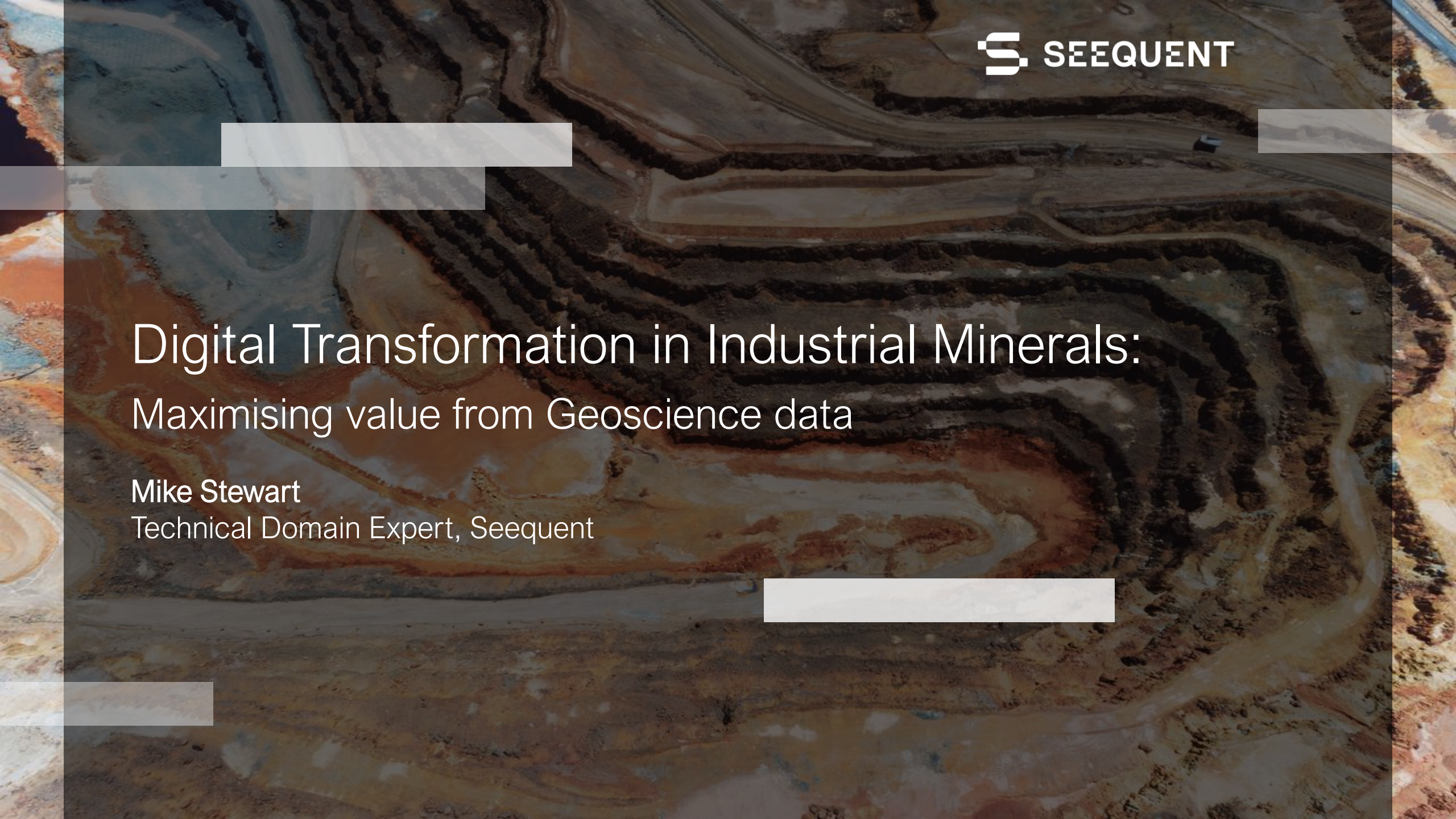


SEEQUENT

Digital Transformation in Industrial Minerals:

Maximising value from Geoscience data

Mike Stewart
Technical Domain Expert, Seequent

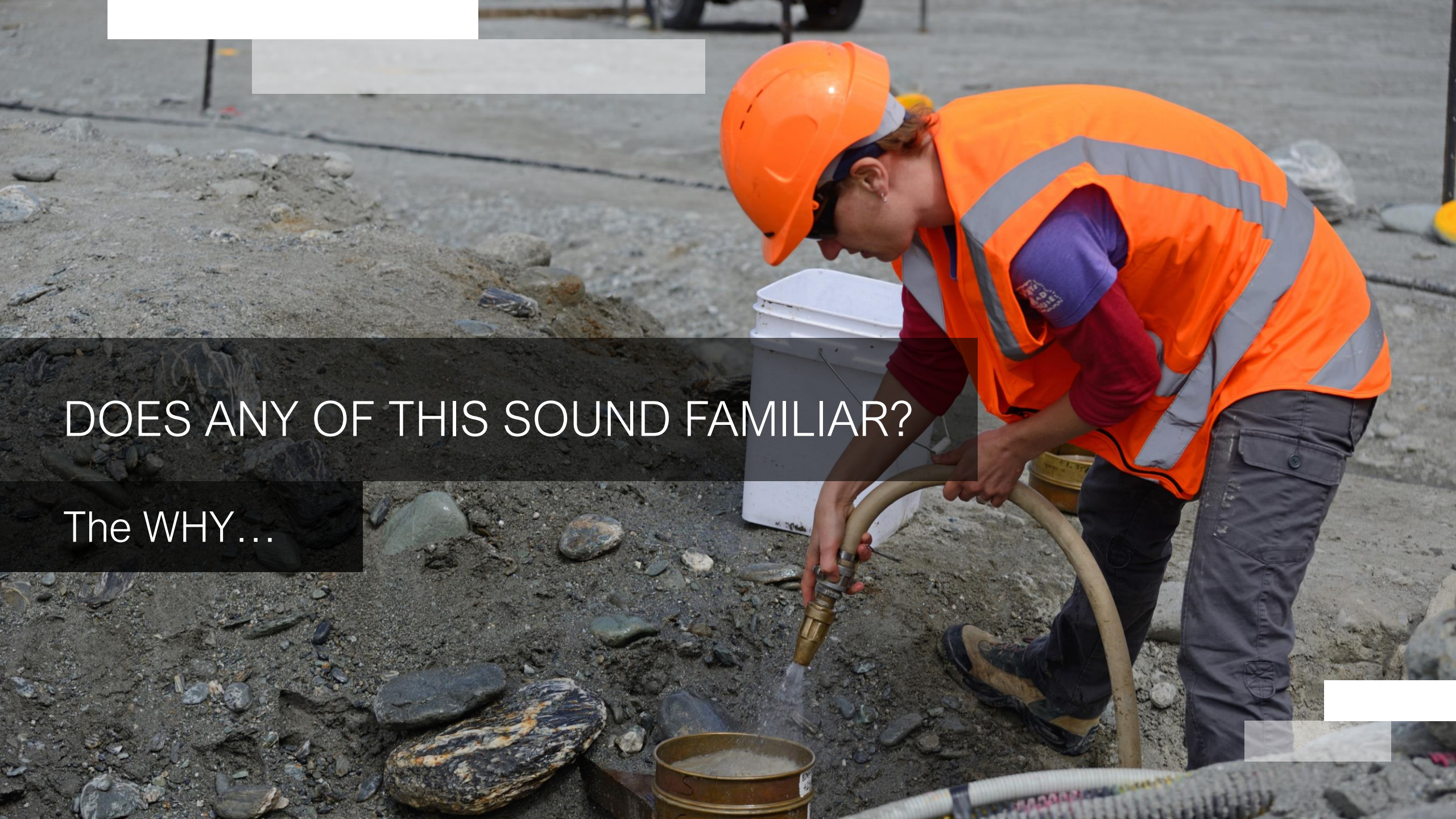
WHO IS SEEQUENT?

WHAT DO WE MEAN BY DIGITAL TRANSFORMATION?

“Digital transformation is the integration of digital technology into all areas of a business, **fundamentally changing how you operate and deliver value to customers.**

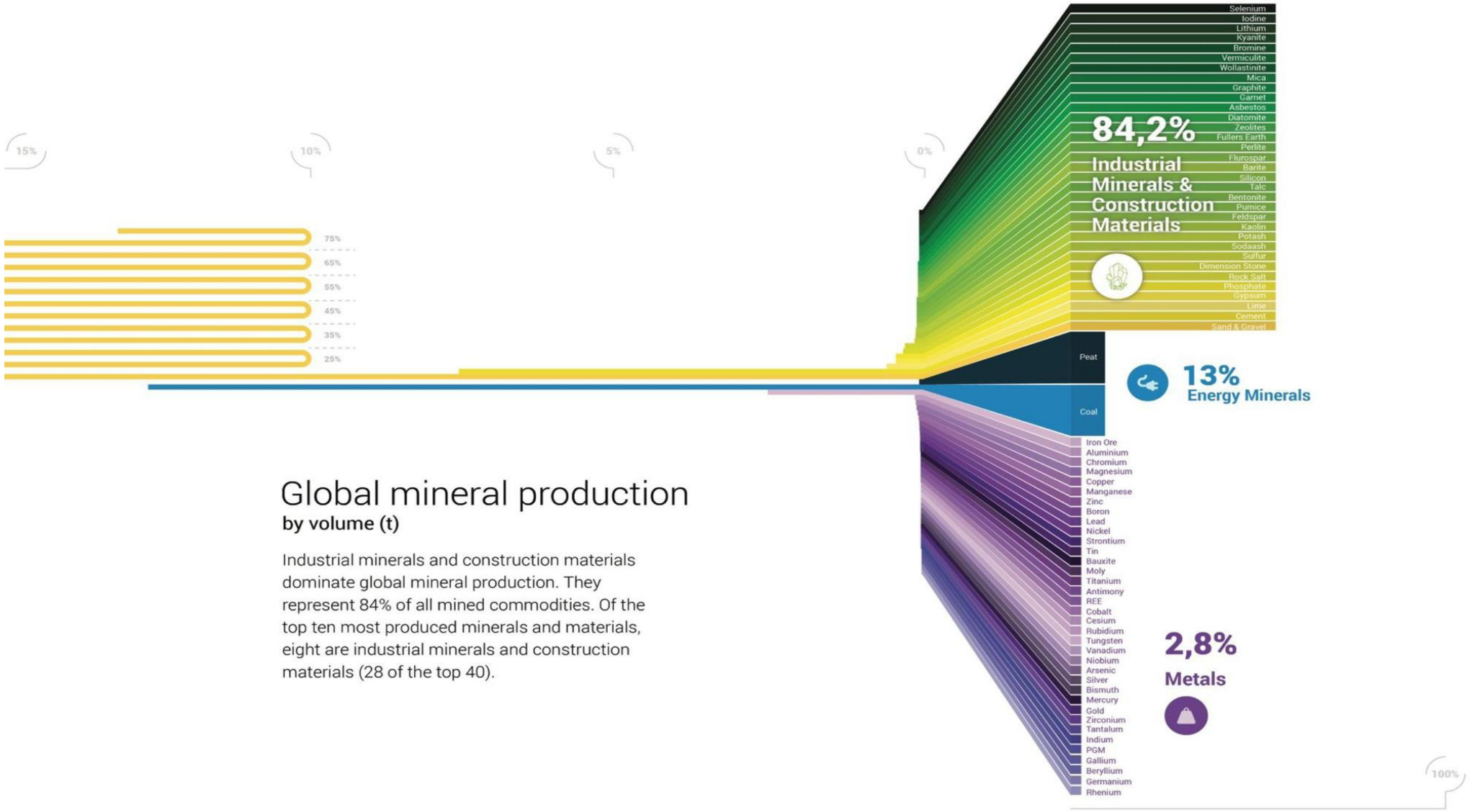
It's also a cultural change that requires organizations to continually challenge the status quo, experiment, and get comfortable with failure.“

https://enterprisersproject.com/what-is-digital-transformation



DOES ANY OF THIS SOUND FAMILIAR?

The WHY…



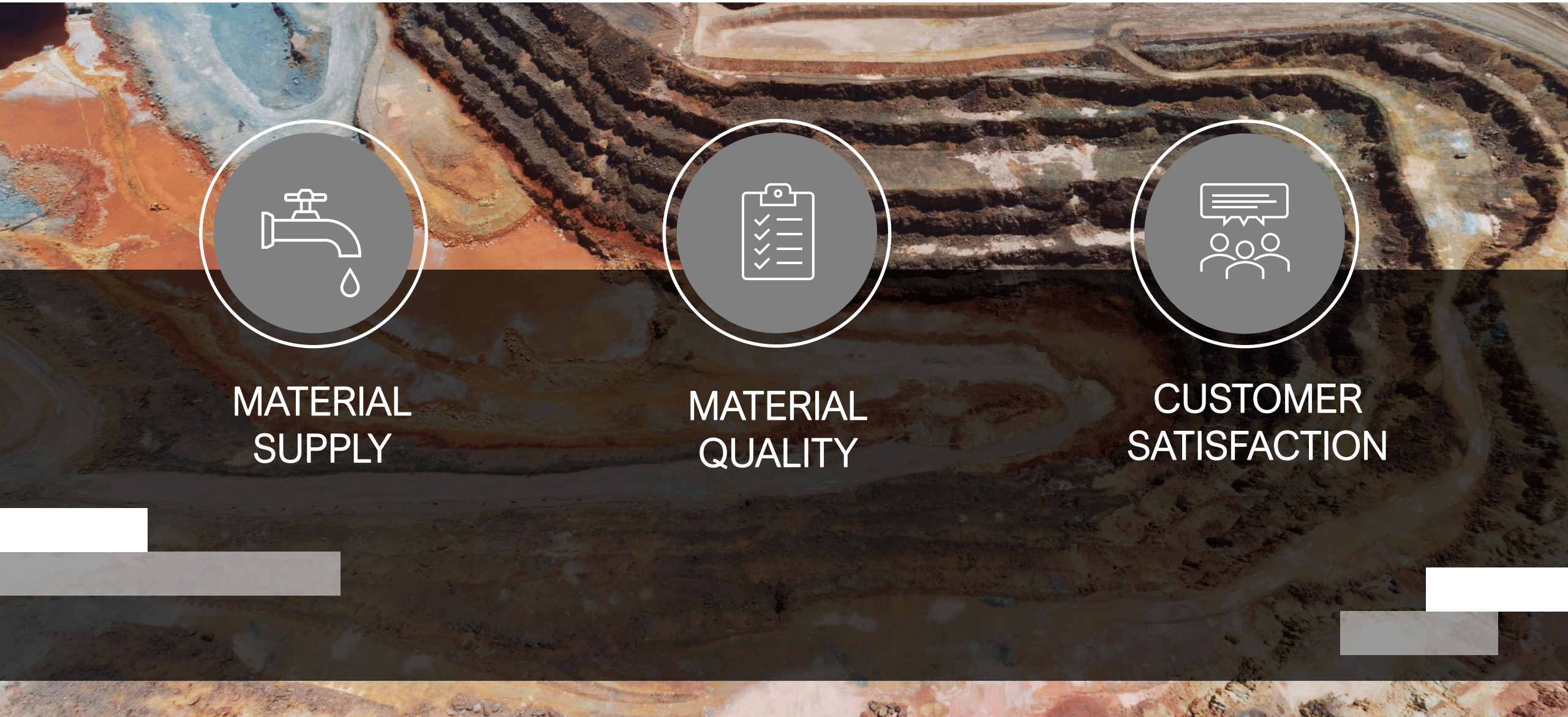
Global mineral production

by volume (t)

Industrial minerals and construction materials dominate global mineral production. They represent 84% of all mined commodities. Of the top ten most produced minerals and materials, eight are industrial minerals and construction materials (28 of the top 40).

Source: analysis by the authors, after Peduzzi (2014), UEPG (2015) and USGS (2017).
https://minerals.usgs.gov/minerals/pubs/mcs/2017/mcs2017.pdf

KEY PRODUCTION OBJECTIVES IN INDUSTRIAL MINERALS

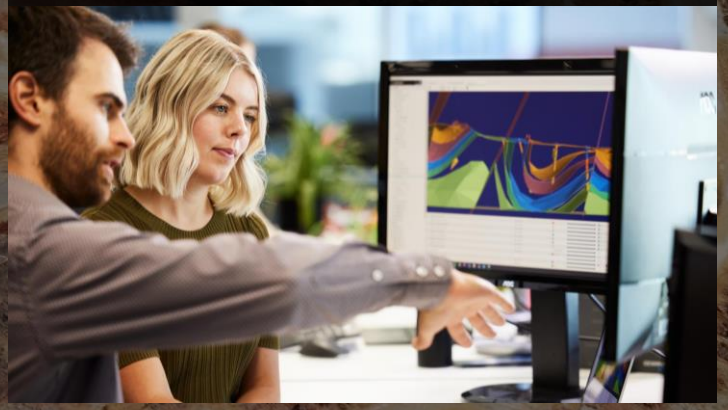


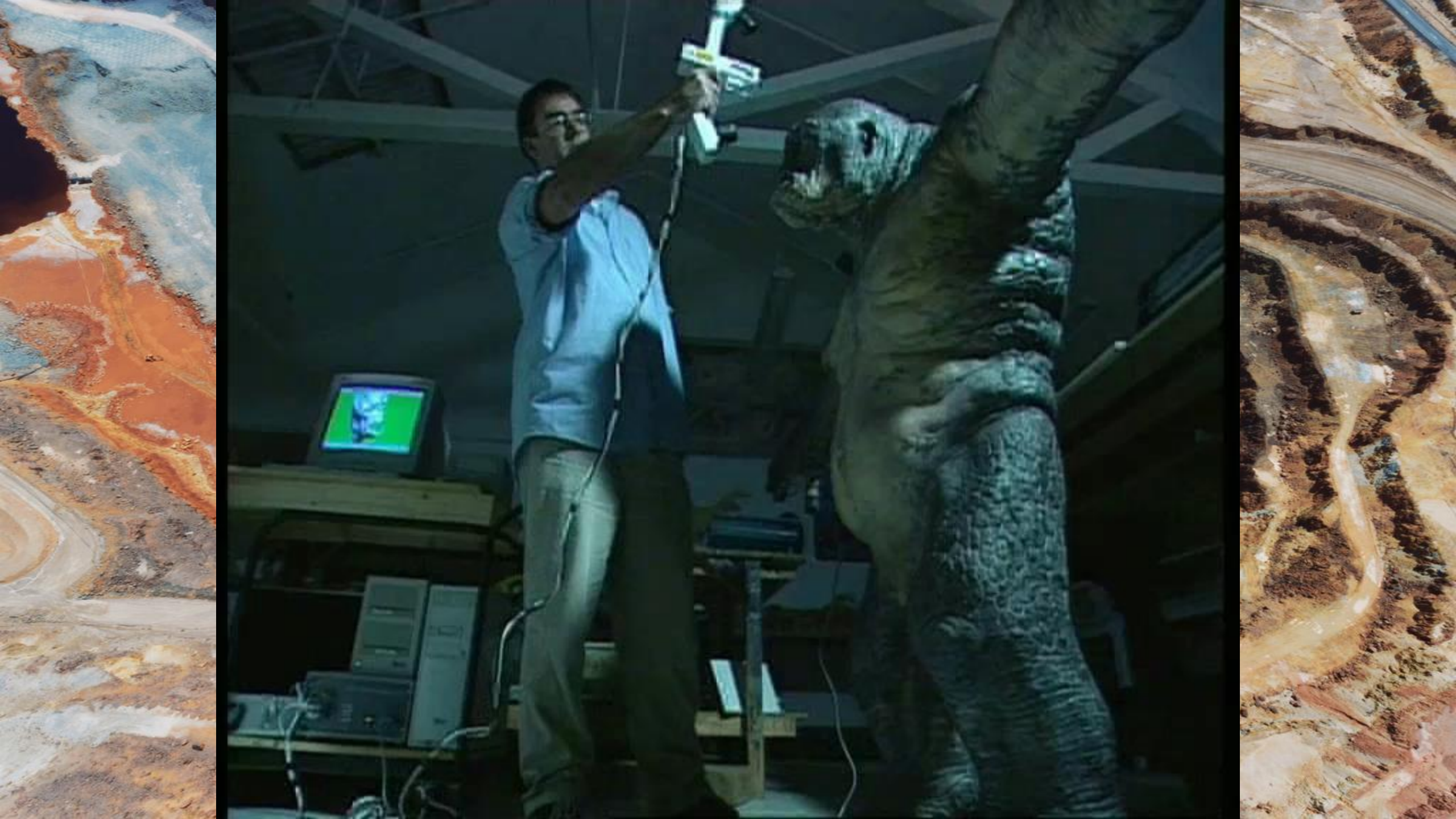
TECHNICAL CHALLENGES

DATA SILOS

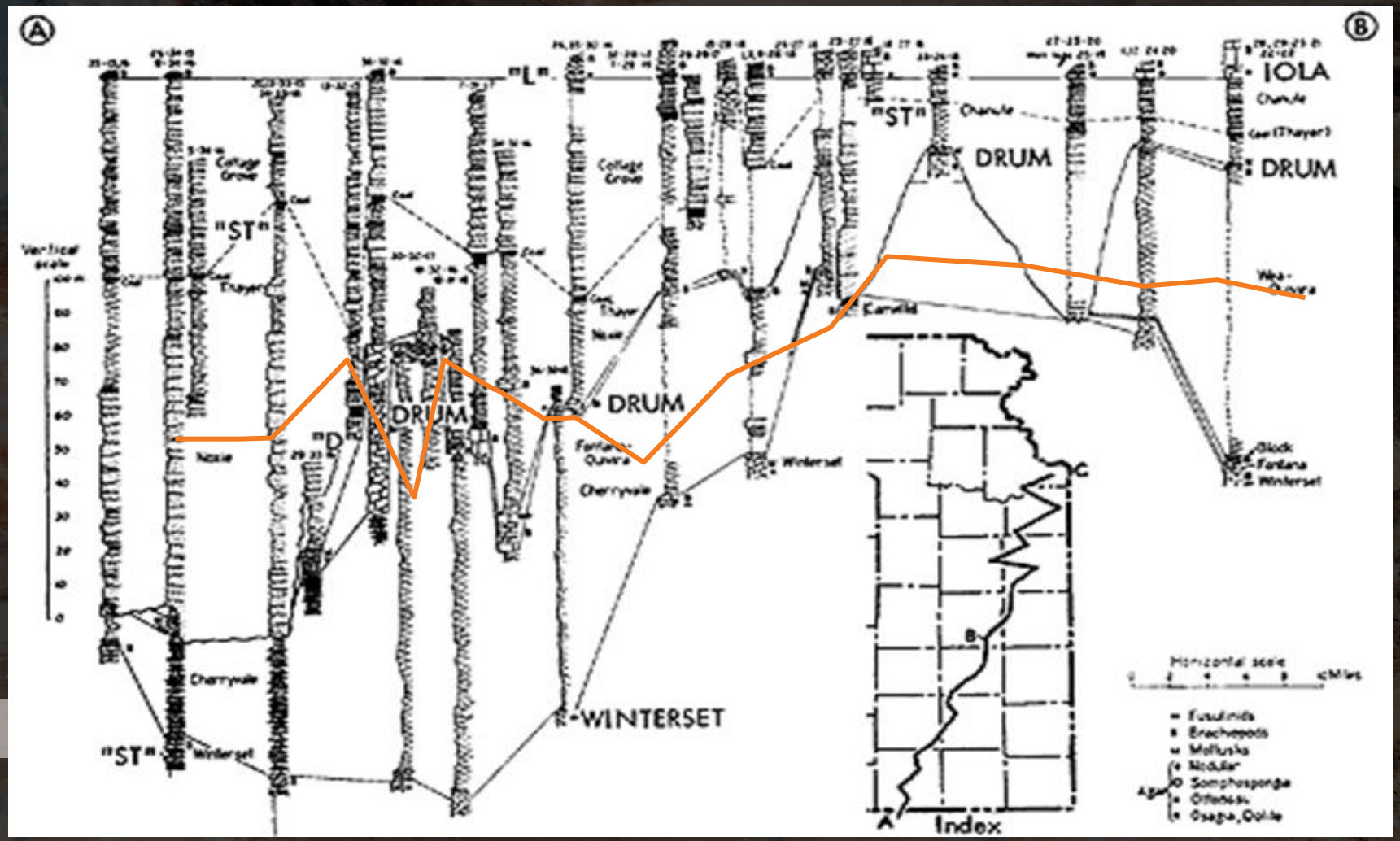
STANDARDISATION

COMMUNICATION & COLLABORATION





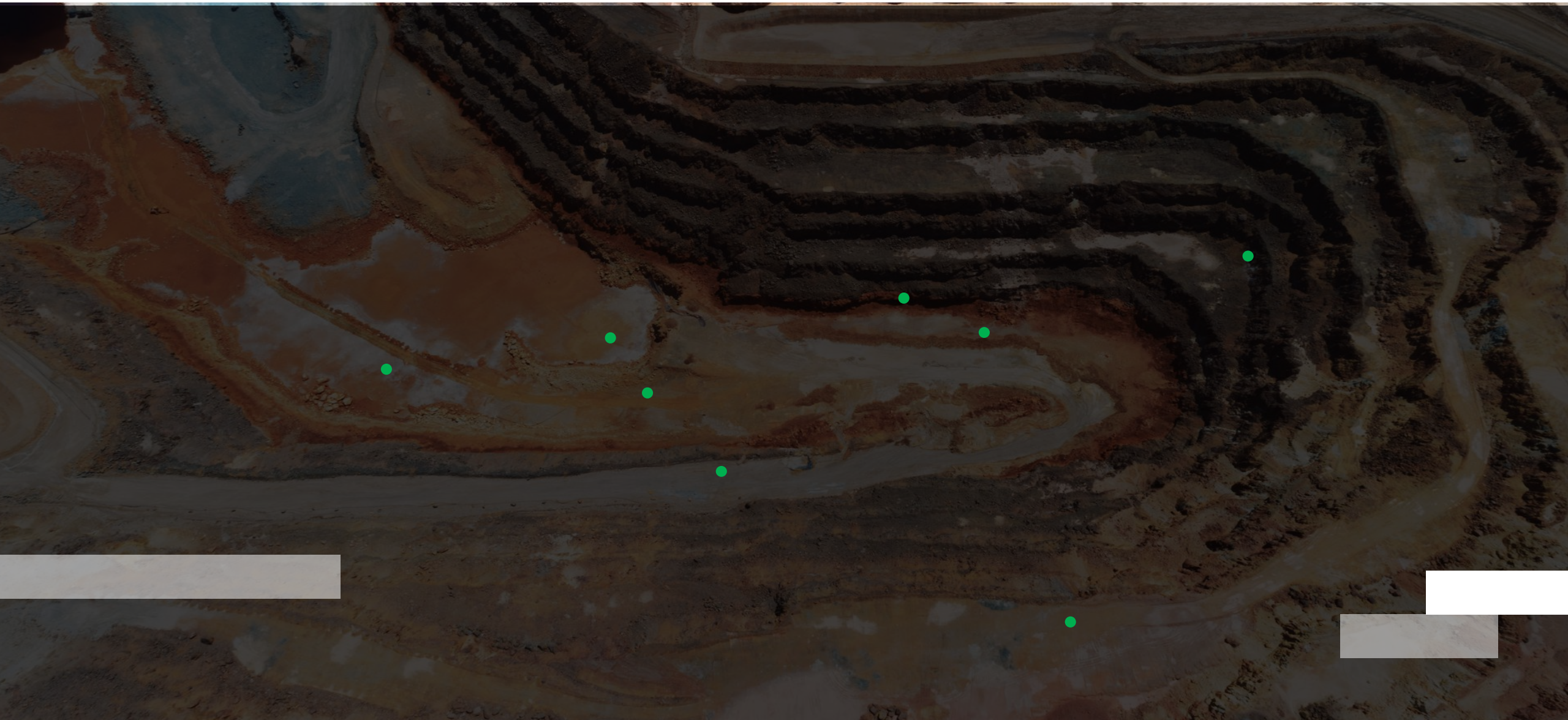
EXPLICIT MODELLING



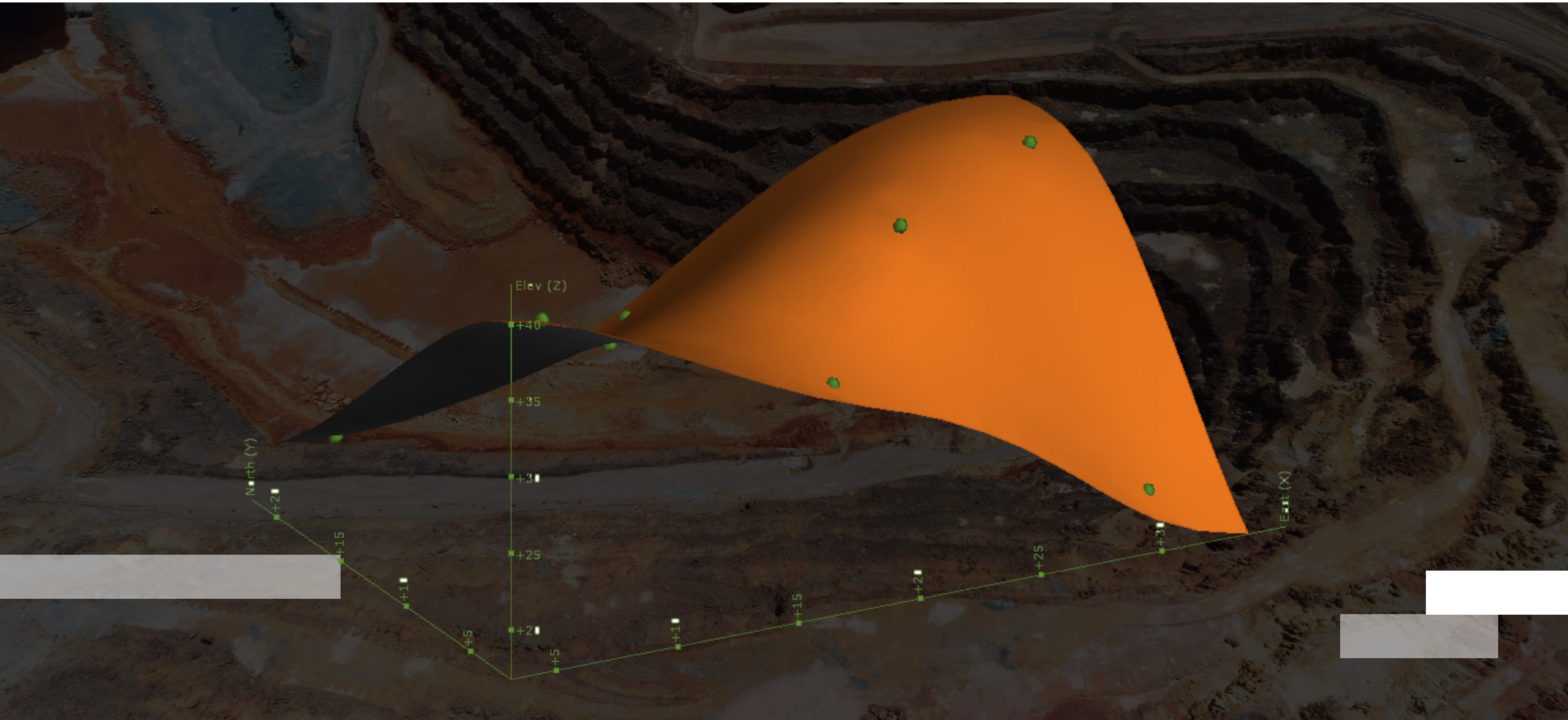
EXPLICIT MODELLING

IMPLICIT MODELLING

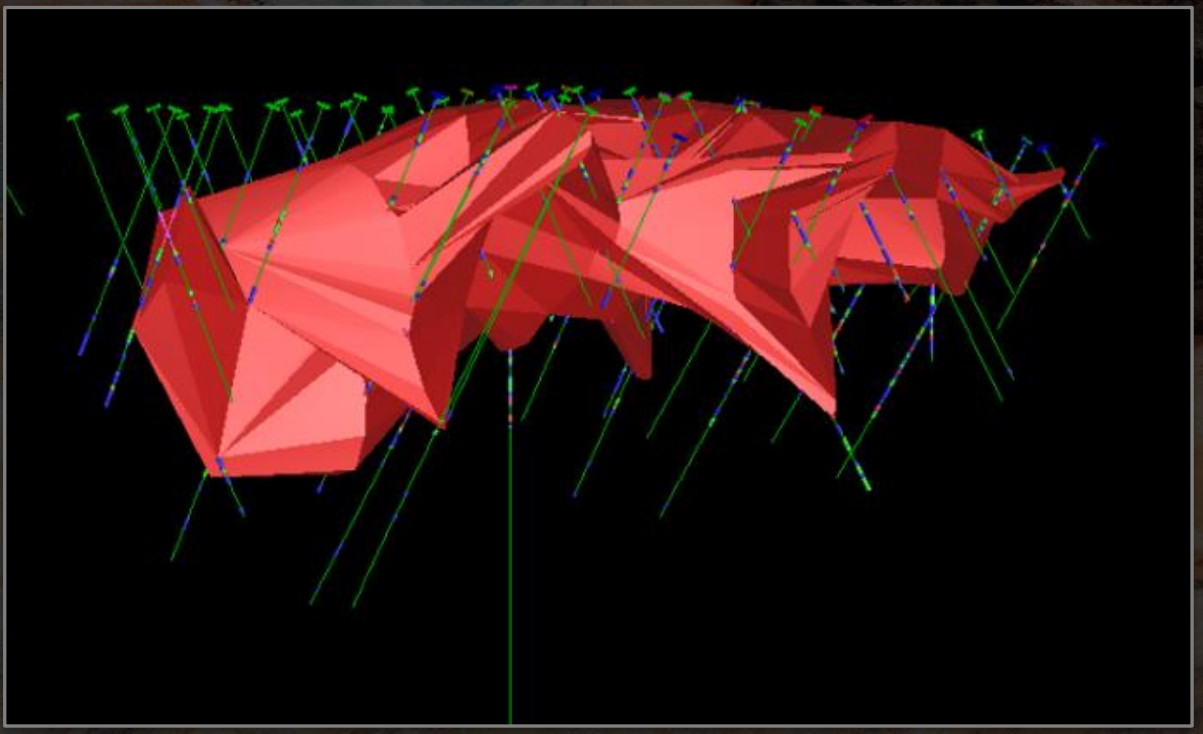
IMPLICIT MODELLING

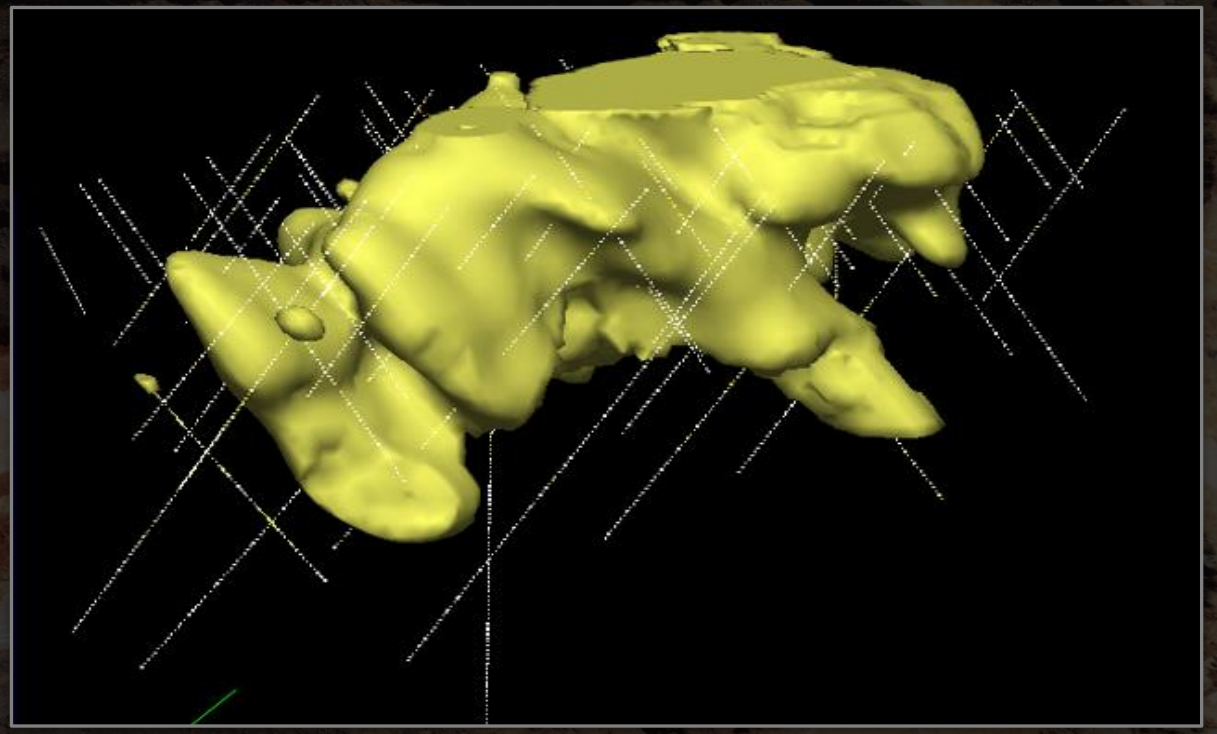


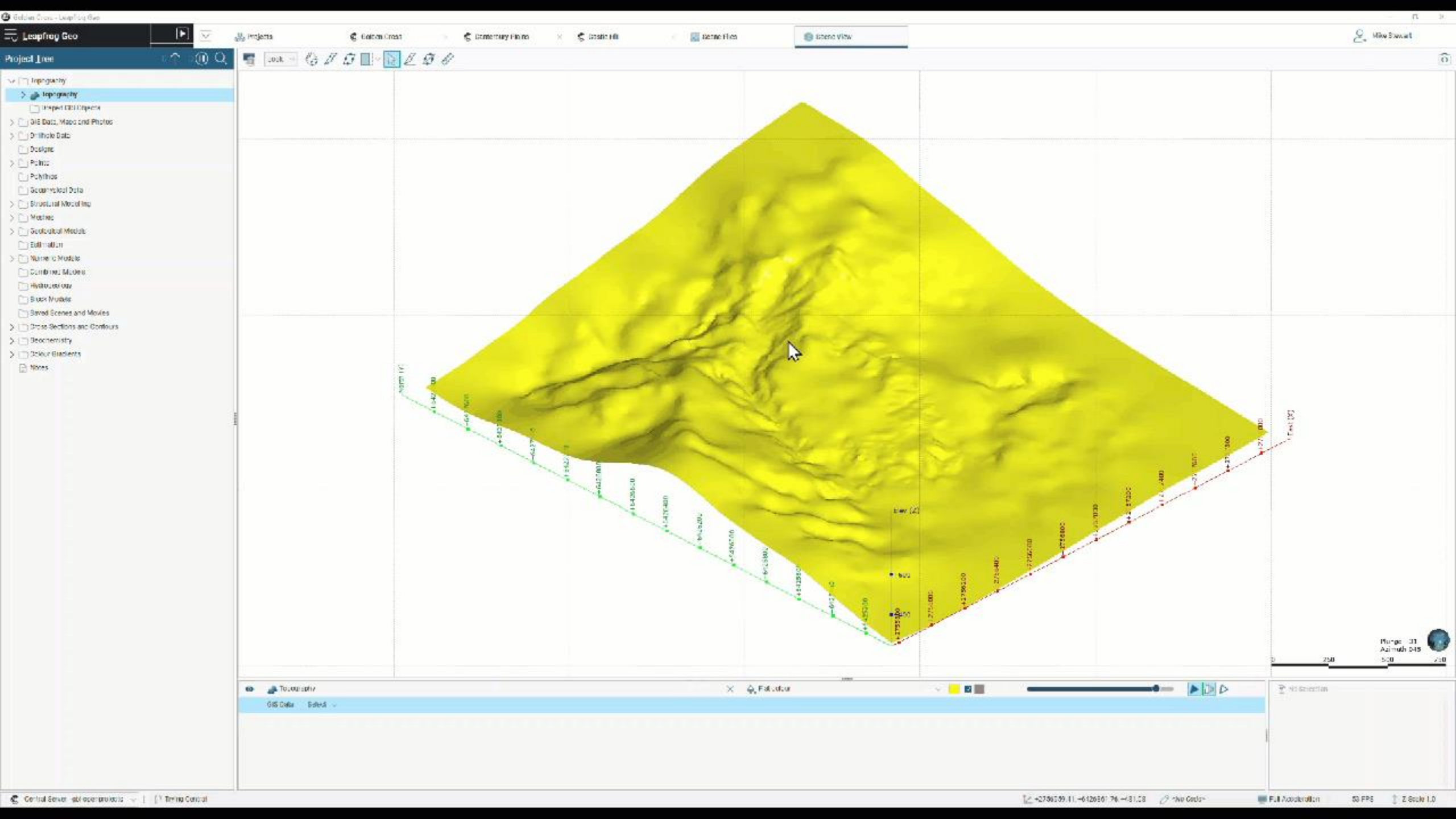
IMPLICIT MODELLING



A PARADIGM SHIFT IN GEOLOGICAL MODELLING






LeapFrog Geo
Project Tree
Topography
Topography
GIS Data, Maps and Photos
Drillhole Data
Designs
Points
Polylines
Geophysical Data
Structural Modelling
Meshes
Geological Models
Estimation
Numeric Models
Combined Models
Hydrology
Block Models
Saved Scenes and Movies
Cross Sections and Contours
Geochemistry
Colour Gradients
Notes
Scene View
Mike Stewart

LAFARGE HOLCIM CASE STUDY

SITUATION

2014 - Nobsa Cement Plant at risk of stopping production

Nobsa Quarry – complex geology, folded/faulted interbedded limestone, marl and clay

Couldn’t deliver to plan, high losses to waste, forced to truck high-grade limestone 30km to maintain quality

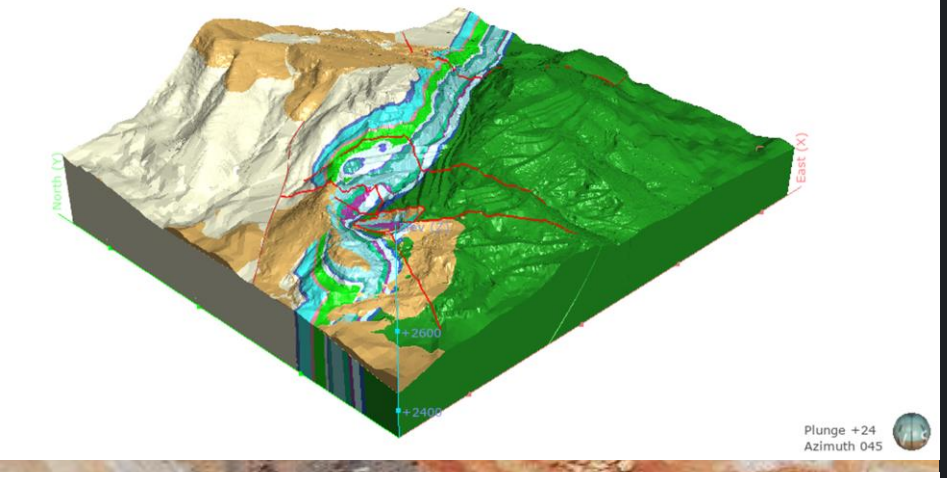
Invested in geological studies

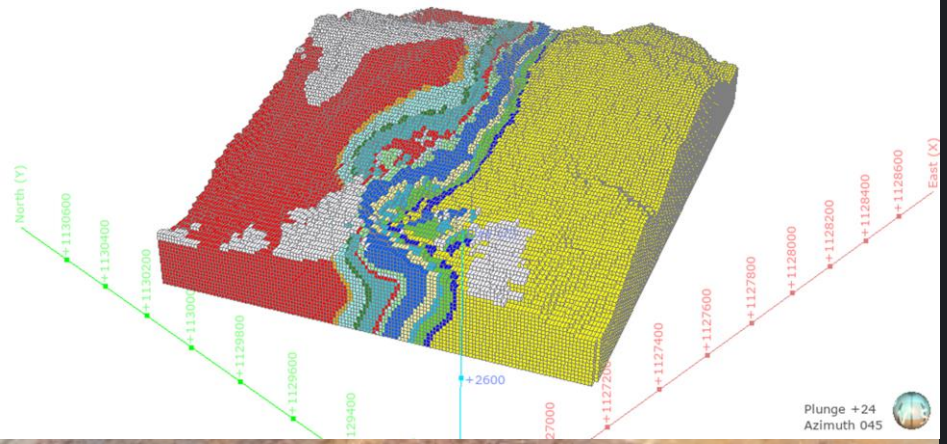
Developed high quality geological model and block model

Upskilling of geological team

LAFARGE HOLCIM CASE STUDY

OUTCOMES





Raw mix resources **increased** from 2 to 35 years

Saved $665,000 USD in first year using material previously defined as waste

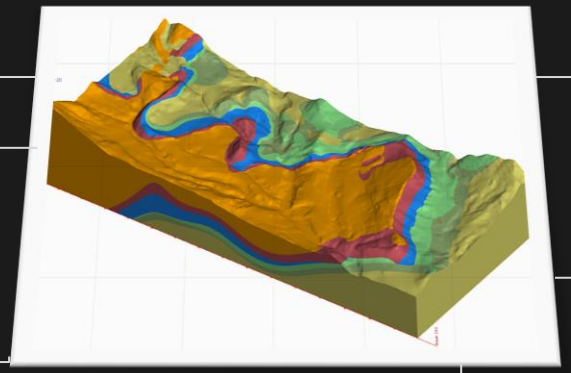
Stripping ratio **decreased** from **7:1 to 1.5:1**

Saved **$2.5M** USD per year of operating costs by not trucking in high grade material

Environmental benefits with the reduction in the volume of material being dumped

WHY FOCUS ON GEOSCIENCE DATA?

GEOSCIENCE DATA



PROCESSING

- Hardness
- Moisture
- Size

FLEET & EQUIPMENT

- Blast
- Strip Ratio
- Haulage

PRODUCT

- Quality
- Variability
- Availability

HUMAN RISK

- Geotechnical risks
- Social license

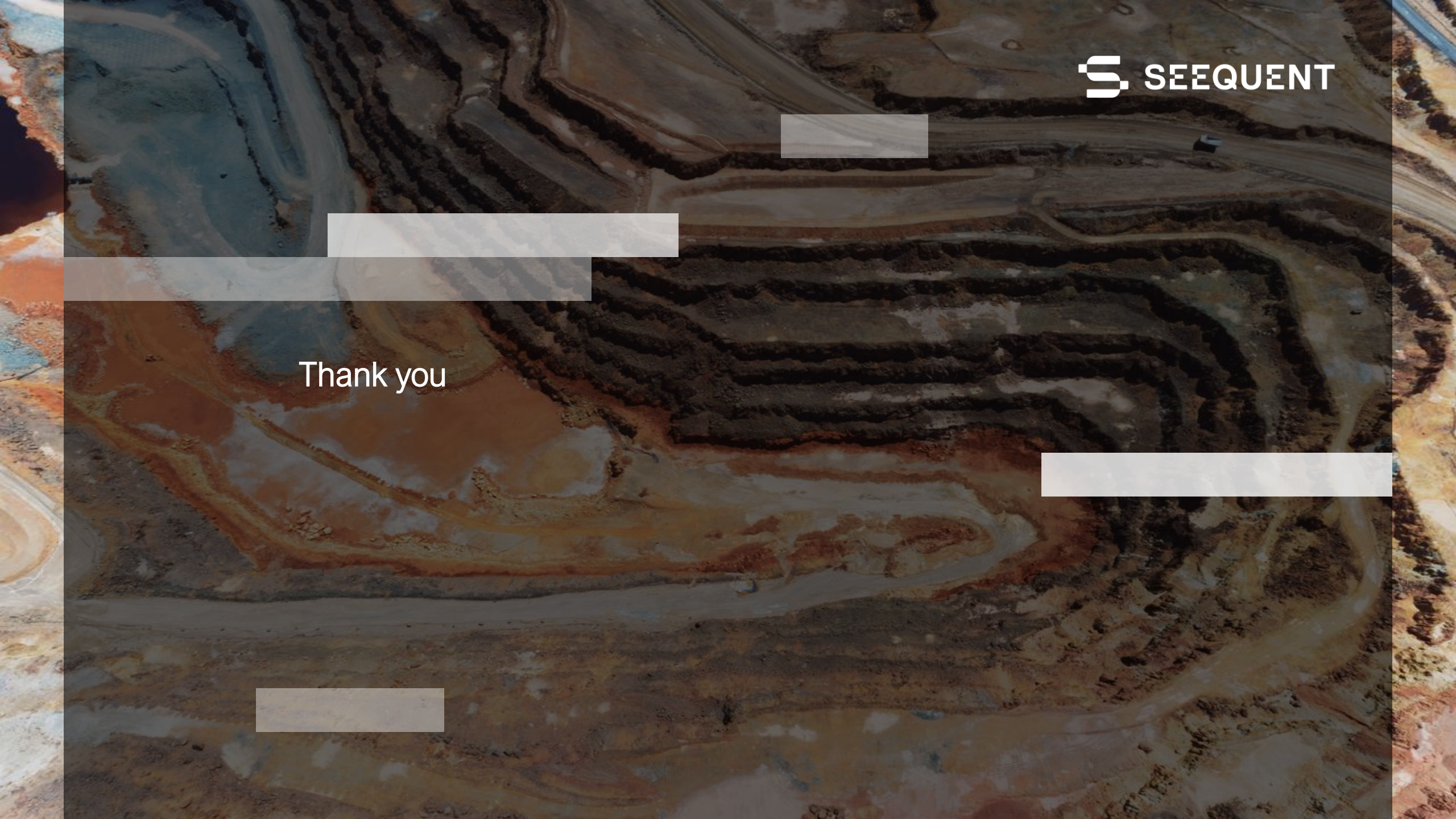
RESOURCE

- Reconciliation
- Recovery
- Grade
- Reporting
- Volume

ENVIROMENTAL RISK

- Rehabilitation
- Tailings
- Water
- Emissions
- Water

Report: https://www.bcg.com/en-gb/publications/2021/adopting-a-digital-strategy-in-the-metals-and-mining-industry


SEEQUENT
Thank you