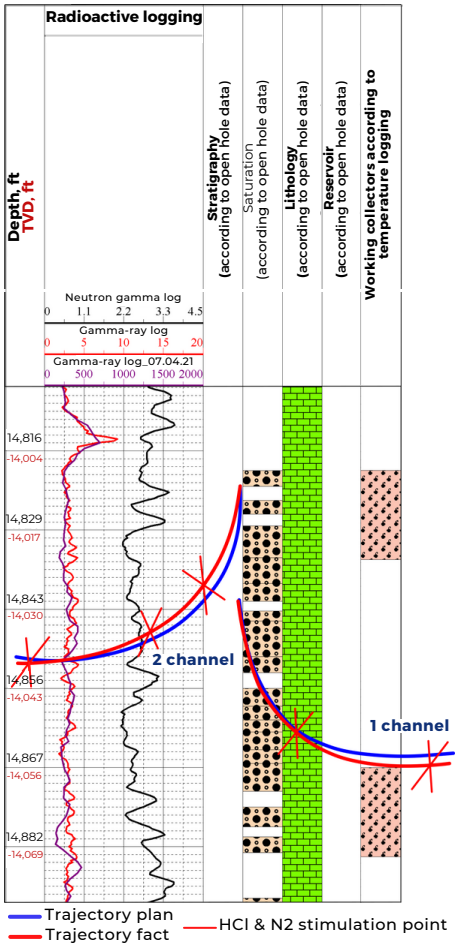
www.perfobore.com | +971 (0)56-370-8857 | info@perfobore.com

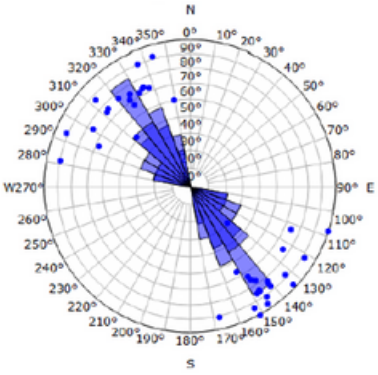
Perfobore Increases PI by 5 times and Delivers 200% Production Increase

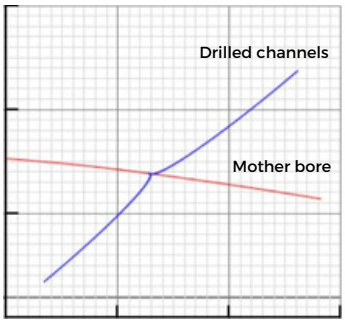
Radial Drilling Job Well X Koshinskoe oilfield, Orenburg Region, Russia

Geophysical Plot on Radial Channels Placement with Points of Acid Stimulation



Fracture direction trend according to interpretation of electric microimager and cross-dipole sonic data





When compiling the design, the azimuth direction of the channels was oriented perpendicular to the regional stress

Geological parameters

Formation	Turney stage (C1t)
Reservoir type	Carbonate
Target interval, ft.	14,905 -14,960
Total net thickness, ft.	51.8
Net thickness, ft.	35.3
Permeability, mD	2.6
Initial / current reservoir pressure, psi	7,274 / 5,217
BHP before stimulation, psi	1,352
Oil density at surface, g/cm3	0.761
Oil viscosity, cP	0.14
Reservoir temp, degC	90
Formation volume factor, stb/scf	0.454

Challenges

- Dropping of the well rate due to the near-wellbore damage;
- Fraccing job is risky because of a high fraccing pressure.

Geological and technical aspects

- The depth of the reservoir is more than 14,500 ft.;
- Loss of circulation;
- High H2S content.

Actions

- When performing Radial Drilling job, the main complicating factor was significant loss of circulation;
- The job continued successfully even though high viscosity drilling fluid and bloking agent (LCM) was required.

Execution

- Drilling of 2 radial channels 45 ft. length each had been done for stimulation of the well No.X of the Koshinskoe field in Jun 2021;
- The accuracy of the well position using the Perfobore inclinometer was confirmed by Perfobore specialists and the client;
- For the first time, a nitrogen-foam acid treatment was carried out inside the drilled channels. Acid composition was washed through the Perfobore's jet nozzle at various points of the channels: nitrogen + 15% HCl (Volume of HCl - 1,710 bbl).

Results

- **Oil increment: 700 bopd;**
- **Start-up: Oil 428 bopd, WC 0,3%;**
- **After clean-up: Oil 369 bopd, WC 43%;**
- **Increasing of PI by 5 times;**
- **Post-job skin: -5.**

Acheivements

- For the first time the technology was applied at a depth of 14,850 ft;
- For the first time in the drilled channels, a foam-nitrogen treatment was carried out;
- It is proposed to put the well on a flowing as per pre-job mode. Incase of reducing BHP to 1,352 psi (pre-job parameter) fluid will reach 1,227 bfpd (oil 933 bopd, WC 12%).

Well schematic

Casing	OD, inc.	Steel grage, wall thickness, inc	Setting depth, ft	Proof-test pressure, psi
Conductor	16.77	«K55» 0.39	0 - 176	
Surface casing	12.76	«K55» 0.47	0 - 3,425	2,049
Protecting casing	9.65	«N80» 0.47	0 - 10,523	3,734
Production casing	6.61	«C90» 0.42	0 - 15,161	5,374

Pre-job and actual well data

Pre-job			Planned result				Well start-up			Final results			Increment	Progress
Qfluid, bfpd	Qoil, bopd	WC, %	Skin	Qfluid, bfpd	Qoil, bopd	WC, %	Qfluid, bfpd	Qoil, bopd	WC, %	Qfluid, bfpd	Qoil, bopd	WC, %	Qoil, bopd	%
244	182	3	-3	563	426	3	557	428	0,3	814	369	43	246	101

Clean-up