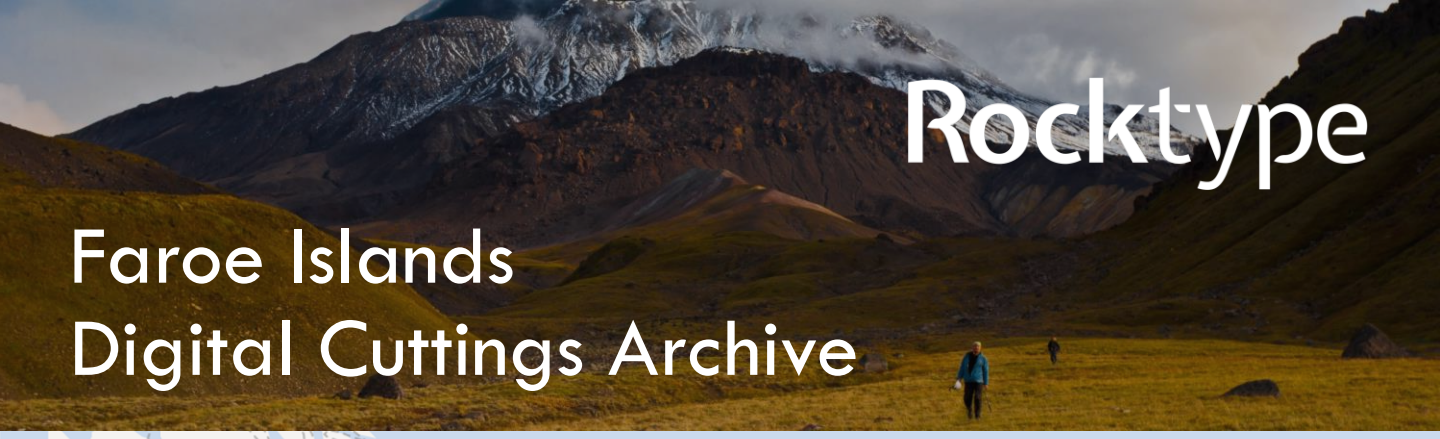


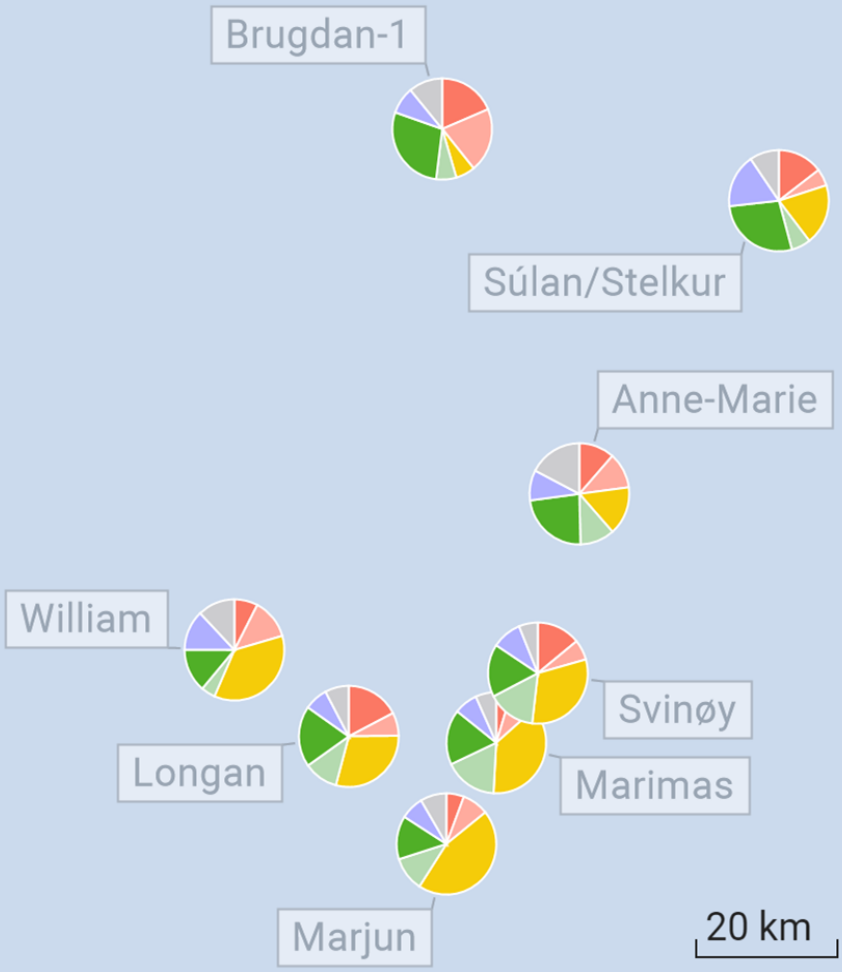
Rocktype

Faroe Islands Digital Cuttings Archive

N

Rocktype and the Faroese Geological Survey, Jarðfeingi, have created a digital cuttings record of the wells held in the Faroes Islands national archive. From first return to TD, each sample has been photographed and QEMSCAN analysed.

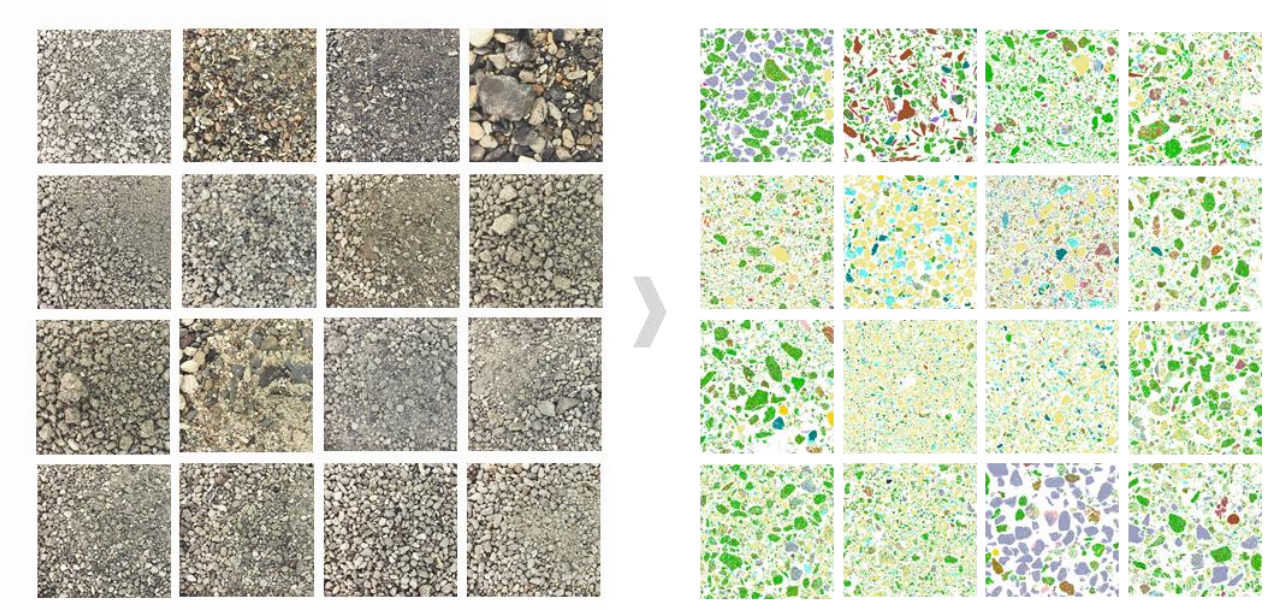
8 Wells **4750** Samples **7** Lithotypes **133** Mineral phases



- Mafic Igneous
- Volcaniclastic
- Sandstone
- Siltstone
- Shale
- Limestone
- Other

Samples and Analysis

This study offers new insights into the mineralogy, grain size and potential source of volcanic, volcaniclastic and clastic units. It can provide information for use in evaluations of both sediment provenance and reservoir quality, an exciting avenue in opening up this complex region and reducing future exploration risk.



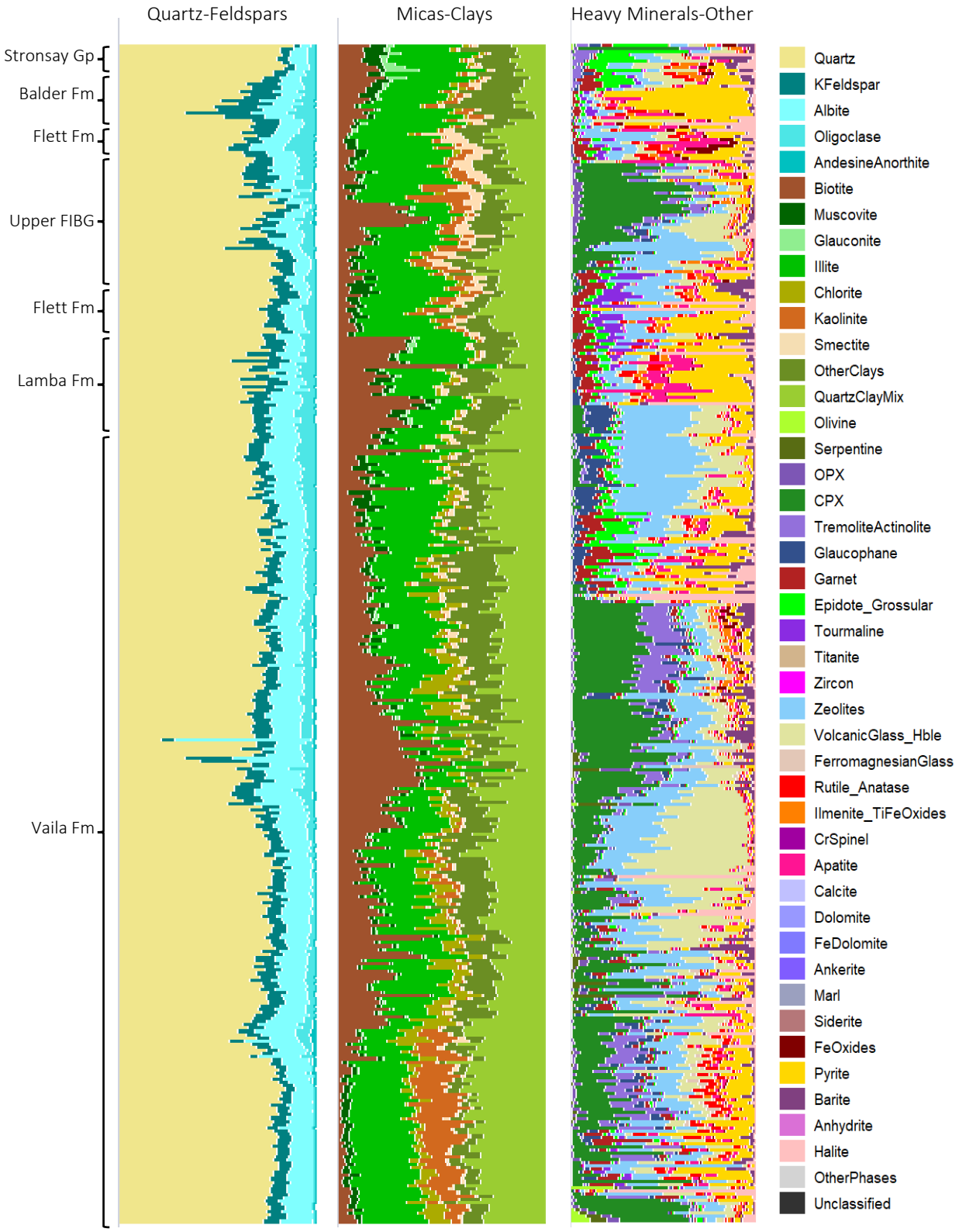
Real and digital cutting samples from Faroese well 6004/12-1, courtesy of Jarðfeingi (Faroese Geological Survey). Samples were set in resin mounts, polished and carbon coated before undergoing QEMSCAN analysis at 50 µm resolution.

Quartz	Chlorite	TremoliteActinolite	FerromagnesianGlass	Marl
KFeldspar	Kaolinite	Glaucophane	Rutile_Anatase	Siderite
Albite	Smectite	Garnet	Ilmenite_TiFeOxides	FeOxides
Oligoclase	OtherClays	Epidote_Grossular	CrSpinel	Pyrite
AndesineAnorthite	QuartzClayMix	Tourmaline	Apatite	Barite
Biotite	Olivine	Titanite	Calcite	Anhydrite
Muscovite	Serpentine	Zircon	Dolomite	Halite
Glauconite	OPX	Zeolites	FeDolomite	OtherPhases
Illite	CPX	VolcanicGlass_Hble	Ankerite	Unclassified

The data has been delivered in a Grouped Mineral List of **45 phases** commonly used in Oil and Gas. This list is optimised for visualisation as mineral map images and charts, and has been further classified across **7 lithotypes**.

A more Detailed Mineral List of **133 phases** is also included, which is ideal for image processing and machine learning applications.

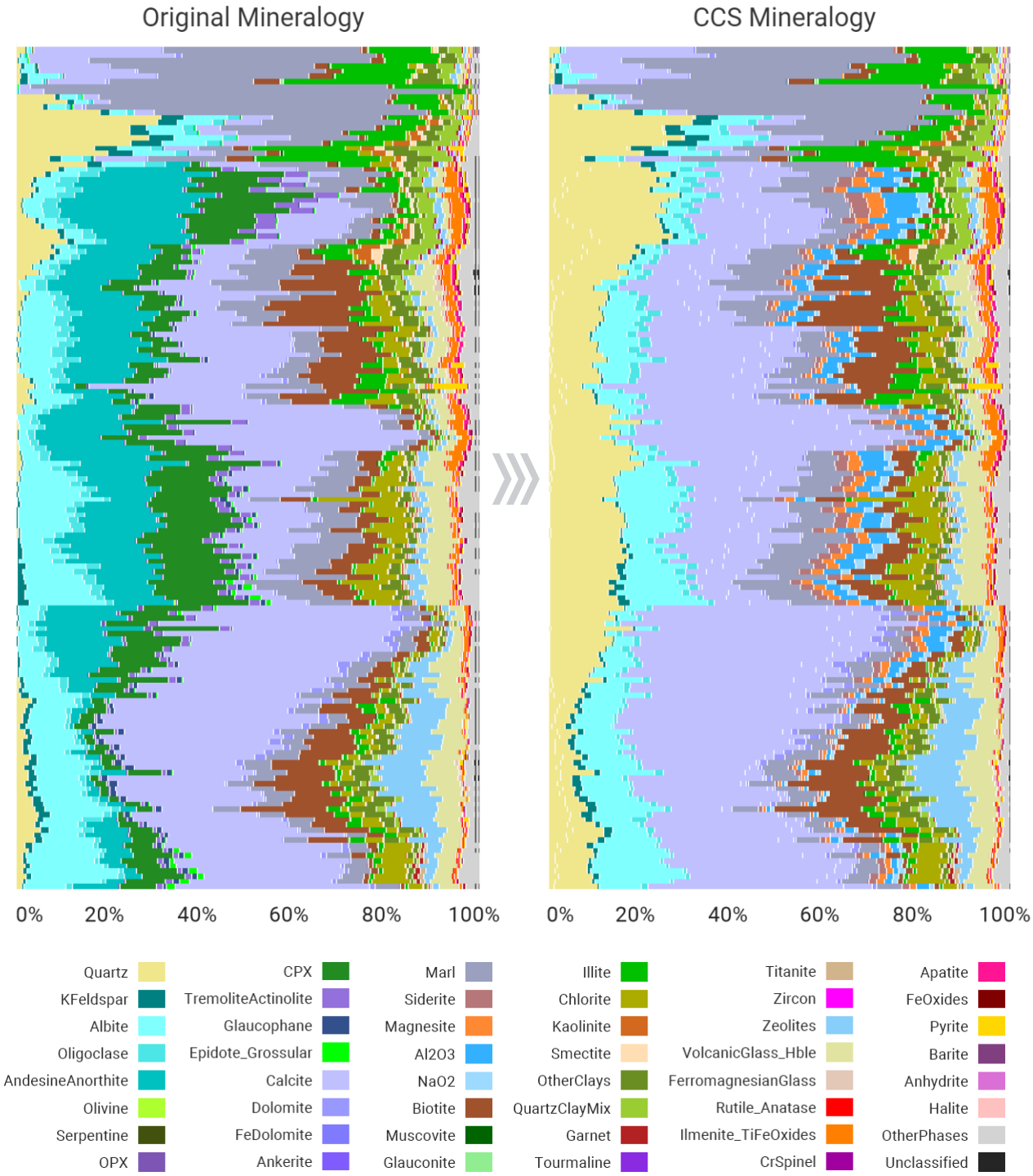
Modal Mineralogy



Throughout this well, it is possible to observe the compositional variations in the modal mineralogy, shown here as in a subdivision of tectosilicate (quartz-feldspars, left), mica-clays (middle) and additional phases (right). This rich datasets allows a wide range of interpretations to be done.

Carbon Sequestration & Mineralisation

Carbon dioxide (CO_2) sequestration in the subsurface is important for achieving atmospheric decarbonisation. CO_2 can be stored in the pore spaces and through mineral trapping in clastic and mafic igneous reservoirs.



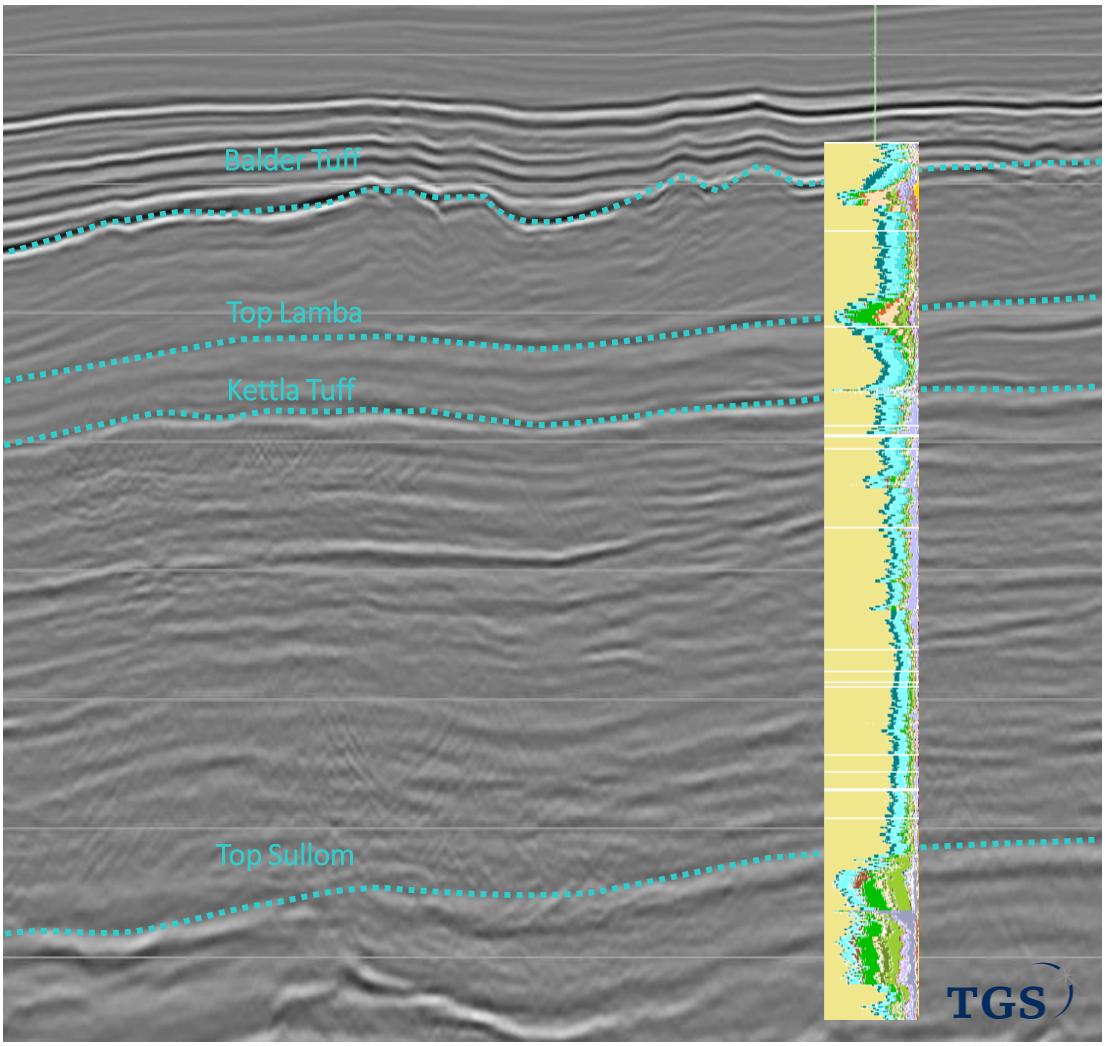
Left: QEMSCAN data for 300 samples from the Faroe Island Basalt Group for a single well showing the measured mineralogy. **Right:** Modelled post carbon sequestration mineralogy for the same well, assuming that carbon dioxide binding reactions consume all Ca-rich phases, producing principally calcite and silica.

Carbon Sequestration & Mineralisation *(continued)*

Within the emerging field of carbon mineralisation, such as enhanced weathering and carbon capture and storage (CCS), Rocktype can help assess the suitability of minerals to bind CO_2 and advise on parameter selection to optimise mineralisation workflows.

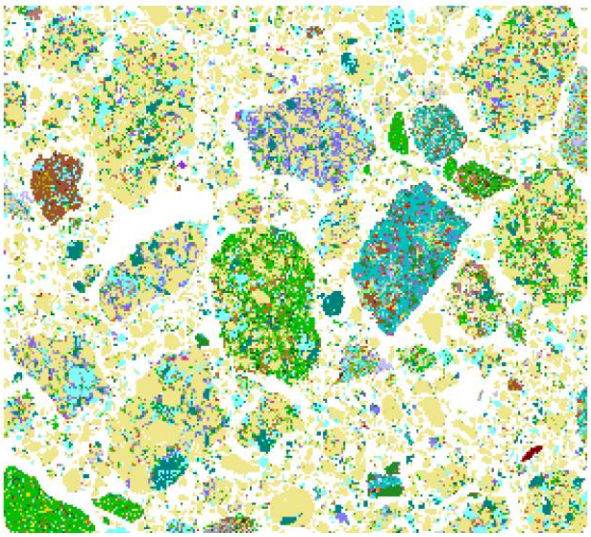
We can model, measure and visualise the changes to rock properties through mineralisation and verify the amount of CO_2 captured in mineral form. In addition, we work to help establish reporting codes for industry and public reporting of CO_2 captured in mineral form.

We carry out carbon dioxide binding reactions with a wet CO_2 rig in our laboratory.



The Marjun well with QEMSCAN data overlain, identifying key geological and seismic boundaries. Seismic line IS-FST-01-18 courtesy of Jarðfeingi (Faroese Geological Survey).

Delivered by Rocktype	
Visual mineral map	50 µm resolution mineral map PNG showing the 45 phases of the **Grouped Mineral List**, with colour legend, scale bar and on-image metadata
Raw mineral map	50 µm resolution mineral map PNG showing the 133 phases of the **Detailed Mineral List**, with embedded metadata, ideal for AI applications
Cuttings lithotyping	Each cuttings particle is assigned 1 of 7 lithotypes
Modal mineralogy	Per sample and per lithotype
Cuttings size index	Per sample and per lithotype
Average grain size	Per mineral phase, per sample and per lithotype
Calculated log values	Includes gamma ray, Vclay, grain density and grain neutron, per sample and per lithotype



Left: Cuttings sample from the Vaila Formation, Faroese well 6005/15- 1, provided by Jarðfeingi. **Right:** Mineral map from QS Cuttings, showing sandstone (yellow), shale (green) and dolerite (blue). QEMSCAN analysis by Rocktype.

v 1.0

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