



# Use of core imagery in modelling geometallurgical properties

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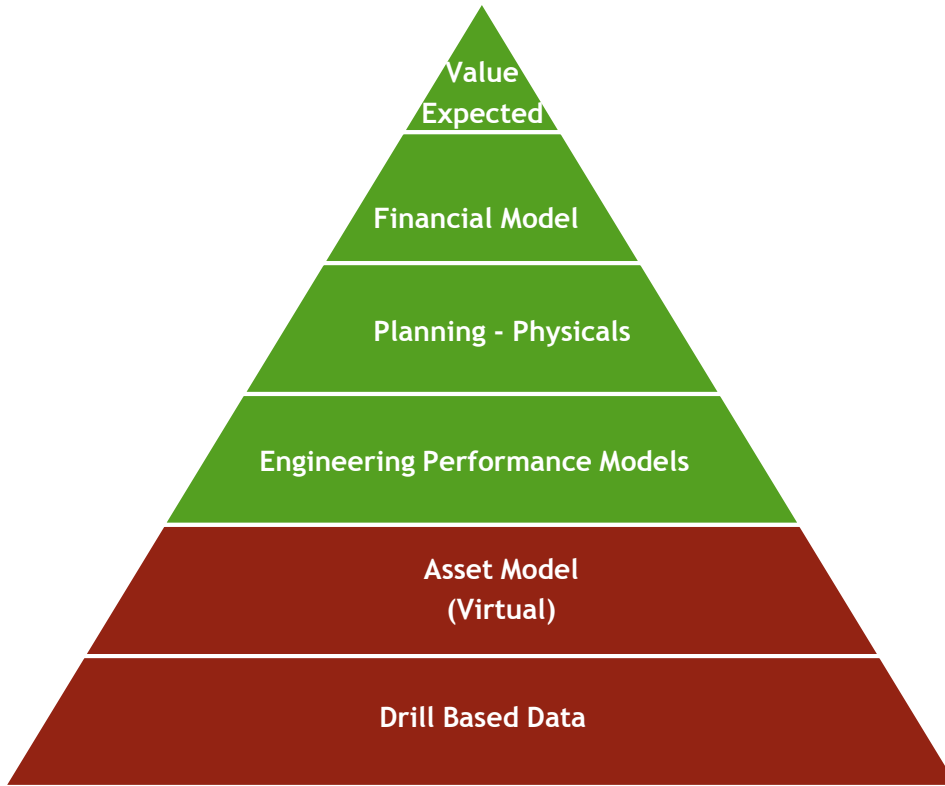
Anh Nguyen, SMI JKMRRC

Tim Dobush, Geosoft

Steve Randall, Geosoft



# Ore Body Knowledge

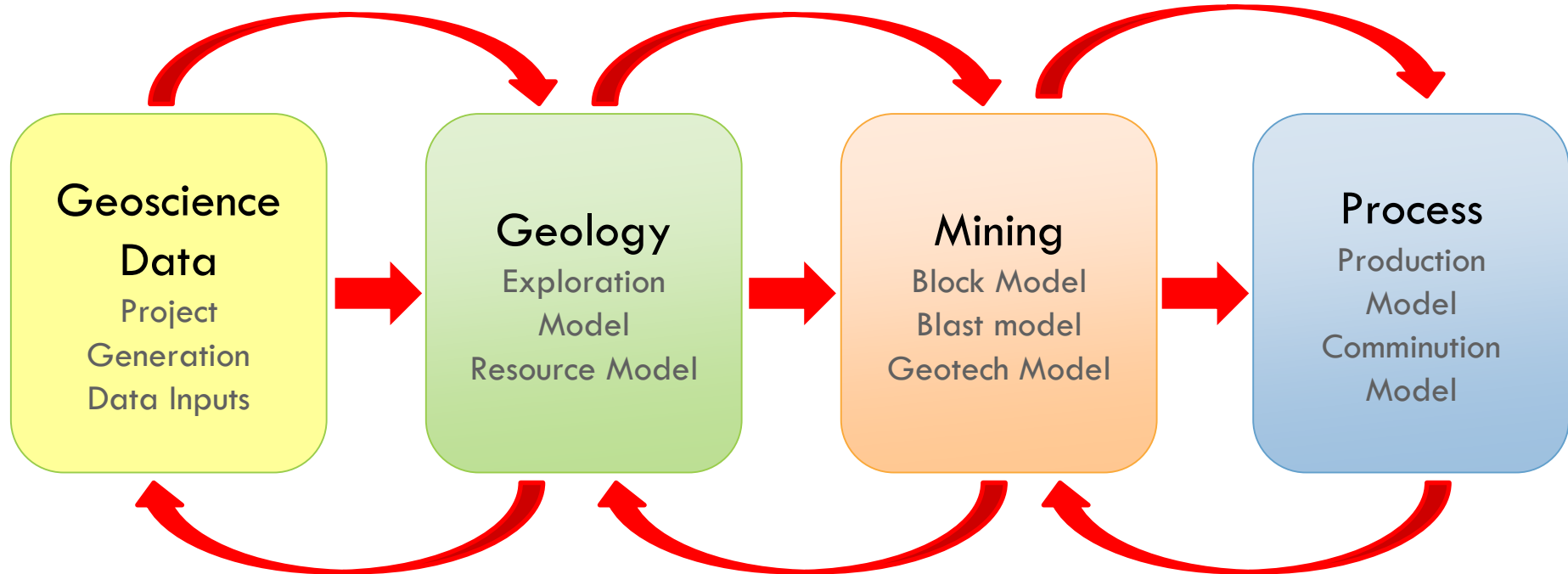


- Size is important
- Grade is important

**But so is.....**

- Throughput
- Recovery
- Product quality
- Geotechnical aspects
- Environmental

# Continuation across the mining value chain



# Advancing the use of drill core

## 'Human observation of core'

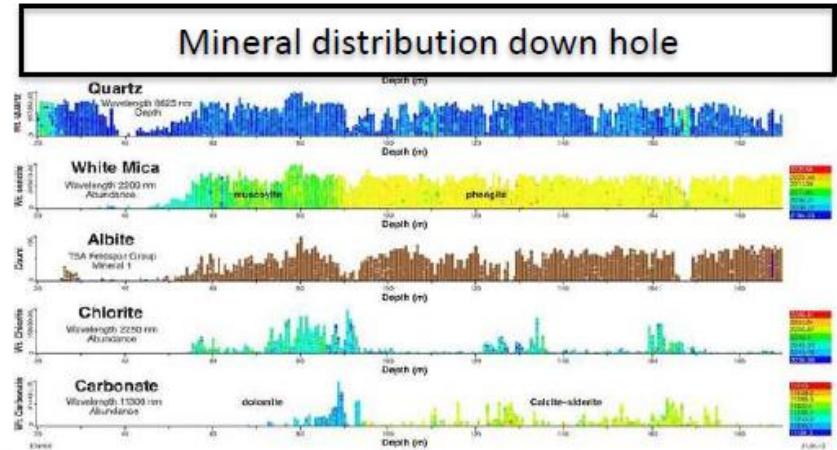
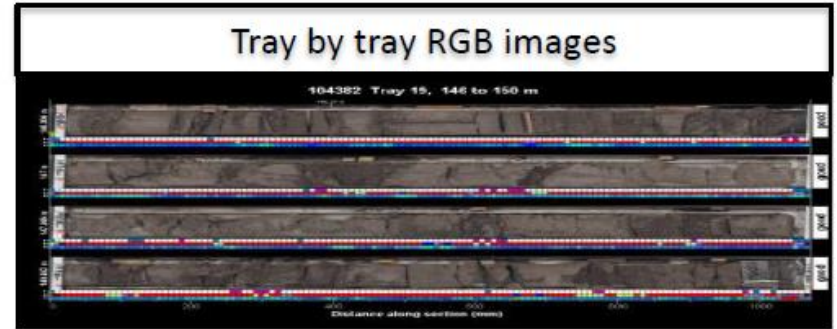
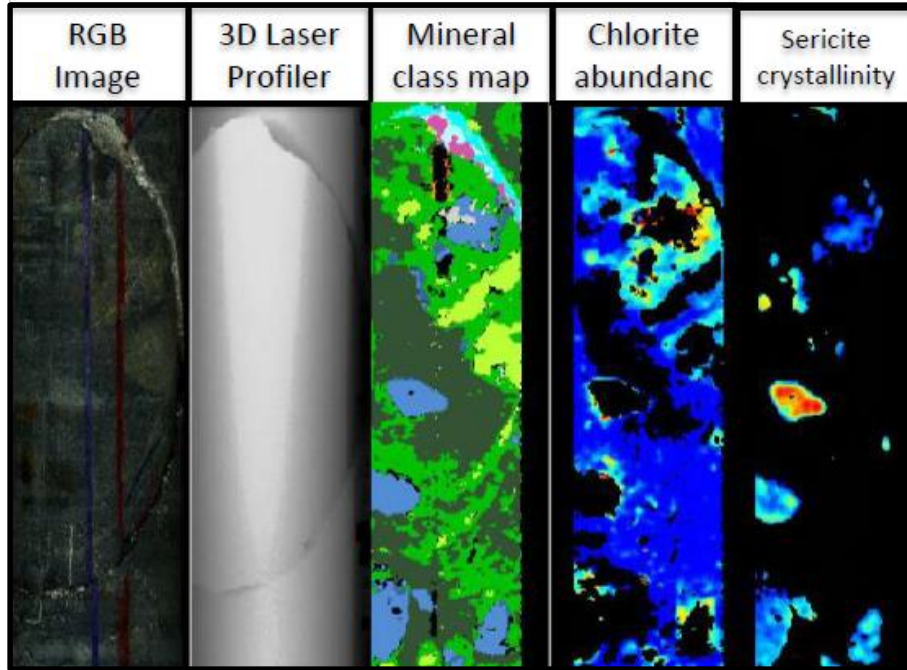
- Multiple personnel involved over many years
- Domaining is interpretative and may not be related to process performance.
- Some minerals not easily identified by eye
- What are the critical data to capture?



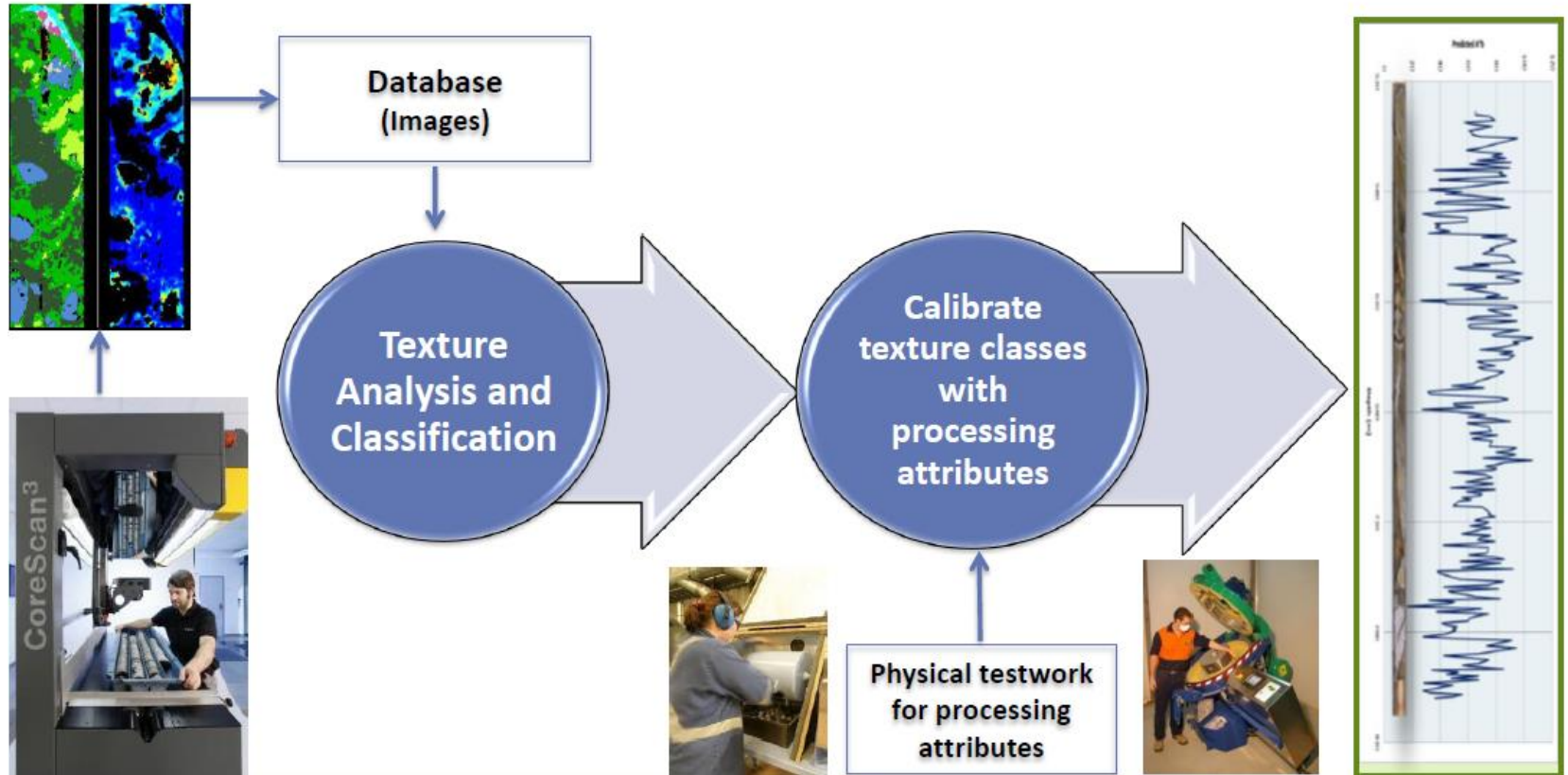
## 'Physical tests'

- UCS, A\*b, BWi
- Sample selection is subjective, often biased toward intact rock
- Test work influenced by discontinuities in the core
- Often one physical test per 'x' million tonnes
- The flow sheet design is based on a sample set that may not represent the actual variability of the orebody both numerically and any mining sequence.

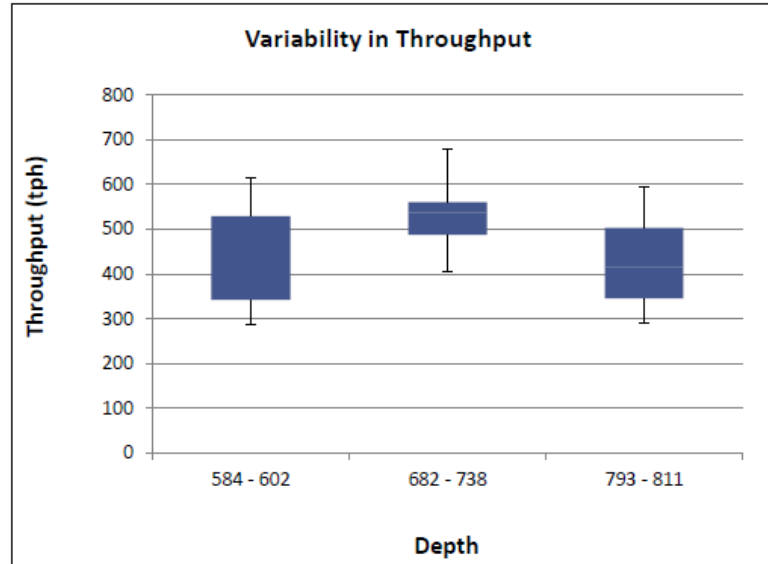
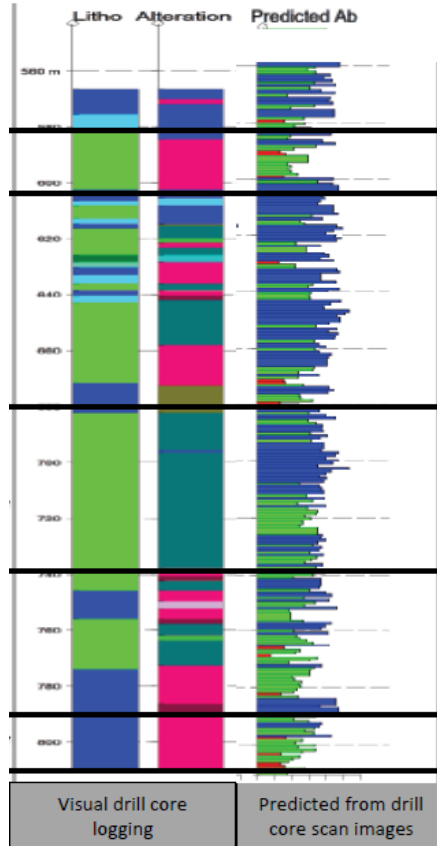
# Hyperspectral Core Scanning



# Predicting Comminution Behaviors



# Predicting Comminution Behaviors



- Textual analysis potentially provides more accurate capture of processing variability
- Derived with less physical test work

# Opportunity

## Our objective

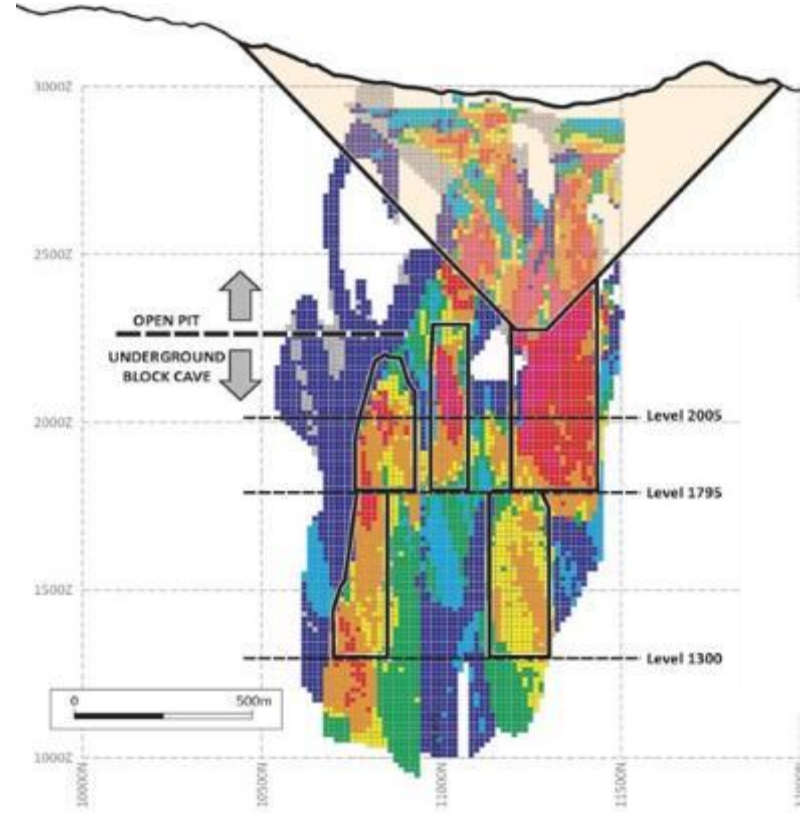
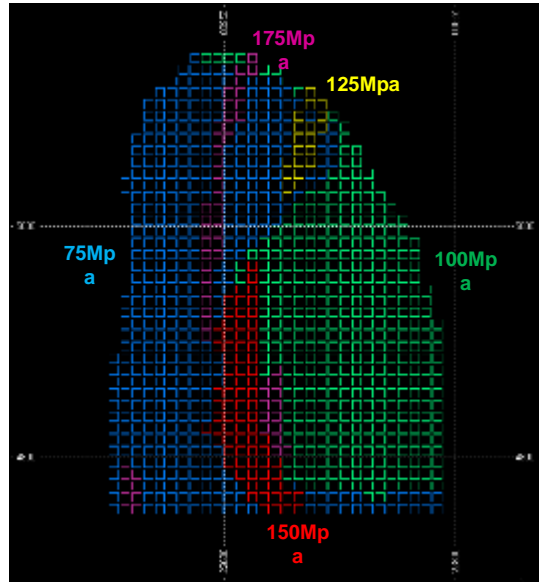
- Leverage hyperspectral data/information using image textural analysis and adaptive learning to:
  - Predict extraction related attributes downhole
  - Create 3D spatial representation of extraction attributes
  - Create spatial representation of processing performance knowledge
  - Generate exploration relevant information in the process

## Outcome

- Better risk management, planning and decisions in project development;
- Minimisation of surprises and technical delays in project development;
- Reduces ramp up times and risks.



# Examples



Example with UCS but could be any parameter such as  $A \cdot b$ ,  $B_{wi}$  etc

# Acknowledgements

- JKMRC & JKTech