



**Carpentaria Exploration Limited**  
**Handheld XRF Workshop – CASE STUDY**  
**Hawsons Iron Project**

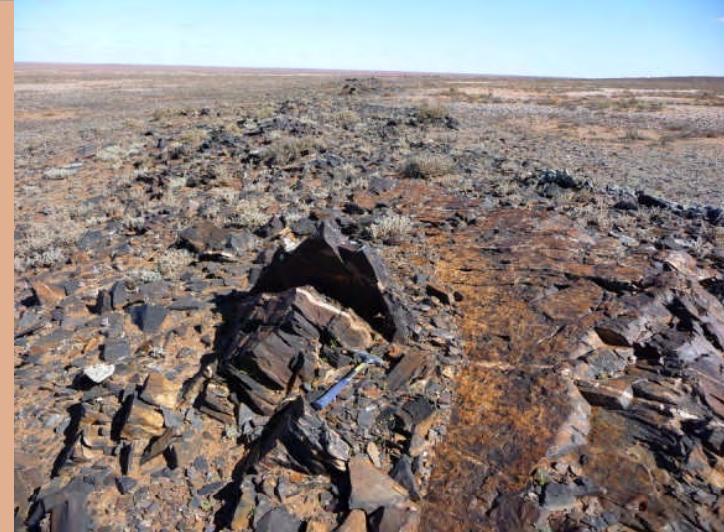


Presented By Quentin Hill – Senior Geologist  
November 6, 2009

# CARPENTARIA EXPLORATION LIMITED



- Introduction
- NITON XL3t XRF Rock Survey
- Performance of the NITON
- Success with drill chips
- Conclusions



# CARPENTARIA EXPLORATION LIMITED



## Broken Hill

- Hawsons Iron Project
- Euriowie tin, silver, lead, zinc
- Panama Hat JV - gold

## Lachlan Fold Belt

- 1,237 sq. kms
- 30km Gilmore suture and Macquarie Arc
- Copper-Gold

## Other

- Mt Agate – Cloncurry (Cu-Au)
- Hughendon Coal Project
- Waterford - uranium

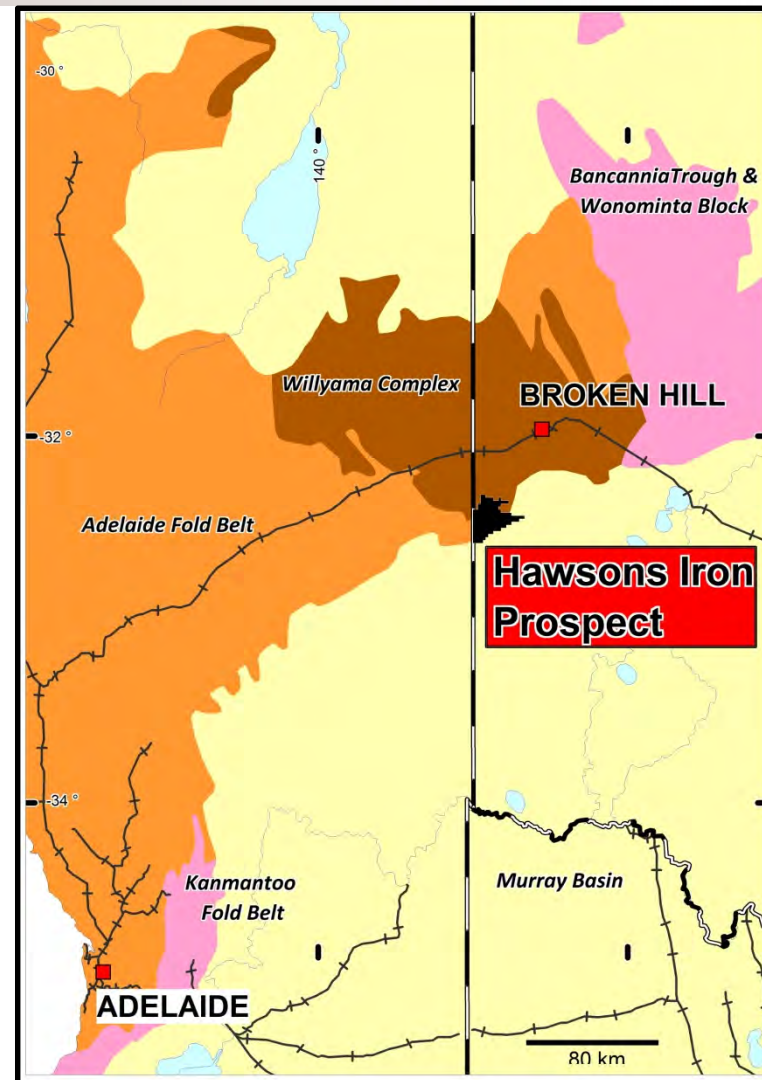


# HAWSONS IRON PROJECT

## Location and Potential



- 60 km SSW of Broken Hill
- Close to infrastructure
  - 30 km south of rail line
  - 30 km to power grid
  - 30 km to highway
- Large tonnage potential
- Excellent concentrate

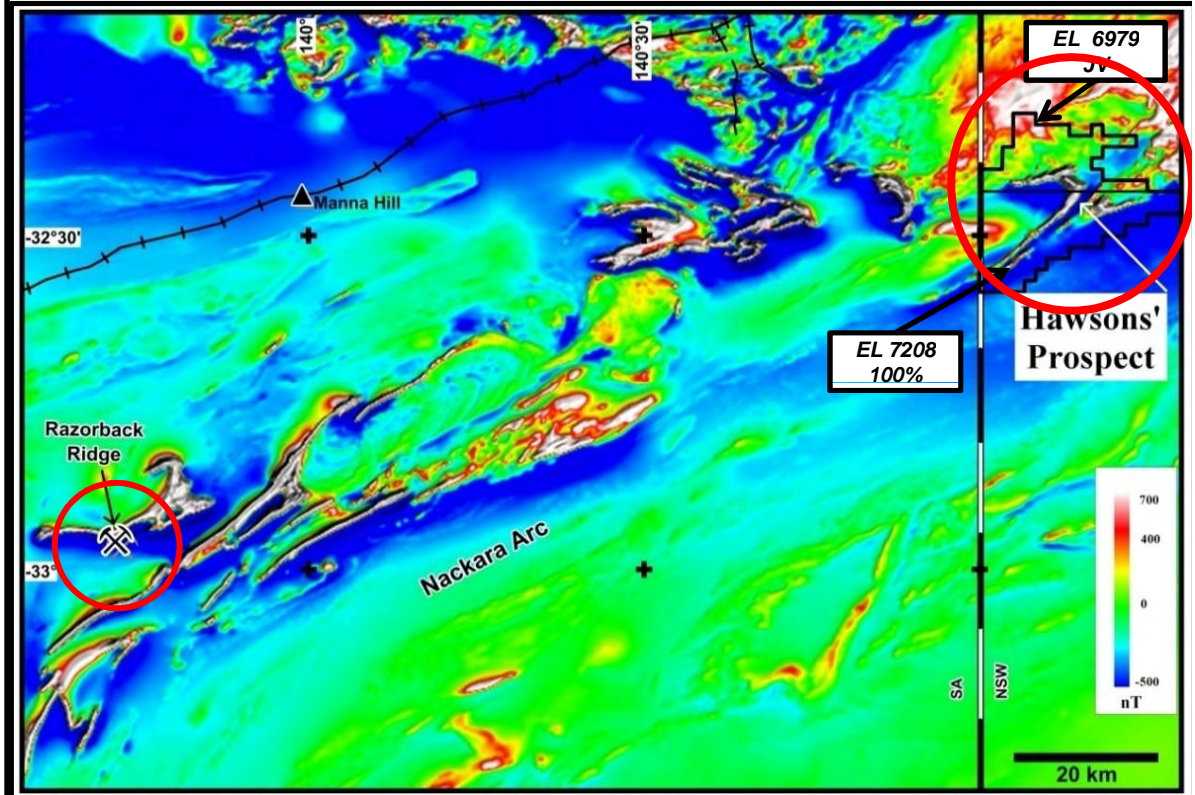


# HAWSONS IRON PROJECT

## Regional Geology & Aeromagnetics



- Two E.L's: 100% CAP & JV
- Neoproterozoic
  - Nackara Arc
- Braemar Ironstone
  - ~660 Ma?
- Known host of magnetite iron-ore mineralisation
- Distinctive high amplitude aeromagnetic anomaly at Hawsons

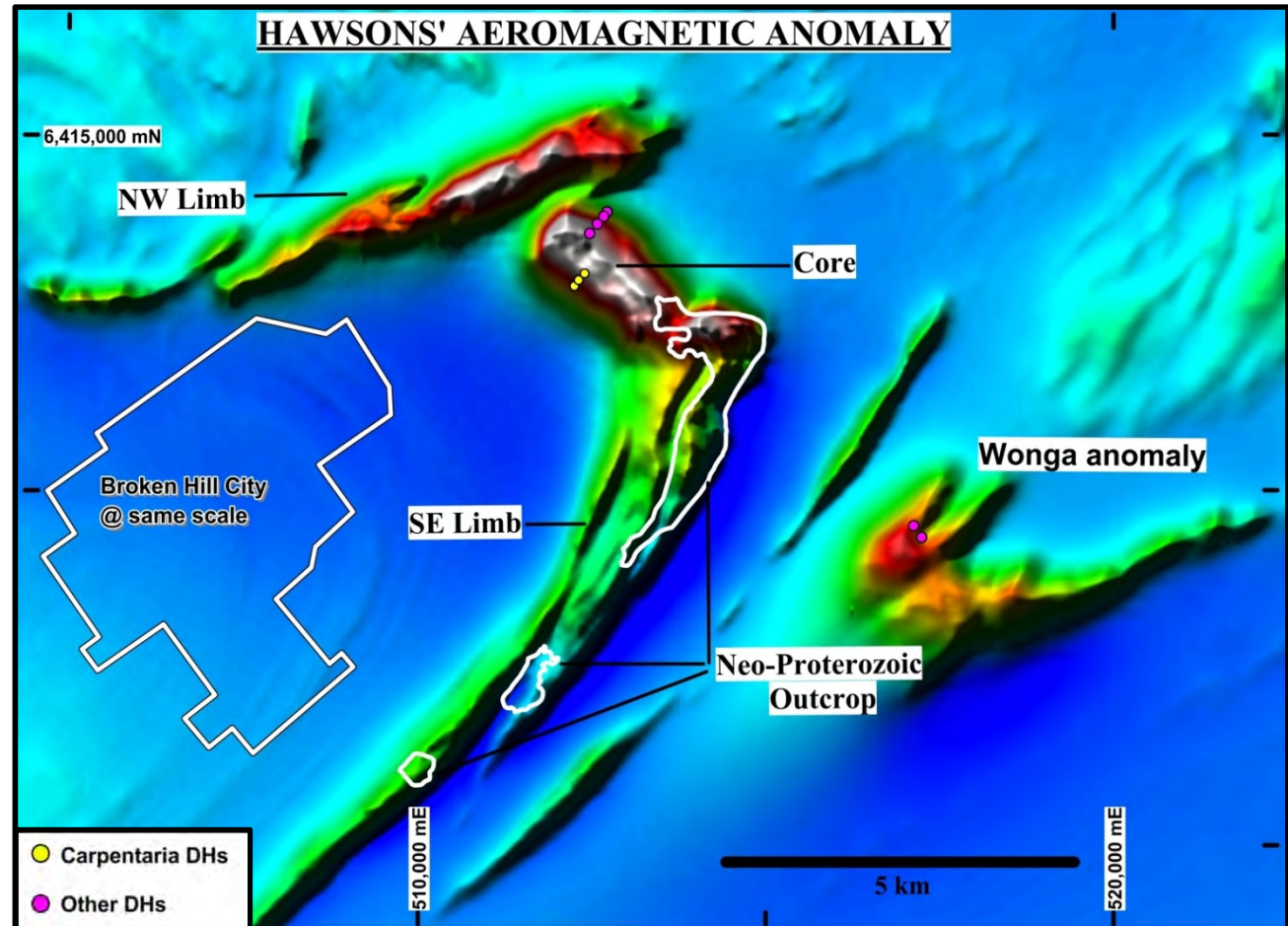


# HAWSONS IRON PROJECT

## Local Aeromagnetics



- The project is large
- +40km combined strike
- Up to five units each up to 130m thick?
- Rock exposure is limited

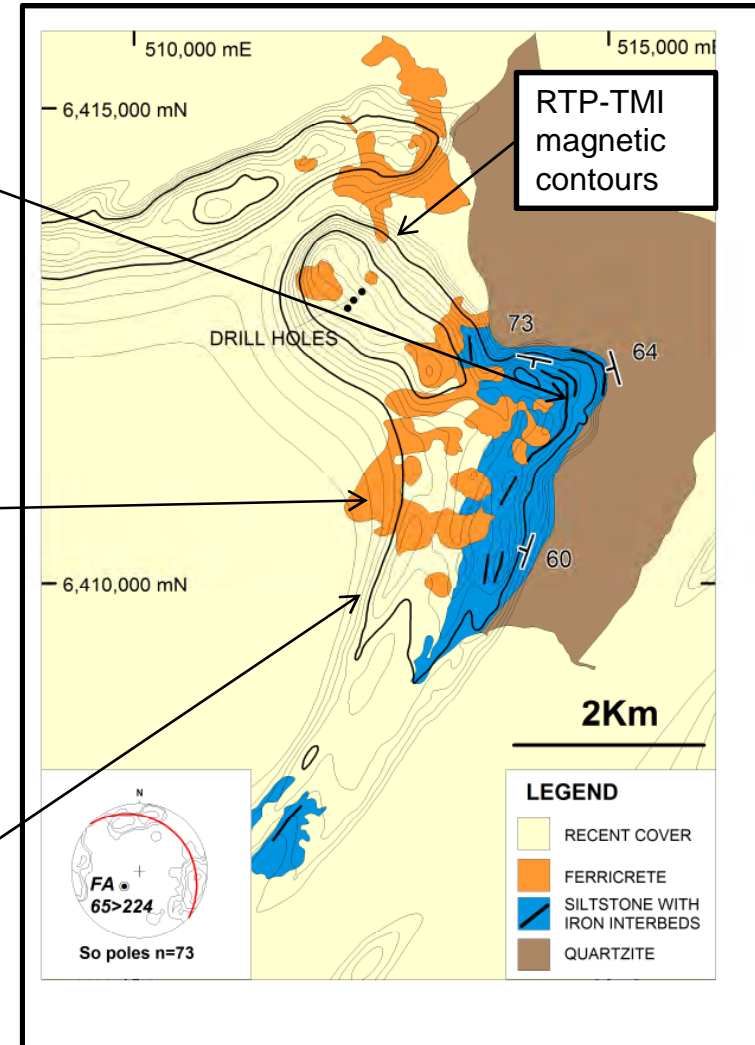
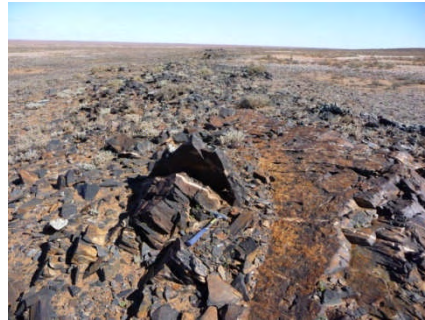


# HAWSONS IRON PROJECT

## Local Geology



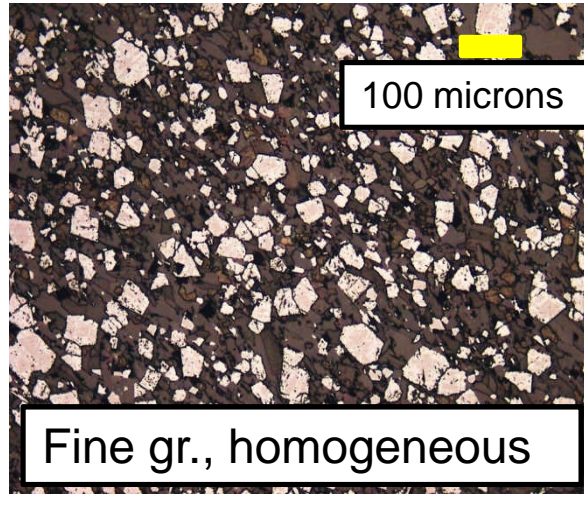
- Siltstone/  
Magnetite  
Ironstone
- Ferricrete
- Fe-stone float/lag
- Aeolian soils



# HAWSONS IRON PROJECT NITON XRF Rock Survey – Why?

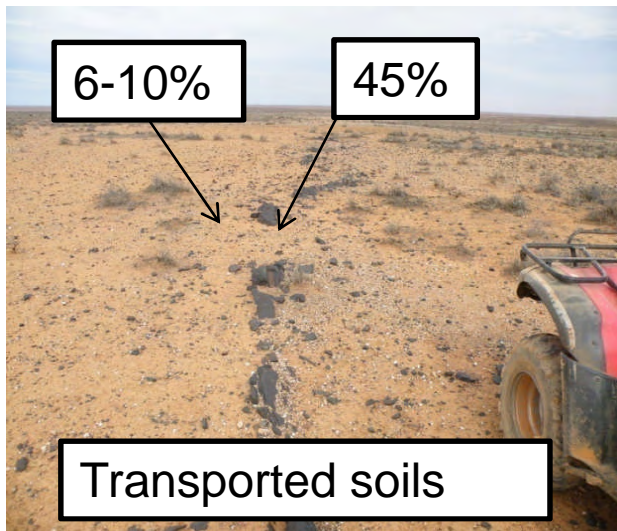


Confirm historical work



100 microns

Fine gr., homogeneous



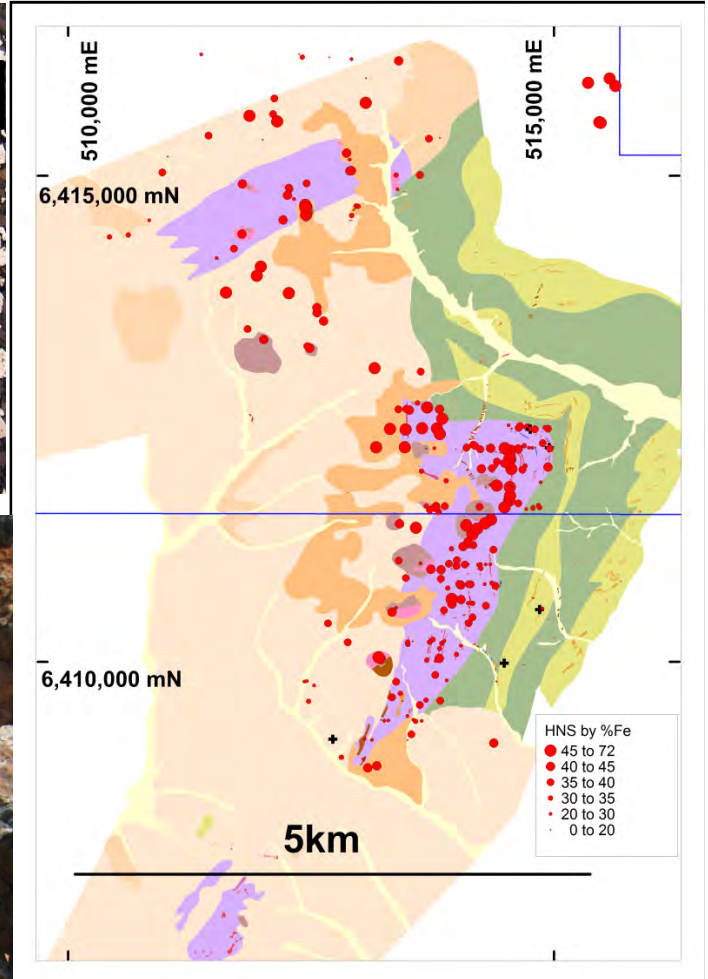
6-10%

45%

Transported soils



In action





# HAWSONS IRON PROJECT

## NITON XRF Rock Survey - How?



### Quality Control

- Concerns - Drift, precision and accuracy?

### Remedies?

- Preparation of a standard
- Check Assays
- Av. 3x30s readings
- Blue tooth GPS



# HAWSONS IRON PROJECT

## NITON XRF Rock Survey - Procedure



- Standard once a day
- Locate a sample site
- Log the material
  - Rock type/class
  - Sampling surface
- 3 NITON analyses
- 3 mag-sus readings
- Photos of each sample site
- 278 Fe% determinations

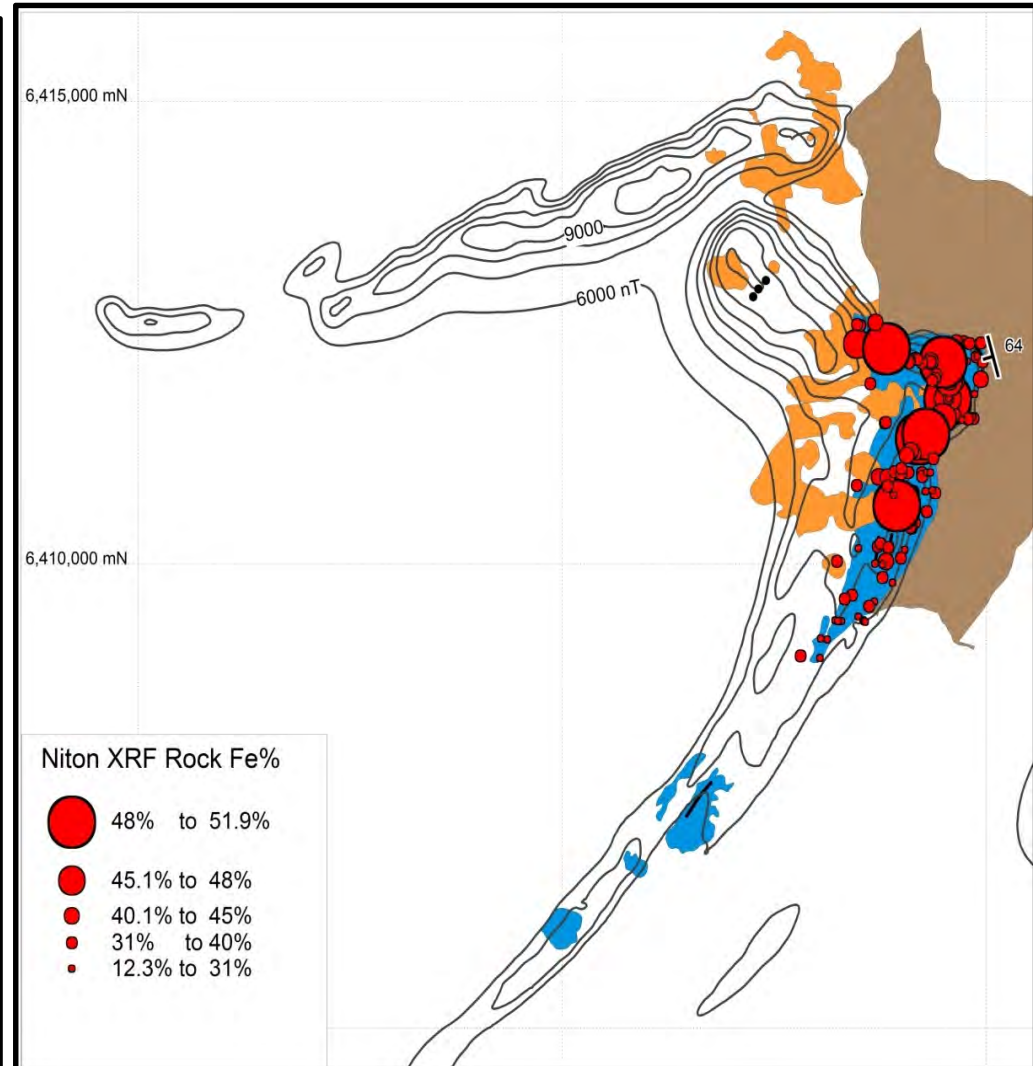


# HAWSONS IRON PROJECT

## NITON XRF Rock Survey - Results



- Confirmed broad extent of highly anomalous iron
- Ferricrete sub sample
  - Av. 36.7% (max. 53.8%)
- Ironstone sub sample
  - Av. 34.9% (max. 51.9%)
- General increasing Fe trend to the north
- Increased real time geological understanding



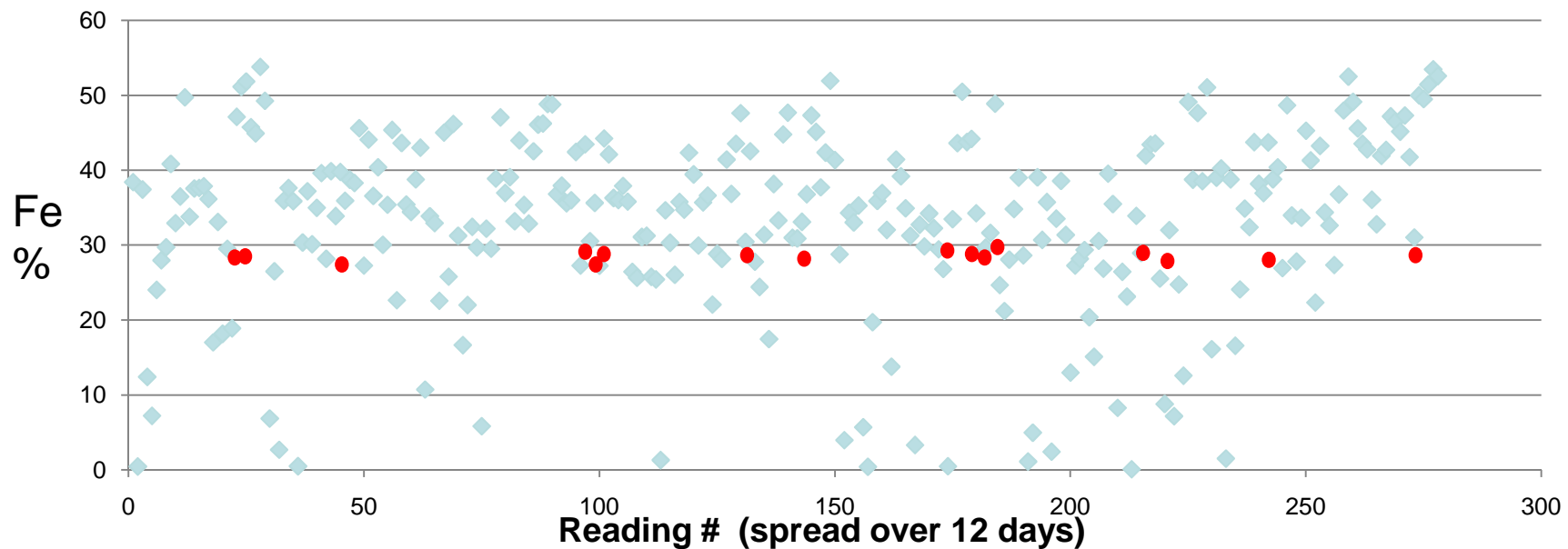
# HAWSONS IRON PROJECT

## NITON XL3t Performance



- Very good
  - No discernable instrument drift over 12 days
  - 5 sample sites per hour (or 15 analyses)

Fe vs time



# HAWSONS IRON PROJECT

## NITON XL3t – Sources of Variance

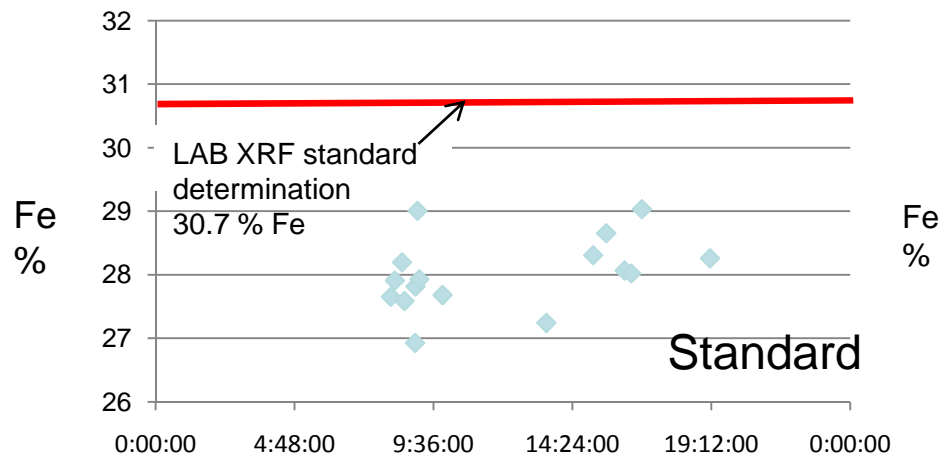


- Low variance (0.32 for STD)
- time of day – temperature stability
- sampling surface type
- Under call Fe% by 10%

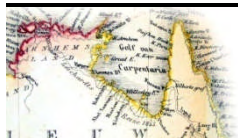
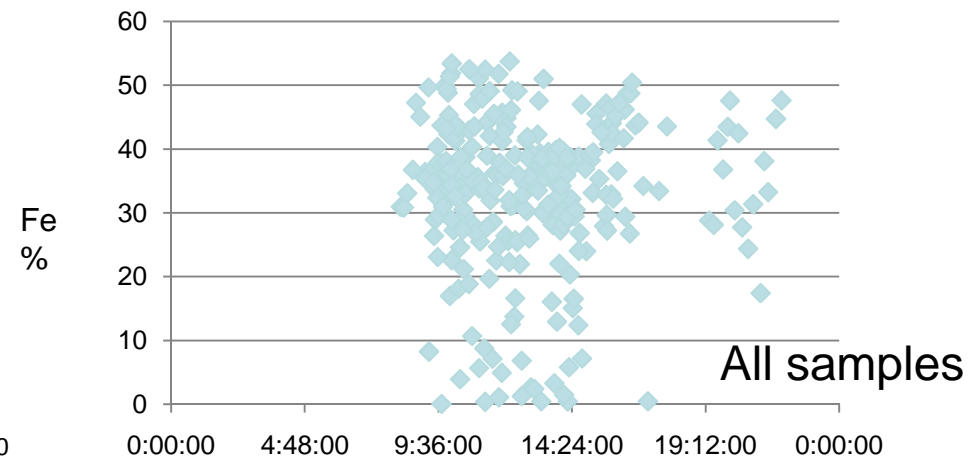
### Magnetite Ironstone Sub Sample

Sampling Surface	Av. Fe %	No. Samples
Rough	34.8%	12
Uneven	35.3%	136
Flat	36.7%	6

**%Fe vs time of day**



**%Fe vs time of day**



# HAWSONS IRON PROJECT

## NITON XL3t - Performance



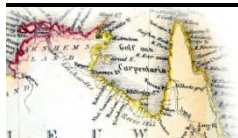
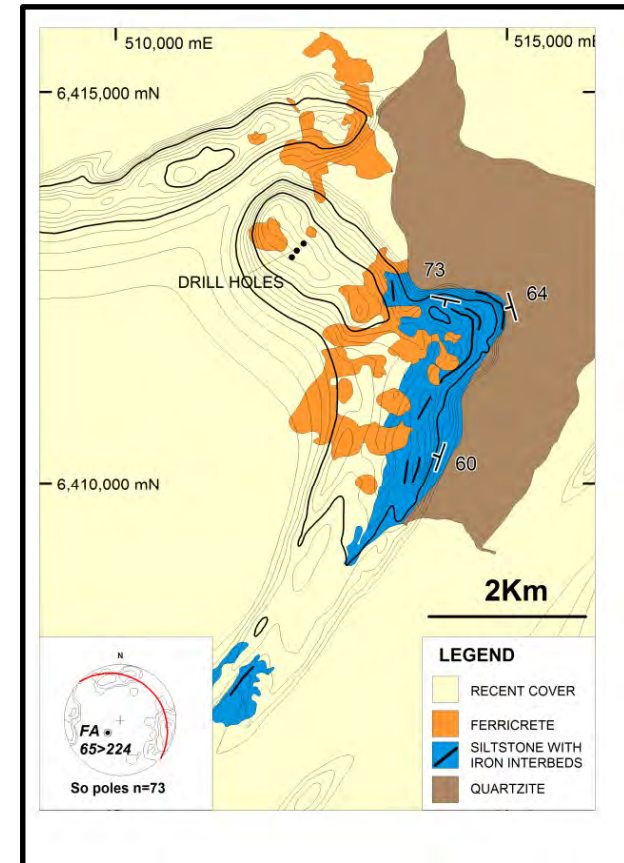
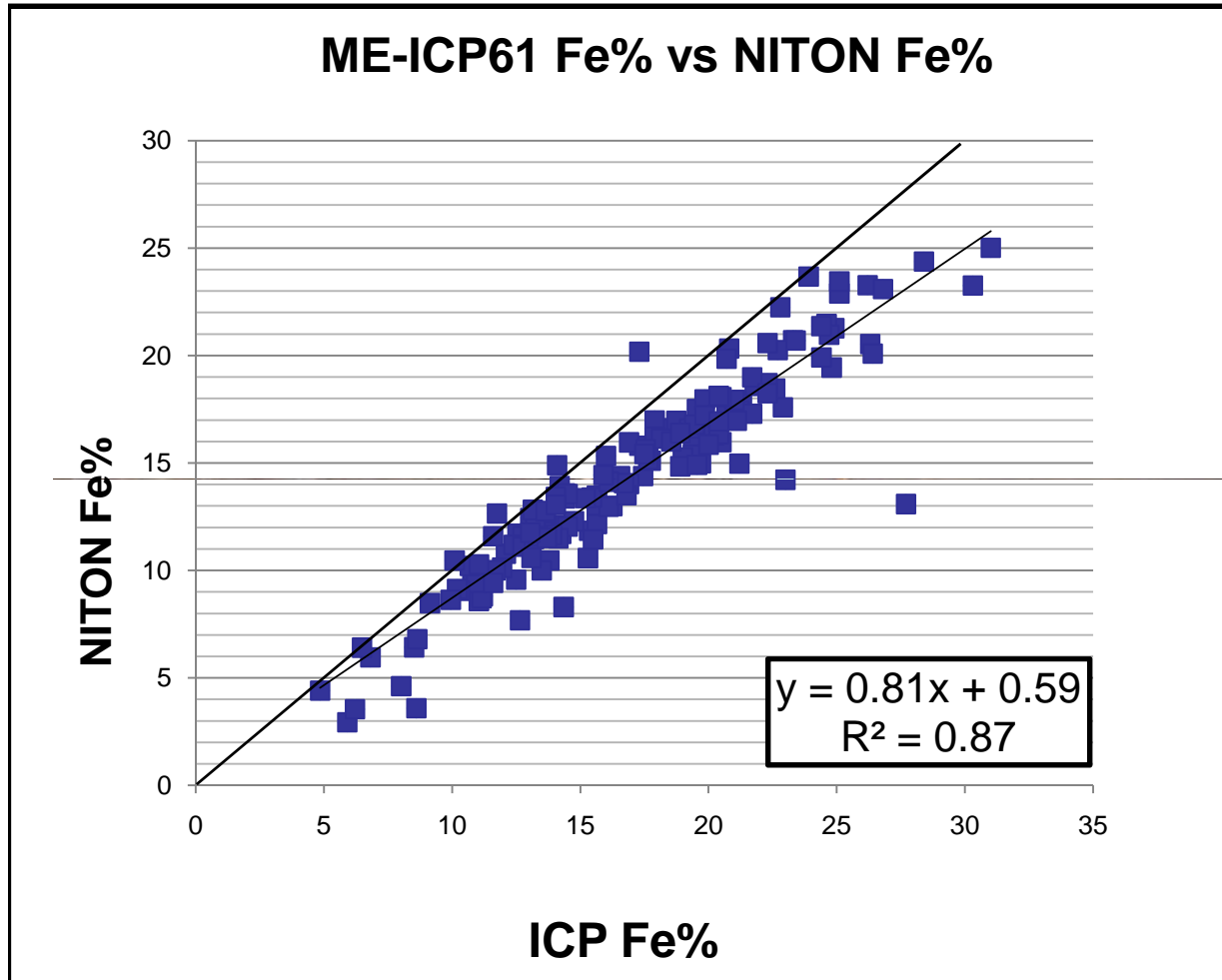
- Comparison with LAB data (four acid digest)
- NITON under call  
Approx. 10%

Sample Number	Niton Fe %	ICP61 Fe%	Niton Ti%	ICP61 Ti%
STD	28.0	30.7*	0.23	0.17
CAP3120	42.5	48.2*	0.23	0.08
CAP3131	33.1	36.1	0.17	0.17
CAP3140	47.2	57.3*	0.15	0.07
CAP3143	47.2	47.5	0.09	0.07
CAP3145	31.6	37.5	na	0.20
		* ME XRF11b		

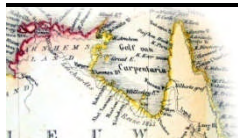
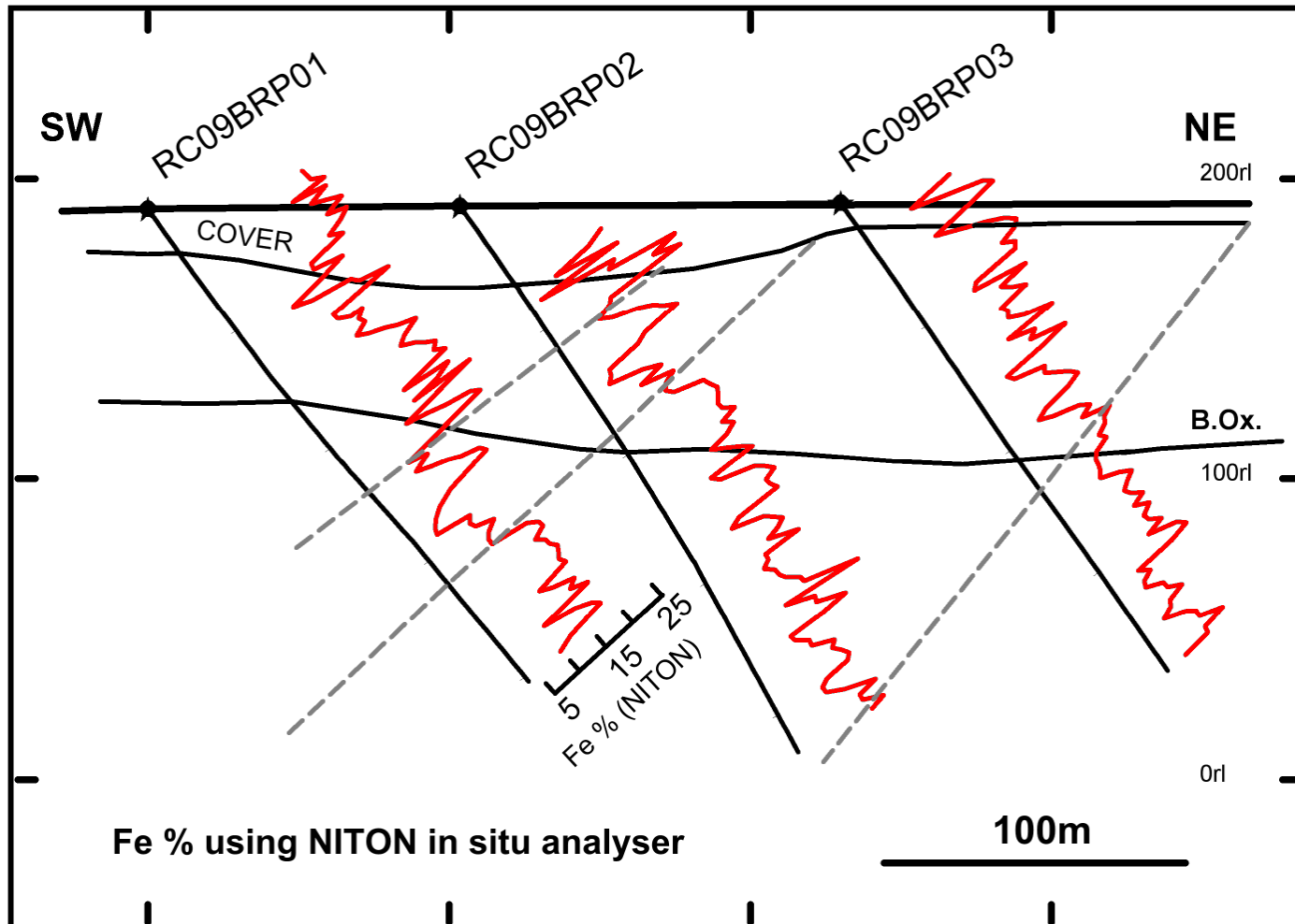


# HAWSONS IRON PROJECT

## NITON XRF -Drilling



# HAWSONS IRON PROJECT NITON XRF -Drilling





# HAWSONS IRON PROJECT

## NITON XRF - Conclusions



### Rock Survey

- NITON XRF highly cost effective
  - saving 278 conventional assays
  - ~\$10,000
  - immediate results and low cost orientation saves time and money \$\$\$???
- Real time results accelerate geological understanding
- Methodical process needs to be followed to ensure reliable results
  - Standards
  - Check assays
  - Repeats



# HAWSONS IRON PROJECT: NITON XRF Conclusions



## DRILLING

- The large data set showed the NITON XRF is highly precise
- Allowed a chemical stratigraphy to be defined with confidence
  - Drill plan modification as you go
  - May drill less core initially
  - Instant data focuses the mind
- Therefore more bang for the drilling buck
- Great exploration tool lesser use in resource drilling



# HAWSONS IRON PROJECT: NITON XRF



## Summary

- NITON XRF is highly cost effective
- NITON XRF for Fe is highly precise but not accurate
  - this precision allows correction factors to be applied with confidence AND
  - Limits the amount of false anomalies generated (for Fe)
- For reliable results the instrument limitations need to be understood and proper checks including standards and check assays



# HAWSONS IRON PROJECT NITON XRF



## WARNING !!!

- Enthusiastic and skilled field technicians wanting to relegate geologists to bystanders



## Acknowledgements

Charlie Foster of AUSSAM Geotechnical Services, Broken Hill  
Manufacturers of our Specialised NITON operation bench

