Pyrite Geochemistry; An Exciting Ore Finder

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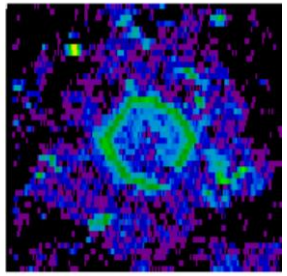
Government of Western Australia
Department of Mines and Petroleum

***speaker**

GSWA-CODES Collaboration



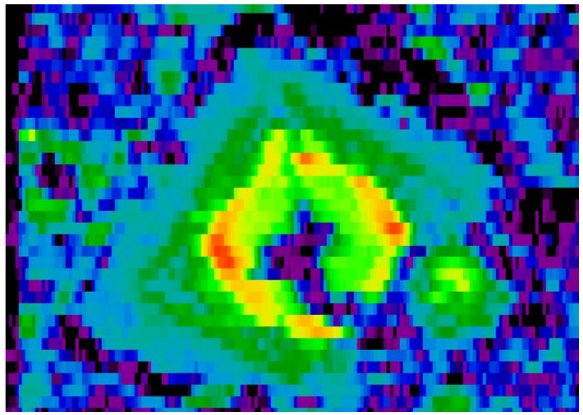
Objectives

- Use the Yilgarn and adjacent terrains to test pyrite and magnetite geochemistry by LA-ICPMS as a fertility indicator and vector to ore
- Build a pyrite geochemistry database for orogenic gold and VHMS Cu-Zn that can be used by explorers in WA and around the world

Scientific Premise

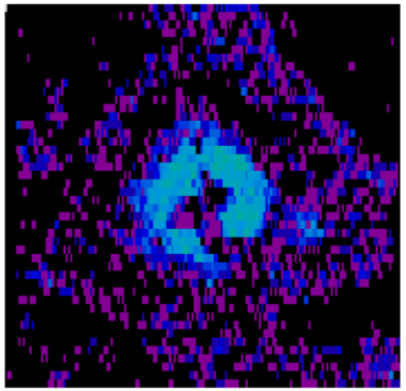
- Pyrite magnifies the footprint **signal** of pyrite-bearing ores up to 1000 times

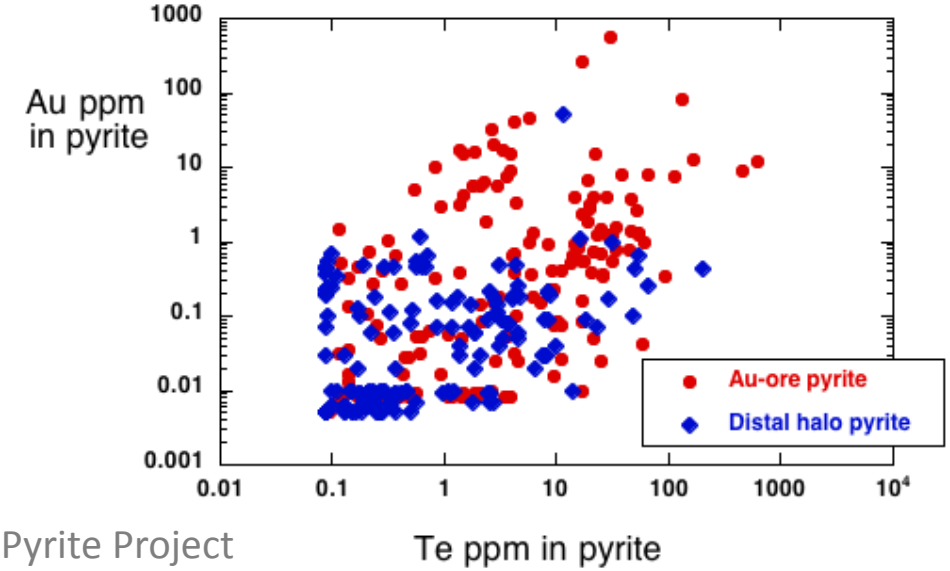
- Pyrite geochemistry is a valuable addition to multi-element whole-rock geochemistry in exploration



Analytical Method

- Laser Ablation ICPMS enables selective analysis of pyrite types – core and rim
- 35 trace elements analysed including Au and Pt
- Also gives qualitative Pb isotope data





Strategy

- Analyse ore pyrite to get the fingerprint of the ore and proximal halo (20 deposits)

- Analyse EIS drill holes to get the medial and distal halos and the **barren signature** (20 holes)

EXPLORATION INCENTIVE SCHEME

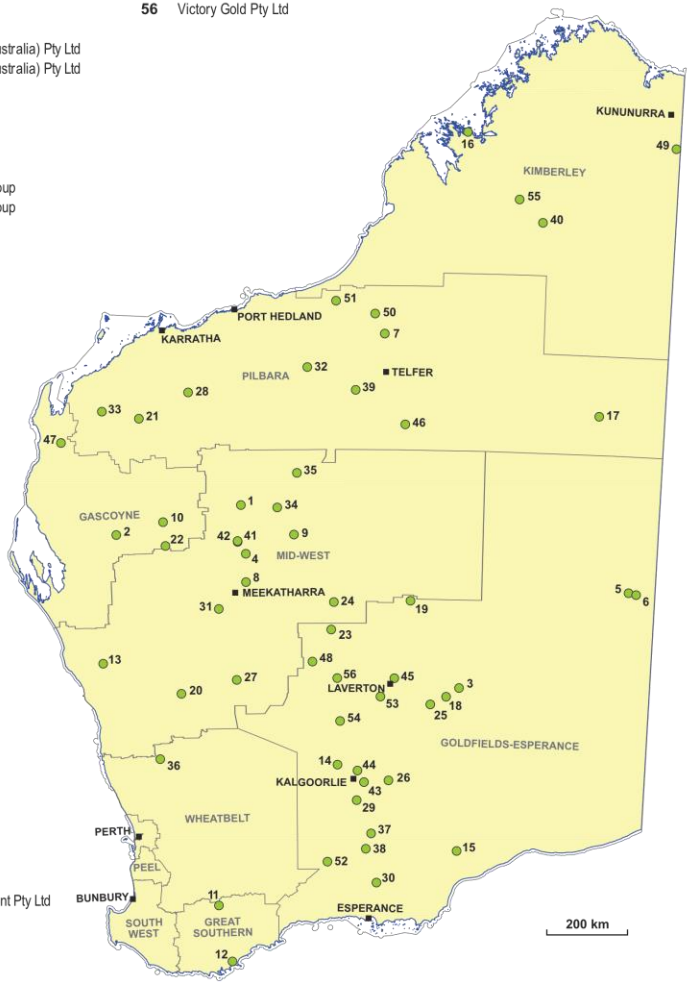
CO-FUNDED GOVERNMENT — INDUSTRY DRILLING 2012–2013

GENERAL

1 Abra Mining
2 Afmeco Mining And Exploration
3 Afmeco Mining And Exploration
4 Alchemy Resources Ltd
5 Anglo American Exploration (Australia) Pty Ltd
6 Anglo American Exploration (Australia) Pty Ltd
7 Antipa Minerals
8 Archean Star Resources Inc
9 Audax Minerals Pty Ltd
10 Aurora Minerals Limited
11 Ausgold Limied
12 Australia Minerals & Mining Group
13 Australia Minerals & Mining Group
14 Barry George Fry
15 Beadell Resources Ltd
16 Beau Resources Pty Ltd
17 Border Exploration Pty Ltd
18 Breaker Resources NL
19 Breaker Resources NL
20 Clancy Exploration Ltd
21 Cradle Resources Ltd
22 Desert Mines & Metals Limited
23 Echo Resources Limited
24 Echo Resources Limited
25 Energy And Minerals Australia
26 Fairstar Resources Limited
27 Flinders Mines Limited
28 Flinders Mines Limited
29 Gold Fields St. Ives
30 Greenpower Energy Limited
31 Hampton Hill Mining NL
32 Hazelwood Resources Ltd
33 Hemisphere Resources Ltd
34 Horseshoe Metals Ltd
35 Laconia Resources Limited
36 Magnetic Resources NL
37 Matsa Resources Limited
38 Matsa Resources Limited
39 Midas Resources Limited
40 Mt Pierre Pty Ltd
41 Naracoota Resources
42 Naracoota Resources
43 Northern Mining Limited
44 Northern Mining Limited
45 Rarus Limited
46 Rumble Resources Limited
47 Strata Minerals Limited
48 Strategic Resource Management Pty Ltd
49 Thundelarra Exploration Ltd
50 Venus Metals Corporation
51 Venus Metals Corporation
52 White Cliff Minerals Ltd
53 White Cliff Minerals Ltd

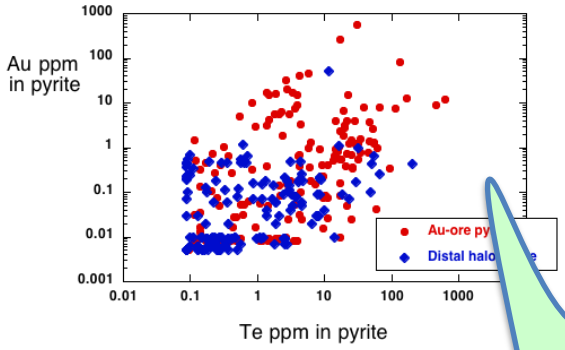
PROSPECTORS

54 Christopher Peter Potts
55 Sarah Dowling
56 Victory Gold Pty Ltd



Primary Orogenic Gold Pyrite Footprint

(modified from Eilu, 2011; using CODES LA-ICPMS data on pyrite)



MEDIAL PY
Au > 300 ppb
Te > 400 ppb
Tl > 2000 ppb
Hg* > 1

PROXIMAL PY
Au > 1 ppm
As > 300 or
Te > 5 ppm

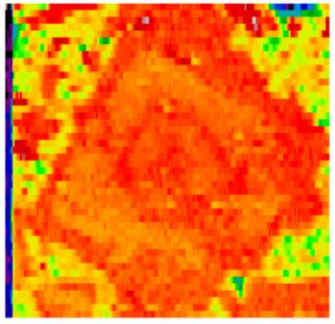
DISTAL PYRITE
Au > 100 ppb
Te > 150 ppb
Tl > 200 ppb
Hg* > 0.5

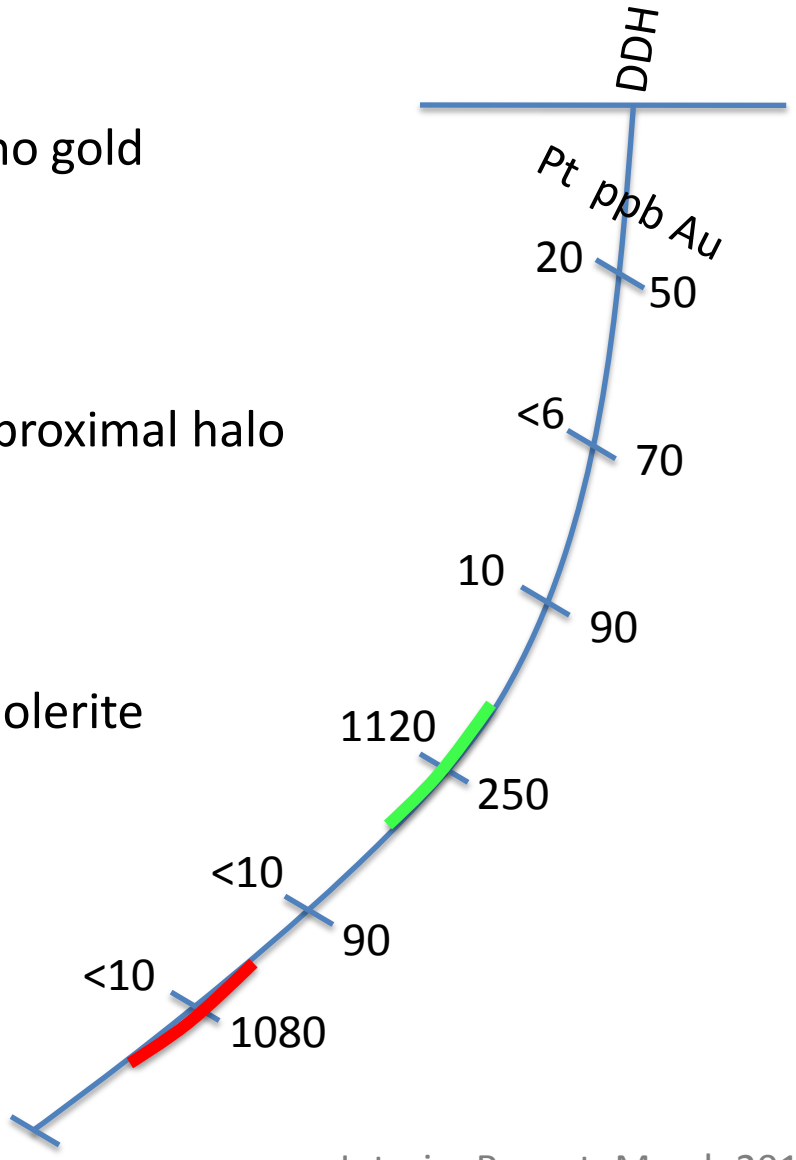
ORE PYRITE
Au > 2 ppm
As > 1000 or
Te > 20 ppm

1 km

Prospect A Drill Hole

- VHMS target in a brownfields environment – no gold intersections found
- Drilled mafic volcanics, dolerite and bifs
- 5 pyritic samples studied – all show a medial/proximal halo signature
- **Au-Prox score = 815 (proximal)**
- 1 sample returned 1.12 ppm Pt in pyrite in a dolerite
- Recommend follow up on the Pt

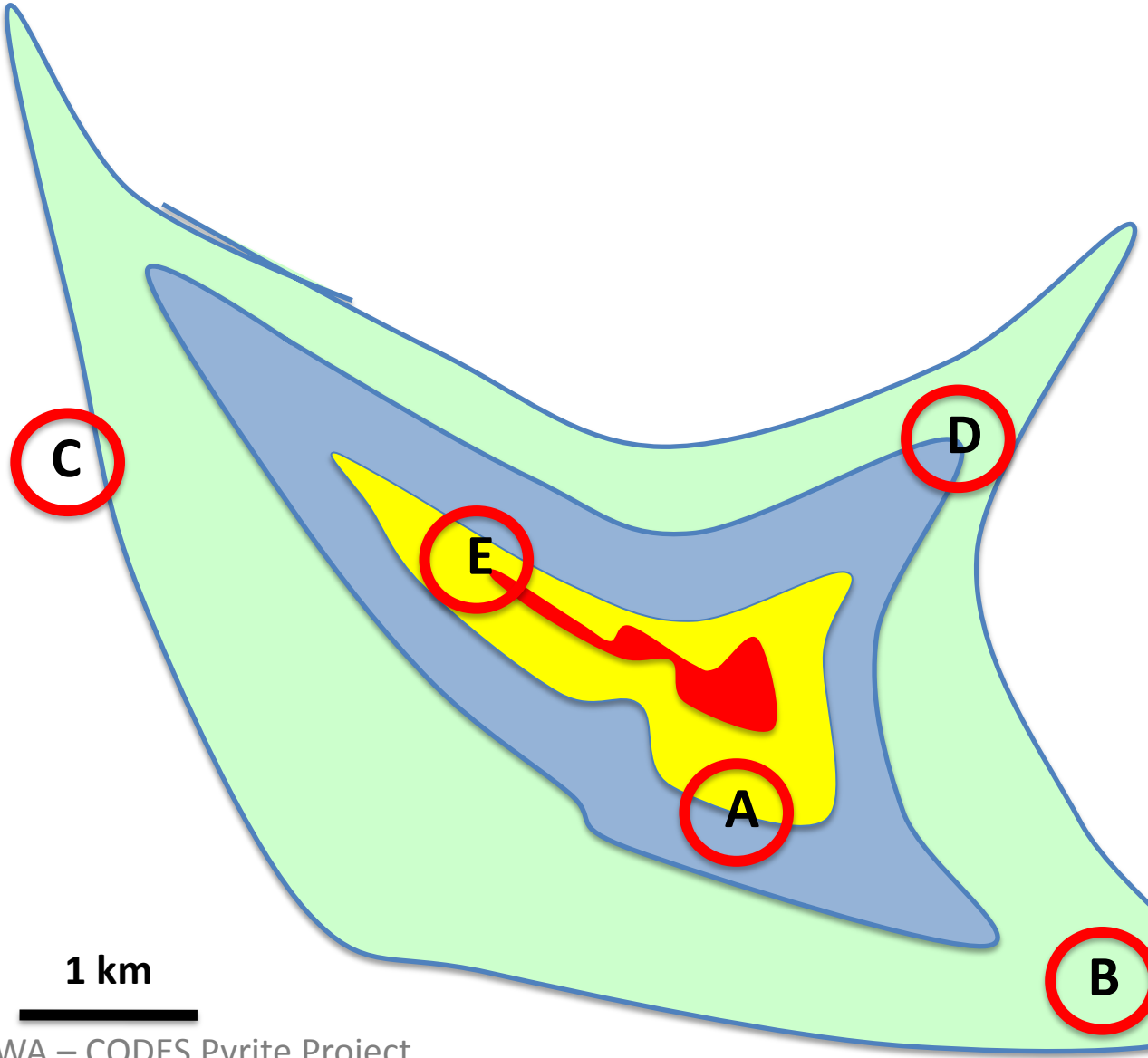


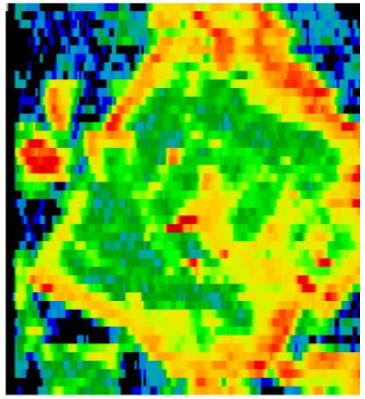


Prospect E; Drill Hole

- Nickel target in ultramafic-mafic rocks
- 3 pyritic samples studied from meta-volcanics and meta-sediments
- 1 sample gave a pyrite ore signature with up to 51 ppm Au, 200 ppm Te and 450 ppm Ag
- **This is a potential gold-ore zone that was previously undetected**
- **Au-Prox score = 4,300 (ore zone)**

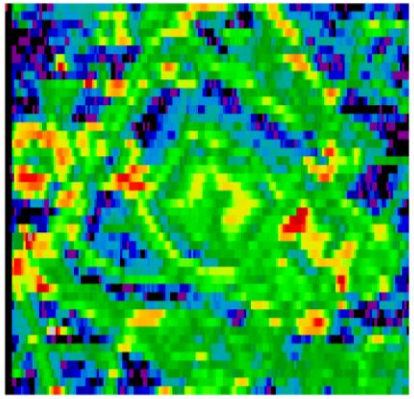
Primary Orogenic Gold Pyrite Footprint



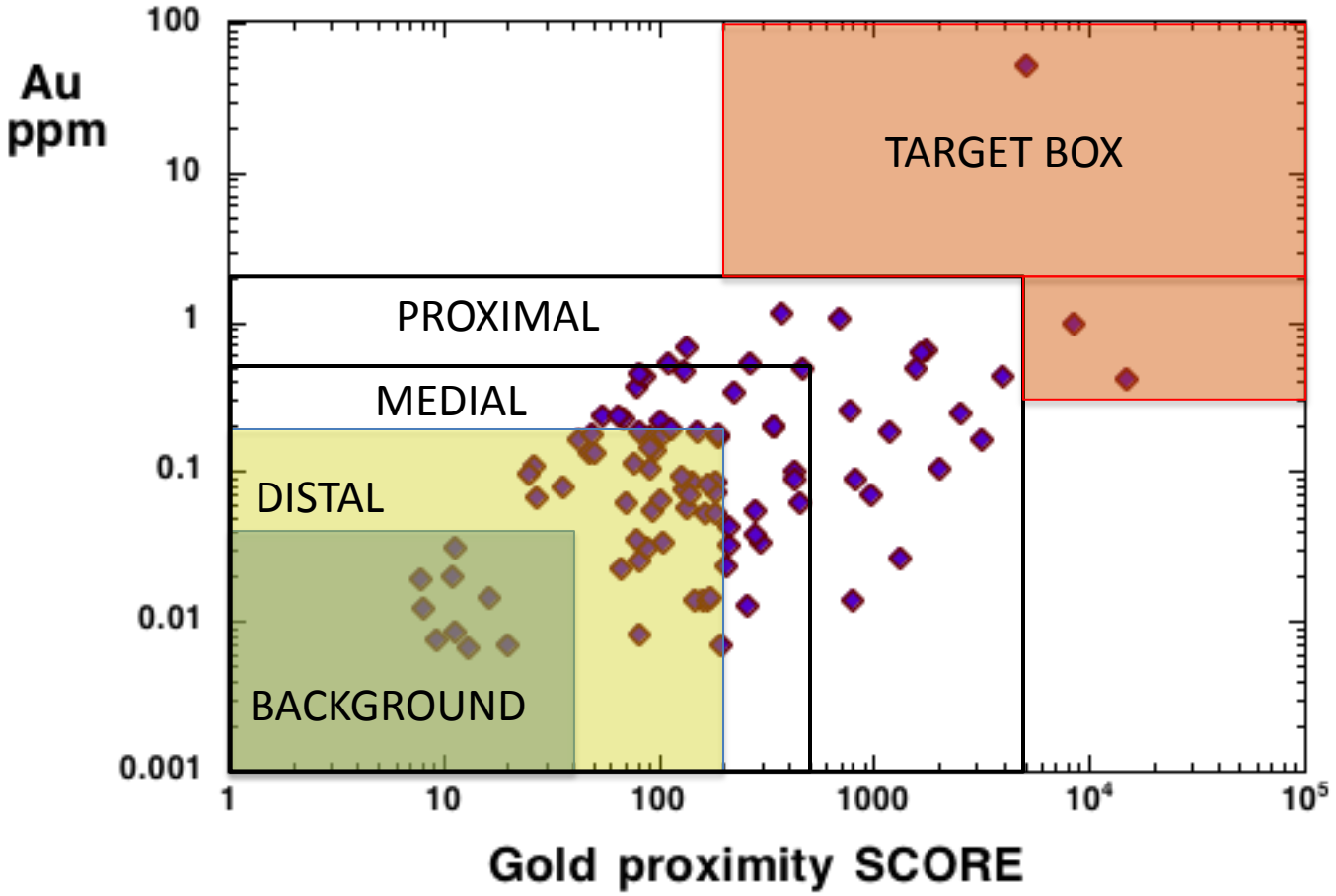


Conclusions

- The results of this LA-ICPMS pyrite-vector approach are very exciting:
  - Discovery of a potential ore-grade gold zone is indicated in an EIS drill hole – *not previously recognised by the conventional approach*
  - PGE potential in dolerite indicated in another EIS drill hole
- The power of pyrite to **MAGNIFY** the halo signal to ore is clearly indicated in this study



Thank You


Au ppm
100
10
1
0.1
0.01
0.001
TARGET BOX
PROXIMAL
MEDIAL
DISTAL
BACKGROUND
1
10
100
1000
10^4
10^5
Gold proximity SCORE