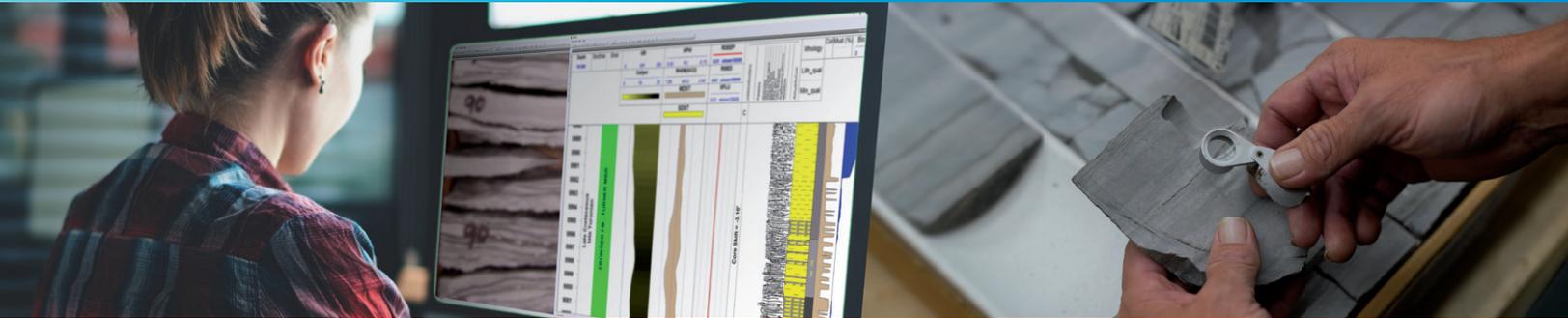


ResPack Sedimentology

Reservoir details from precise rock interpretation



INDUSTRY CHALLENGES

Quality

Accurately predicting and identifying quality reservoir/seal couplets plays a key role in exploration and development success.

Distribution

Heterogeneous formations present a host of challenges related to reservoir distribution. Determining depositional settings and styles helps optimize development plans.

Connectivity

Knowing vertical and lateral geometries, both in discrete and amalgamated sand bodies, provides better understanding of reservoir connectivity.

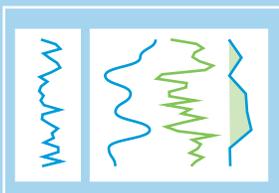
GEOSCIENCE SOLUTIONS

RESPACK SEDIMENTOLOGY ADVANTAGES

- Identify new opportunities through predictive modeling of sedimentary architectures derived from core and facies analysis
- Understand reservoir development risks through petrographic and diagenetic evaluations
- Recognize rock types for geologically constrained petrophysical modeling, upscaled to seismic
- Add regional stratigraphic frameworks and geological context to your seismic data using seismic stratigraphy interpretation

SEDIMENTOLOGY STUDY HELPS IDENTIFY LOW-RISK RESERVOIRS

A regional **ResPack Sedimentology** study of the Frontier Formation within the Powder River Basin evaluated depositional setting, sand body continuity, and reservoir quality to better understand the regional prospectivity of the play. The study — completed by integrating core facies analysis, petrography, biostratigraphy, petrophysics, and seismic interpretation of stratal slices — was used to extrapolate facies into uncored intervals across the basin and identify low-risk [better reservoir quality] frontier formation reservoirs.



Core description and facies analysis



Reservoir quality analysis



Reservoir quality linked to depositional facies



Conceptual depositional models for reservoir development

ResPack Sedimentology revealed details of the Frontier Formation reservoir using in-depth formation analysis.

RESPACK SEDIMENTOLOGY DELIVERABLES

Rock typing

- Core description charts, integrated with wireline and core data, for detailed facies analysis designed for core-log-seismic upscaling
- Rock typing classification from cuttings samples
- Provenance analysis



Reservoir quality

- Petrographic analysis for bulk rock mineralogy and reservoir quality analysis
- Diagenetic sequencing
- Particle size distribution, cement/clay volumes and distribution, and pore types and distribution



Stratigraphy

- Sequence stratigraphic framework from litho- and chronostratigraphy interpretations
- Depositional models of study formations
- Seismic sequence stratigraphy interpretation



RESPACK SEDIMENTOLOGY ADD-ONS

Biostratigraphy	Evaluation and determination of formation age and depositional environment. Key input to regional stratigraphic understanding with sedimentology.
RoqScan™	Automated mineralogy to provide geological ground-truth calibration for petrophysical analysis, rock physics, and reservoir characterization.
ResPack Hydrocarbons	Evaluation of source rock potential and hydrocarbon occurrence.
ResPack HD	Geostatistical inversions of rock-constrained petrophysical lithofacies, providing fine-bed equiprobable rock property solutions for seismic volumes.
ResPack Fast	Deterministic inversion utilizing well logs, 3D seismic data, and machine learning to deliver rock properties fast.
ResPack Structure	Evaluation of faults, fractures, karsts, and geobodies from 3D seismic using coherency and curvature analysis.

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