“End-To-End Automation For Orebody Knowledge. The application of machine learning and automation to unlock the value of geoscientific data and inform critical decisions in exploration and mining.”

Presented by:

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Chief of Strategy

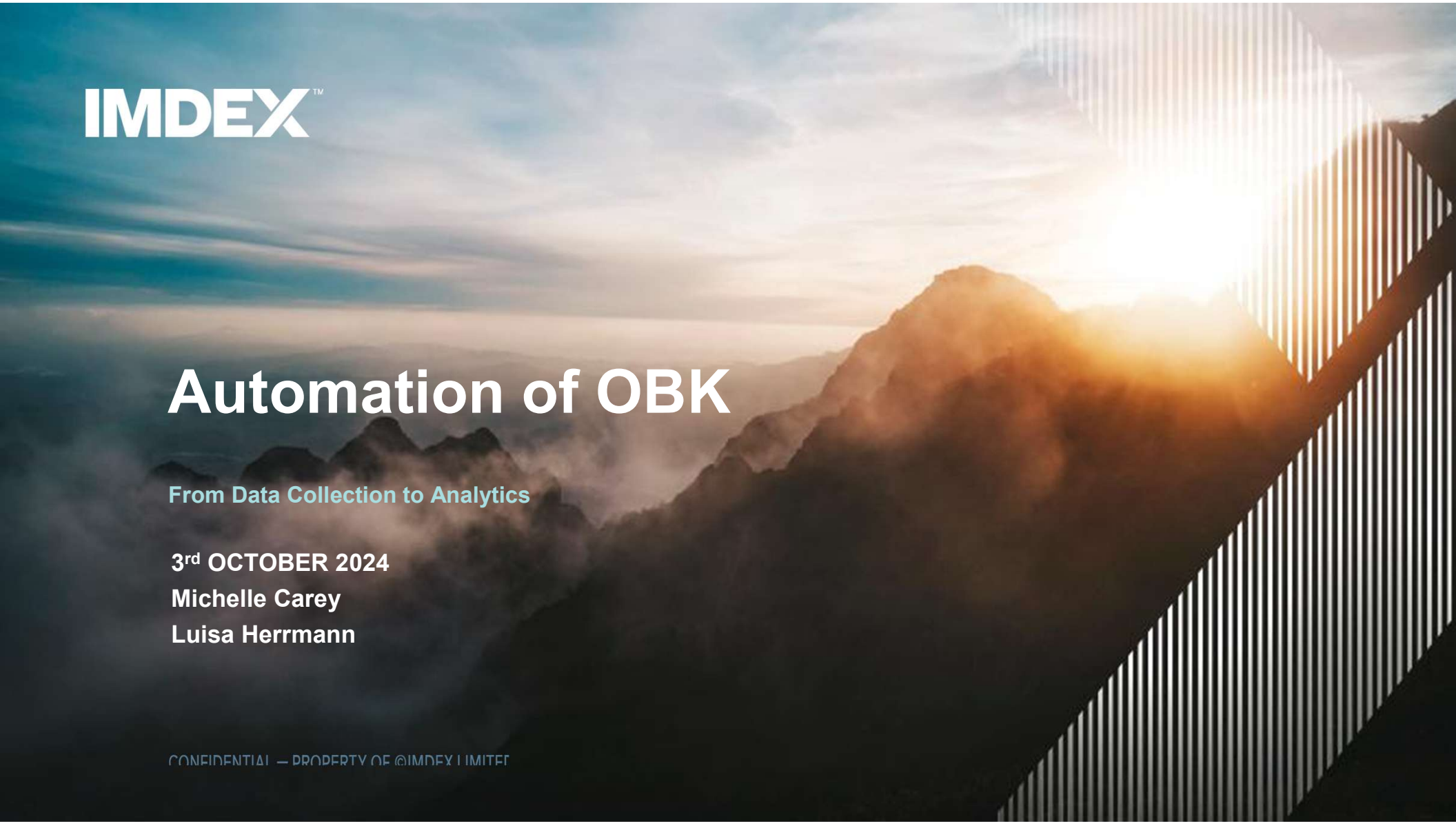
IMDEX™

Presented by:

Luisa Herrmann

Principal Geoscientist

Datarock



Automation of OBK

From Data Collection to Analytics

3rd OCTOBER 2024

Michelle Carey
Luisa Herrmann

The Role of Geology in Decision Making

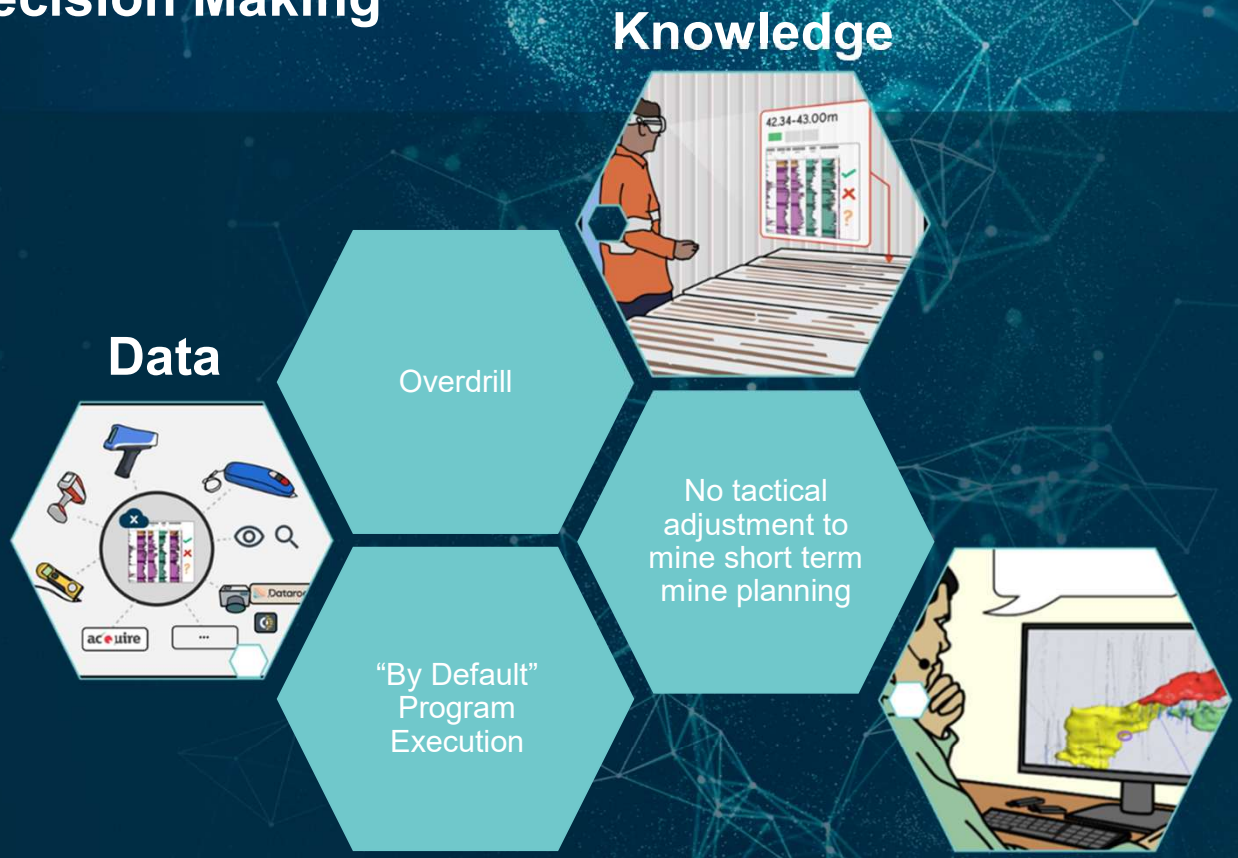
Reducing Unquantifiable Errors

When is visual observation not enough?

Threats and Opportunities

The rise of sensors and AI

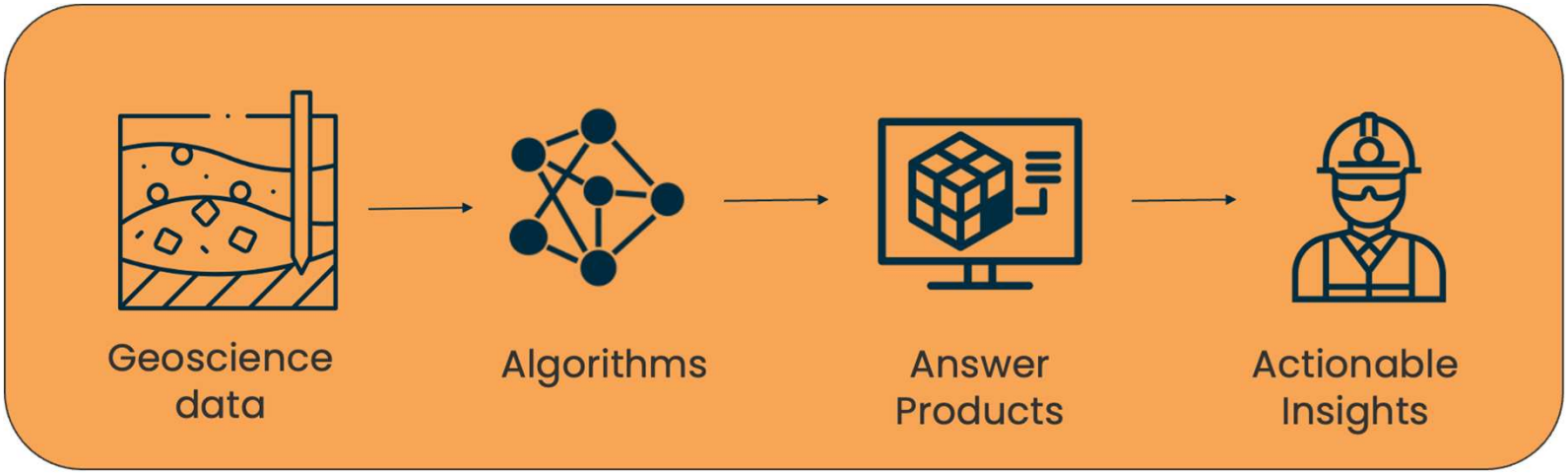
Gescience capability gaps



AUTOMATION OF OBK

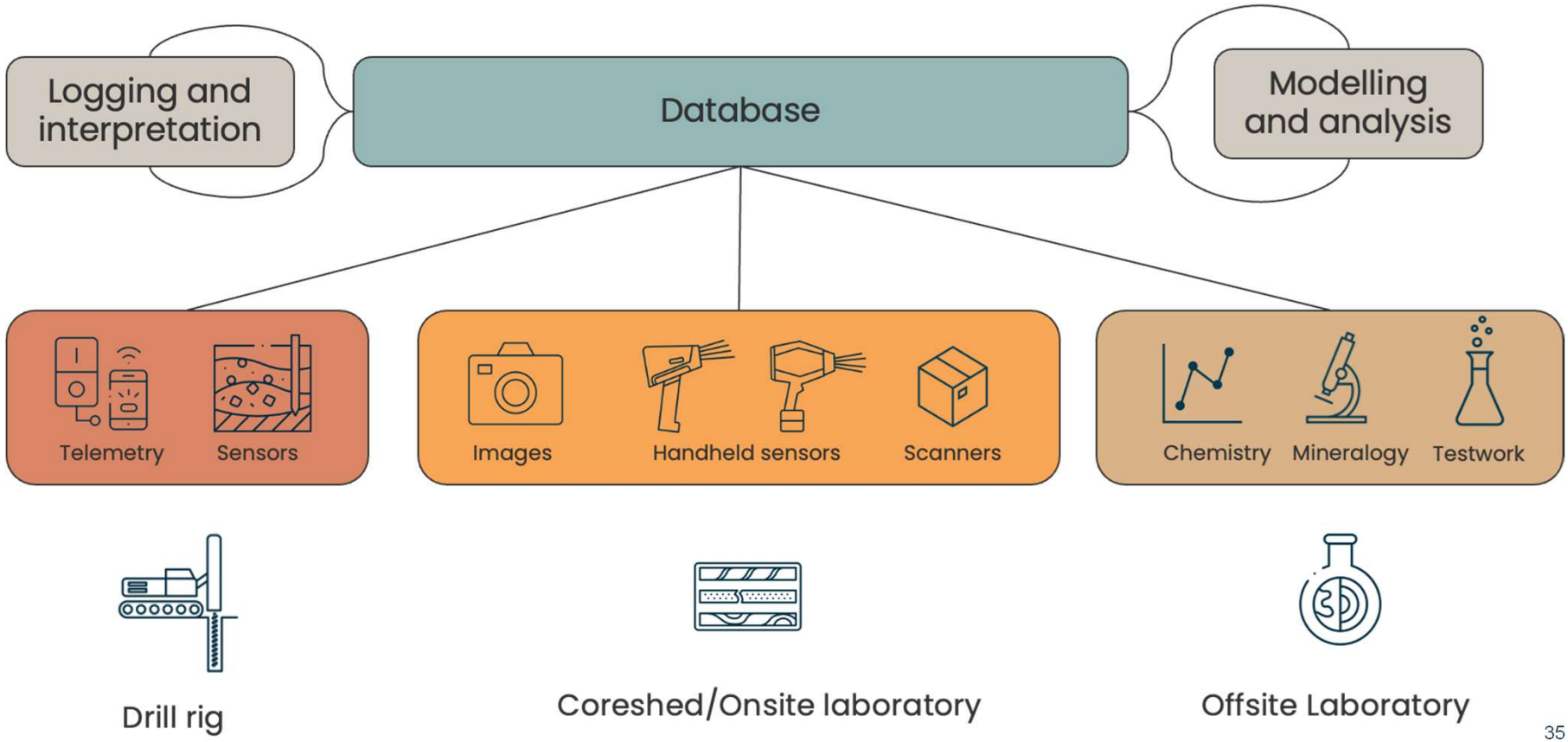
Presentation Outline

- Current and future state of data collection and OBK
- Automated OBK examples from Datarock and IMDEX



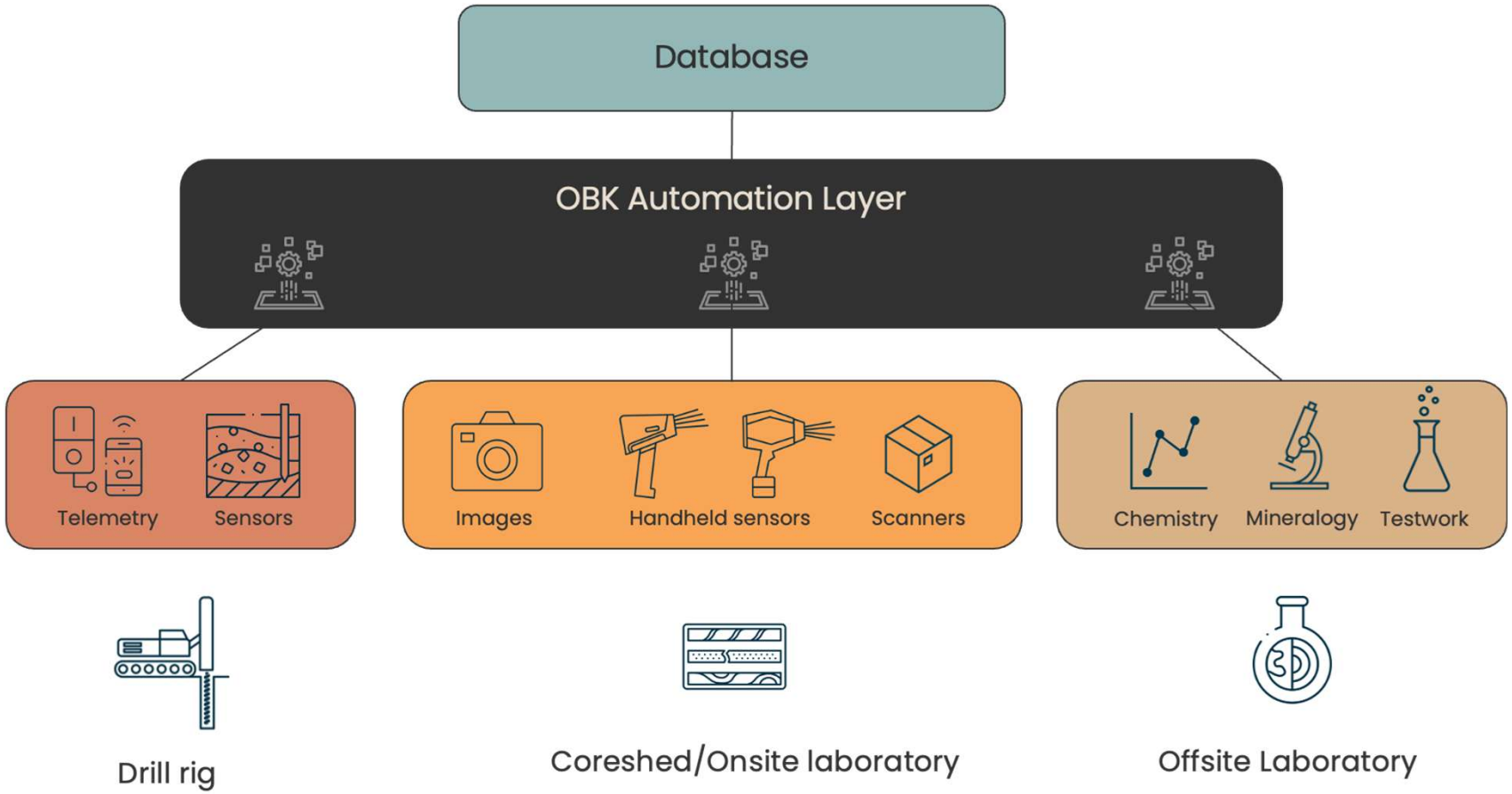
Current State

Human-centric workflows



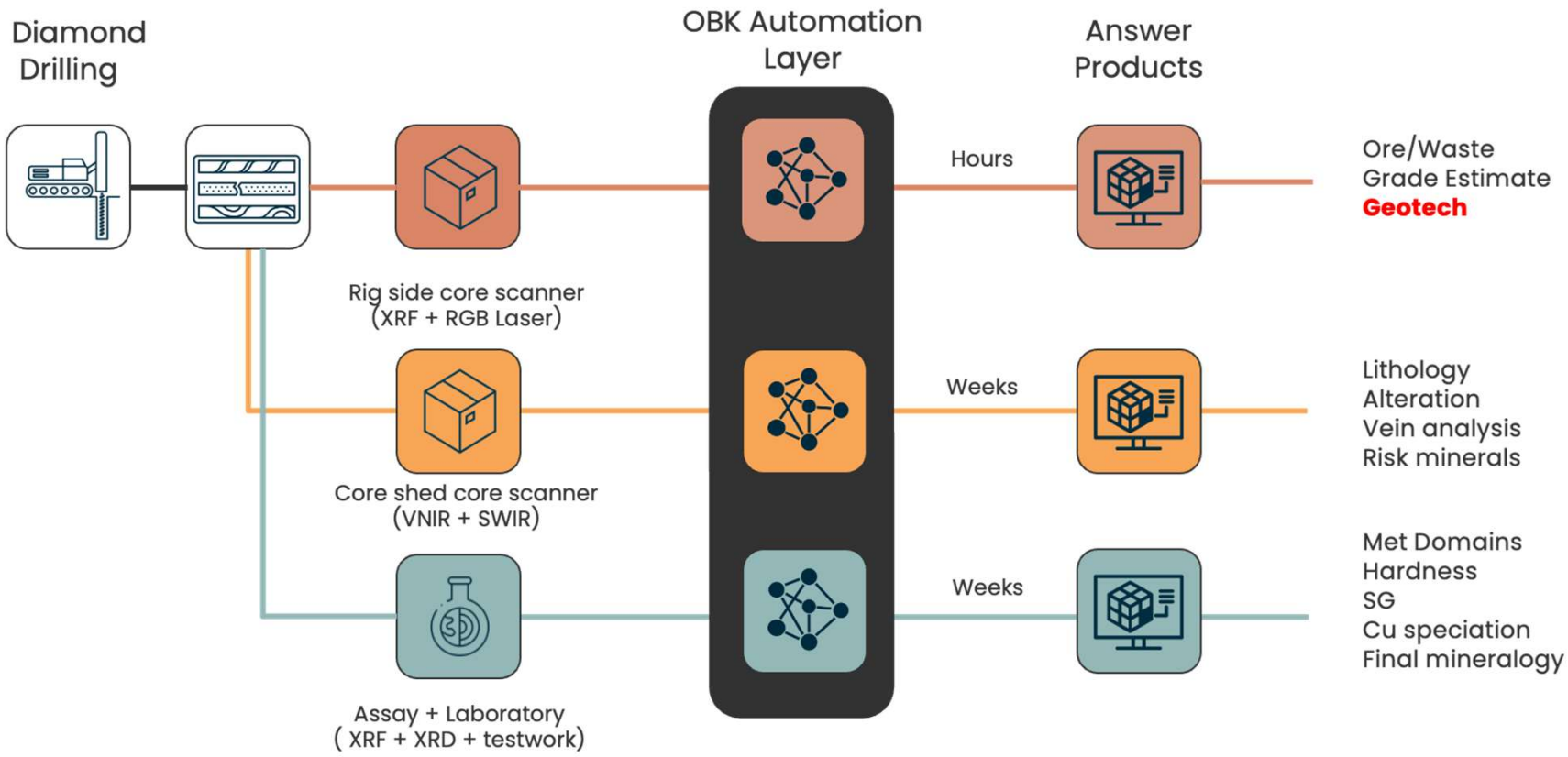
Future State

Greater emphasis on data and algorithms



Example 1

Cu-Au Porphyry

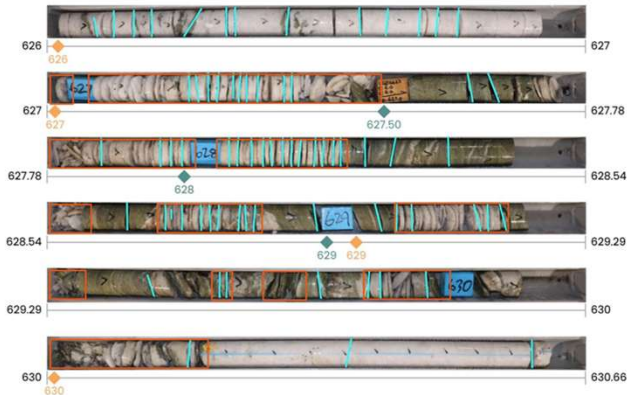


Automated Geotech

Discing analysis from core imagery

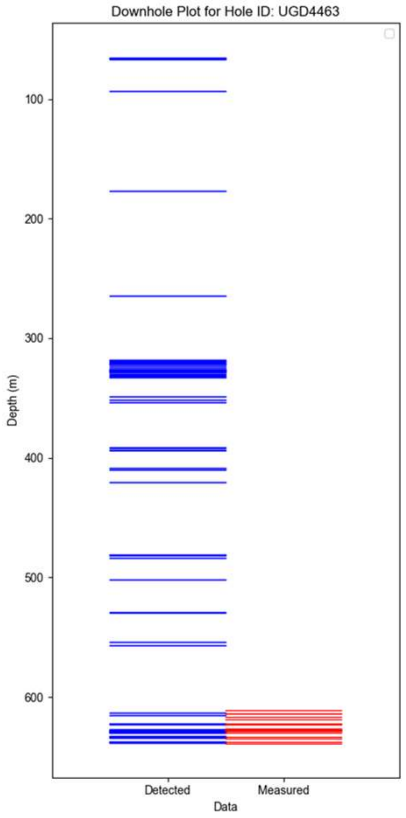
RGB CORE IMAGERY

AUTOMATED COMPUTER VISION ANALYSIS



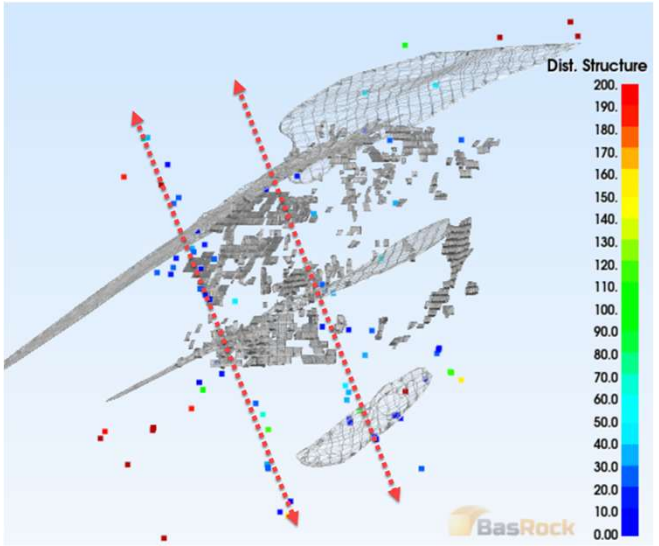
100km of core logged in a few hours using machine learning

PREDICTED GEOTECHNICAL DATA



Analysis revealed under logging of discing intervals

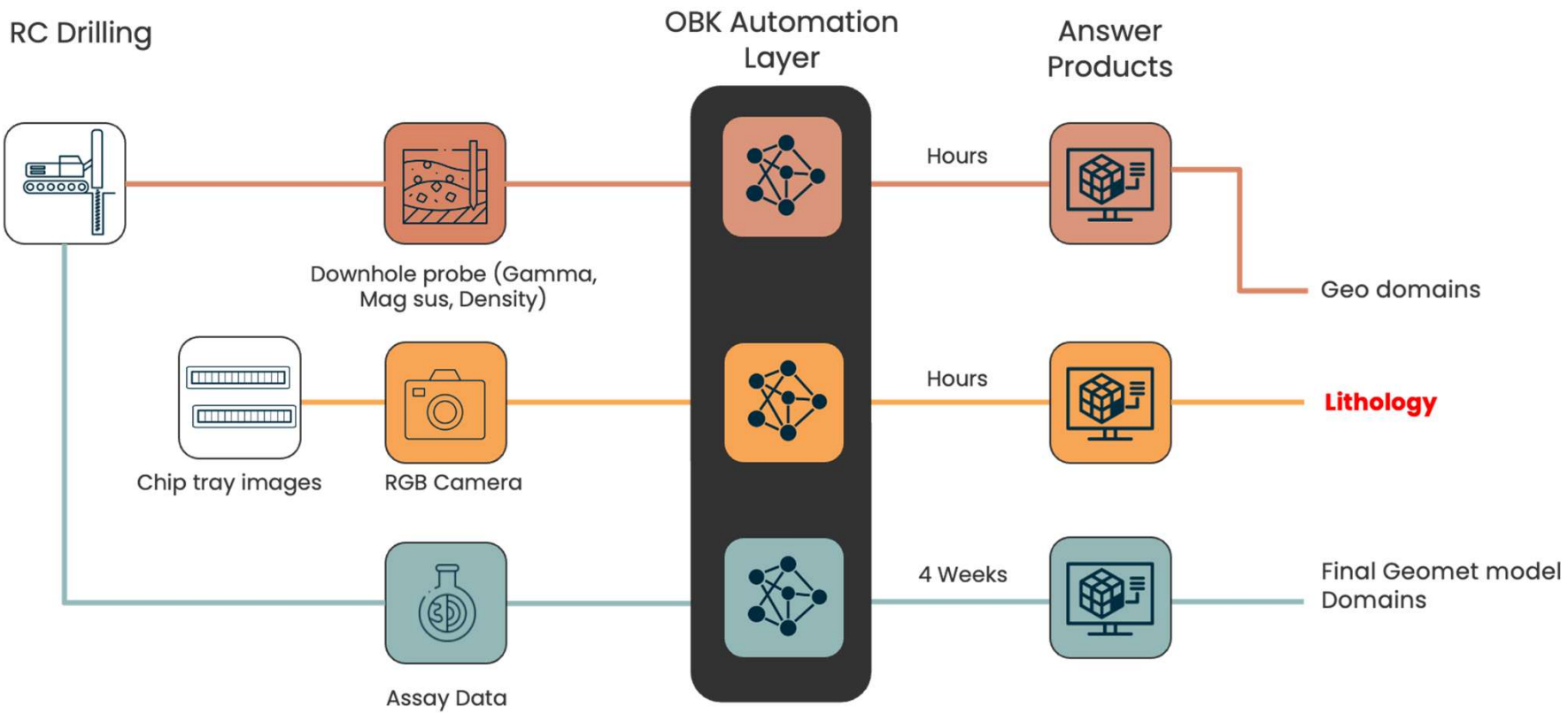
3D MODELLING



3D visualisation of automated discing results reveal new high strain zones

Example 2

Iron Ore



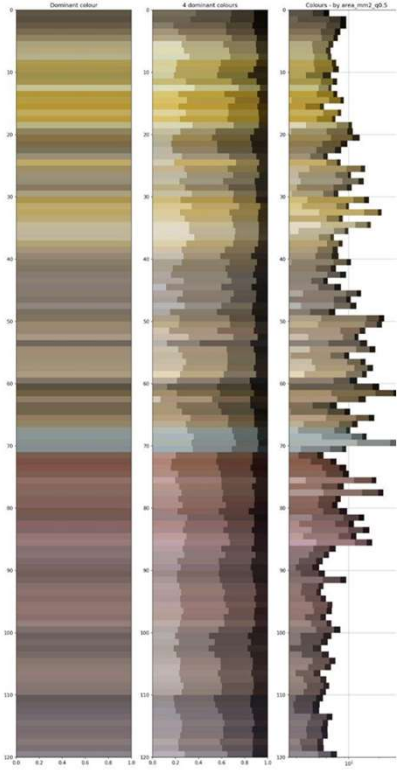
Lithological domaining from chip images

Iron Ore

RGB RC CHIP IMAGERY

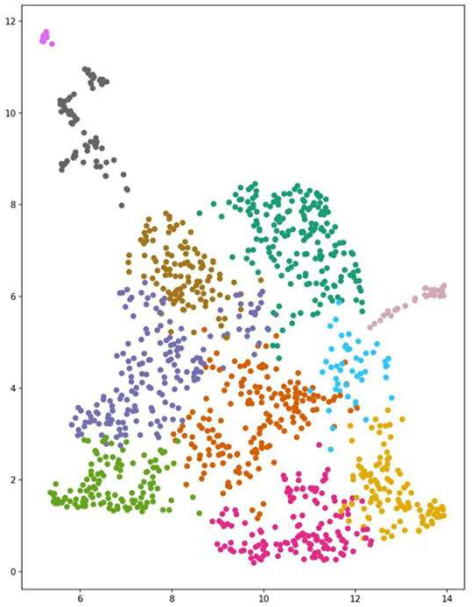
Massive amounts of chip imagery are collected for each 1m of RC drilling

AUTOMATED IMAGE ANALYSIS



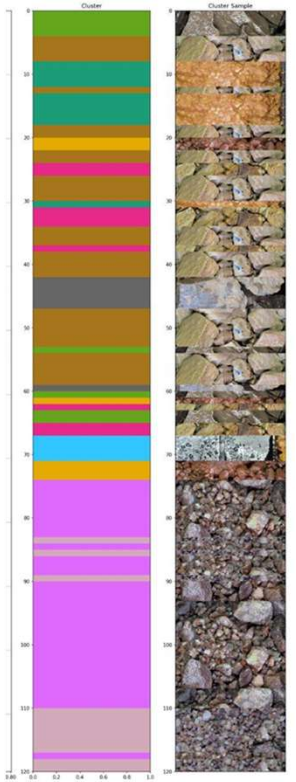
Imagery is analysed for colour, grainsize and texture, avoiding the need for manual visual logging

DATA CLUSTERING



Imagery data is domained into lithology groups using ML algorithms

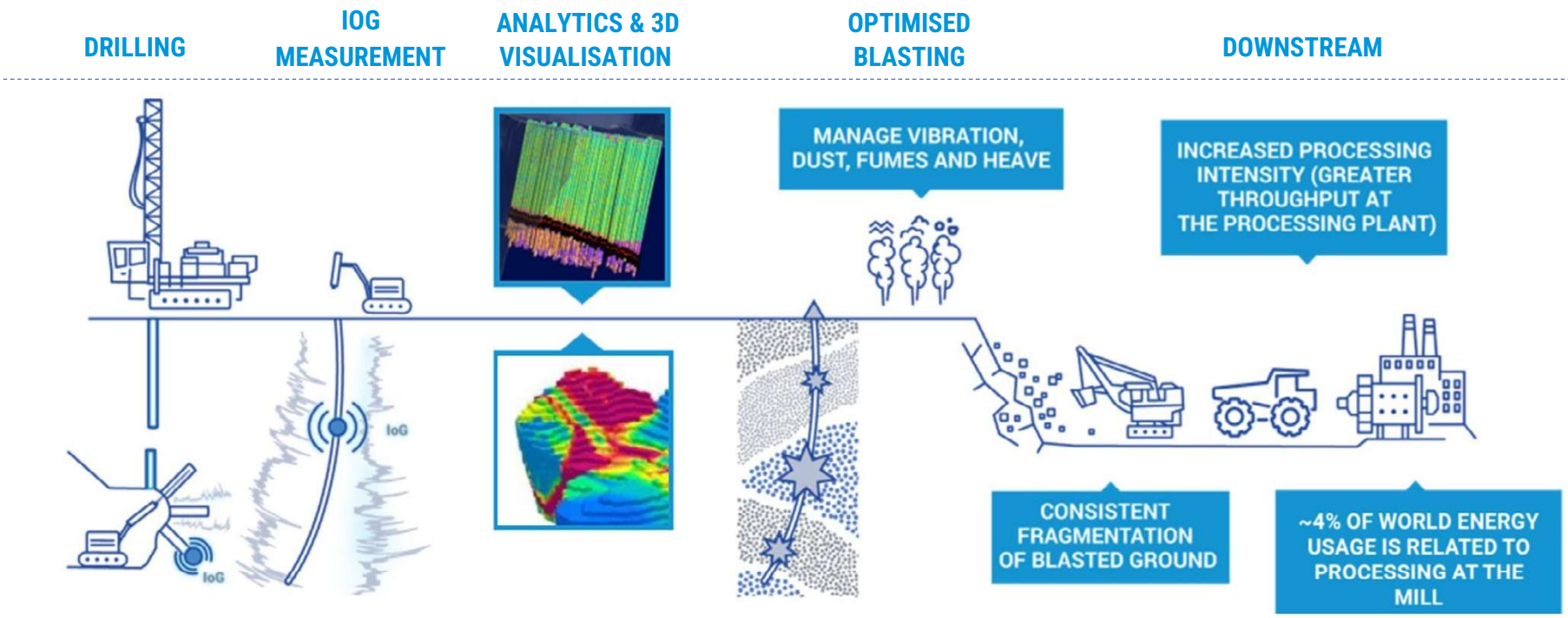
LITHOLOGY DOMAINS



Data-driven lithology domains are produced automatically from imagery

Example 3 - BLASTDOG

Integrated process



IMDEX BHS™
Drill once, stabilising the walls of the hole to reduce fallback

IMDEX BLASTDOG™
Holes are logged using IMDEX multi-sensor, which measures physical properties

IMDEXHUB-IQ™ & MINEPORTAL
Analytics are applied to produce Rock Knowledge answer products (top) and 3D block models (bottom)

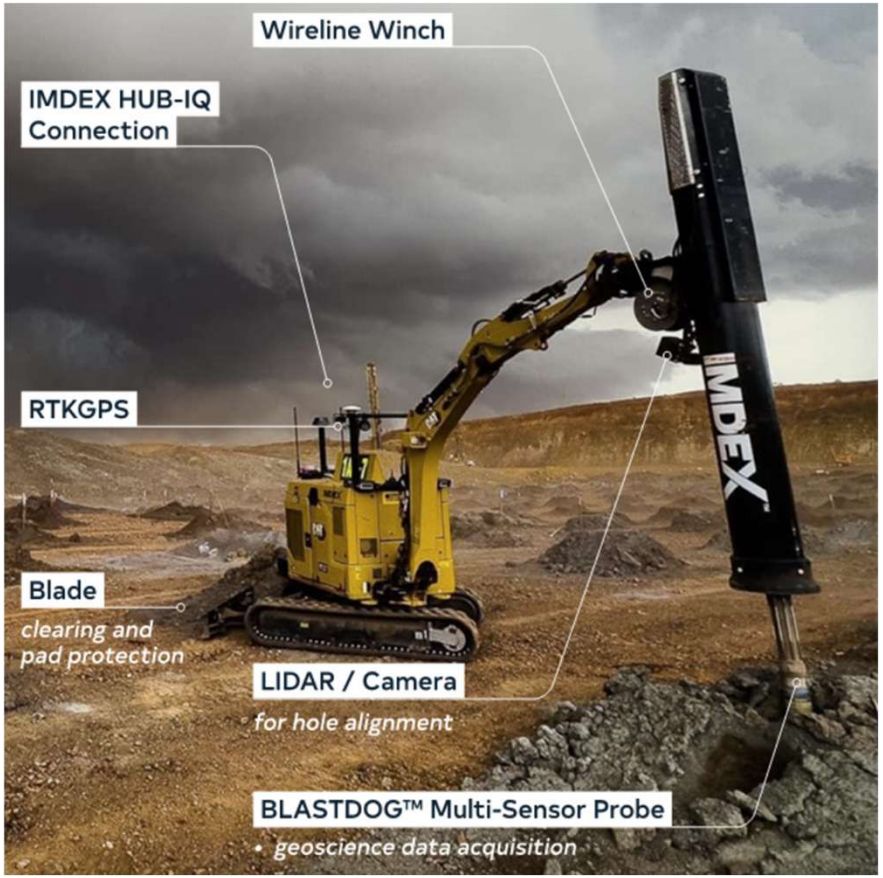
Use the Rock Knowledge as input to the blast design via **IMDEXHUB-IQ™**

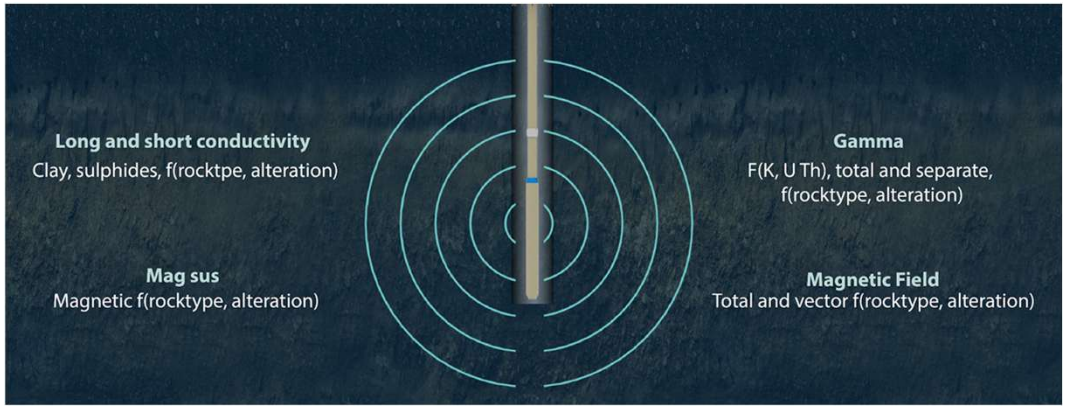
Mitigate risk and negative impacts on the blast by measuring hole gauge and reducing redrilling and improving the blast outcome

Enhance productivity for resource companies

BLASTDOG

How the Need for Automation Drove Design

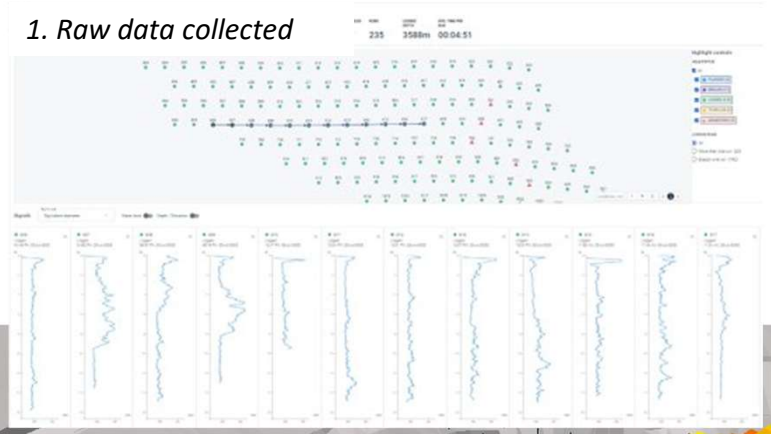


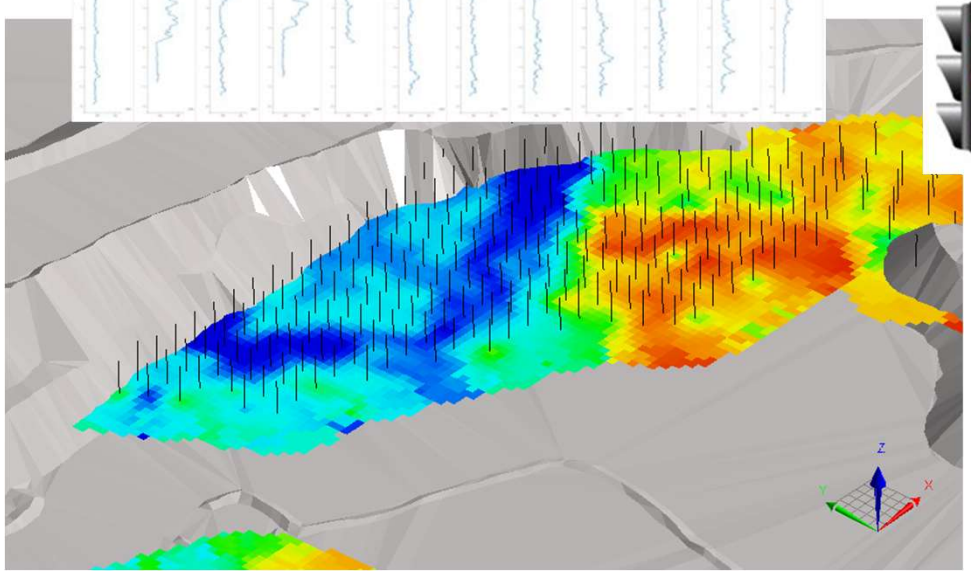


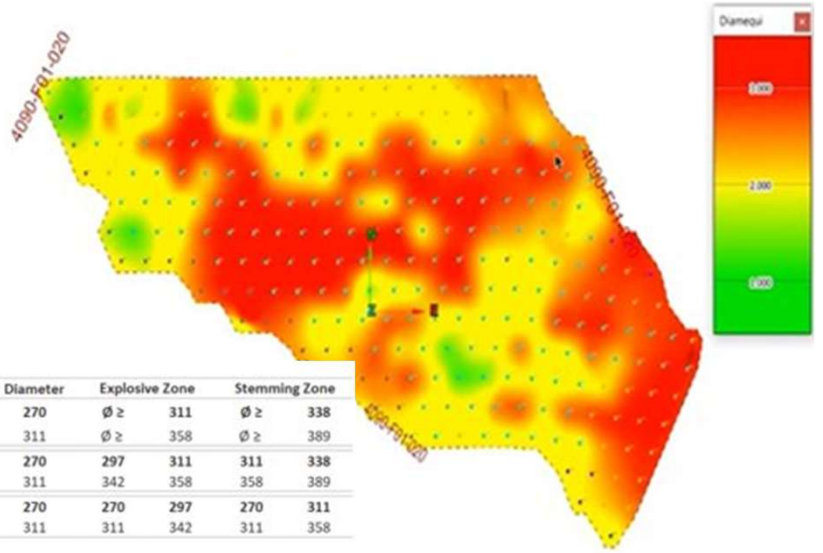
BLASTDOG

Data Use Cases

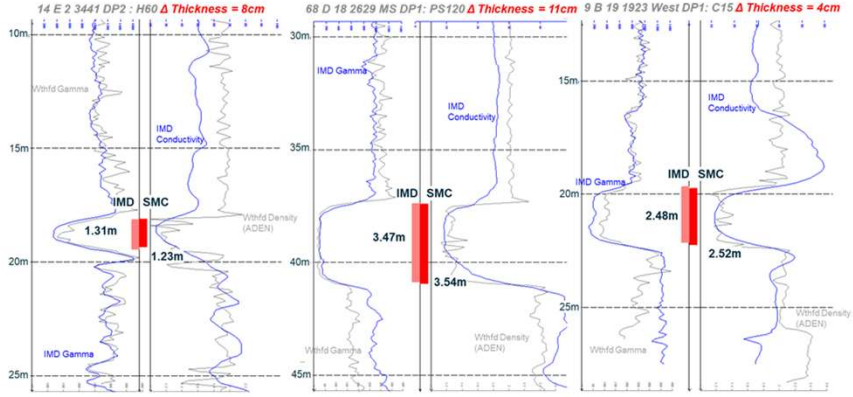
1. Raw data collected







Value	Diameter	Explosive Zone		Stemming Zone	
3	270	Ø ≥	311	Ø ≥	338
	311	Ø ≥	358	Ø ≥	389
2	270	297	311	311	338
	311	342	358	358	389
1	270	270	297	270	311
	311	311	342	311	358



Automation of OBK

Thank you.

IMDEX™