Weatherford®

REAL RESULTS

DwC™ Technology, Defyer™ Bits, TorkDrive™ Tool Optimize Vienna Basin Drilling in One Trip, Save Rig Time, Costs, Improve HSE

Objectives

- Reduce drilling costs by applying drilling-with-casing (*DwC*) technology in the Vienna Basin. This region of Europe is the standard for continental Europe as new drilling technologies are applied and introduced here first. Low production rates from mature reservoirs demand optimized drilling cost and reduced budget.

Results

- Weatherford's Total Depth® engineering team worked in close collaboration with the operator to conduct a thorough analysis of the wells. To ensure there were no issues with conglomerates and gravels, the operator drilled the first 196 ft (60 m) of the well with a 17 1/2-in. conventional bit.
- Weatherford used *DwC* technology to deploy Weatherford's 13 3/8- × 16-in. *Defyer* DT506 drillable-casing bit in combination with the remotely operated OverDrive™ system featuring the *TorkDrive* 500 Compact ™ internal clamping tool (ICT).
- Drilling commenced and continued with the following general parameters: single-shot surveys every 328 ft (100 m), rpm rates of 20 to 80, weight-on-bit (WOB) between 1.1 to 11 tons (1 to 10 metric tons), flow up to 507 gal/min (1920 L/min), a standard pipe pressure of 290 to 580 psi (20 to40 bar), and torque values varying from 737 to 4,425 ft-lb (1 to 6 kNm).
- Good rates of penetration (ROP) were achieved in the early stages. Hard, thin stringers were often encountered between 951 to 1,230 ft (290 to 375 m). On these stringers, the ROP would drop off to ± 9.8 ft/hr (3 m/hr), while the average on-bottom ROP throughout the job was 60.46 ft/hr (18.43 m/hr).
- The combination of technologies enabled the operator to reach section total depth (TD) with almost no change in vertical inclination. The string was cemented with good results and with the DT506 drill-out time having little or no appreciable effect on rig time.
- A total of 38 joints of 13 3/8-in. 54.5 lb/ft (81.2 kg/m) casing were picked up and drilled down from 196.0 to 1,545.9 ft (60.0 to 471.2 m). Total casing drilling time was 35.6 hr at an ROP of 37.7 ft/hr (11.5 m/hr). Total on-bottom time was 22.3 hr, providing an on-bottom ROP of 60.46 ft/hr (18.43 m/hr).
- The operator experienced no accidents or health, safety, and environmental (HSE)-related concerns.

Weatherford's *Defyer* drillable-casing bit provides custom solutions for *DwC* operations in any environment. The innovative, robust design of the *Defyer* tool is capable of penetrating soft, medium, or hard formations. The *Defyer* series delivers the technology, features, and adaptability that conventional methods cannot offer.

Location
Austria, Vienna Basin

Well Type
Onshore, production

Section Total Depth
1,545.9 ft (471.2 m)

Casing
13 3/8-in. 54.5 lb/ft (81.2 kg/m)

Products/Services
- *Total Depth* services
- Tubular running services
- *Overdrive* casing-running system
- *TorkDrive* 500 *Compact* ICT tool
- *Defyer* DT506 drillable-casing bit

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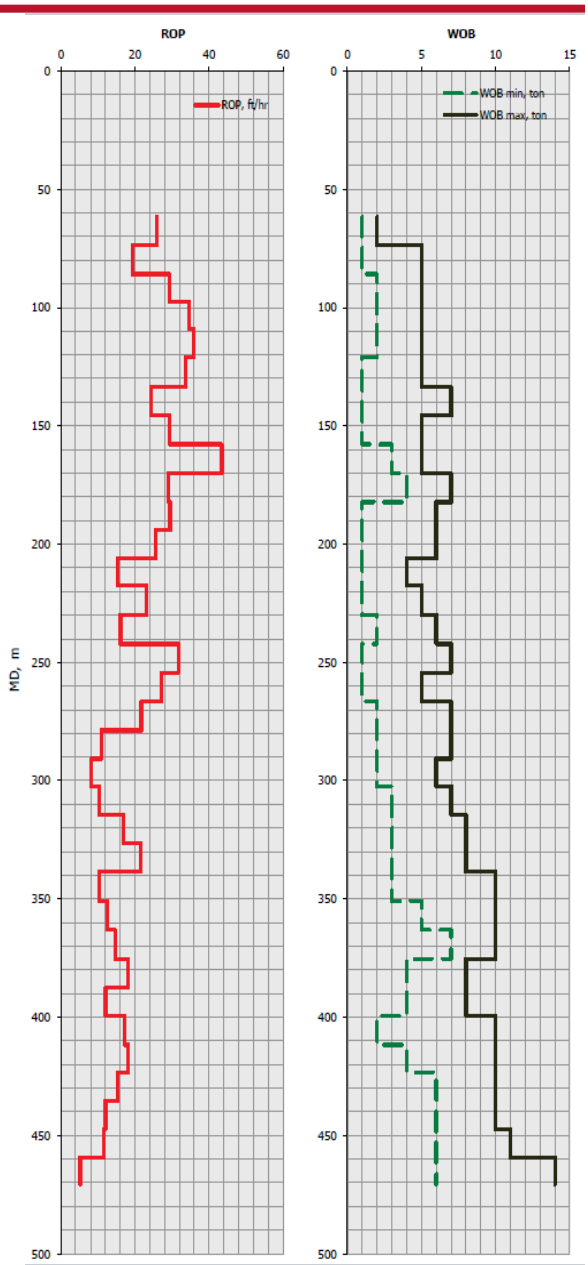
Value to Client

- The combination of Weatherford's *Overdrive* system and *Defyer* drill shoe enabled the client to eliminate further nonproductive time by installing the casing string to the planned depth on the first trip.
- Collaboration between Weatherford's *Total Depth* engineering team and the operator to select the appropriate technology and properly plan the operation was essential to the success of the project.
- The operator reported Weatherford's technology saved from 1 to 1.5 days of rig time and associated costs. Projecting these savings out over a year, the operator estimated that an additional half-well more per year could be completed using *DwC* technology, gaining on the earlier produced oil/gas and compensating for the undertaken costs.
- By using the automated system for tubular makeup and eliminating the need for a stabber in the derrick, the *OverDrive* system enabled the operator to reduce the exposure risk of the crew, thereby enhancing operational safety.
- Two additional tophole sections have been drilled, with drilling times improving from job to job (28 and 26 hours respectively).



Weatherford's *Defyer* DT506 bit drilled with excellent ROP and WOB, as shown in the graphs above, and was well suited to the formations encountered. The *Total Depth* team, working in conjunction with the operator, determined that a lesson learned was to conventionally drill the first section of future wells in this region to avoid any issues with gravel and conglomerates.

