

**SOUTHERN CROSS  
GOLD**

## **REDISCOVERY OF THE SUNDAY CREEK GOLD- ANTIMONY PROJECT, VICTORIA**

Michael Hudson & Nick Cook

13 May 2022

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# Acknowledgements

- The authors wish to thank all current and past workers who have progressively contributed to the rediscovery of Sunday Creek Goldfield. It takes a team to raise a discovery!
- Most recently in particular we would like to thank Lisa Gibbons, Angela Lorrigan, Thomas Fromhold, Lisa Andersson, Marcus Tomkinson, Roland Hill, Matthew Coad, Angus McKay, David Henstridge and Henry Rech.





## The Next 25 Minutes

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1. Review of Victorian gold production, orogenic events and the new search space
2. Sunday Creek Au-Sb history and rediscovery
3. Virtual core yard review and timing of key events



# Spinning out the Australian assets of TSX-listed Mawson Gold Ltd through an ASX IPO

## Nordic Discovery and Development

Finland and Sweden: Drilling 8 km now

### Rajapalot Gold-Cobalt

1.04 Moz @ 3.0 g/t AuEq

Camp-Scale Potential, Pre-Development Strategic  
Project for Finland and EU

### Skellefteå North Project

3.8 m at 4.5 g/t in outcrop. 2 km Mag Anomaly  
Mawson earning in 85% over 10 years

## Southern Cross Gold

2022 ASX IPO "SXG" 16 May, 2022

### Victorian Goldfields Renaissance

Leading Discovery, Gold-Antimony  
Grade and Width: 11.7 m at 16.0 g/t AuEq  
3 of 9 Epizonal Historic Fields

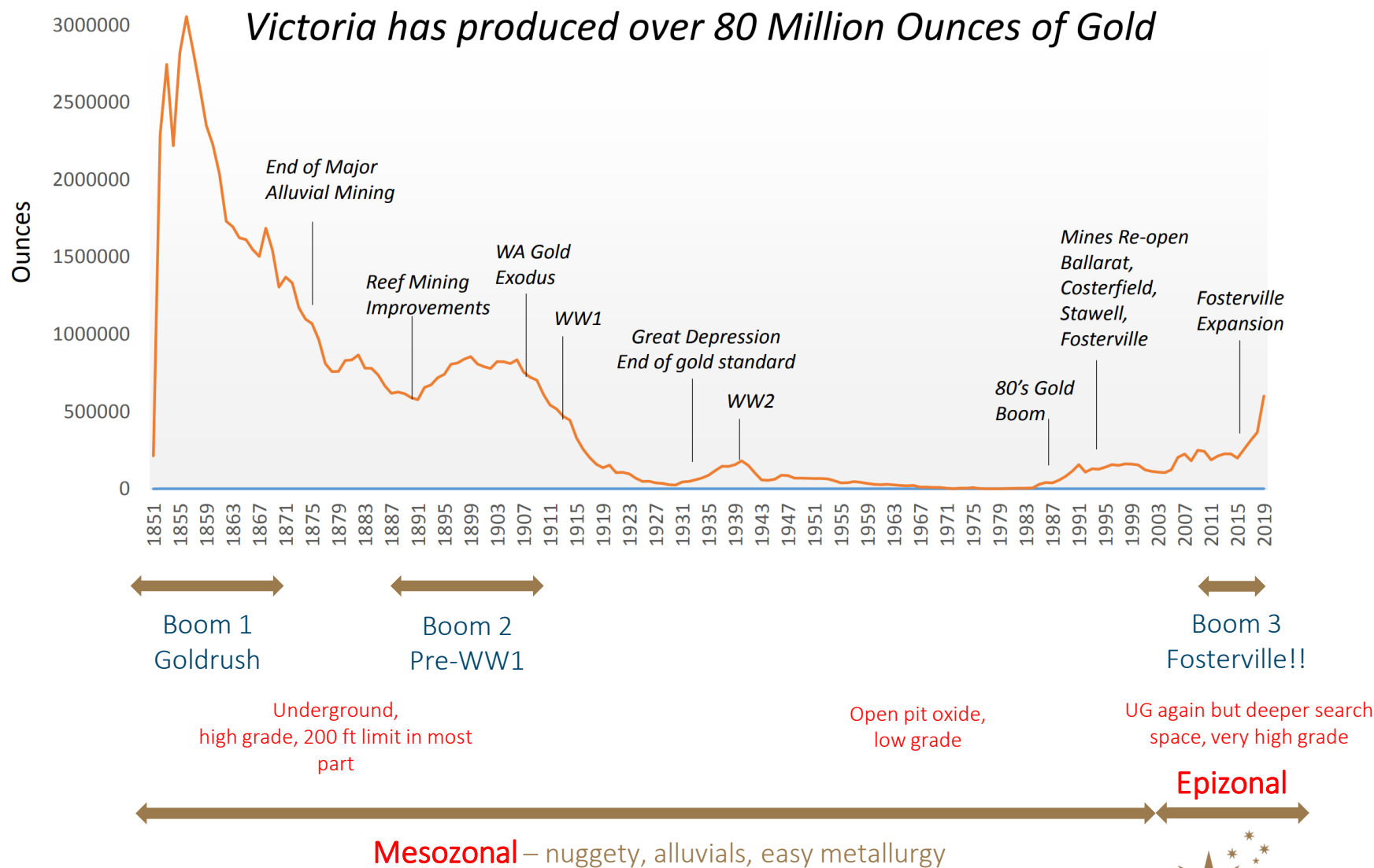
### Mt Isa

Ag, Cu, Au. 785km<sup>2</sup>  
60km strike undercover

# Giant Orogenic Gold Deposits



# Driven by geological style And the drill bit





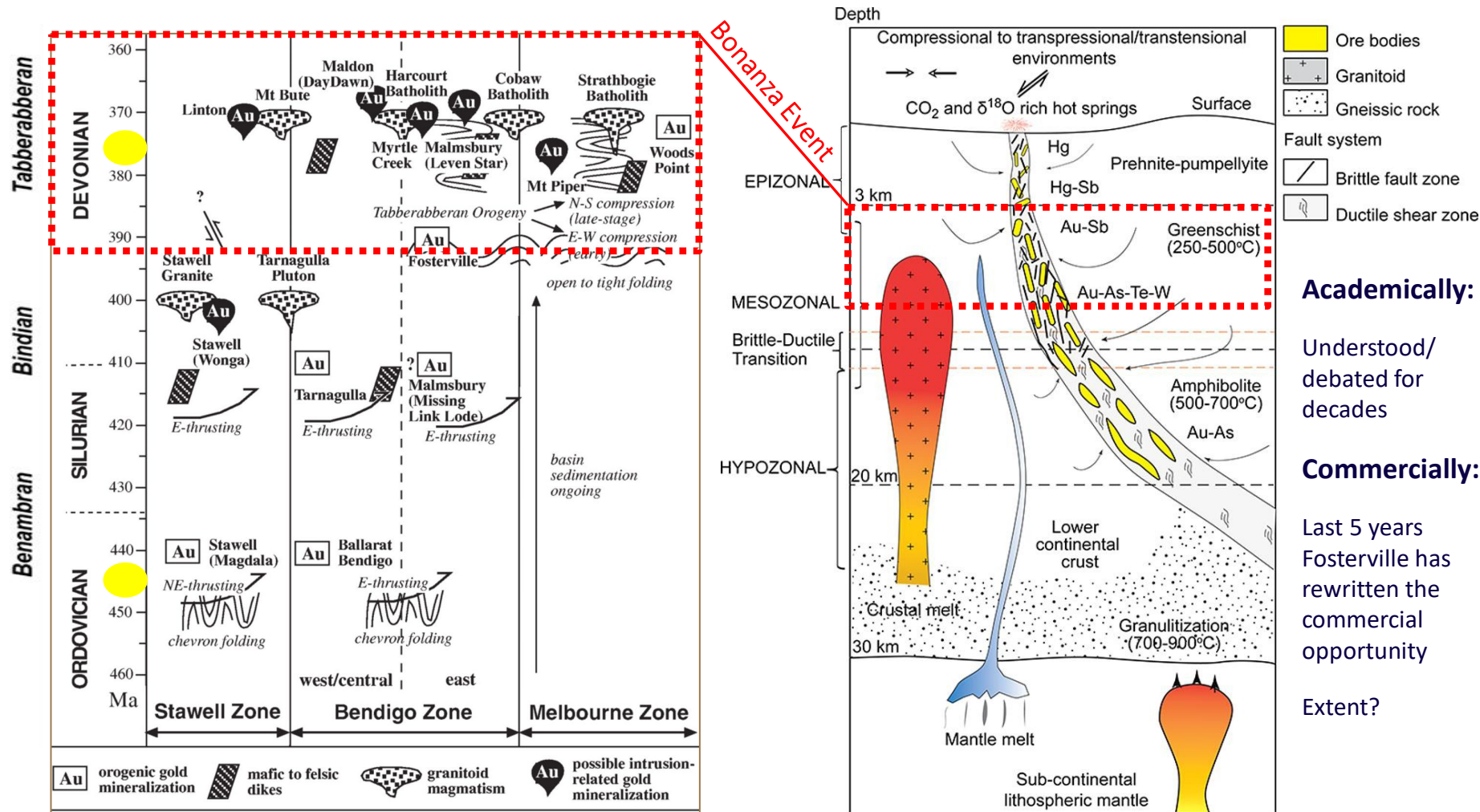
# Victoria – Why the Interest?

HIGHEST-GRADE GOLD MINES 2021				Q1 2021 Au milled grade, g/t
	MINE		OWNER	
1	Fosterville	Australia	Agnico Eagle	19.8
2	Macassa	Canada	Agnico Eagle	19.8
3	Island Gold	Canada	Alamos Gold	13.0
4	Segovia Operations	Columbia	Gran Columbia	12.8
5	Eagle River	Canada	Wesdome	12.8
6	Fruta del Norte	Ecuador	Lundin Gold	11.4
7	Costerfield/ Augusta*	Australia	Mandalay	11.0
8	Hope Bay	Canada	TMAC	10.8
9	Bambanani	South Africa	Harmony Gold	8.8
10	Cerro Negro	Argentina	Newmont	8.5

TOP GOLD PRODUCERS 2020						
MINE	LOCATION	OPERATING OWNER	TYPE	2020 PROD (KOZ)	2020 COSTS (USD/OZ)	
1	Olympia	Russia	Polysus	Open-Pit	1,200	532
2	Pueblo Viejo	Dominican Rep	Barrick Gold	Open-Pit	899	661
3	Grasberg	Indonesia	Freeport-McMoRan	U/G	848	1,279
4	Cadia Valley	Australia	Newcrest	U/G	822	104
5	Kibali	DRC	Barrick Gold	Open+ UG	807	778
6	Cortez	USA	Barrick Gold	Open+ UG	798	1,000
7	Lihir	PNG	Newcrest	Open-Pit	772	1,308
8	Loulo Gounkoto	Mali	Barrick Gold	Open+ UG	680	1,001
9	Boddington	Australia	Newmont	Open-Pit	670	1,091
10	<b>Fosterville</b>	<b>Australia</b>	<b>Agnico Eagle</b>	<b>U/G</b>	<b>640</b>	<b>313</b>

# Tabberabberan Orogeny : Epizonal gold window

Two orogenic events separated by 70ma



Modified from: pubs.geoscienceworld.org/segweb/economicgeology/article/100/2/385/151101/POSSIBLE-INTRUSION-RELATED-GOLD-SYSTEMS-IN-THE

Sourced from: ars.els-cdn.com/content/image/1-s2.0-S0169136821006120-ga1\_lrg.jpg

# Southern Cross Gold

## *Controls 3 of the 9 epizonal fields in Victoria*



### LEGEND



Key Mines



Towns & Cities



Project areas

Gold occurrences



Orogenic Au



Epizonal gold

Selected regional geology



Late Devonian volcanic



Significant intrusions



Geologic form lines

Tectonostratigraphic zones



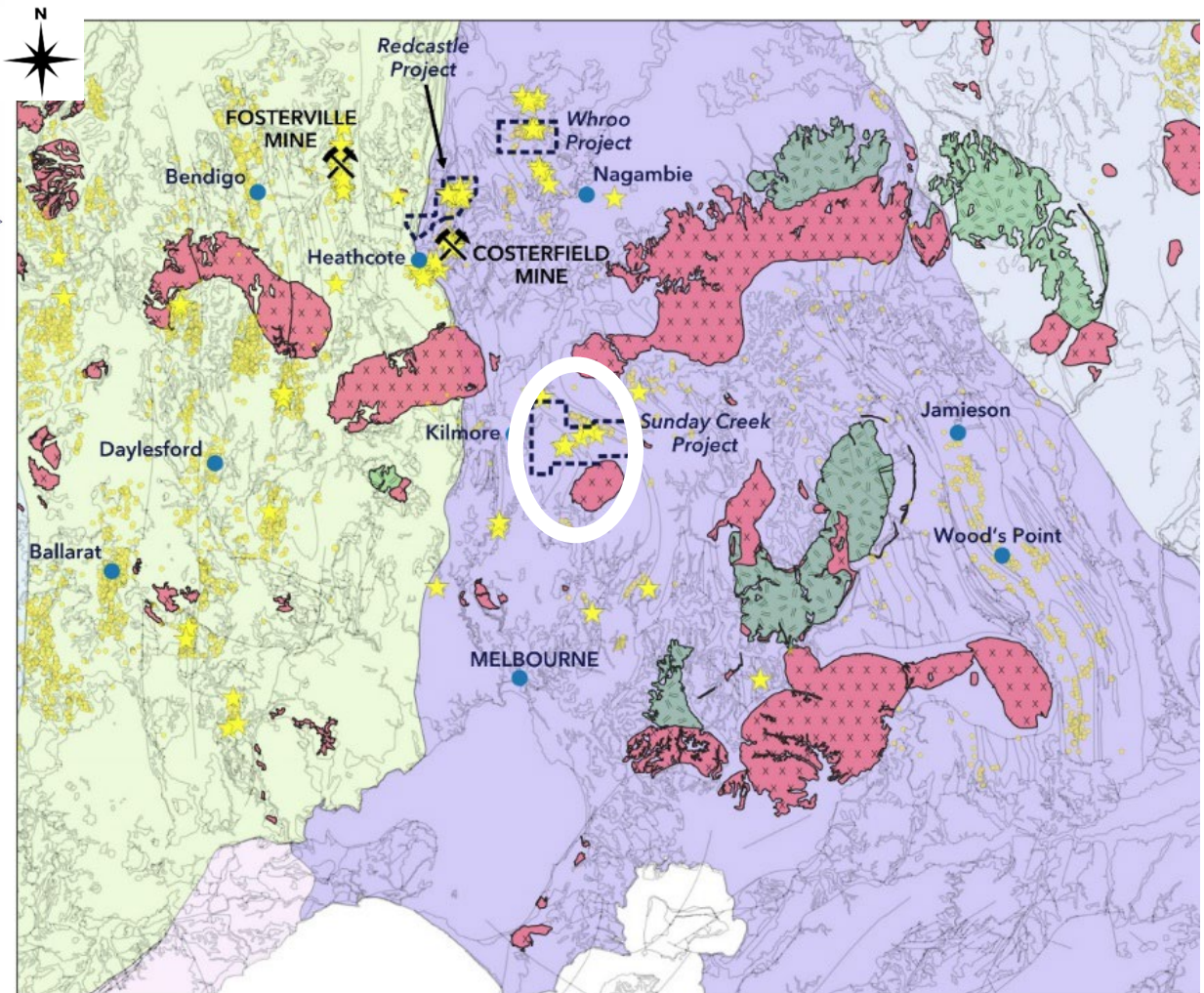
Bass



Bendigo



Melbourne



0

80 km





# Sunday Creek Hans the Swede 1857-1894

THE KILMORE FREE PRESS, THURSDAY, JANUARY 25 1894.

## GOLD-MINING IN THE SUNDAY CREEK DISTRICT.

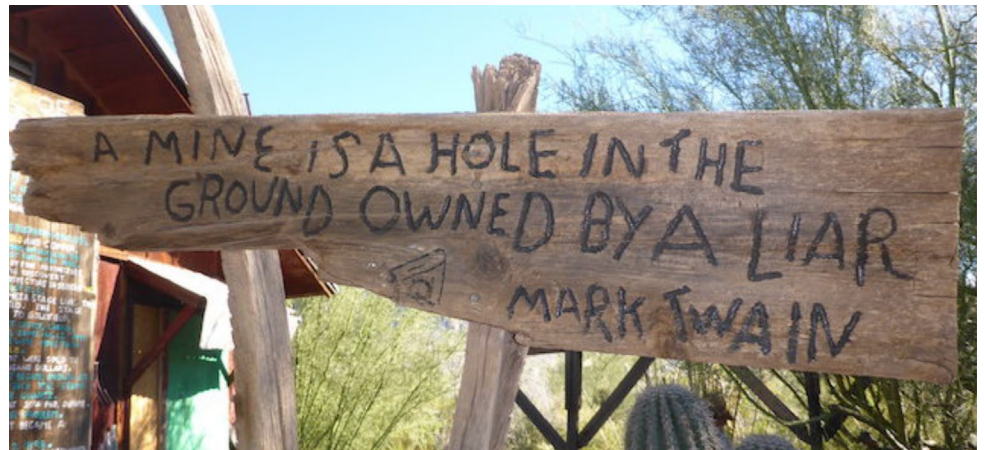
BY PATHFINDER.

There is a mining revival in the above district and that usually quiet and unfrequented spot known as the Comet and One Speck Creeks, is now being searched in all directions for the precious metal.

Parties are daily arriving from the metropolis and elsewhere decked out in all the gorgeous panoply of the early Victorian digger, but whether or not their gorgeous appearance is to be accepted as a knowledge of mining is a very moot point—perhaps it is so let us so hope and wish them success.

For the last 37 years mining has been carried on in this district with fairly good results. Hans, the Swede, is credited with having made thousands. No doubt he did well indeed. He kept very secluded and led people to believe that he was keeping body and soul together and nothing more. Others did well and profited by it—selected land and settled down to live by the soil. More followed the glorious uncertainty of mining with persistency and sacrificed the fortune they already had in their anxiety to secure more. The country is dyke formation and requires experience to understand where to begin and where to knock off. The peculiarity in all dyke formation is more strongly marked at Sunday Creek than in other districts I have visited, inasmuch as when leaving the alluvial and getting into the quartz a combination of minerals is found and which at times is rather difficult to separate.

“For the last 37 years mining has been carried on in this district with fairly good results. Hans, the Swede, is credited with having made thousands. No doubt he did well indeed. He kept very secluded and led people to believe that he was keeping body and soul together and nothing more.”



# Sunday Creek Exploration and Mining History

- 1850s - Alluvial mining
- 1860s - Surface mining between to 30m
- 1880s - Shaft mining to 100m, 1890s to 180m
- Early 1900s – cyanide
- WW1 – antimony to Costerfield
- 1960s Eastern Prospectors – few drill holes
- 1980s CRA/BHP
- 1986 – mid 1990's, Ausminde - 29 RC drill holes totalling 960 metres;
- 2008 - Beadell Resources 30 RC holes with 7 diamond drill tails – oxide focus



The Golden Dyke Mine

# Sunday Creek

## Width and Grade

- Southern Cross has completed 26 oriented diamond drill holes for 6,524 metres that have been the key to understanding and targeting the structurally-hosted gold. Drilling is ongoing.
- Wide drill widths (ie 10 m-20 m @ 2-5 g/t Au) in zones that the old timers ignored; and
- High-grade hits that they mined and missed going to depth (ie 0.3 m-3 m @ 20-150 g/t Au)

### Grade

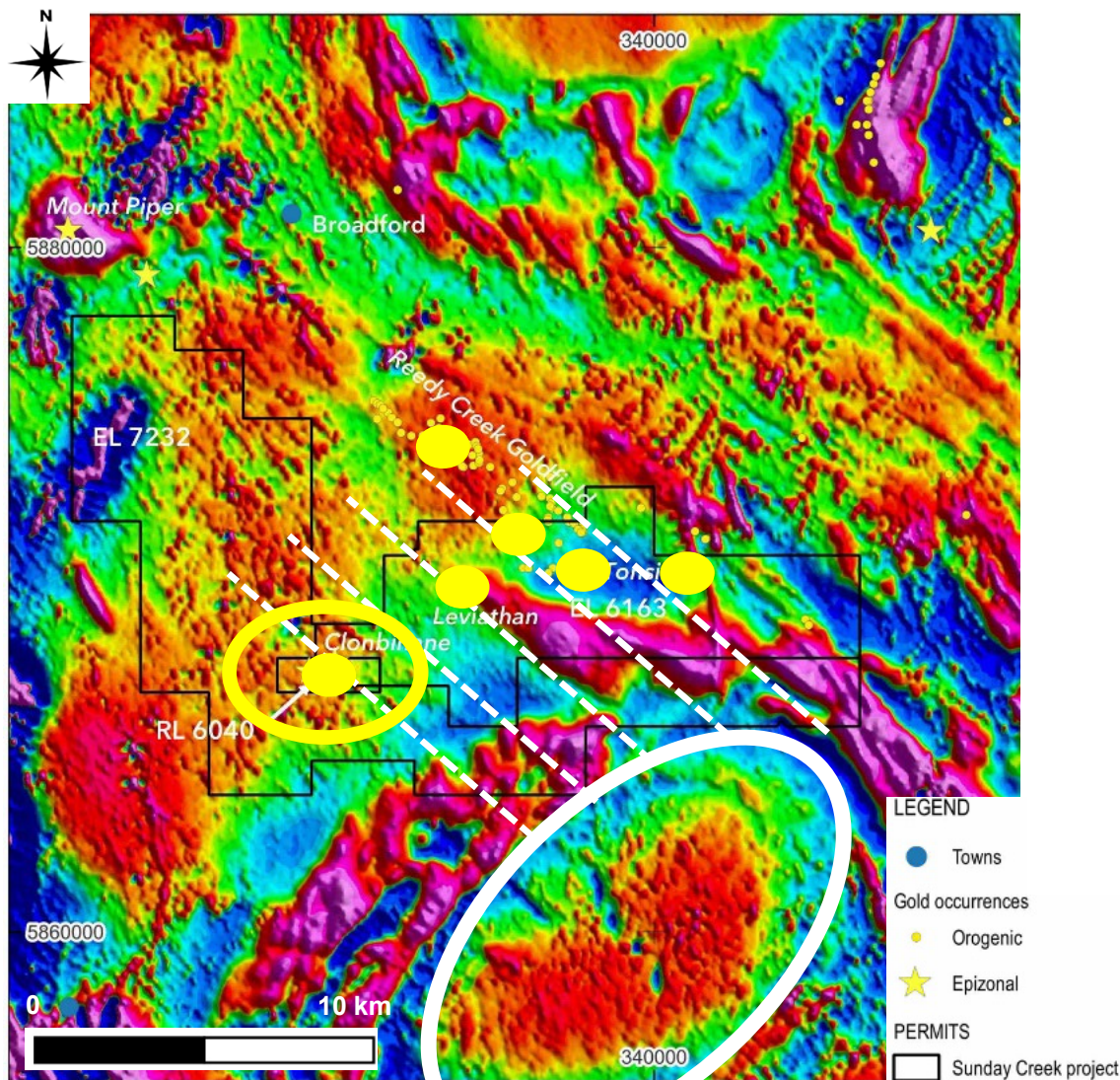
- 3.0m @ **53.4 g/t** AuEq ( 41.4 g/t Au, 12.0% Sb)
- 0.4m @ **165.4 g/t** AuEq (145.5 g/t Au, 20.0% Sb)
- 1.2m @ **39.4 g/t** AuEq ( 36.2 g/t Au, 3.3% Sb)
- 2.0m @ **19.1 g/t** AuEq ( 18.6 g/t Au, 0.5% Sb)
- 0.3m @ **96.5 g/t** AuEq ( 82.8 g/t Au, 13.8% Sb)
- 0.3m @ **78.7 g/t** AuEq ( 74.0 g/t Au, 4.8% Sb)
- 0.3m @ **70.3 g/t** AuEq ( 45.1 g/t Au, 25.3% Sb)

### Width

- **11.7m** @ 16.0 g/t AuEq (12.4g/t Au, 3.6% Sb)
- **21.7m** @ 5.6 g/t AuEq ( 4.7 g/t Au, 1.0% Sb)
- **36.4m** @ 2.8 g/t AuEq ( 2.4 g/t Au, 0.4% Sb)
- **10.4m** @ 6.4 g/t AuEq ( 5.4 g/t Au, 1.0% Sb)
- **15.2m** @ 3.9 g/t AuEq ( 3.7 g/t Au, 2.5% Sb)
- **9.0m** @ 4.8 g/t AuEq ( 4.7 g/t Au, 0.1% Sb)
- **5.6m** @ 10 g/t AuEq ( 9.2 g/t Au, 0.8% Sb)



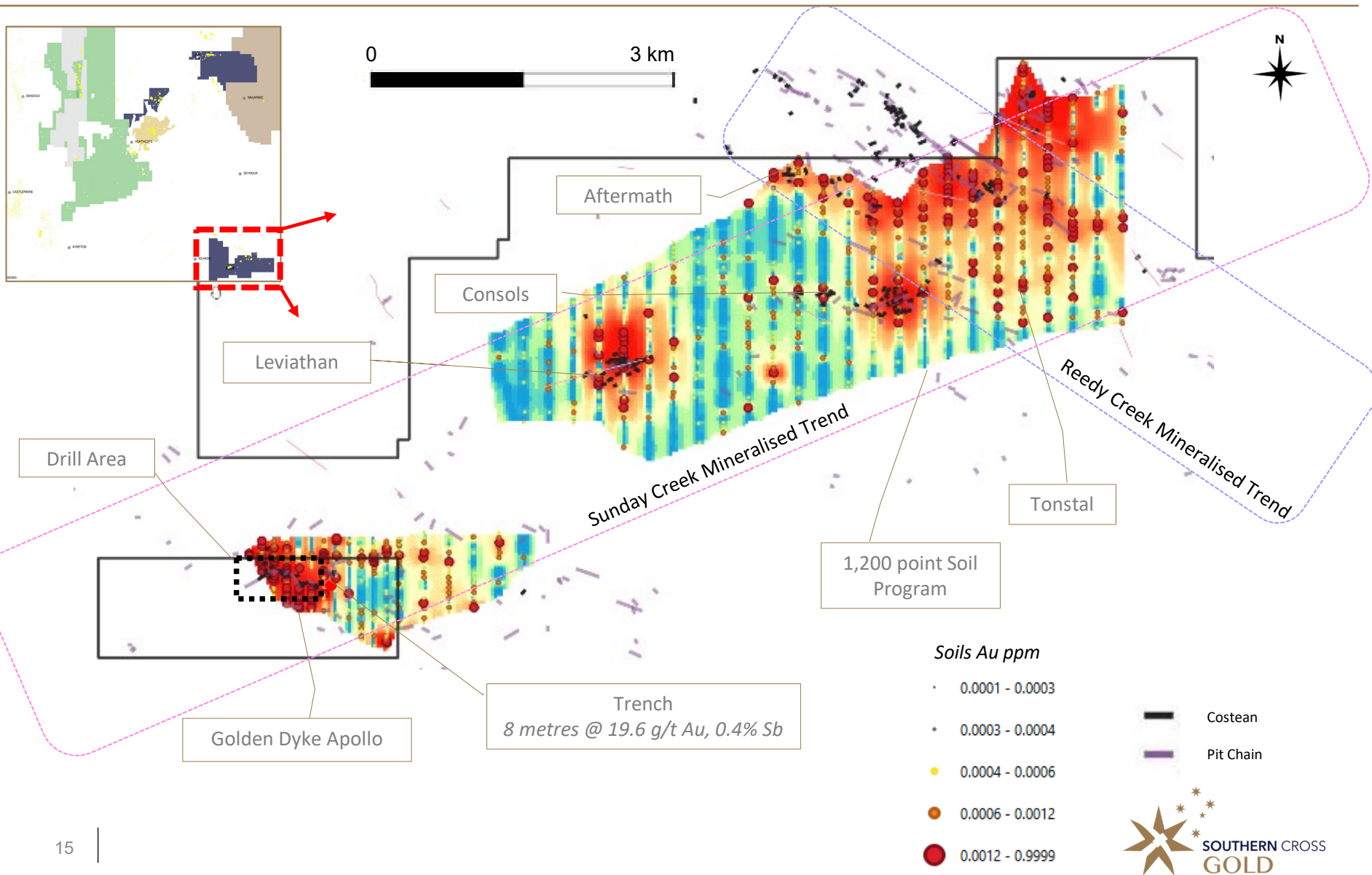
# Aeromagnetic image (RTP) Sunday Creek



- Dominated by north-westerly striking open to tightly folded Silurian to early Devonian low-grade turbiditic metasediments (Humevale Siltstone and Melbourne Formation).
- Metamorphism coincident with the deformation during the Tabberabberan Orogeny in the Late Devonian produced lower greenschist facies assemblages, somewhat complicated by the thermal aureole of the multi-event emplaced I-type Mt Disappointment Granodiorite
- NW Faults

# Sunday Creek

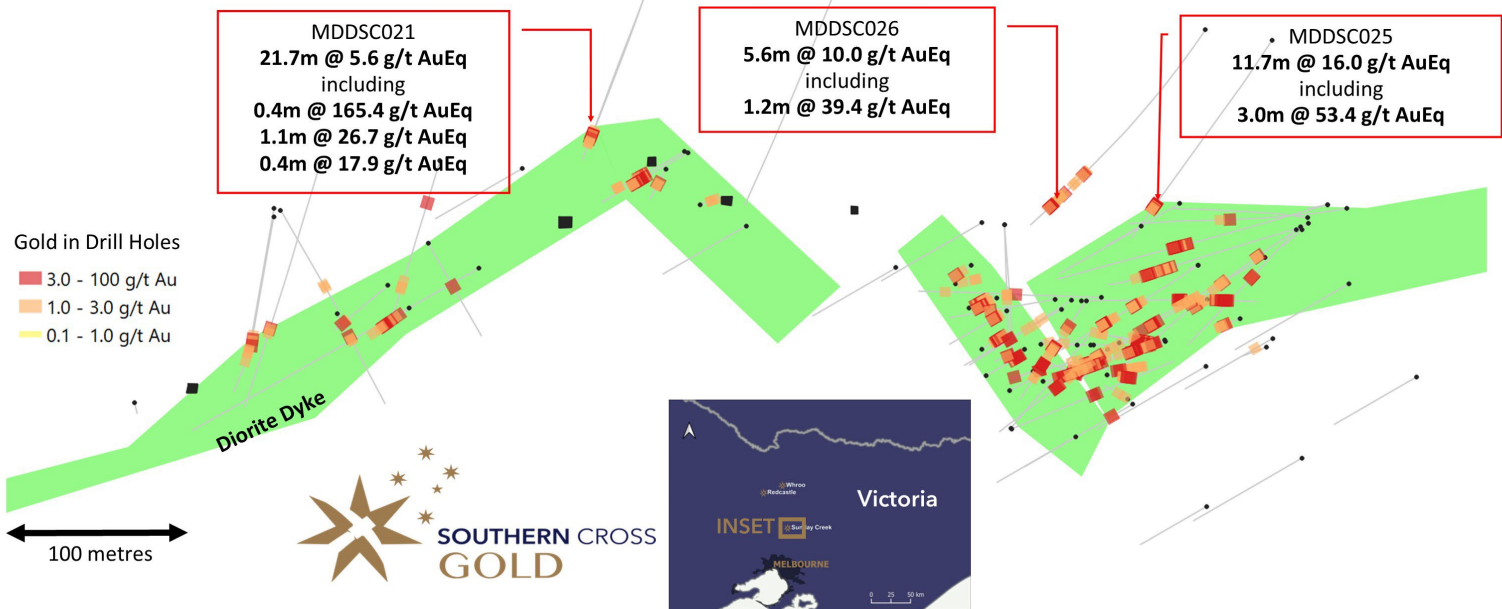
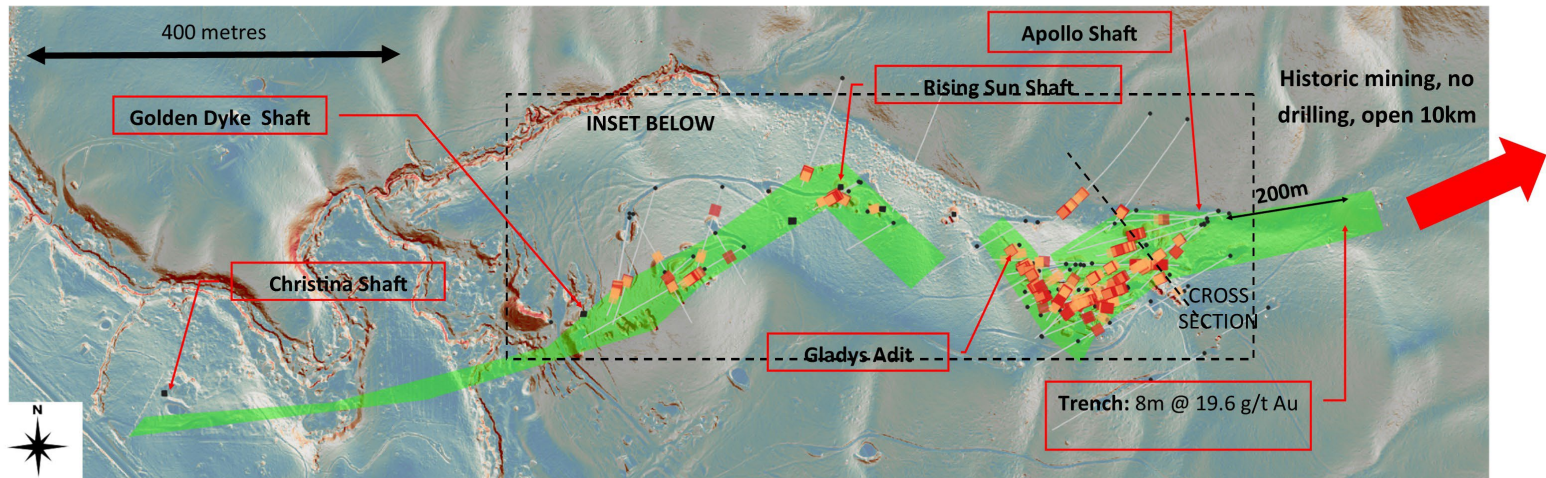
11 km strike extension undrilled extensions & historic mining





# Sunday Creek

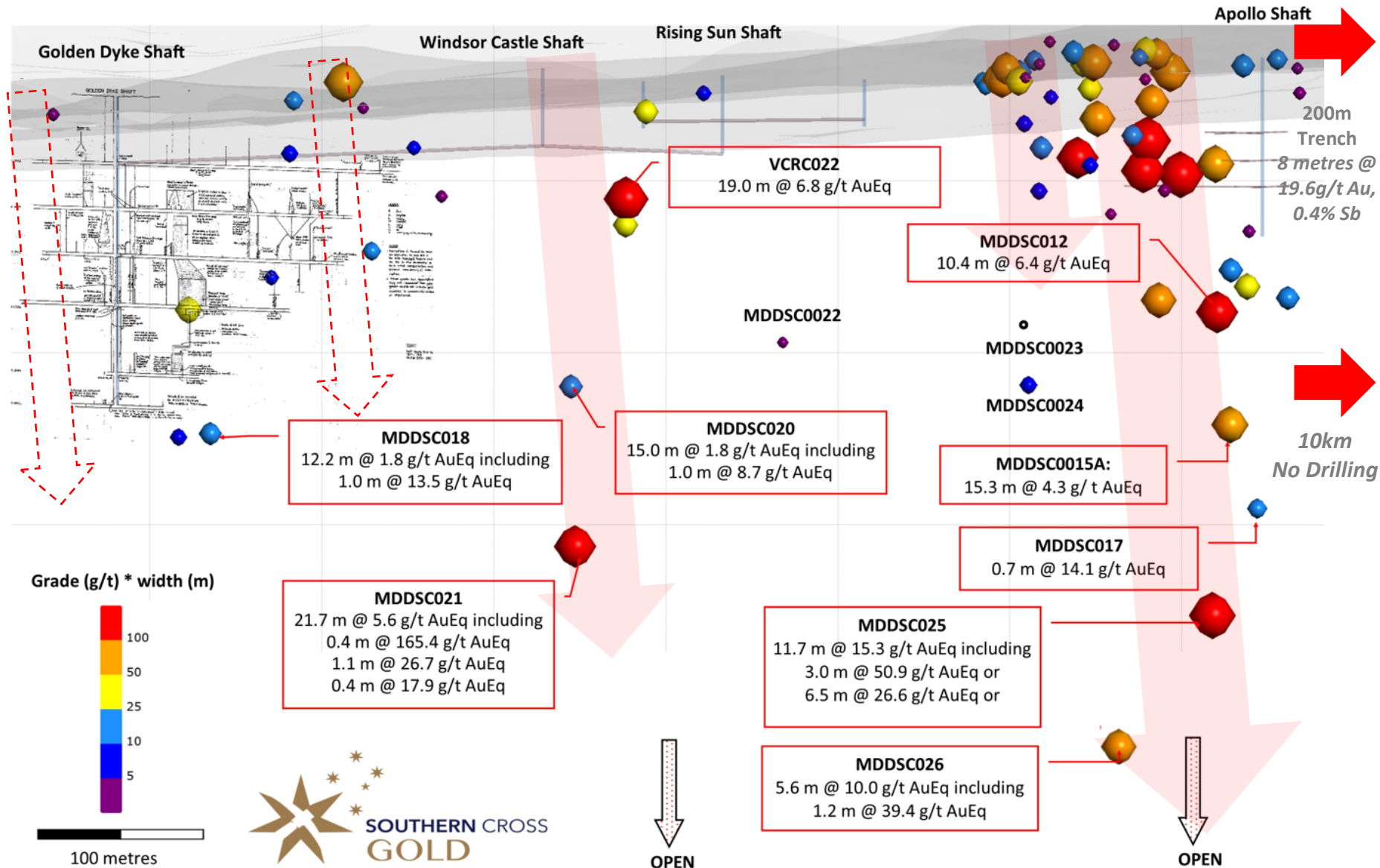
## Golden Dyke, Gladys & Apollo Plan





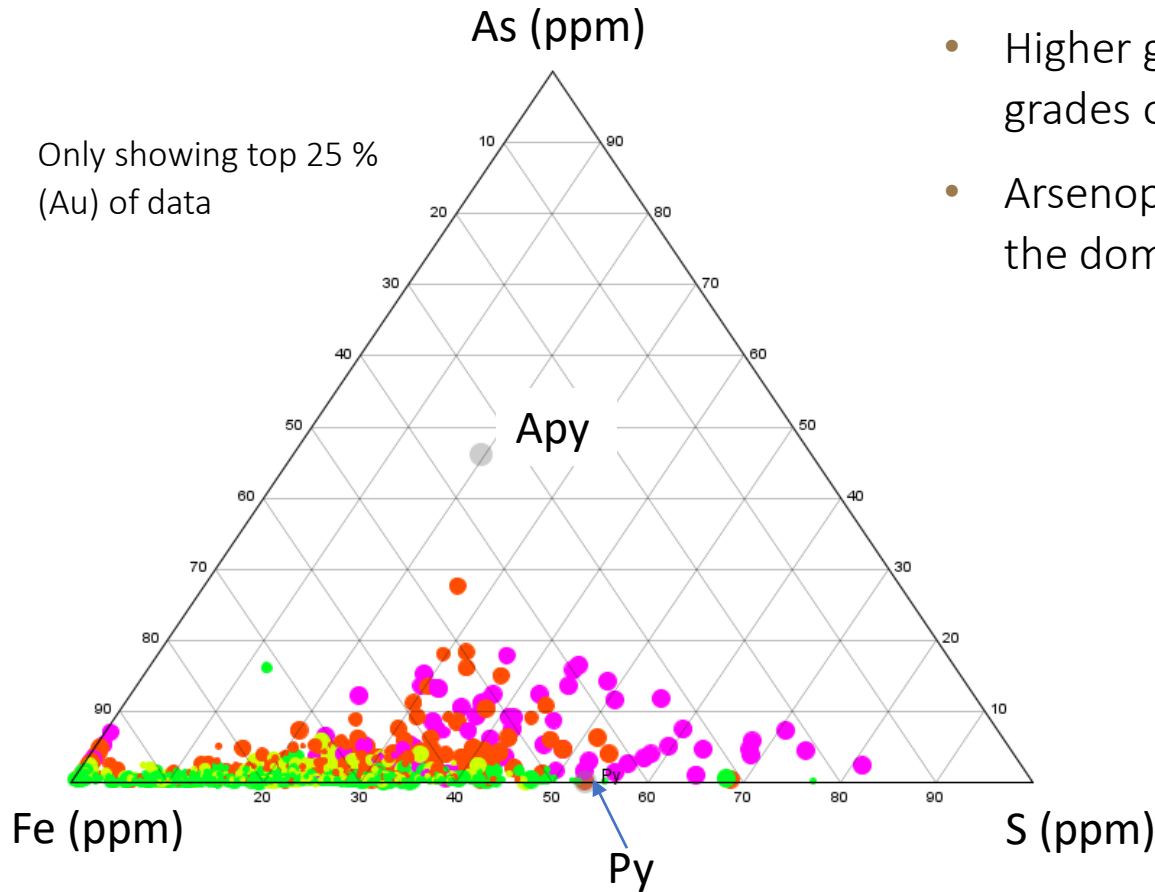
# Sunday Creek

## Golden Dyke to Apollo Long Section – Shoot!



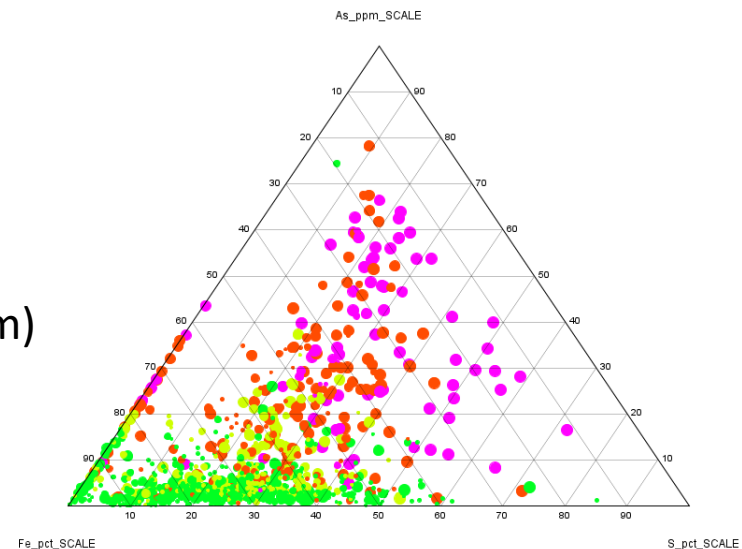
# Arsenic, Antimony and Gold

Only showing top 25 %  
(Au) of data



- Higher grade gold tends to form with higher grades of both As and Sb
- Arsenopyrite does occur, but is generally not the dominant sulphide mineral

Scaled plot to show variation



Colour

**Au\_ppm Progressive Half**

- Au\_ppm to 0.33 [87.00%]
- Au\_ppm to 0.81 [93.00%]
- Au\_ppm to 3.625 [98.00%]
- Au\_ppm to 145.5 [100.00%]

Size

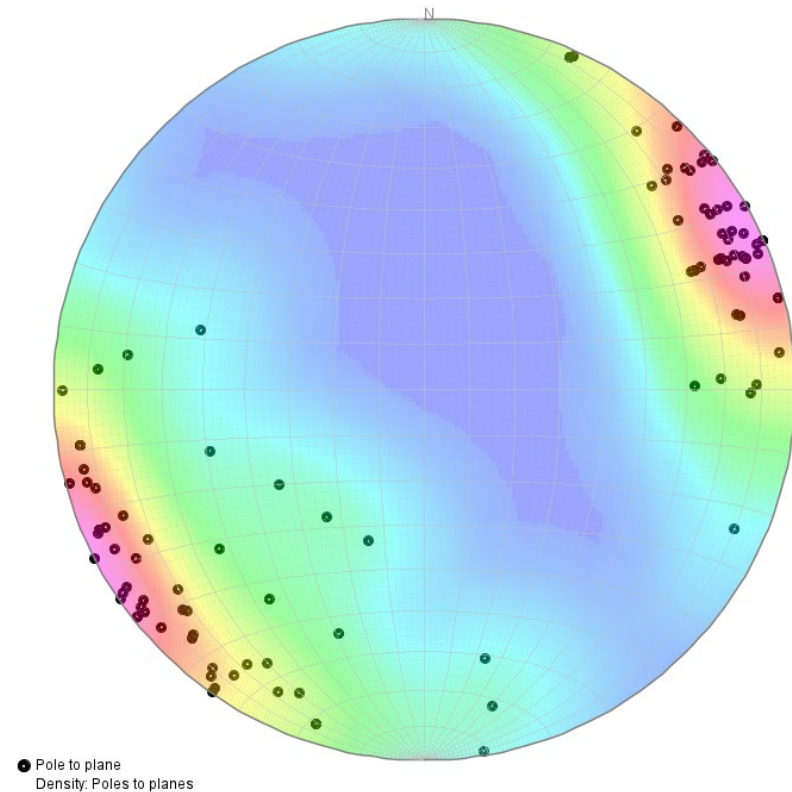
**Sb\_ppm Progressive Half**

- Default Size
- Sb\_ppm to 22 [50.00%]
- Sb\_ppm to 62 [75.00%]
- Sb\_ppm to 169 [87.00%]
- Sb\_ppm to 487 [93.00%]
- Sb\_ppm to 5300 [98.00%]
- Sb\_ppm to 287500 [100.00%]

# Sunday Creek

## Quartz-carbonate veins + Au + Stibnite

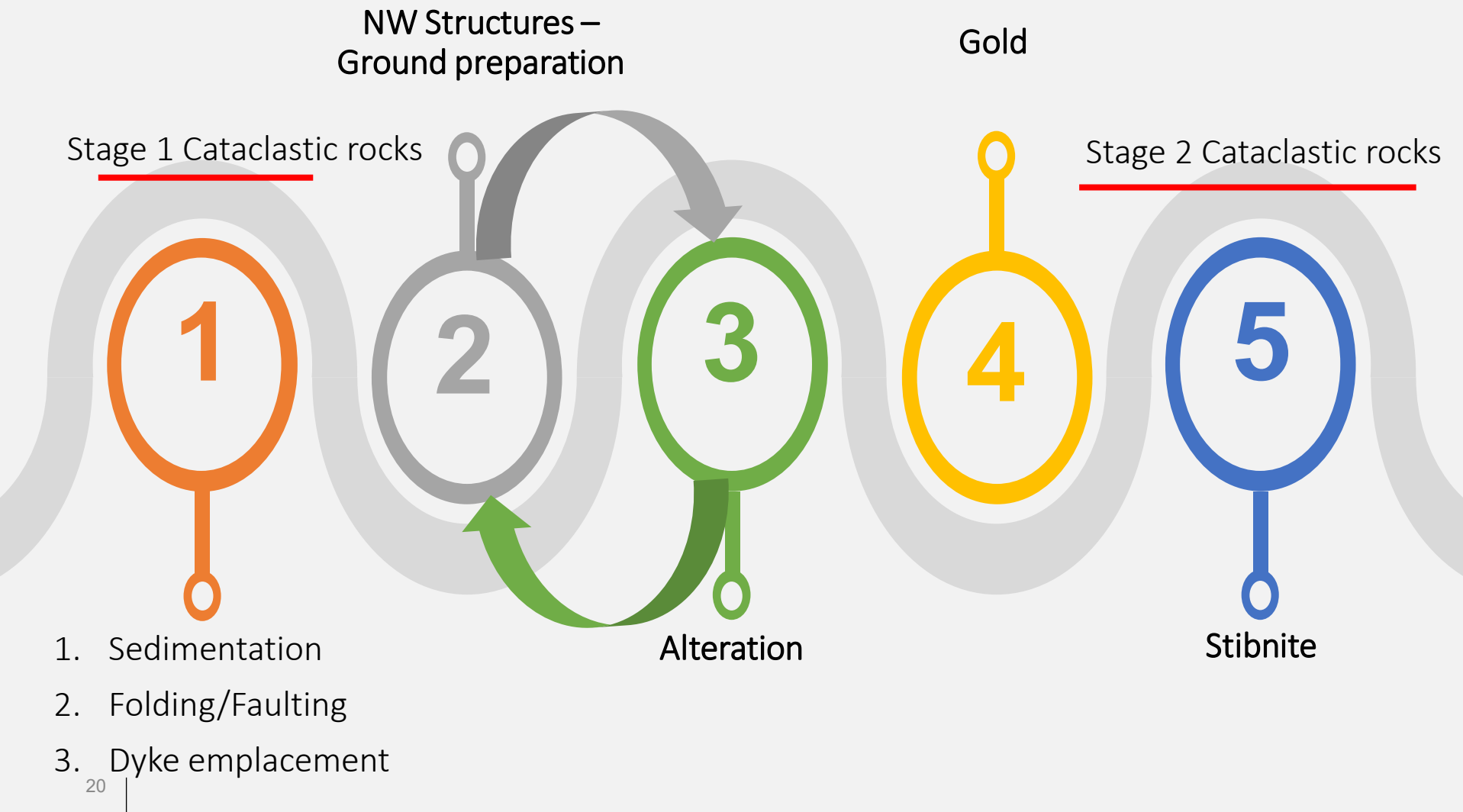
- Gold mineralisation intersected in drill core is dominantly, but not exclusively found within quartz veins striking approximately 330° dipping vertically to very steeply east.
- Abundant parallel-sided quartz-carbonate veins occur within E-W striking diorite dykes and extend for short distances into the country rock metasediments
- The dominant NW structural trend of the quartz-carbonate veins controls the gold grade in the dyke zone and the preference for veins to form within the generally altered diorite dyke produces an intersection trend plunging very steeply NNE.



Parallel-sided & laminated vein data coloured

- Very strong NNW trend with sub-vertical veins striking 330 (n=109 from 6 drill holes)

# Sunday Creek Chronology





# Sunday Creek

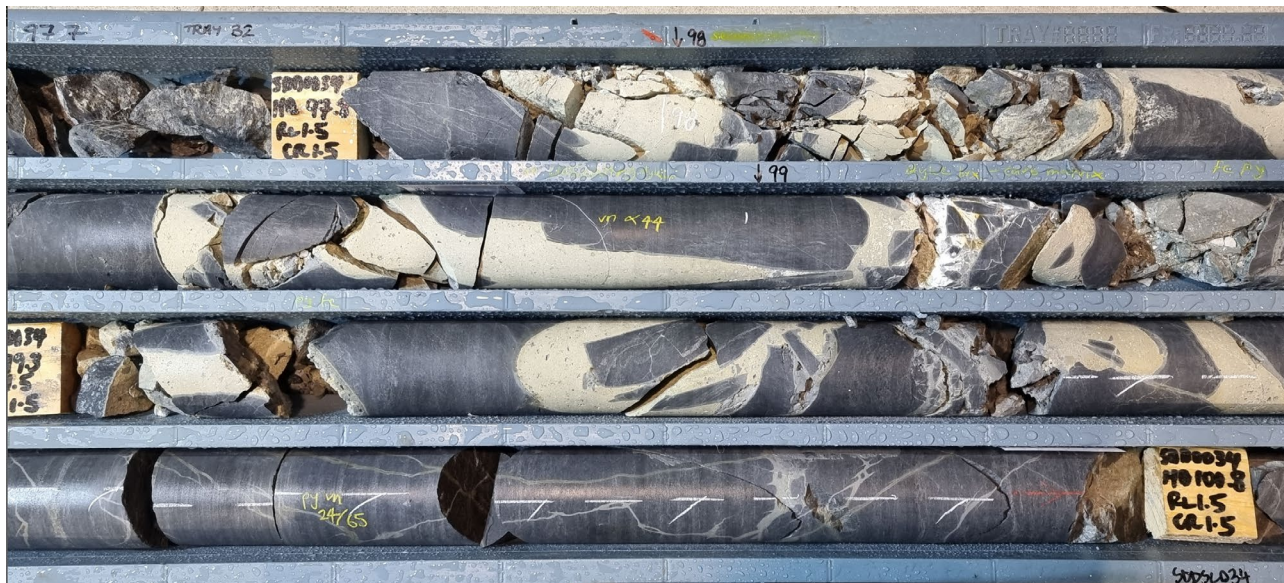
## *Stage 1 – Sedimentation and intrusions*



# Sunday Creek

## *Intrusive Rocks*

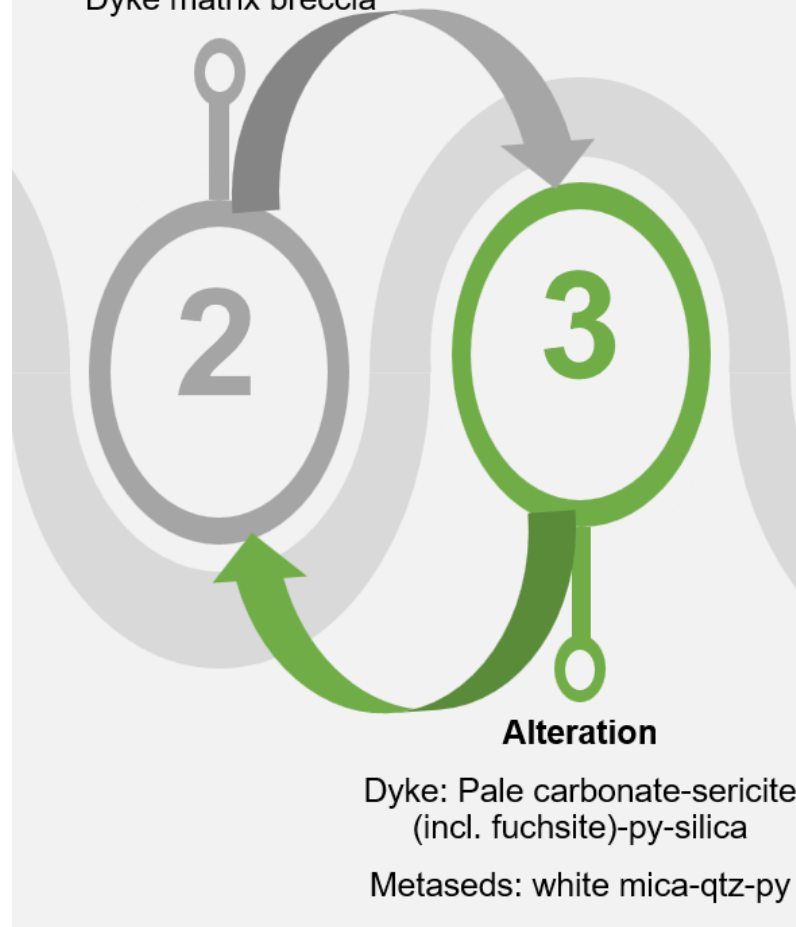
- An extensive NNE-trending diorite dyke-zone occurs over 11 kilometres strike
- The dyke zone varies from 10 metres to 100 metres. Gold-antimony mineralisation and the dyke show an intimate spatial association, with mineralisation rarely extending past the influences of the dyke zone.
- However, volumetrically structurally-hosted gold-antimony mineralization is more common in the intervening sediments than in the dyke itself.
- Examination of the host dyke rocks to mineralisation shows amygdaloidal features, suggesting shallow emplacement.



### NW Structures – Ground preparation

Qtz-carbonate matrix bx  
(mineral breccia)

Dyke matrix breccia





# Sunday Creek

## Dyke and vein timing - 2



Note “clast” has unaltered core, but wall-rock alteration is related to dyke

Note relation of dyke to alteration and vein at this spot – that is, dyke is related to alteration and cuts vein



### Gold

NNW-striking parallel-sided carbonate-quartz gold veins, development of apy laths and apy after py pseudomorphs

4

# Vein examples

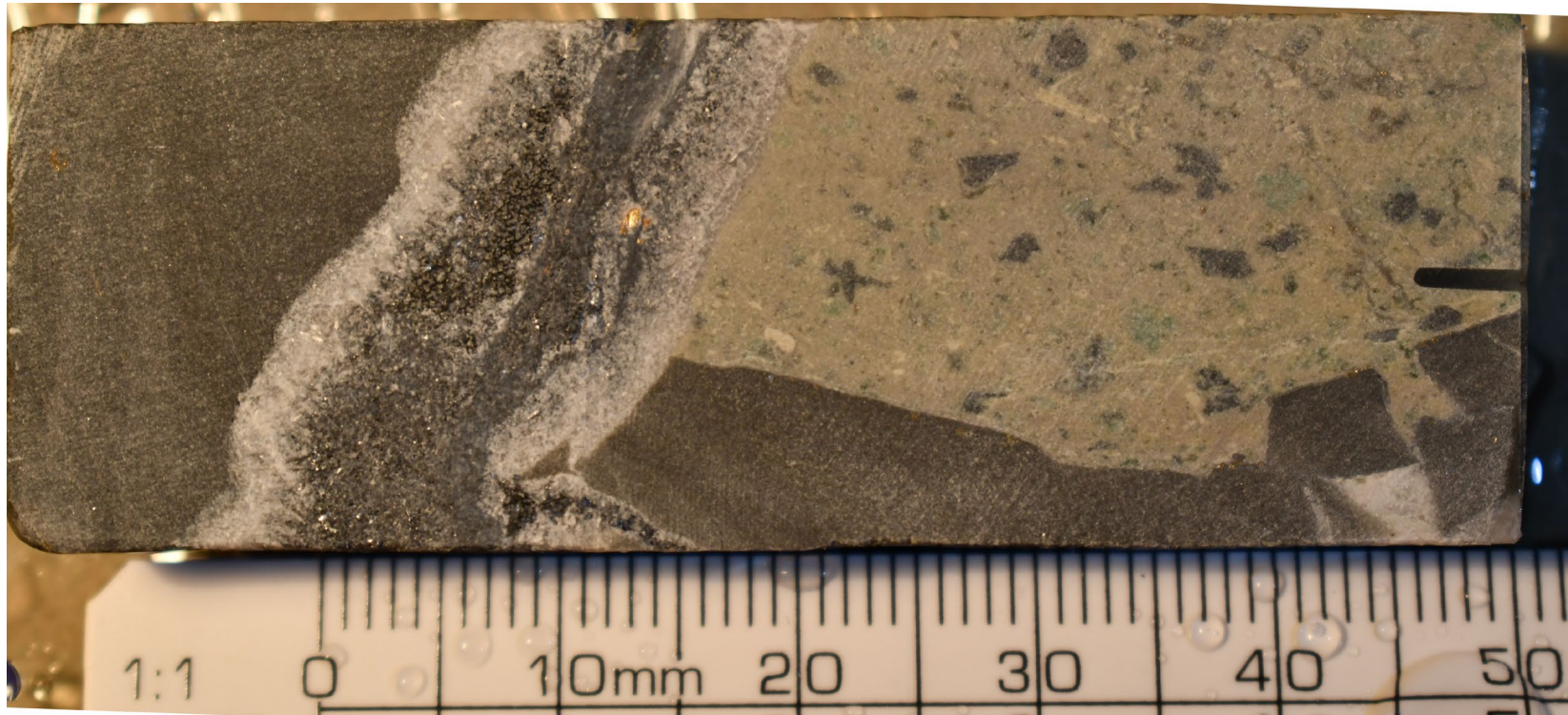


- Stained carbonate-quartz +/- stibnite veins (Qtz-Crb-Stib; parallel sided type) – some lamination evident
- Note centreline development of stibnite.
- Note carbonate veins in altered siltstone on left, but altered siltstone host lacks carbonate (silica-sericite-pyrite).
- Pink colour in right image results from ferroan calcite with probably chlorite on very late fracture – this set of veins appears to cut all features and may include fine pyrite on the fracture



# Sunday Creek

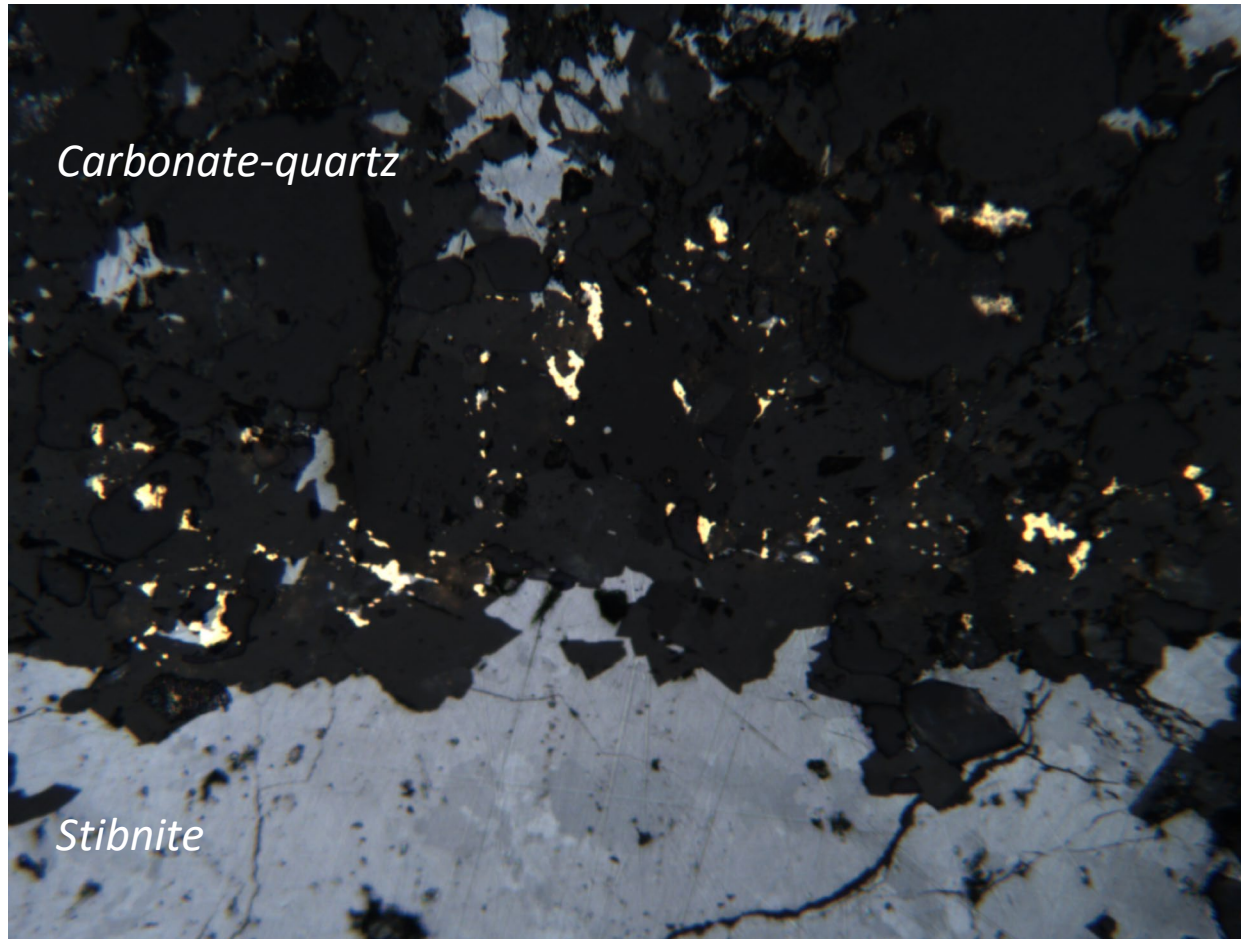
## *Quartz-carbonate-stibnite-gold vein*



- Example of relationship of quartz-carbonate-stibnite-gold vein to host rock types – note lack of any wall-rock alteration (carbonate alteration is earlier than veining). White mica (locally fuchsitic), carbonate and pyrite are the main alteration minerals within the dyke.

# Sunday Creek

## *Gold in Carbonate*



- Gold within carbonate adjacent to stibnite zone
- Only a very small amount of gold is ever in contact with the stibnite.
- Field of view approx. 2 mm





## Fractures displacing early veins



**SOUTHERN CROSS**  
**GOLD**

# Sunday Creek

## Dyke-hosted mineralization



Brecciated (mineral matrix) and altered sediments

Quartz +/- carbonate breccia zone



Altered dyke and hydrothermal white mica, carbonate, pyrite and ?silica

Drill hole  
MDDSC005

Also see “fuchsite” – likely derived from high-Cr and Ni phenocrysts in protolith



# Sunday Creek

## *Alteration, brecciation and vein timing*

Example of stibnite-rich carbonate-quartz vein cutting dyke breccia with both hydrothermally altered and unaltered clasts





# Sunday Creek

## Stage 5 - Stibnite

Stage 2 Cataclastic rocks (Au+Sb)

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5

**Stibnite**

Centreline-filling stibnite veining  
and development into inclined  
stibnite-rich veins and breccias

# Sunday Creek

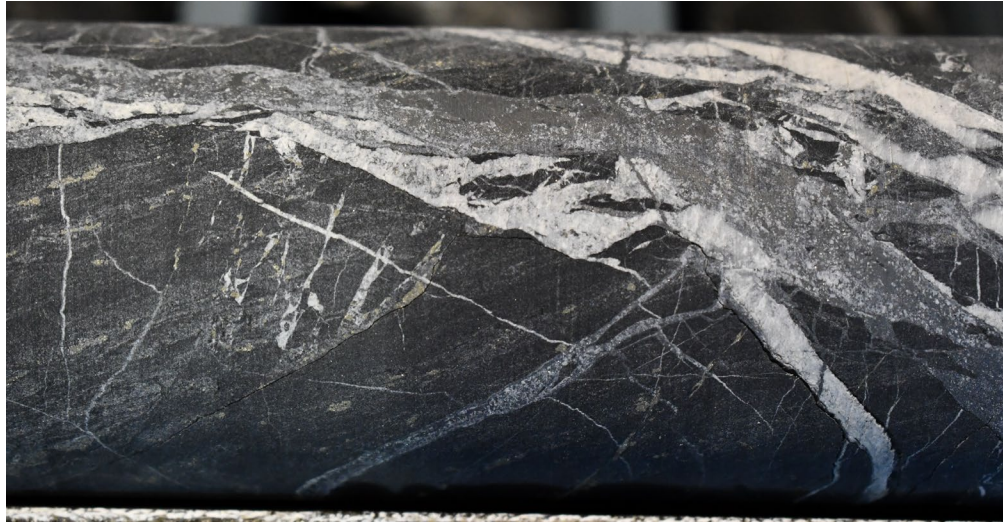
## *Vein-hosted mineralization*



- Complete centreline filling by stibnite of stained qtz-carbonate vein. Note how wall-rock alteration is bulk rock compositionally dependant – and, prior to veining.
- Host to vein is white mica-qtz-pyrite altered siltstone on the left, and white mica-carbonate-pyrite (?silica)-altered dyke on the right
- Stibnite appear to preferentially dilute the quartz component of the veins and where concentrations are high, breaks out into a more core-axis parallel orientation.

# Sunday Creek

## *Increased stibnite concentrations*



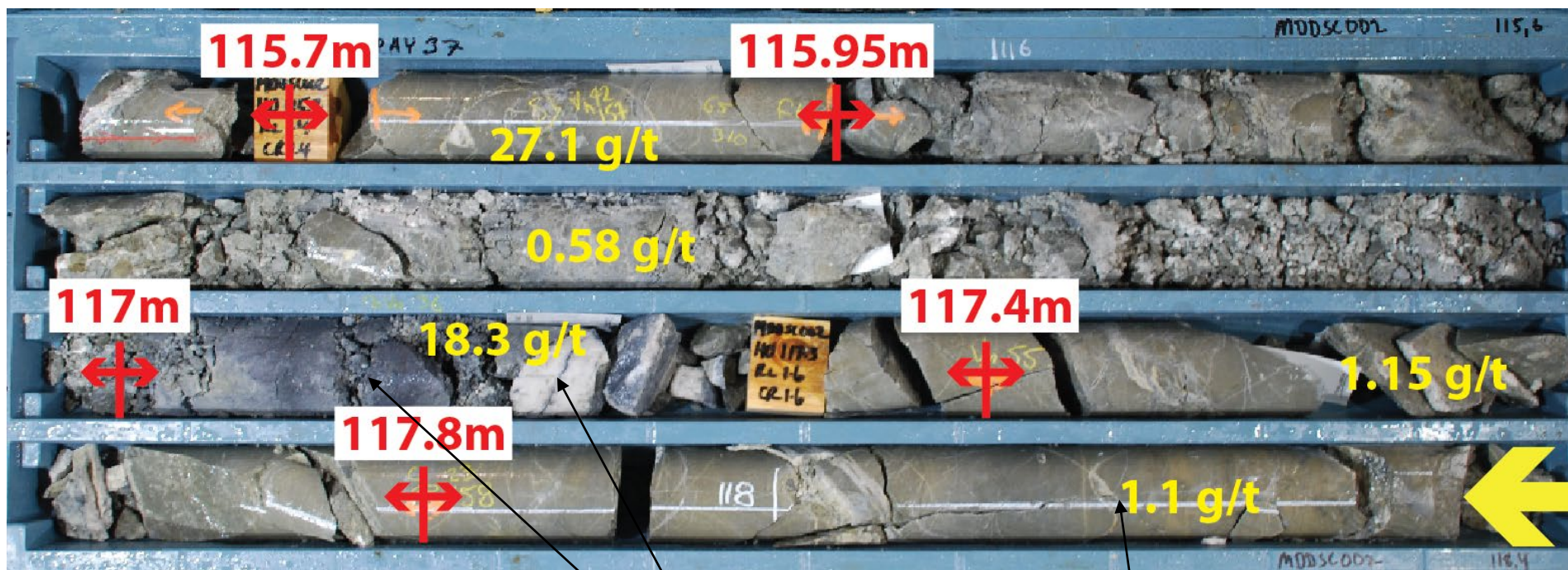
- Once stibnite concentrations increase significantly, centreline is no longer the dominant control on Sb grade. Brecciation and multiple generations of veins become evident, including the latest, almost 100% stibnite veinlets.
- It appears that the gold-bearing parallel-sided veins are prior to the stibnite event.



# Sunday Creek

## Cataclaste-hosted mineralisation

Two metre thick cataclasite zone – note typical spatial association of fractured to brecciated margins with progressively more matrix to cataclasite in core (usually a function of greatest displacement vector in central area of zone)



Drill hole  
MDDSC002

White mica-qtz-pyrite alteration of  
metasediments

Quartz-stibnite vein and stibnite-rich zone in  
cataclastic rocks

# Conclusions

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- Renewed interest in Victorian gold exploration, driven by the discovery of Tabberabberan-age high-grade, low nugget effect, free-gold (esp. Fosterville)
- This has provided a new economic opportunity to discover high-level and late epizonal gold deposits, with fluid flow potentially driven by late Devonian intrusives in the Victorian Goldfields.
- The rediscovery of an old goldfield at the Sunday Creek Project, 60 kilometres north of Melbourne, by oriented diamond drilling over an 800 metres strike to 400 metres vertical depth to date, reveals an exciting Late Devonian structurally-controlled shallow-level gold system with similar features to other Victorian epizonal gold-antimony occurrences.
- The project extends into undrilled 11 kilometres of historic gold mines as defined by LiDAR surveying, and surface soil sampling, providing room for the system to grow.

**Company Secretary**

Justin Mouchacca  
JM Corporate Services  
Level 21  
459 Collins St  
Melbourne Vic 3000

**Registered Office**

Level 21  
459 Collins St  
Melbourne Vic 3000

**Email:** [info@southerncrossgold.com.au](mailto:info@southerncrossgold.com.au)

**Website:** [www.southerncrossgold.com.au](http://www.southerncrossgold.com.au)

**Joint Lead Managers****Baker Young**

Level 6  
121 King William St  
Adelaide SA 5000

**Pulse Markets**

Governor Phillip Tower  
Level 24  
1 Farrer Place  
Sydney NSW 2000

**Legal Advisors**

QR Lawyers  
Level 6  
400 Collins St  
Melbourne Vic 3000

**Tax Advisor**

AFS Partners  
61 Bull St  
Bendigo Vic 3550

**Investigating Accountant**

William Buck Audit (Vic)  
Level 20  
181 Williams St  
Melbourne Vic 3000

**Auditor**

William Buck Audit (Vic)  
Level 20  
181 Williams St  
Melbourne Vic 3000

**Share Registry**

Computershare Investor Services  
Level 43  
60 Carrington St  
Sydney NSW 2000

**Independent Geologist**

Terry Lees  
South Melbourne Vic 3205



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