

Expro Excellence

Delivering accurate Injection profiling in a complex reservoir

Well Intervention and Integrity



Objectives and background

- The operator required a detailed understanding of water injection distribution across a complex, multi-zone reservoir with barriers and sleeves in place. However, several factors made this difficult:
 - Uncertainty in injection rates** relative to expected reservoir permeability, limiting confidence in the reservoir model
 - Need for an accurate zonal injection profile** to understand sweep efficiency and optimize waterflooding
 - Low injection rates** in the 7" casing section, reducing the effectiveness of conventional spinner-based measurements
 - Annular flow behind tubing**, compromising the reliability of standard Injection Logging Tool (ILT) strings
 - A highly **complex completion design**, making zonal attribution challenging
 - Standard logging approaches could not reliably meet these objectives, requiring a tailored and technically advanced solution

Expro Excellence

- Expro leveraged technical expertise and innovation to deliver a **customized logging and interpretation solution**, specifically designed for the well conditions
- Developed a **bespoke logging procedure** tailored to low-rate injection and complex completion architecture
- Adapted the **data interpretation workflow** to ensure seamless integration with third-party systems
- Applied a **non-standard, multi-method interpretation approach**, combining:
 - ILT measurements
 - Thermal inversion analysis
 - Spectral noise analysis
- This integrated methodology enabled accurate identification of zonal injection behavior, overcoming the limitations of conventional techniques.
- Successfully distinguished flow contributions despite **annular flow interference**
- Delivered robust results in conditions where traditional logging methods would be unreliable
- Expro also demonstrated strong collaboration with third-party providers, ensuring **smooth execution and effective communication** throughout the project

Value to the client

- Expro's solution delivered critical insights and measurable value:
 - Identified that **~75% of injected water** was being absorbed by a single sand, with minimal contribution from other zones
 - Enabled the operator to **verify well integrity** and accurately quantify injection rates, previously unknown to surface teams
 - Provided data to **update and refine the reservoir model**, improving forecasting and long-term field performance

Operational Impact

- Optimized **waterflood strategy and reservoir pressure management**
- Enabled targeted interventions such as:
 - Adding perforations
 - Adjusting sleeve configurations
 - Selective stimulation of underperforming zones

Business Value

- Improved **decision-making speed and confidence**
- Reduced uncertainty in reservoir performance
- Unlocked opportunities to **enhance recovery and production efficiency**

Enhanced production



Cost saving

