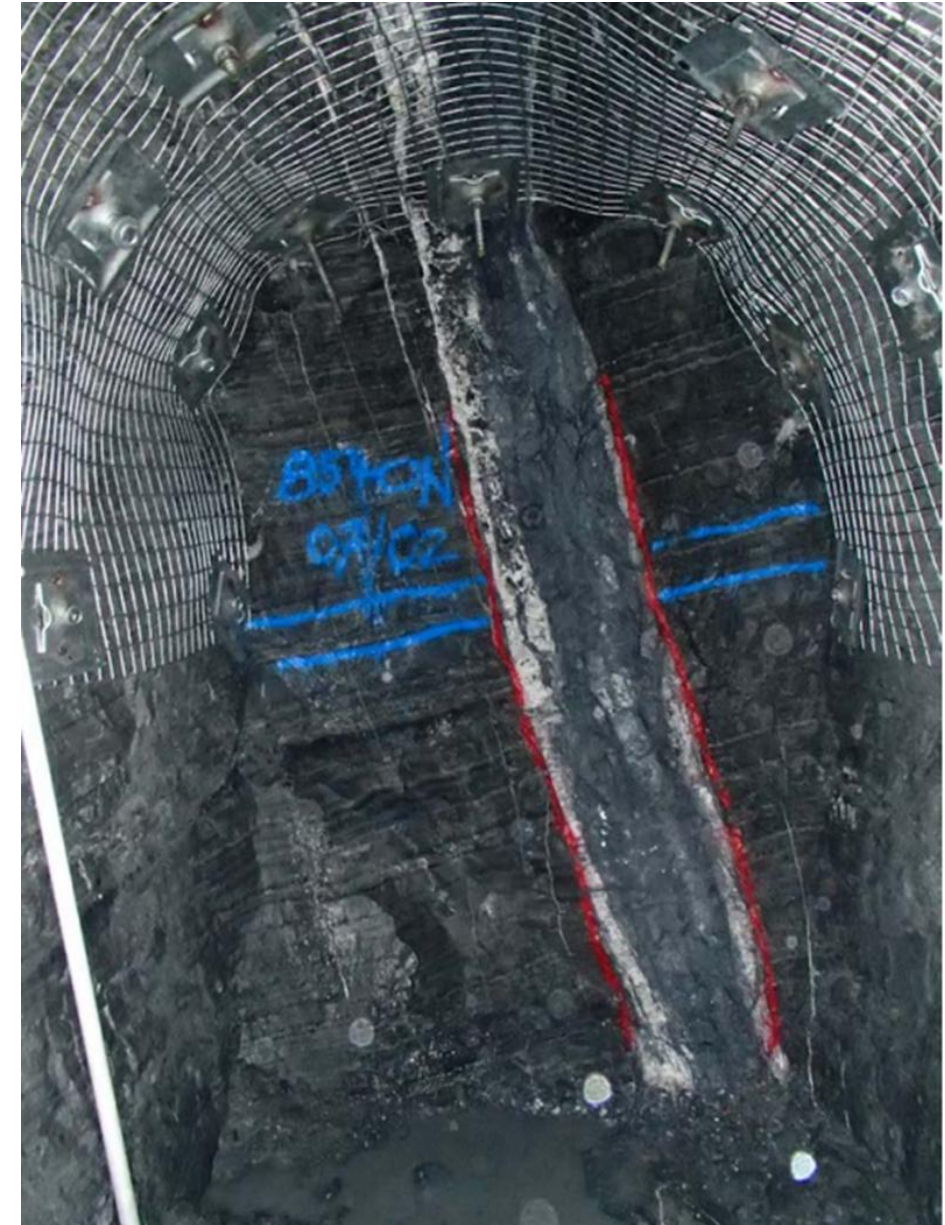
Schematic representation of crustal depth and structural style of orogenic Au-As-Te-Sb-Hg deposits (after Cox et al., 1991; Groves et al., 1998).

Alluvial gold production: a proxy for preservation?



Host geology and mineralisation

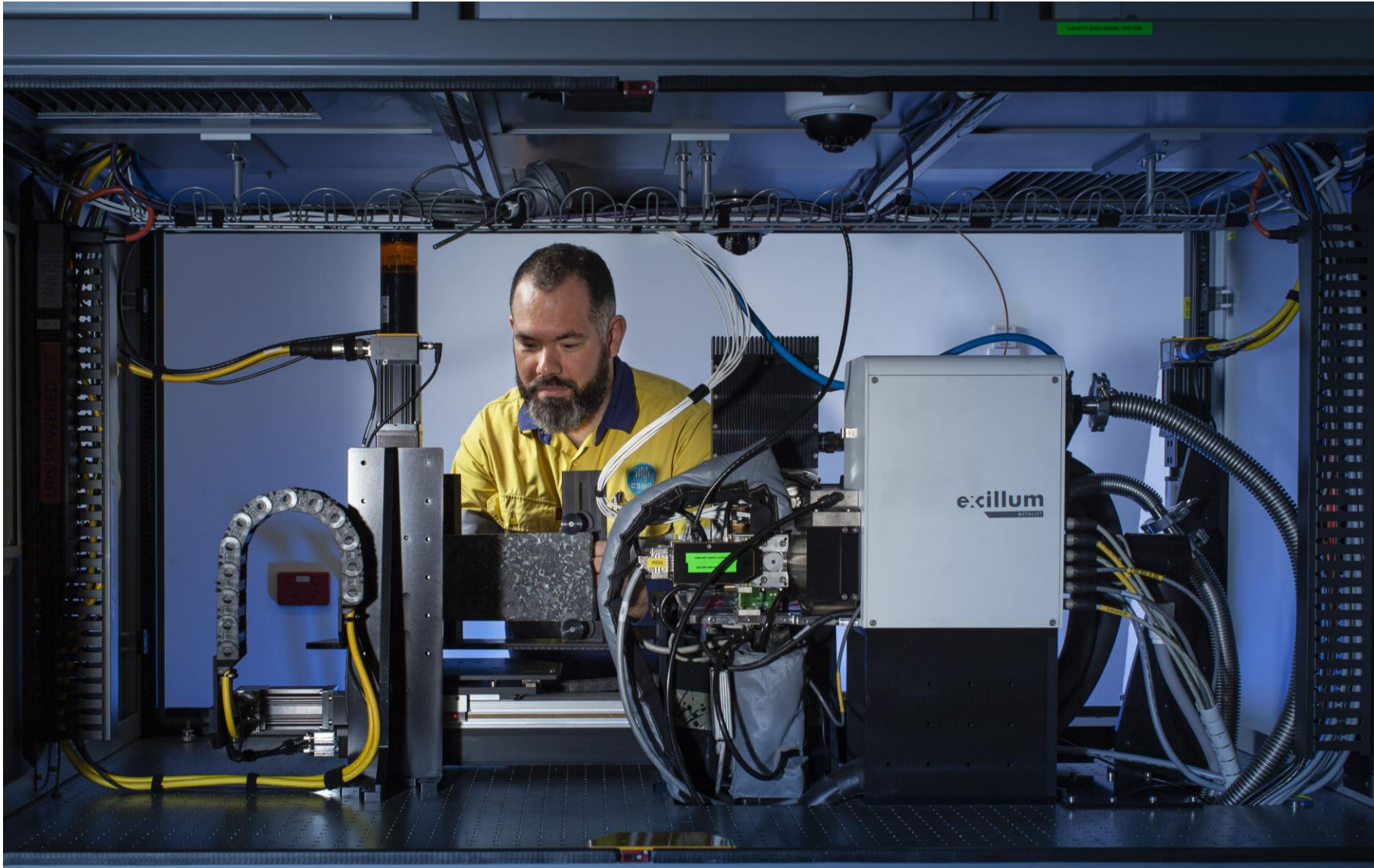
- Murrindindi Supergroup (Silurian-early Devonian) – Melb Zone
 - Marine mudstone, shale, sandstone
 - prehnite-pumpellyite facies
- Massive to semi-massive quartz-stibnite-carbonate veins
 - cm's to up to 1m wide
 - 10's m to +100m, strike and down dip
 - Predominantly north-south, steep
 - ~1km vertical extent: zonation
- Primary ore mineral: Stibnite
 - **Sulphosalts**: boulangerite, jamesonite, tetrahedrite, chalcostibite, famatinite, zinkenite
 - Aurostibite (Costerfield, Coimadai, Fosterville)
 - Accessories: **arsenopyrite**, pyrite, lesser chalcopyrite, galena, sphalerite, **gold**
- Cryptic confined(?) hydrothermal alteration
 - sericite, carbonate, chlorite, clay
- High level with favourable preservation



Steep dipping massive stibnite-quartz vein cross cutting bedding, Cuffley Lode, Costerfield ([Fenwick, 2019](#)).

Maia Mapper

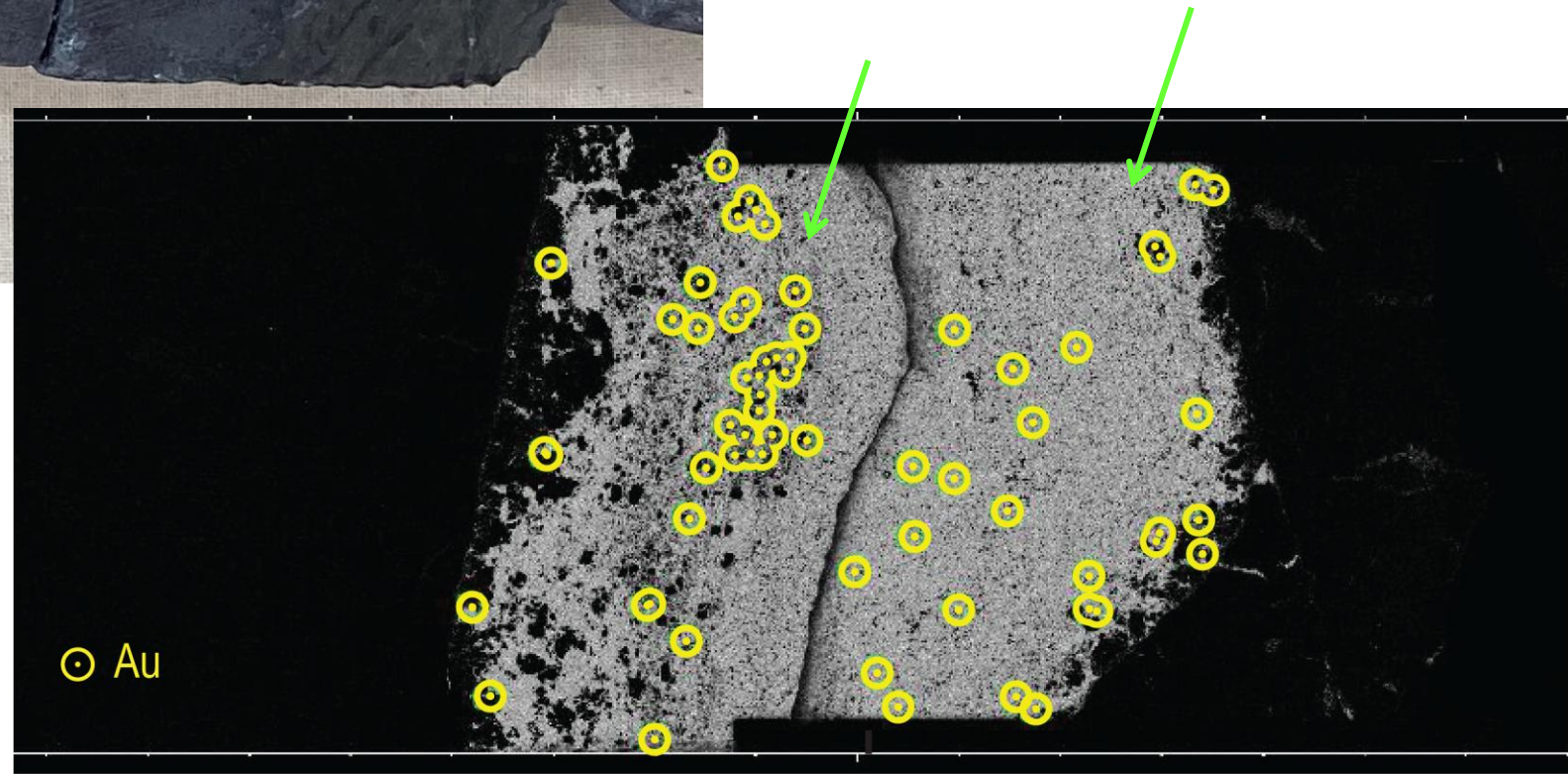
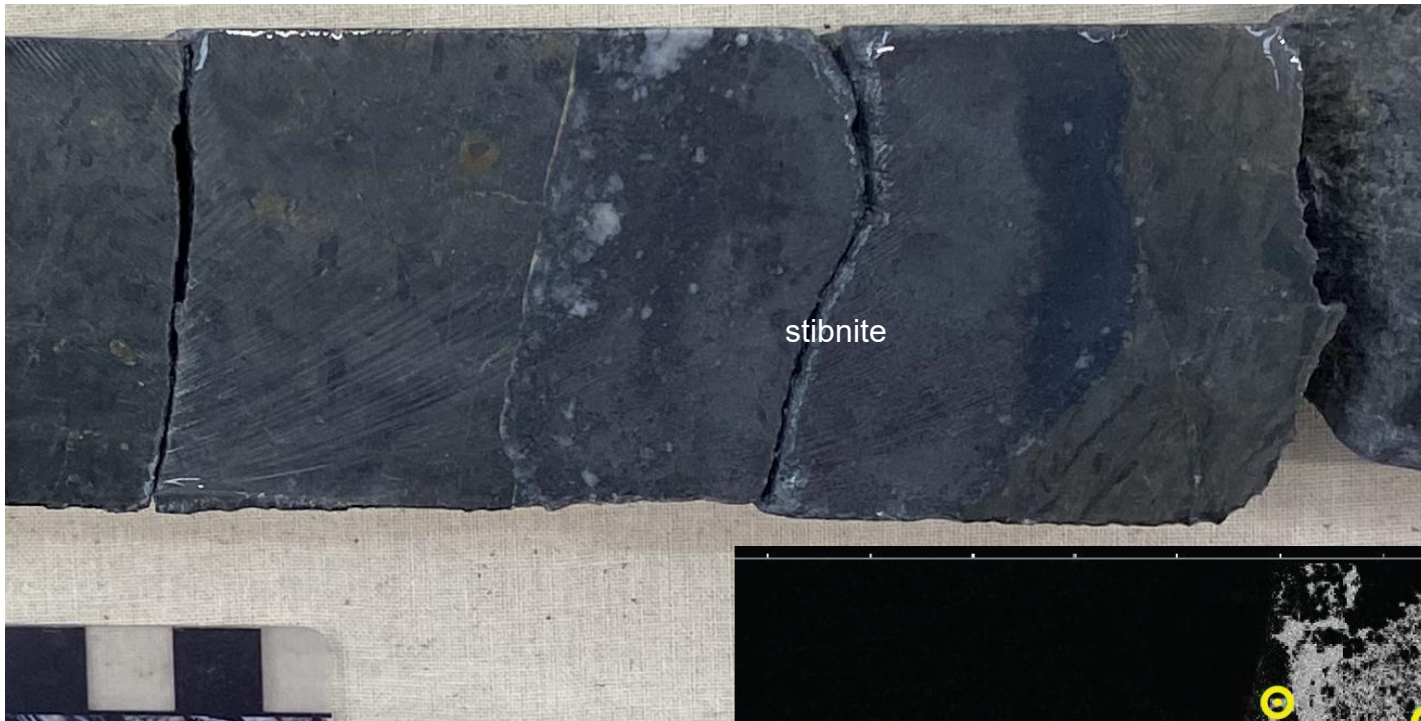
A laboratory μ XRF mapping system for efficient elemental imaging of drill core.



OFFICIAL

Costerfield (Youle)

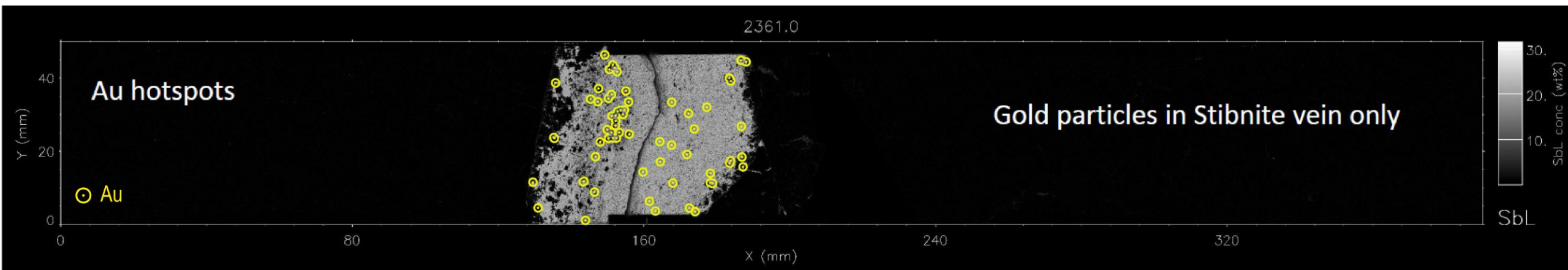
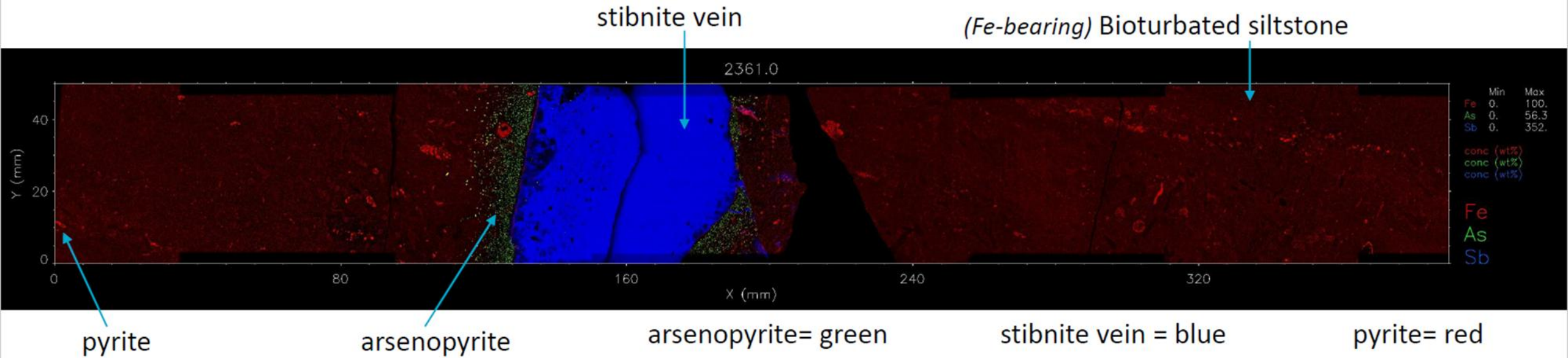
GSV sample 310415, drill hole BC120, 131.50-132.00m. The Maia map is within sample interval 131.76-131.98 43.9g/t Au and 21.0% Sb ([Mandalay Resources, 2020](#)).



Costerfield (Youle)

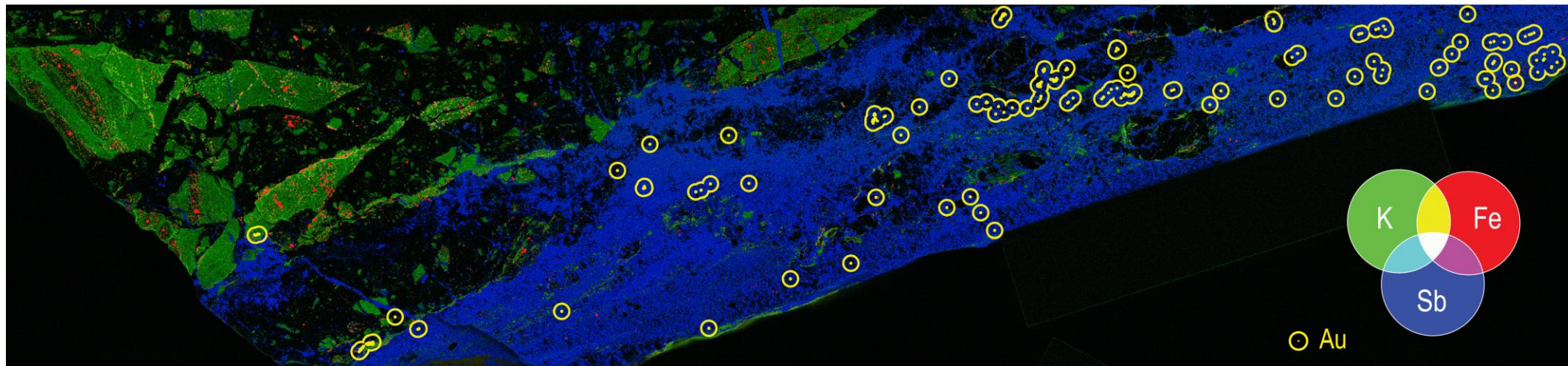


GSV sample 310415, drill hole BC120, 131.50-132.00m. The Maia map is within sample interval 131.76-131.98 43.9g/t Au and 21.0% Sb ([Mandalay Resources, 2020](#)).

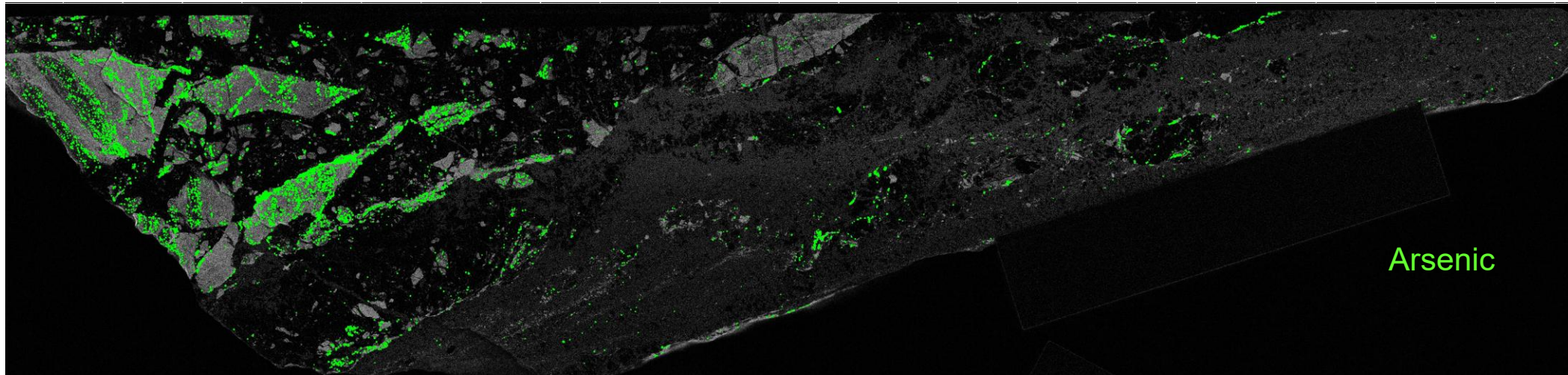
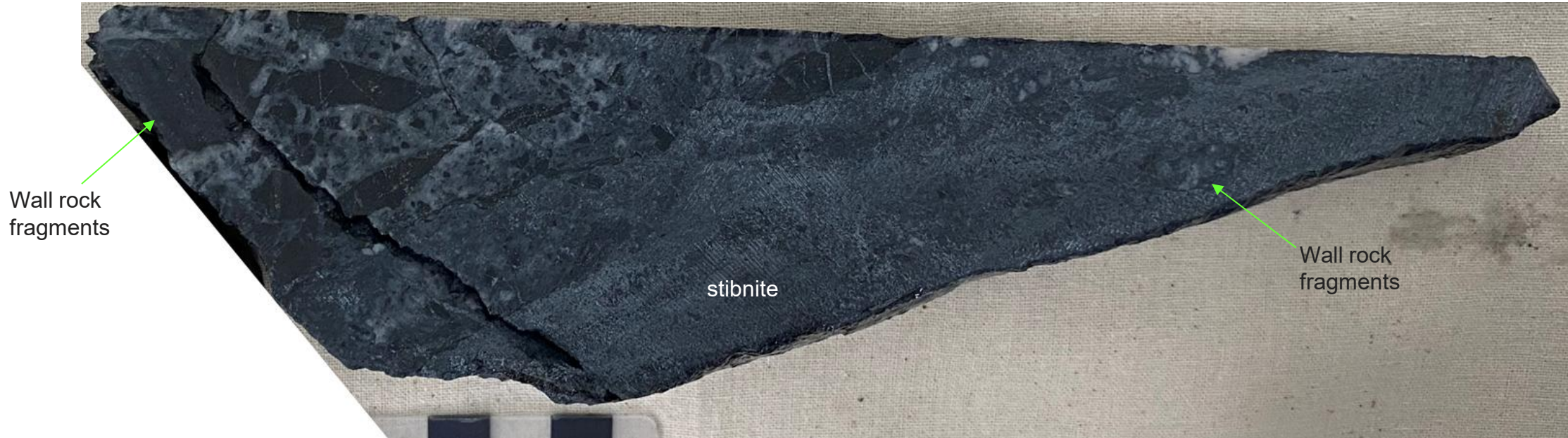


Sunday Creek (Apollo)

GSV sample 322114, drill hole SDDSC033, 194.20-194.45m. The Maia map occurs within sample interval 194.3 – 195.1m, 38.35g/t Au and 7.12% Sb ([Mawson Gold Limited, 2022](#)).



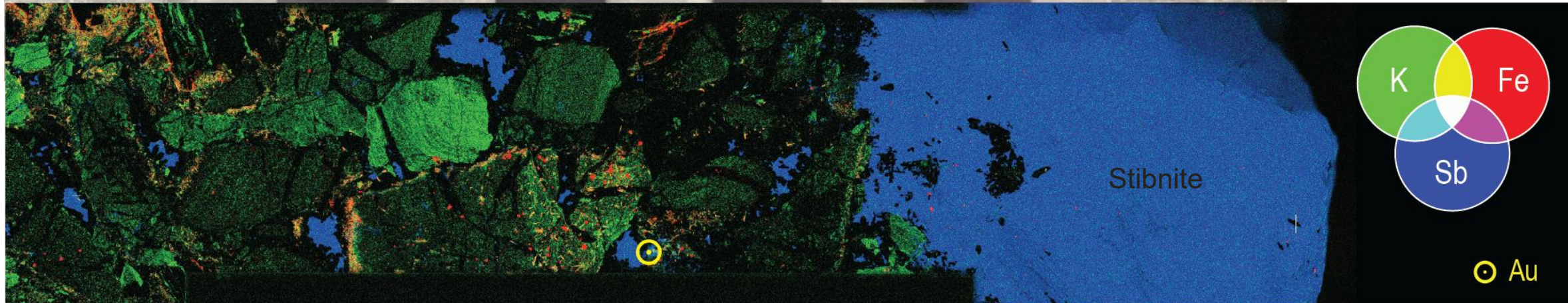
Sunday Creek (Apollo)



Nagambie (C1 vein east)



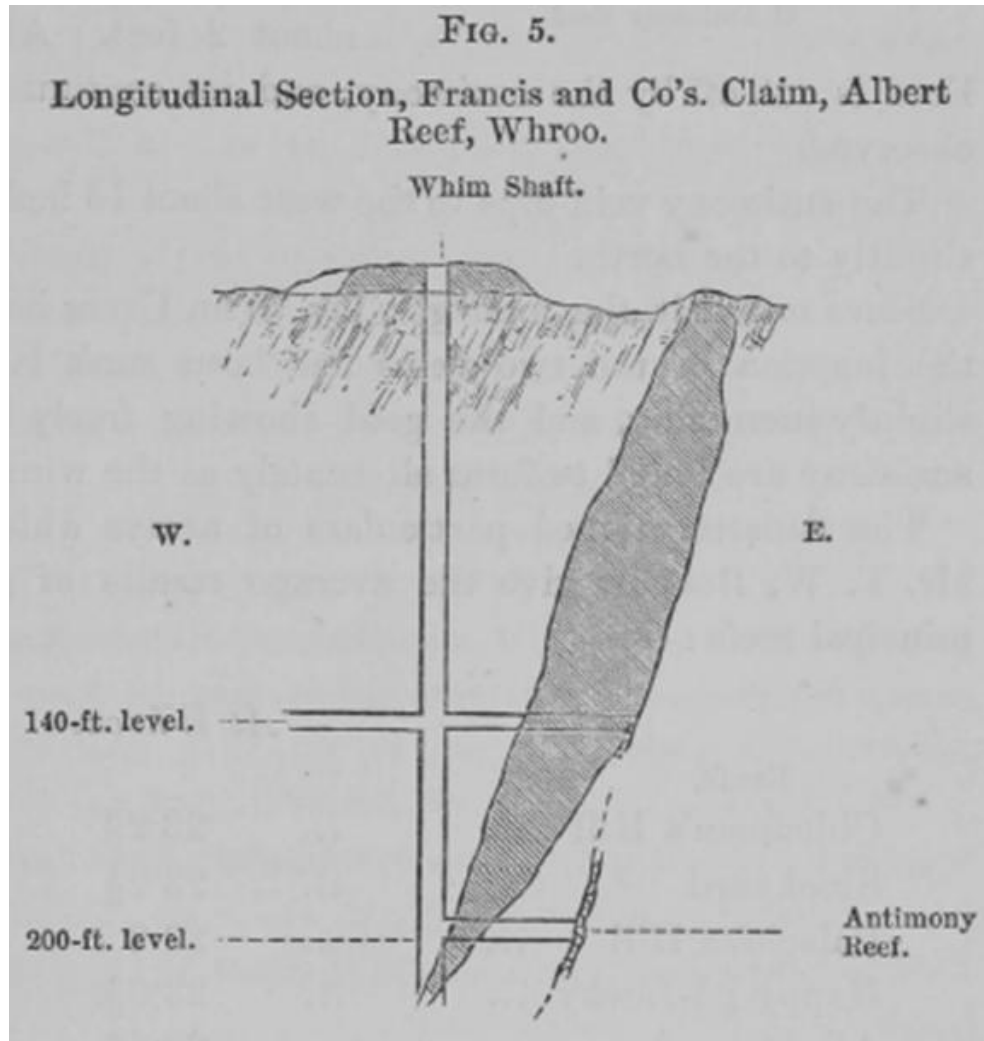
GSV sample 322247, N1 vein, drill hole NAD036, 311.45-311.72m. The Maia map occurs within interval 310.00-314.16m, 3.32g/t Au and 1.24% Sb ([Nagambie Resource](#))



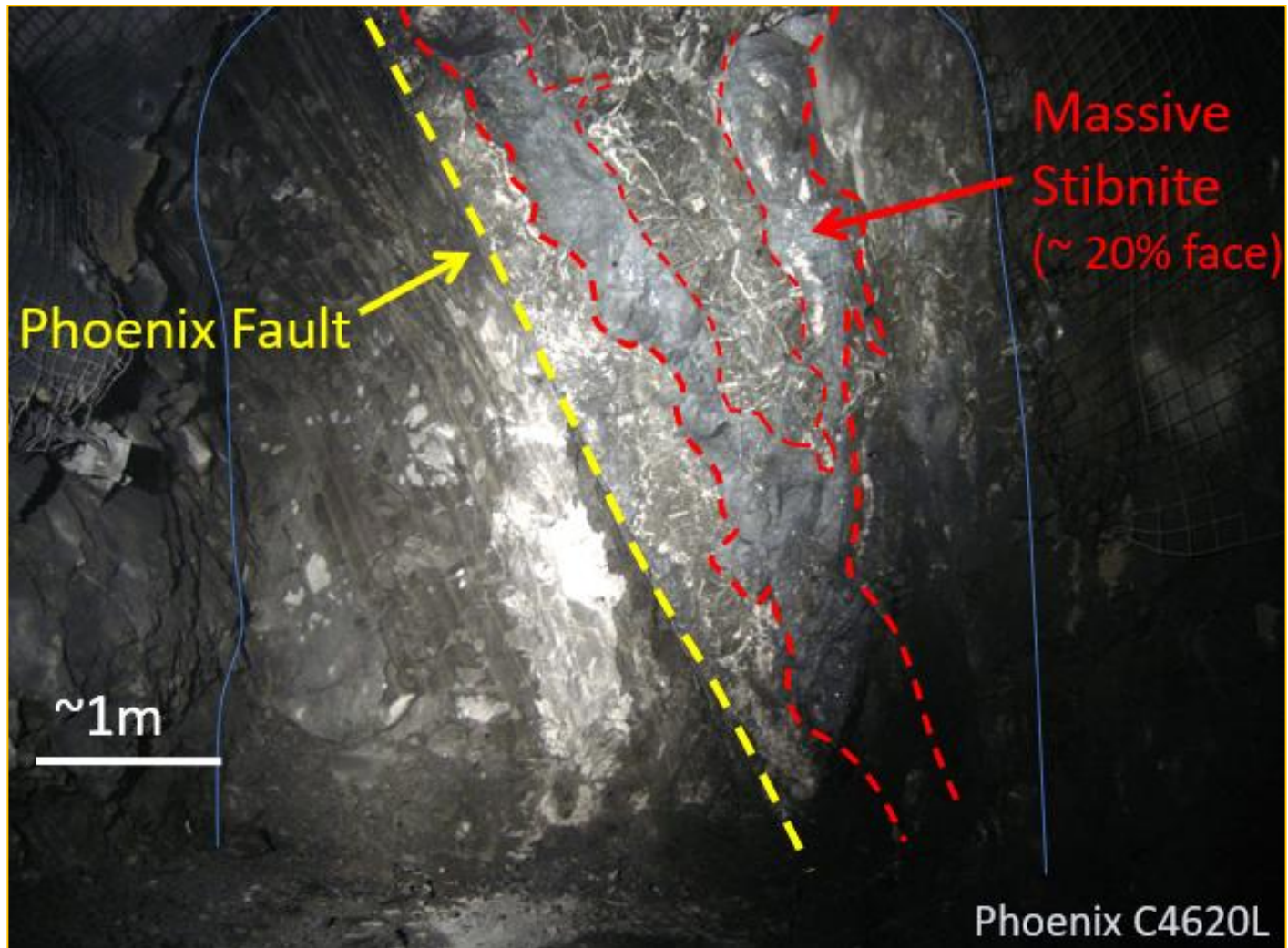
Brecciated wall rock

OFFICIAL

Timing

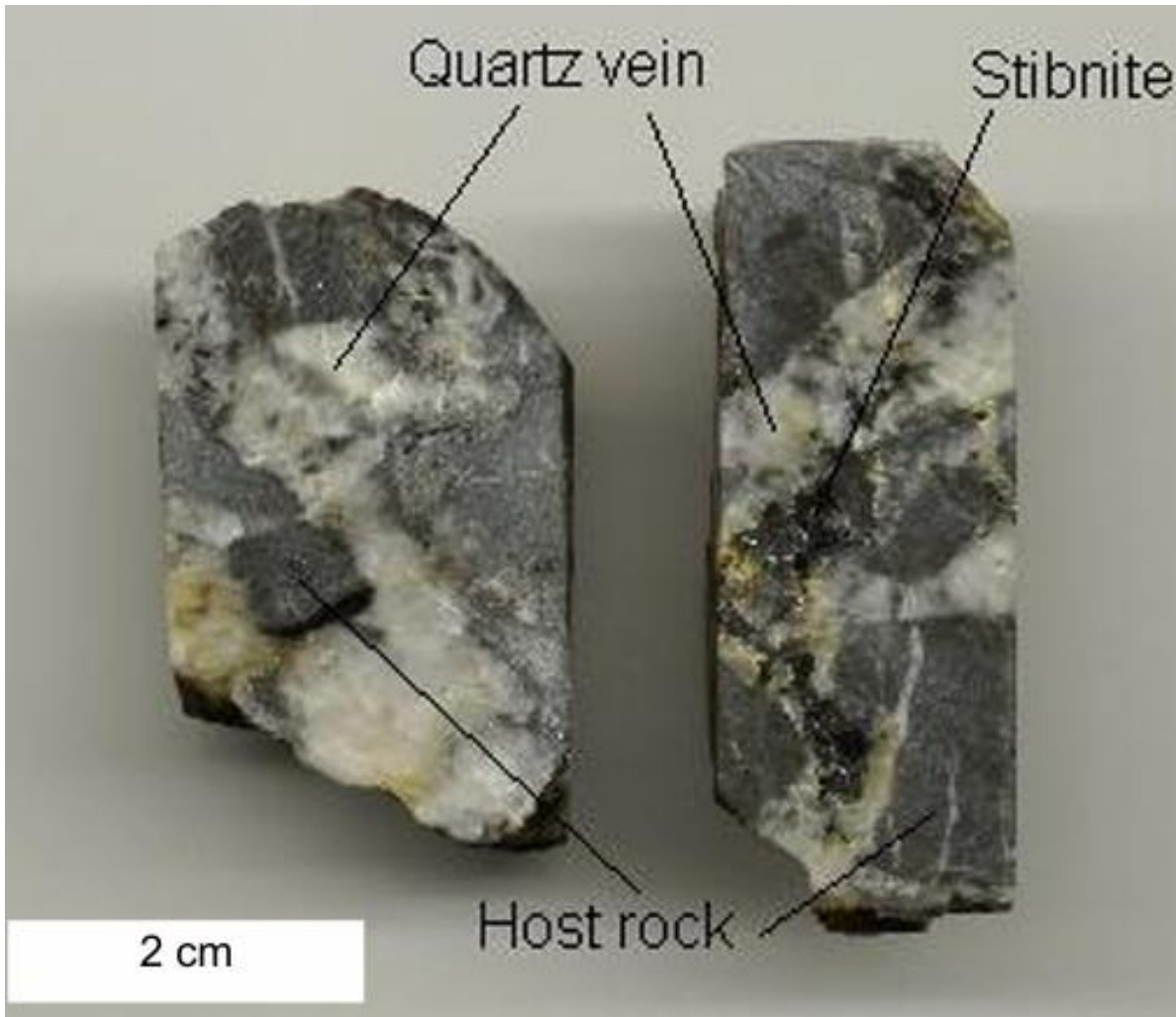


Couchman (1877)

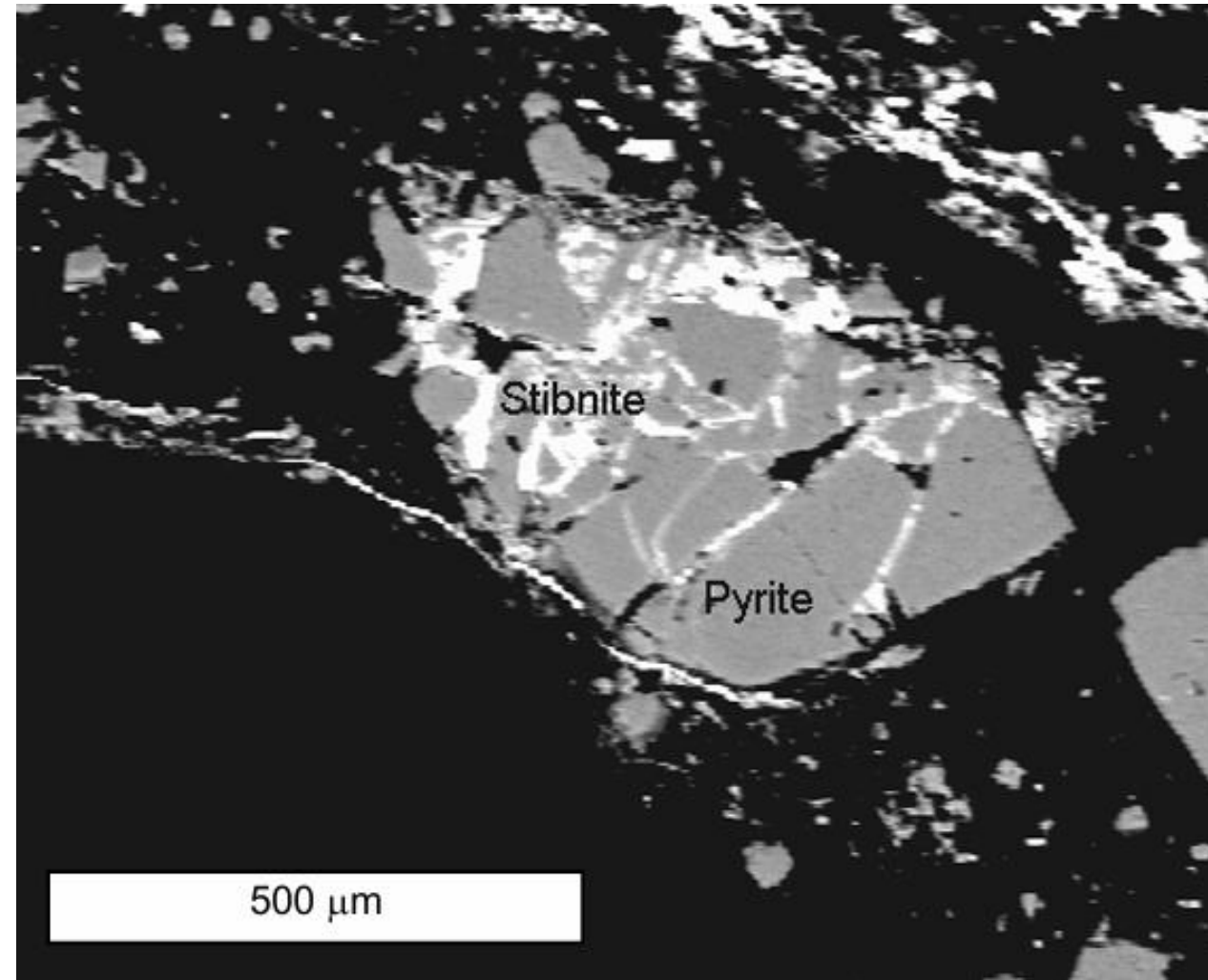


Quartz-filled faults with variable gold associated with the Phoenix Fault overprinted by massive stibnite, Fosterville (Bush et al. 2024).

Coimadai

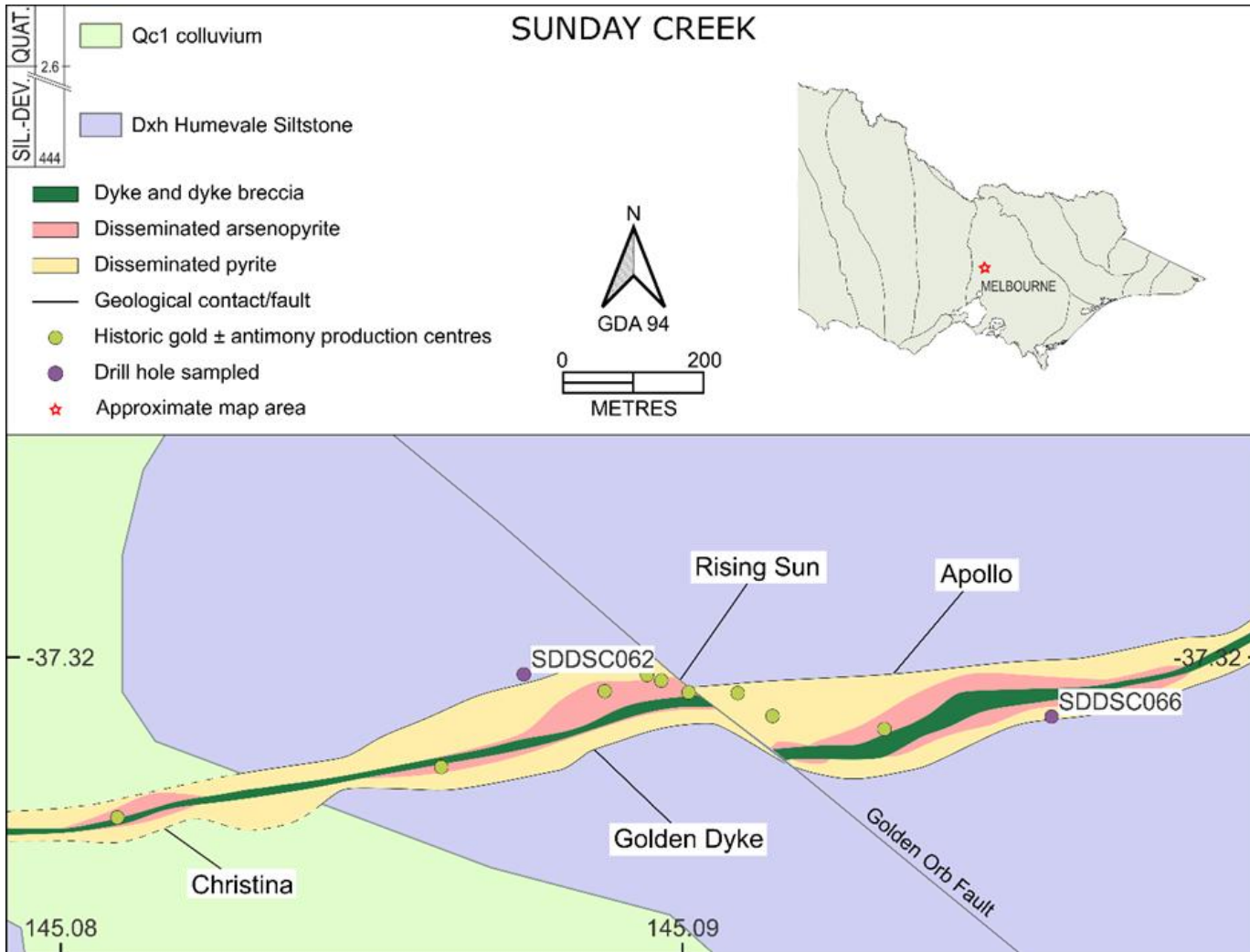


Stibnite vein crosscutting host rock and quartz veining (Wightwick, 1999).



SEM image of stibnite veinlets crosscutting a pyrite crystal (Wightwick, 1999).

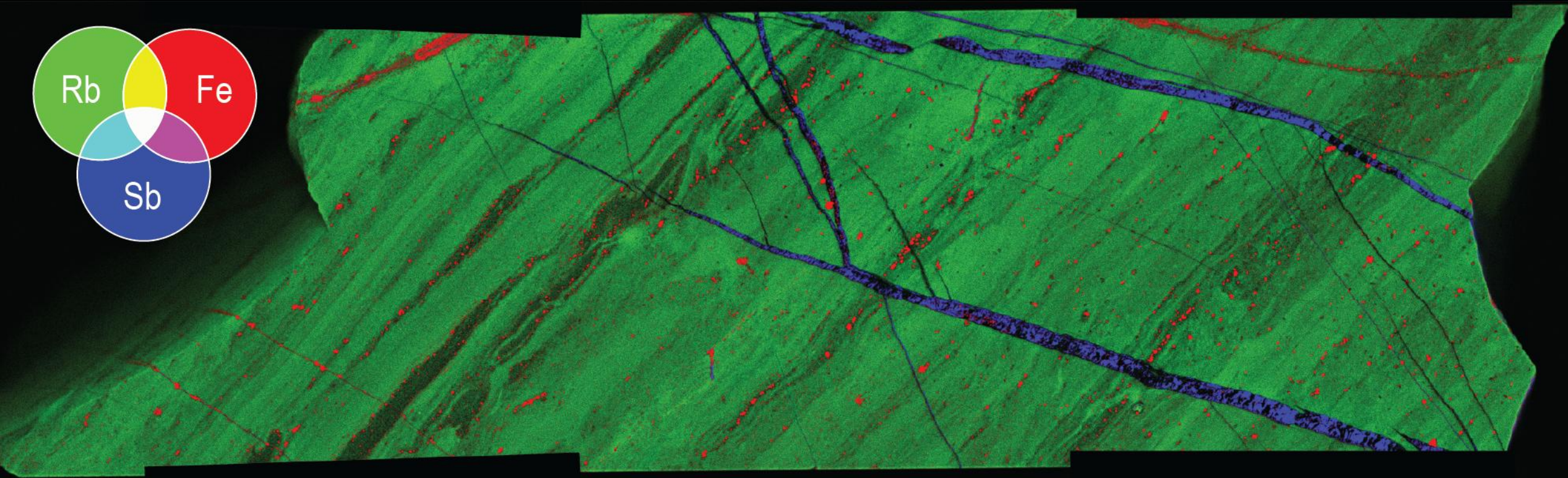
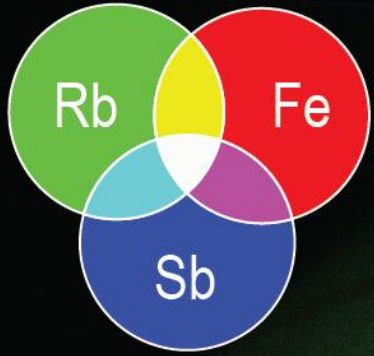
Re-Os geochronology



GSV Sample	Occurrence	Mineral	Model age (Ma)	$\pm 2\sigma$
322119	Golden Dyke	Pyrite	378.8	1.6
322866	Apollo	Arsenopyrite	379.1	1.6
322867	Apollo	Arsenopyrite	380.0	1.6

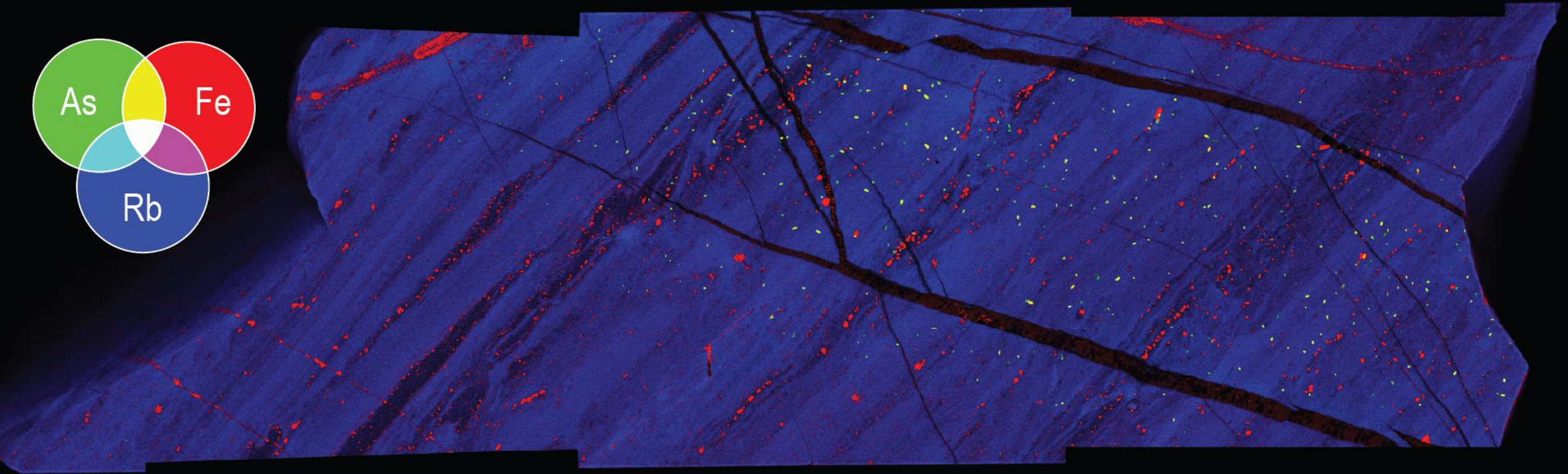
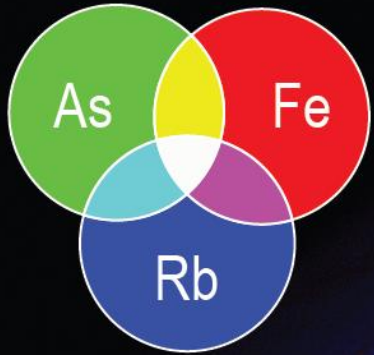


Sunday Creek (Apollo)



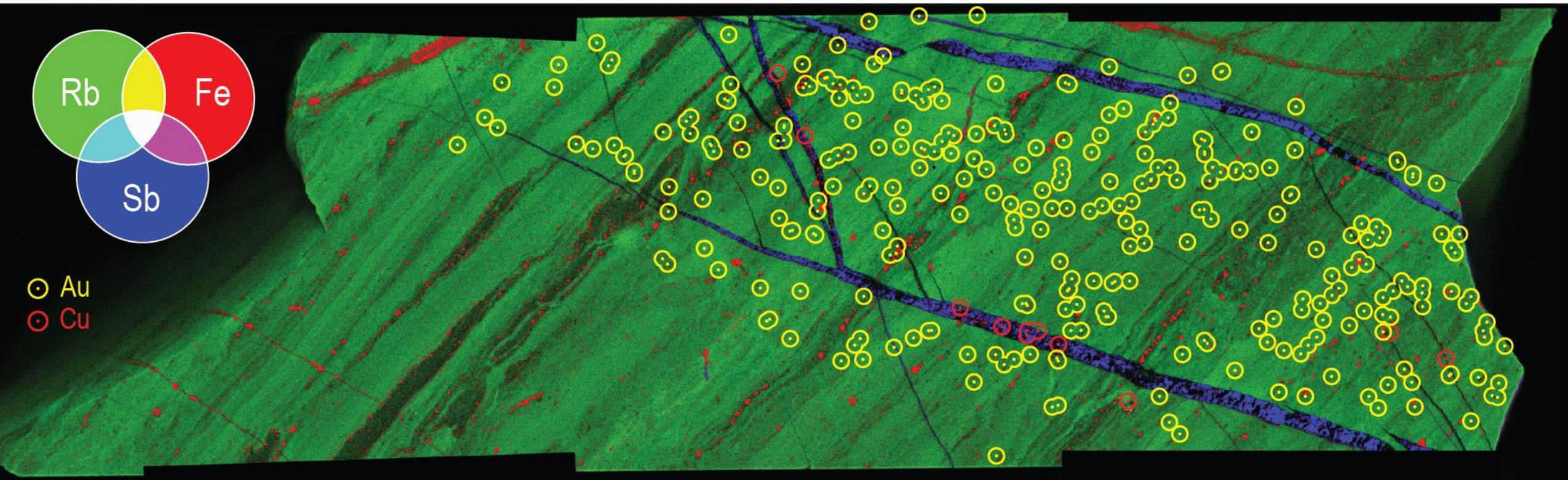
GSV sample 323029, Apollo, Sunday Creek, drill hole SDDSC066, 307.65-307.87m. The Maia map occurs within interval 307.61-307.96m, 0.9g/t Au and 0.1% Sb ([Mawson Gold Limited, 2023](#)).

Sunday Creek (Apollo)



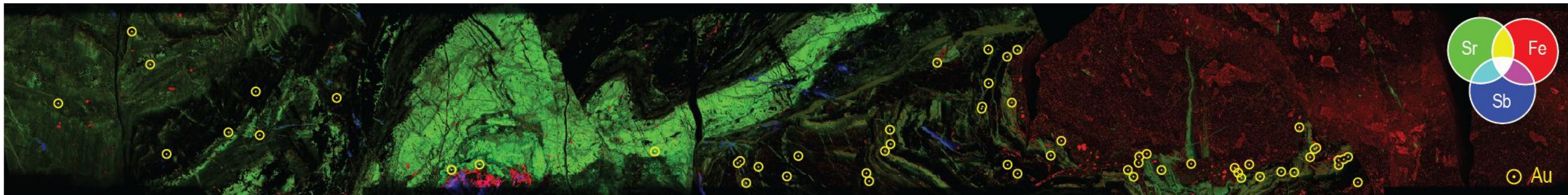
GSV sample 323029, Apollo, Sunday Creek, drill hole SDDSC066, 307.65-307.87m. The Maia map occurs within interval 307.61-307.96m, 0.9g/t Au and 0.1% Sb ([Mawson Gold Limited, 2023](#)).

Sunday Creek (Apollo)



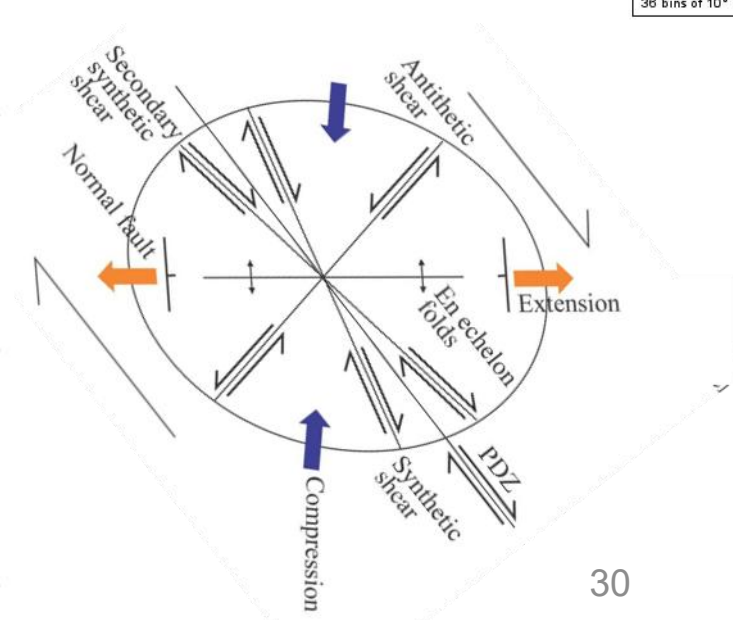
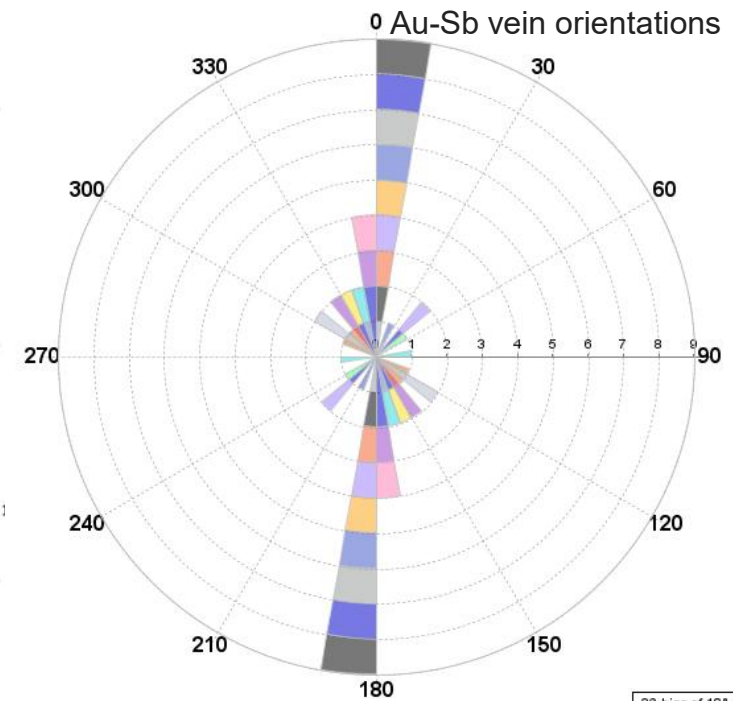
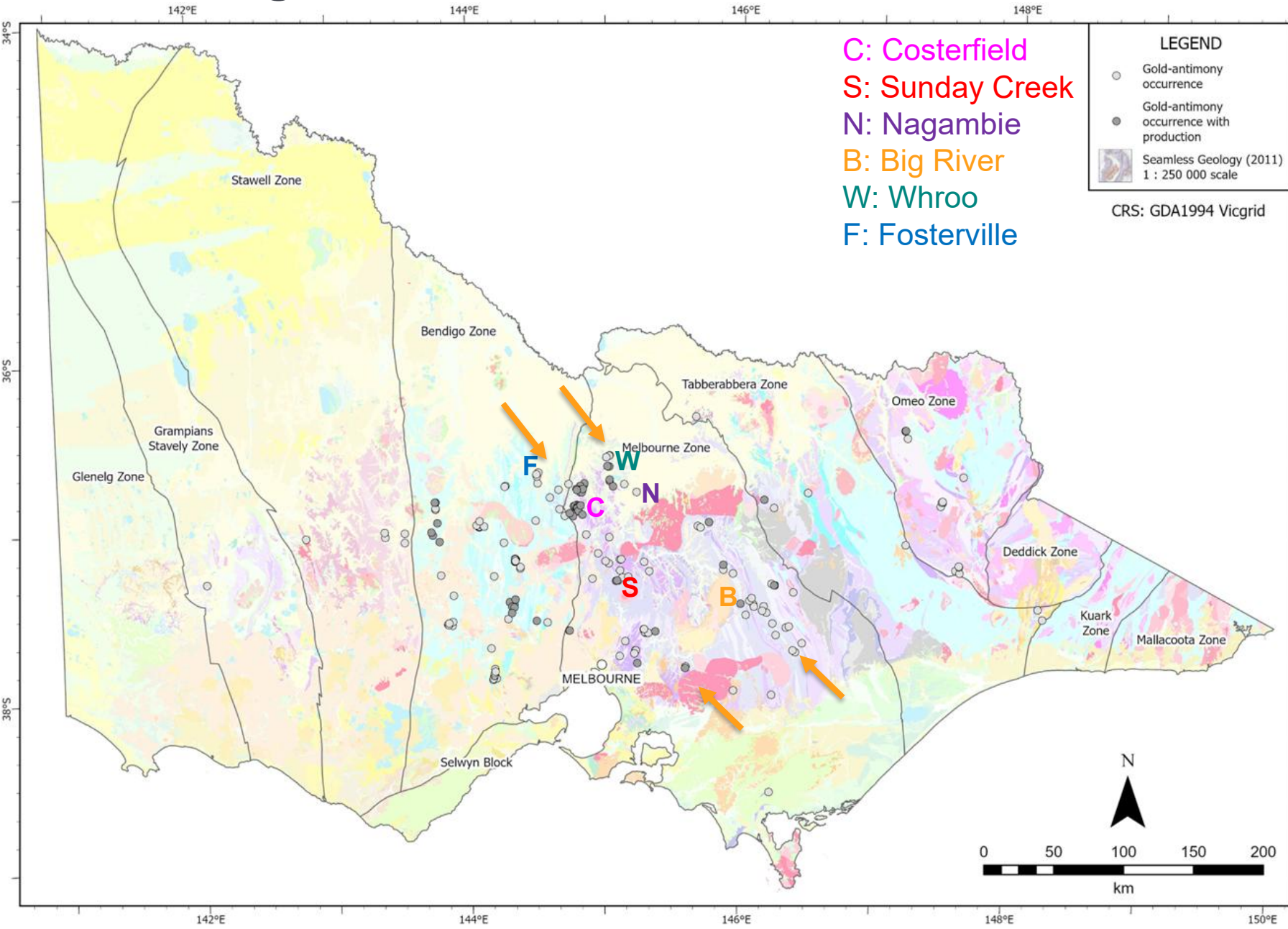
GSV sample 323029, Apollo, Sunday Creek, drill hole SDDSC066, 307.65-307.87m. The Maia map occurs within interval 307.61-307.96m, 0.9g/t Au and 0.1% Sb ([Mawson Gold Limited, 2023](#)).

Costerfield (Youle)

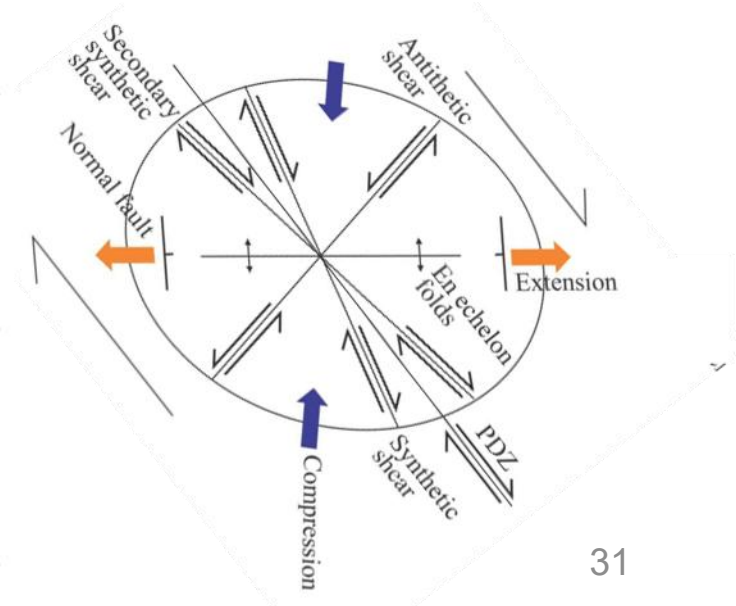
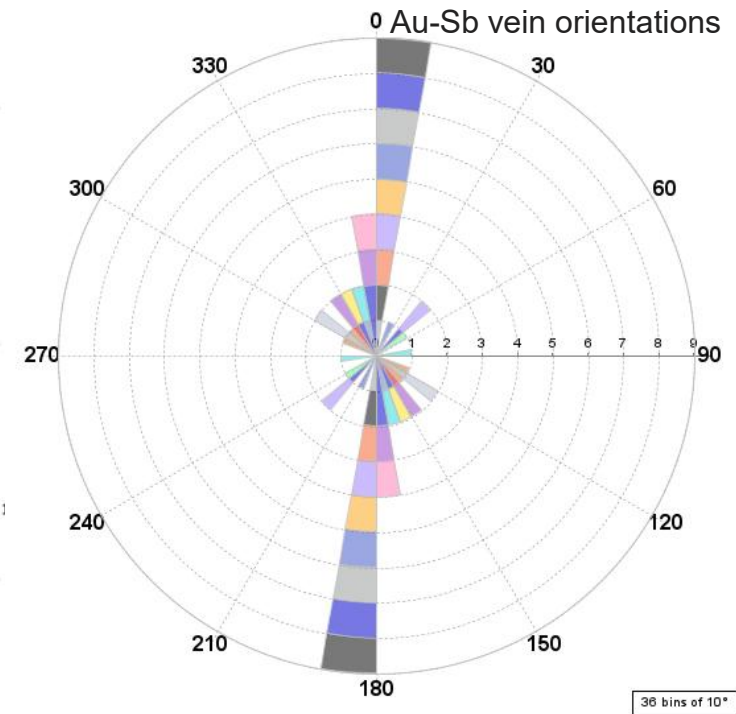
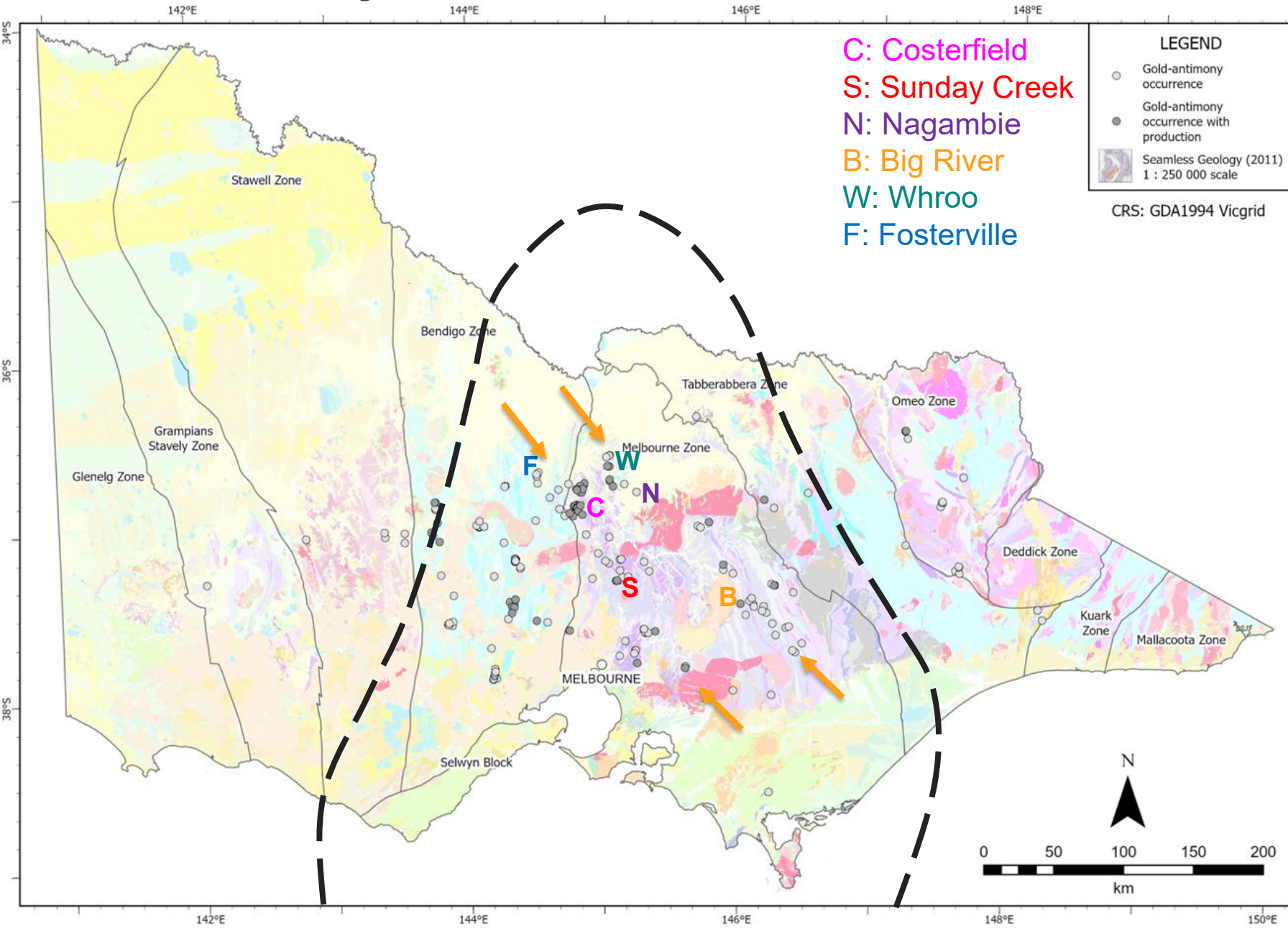


GSV sample 310411, Youle, Costerfield, drill hole BC100, 160.09-160.50m. Maia map.

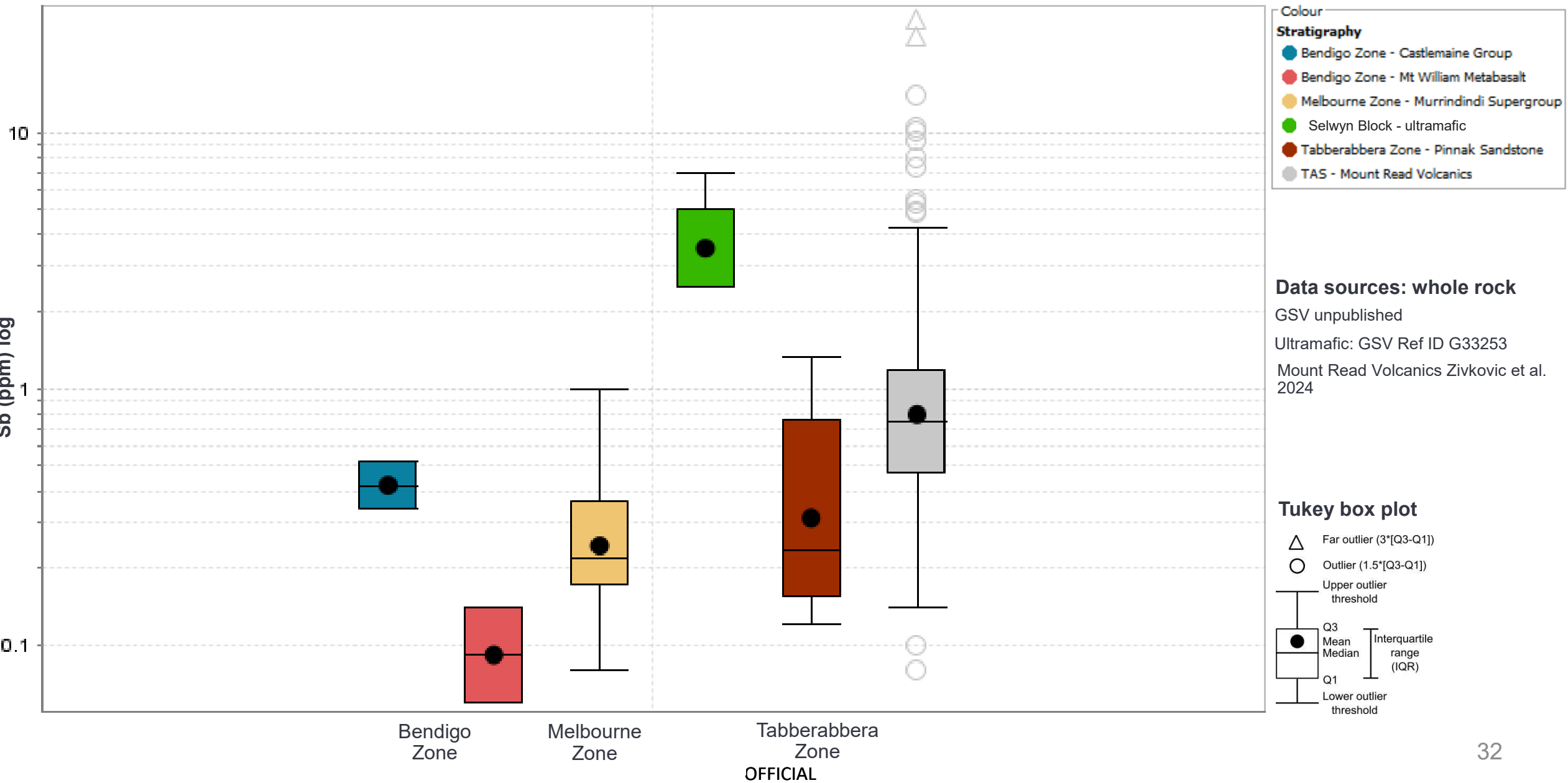
Contrasting orientations



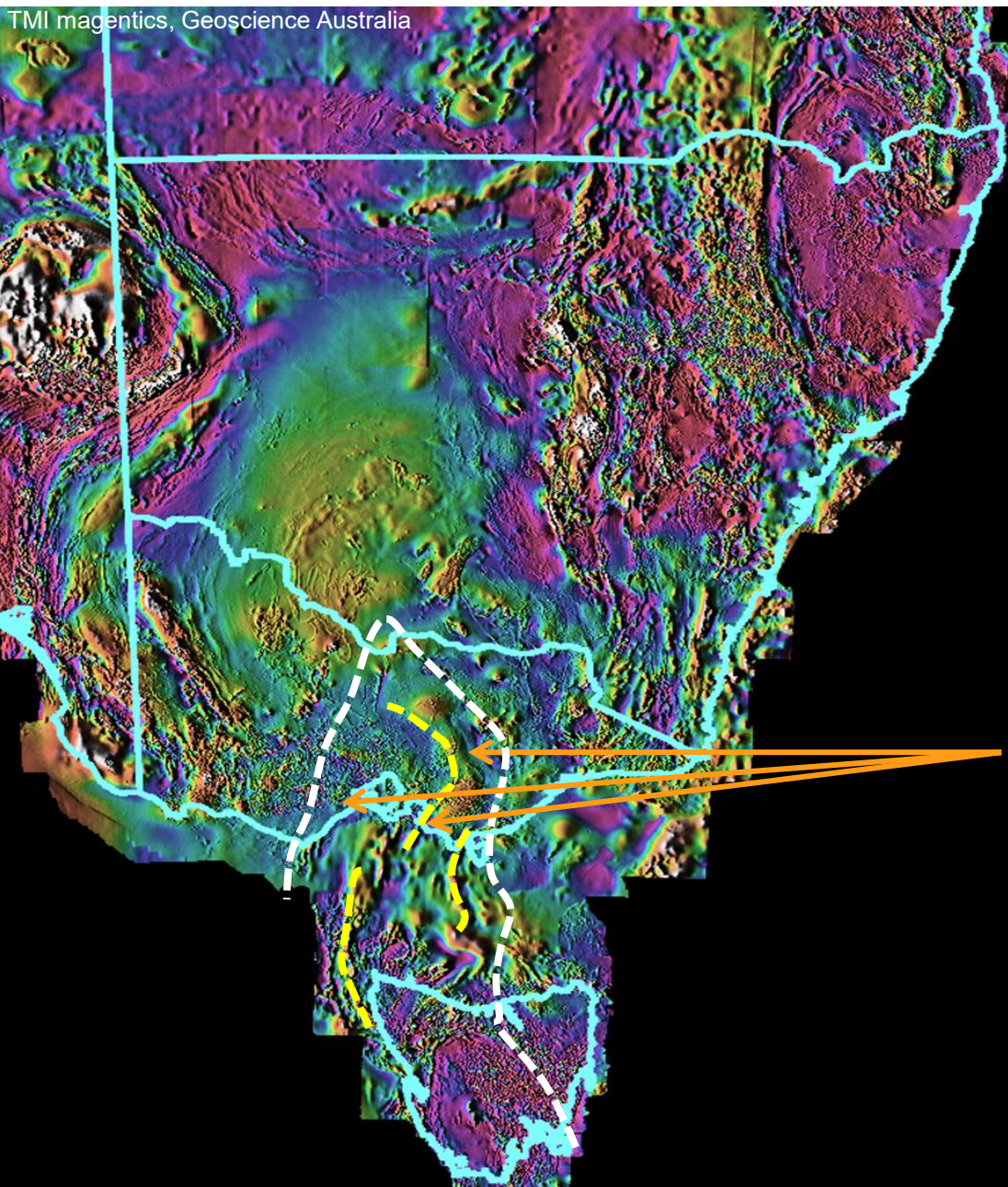
Enter the Selwyn Block



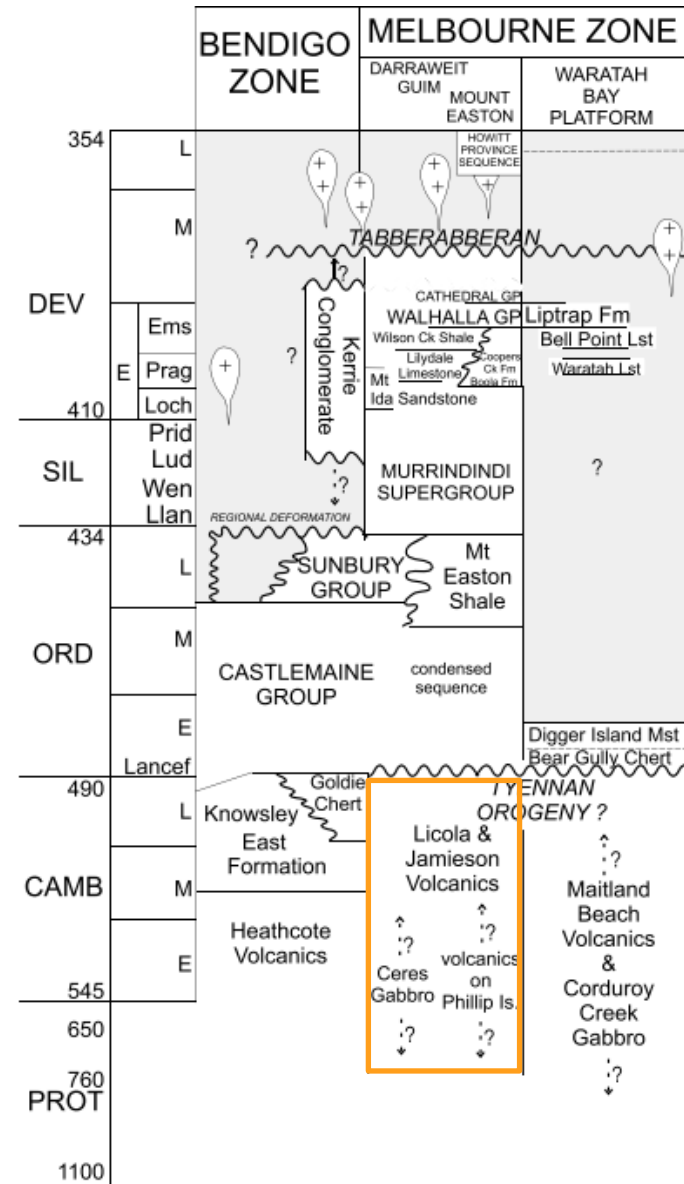
Is there a source for the antimony?



A bigger picture emerging for gold-antimony?

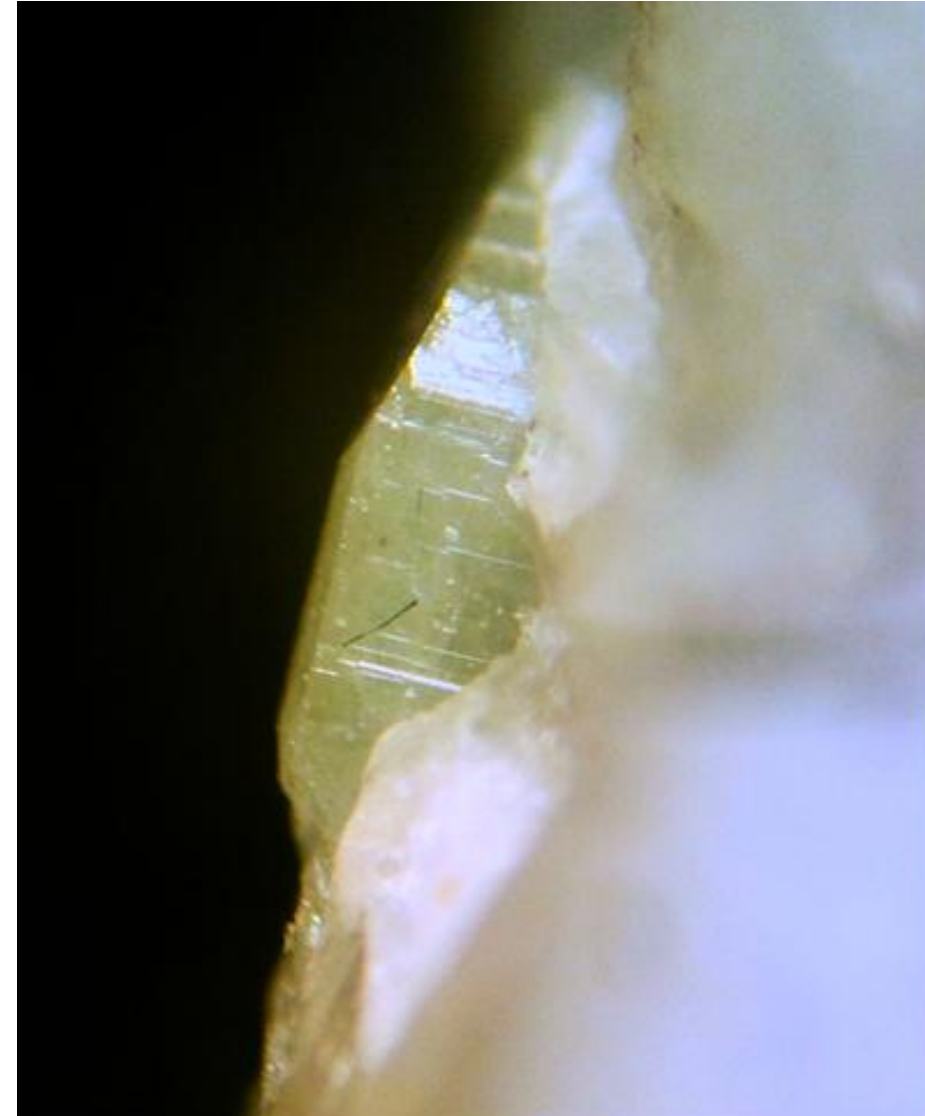


Includes Cambrian volcanic rocks:
Mount Read Volcanics equivalent



What's next?

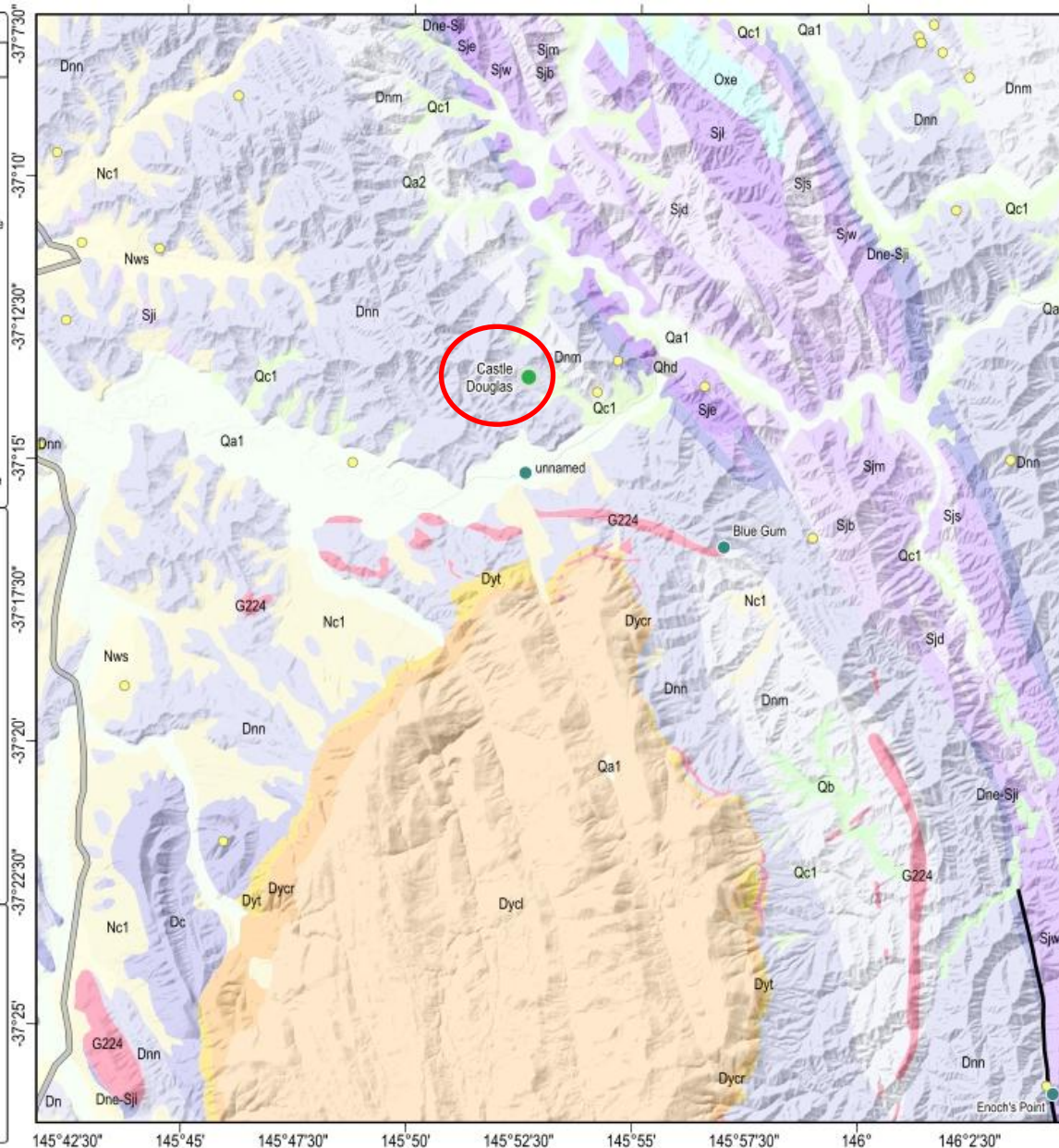
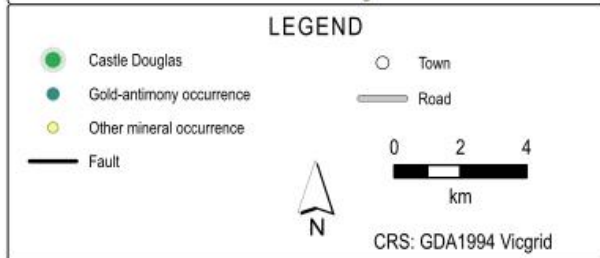
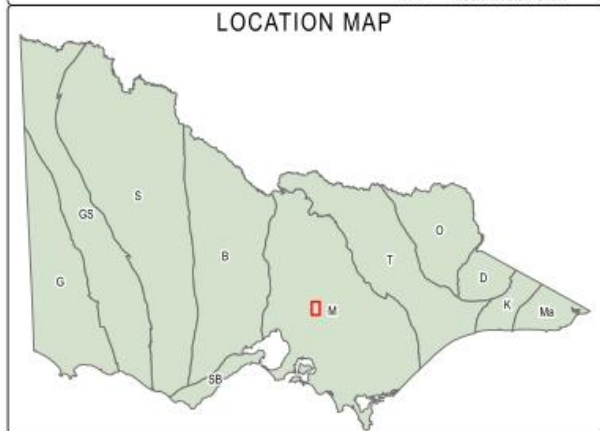
- Report
 - **Mineralisation and textures of select gold-antimony occurrences from the Melbourne Zone, central Victoria**
- Geochronology
 - U-Pb Apatite
 - Rb-Sr Mica
 - SHRIMP U-Pb zircon
- Mineral systems analysis
 - Sourcing a source
 - The age-old debate: orogenic vs intrusion-related? An emerging interplay?



Stibnite(?) needle within apatite, Costerfield. Courtesy R. Eagle

Snobs Creek / Castle Douglas

STRATIGRAPHIC LEGEND				
Era	Period	Sedimentary	Igneous	Stratigraphic name
CENOZOIC	Q	2.6	Nc1 Nws Qc1 Qa1 Qa2	Qhd dam wall deposits Qa1 alluvium Qa2 alluvial terrace deposits Qc1 colluvium
	N	23		Nc1 incised colluvium Nws Shepparton Formation
PALAEOZOIC	D	359	Dne-Sj	Dyt Taggart Subgroup G224 Buxton Granodiorite
		419	Dnm Dnn Dc Dn Sje Sji	Dycl Lake Mountain Rhyodacite Dycr Rubicon Rhyolite
	S	444	Sjw Sjs Sjb Sjm	Dne-Sji Easts Lookout Siltstone-Wilson Creek Shale: hornfels Dnn Norton Gully Sandstone Dnm Monty's Hut Formation Dc Cathedral Group Dn Walhalla Group: hornfels Sji Wilson Creek Shale
			Sjd	Sje Eldon Sandstone Sjw Whitelaw Sandstone Sjs Sinclair Valley Sandstone Sjb Bullung Siltstone
	O	Oxa	Sjm McAdam Sandstone Sjd Donnelly's Creek Siltstone Oxe Mount Easton Shale	

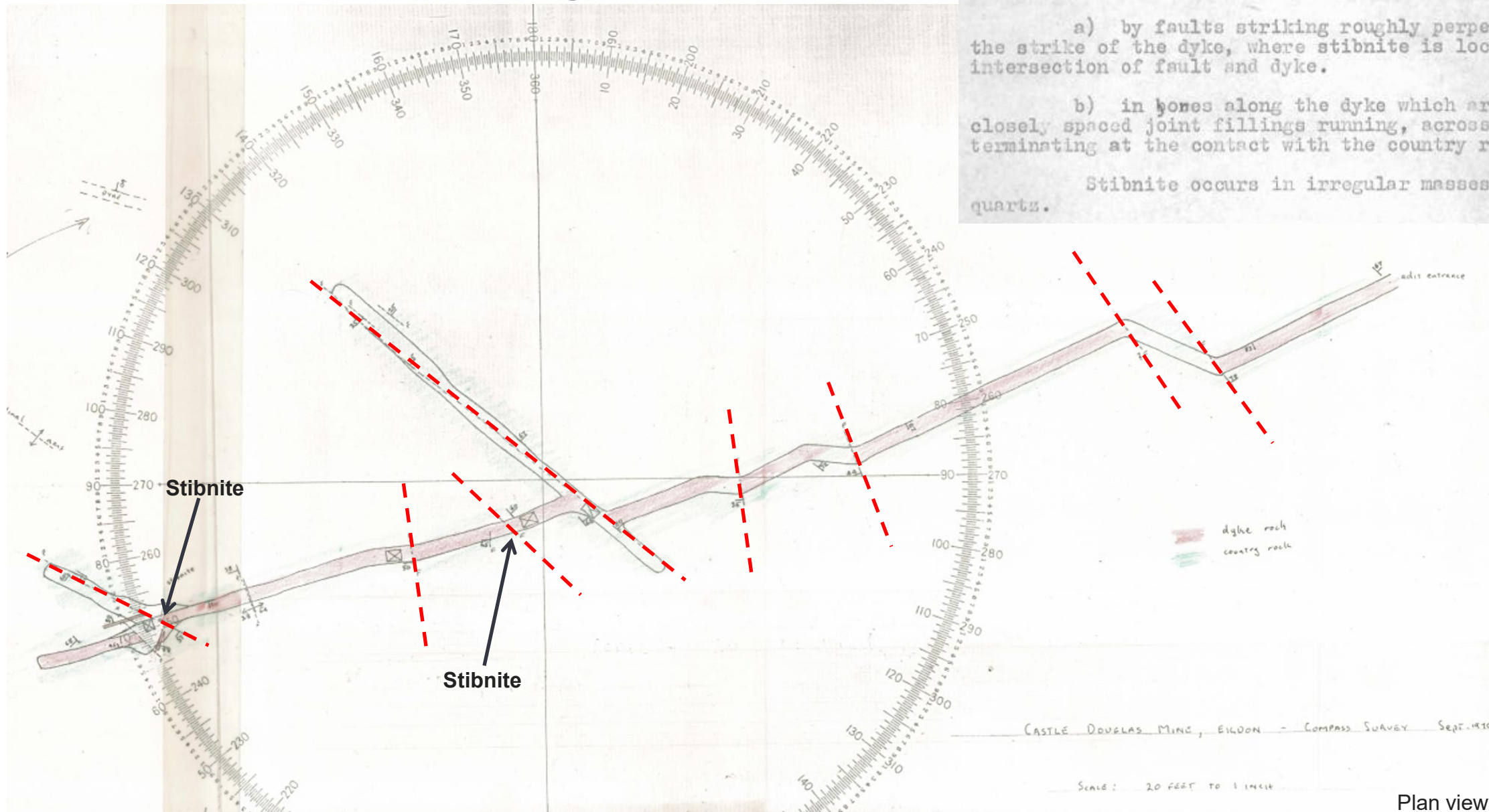


Snobs Creek / Castle Douglas

Mineralisation is structurally controlled in two ways:

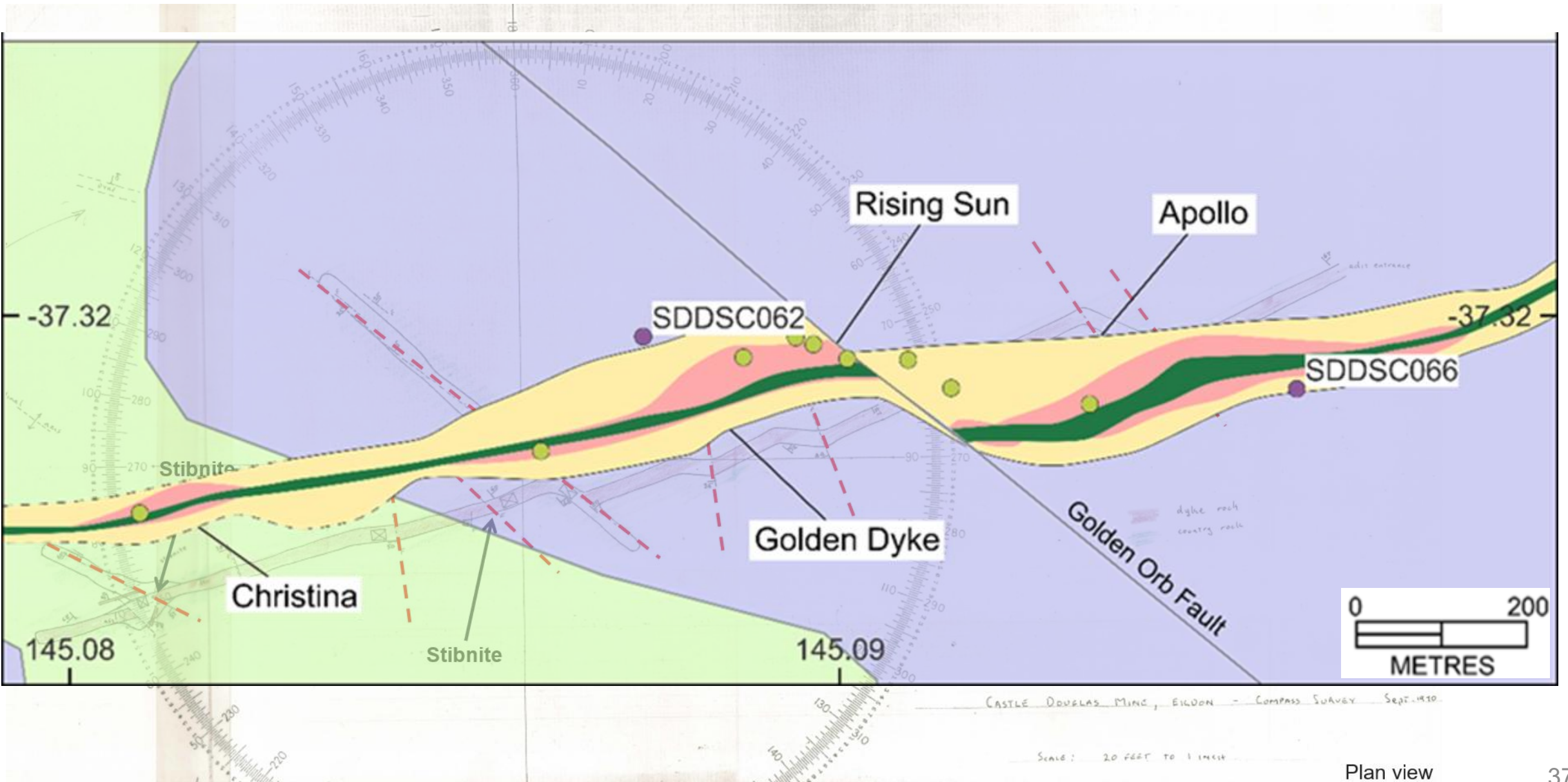
- a) by faults striking roughly perpendicular to the strike of the dyke, where stibnite is localised at the intersection of fault and dyke.
- b) in boxes along the dyke which are present as closely spaced joint fillings running, across the dyke and terminating at the contact with the country rock.

Stibnite occurs in irregular masses with or without quartz.



Plan view

Sound familiar?

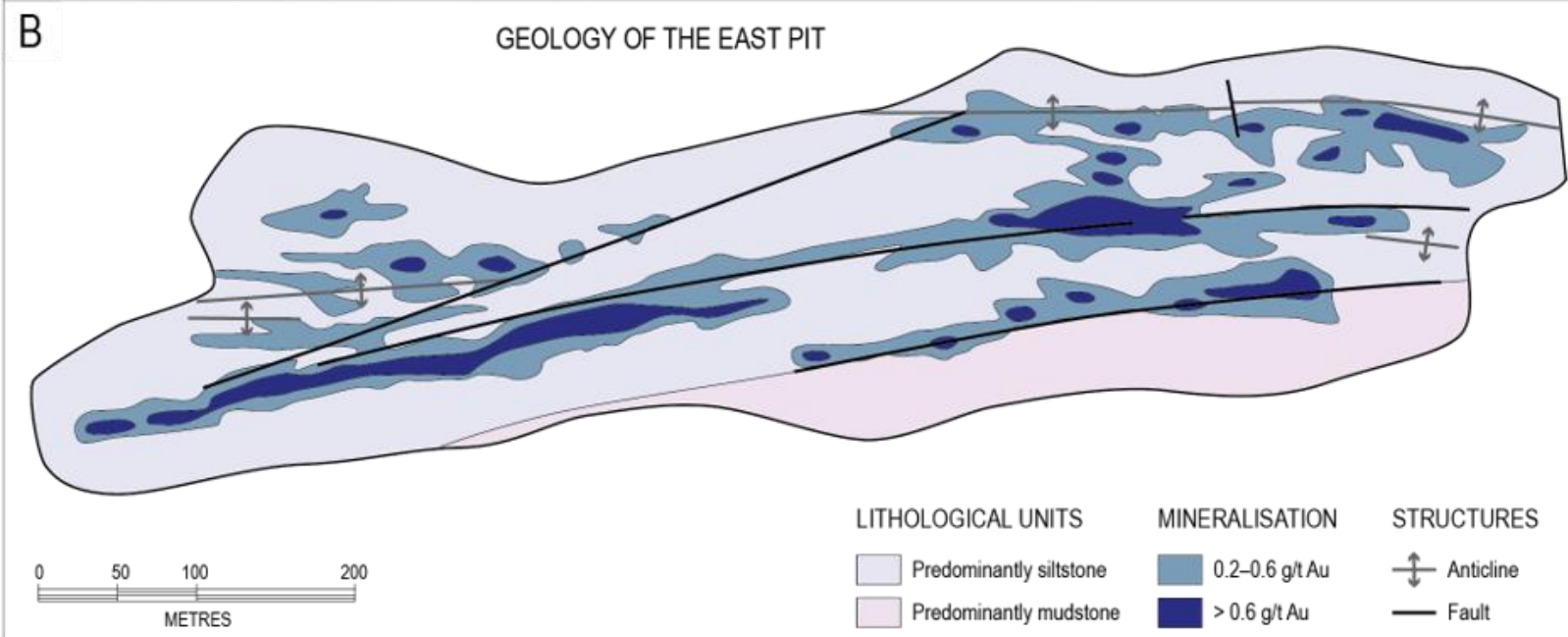


Note: difference in scales

OFFICIAL

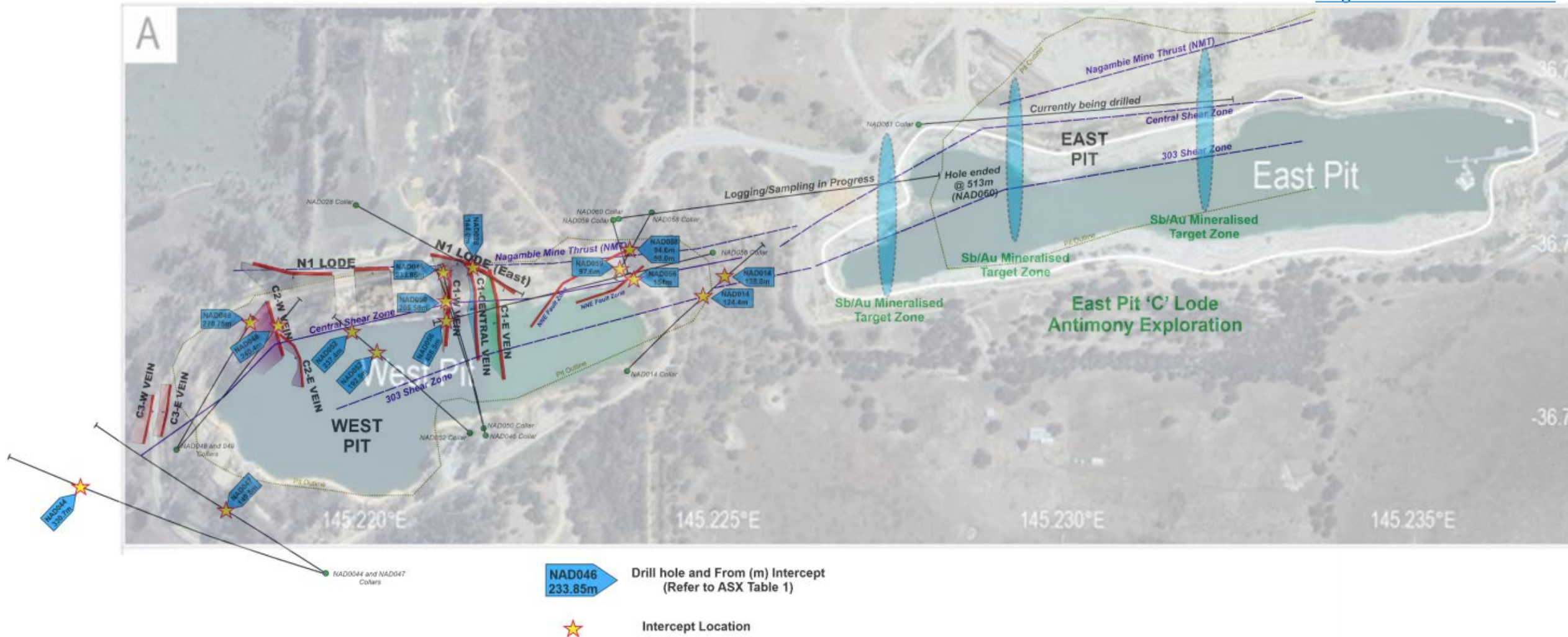
Plan view

Nagambie: a different form of east-west competency



OFFICIAL

Nagambie: emerging north-south mineralisation?



Thank you

Cameron.Cairns@deeca.vic.gov.au

Manager Minerals Geoscience

Geological Survey of Victoria

resources.vic.gov.au