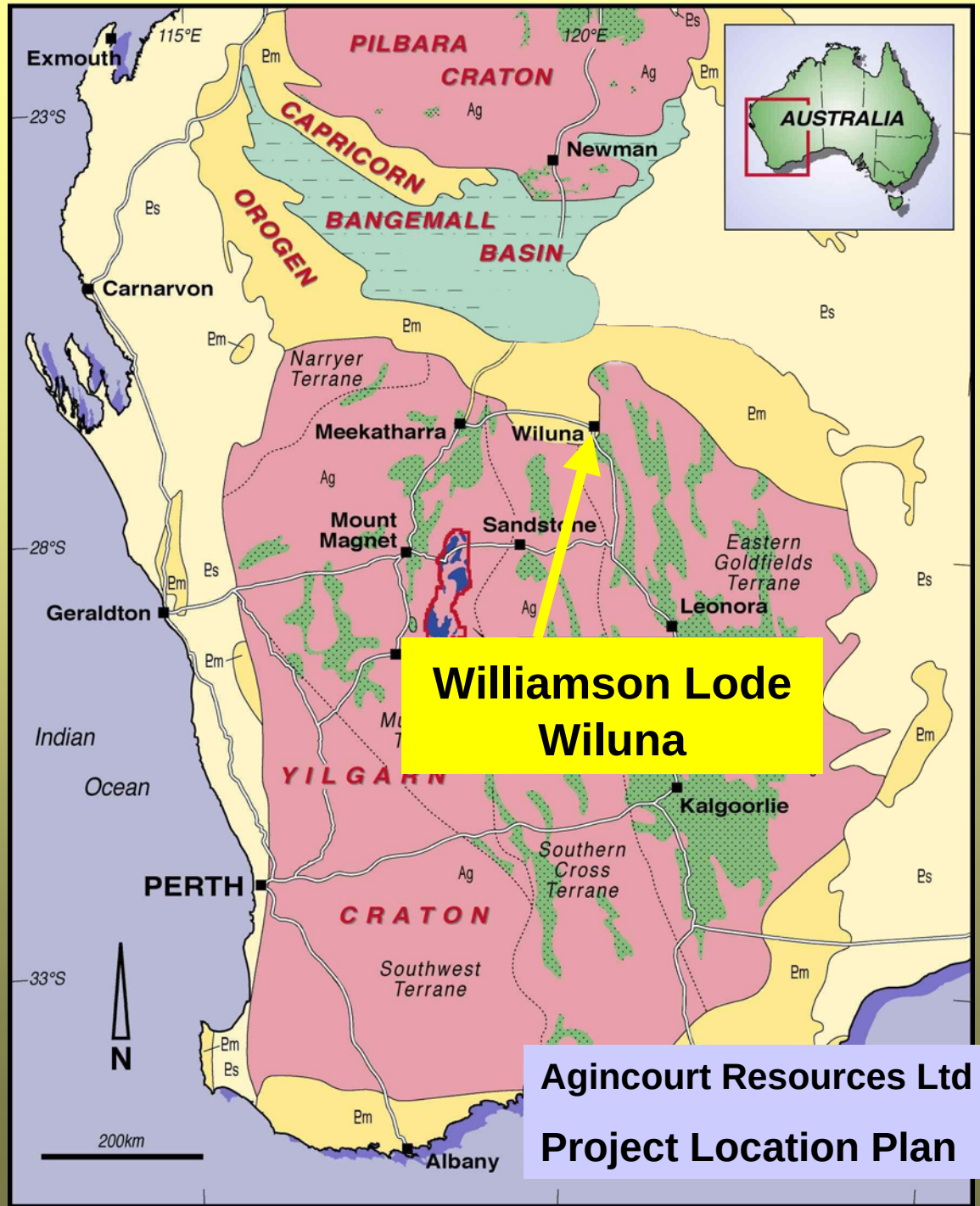
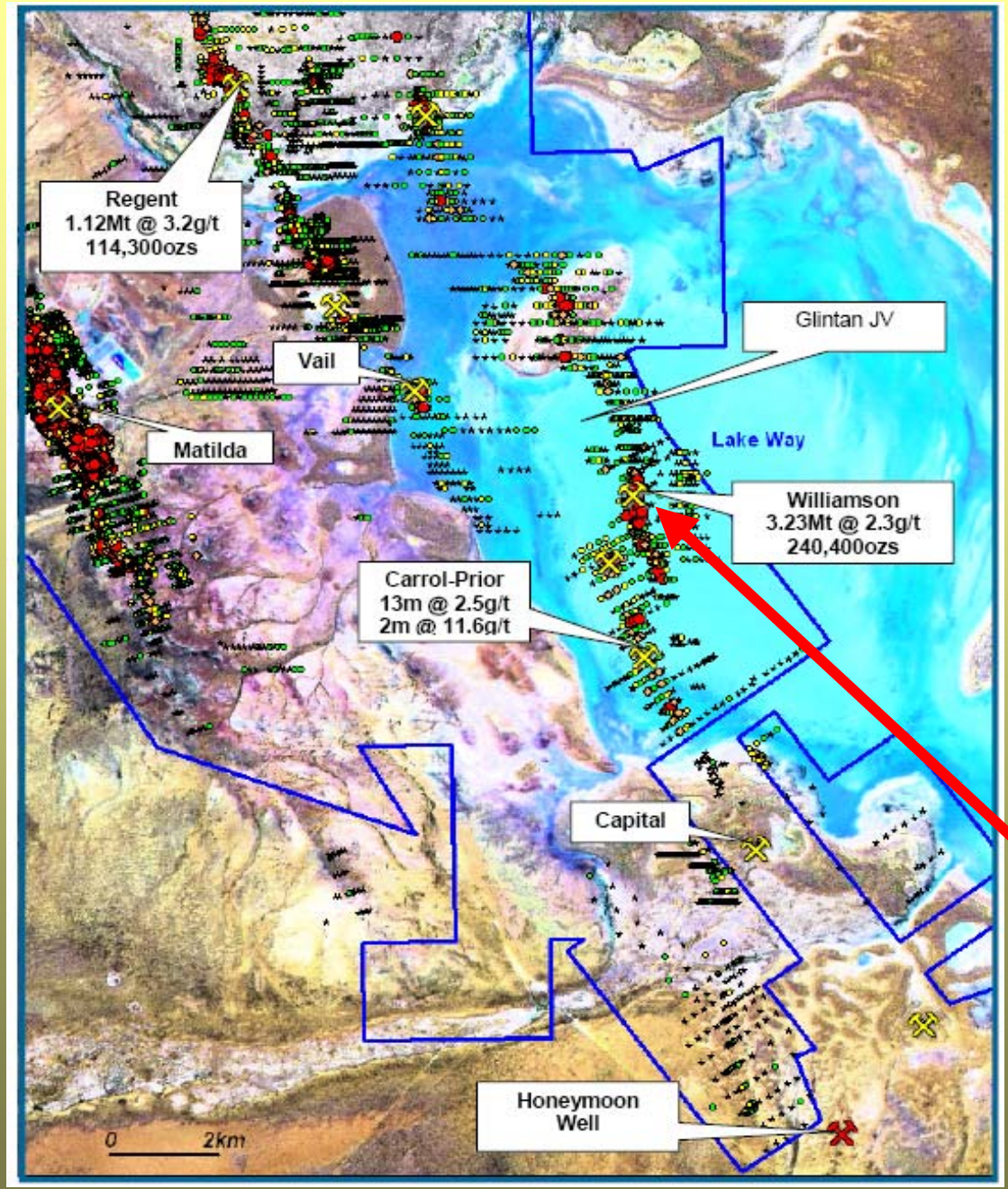
Targeting Gold Mineralisation Below Lake Way, near Wiluna – A Potential Geochemical Method for Exploring the Extensive Salt Playa Lake System of Western Australia

Craig S. Rugless and Robert Watkins


Exmouth
115°E
120°E
PILBARA
CRATON
CAPRICORN
OROGEN
BANGEMALL
BASIN
Newman
AUSTRALIA
23°S
Carnarvon
Narryer
Terrane
Meekatharra
Wiluna
Mount
Magnet
Sandstone
Eastern
Goldfields
Terrane
Leonora
28°S
Geraldton
Williamson Lode
Wiluna
Indian
Ocean
YILGARN
Kalgoorlie
Southern
Cross
Terrane
PERTH
CRATON
Southwest
Terrane
33°S
N
200km
Albany
Agincourt Resources Ltd
Project Location Plan

Lake Way Auger Geochemical Programme

- Lake Way is located immediately south of Wiluna in the Eastern Goldfields of WA
- Lake Way provides the opportunity of examining geochemical dispersions in a salt lake with a relatively shallow cover ~ 2 to 12m and near neutral pH ~ 6.5
- Archaean epigenetic gold mineralisation hosted by a monzogranite porphyry dyke – the Williamson Lode that was originally located using expensive track mounted air core drilling techniques.
- Typical greenstone sequence of tholeiitic basalt, high Mg basalt, komatiites and intercalated volcaniclastic units.



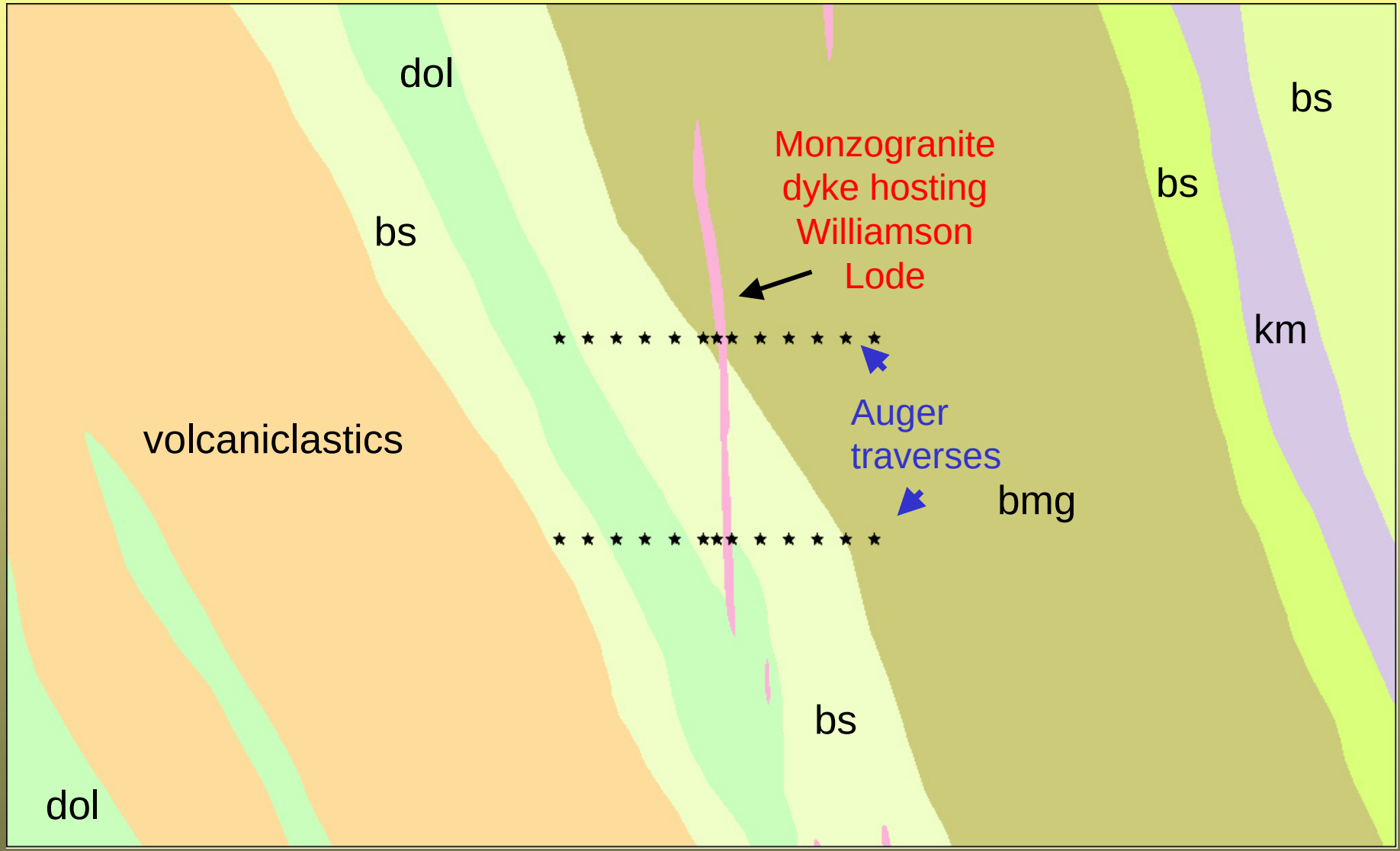
Agincourt Resources Ltd Lake Way Gold Prospects

Williamson Lode

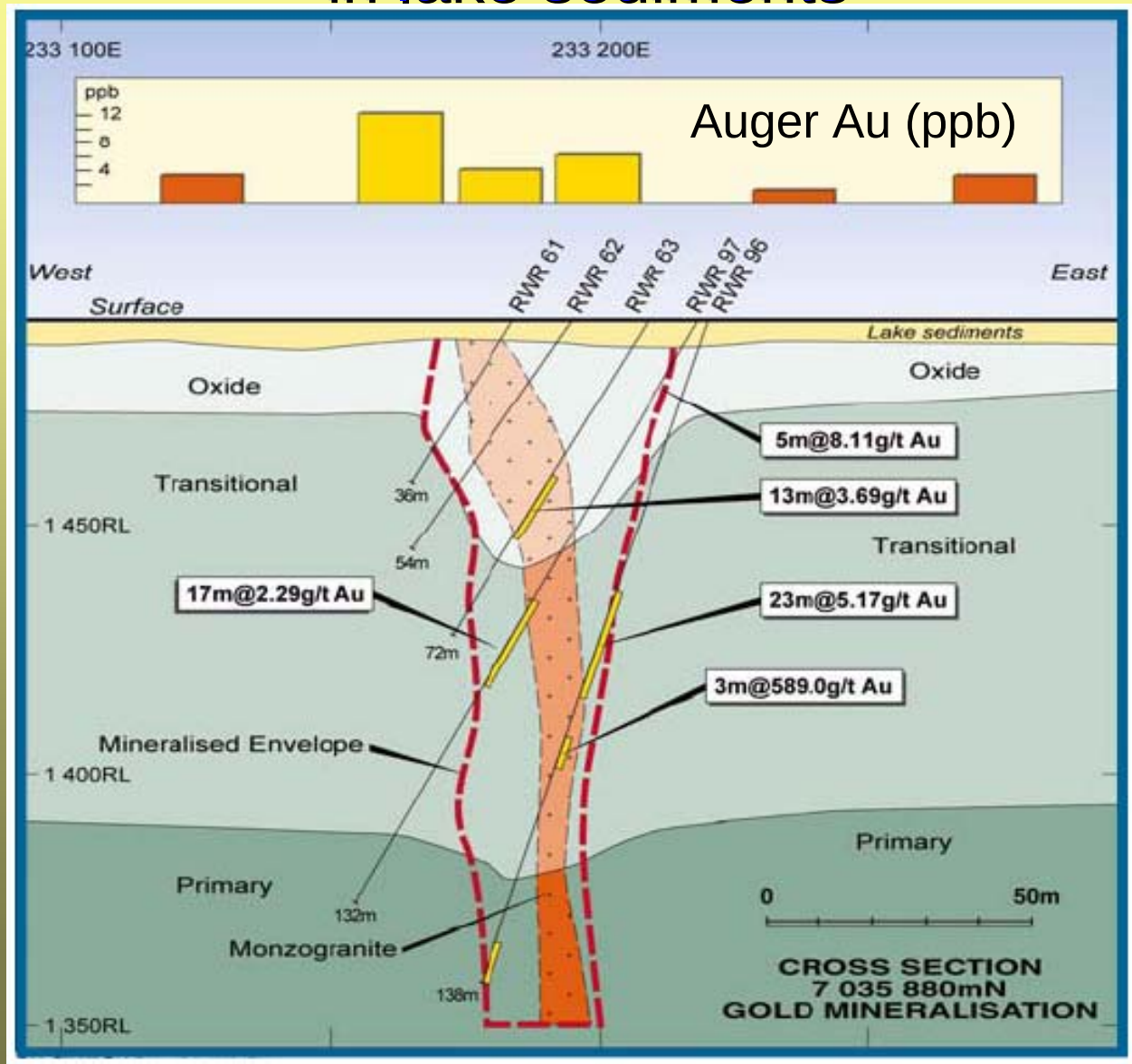
3.23 Mt @ 2.3 g/t Au

Williamson Lode

Williamson Lode – initial auger geochemical traverses



Williamson Lode – Cross Section 7035880N showing auger geochemical Au (ppb) anomaly in lake sediments



Lake Way Auger Geochemical Programme

Programme Aims

- To provide a cost effective method of exploring the extensive playa lake system in the East Yilgarn of Western Australia
- Establish the optimum sampling medium or depth & sample density
- Define partial geochemical analytical methods and trace element suites that will potentially define mineralisation under the lake cover.

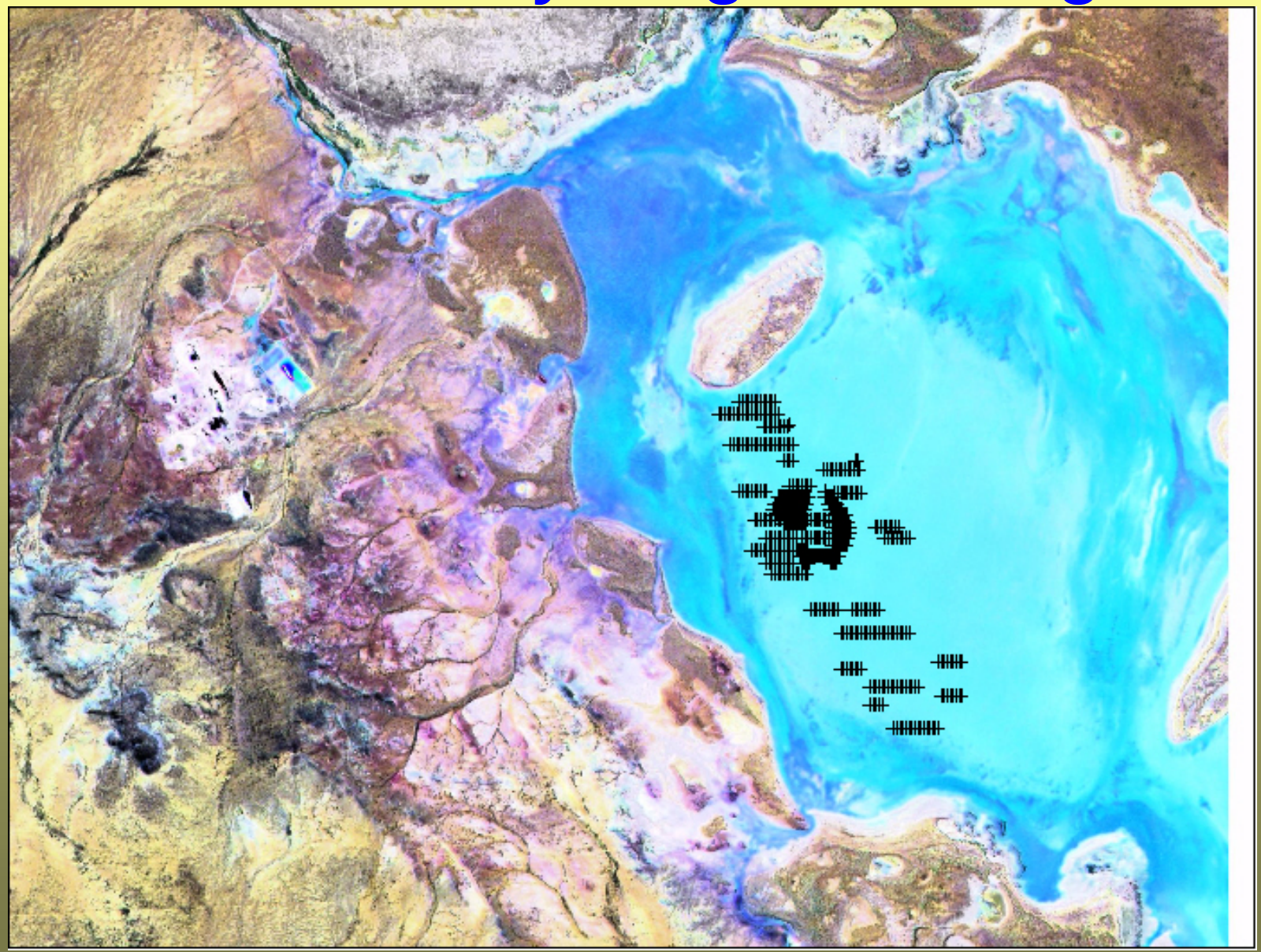
Lake Way Auger Geochemical Programme

Practical considerations

- Playa lakes in the Eastern Goldfields can be filled with > 100m of transported sediments particularly along their eastern boundaries.
- Hypersaline regime with TDS >35,000 mg/l and relatively acid pH readings ~ 4 to 6.5
- Trace element dispersions in the salt lake environment are still poorly understood despite the excellent work at Lake Lefroy by Michelle Carey & co-workers at WMC Ltd.
- Lake Way provides the opportunity to examine geochemical dispersions associated with epigenetic gold mineralisation.

Pathfinder Salt Lake Auger

Lake Way Auger Drilling

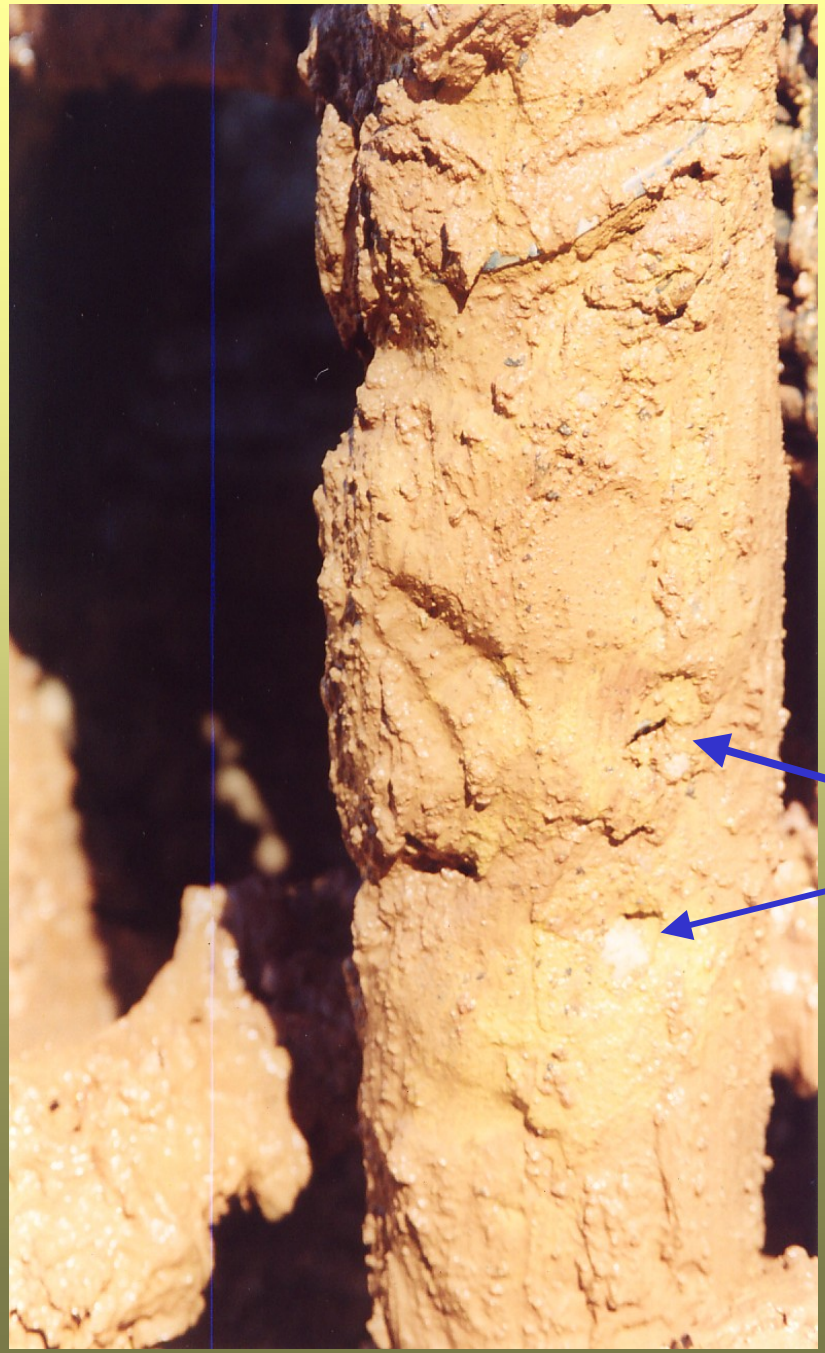


Auger interval showing Playa Transition & Saprolite Zones

Lake Way Regolith Units – Playa Transition Zone

Playa Transition Zone - showing fine grained pisolites

Lake Way Regolith Units - Saprolite



Saprolite - showing saprock clasts

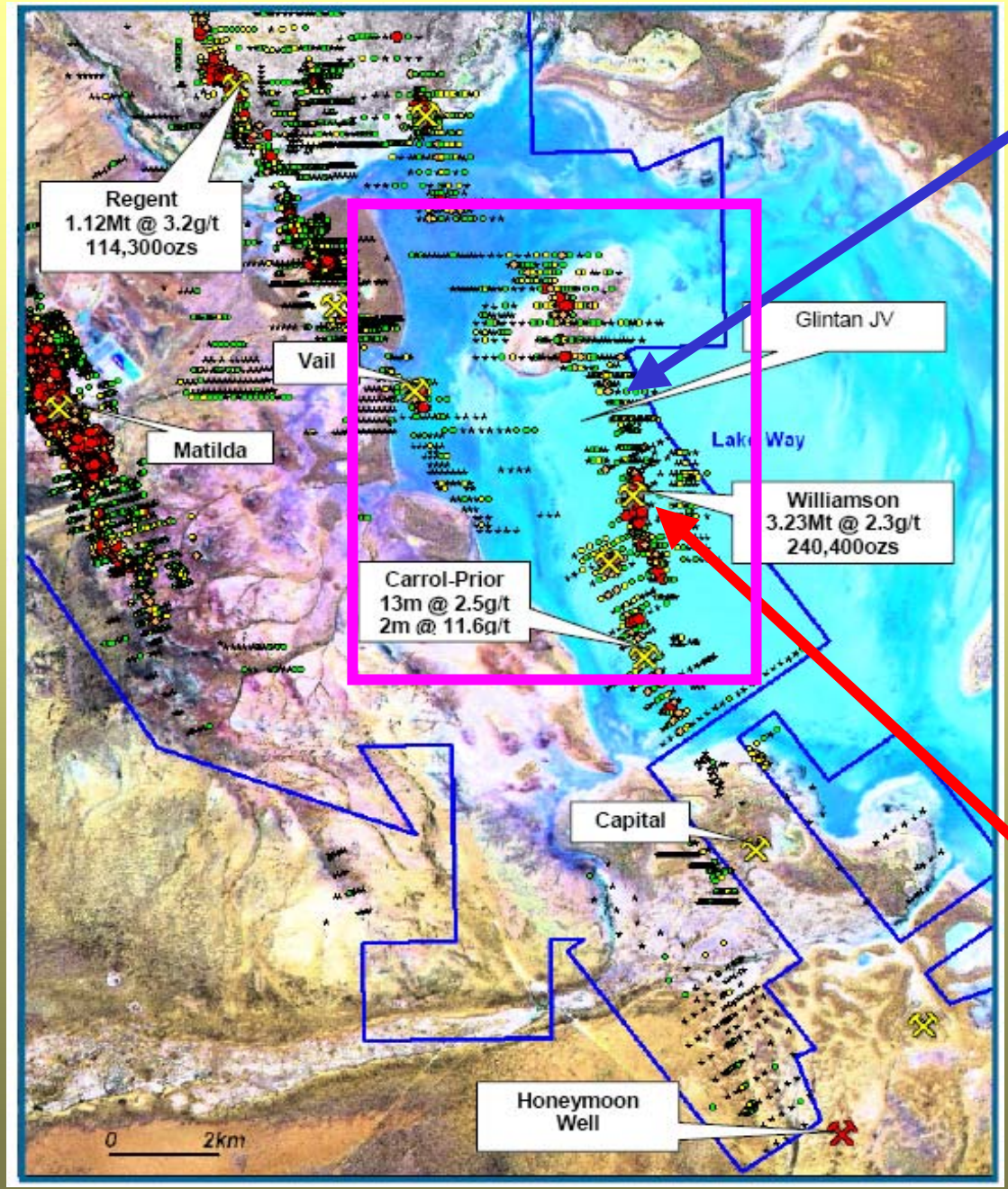
Partial Geochemical Orientation Programme

Traverses selected:

- 7037400N (Ore Zone)
  7036400N (Weak mineralisation/background)
- Auger Drill holes at 50 m intervals

Analytical Methods used (6):

- Aqua Regia (B-EDTA) Method – Genalysis
- Sodium pyrophosphate - Genalysis
- Conc (10M) HCl & dilute (4M) HCl – Ultra Trace Labs
- Hot Cyanide (CN) Leach – Ultra Trace
- Enzyme Leach - Actlabs



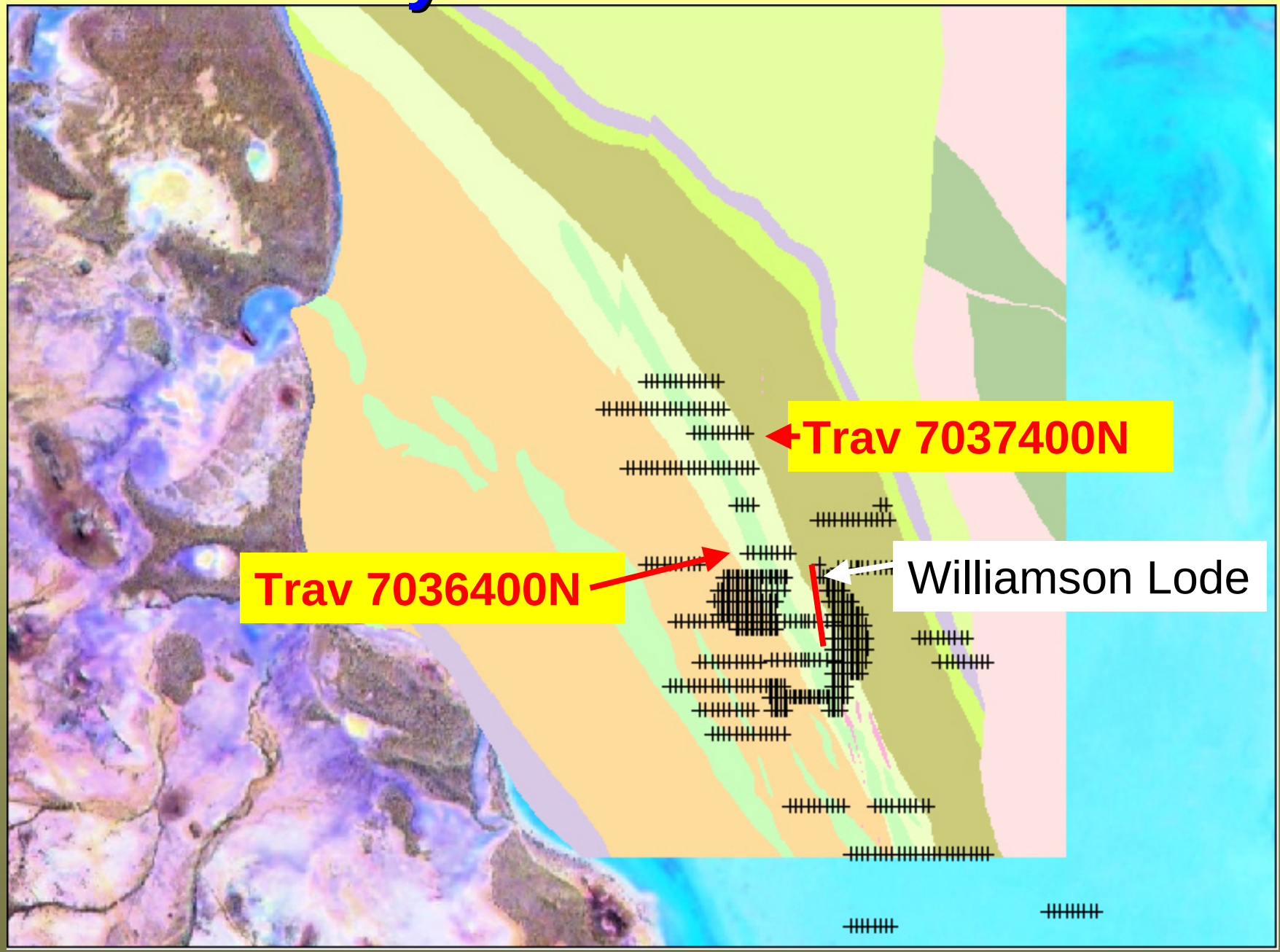
Partial Geochemistry Orientation Survey

Agincourt Resources Ltd Lake Way Gold Prospects

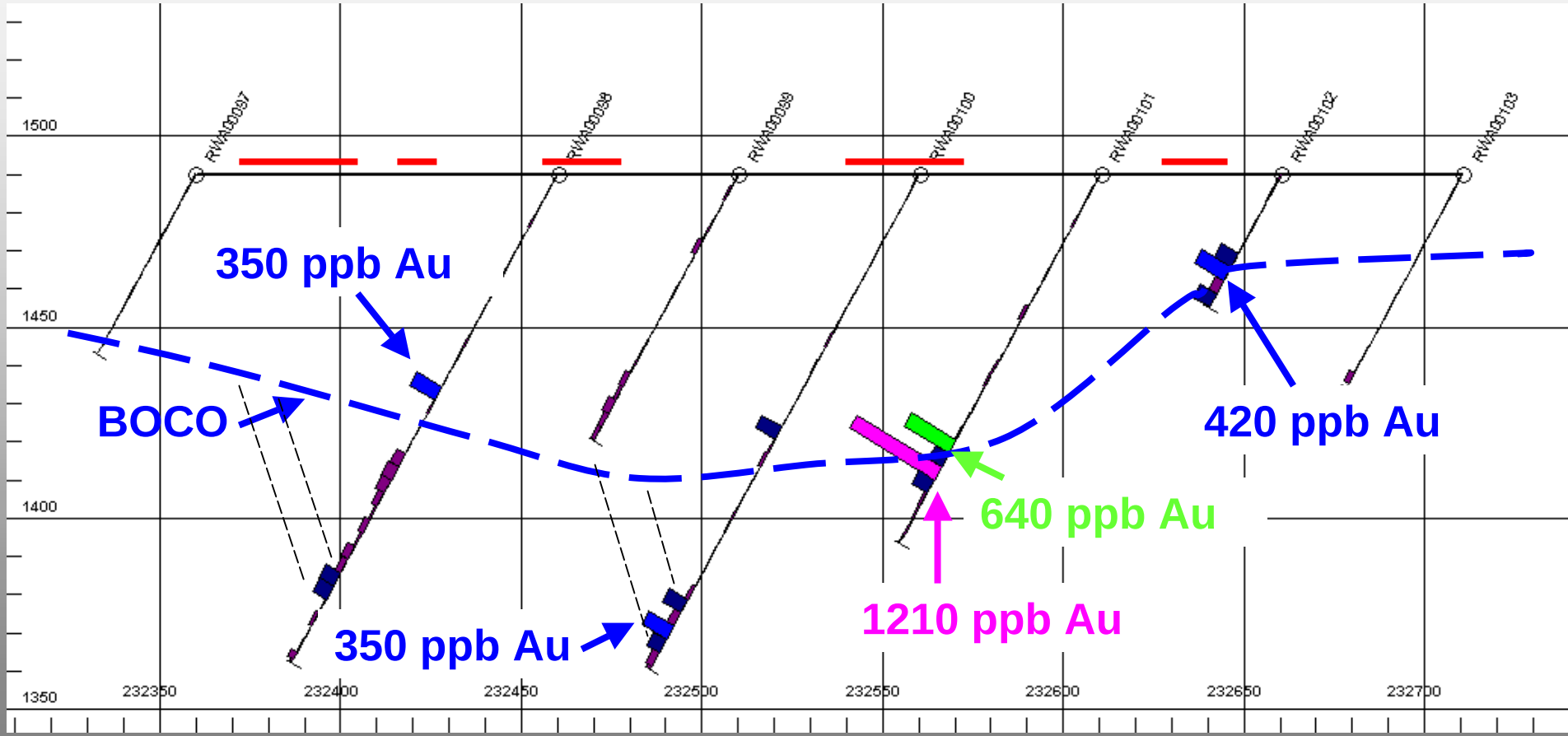
Williamson Lode

3.23 Mt @ 2.3 g/t Au

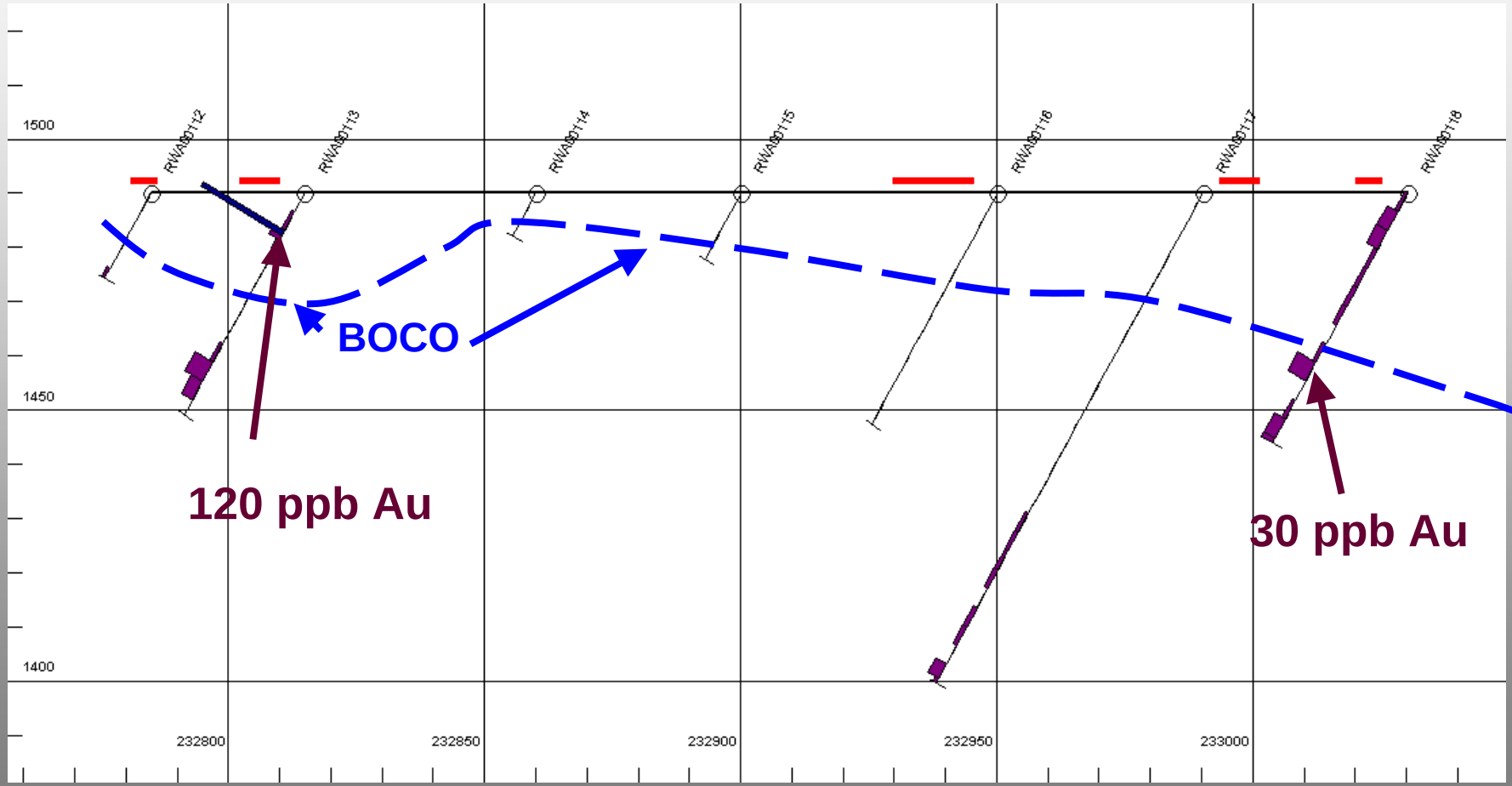
Lake Way Orientation Traverses



Mineralised Drill Hole Section – 7037400N



Weakly mineralised/background drill hole section 7036400N

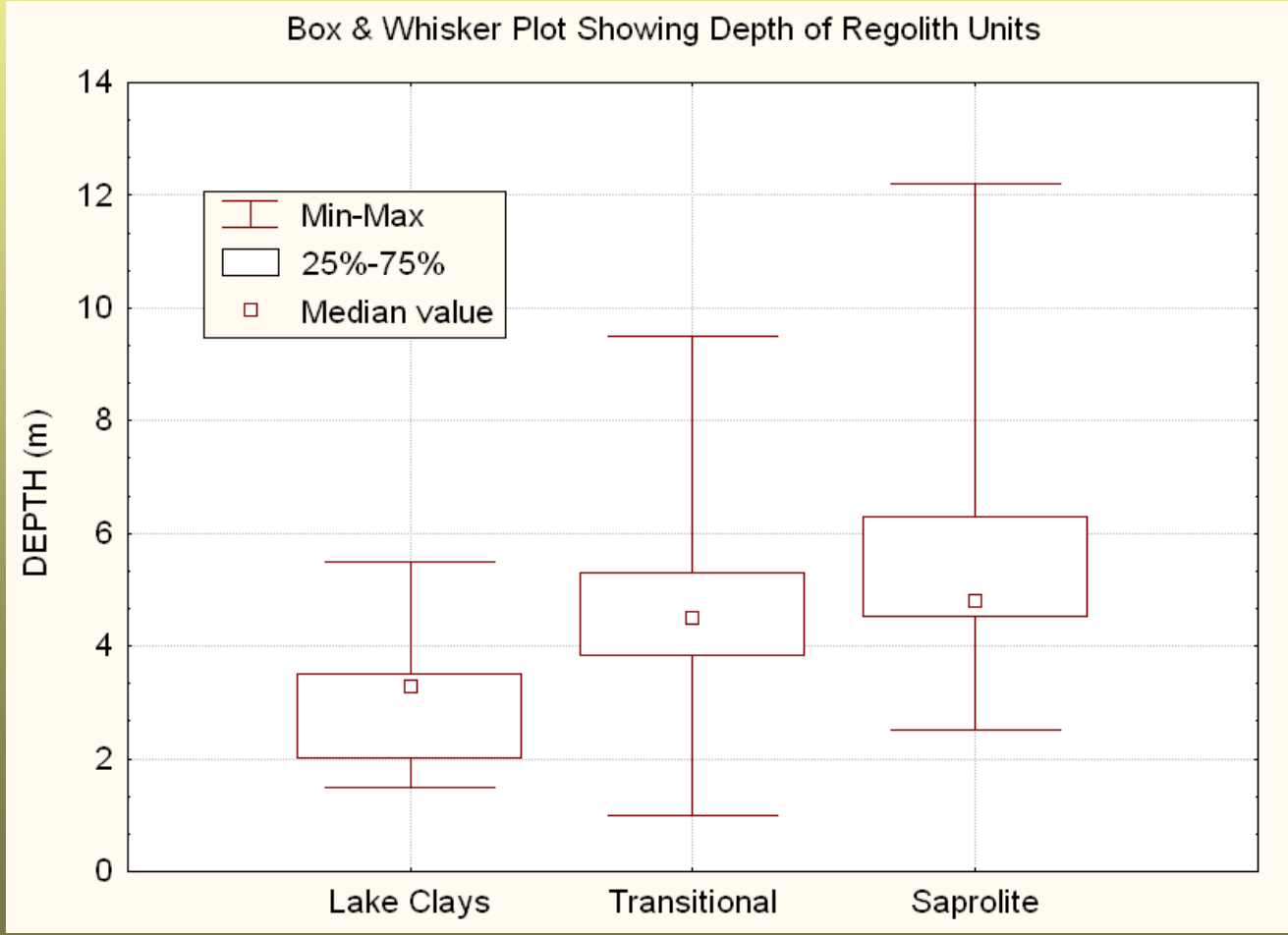


Lake Way Regolith Units

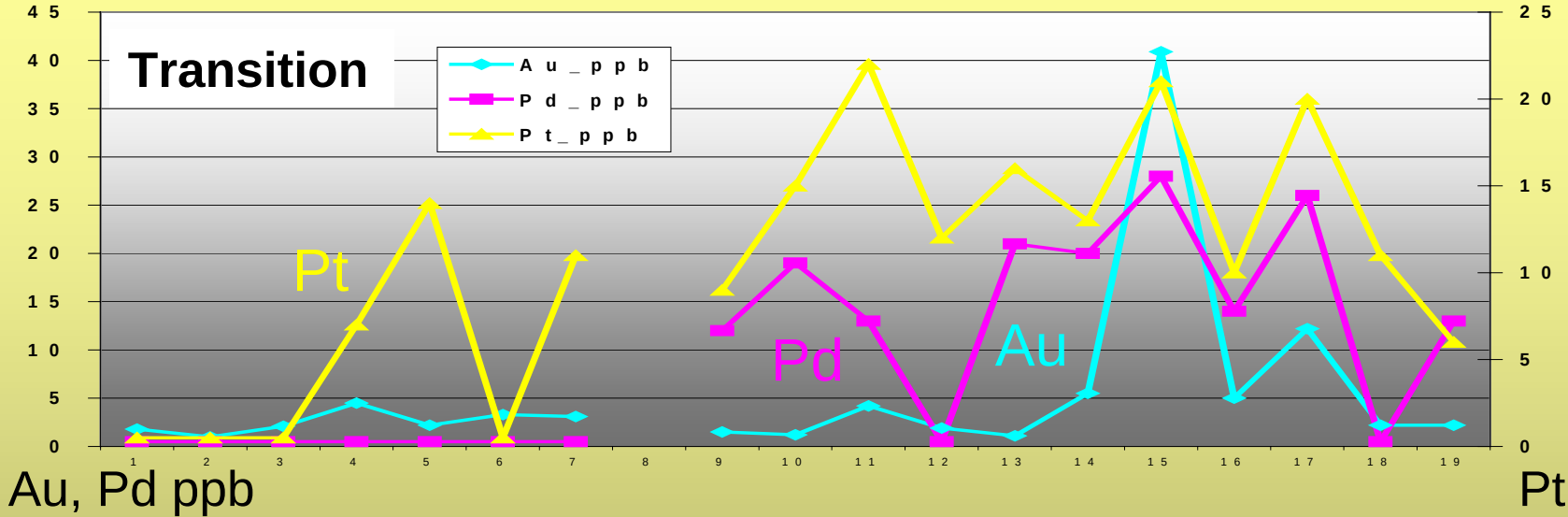
Lake Clays 0 – 5.5 m (Average thickness - 3 m)

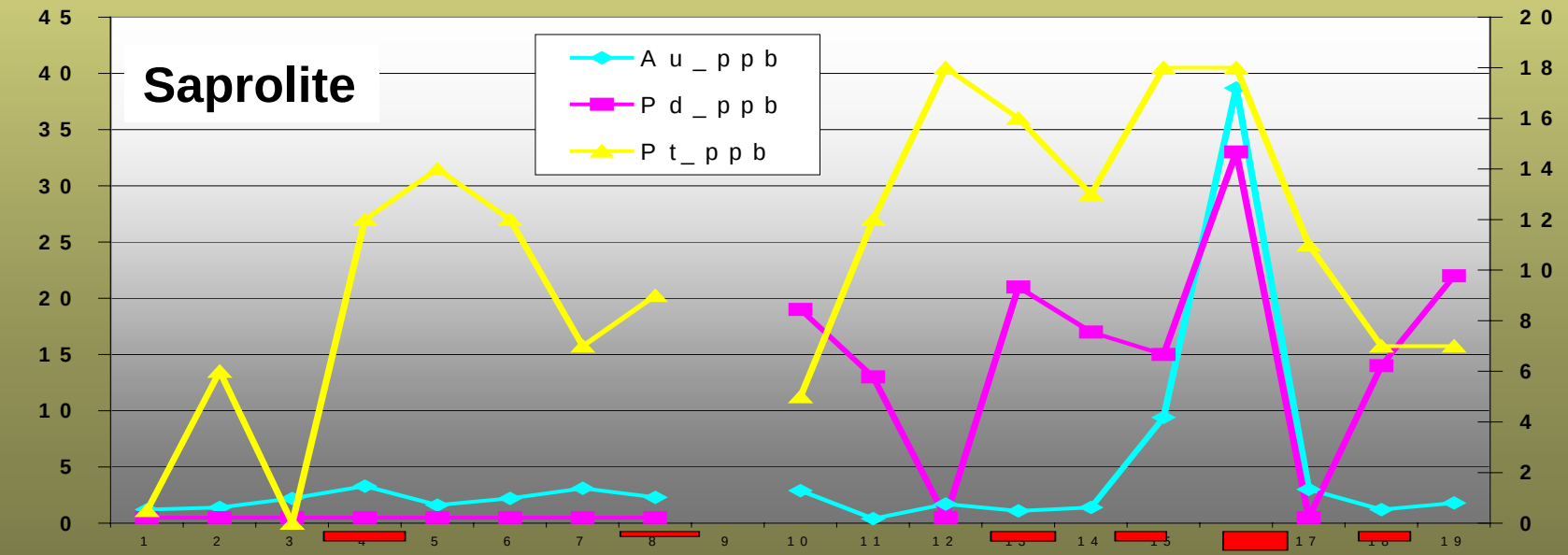
Playa Transition Zone (incl fine pisolites) 3 – 9.5 m (Average depth – 4 m)

Saprolite Zone 4 – 12.2 m (Average depth – 5 m)

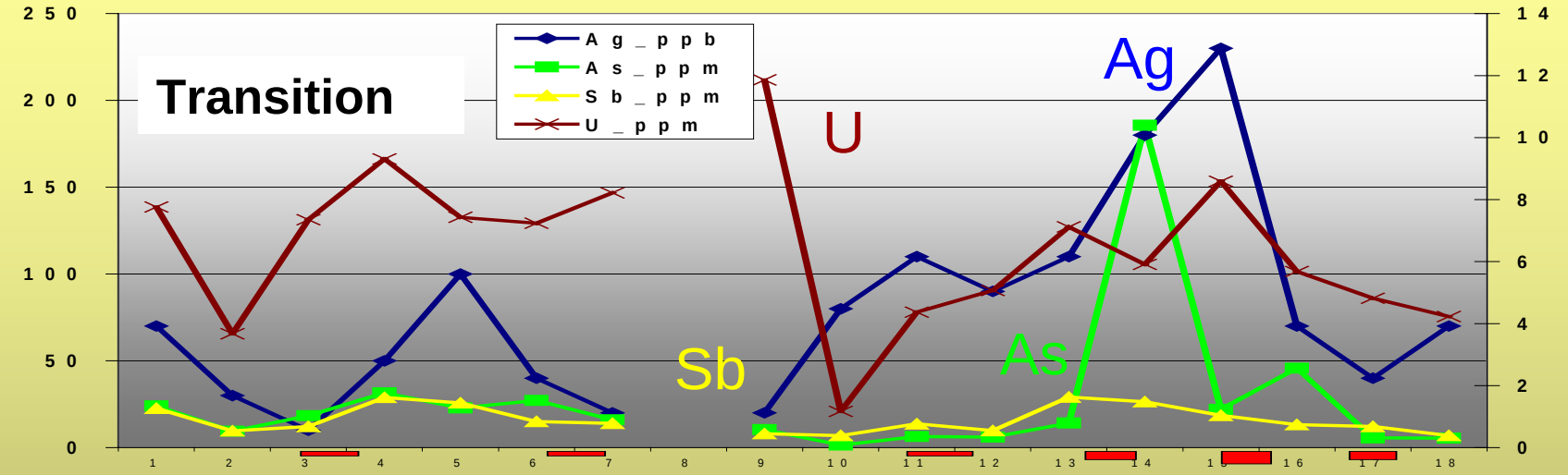


Aqua Regia Digest – Au, Pt & Pd



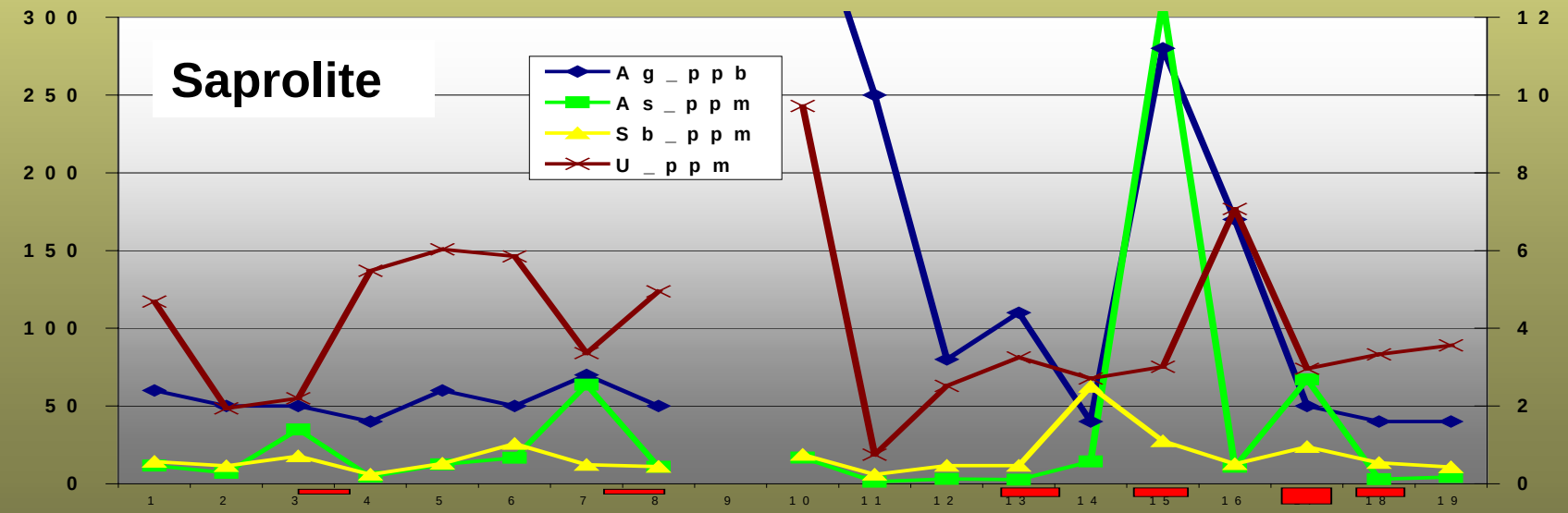


Aqua Regia Digest – As, Ag, U & Sb



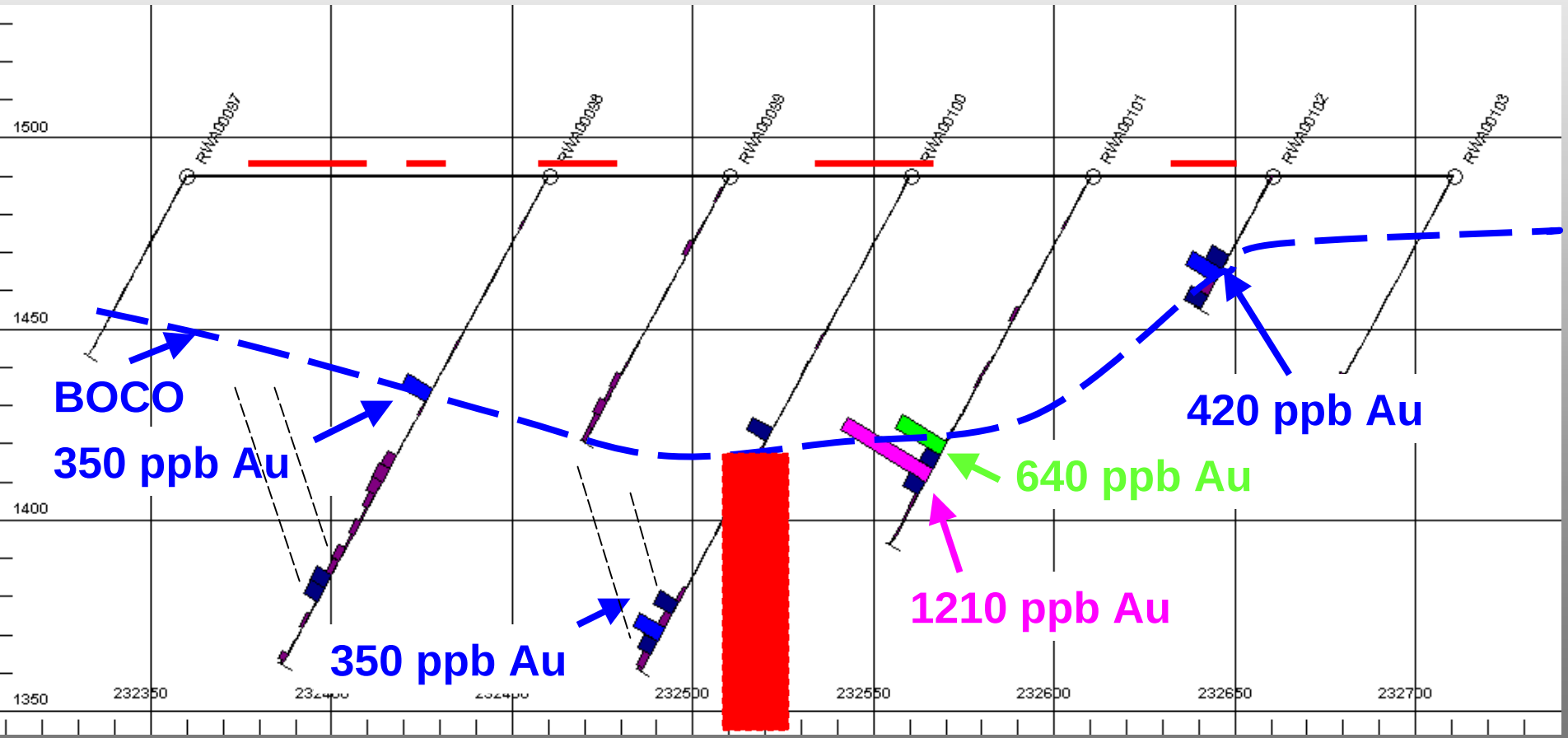
As ppm, Ag ppb

U, Sb ppm

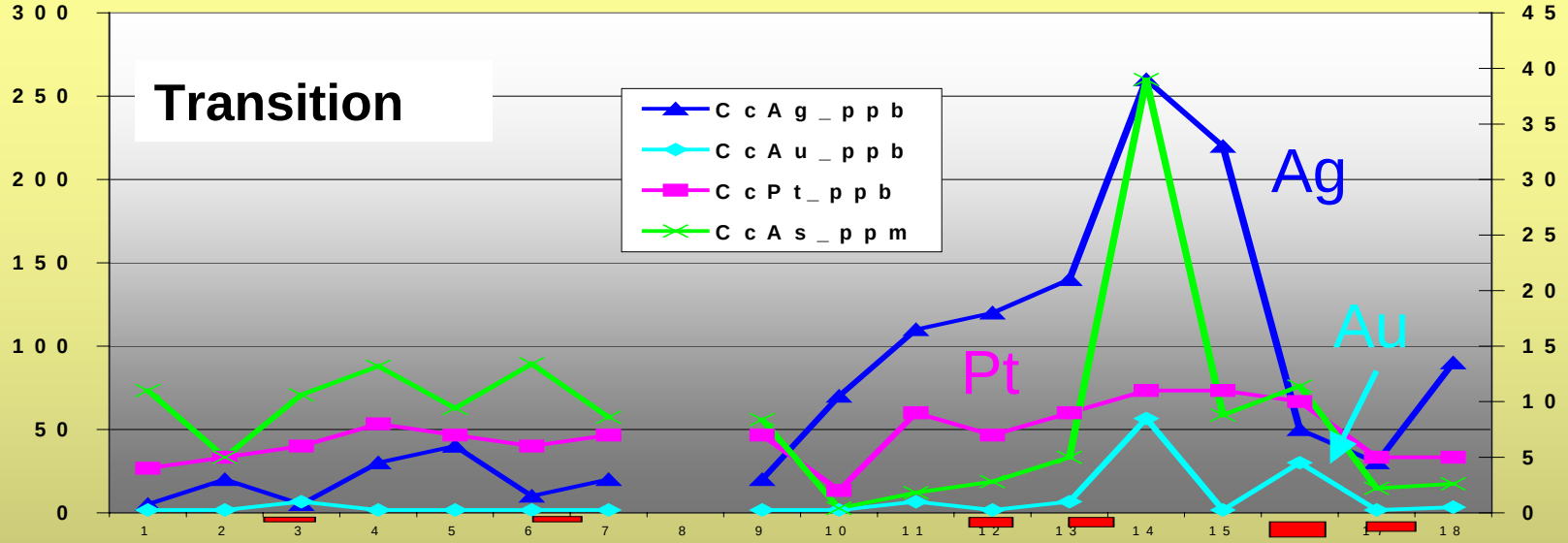


7036400N **7037400N**

Mineralised Drill Hole Section – 7037400N - potential deep Au target based on AR Digest of the Transition & Saprolite Zones

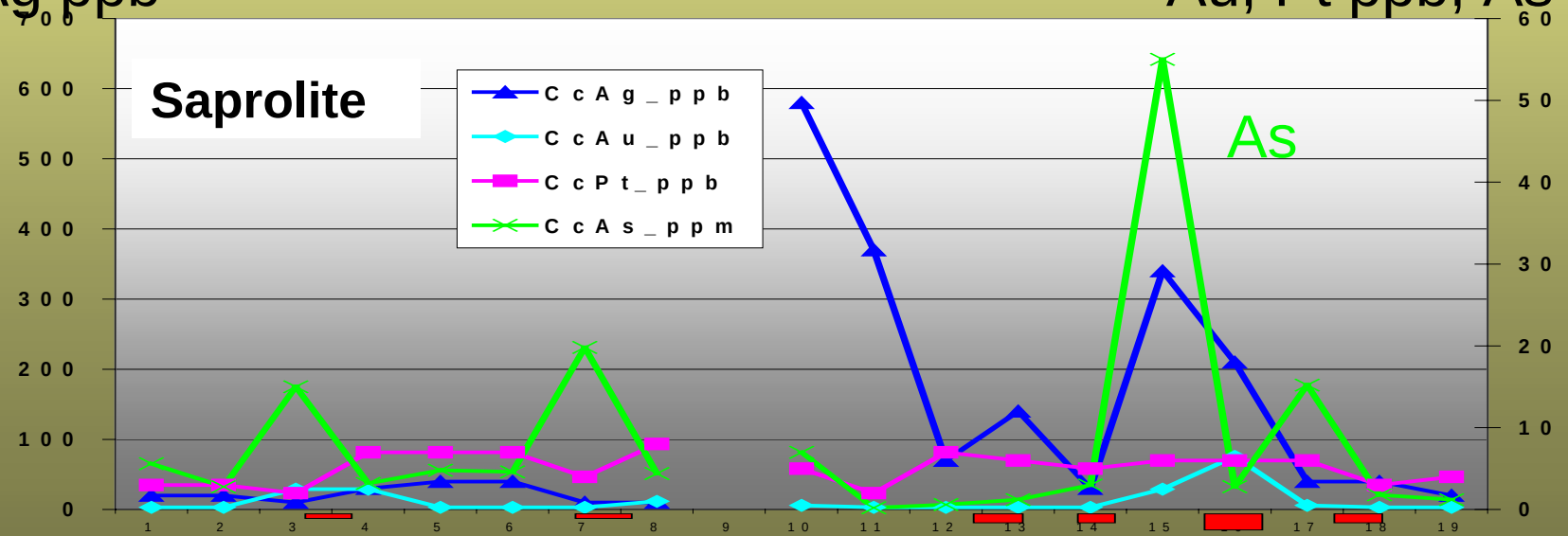


Conc (10M) HCl Digest – Au, Pt, Ag & As



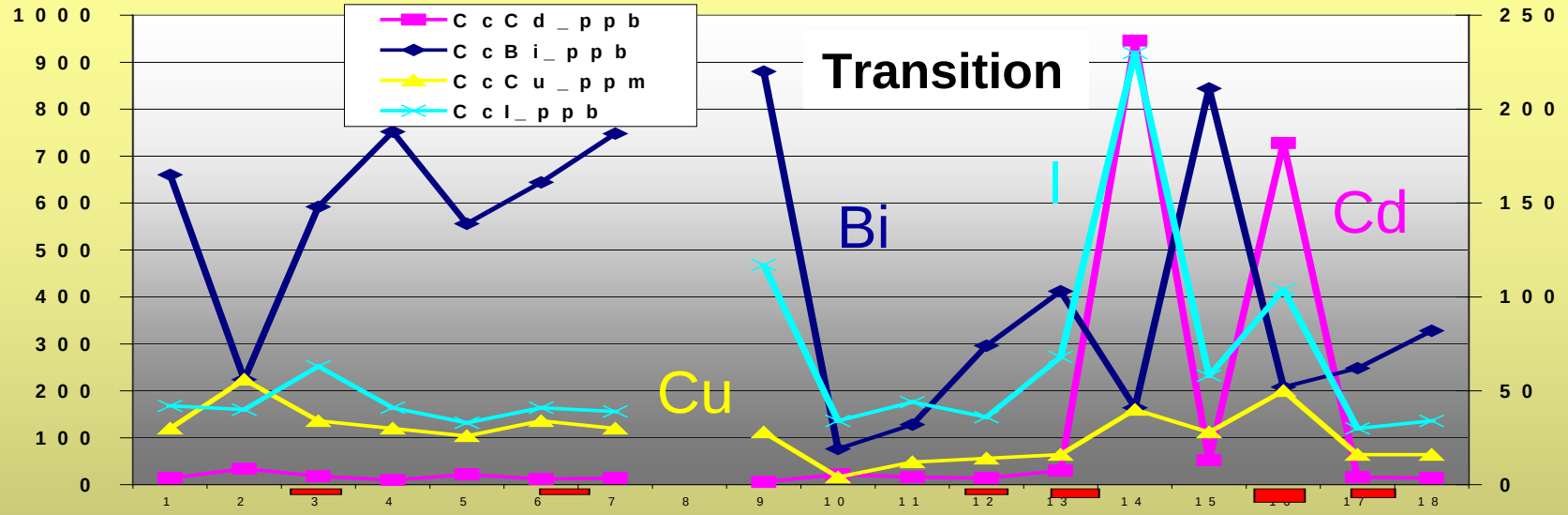
Ag ppb

Au, Pt ppb, As ppm



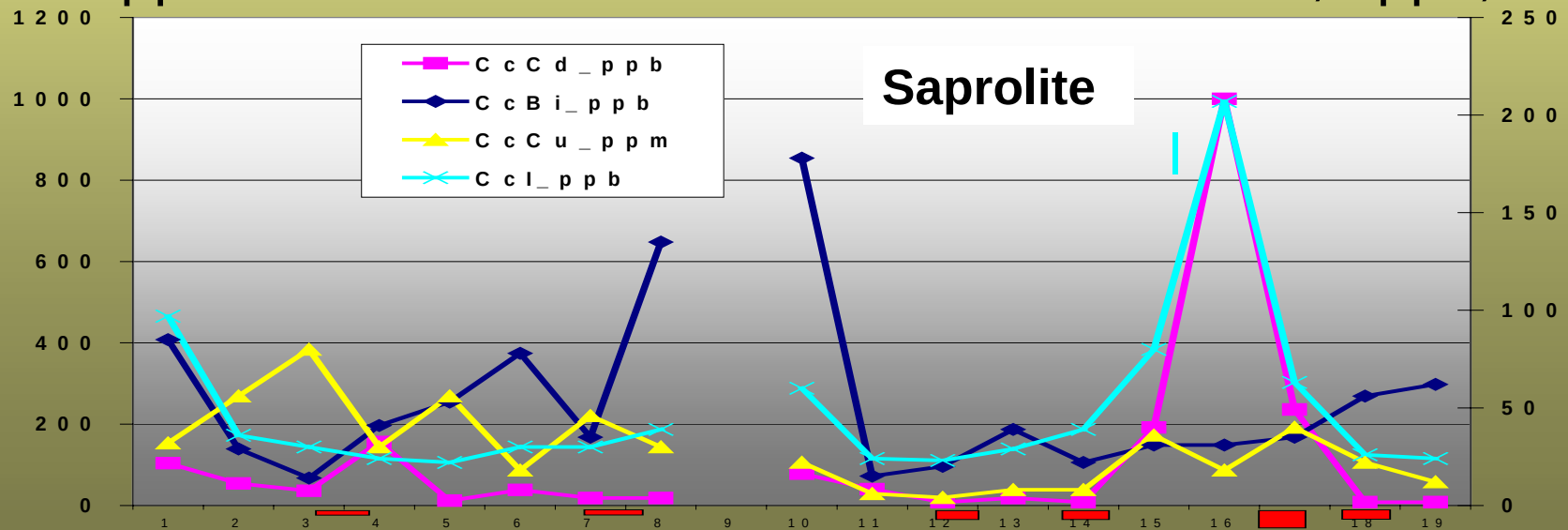
7036400N **7037400N**

Conc (10M) HCl Digest – Cu, Cd, Bi & I



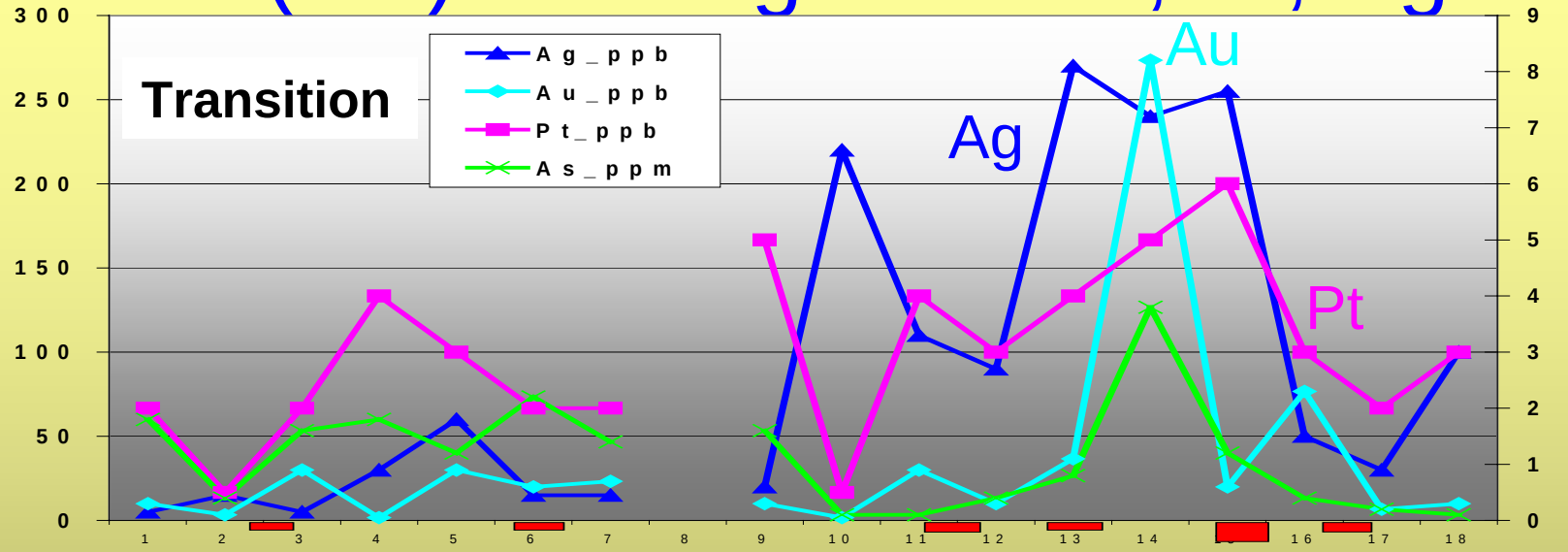
Cd ppb

Bi, I ppb, Cu ppm



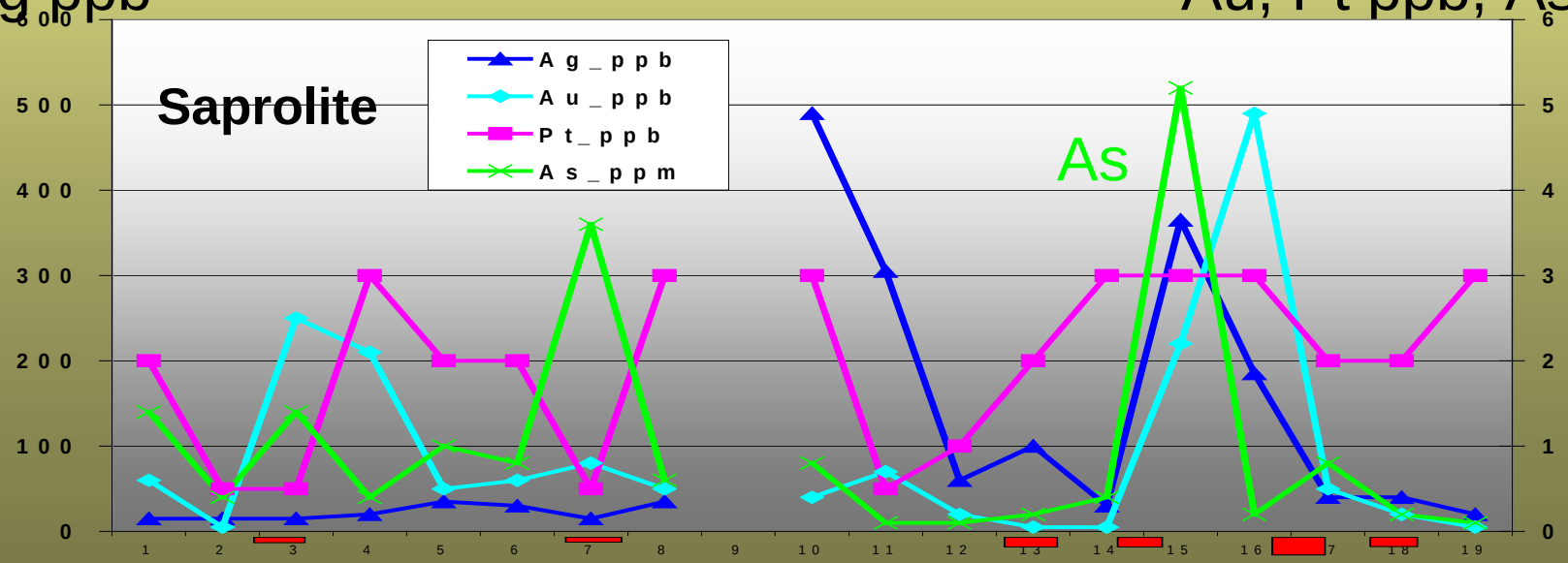
7036400N **7037400N**

Dilute (4M) HCl Digest – Au, Pt, Ag & As



Ag ppb

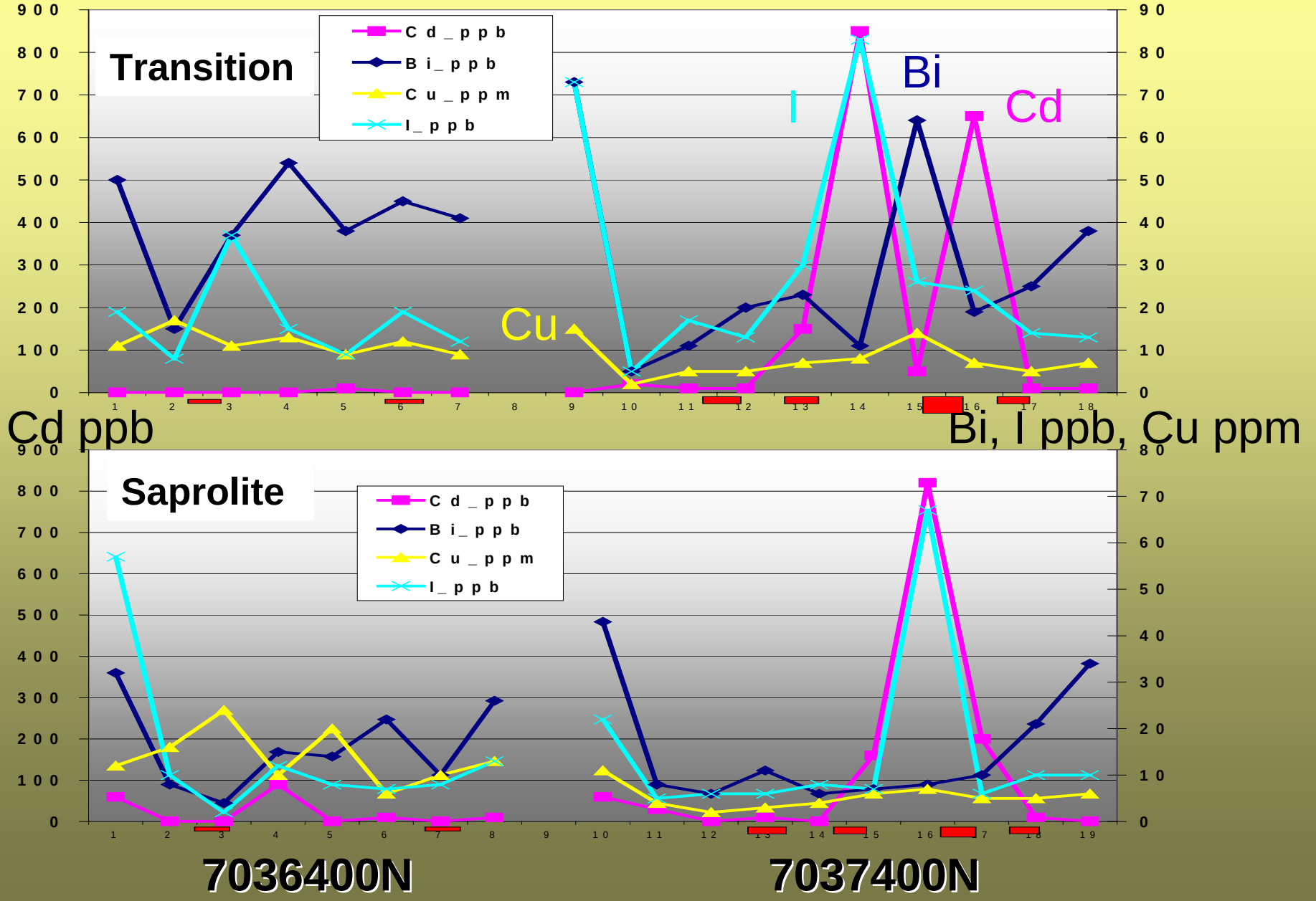
Au, Pt ppb, As ppm



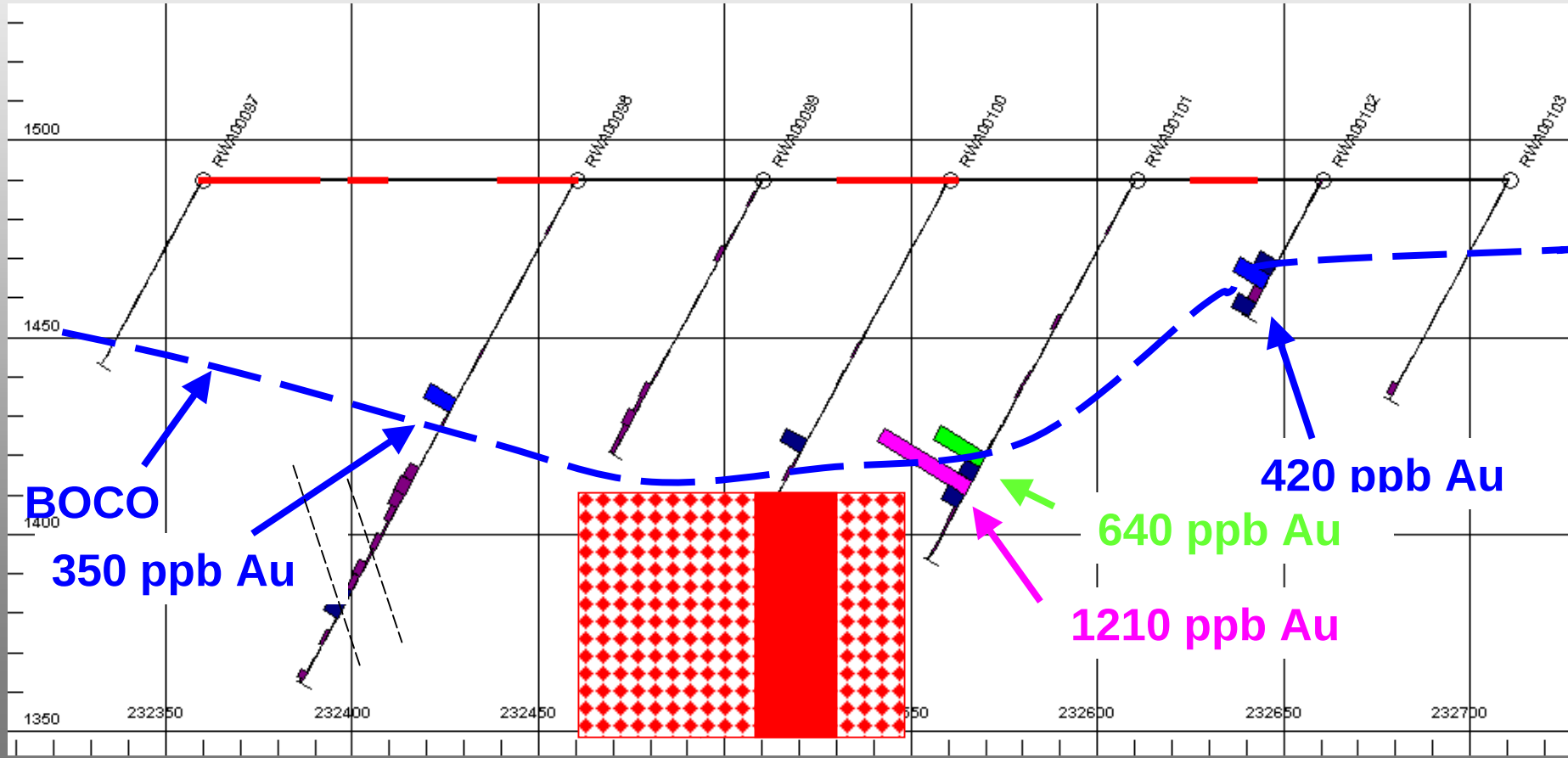
7036400N

7037400N

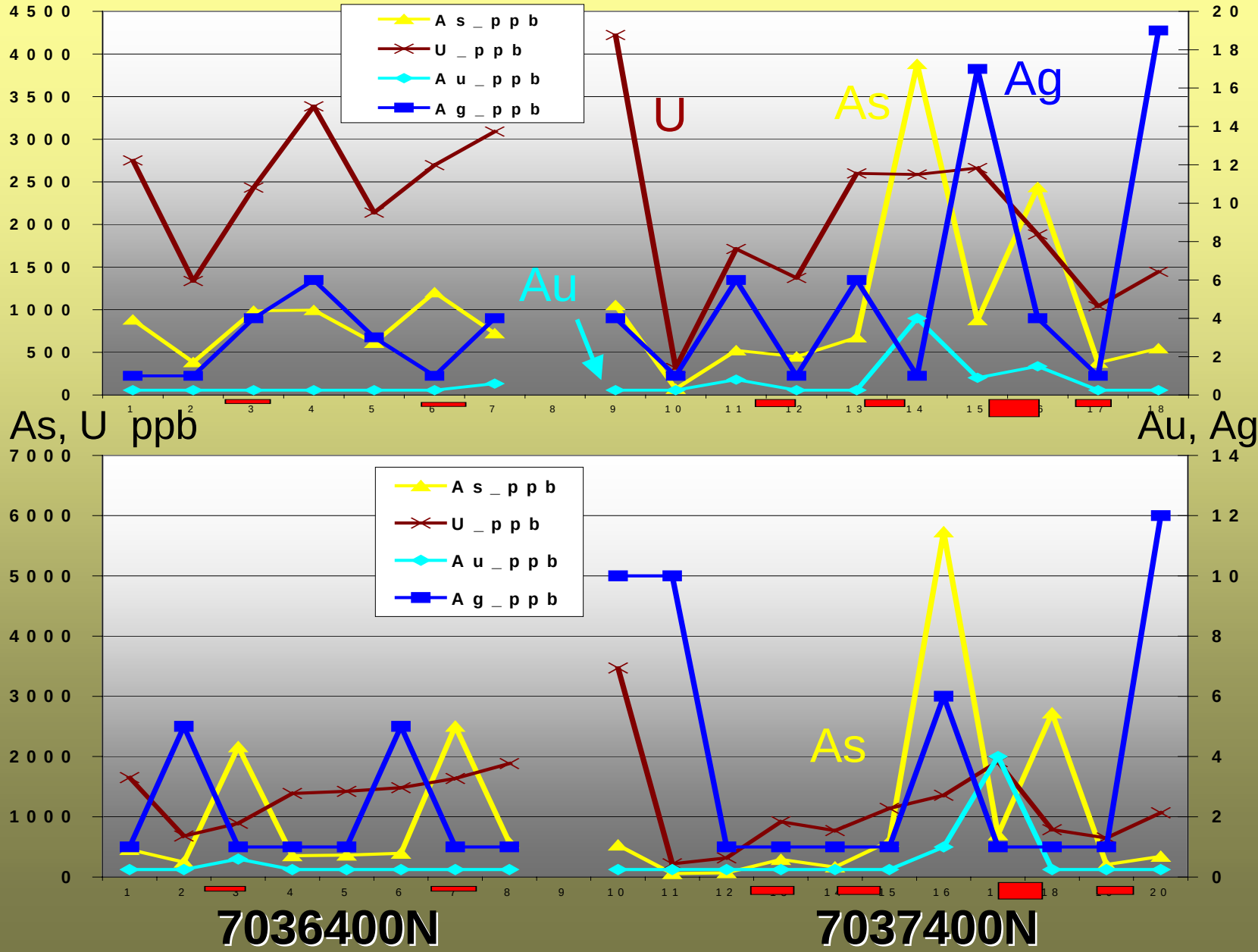
Dilute (4M) HCl Digest – Cu, Cd, Bi & I



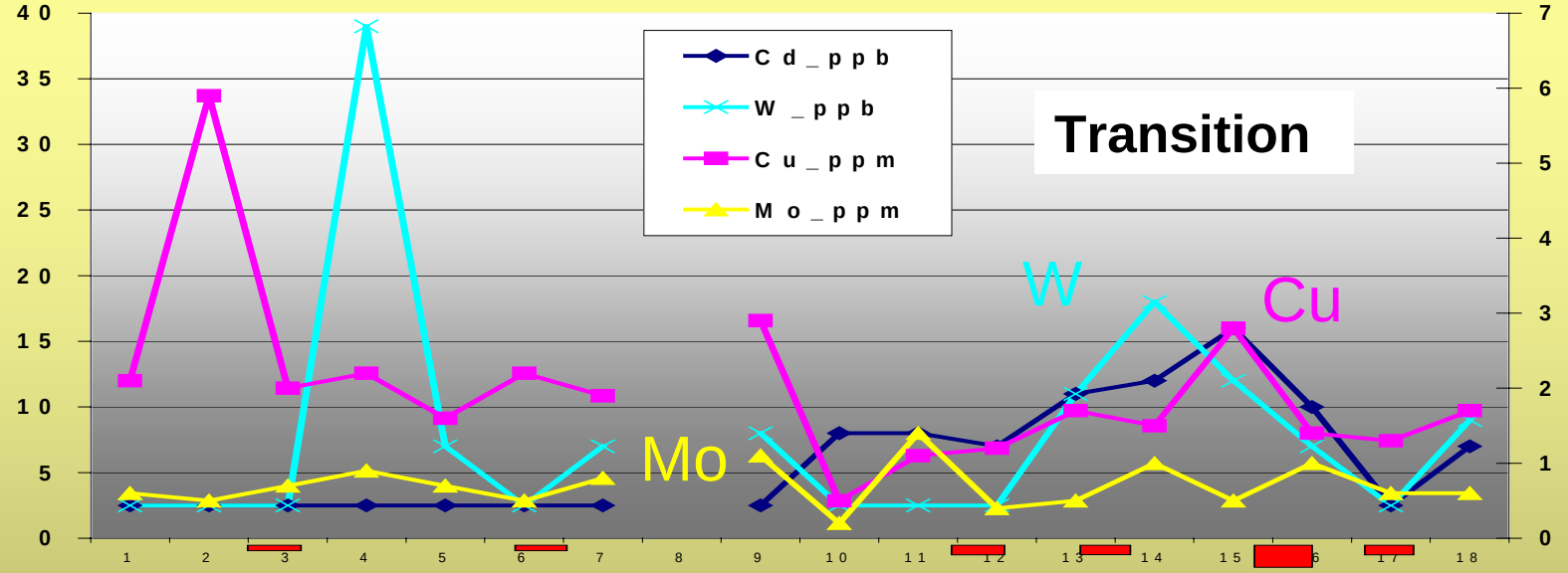
Mineralised Drill Hole Section – 7037400N - potential deep Au target based on Transition Zone sampling using partial HCl digests



Na Pyrophosphate Digest – Au, Ag, As & U

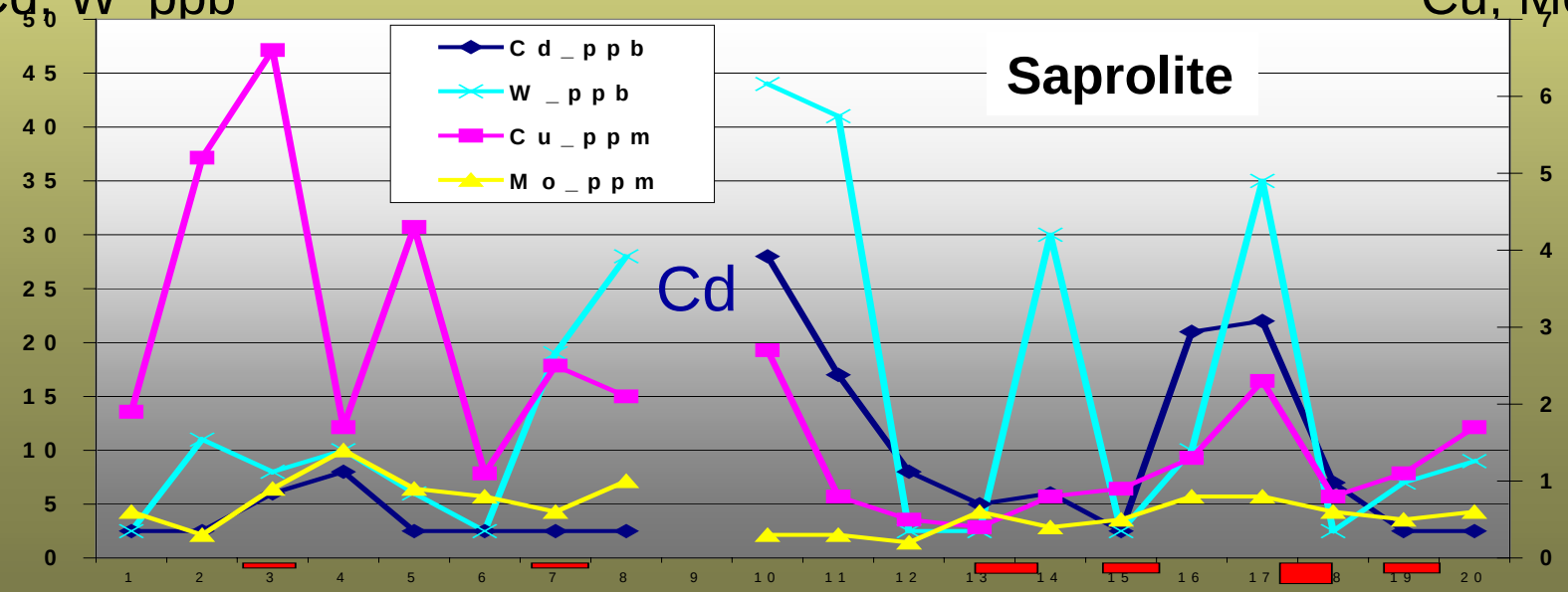


Na Pyrophosphate Digest – Cu, Cd, W & Mo



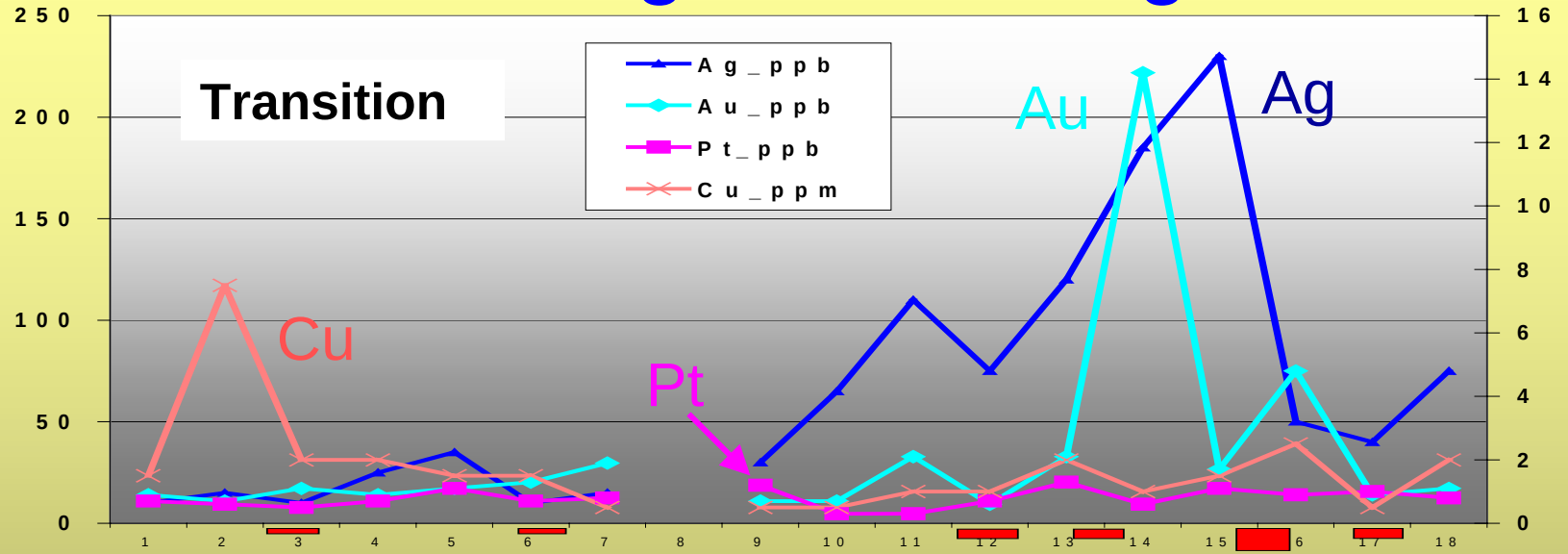
Cd, W ppb

Cu, Mo ppm



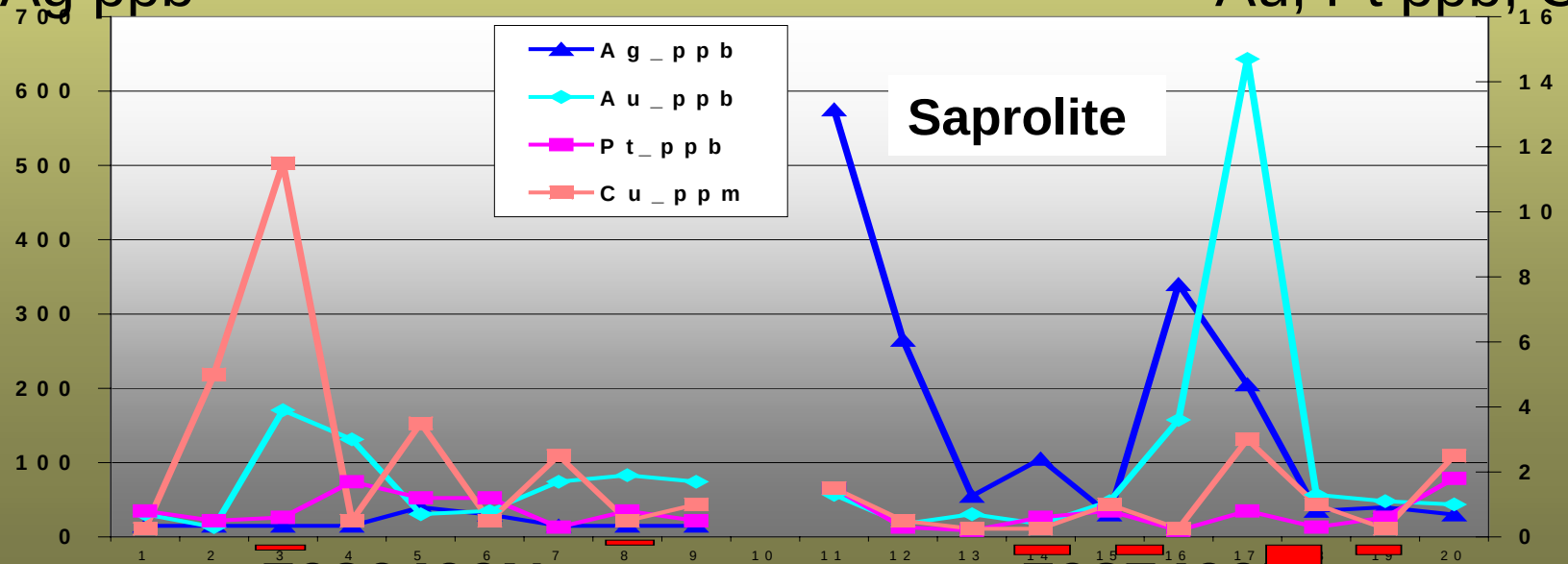
7036400N **7037400N**

Hot CN Digest – Au, Ag Pt & Pd



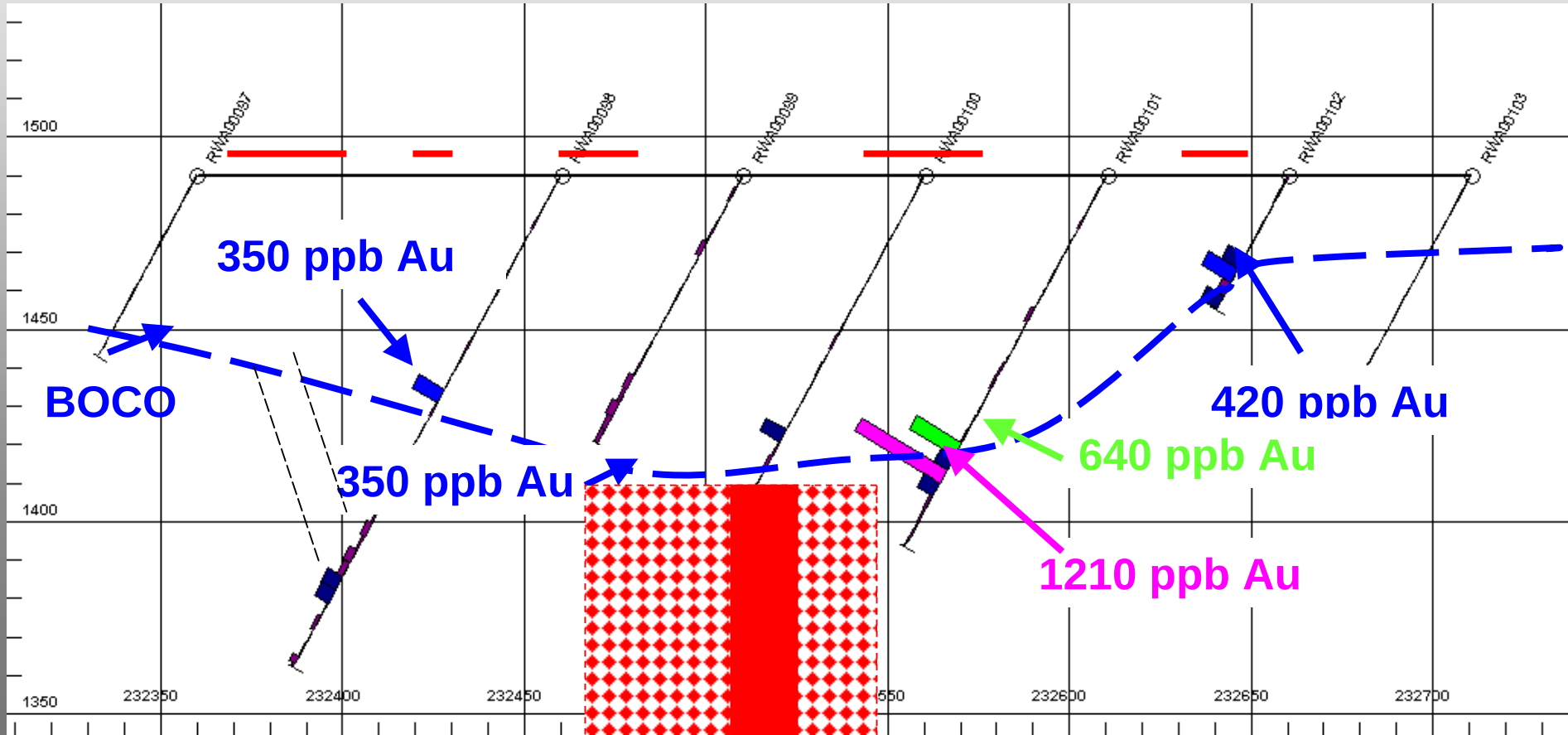
Ag ppb

Au, Pt ppb, Cu ppm

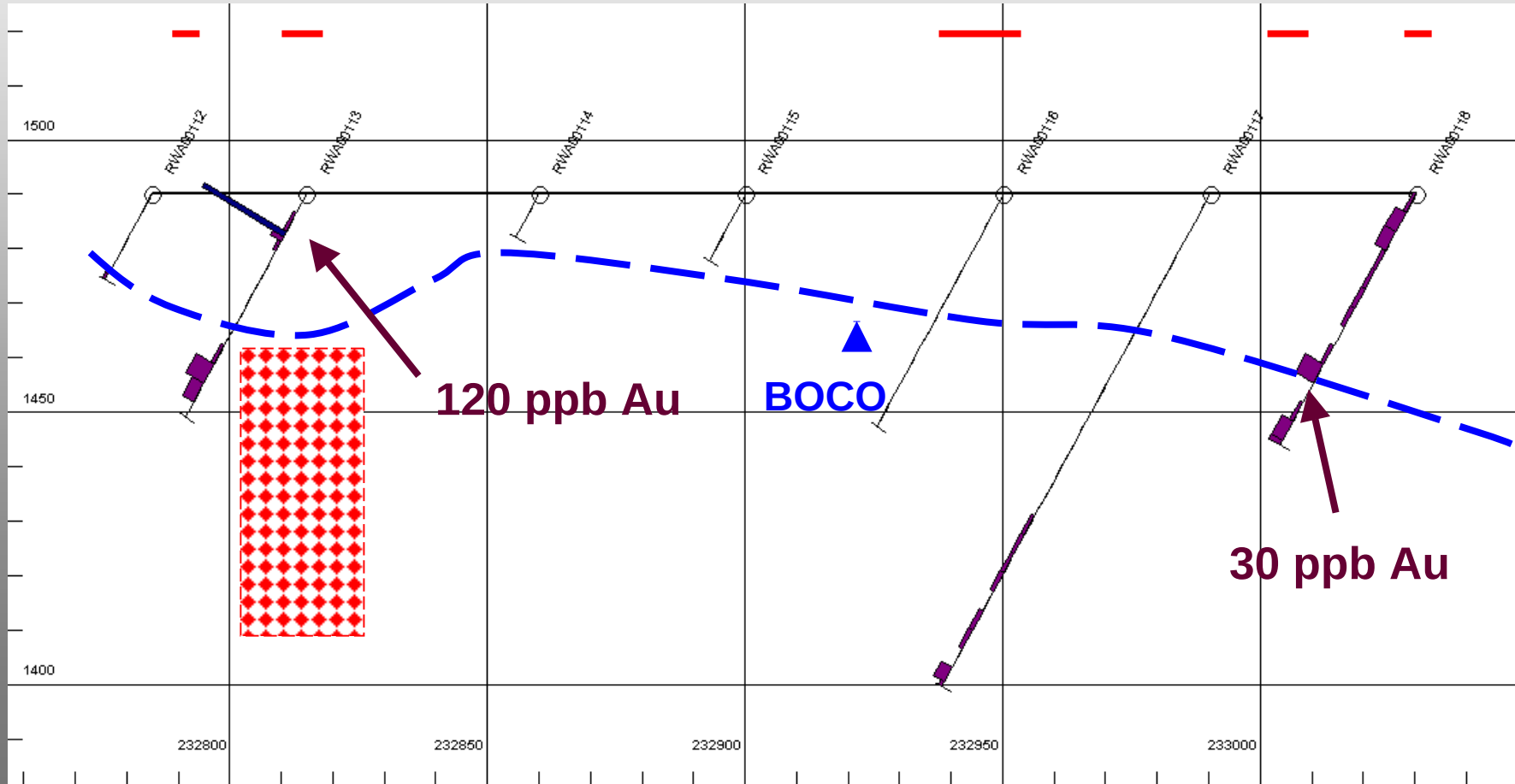


7036400N **7037400N**

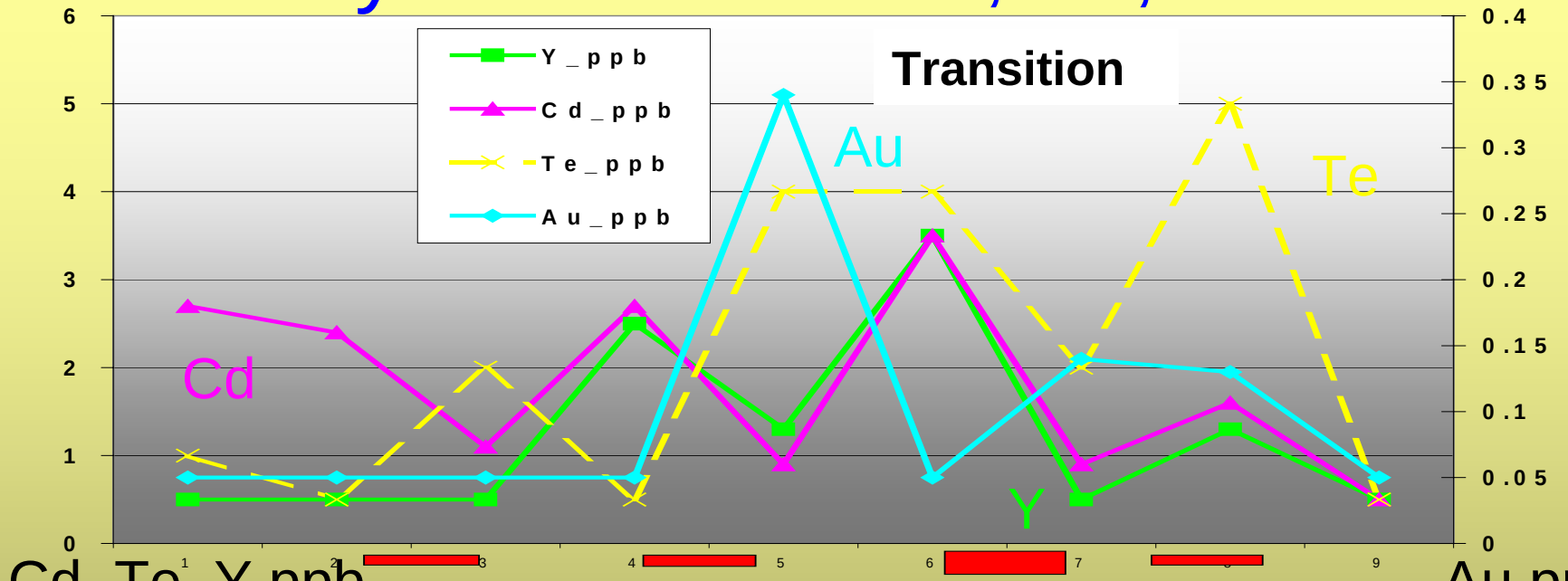
Mineralised Drill Hole Section – 7037400N – potential deep Au target based on Transition Zone sampling using Na pyrophosphate & Hot CN Digests

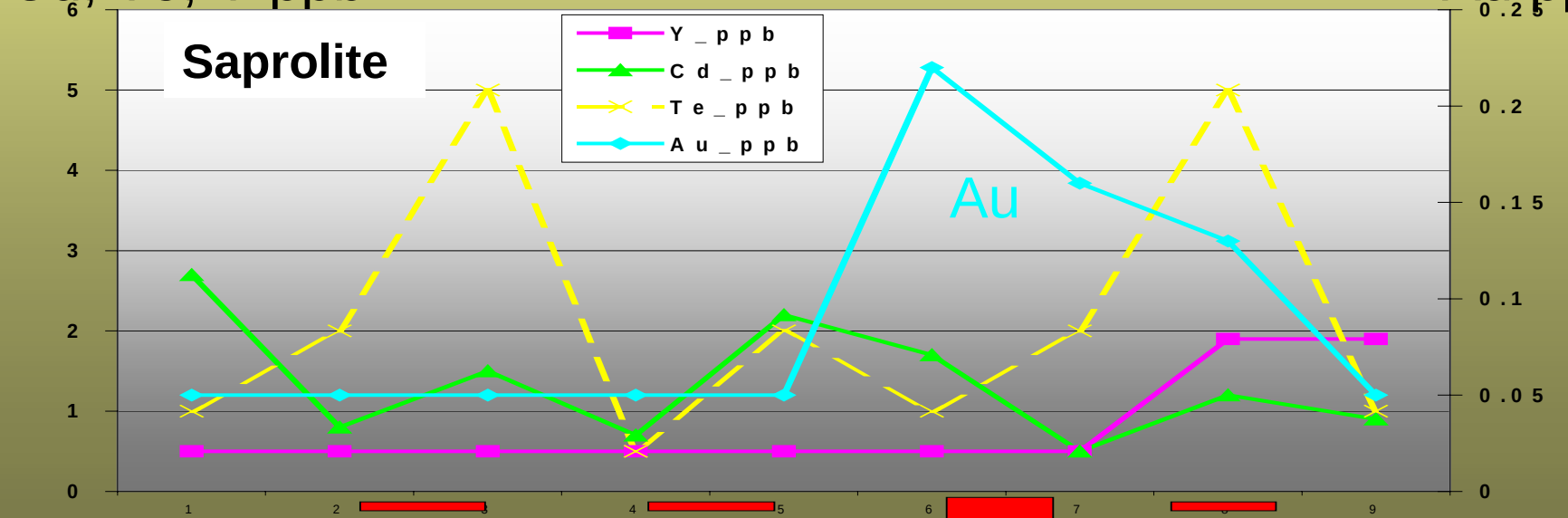


Weakly mineralised/background drill hole section 7036400N – possible Au target based on Transition Zone sampling using Na pyrophosphate & Hot CN Digests



Enzyme Leach – Au, Te, Cd & Y

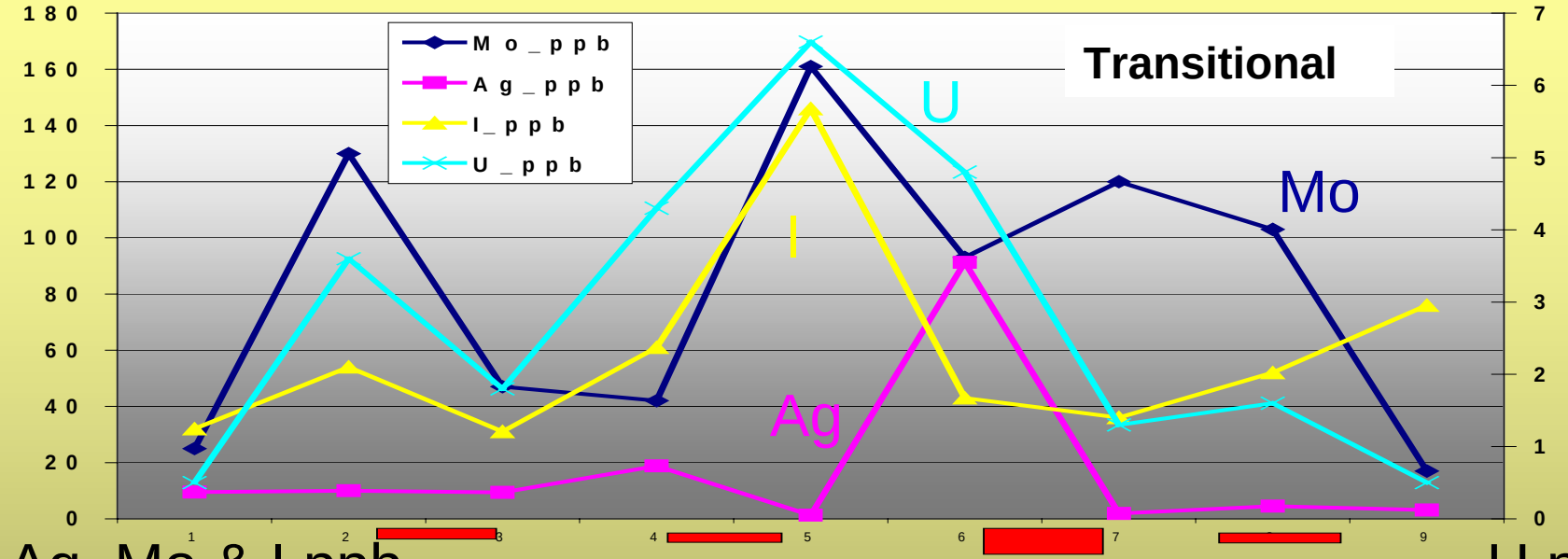


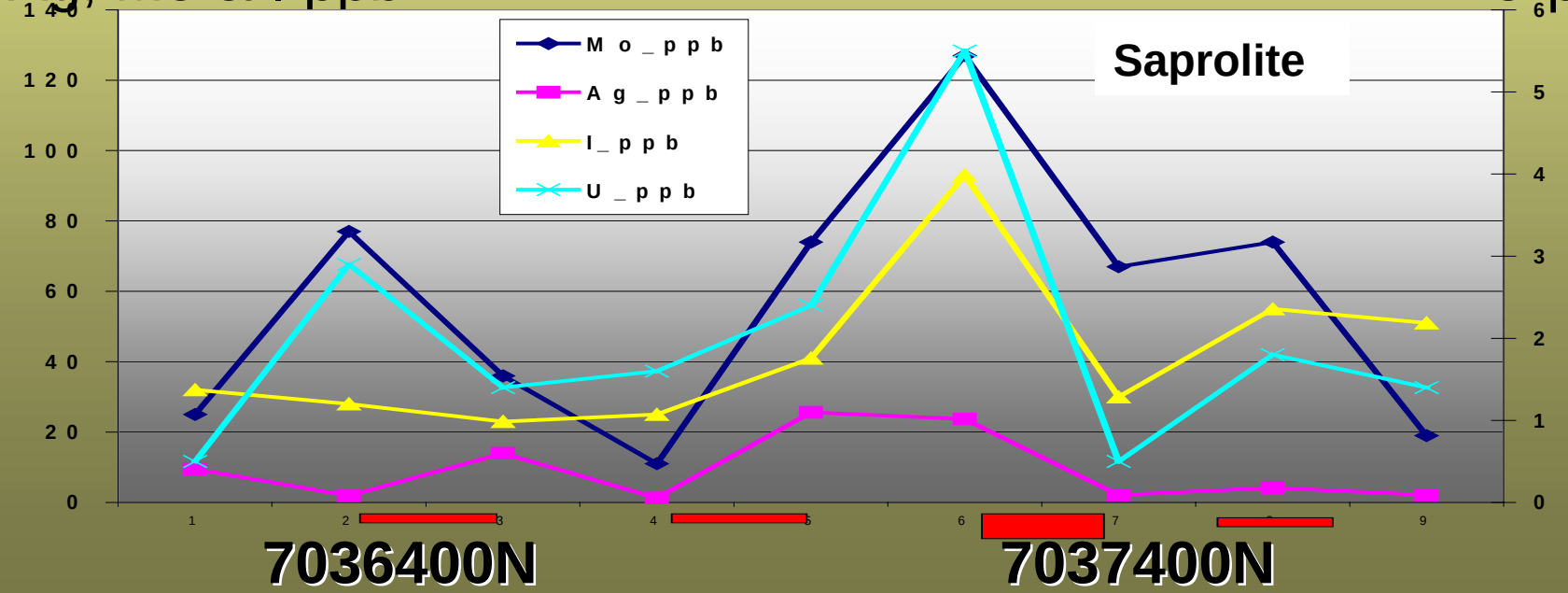


7036400N

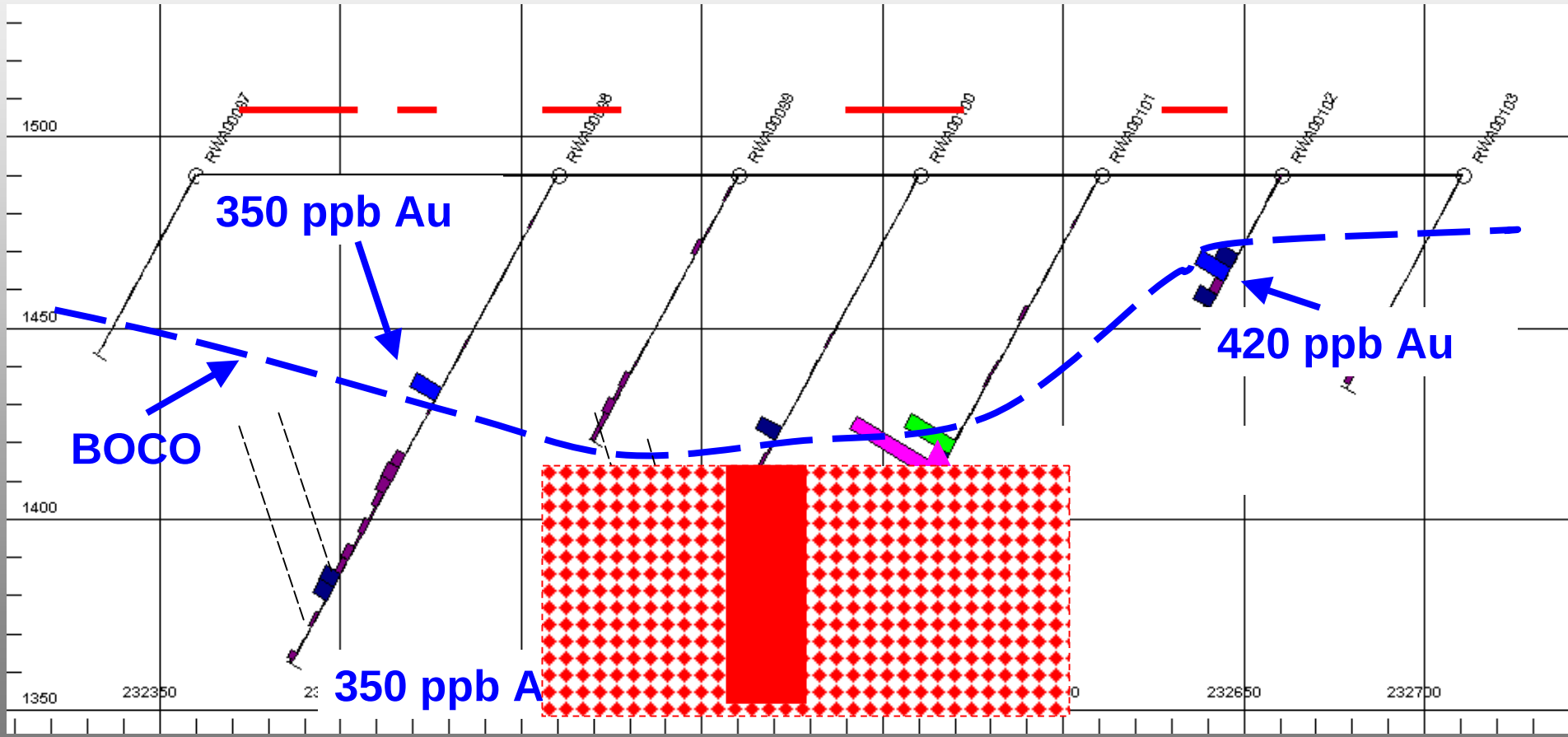
7037400N

Enzyme Leach – Au, Ag Pt & Pd





Mineralised Drill Hole Section – 7037400N – potential Au target based on Transition Zone sampling using Enzyme Leach



Partial Geochemical Orientation Programme – Result Summary

Saprolite Zone Sampling:

- All digestion methods satisfactory
- AR digest achieved Au, Pt, Ag & As anomalies that were followed up successfully by air core drilling

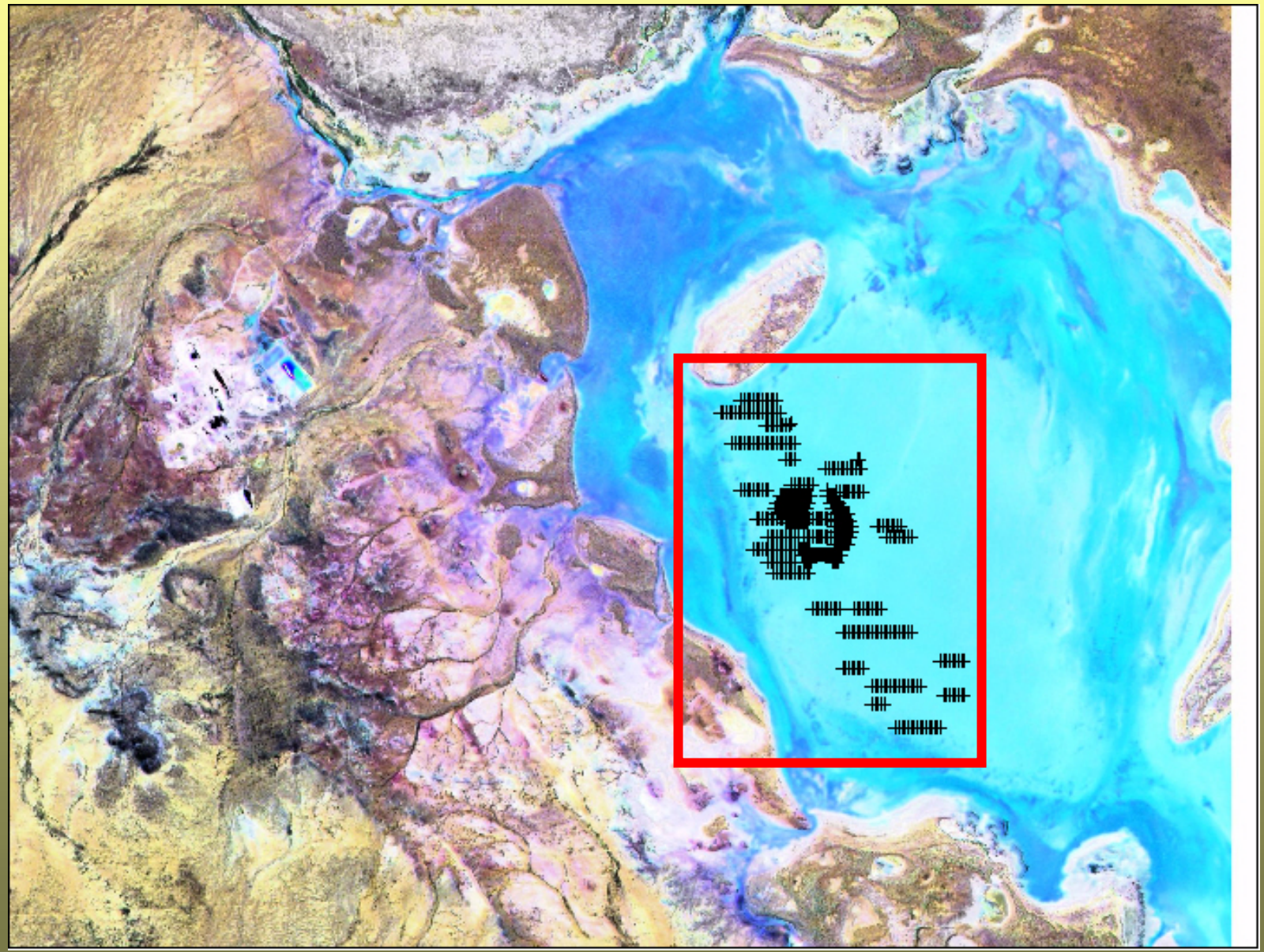
Disadvantages – deeper lake auger drilling required, ie > 5m, and relatively narrow dispersions, ie ~ 50m.

Partial Geochemical Orientation Programme – Result Summary (cont)

Playa Transition Zone Sampling:

- Broad (>100 m) dispersion haloes achieved by all partial digests
- Broad target element anomalies (Au, Ag & Pt) achieved by Conc & Dilute HCl
- "Rabbit ears" and apical anomalies for Cd, I, Bi & Cu in Conc & Dilute HCl data may indicate a deeper target
- Na pyrophospate responsive with broad As, U, Cd, W & Cu anomalies
- Enzyme Leach has produced very broad (~ 150 m) apical anomalies for Au, Cd, Te, Mo & Y.

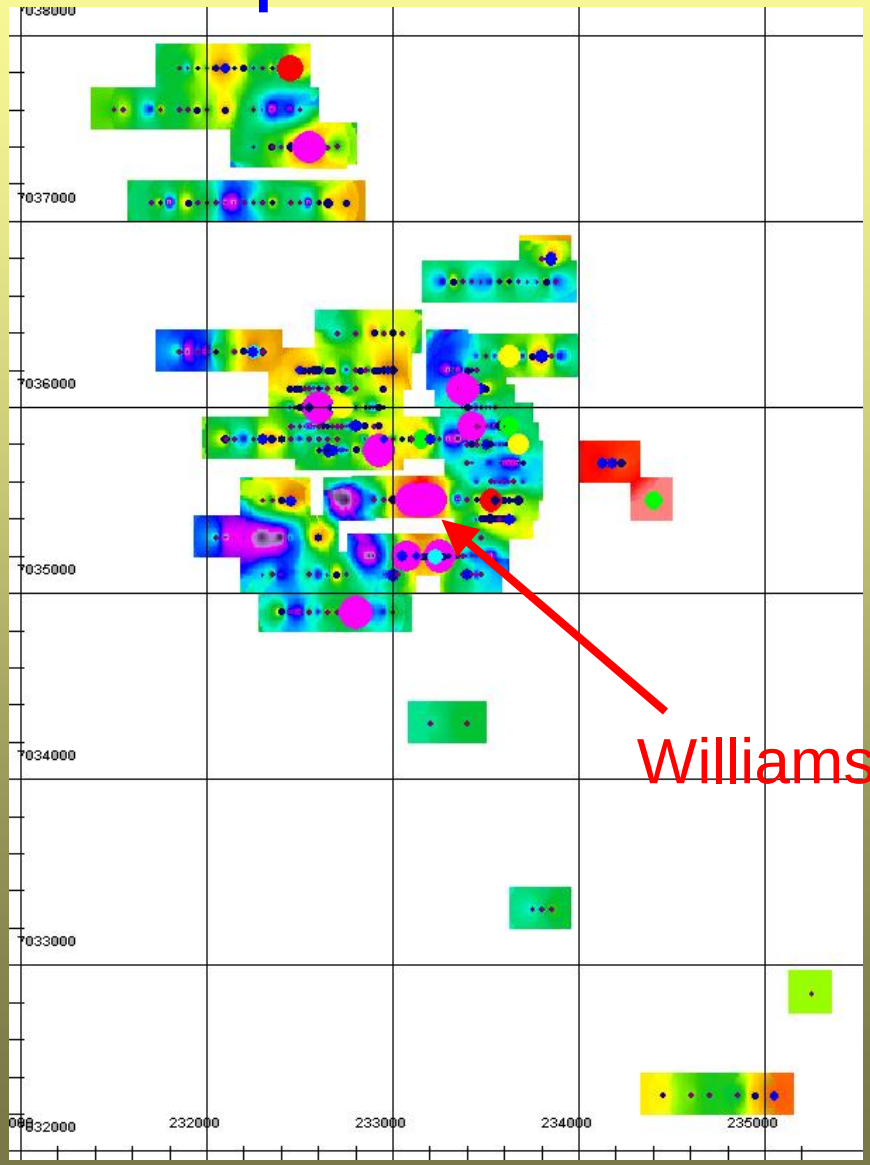
Lake Way Auger Drilling - Results



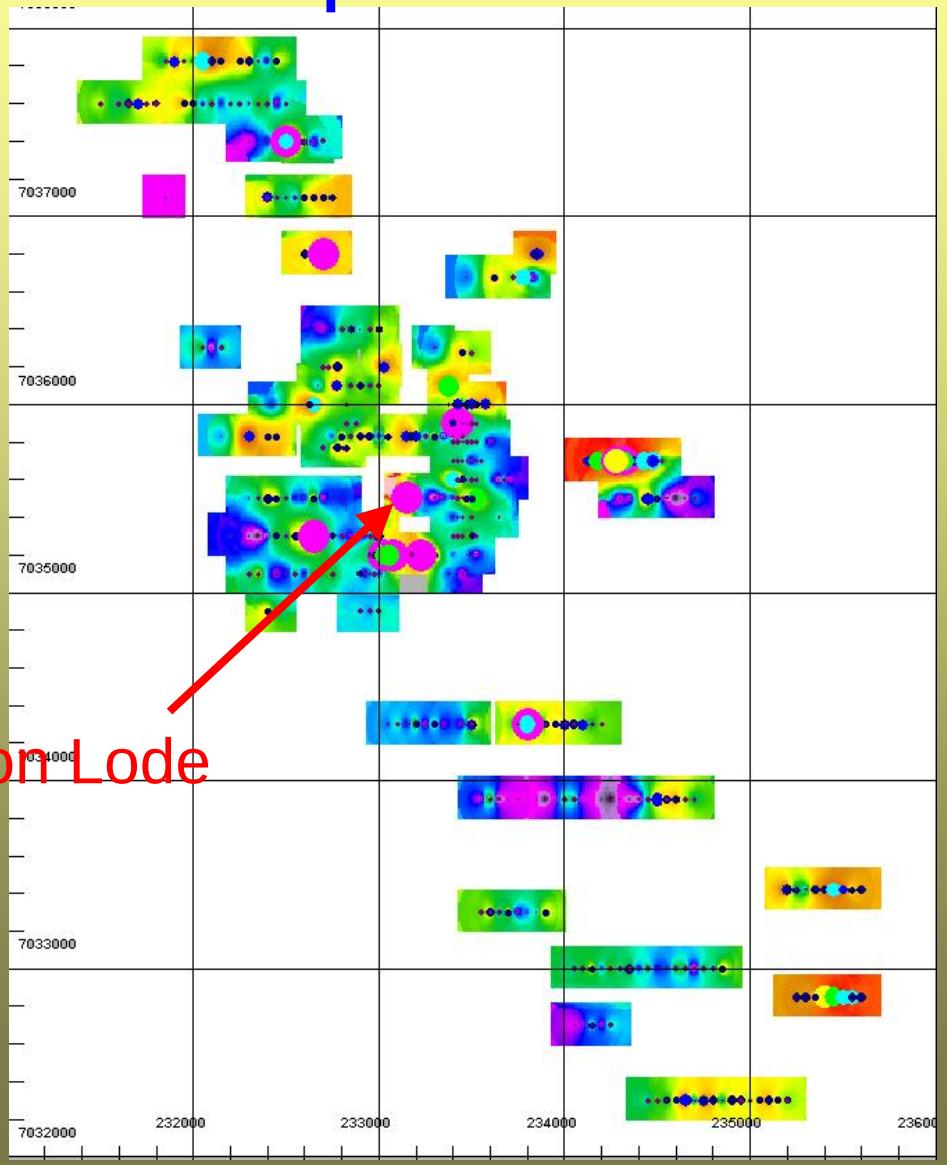
Lake Way Auger Geochemistry

Aqua Regia Au (ppb) Images

Depths - 0 – 4 m



Depths > 4 m



Acknowledgements

The authors would like to thank Agincourt Resources Ltd for permission to publish data from the Lake Way and Williamson Lode Projects and the following laboratories for their generous support:

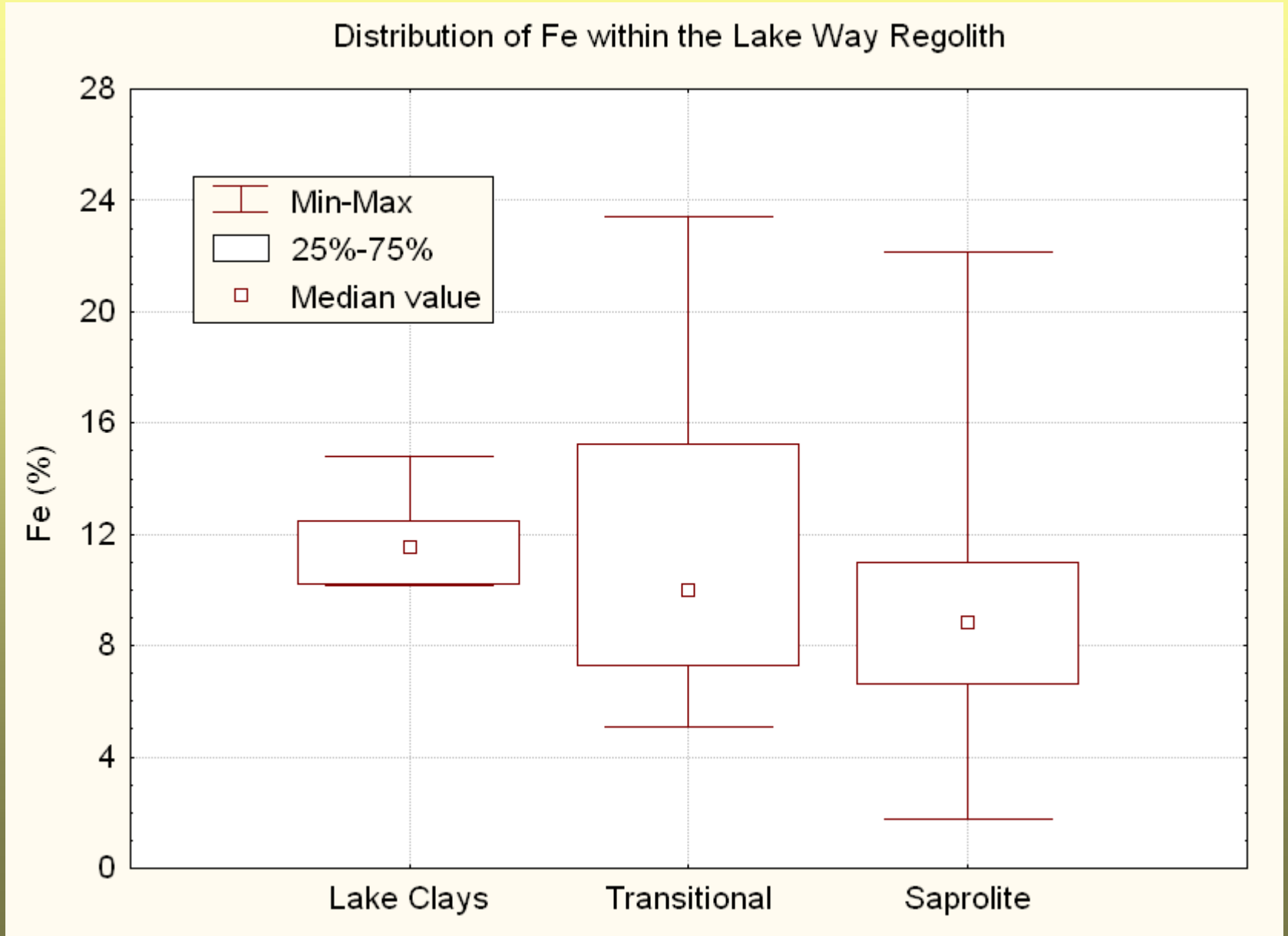
Ultra Trace Laboratories, in particular Colin Eldridge and Alex Christ.

Genalysis Laboratories, in particular John Flynn and Ed Dronseika.

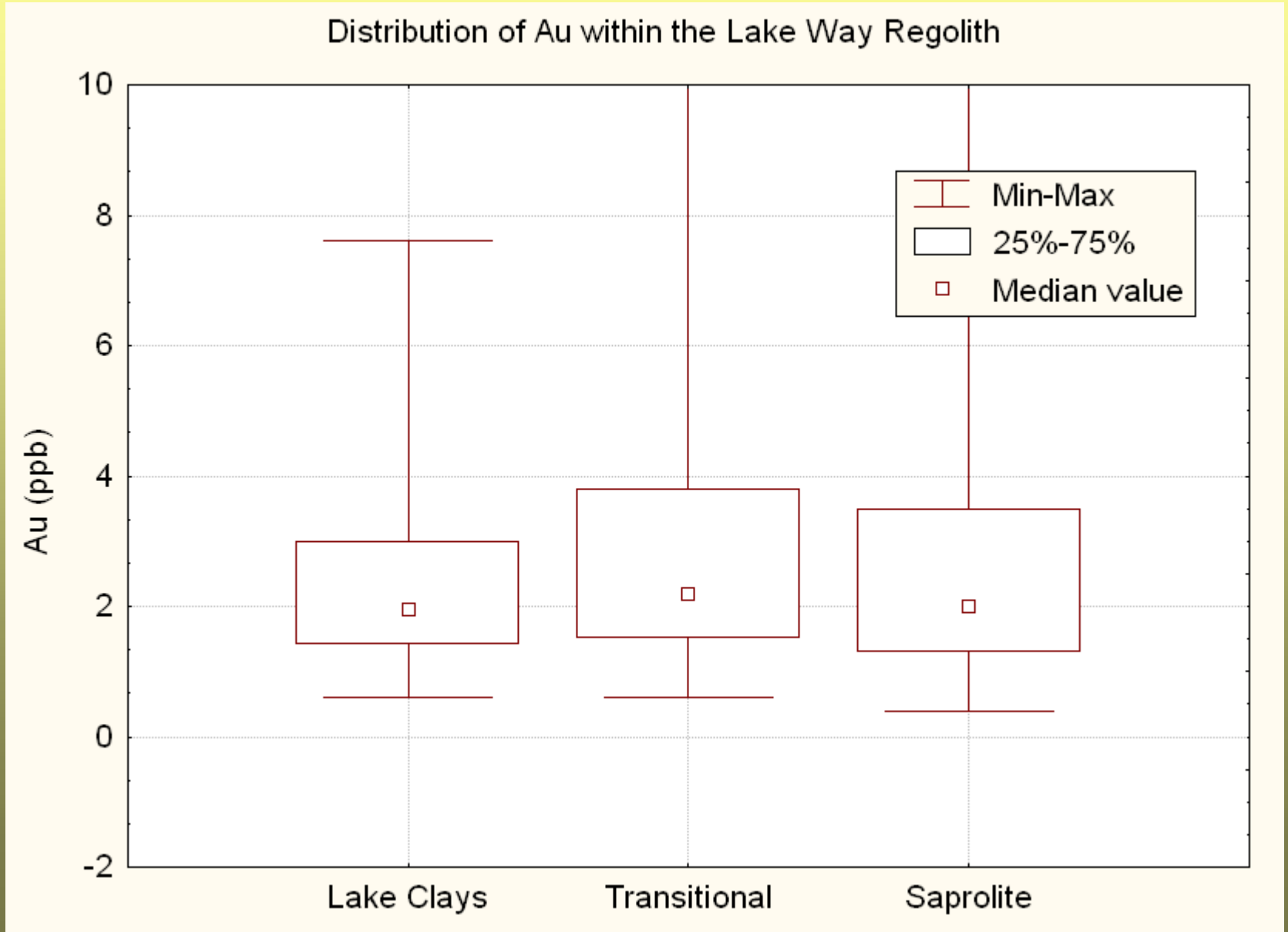
Actlabs Pacific Limited, in particular Martin Lamb.

I would also like to thank my wife on her birthday for her patience and understanding.

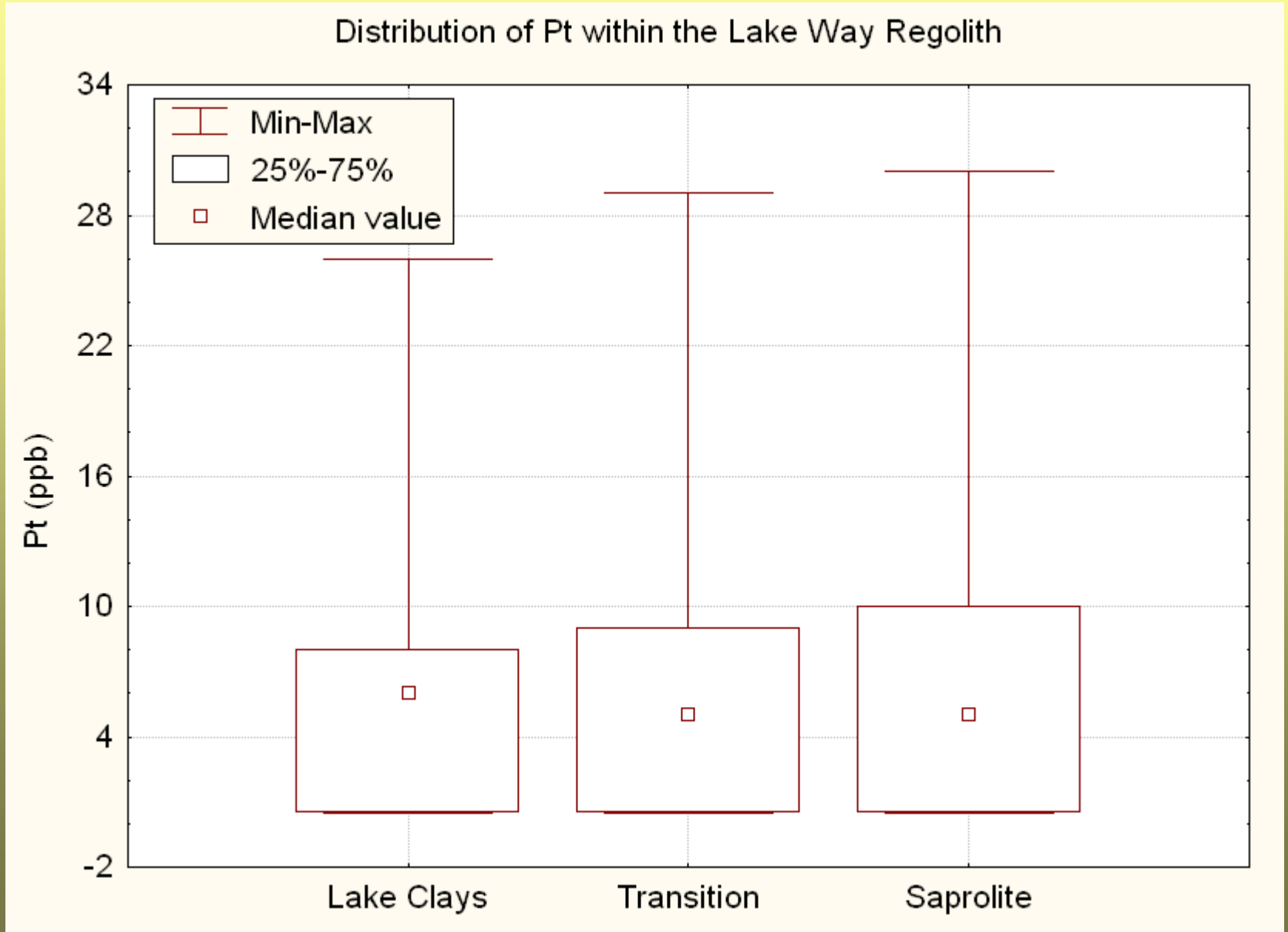
Distribution of Elements in Lake Way Regolith Units – Fe (%)



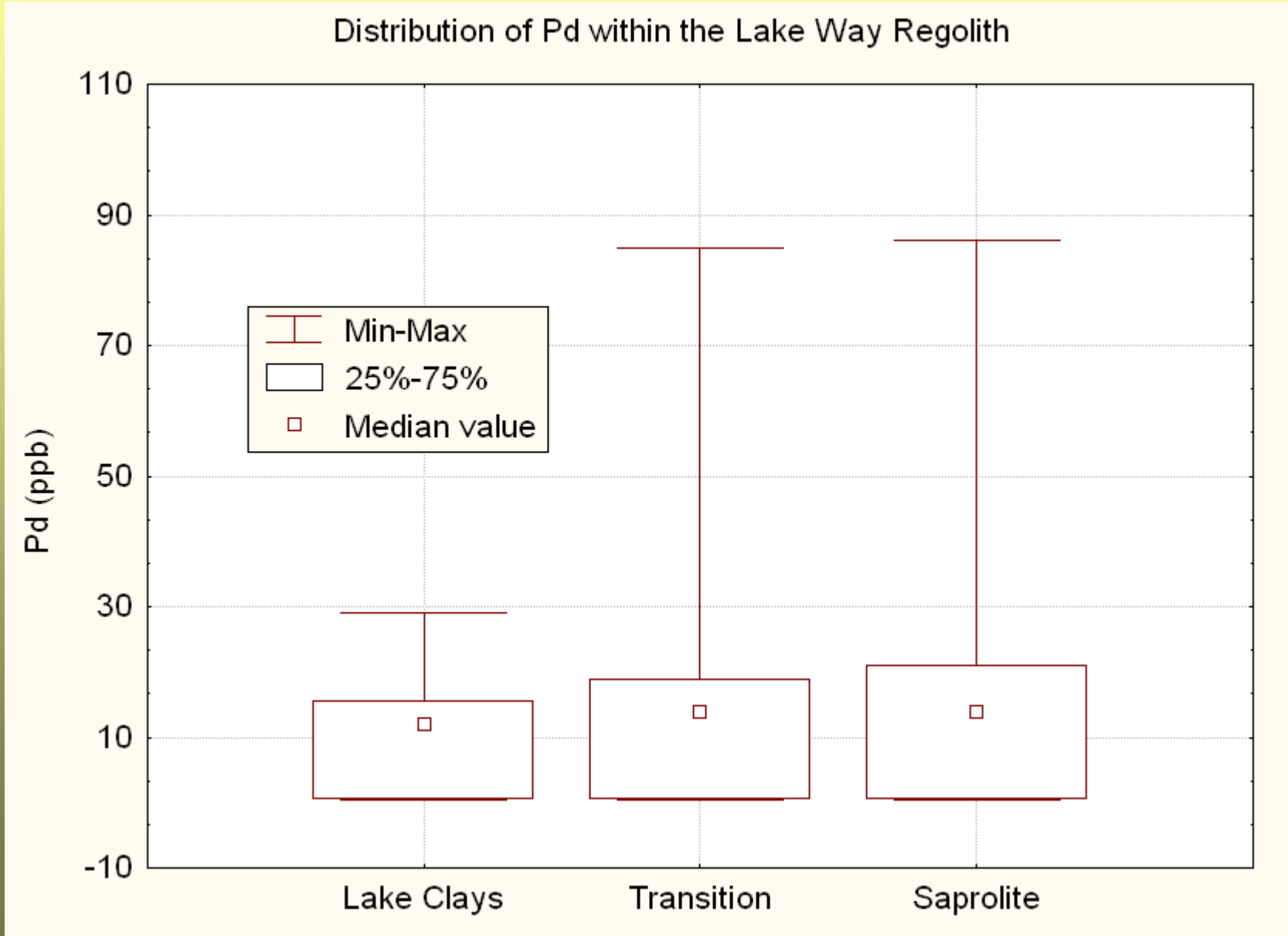
Distribution of Elements in Lake Way Regolith Units – Au (ppb)



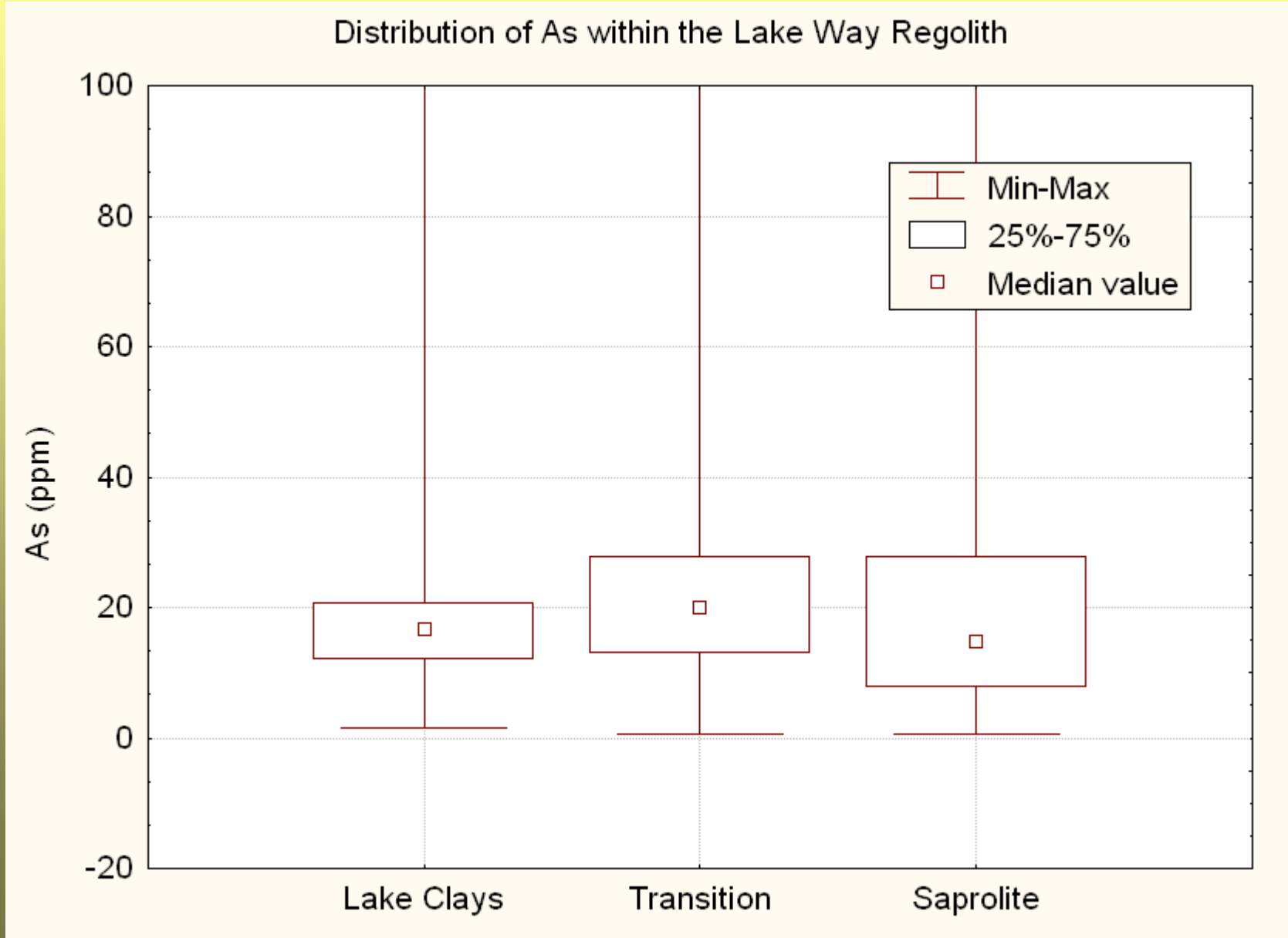
Distribution of Elements in Lake Way Regolith Units – Pt (ppb)



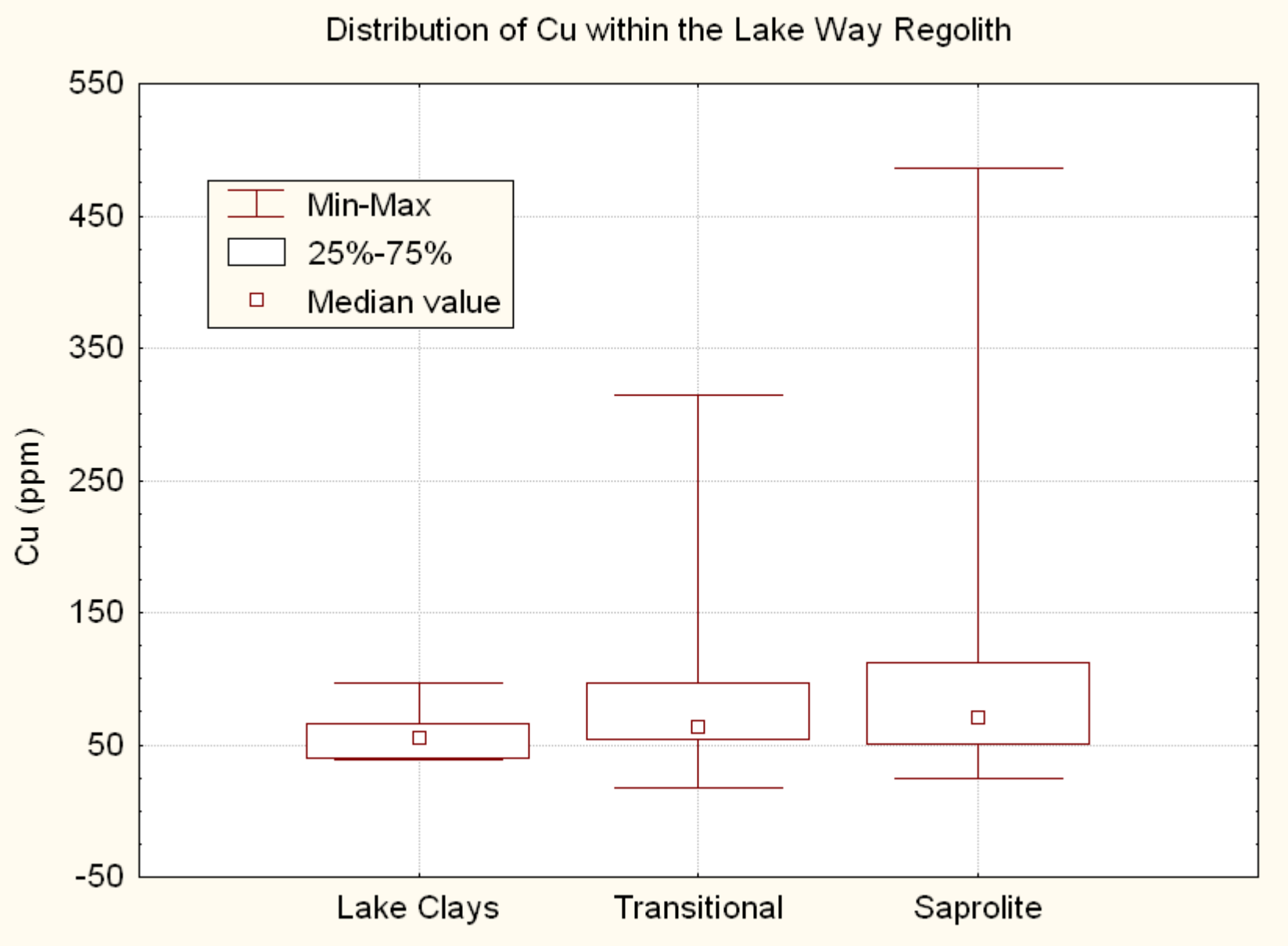
Distribution of Elements in Lake Way Regolith Units – Pd (ppb)



Distribution of Elements in Lake Way Regolith Units – As (ppm)



Distribution of Elements in Lake Way Regolith Units – Cu (ppm)



Distribution of Elements in Lake Way Regolith Units – U (ppb)