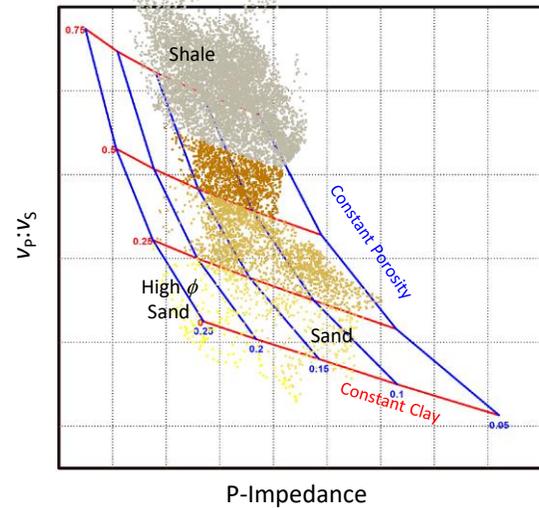


Rock physics links the geological properties of rocks to the elastic properties measured from seismic data. Modelling allows for systematic changes to be investigated and interpreted.

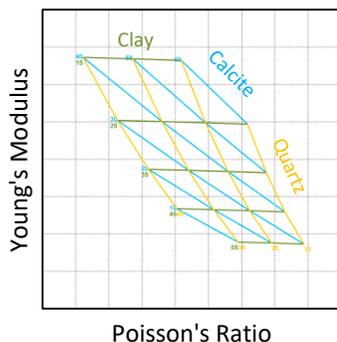
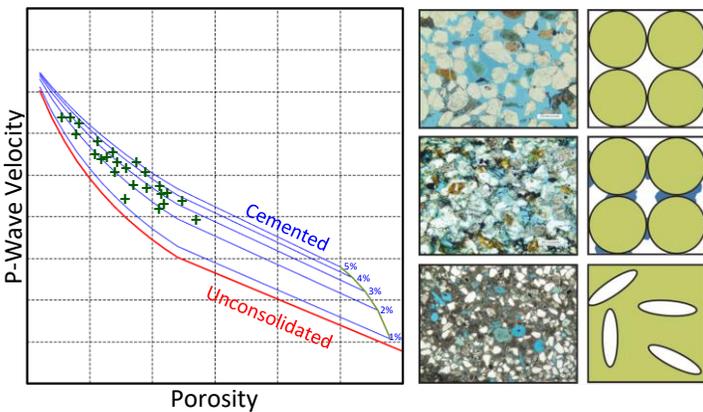
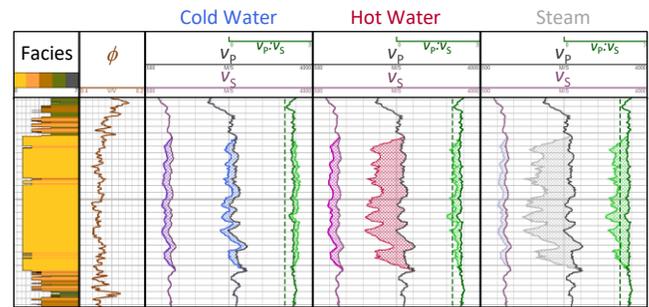
Crossplot Templates

Rock-physics templates are the result of creating a series of models with systematic property changes. These templates are used to interpret crossplots of elastic properties obtained from seismic inversion, giving the data geological significance. Templates are created to address the unique geological conditions of the investigated reservoir. Variables that can be changed in the template include mineralogy, porosity, fluid saturations, pressure, temperature, fracture density, and cementation. As a supplement to well data, rock-physics templates allow previously undrilled geology to be understood and compared with known areas.



Fluid Substitution

Fluid substitution can introduce the effects of different fluid properties into a rock-physics model, or it can be used to test the effects of changing fluids in a known well. Fluid substitution allows models to be created to investigate pressure depletion, steam injection, CO_2 flooding, or simply the difference in response between a reservoir saturated with hydrocarbons and one that is wet.



Calibration

Rock-physics models incorporate a wide array of available information, including core analysis, engineering data, and petrophysical calculations. Calibration of the modelled elastic properties to log and core data helps to test the appropriateness of the choice of model and verify any assumed parameters. Model types include those that are unconsolidated, cemented, or that consist of isolated pore space in a background medium.

Unconventional Modelling

Unconventional reservoirs require special attention to details that are not always relevant to conventional models. Special relationships are used for rocks saturated with heavy oil, rocks with mineral mixtures that have large contrasts in elastic properties, or for low-porosity reservoirs. Sound QI has experience with these types of plays in different basins.