PERFOBORE

PETRO SHEKAF

RESERVOIR ACCESS

STIMULATION

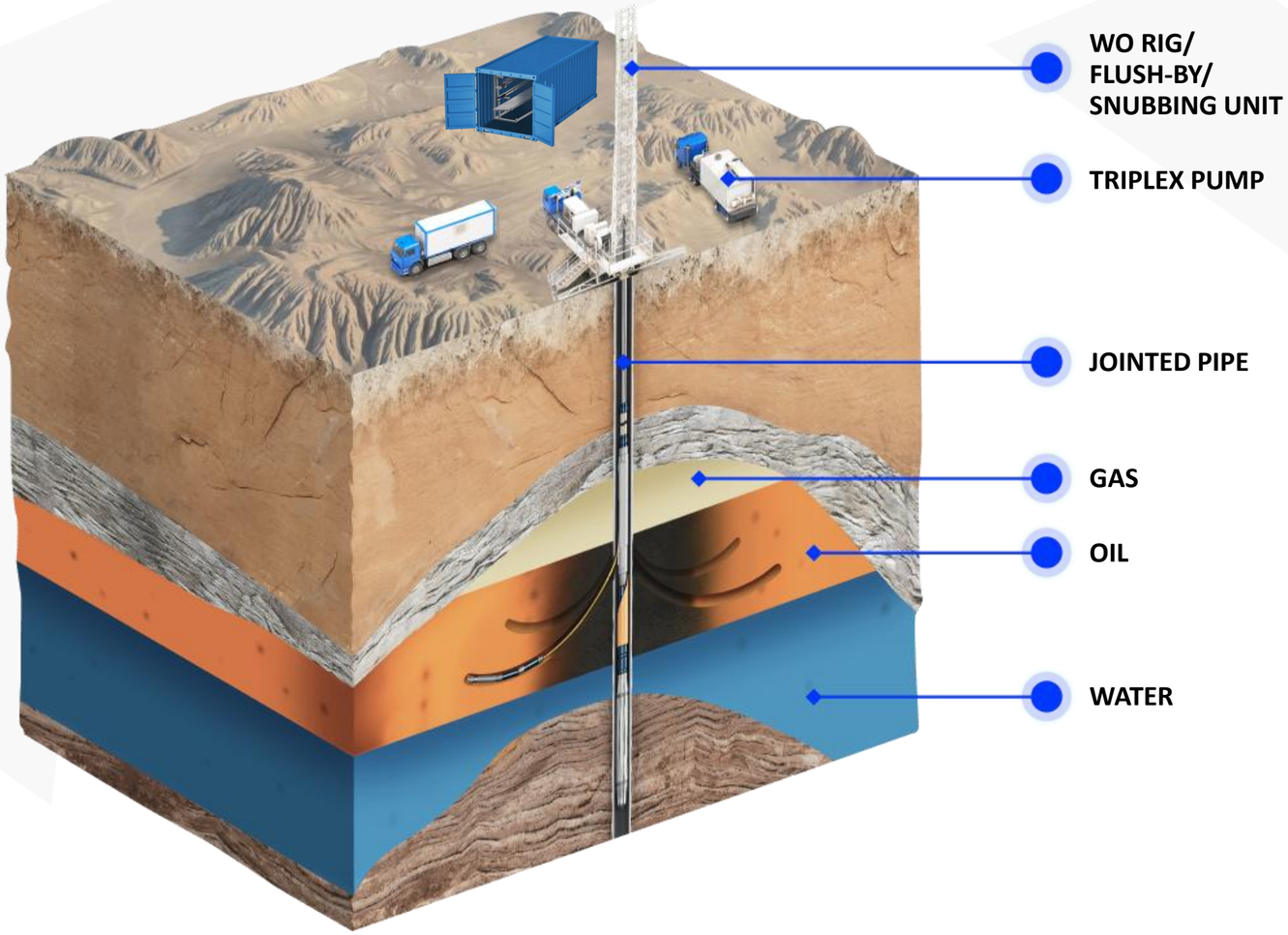
FORMATION EVALUATION

2025

ABOUT TECHNOLOGY

PERFOBORE DIRECTIONAL CONTROLLED DRILLING – A NOVEL STIMULATION METHOD FOR IOR&EOR

- Length of channel is 45÷80 ft (13÷25 m)
- Controlled trajectory (confirmed by surveying)
- Re−entry:
  - − Acid Stim by Jet Sub
  - − GR, Resistivity
  - − Slotted liner/screen
  - − Tracers
- Azimuthal orientation of channels
- Deploying by Workover Unit/Hoist/Snubbing unit
- Proprietary design
- Modular design (transported in a 40−ft container)



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5X HIGHEST OIL INCREMENT IN CARBONATES

10X HIGHEST OIL INCREMENT IN SANDSTONES

TIGHT THIN-BED RESERVOIR STIMULATION

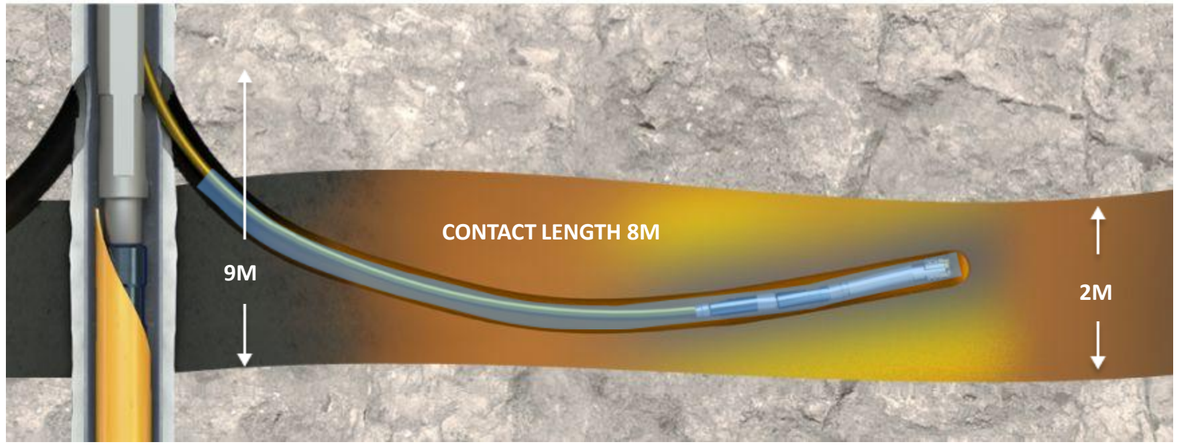
COMPARISON OF CONTACT AREA:

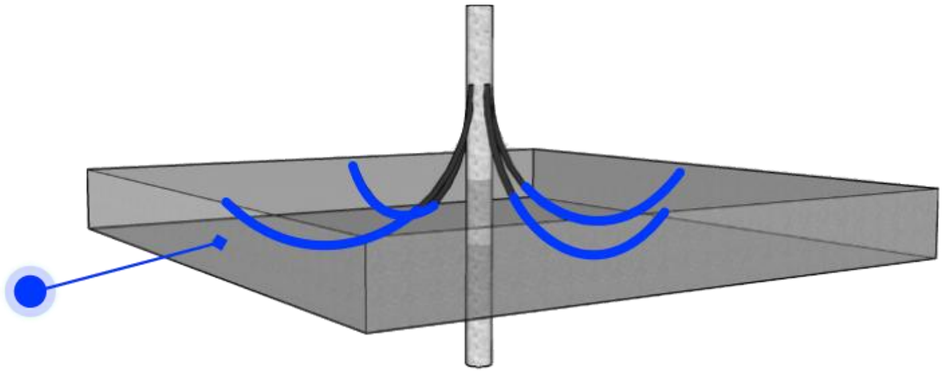
of 4 PERFOBORE channels:
(channel size 69 mm
30m of new reservoir)

=22 M^2
FRESH RESERVOIR

12 spf perforations:
(3mm x 1m channels over 2 m)

=8 M^2
OLD/DAMAGED RESERVOIR





2.5X LARGER CONTACT AREA

Large **fresh reservoir** exposure

Viable replacement for Standard Perforation avoiding HSE and Security risks

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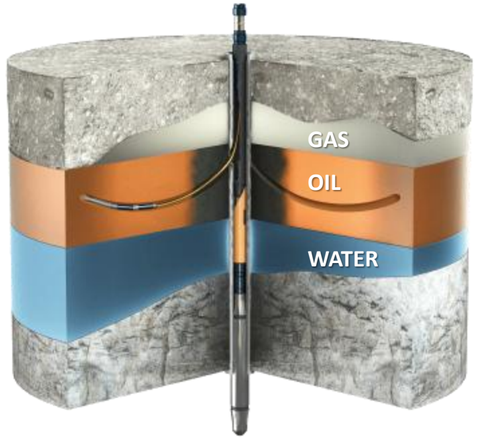
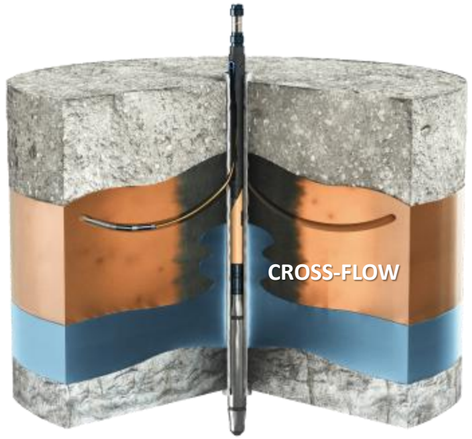
APPLICATION AREA



WELL STIMULATION

- Stimulation of oil rim
- Stimulation of bottom water-drive reservoirs
- Carbonate reservoirs development



DRILLING METHOD

- After a water shutoff for isolation of cross flow behind the casing
- Non-damaging completion
- Horizontal displacement up to 10 m from the well

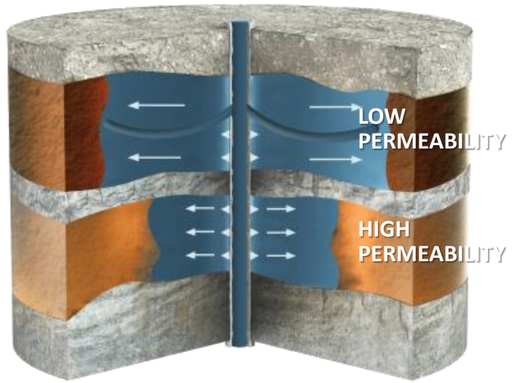
MULTIPLE CHANNELS

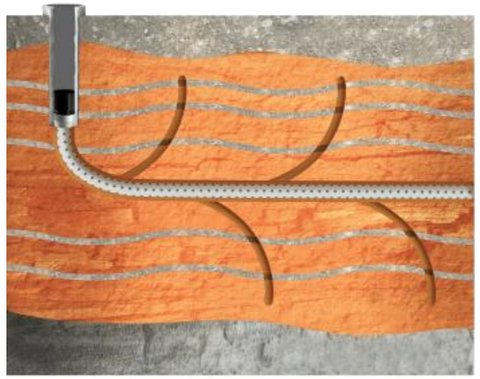
- Possibility to stack multiple channels at different levels in a single reservoir and/or provide access to separated reservoirs.

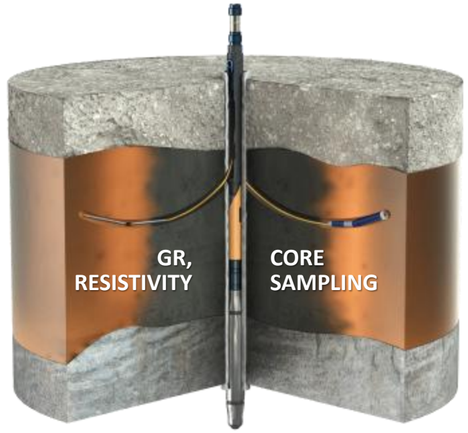
ALTERNATIVE TO SIDE TRACKING

- In the presence of abandoned equipment
- No reasons to retrieve emergency equipment
- Cutting a window in the cased well above the reservoir (up to 15 m higher from the formation top)

APPLICATION AREA







STIMULATION OF INJECTORS

- Heterogenetic deposits with different permeabilities
- Conformance control for water injectors in low-permeable reservoirs without hydraulic fracturing

WELL COMPLETION

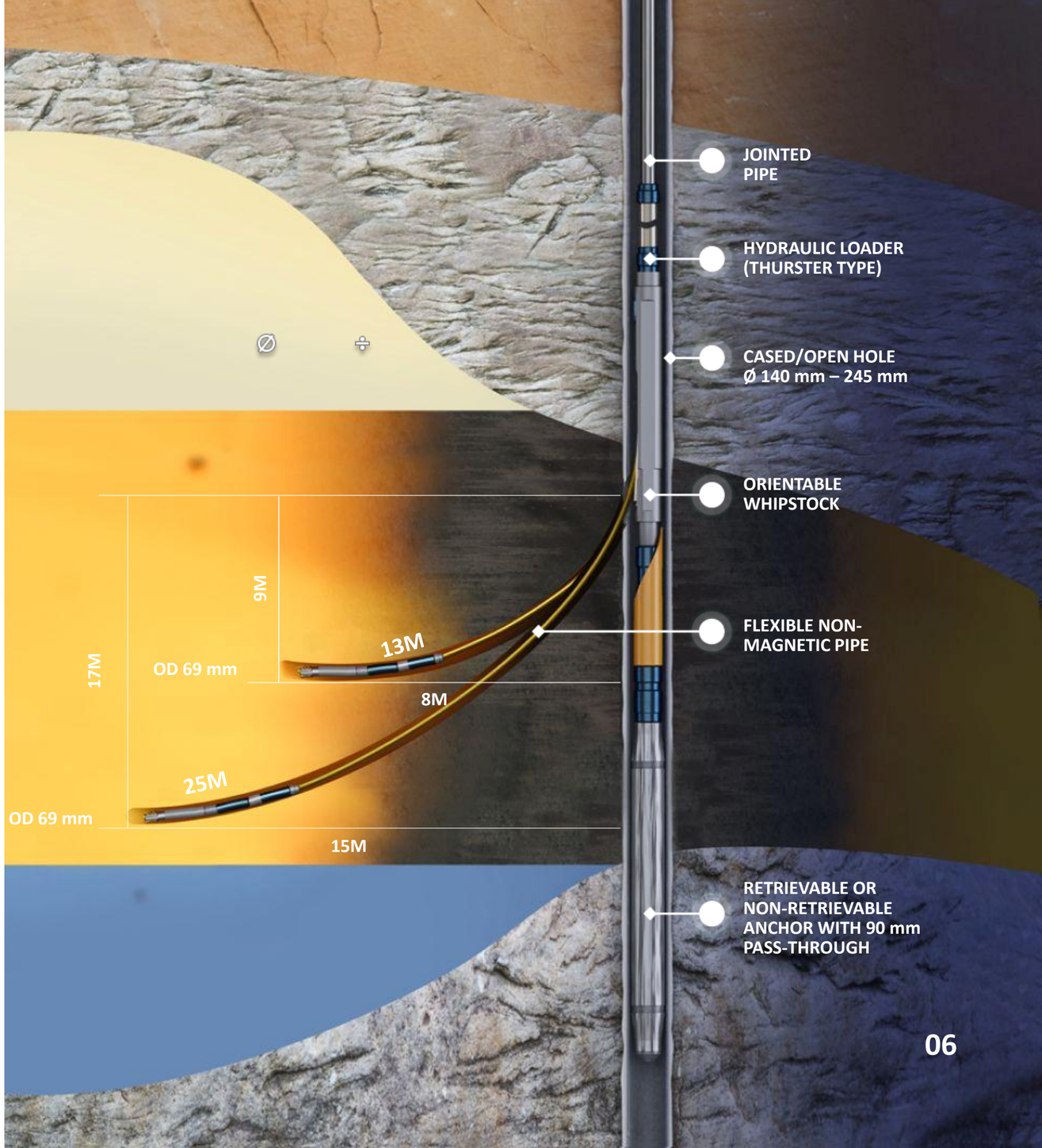
- Channel drilling in open hole well before deploying of uncemented liner
- Channel drilling in cased well (instead of jet perforation while low quality of cement bond)
- Opportunity of drilling channels in both vertical and horizontal wells
- Joining thin reservoir intervals in multi-layer reservoirs from a single horizontal wellbore (cased or open hole)

RESERVOIR FORMATION EVALUATION

- Method of testing/re-testing of intervals at exploration wells
- Possibility to perform GR/resistivity in channels*
- Possibility of coring in cased wells (2024)

DOWNHOLE EQUIPMENT

- Length of channel up to 25 m, OD is 69 mm
- Adjustable trajectory (pre-planned and fixed)
- Azimuthal orientation of channel
- DLS is up to 65 deg/10 m.
- 4 channels at the same TVD (for 178 mm csg)
- Possibility to stack channel sets at multiple depths in the same wellbore
- Re-enter any channel as required including for re-stimulation
- Cased/Open hole wells for OD from 140 mm ÷ 245 mm



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SEQUENCE OF OPERATIONS

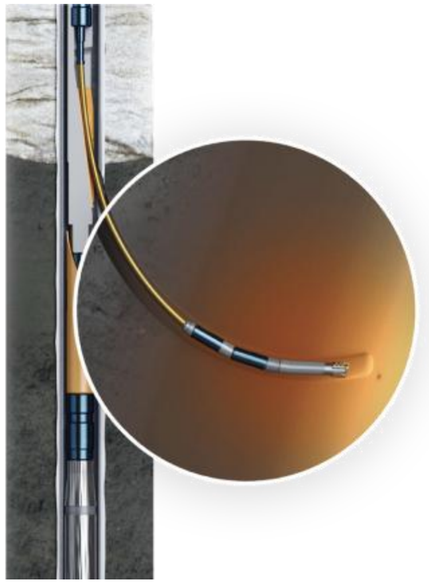
1 RIH

- Tying of depth by GR and collar locator (one time wireline/slickline unit involvement)
- Azimuth setting – PERFOBORE orientation tool

2 RIH

- Window size: Length 0,7 m, width 75 mm.
- Duration: 8-24 h (depends on steel grade)

3 RIH



- Average time for drilling of 1 (13 m) channel is 12 hrs

ADDITIONAL RIH

- Inclinometer, GR, Resistivity
- Jet sub for acid stimulation
- Slotted liner/screen
- Tracers

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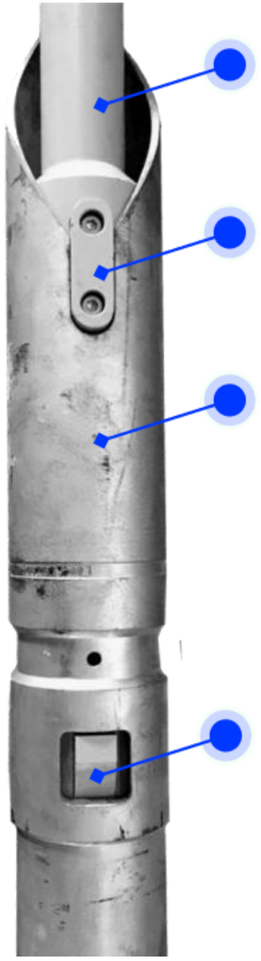
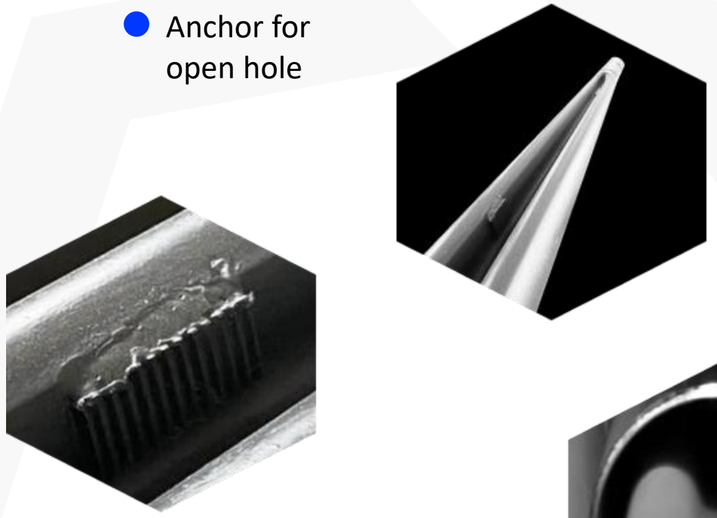
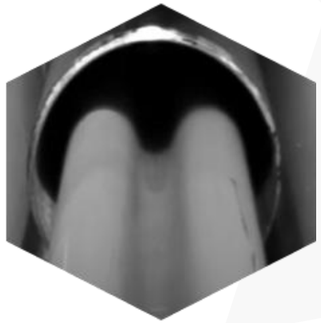
Milling/drilling style BHA is under testing

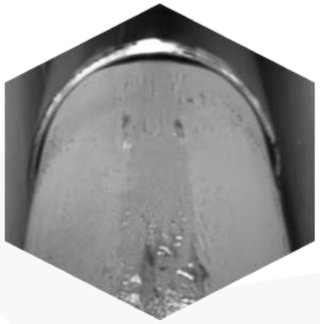
ANCHOR SETTING



- Anchor for open hole

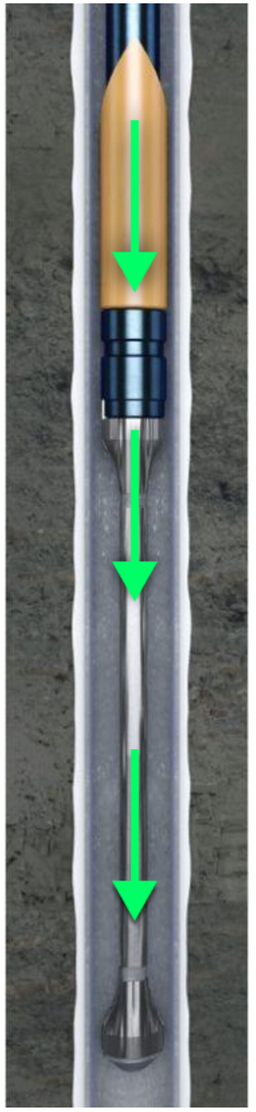






- Inflatable packer: 120/100 bar (non-retrievable/retrievable)

ANCHOR RUNNING AND ORIENTATION ON TUBING



SETTING ANCHOR AND DISCONNECTION

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MILLING

KEY

NIPPLE

WHIPSTOCK

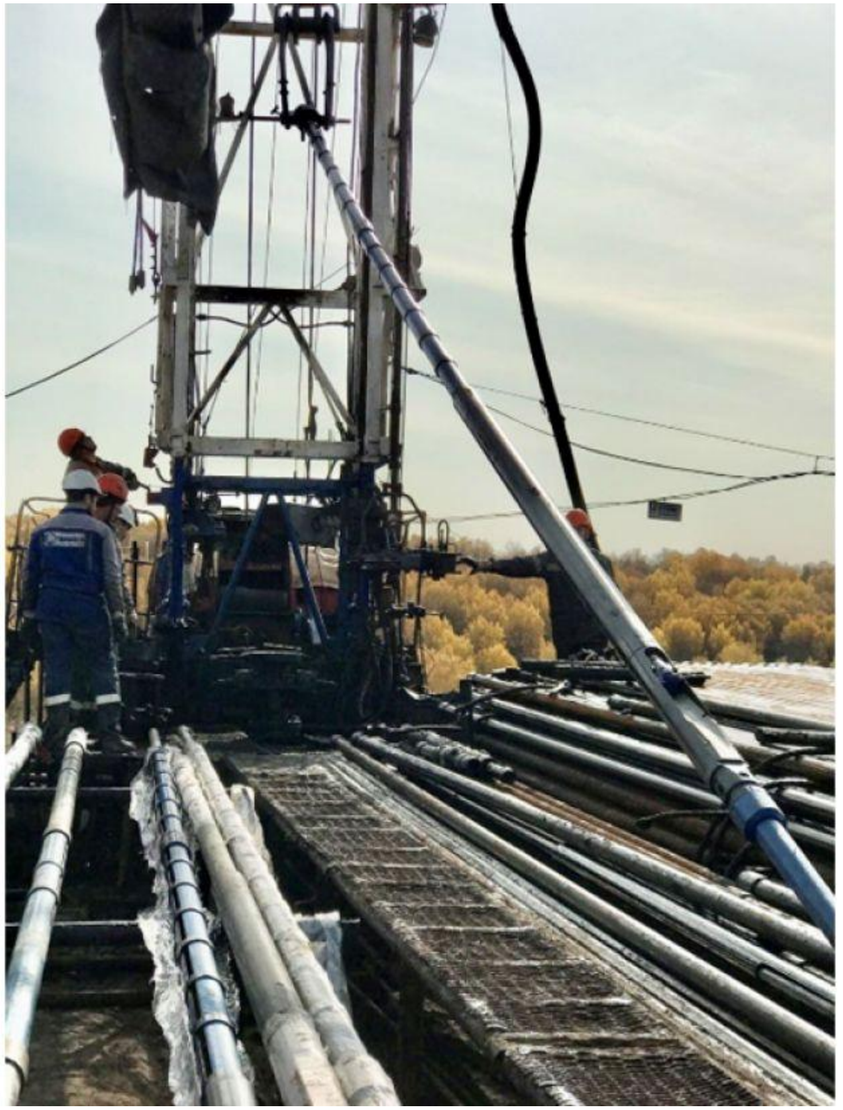
WINDOW FOR SETTING TOOL FACE

- Mill–Drill Bit OD: 75mm

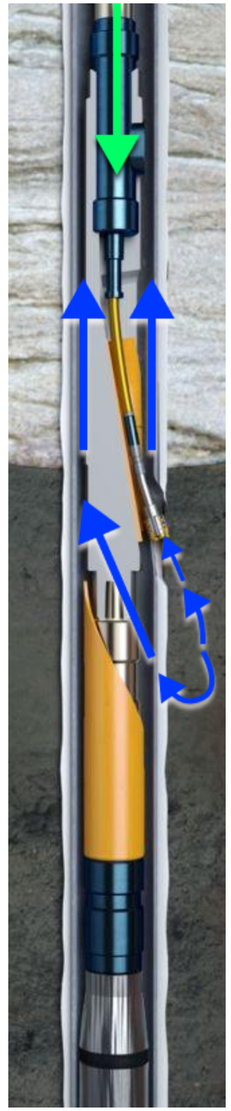
- Pre–run mechanically adjustable tool face of BHA (every 10 deg)

- Standard Mill OD: 75 mm

- Key slot for keeping azimuthal direction



MILLING WINDOW



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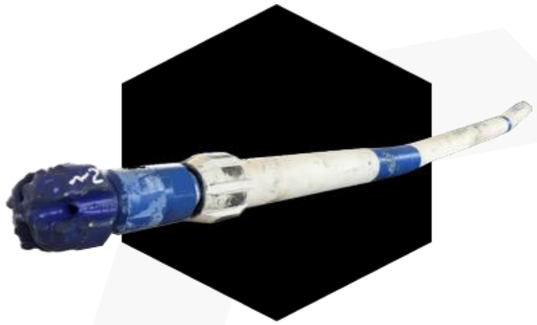
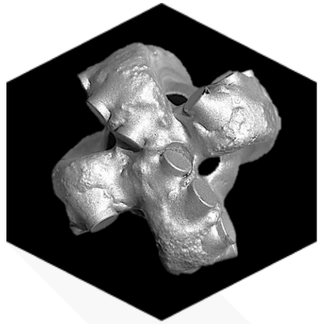
DRILLING



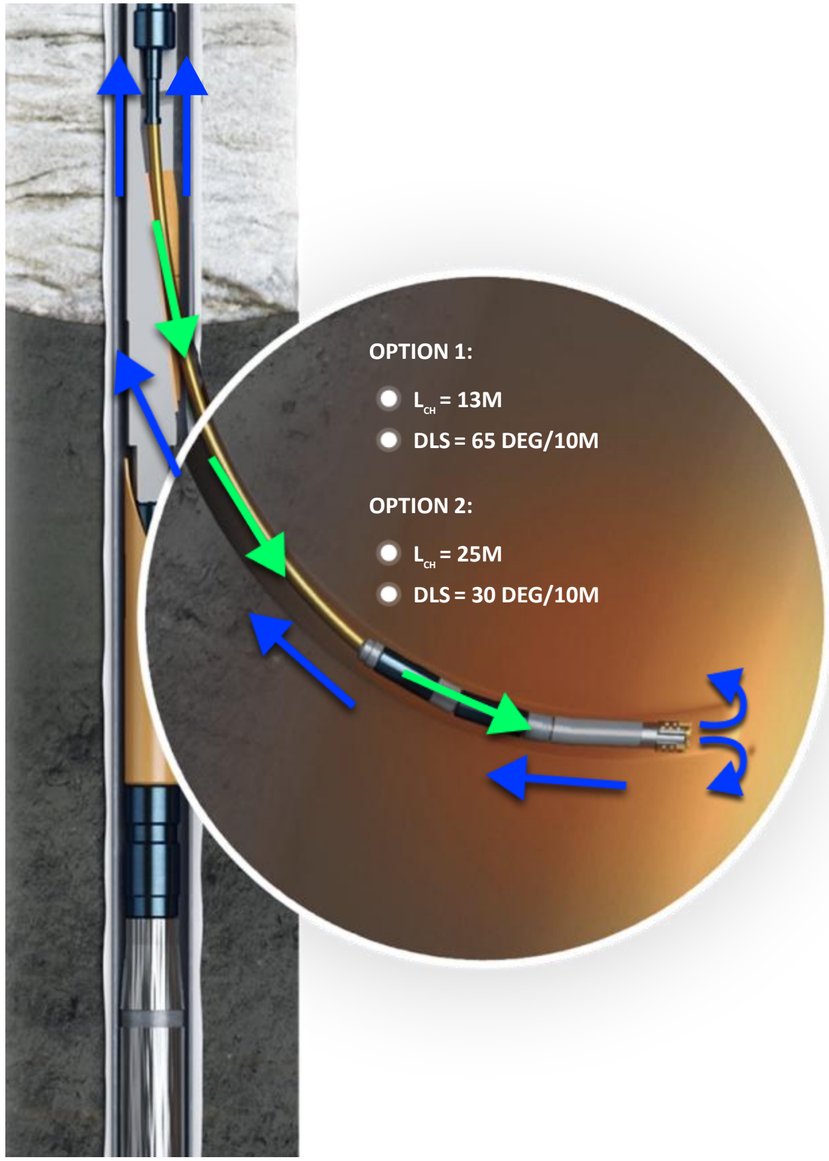
- Mud motors:
  OD: 54 mm (for milling)
  OD: 49 mm (for drilling)

- Hydraulic loader
  (thruster system)



- PDC bit OD: 69mm

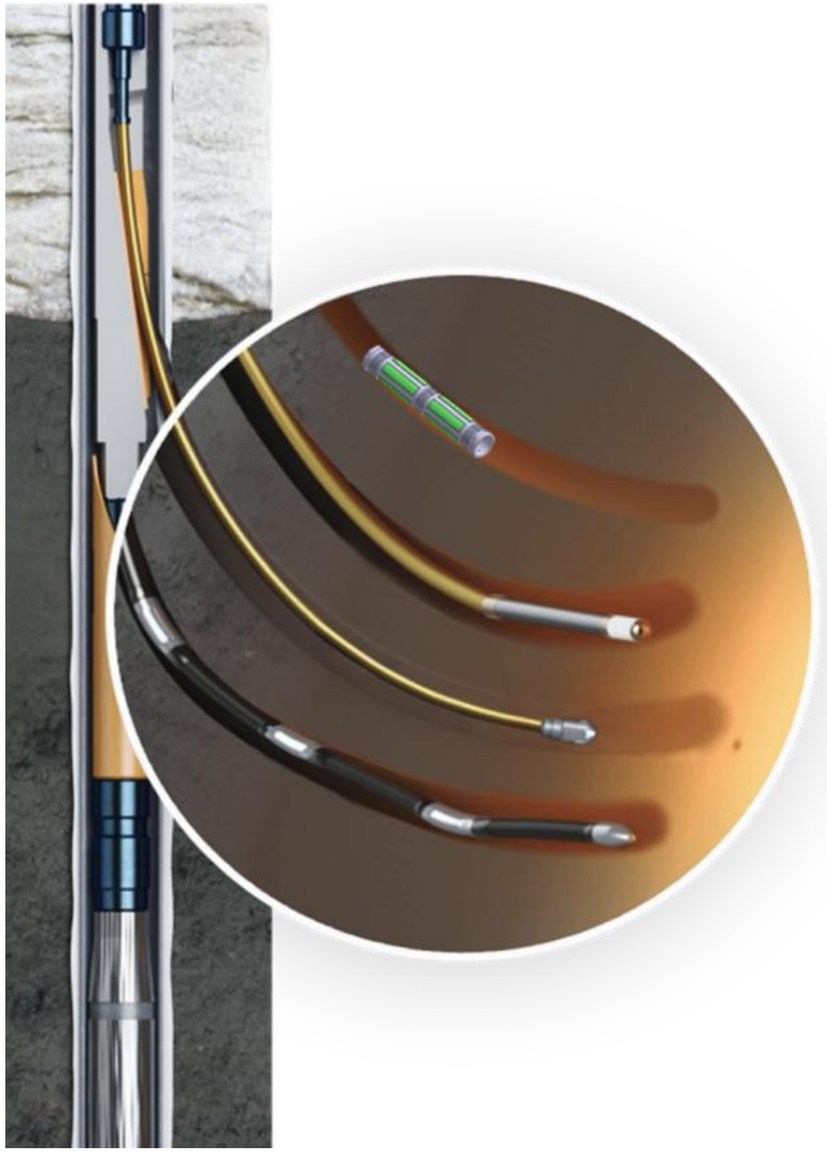
DRILLING PERFOBORE CHANNEL



RE-ENTRY

- Inclinometer **(memory):** magnetic
  - OD – 30 mm.
- Logging tool **(memory)** – one assembly : GR, Resistivity, SP, P, T.
  - OD – 36 mm.
- Jet Nozzle:
  - OD – 42 mm
  - Velocity of jet – 100 m/sec
- Screens:
  - OD – 42 mm
  - ID – 20 mm

INCLINOMETER, GR, RESISTIVITY; JET NOZZLE; SLOTTED LINER/SCREEN; TRACERS



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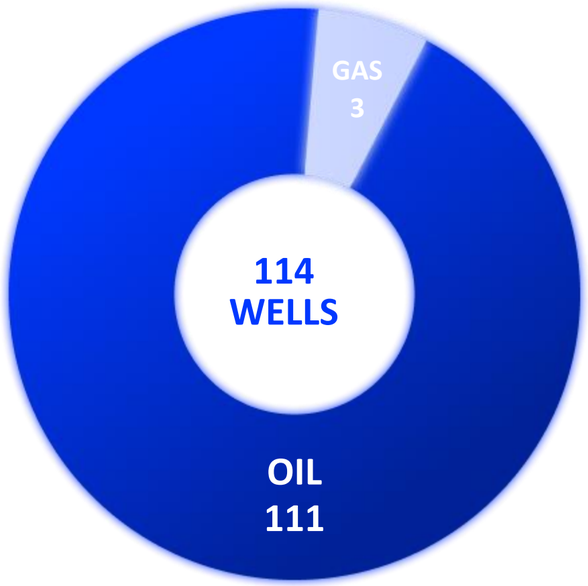
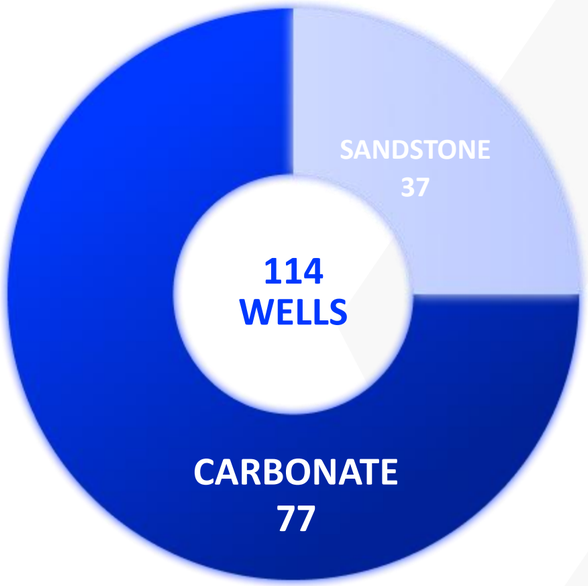
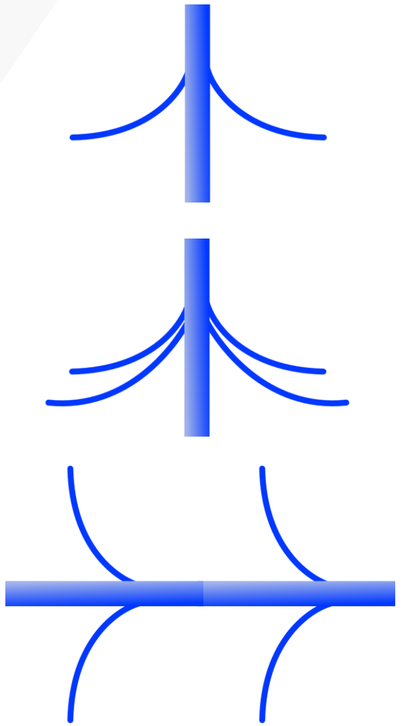
TRACK RECORD (Q4 2024)

WELL TYPE



RESERVOIR TYPE





66% WELLS

2 channel wells

4 CHANNELS

Maximum number of drilled channels

OH Hz

Open−hole horizontal application

114
WELLS

260+
CHANNELS

80+
FIELDS
(HOME MARKET, CIS, US, MENA)

- **90%** operational success rate
- **3X** average oil increment
- **4000 m.** deepest deployment to date

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DEVELOPMENT OF THE TECHNOLOGY

	Current solutions			In development	
Well design	**Open hole**[2] **5 1/2” – 7”**	**Casing 5.5” – 7”**	**Casing 9 5/8”**	**Casing 5 ½” – 7”**	**Liner 4 ½”**
Channel length	Up to 25 m – in vertical, Inclined or horizontal wellbores			Up to 25 m – in vertical, Inclined or horizontal wellbores	
Number of channels from 1 level	4			4	2
Trips	2 trips per Channel (cased hole), 1 trip per Channel (Open hole)			1 channel per 1 trip (Cased and Open hole) + Acidizing in same run	
Directional survey	Survey (memory record) available for all channels			Recorded mode survey while drilling	
Multiple entrance in the drilled channel	Yes				
Method of deploying equipment into the well	Workover Unit/Hoist/Snubbing unit			Workover Unit/ Hoist/Snubbing unit	Coil tubing
	2016	**2018**	**2022**	**Q1 2025**	**Q4 2025**

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CASE STUDIES: OIL WELLS (CARBONATES)

MENA OH Hz OIL CASE: WELL#1

OBJECT: Open − hole horizontal oil well

CHALLENGE:

- Heterogenous dolomite reservoir

TASK: Connect new sublayers by drilling channels UP and DOWN through dense barriers

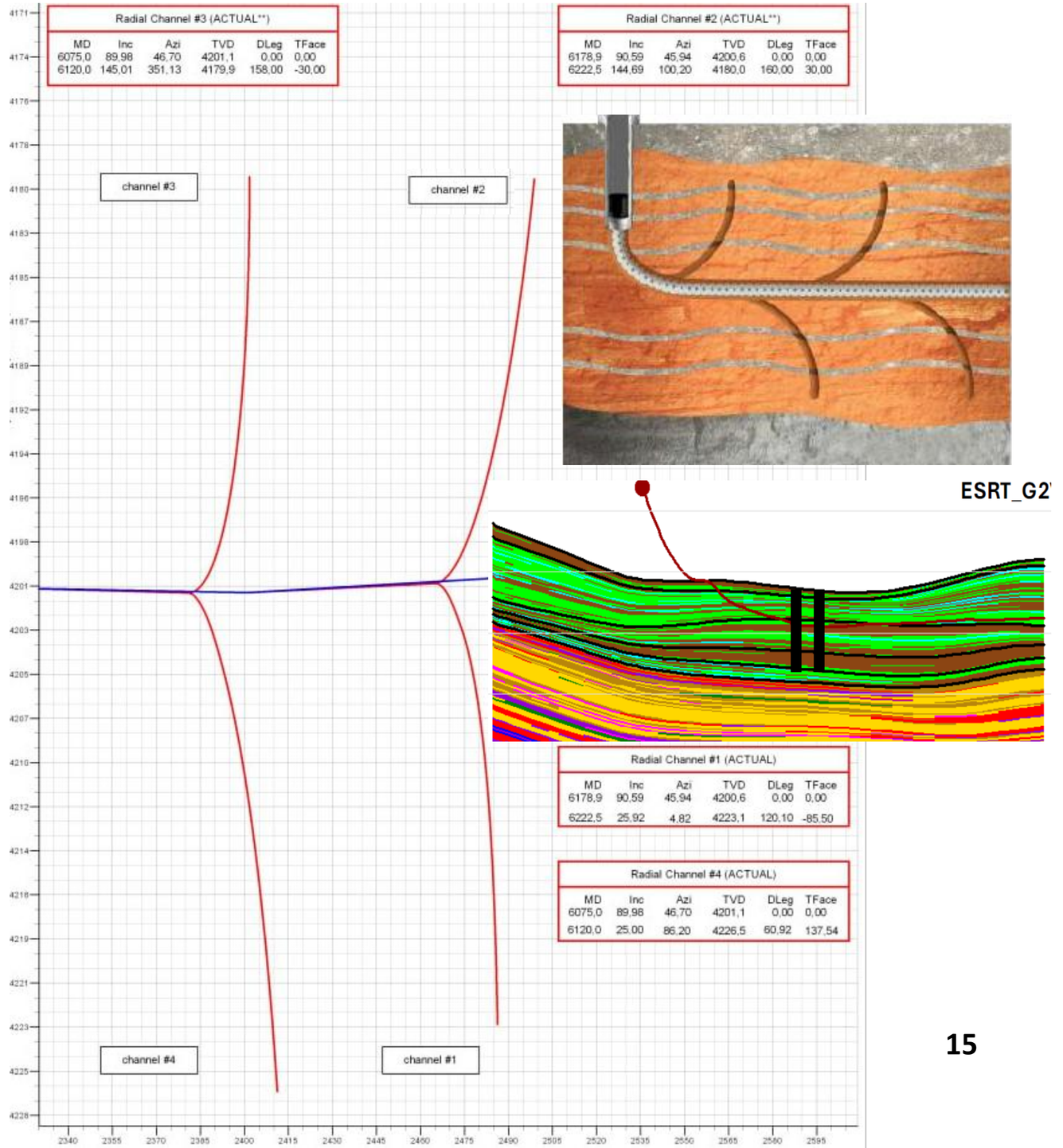
EXECUTION: 4 channels drilled 13 m length (DLS=56 deg/10m) each and surveyed by small−sized inclinometer.

RESULTS:

- Cleanup of the well

GEOLOGICAL PARAMETERS

Formation	R1
Type of reservoir	Carbonate
Target interval,ft	6,075÷6,222.5
Net pay,ft	90
Permeability, mD	100÷250
Initial reservoir pressure, psi	1,970
Current reservoir pressure, psi	1,100
Oil density API	30.6
Oil viscosity, cP	2.64
Reservoir temperature, degC	77
Bubble point, psi	326
GOR, scf/bbl	50



PERFOBORE PETRO SHEKAF

MENA HEAVY OIL CASE: WELL#1

OBJECT: Heavy Oil

CHALLENGE:

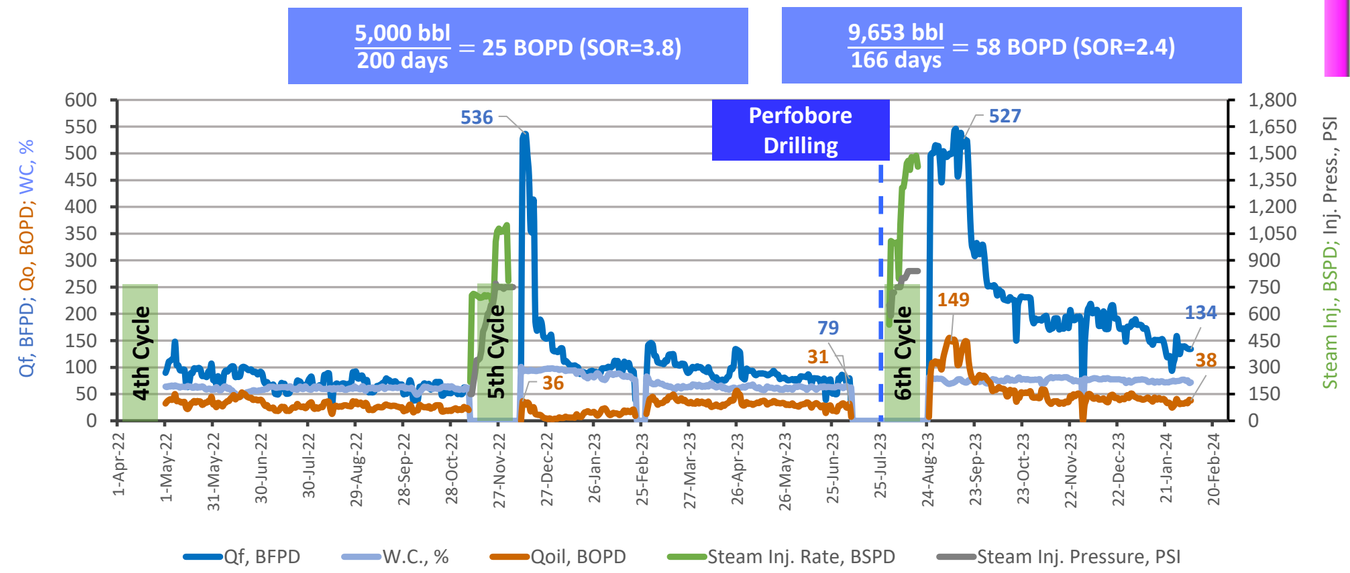
- Poor vertical steam conformance (CSS) in the complex geological conditions

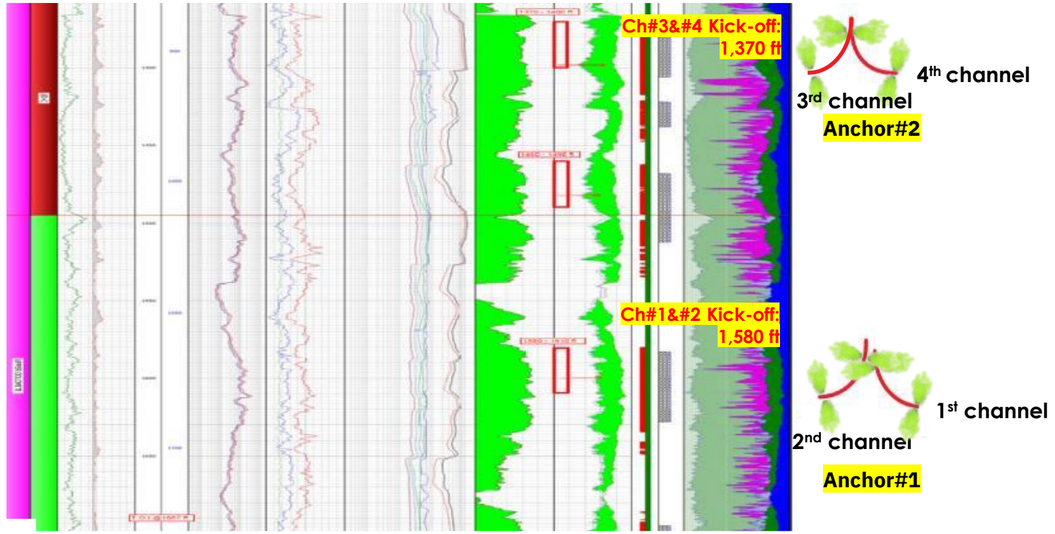
TASK: Increase efficiency of acid and steam injection

EXECUTION: 4 channels drilled 13 m length (DLS=63 deg/10m) each with acid (V=200 bbl of 15%HCL) performed through a jet sub and then steam cycle (V=23,000 bbl) .

RESULTS:

- 2.5X increment





GEOLOGICAL PARAMETERS

Formation	Upper Dolomite
Type of reservoir	Carbonate
Target interval,ft	1,379÷1,590
Net pay,ft	90
Permeability, mD	4.3÷6.5
Initial reservoir pressure, psi	308
Current reservoir pressure, psi	235
Oil density, g/cm3	0.974
Oil viscosity, cP	1,800÷5,000
Reservoir temperature, degC	44
Bubble point, psi	72
GOR, scf/bbl	23

PERFOBORE PETRO SHEKAF

MENA HEAVY OIL CASE: WELL#2

OBJECT: Heavy Oil

CHALLENGE:

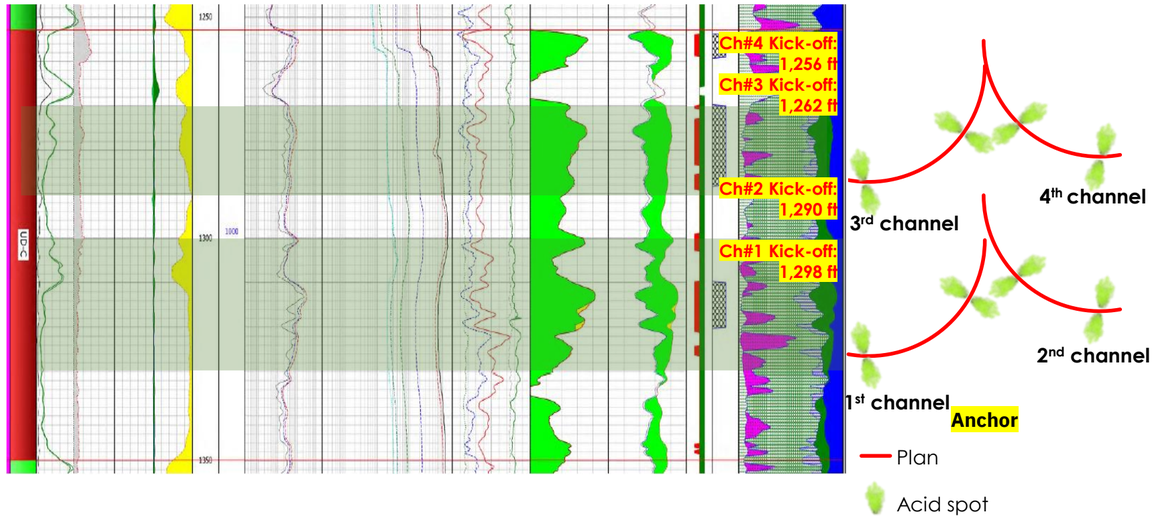
- Poor vertical steam conformance (CSS) in the complex geological conditions

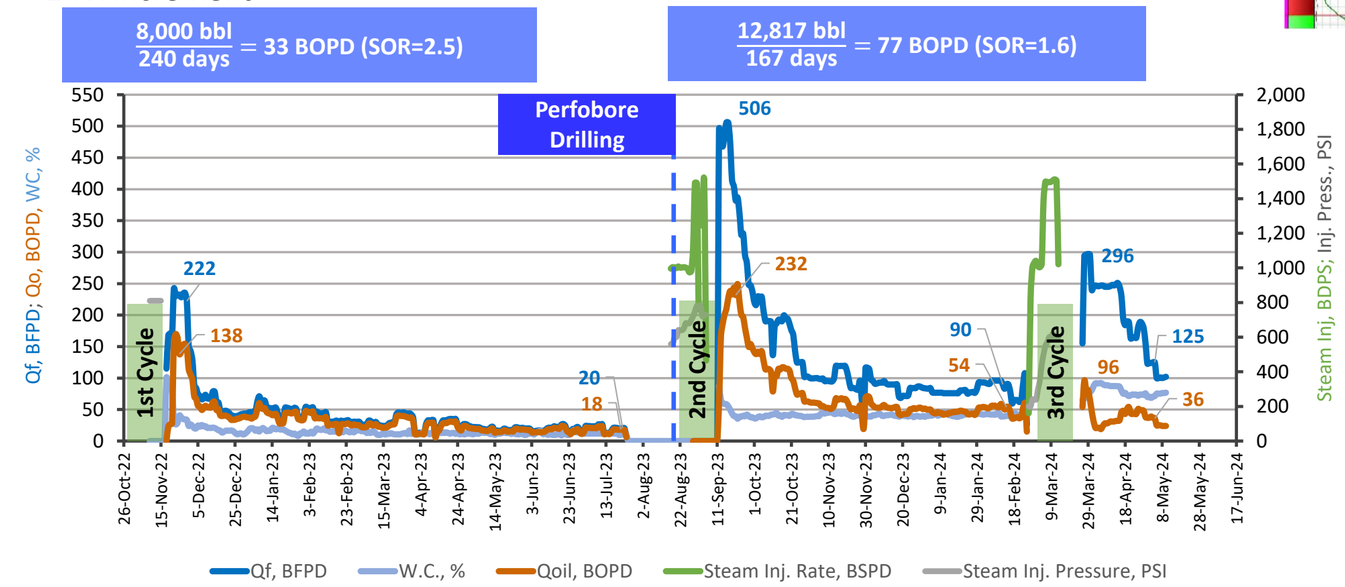
TASK: Increase efficiency of acid and steam injection

EXECUTION: 4 channels drilled 13 m length (DLS=63 deg/10m) each with acid (V=200 bbl of 15%HCL), performed through a jet sub and then steam cycle (V=20,000 bbl).

RESULTS:

- 2.7X increment





GEOLOGICAL PARAMETERS

Formation	Upper Dolomite
Type of reservoir	Carbonate
Target interval,ft	1,256÷1,298
Net pay,ft	60
Permeability, mD	4.3÷6.5
Initial reservoir pressure, psi	308
Current reservoir pressure, psi	235
Oil density, g/cm3	0.974
Oil viscosity, cP	1,800÷5,000
Reservoir temperature, degC	44
Bubble point, psi	72
GOR, scf/bbl	23

MENA HEAVY OIL CASE: WELL#3

OBJECT: Heavy Oil

CHALLENGE:

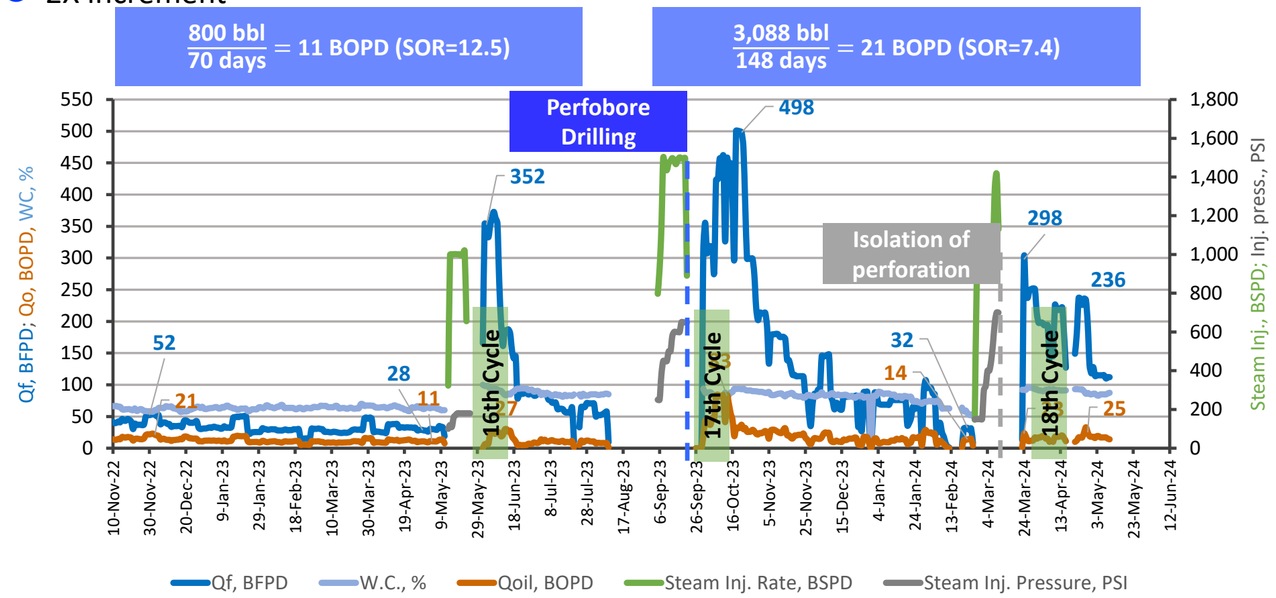
- Poor vertical steam conformance (CSS) in the complex geological conditions

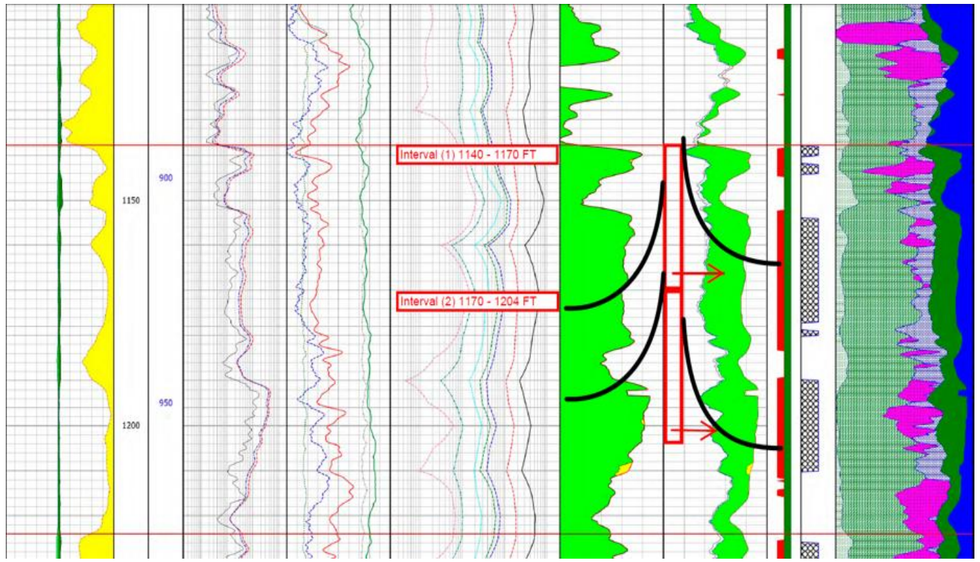
TASK: Increase efficiency of acid and steam injection

EXECUTION: 4 channels drilled 13 m length (DLS=63 deg/10m) each with acid (V=200 bbl of 15%HCL), performed through a jet sub and then steam cycle (V=23,000 bbl).

RESULTS:

- 2X increment





GEOLOGICAL PARAMETERS

Formation	Upper Dolomite
Type of reservoir	Carbonate
Target interval,ft	1,140÷1,204
Net pay,ft	64
Permeability, mD	4.3÷6.5
Initial reservoir pressure, psi	308
Current reservoir pressure, psi	235
Oil density, g/cm3	0.974
Oil viscosity, cP	1,800÷5,000
Reservoir temperature, degC	44
Bubble point, psi	72
GOR, scf/bbl	23

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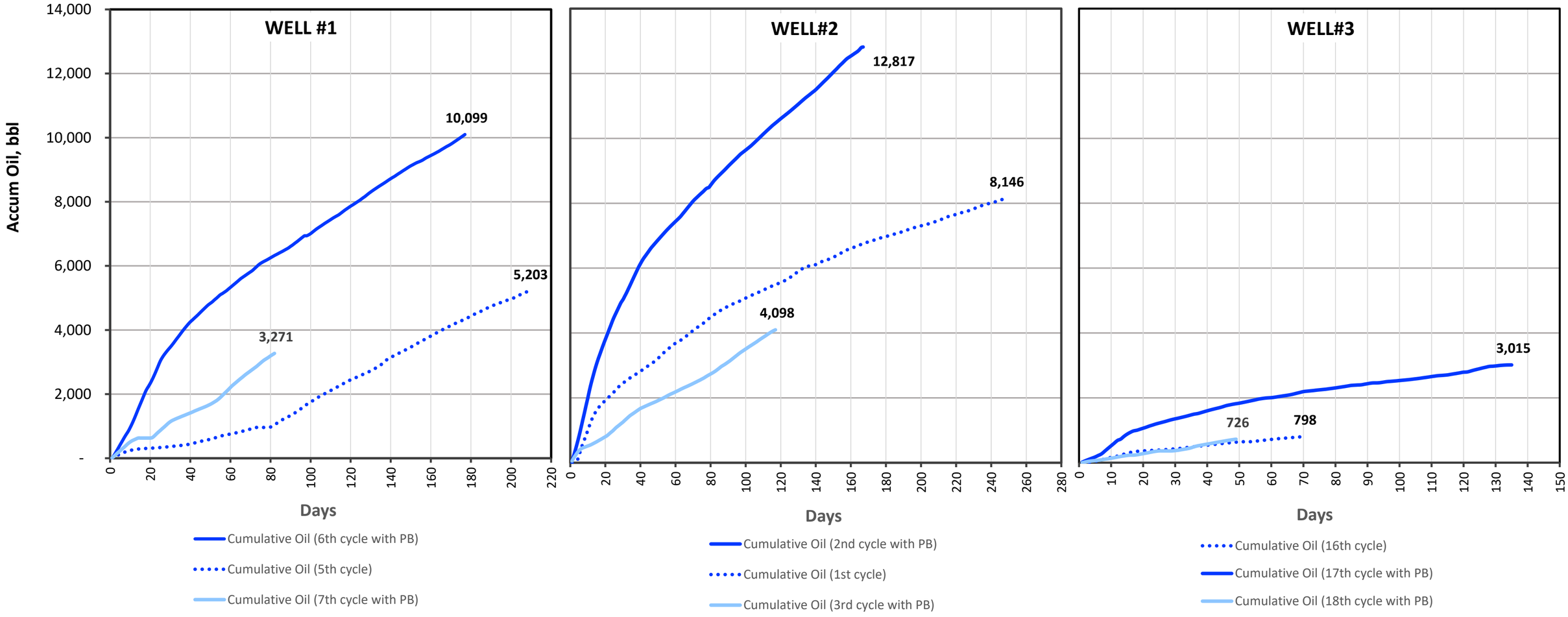
MENA HEAVY OIL CASE: SUMMARY



The heavy oil field is under depletion drive development mode

PERFOBORE PETRO SHEKAF

PERFOBORE VS ACID FRAC IN CARBONATE

SPE-202661-MS
SPE-0621-0053-JPT

OBJECT: Light Oil

CHALLENGE:

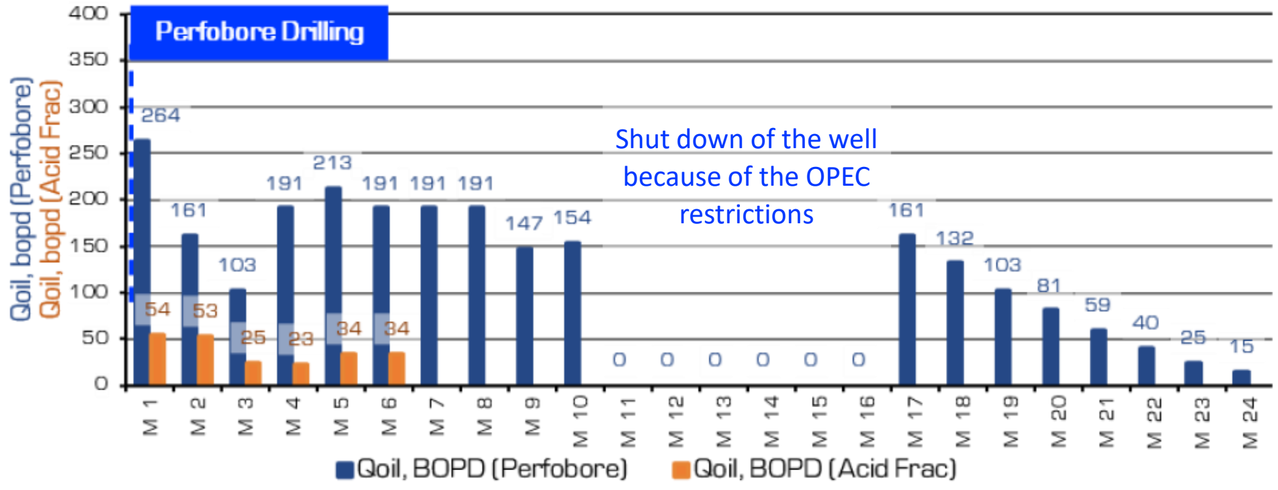
- Proximity of water
- High heterogeneity

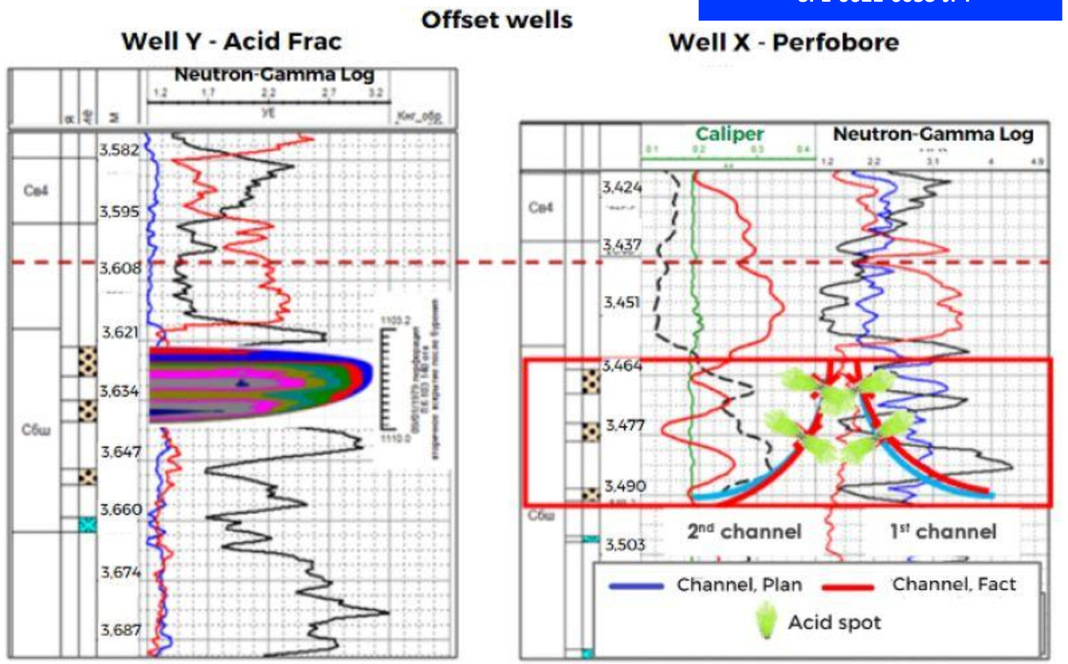
TASK: Well re-completion to overlying formation

EXECUTION: 2 channels drilled 13 m length each with acid stim performed through a jet sub

RESULTS:

- Start-up: fluid 301 bfpd, oil bopd, WC 10%;
- Current after 22 months: fluid 183 bfpd, oil 59 bopd, WC 66%;
- More than 4 times higher oil increment after PERFOBORE Drilling compared to Acid Frac





GEOLOGICAL PARAMETERS

Formation	Sbsh
Lithology	Carbonate
Target interval,ft	3,461÷ 3,491
Current bottomhole,ft	3,609
Gross thickness,ft	30
Total net	12,5
Permeability,mD	27 ÷ 43
Initial reservoir pressure,psi	1,523
Current reservoir pressure,psi	986
Oil density at surface, g/cm^3	0,891
Oil viscosity, cP	14,01
Reservoir temp, degC	58
Formation volume factor, stb/scf	1,058

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STIMULATION AFTER WATER SHUTOFF

SPE-211339-MS

OBJECT: Light Oil

CHALLENGE:

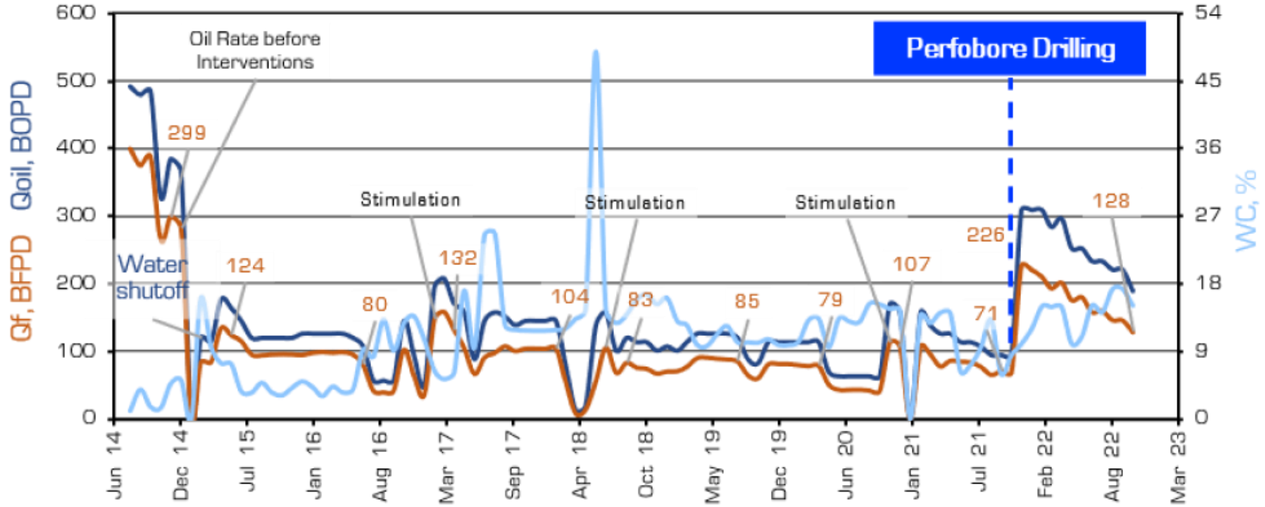
- Significant reduce of fluid rate after water shutoff
- Reperforation and re-stimulation didn't recover fluid rate

TASK: Stimulation after water shutoff job to eliminate a cross-flow behind the casing

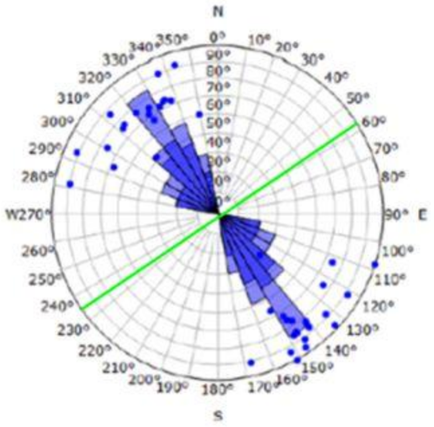
EXECUTION: 2 channels drilled 45 ft length each with acid stim performed through a jet sub

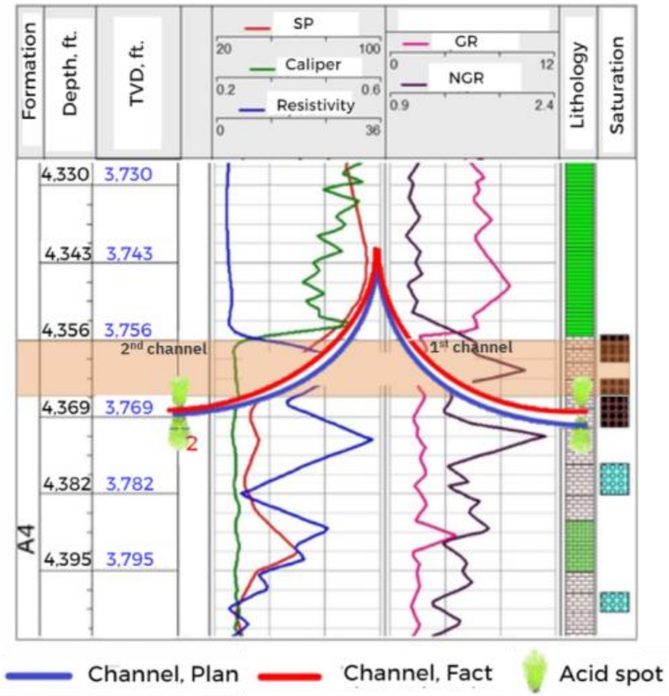
RESULTS:

- Oil increment +150 BOPD
- Increasing of PI by 6 times
- Post-job skin: –5.9



REGIONAL STRESS ORIENTATION





GEOLOGICAL PARAMETERS

Formation	Bashkirian
Type of reservior	Carbonate
Target interval,ft	4,355.8 ÷ 4,369
Net pay,ft	12,8
Permeability,mD	15,4
Reservoir pressure initial/current,psi	1,984/1,719
Oil density, g/cm3	0,801
Oil viscosity, cP	2,35
Reservoir temperature, degC	37
Formation volume factor, stb/scf	0,183
Bubble point pressure, psi	397
Production casing, inc	5,5

PERFOBORE PETRO SHEKAF

THIN-BED CARBONATE STIMULATION

SPE-208035-MS

OBJECT: Carbonate

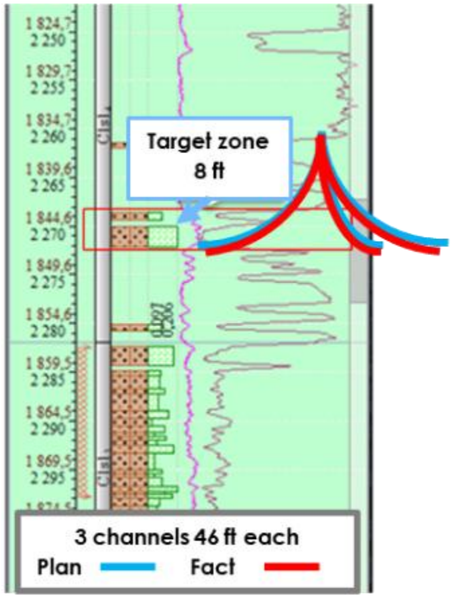
CHALLENGE: Stimulation of overlaying low perm (5 mD) thin-bed reservoir

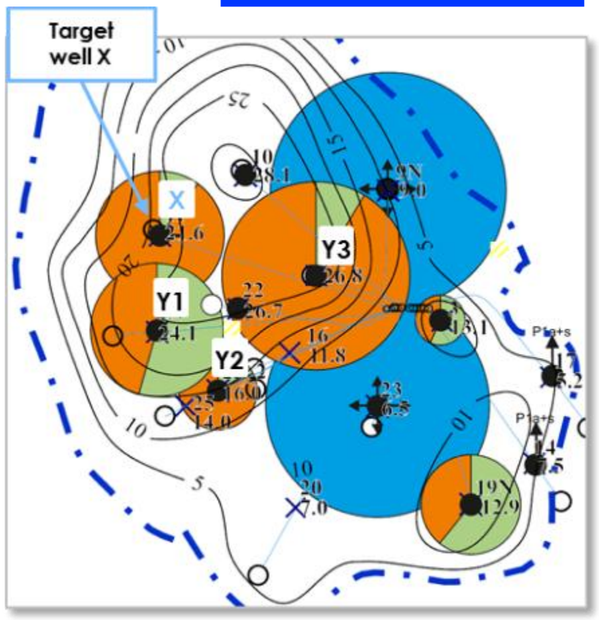
TASK: Alternative to ACID FRAC

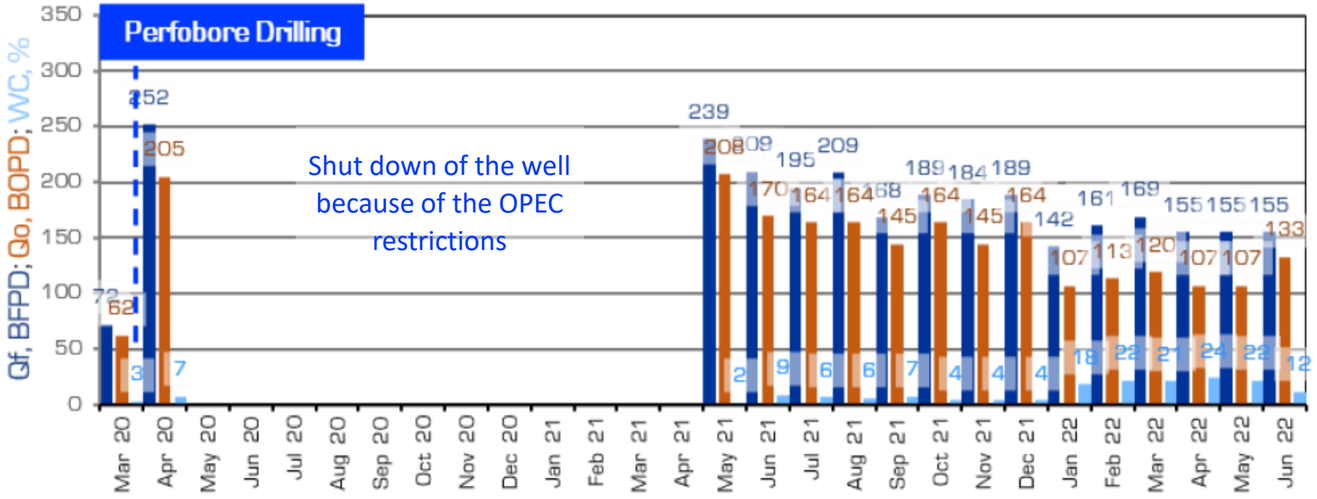
EXECUTION: 3 channels drilled 13 m length each, acid bull heading

RESULTS:

- Oil increment +200 BOPD
- Post-job skin is -4.4
- **Incremental production >33,000 bbl after 12 months**







GEOLOGICAL PARAMETERS

Formation	Serpukhovsky
Type of reservior	Carbonate
Target interval,ft	7,486.4-÷ 7,498.3
Net pay,ft	10
Permeability, mD	5
Initial reservoir pressure, psi	2,748
Current reservoir pressure, psi	2,469
Oil density, g/cm3	0,88
Oil viscosity, cP	4.1
Reservoir temperature, degC	36.8
Bubble point, psi	1,146
Gas factor, cub.m/ton	97,3

PERFOBORE

PETRO SHEKAF

69 FT. LENGTH CHANNEL IN CARBONATE

OBJECT: Carbonate

CHALLENGE:

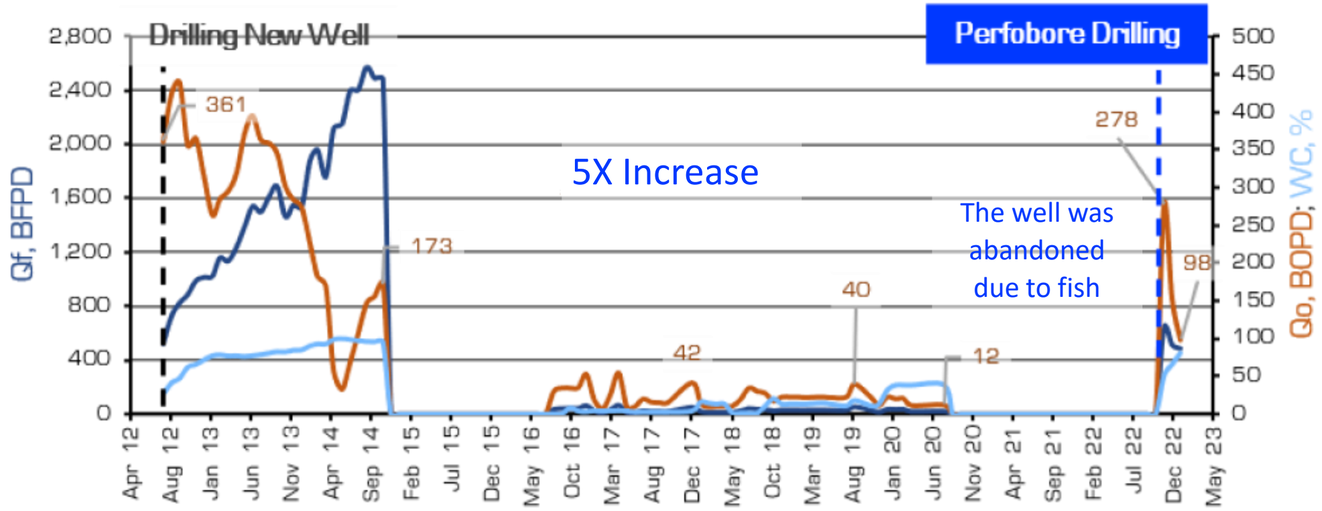
- An abandoned well due to fish in front of the target interval

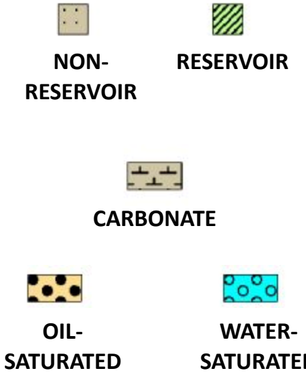
TASK: Alternative to sidetrack

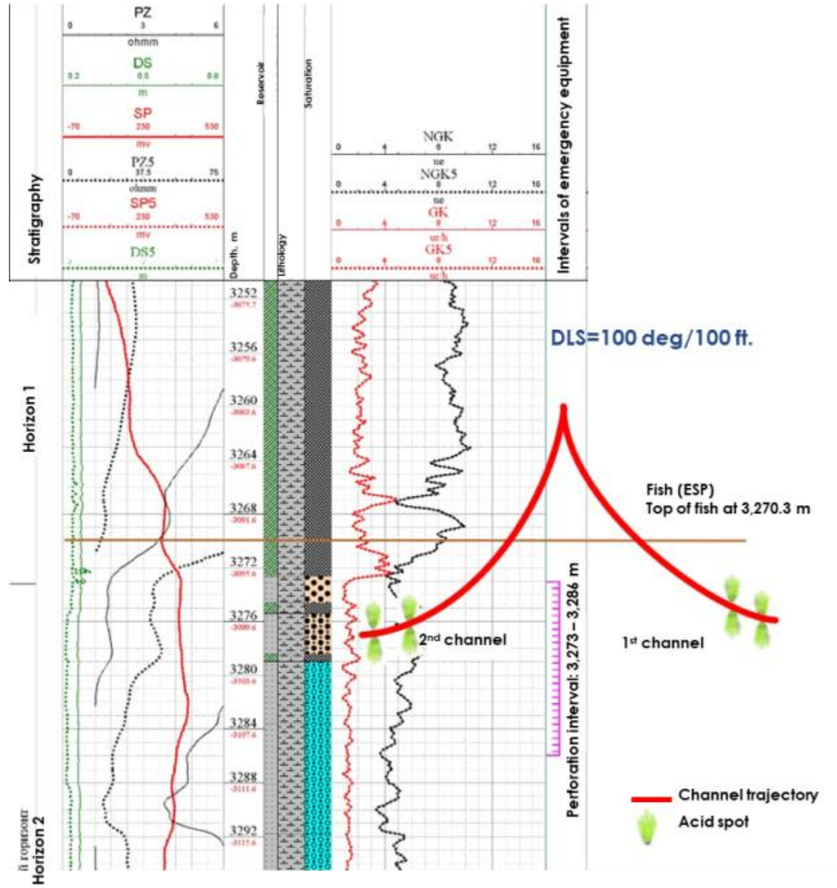
EXECUTION: 2 channels drilled 21 m length (DLS=30 deg/10m) each with acid stim performed through a jet sub (V=180 bbl of 18%HCL)

RESULTS:

- Oil increment +200 BOPD







GEOLOGICAL PARAMETERS

Formation	D3br
Type of reservoir	Carbonate
Target interval,ft	10,733.8 ÷ 10,753.5
Net pay,ft	19,7
Permeability, mD	1.5
Initial reservoir pressure, psi	4,000
Current reservoir pressure, psi	3,200
Oil density, g/cm3	0.8
Oil viscosity, cP	1
Reservoir temperature, degC	73
Bubble point, psi	1,470
Gas factor, cub.m/ton	100

PERFOBORE PETRO SHEKAF

DEEP WELL (CARBONATE)

OBJECT: Carbonate

CHALLENGE:

- High pressure to do Frac
- H2S and losses of circulation

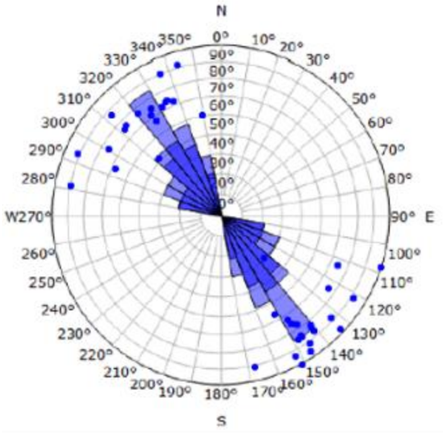
TASK: Formation stimulation in complicated well conditions

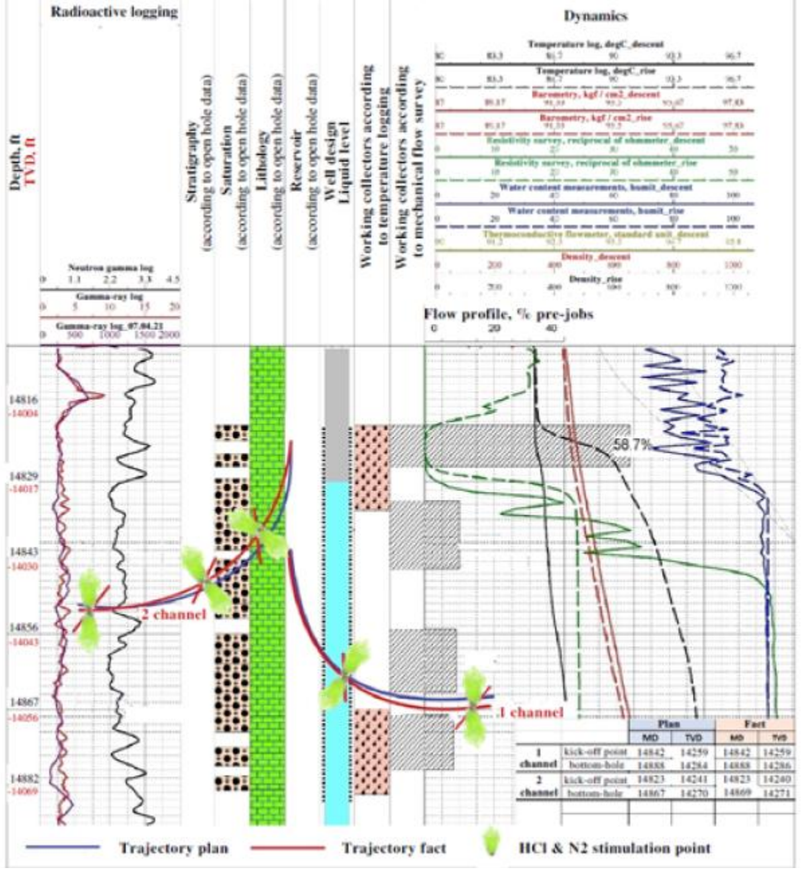
EXECUTION: 2 channels drilled 13 m length each with acid stim performed through a jet sub (N2 + V=1,710 bbl of15%HCL)

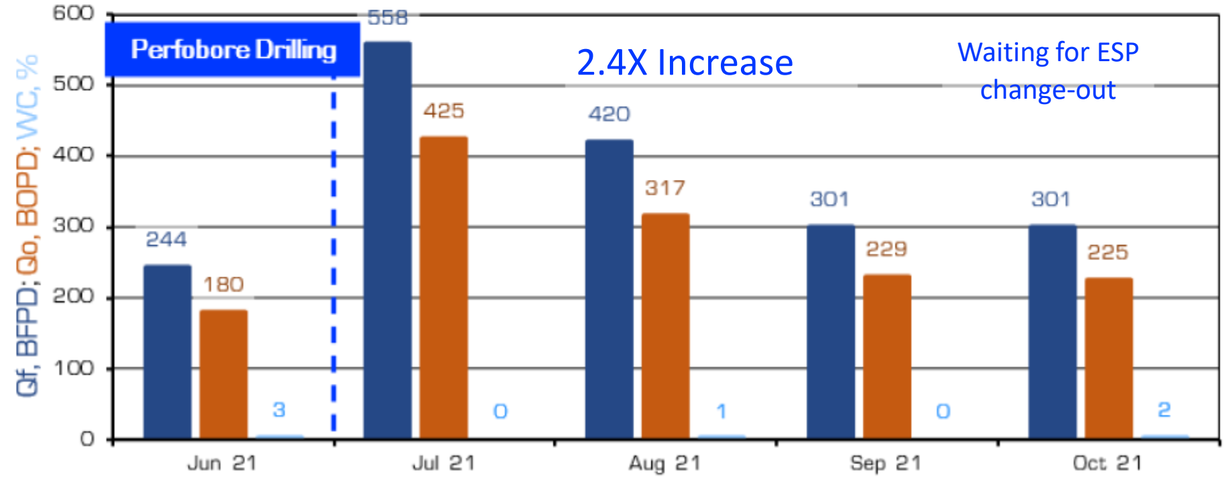
RESULTS:

- Oil increment +245 BOPD
- Increasing of PI by 5 times
- Post-job skin: –5

REGIONAL STRESS ORIENTATION







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

PERFOBORE PETRO SHEKAF

CASE STUDIES: OIL WELLS (SANDSTONES)

OIL RIMS STIMULATION IN SANDSTONE

OBJECT: Sandstone

CHALLENGE:

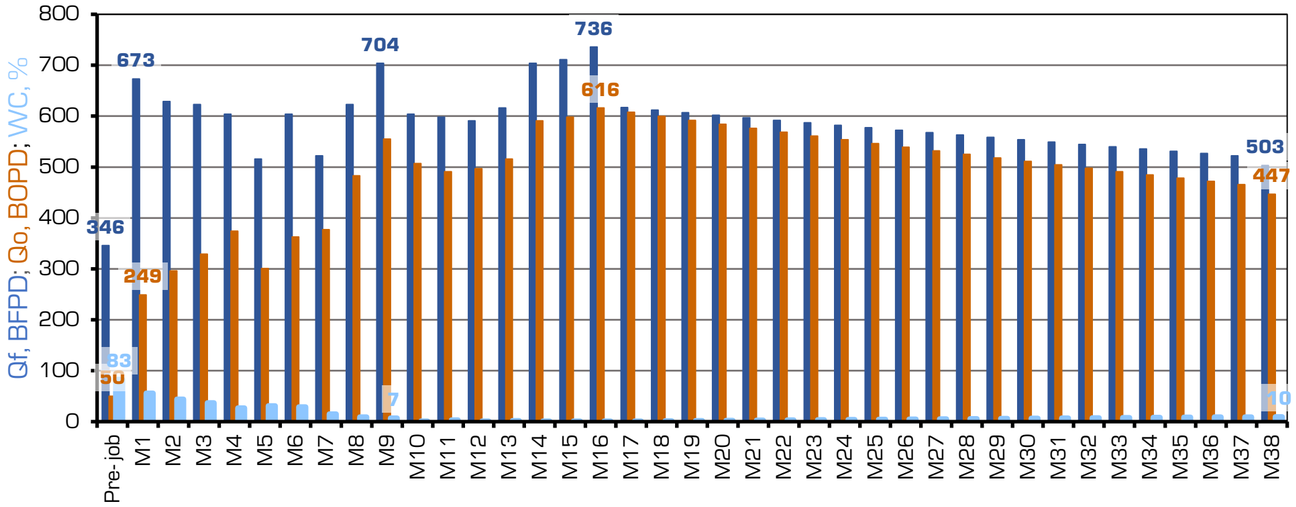
- Cas cap
- Low permeability (6 mD)
- No other options except PB to develop this zone

TASK: seeking for reasonable technology to develop oil rims

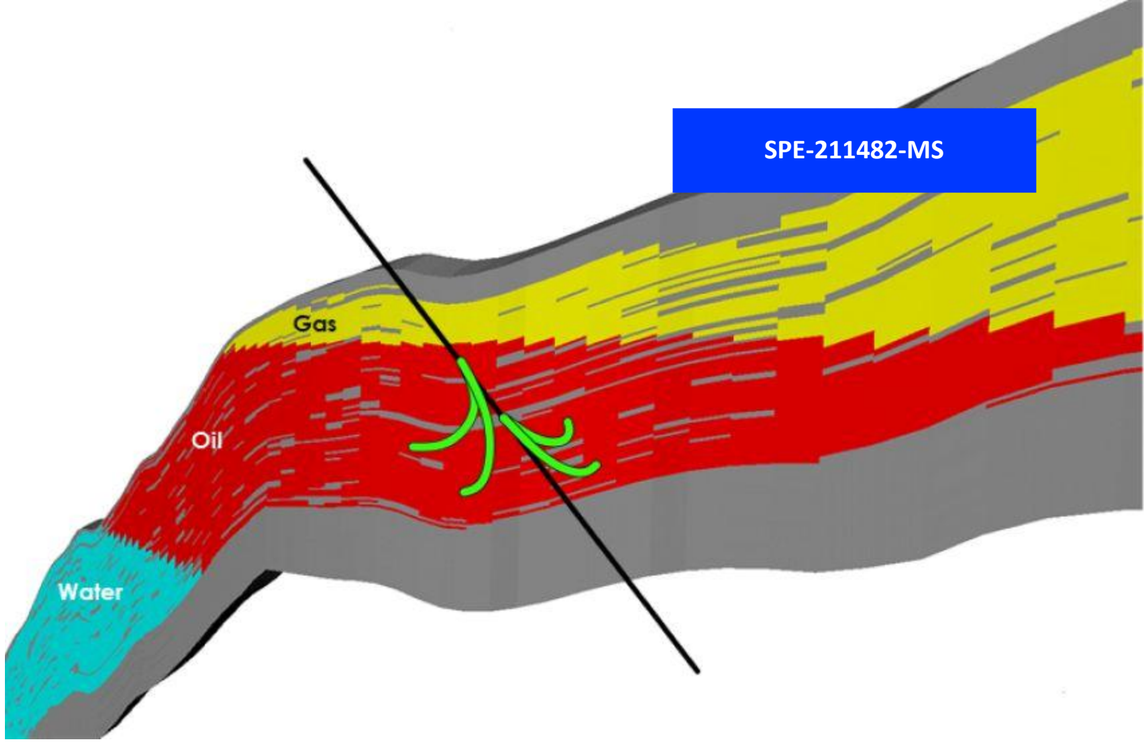
EXECUTION: 4 channels drilled 13 m length each with screens run

RESULTS:

- Oil increment +600 BOPD
- **Incremental production >500,000 bbl after 38 months**



SPE-211482-MS



GEOLOGICAL PARAMETERS

Formation	NP-4
Lithology	Sandstone
Target interval,ft	7,008 ÷ 7,054
Current bottomhole,ft	8,307
Gross thickness, ft	102
Total net thickness, ft	21,7
Permeability, mD	6
Initial reservoir pressure, psi	2,645
Current reservoir pressure, psi	2,019
Oil density at surface, g/cm3	0,854
Oil viscosity, cP	1,05
Reservoir temp, degC	58
Formation volume factor, stb/scf	0,209

PERFOBORE PETRO SHEKAF

STIMULATION OF LOW PERMABLE FORMATION

OBJECT: Light Oil with asphaltenes and paraffins

CHALLENGE: Low inflow:

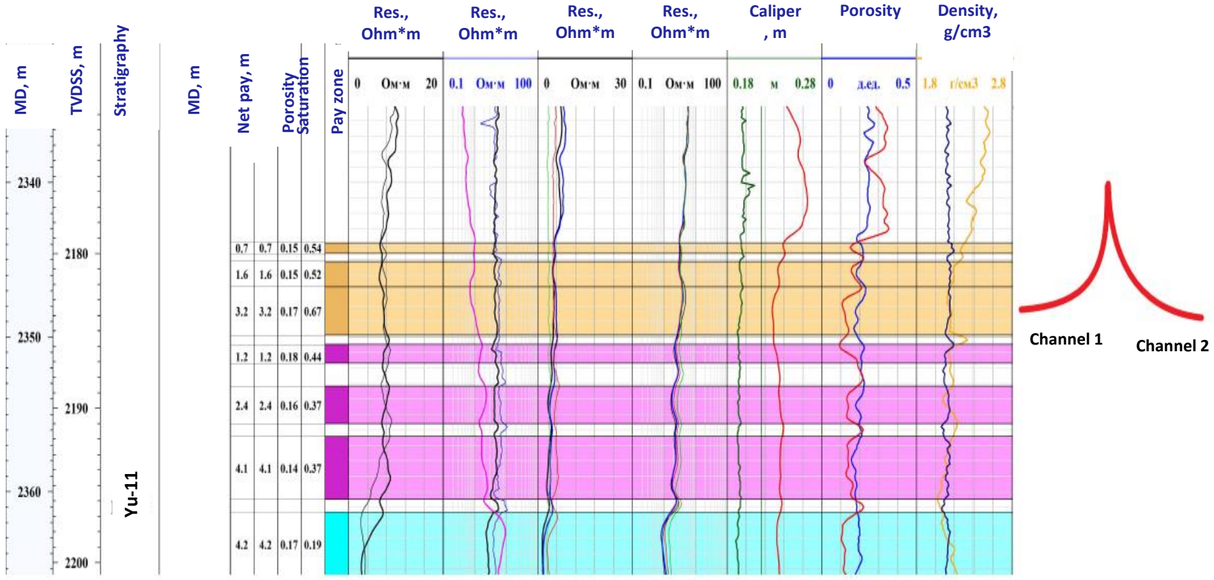
- Poor well productivity due to ARPD (asphalt and paraffin) deposits
- Proximity of water zone

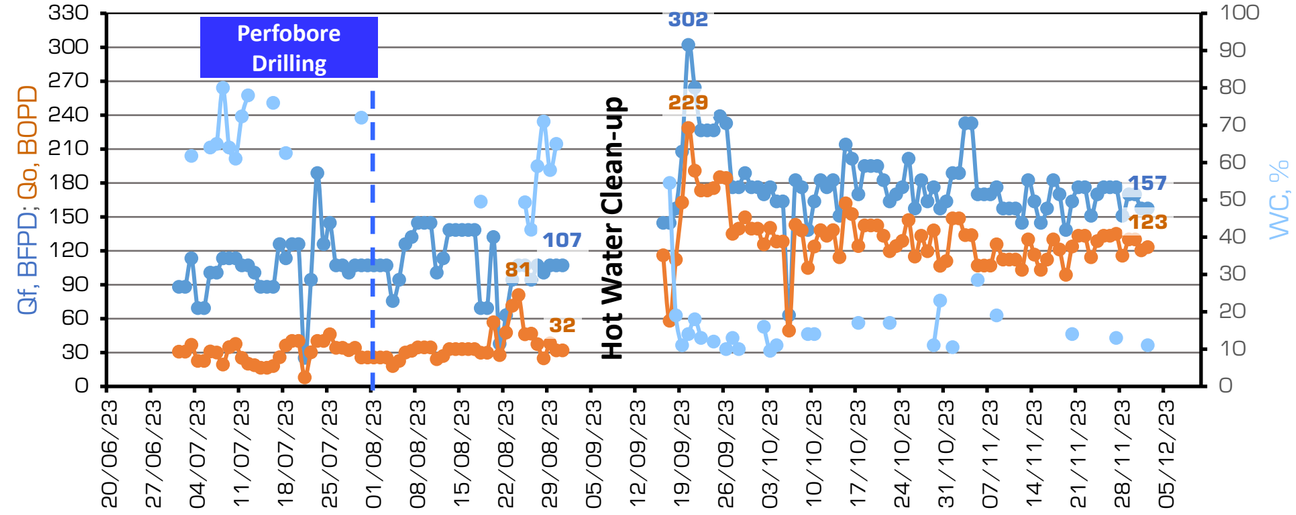
TASK: Inflow Stimulation

EXECUTION: 2 channels drilled 13 m length and channel cleanup with hot water.

RESULTS:

- Oil increment **+76 BOPD**





GEOLOGICAL PARAMETERS

Formation	Yu 11
Type of reservior	Sandstone
Target interval, m	2341 ÷ 2349
Net pay, m	5.5
K,mD	9
Initial reservoir pressure, psi	n/a
Current reservoir pressure, psi	2,900
Oil density, g/cm3	0,779
Oil viscosity, cP	2,68
Reservoir temperature, degC	88
Bubble point, psi	2,349
Formation volume factor, stb/scf	0,181
H2S content, %	n/a

PERFOBORE PETRO SHEKAF

STIMULATION OF LOW PRODUCING FORMATION

OBJECT: Light Oil with asphaltenes and paraffins (waxing)

CHALLENGE: Low inflow:

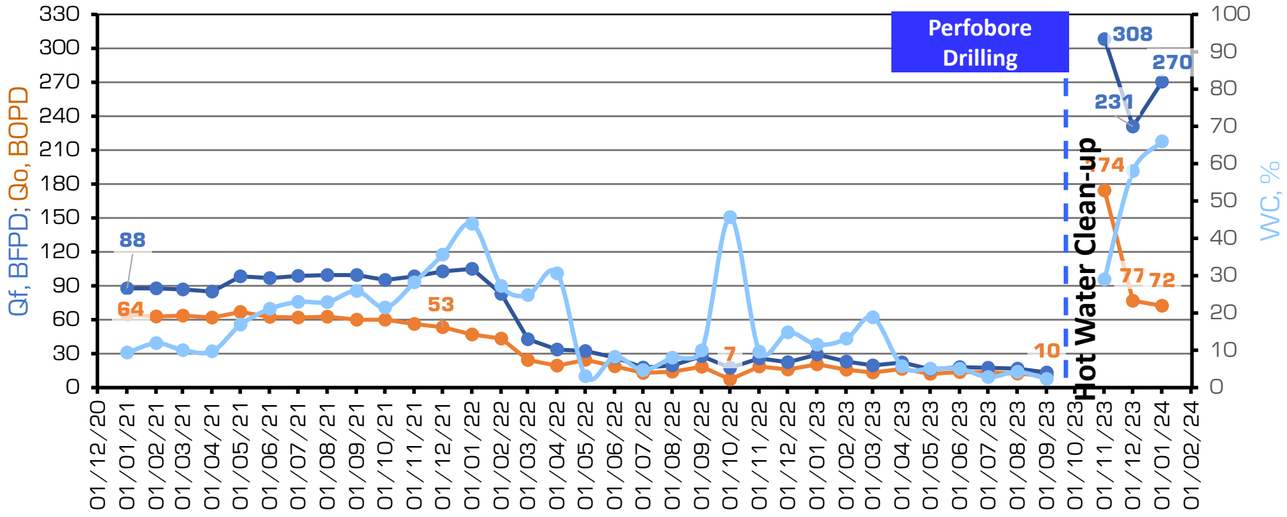
- Poor well productivity due to ARPD (asphalt and paraffin) deposits
- Low reservoir pressure

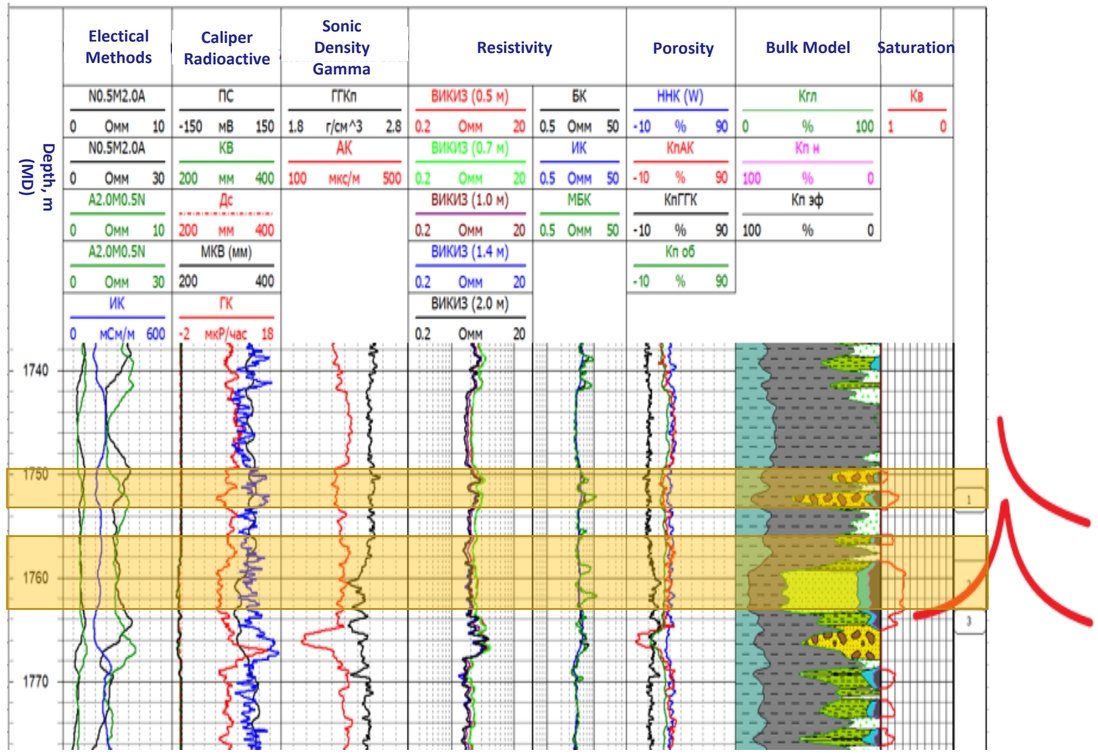
TASK: Inflow Stimulation

EXECUTION: 3 channels drilled 13 m length and channel cleanup with hot water

RESULTS:

- Oil increment **+163 BOPD**





GEOLOGICAL PARAMETERS

Formation	M II
Type of reservior	Sandstone
Target interval, m	1745 ÷ 1765
Net pay, m	11.4
K,mD	272
Initial reservoir pressure, psi	n/a
Current reservoir pressure, psi	1,682
Oil density, g/cm3	0,791
Oil viscosity, cP	3,15
Reservoir temperature, degC	75
Bubble point, psi	1,276
Formation volume factor, stb/scf	0,187
H2S content, %	n/a

PERFOBORE PETRO SHEKAF

CASE STUDIES: GAS WELLS

RECOMPLETION AFTER WATER SHUTOFF (SANDSTONE)

OBJECT: Sandstone

CHALLENGE:

- The well was being idle because of water cross flow behind casing

SPECIFICS: A hard 140 mm casing (SM80LV)

EXECUTION: 1 channels drilled 13 m length after the water shutoff job

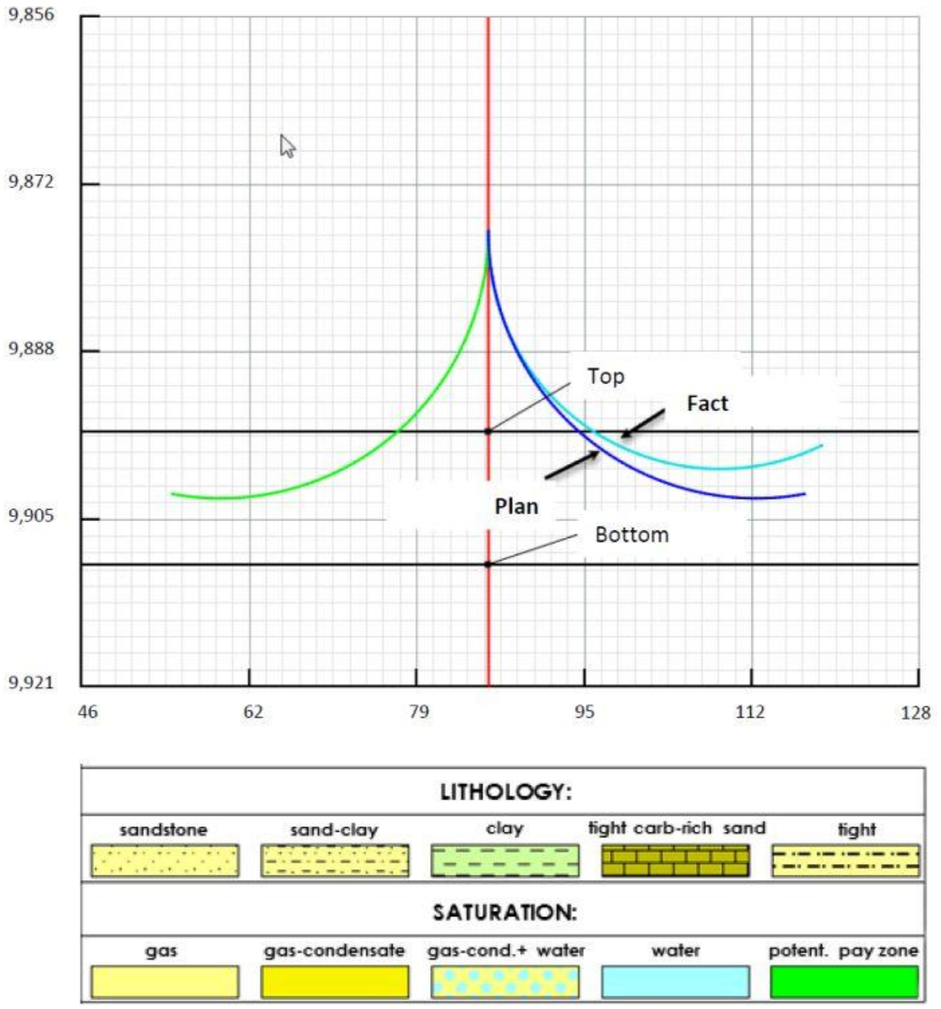
RESULTS:

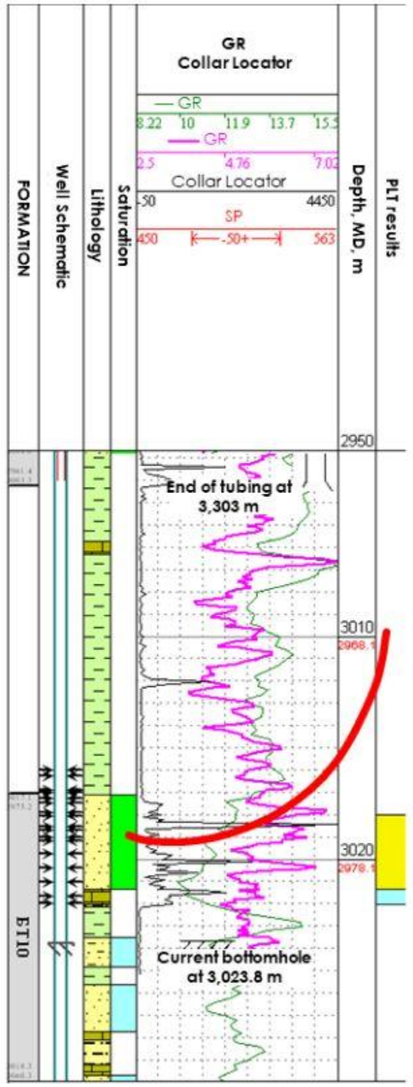
- Gas increment +1.7 MMCF
- The result is confirmed by well test before and after the job

GEOLOGICAL PARAMETERS

Formation	BT-10
Type of reservoir	Sandstone
Target interval,ft	9,898-÷ 9,911
Net pay, ft	13
Permeability, mD	9
Initial reservoir pressure, psi	4,456
Current reservoir pressure, psi	3,821
Gas viscosity, cP	0.02
Reservoir temperature, degC	78

RECORDING OF THE CHANNEL TRAJECTORY





PERFOBORE PETRO SHEKAF

SANDSTONE WELL STIMULATION

OBJECT: Sandstone

CHALLENGE:

- Low gas influx

TASK: Well stimulation

EXECUTION: 3 channels drilled 13 m length of each

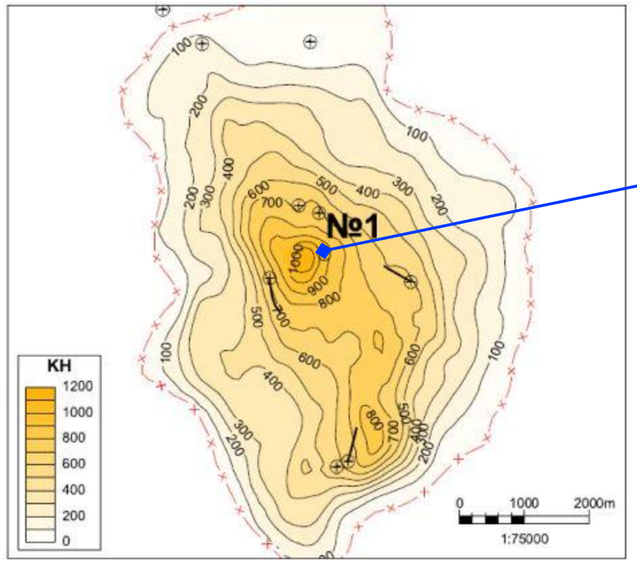
RESULTS:

- Gas increment +7.66 MMCF

GEOLOGICAL PARAMETERS

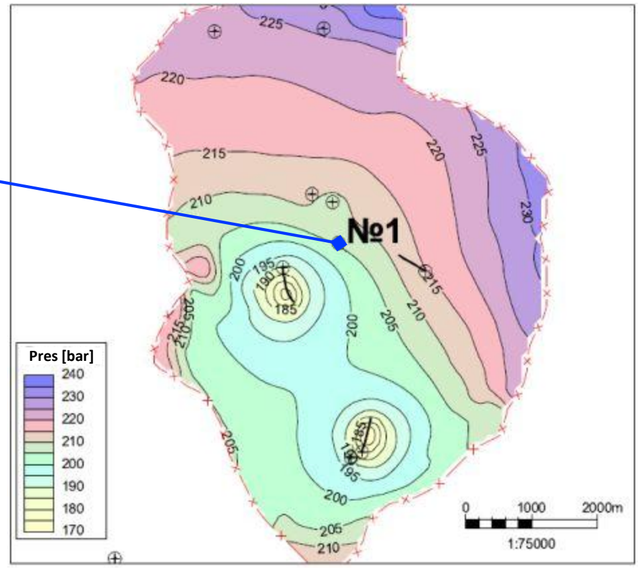
Formation	BT-10
Type of reservoir	Sandstone
Target interval,ft	9,898÷ 9,911
Net pay, ft	13
Permeability, mD	9
Initial reservoir pressure, psi	4,456
Current reservoir pressure, psi	3,821
Gas viscosity, cP	0.02
Reservoir temperature, degC	78

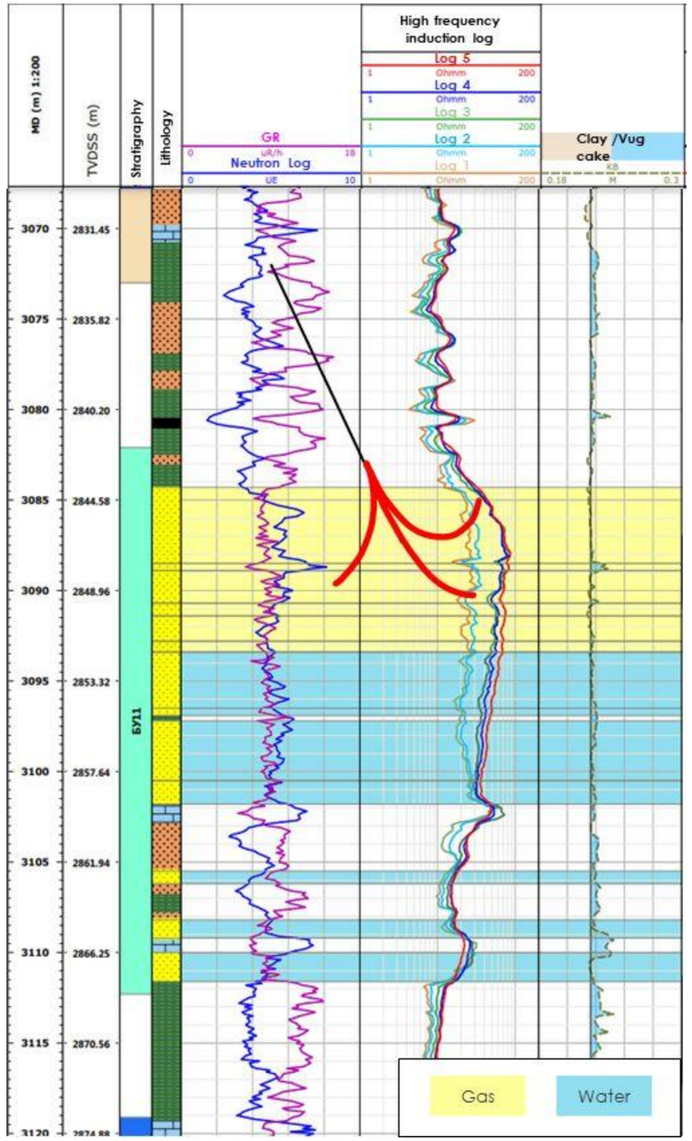
THICKNESS MAP



TARGET WELL X

ISOBAR MAP





PERFOBORE

PETRO SHEKAF

PERFOBORE

PETRO SHEKAF

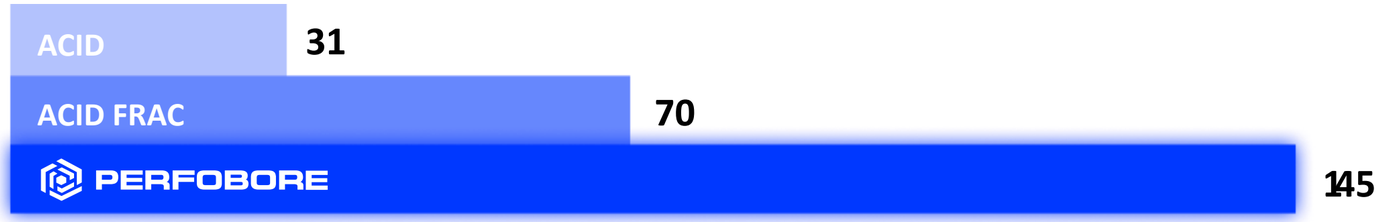
2025

SEQUENCE OF OPERATIONS

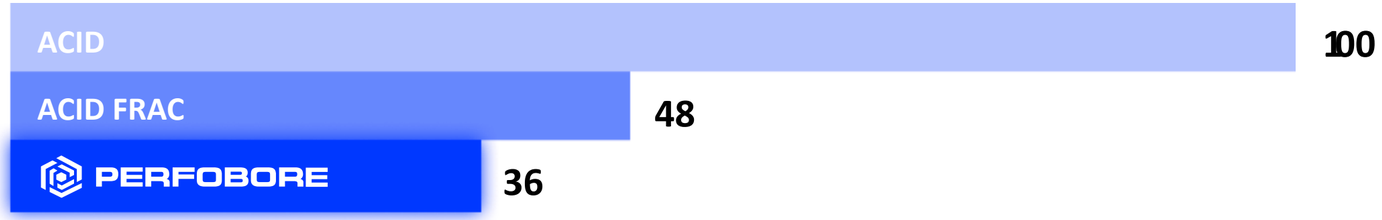
COMPARISON WITH OTHER STIMULATION TECHNOLOGIES (ONE CLIENT)

CARBONATE RESERVOIRS

Average increment, BOPD



Decline rate, % a year



COST OF 1 ADDITIONAL BARREL OF OIL WHEN USING PERFOBORE IS 50% LESS THAN WHEN USING ACID FRAC.

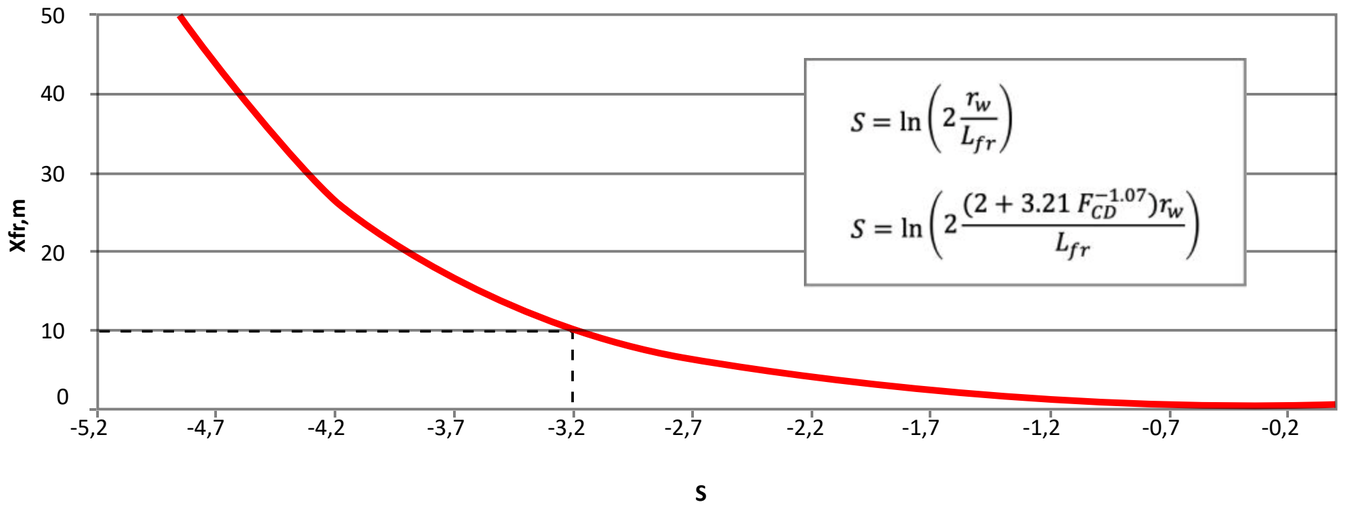
PERFOBORE SIGNIFICANTLY INCREASES PRODUCTION RATES AND MAINTAINS THESE INCREASED PRODUCTION RATES SIGNIFICANTLY LONGER THAN CONVENTIONAL STIMULATION TECHNIQUES

- Production Increment after PERFOBORE Drilling is 2 times higher than ACID FRAC and 4.5 times higher than after Acid stimulation.
- Longevity after PB is 1.4X more than after ACID FRAC

PERFOBORE PETRO SHEKAF

SKIN-FACTOR ESTIMATION - CARBONATES

SKIN-FACTOR VS LENGTH OF PERFOBORE CHANNEL



Xfr, m	50	30	25	20	15	12	9,5	7	5	2	0,5
S	-4,85	-4,35	-4,18	-3,96	-3,67	-3,45	-3,22	-2,92	-2,59	-1,68	0

- **ESTIMATED DURATION OF EFFECT AFTER PERFOBORE DRILLING IS 3 YEARS.**
- **THE WELLS COMPLETED IN 2019 PERFORM AT THE SAME SKIN FACTOR.**

WELL FLOW TEST RESULTS AFTER DRILLING OF 2 PERFOBORE CHANNELS WITH ACID STIM

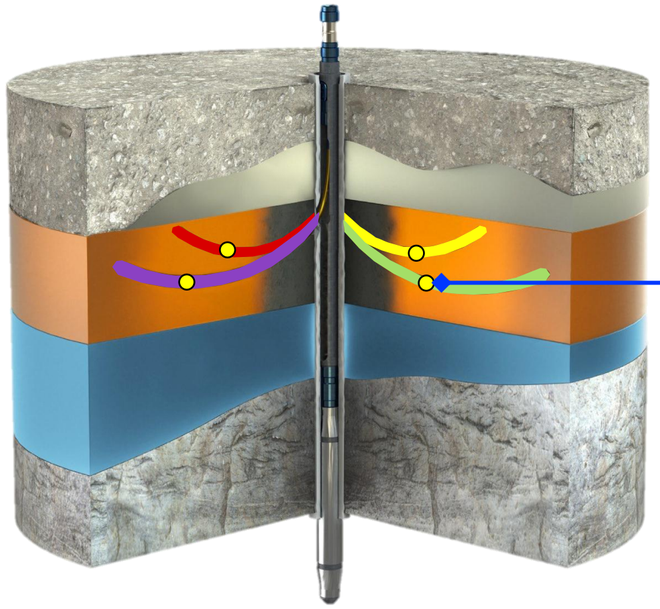
Client	Field	Well	Formation	S plan	S fact	Achievement,%
Client A	Field A	A	SKZ+SChR	-3,2	-3,2	100%
Client A	Field A	b	SKZ+SChR	-3,2	-4,9	153%
Client b	Field B	C	C1s-3+C1s-4	-3,2	-6,9	217%
Client C	Field C	D	XVI	-3,2	-4,8	150%

* Skin factor was calculated similarly to calculation of fracture half-length. Gringarten, A.C., Ramey Jr., H.J., Raghavan, R. Applied Pressure Analysis for Fractured Wells, JPT, 1975.

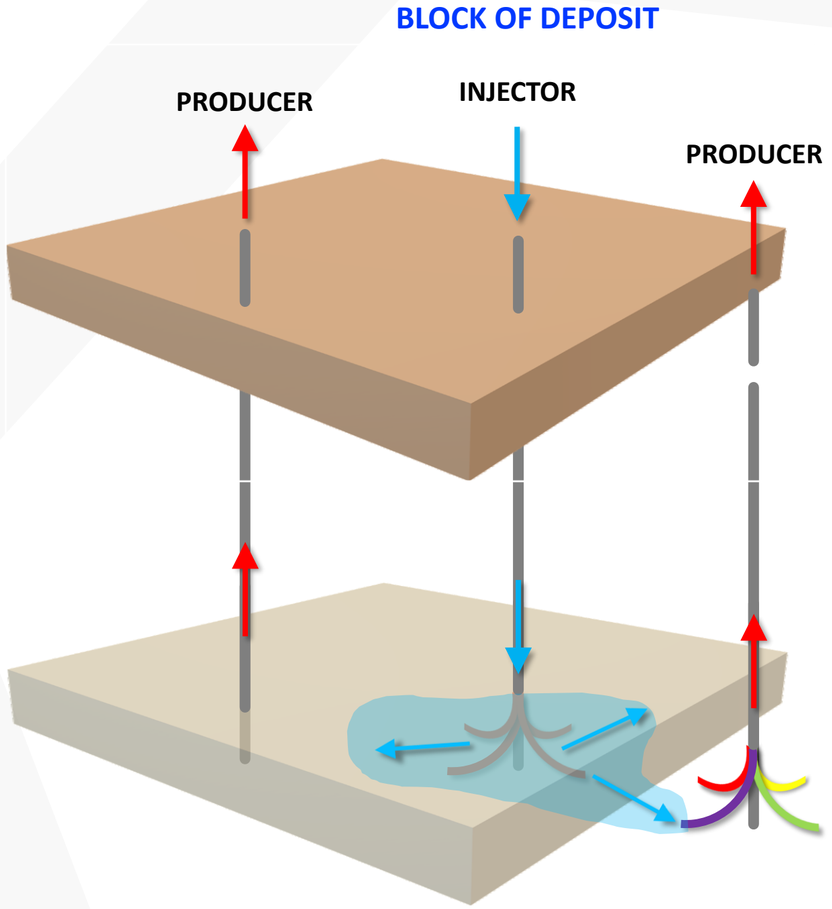
COMPARISON WITH OTHER STIMULATION TECHNOLOGIES

TECHNOLOGY	PERFOBORE	ULTRA-SHORT RADIUS	RADIAL-JET DRILLING	NEAR-WELLBORE JETTING	FISHBONES
Anchor Suitability for OH and Horizontal	**Stimulation, Re-entry & Evaluation**	Sidetrack Drilling	Stimulation	Stimulation	Stimulation
Method of Execution	**Simple Mechanical bit drilling**	Complex Mechanical bit directional drilling	Channeling by Jetting	Jetting device in main bore	Channeling by Jetting
Well type	**Open hole or cased hole**	Open hole (Section mill casing)	Open hole or cased hole	Open hole	Open hole
Laterals length OD	**Up to 80 ft (currently) 2.75”**	Up to 1500’ (Full DD) 3.875” (Bi-center bit)	Up to 300 ft (no control) 2”	Near wellbore only, uncontrolled channel	Up to 40 ft 0.5”
Thin Reservoir Application	**Yes**	Yes	Yes	Yes	No
Laterals at same TVD	**Yes, x4**	No - single channel	Yes, x2	N/A	Multiple small diameter jetted channels
Directional control & survey	**Yes**	Yes	No	N/A	No
Formation evaluation	**Yes**	Potentially	No	N/A	No
Re-entry / intervention of laterals	**Yes**	Yes - but single lateral	No	N/A	No
Surface equipment	**W/O rig, hoist, drilling rig, coil tubing**	Drilling Rig, W/O rig	Own equipment	Coil Tubing, W/O Rig	Drilling rig
Rotary Table Required	**No**	Yes	No	No	Yes

TRACERS



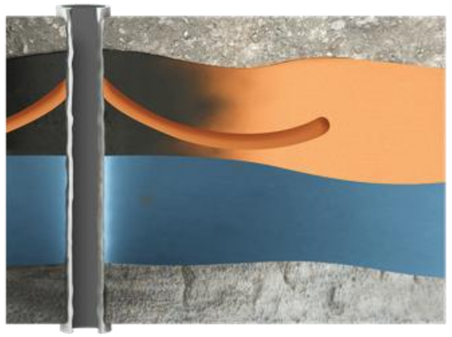
BALL-CENTRALIZER



- Is being delivered into the channel using Perfobore BHA
- Different channels are equipped by tracers with different colors
- Tracer might be for water or oil
- Ball–centralizer is fully dissolvable after programmed period of time
- Fluid production in each channel of producing well can be monitored separately and watered channel can be selectively shut–off.

PERFOBORE PETRO SHEKAF

COMPARISON WITH FRAC



- Inability to control frac propagation
- Risk of breakthrough to water/gas

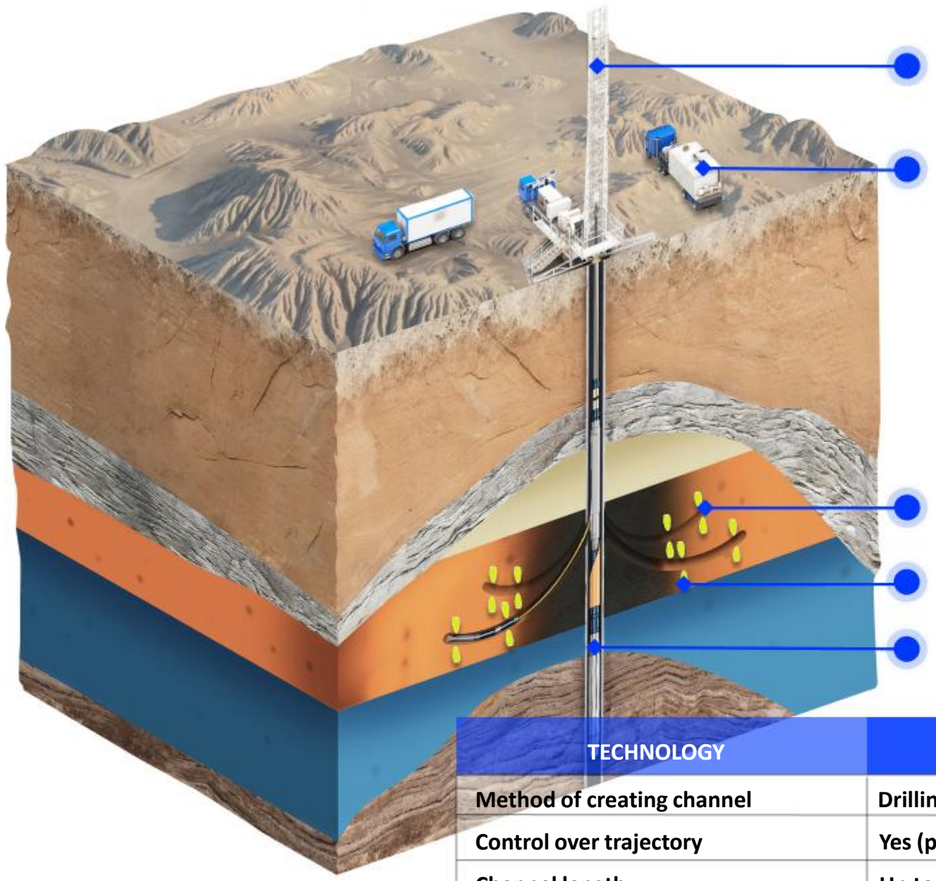
- Controlled trajectory allows to work in deposits with bottom water-drive reservoir
- Ability to record the trajectory of the channel
- No risk to breakthrough to underlying water zones

FOOTPRINT FOR PERFOBORE TECHNOLOGY IS 5 TIMES LESS THAN FOR FRAC

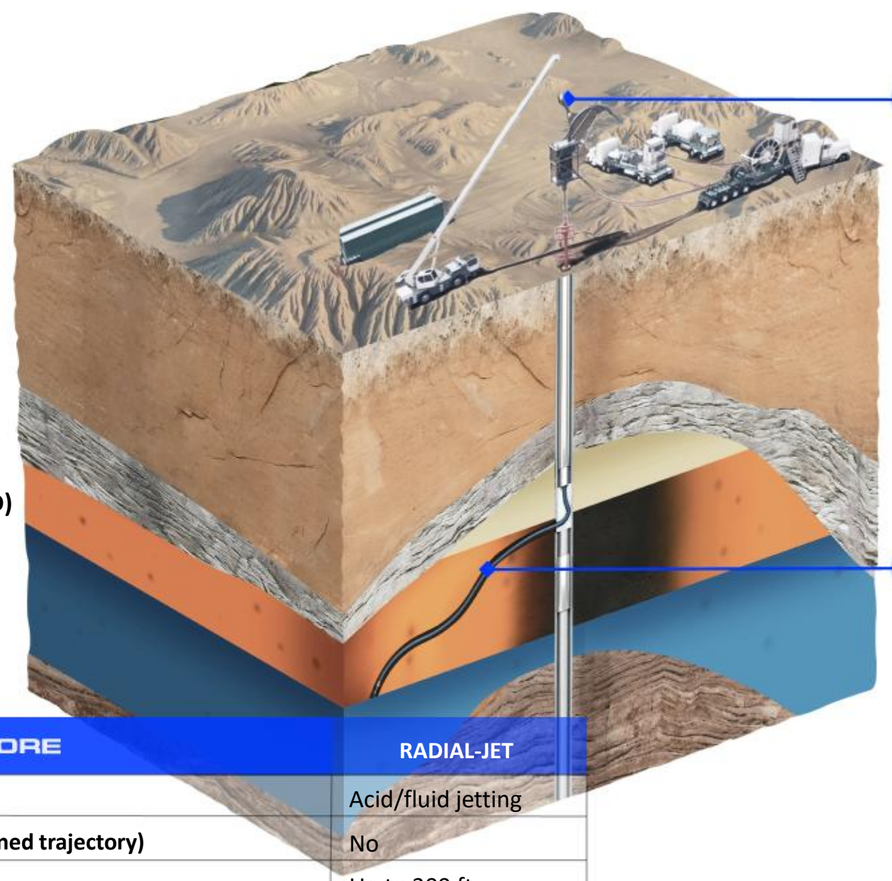
PERFOBORE PETRO SHEKAF

COMPARISON WITH OTHER STIMULATION TECHNOLOGIES

PERFOBORE



RADIAL-JET CHANNELING



TECHNOLOGY	PERFOBORE	RADIAL-JET
Method of creating channel	Drilling using BHA with mud motors	Acid/fluid jetting
Control over trajectory	Yes (pre-set directional BHA delivers a designed trajectory)	No
Channel length Channel OD	Up to 82 ft (currently) 2.75”	Up to 300 ft 2”
Re-entry	Yes (inclinometry, GR&Resistivity, screens)	No
Acid treatment inside channel	Yes	No

PERFOBORE APPLICATION AREA