



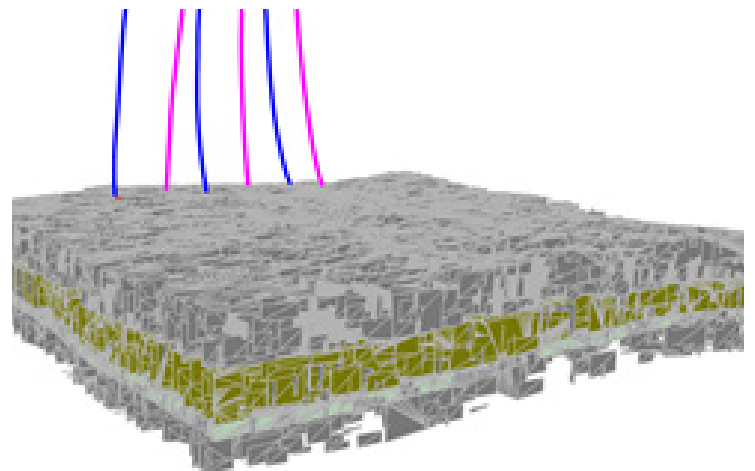
Fractured reservoir characterisation and modeling services

Fractured reservoirs present unique challenges in their characterization, analysis, modeling and decision making. WSP USA has unrivaled experience with its Discrete Fracture Network based approach and FracMan® software we meet these challenges head on.

WSP has been providing solutions for naturally fractured reservoirs for over two decades. These are notoriously difficult reservoirs to understand, but at WSP we bring together our global experience from petroleum, mining and waste disposal, combined with unique analytical tools, to provide you with practical timely solutions. We have worked on fractured reservoirs from across the world in a wide range of geological settings including fractured carbonates and sandstones, tight shales, controlled-beam migration, volcanics and fractured basement rocks.

We are experts in the development of geologically realistic fracture models-using these for reservoir appraisal, development, engineering and exploration. Combining a wealth of practical experience with access to our state of the art FracMan Discrete Fracture Network (DFN) modeling environment, to provide you with solutions to your fractured reservoir problems.

So whether its imaging, analysis, modeling or simulation, WSP can provide you with the expertise to help you unlock the potential of your fractured reservoirs.



Fractured reservoir geology

- Analysis of faults and fractures
- Fracture analysis from geophysics
- Discrete fracture reservoir modeling
- Field scale fracture extrapolation
- Reservoir architecture assessment
- Microseismic data visualization
- Fractured core logging
- Fracture mapping and geomechanical characterization

Fracture reservoir static modeling

- Reservoir volumetrics
- Tributary drainage volumes
- Compartmentalization analysis
- Matrix-fracture interaction
- Subsidence analysis
- Deep water injection modeling
- Cap rock integrity for gas storage

Fractured reservoir dynamic modeling

- True multiple porosity/multiple permeability dynamic simulation
- PLT, DST and production test data analysis and interpretation
- Multiphase discrete fracture network flow modeling
- Dynamic data calibration and conditioning
- Dynamic upscaling

Fractured reservoir engineering

- Development strategies
- Well trajectory optimization
- Fracture permeability upscaling
- Fracture porosity analysis
- Stress/permeability coupling
- Fracture anisotropy and heterogeneity
- Uncertainty analysis
- Risk assessment
- IOR strategy development
- Critical stress analysis
- In-situ stress changes due to hydraulic fracturing
- Induced seismicity predictions
- Coupled geomechanics and dynamic flow simulation
- Field development strategies

Hydraulic fracture modeling

- Full 3D analysis
- Multistage hydraulic fracture simulation
- Microseismic data matching
- Infill strategies
- Completion and hydraulic fracturing strategies
- Simulated post-frac production
- Refracture simulation
- Exploration prospect evaluation

ABOUT WSP

As one of the world's leading professional services firms, WSP exists to future-proof our cities and environment. We provide strategic advisory, engineering, and design services to clients in the transportation, infrastructure, environment, building, power, energy, water, mining and resources sectors. Our 55,000 trusted professionals are united by the common purpose of creating positive, long-lasting impacts on the communities we serve through a culture of innovation, integrity and inclusion. Sustainability and science permeate our work. To find out more, visit wsp.com.

CONTACT US

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