

HyLogger - New Eyes For Old Core: SA Spectral Logging Campaign 2003-2004.

Alan Mauger
John Keeling
Jon Huntington

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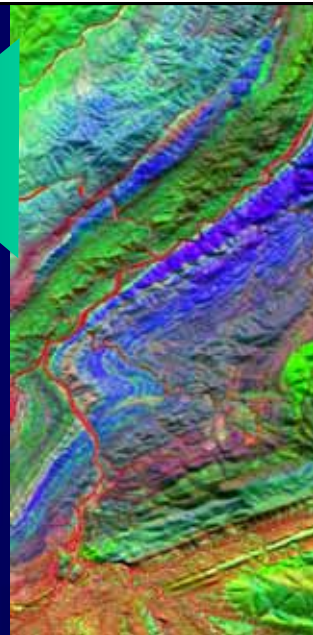
Field Spectrometer - PIMA



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HyMap - HyVista



Integrated Spectronics Pty Ltd

126 bands : 0.44 – 2.48 μm

10 – 20 nm band widths

512 pixel swath (63 degrees FOV)

2 – 10 metre pixels

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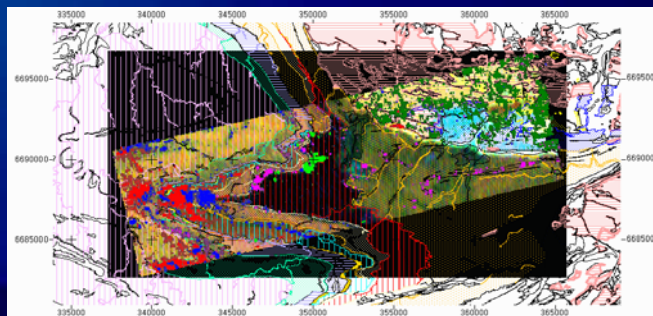
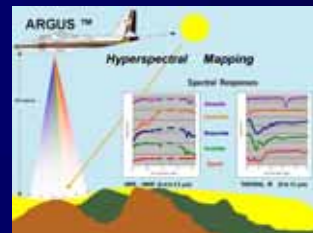
ARGUS – Integrated Line Profiling System

Fugro Airborne Surveys Pty Ltd

VNIPS : 370 – 1050 nm @ 5 nm sampling

SWIPS : 900 – 2500 nm @ 10 nm sampling

TIPS : 8 – 13 μm @ 60 nm sampling



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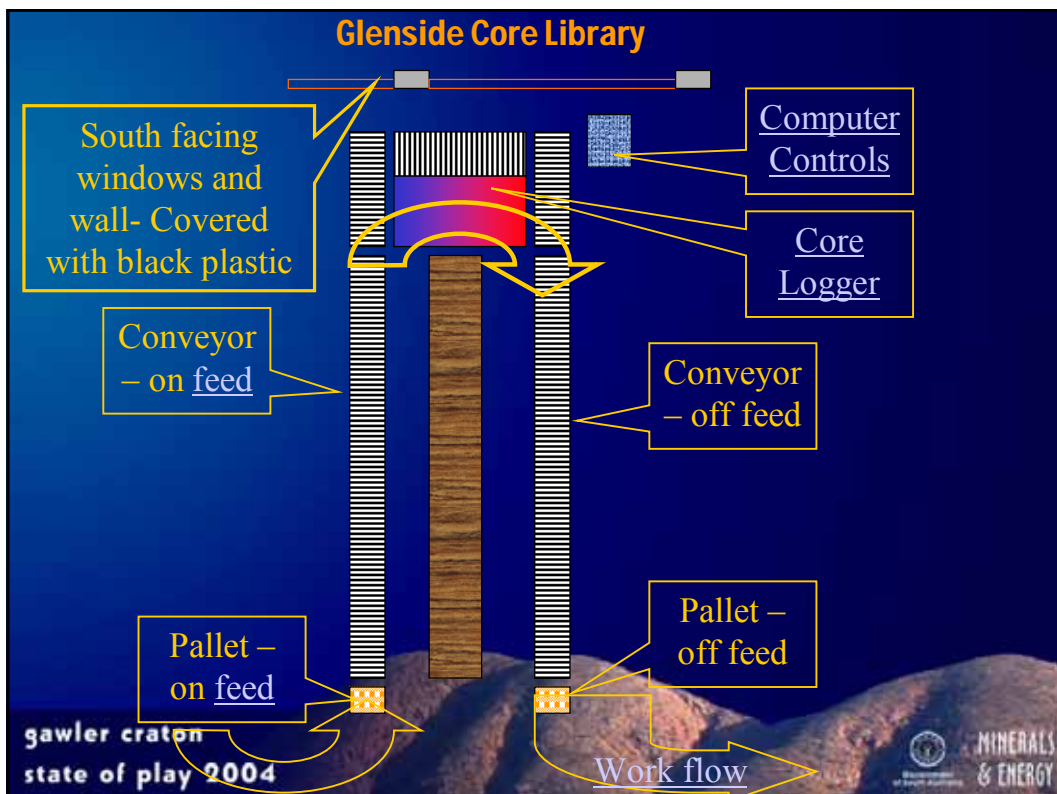
OARS Prototype Core Logging

- Continuous core /chip scanning
- 0.5-1 cm Resolution for spectra
- 10,000's of observations
- << 1 m / minute per scan
- 1000's metres of core/chips



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MINERALS
& ENERGY





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Project Outline

After AMIRA – sponsor's opportunity

40 days scanning

Signature holes over SA

357 holes

35,000 metres (600-1000m/day)

110 Gigabytes of data

WMC, 1 month, 17,000 metres

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Gawler Craton

Stuart Shelf

Mulgathing Complex

Central Gawler Au

- Barns
- Weednanna
- Tunkillia
- Nuckulla Hill
- Menninnie Dam

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Company Contributions

Adelaide Resources (Barns)

Aquila (Weednanna)

Helix (Tunkillia)

Minotaur (Prominent Hill)

Tasman Resources (Titan 2)

Dave Miller (Prince Alfred)

Euro (Yudnamutana)

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MINERALS & ENERGY

AMIRA Project P685

May 2002 – one week

PIRSA's contribution was:

Emmie Bluff

2,000 m of core

8 holes

Fe-Oxide Cu-Au

Dark minerals

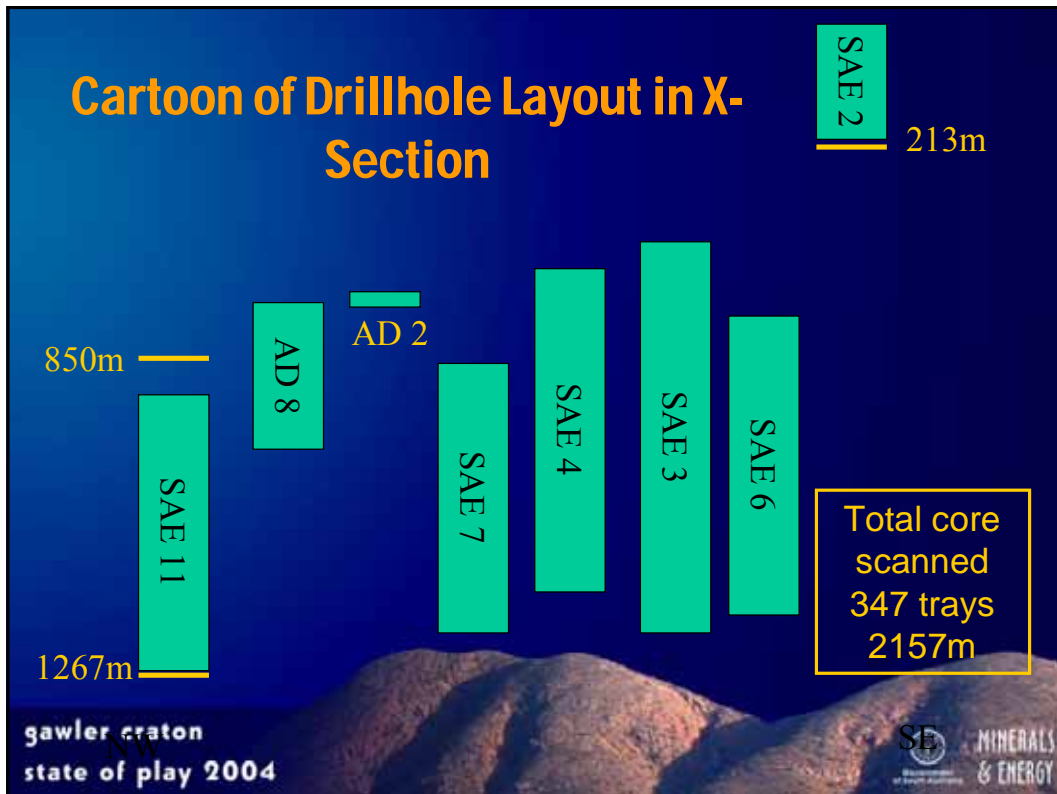
Non-SWIR responsive (?)

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Ancillary Information

Original geologist's logs held on open file

Assays:

- Cu
- Zn
- Au
- Pb
- Ba
- U₃O₈
- Magnetic Susceptibility
- Specific Gravity

Lithology and alteration

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SE MINERALS & ENERGY

Geological Setting

Proterozoic iron oxide deposit

Cu-U-Au-REE assemblage

Upper Prot. Overlying Pandurra Fm – arenaceous seds

Mid Prot. Silicified reverse fault zone

Mid Prot. Fe-oxide rich, fine-grained, laminated sed. Deposits containing siliclastic lenses – interpreted as equiv. Wandearah Metasiltstone

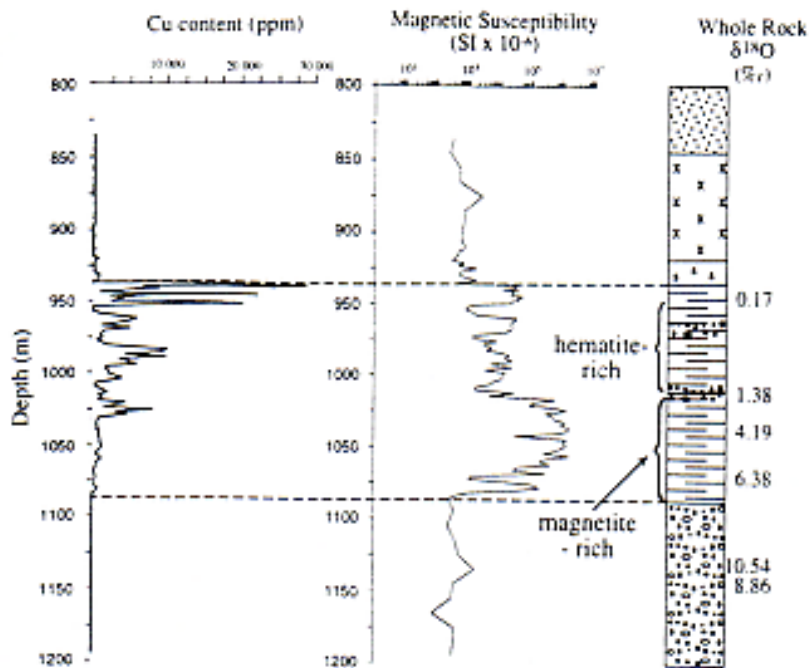
Mid Prot. Coarse grained arkosic unit – basal unit Wandearah Metasiltstone

Lower Prot. Metagranite – interpreted as equiv. Lincoln Complex

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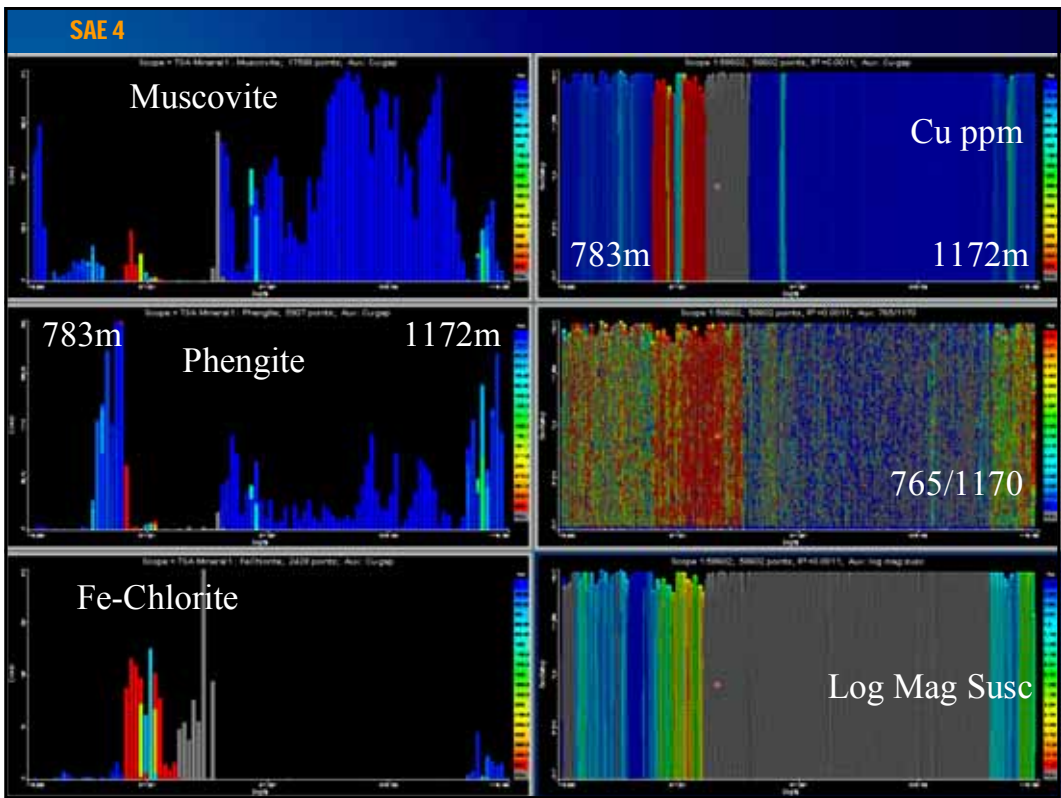
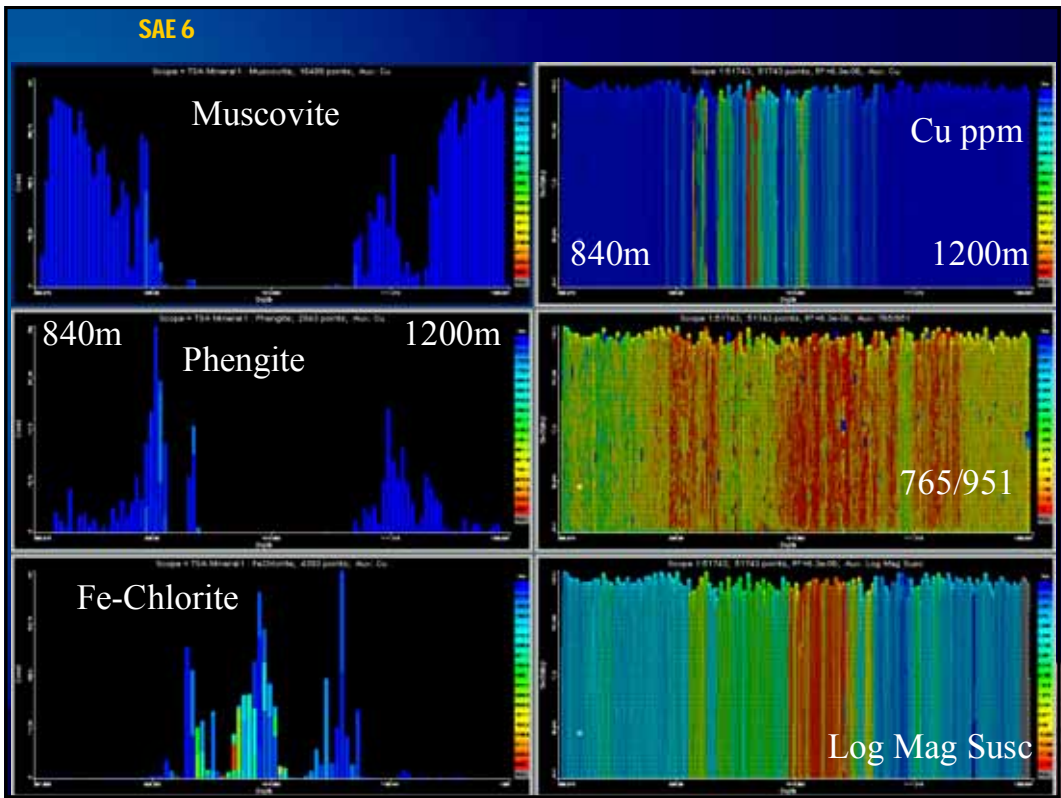


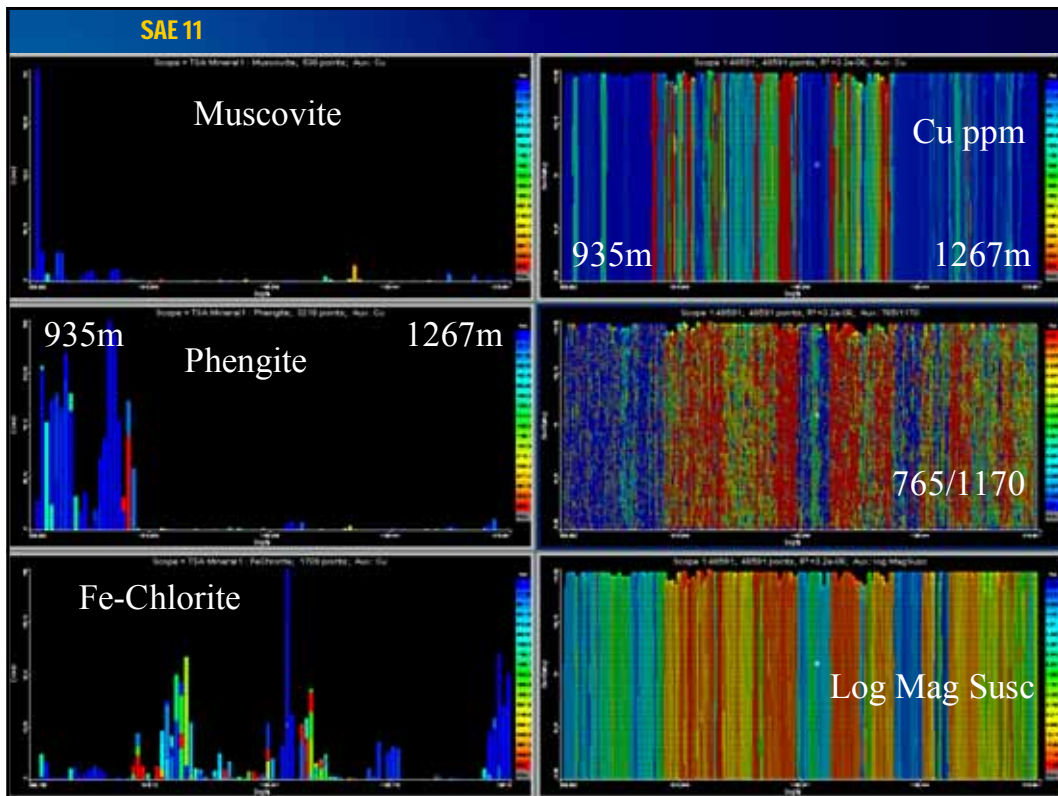
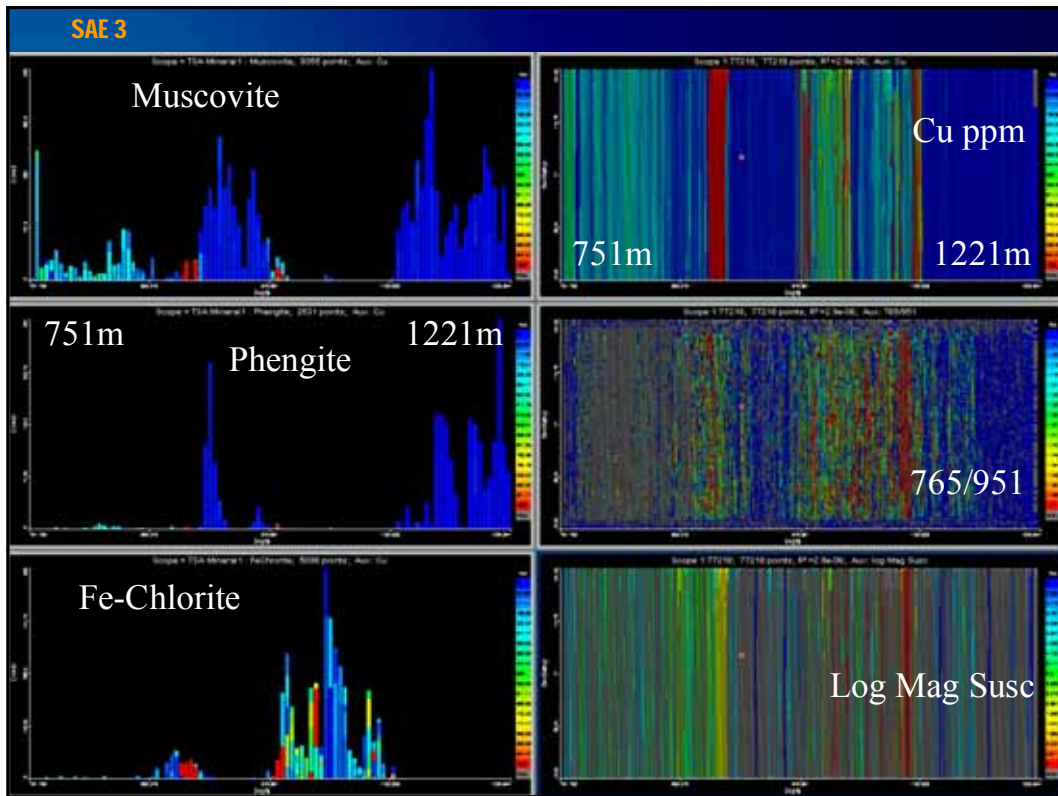
SAE 6

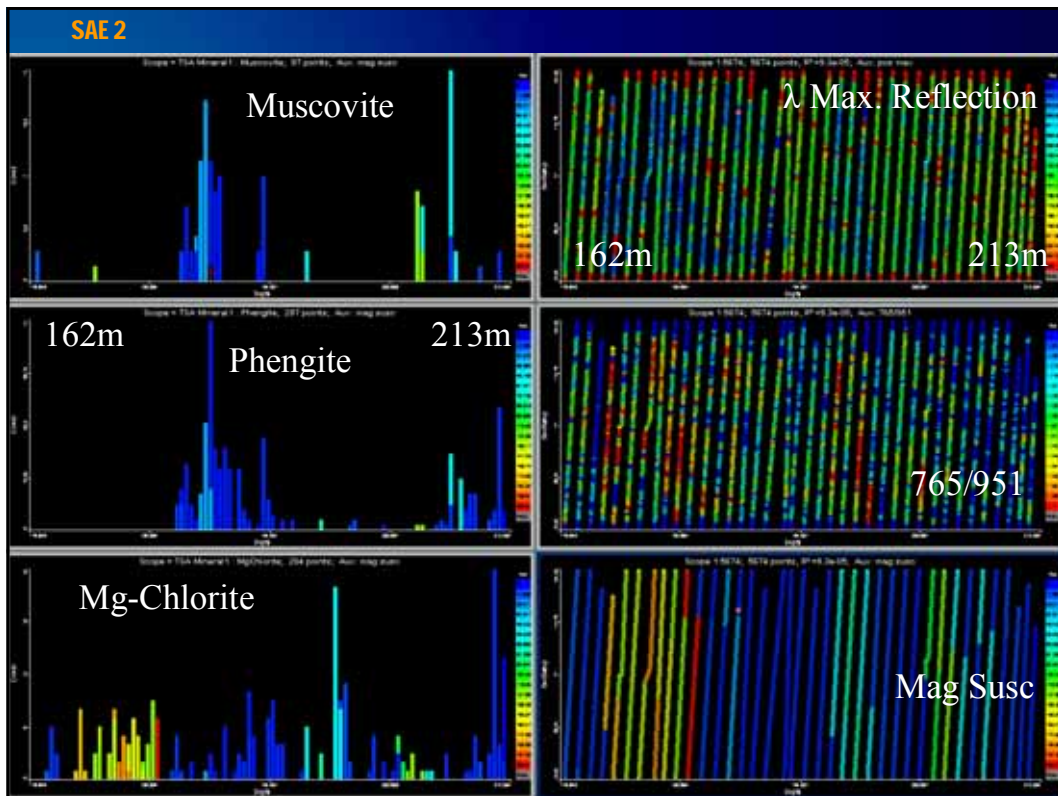
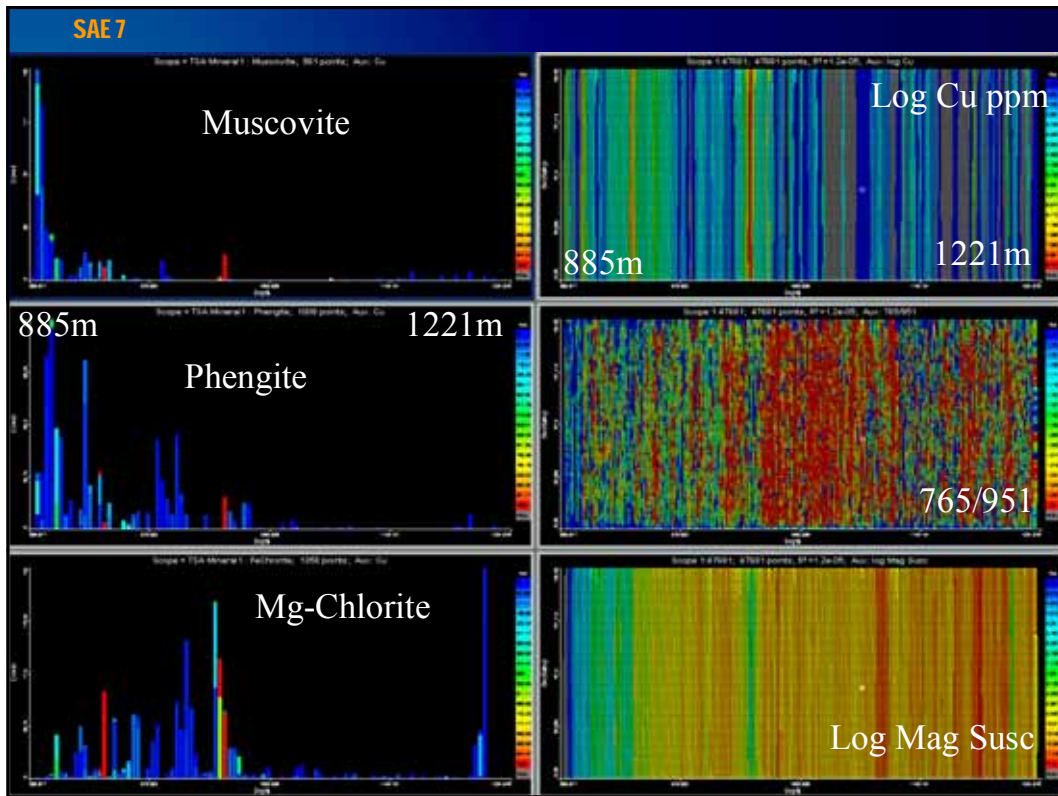


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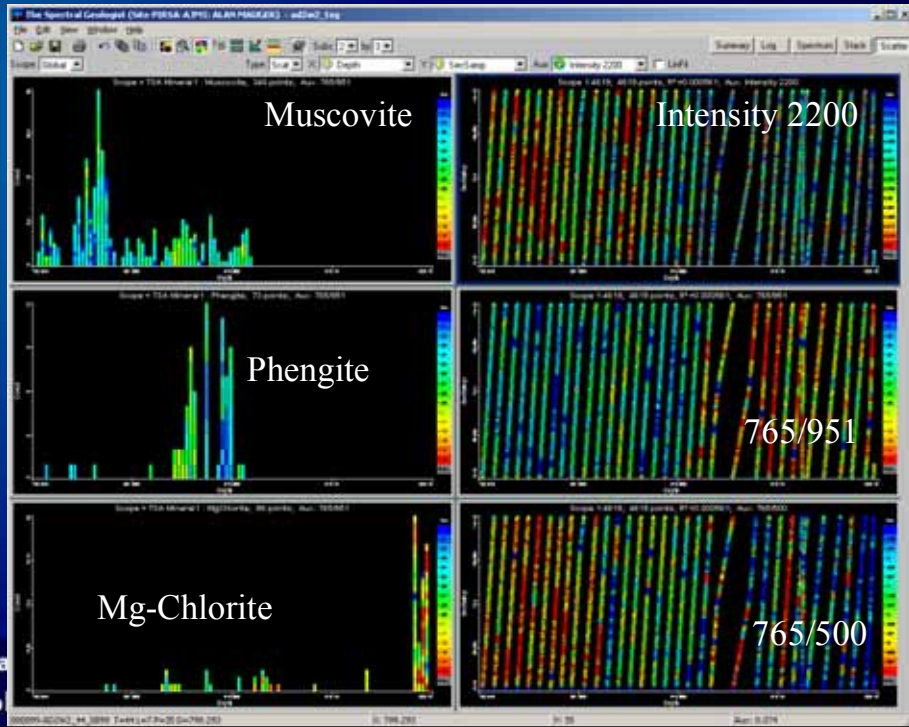




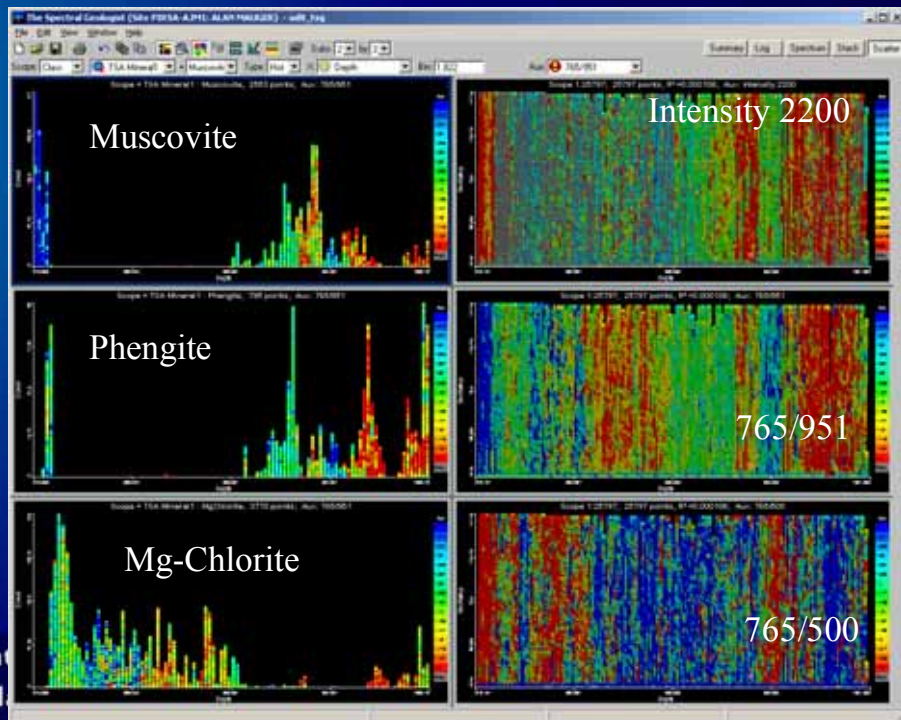




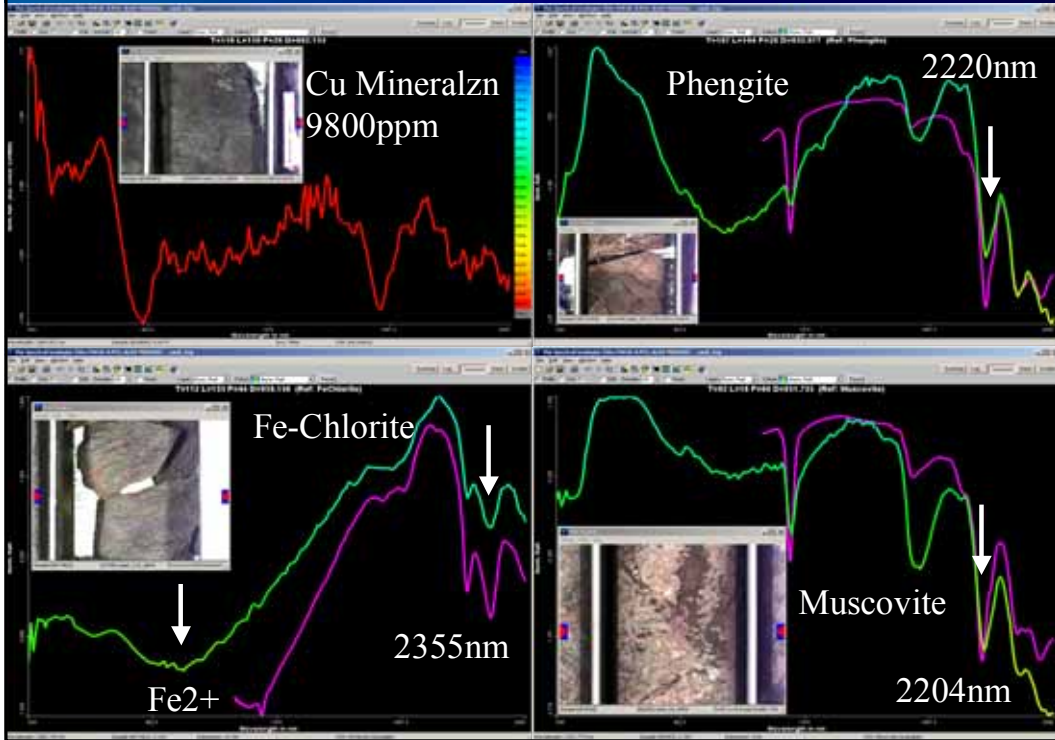
AD2W2



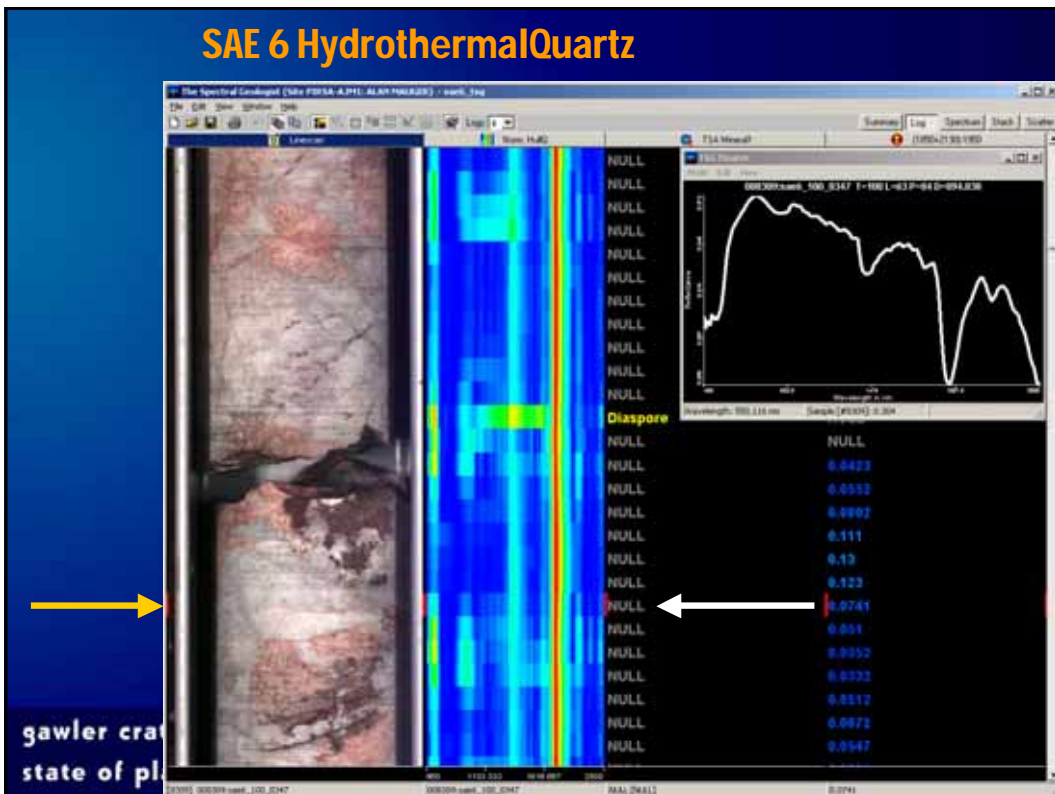
AD 8



Emmie Bluff SAE6



SAE 6 Hydrothermal Quartz



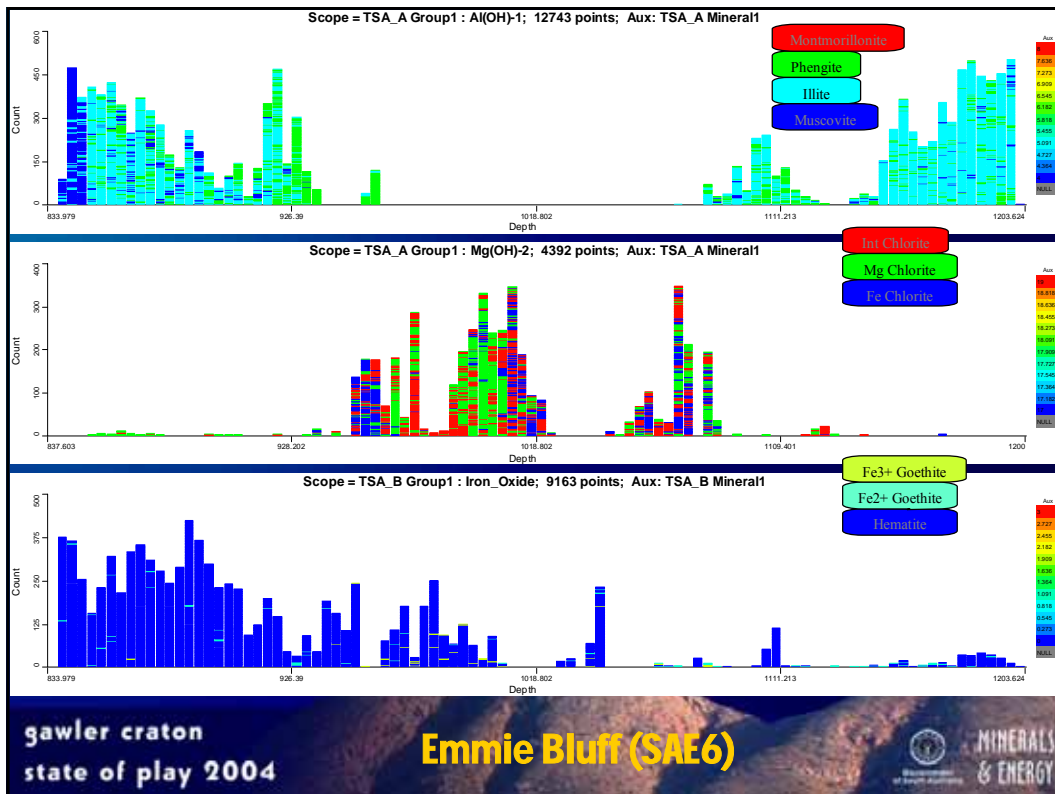
Results

SAE 6 – Type hole

Although material dark giving noisy signal and apparent low on “SWIR Visible” minerals-

Patterns appear in the spectra which can be correlated with mineralization model

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Results cont.

Muscovite (Sericite) distal to ore

Phengite increases towards ore zone

Al(OH) minerals absent in ore zone

Chlorites present in ore zone – Fe-Chlorite

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LIVE DEMO



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Web Delivery

PIRSA anticipates delivering HyLogger Data over the Web
This is a demonstration file showing how this might work



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Summary

- Creates objective log of drill core
- Reveals new mineralogical relationships which are otherwise difficult and expensive to measure
- Correlation with visual log is great asset
- Integration of ancillary data easy and very effective
- Need to scan whole drill holes not single trays
- Produces large data sets
- Works best with high end computers

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Summary

Creates objective log of drill core

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Acknowledgements

Rob Hewson, CSIRO – slides 2,3,4,5

AMIRA Project P685 “Automated Mineralogical Logging of Drill Core, Chips and Powders”

CSIRO detection Technologies, Delhi Rd, North Ryde, NSW

For more information on the HyLogger contact Dr Jon Huntington on jon.huntington@csiro.au

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