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CASE STUDY

CONFORMANCE CONTROL IN HORIZONTAL WELLS

USING DYNAMIC TRACER-BASED PRODUCTION PROFILE SURVEILLANCE AND REAL-TIME CONTROL OF FLOODING

Objective

Dynamic tracer-based production profile surveillance was performed in one of the horizontal wells with a 3-stage hydraulic fracturing on a large field in Western Siberia.

The data obtained during the first months of production revealed that the inflow profile is highly non-uniform and the heel of the horizontal well (port No. 3) shows the least contribution to reserves recovery.

Maintaining a non-uniform production profile for a long period of time could lead to incomplete reserves recovery from the reservoir and loss of some part of the target production level, to restore which significant capital expenditures will be required.

Value for customer

- Improvement of the development system efficiency
- Increasing the oil recovery factor
- Reducing the uncertainty level when creating the reservoir pressure maintenance system

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Solution

The reservoir data analysis revealed that the south-western part of the reservoir is a low reservoir pressure area, which may be the factor responsible for the insufficient recovery from the heel of the horizontal well in question.

For this reason, it was decided to create an additional source of flooding and use well No. 1n, located in the immediate vicinity of port No. 3 of the horizontal well under study, as part of the reservoir pressure maintenance.

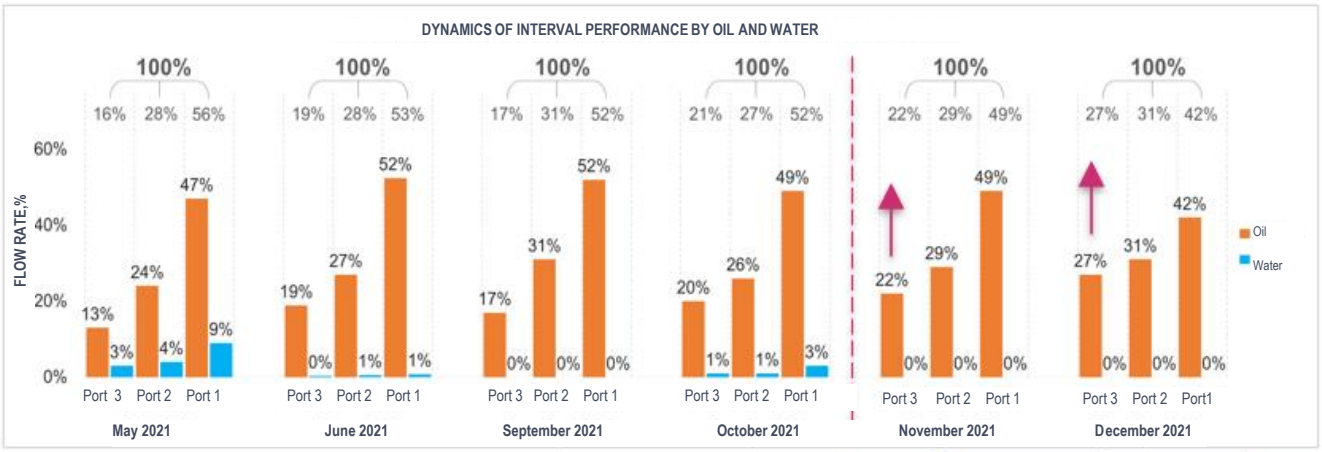
Well interventions aimed at bringing well No. 1n to the reservoir pressure maintenance system were successfully implemented without increasing the water content in neighbouring producing wells.
Thus, the creation of an additional source of flooding helped achieve both the growth in cumulative oil production from the horizontal well in question and a greater contribution from port no. 3 to the production, while decreasing the production profile non-uniformity coefficient.

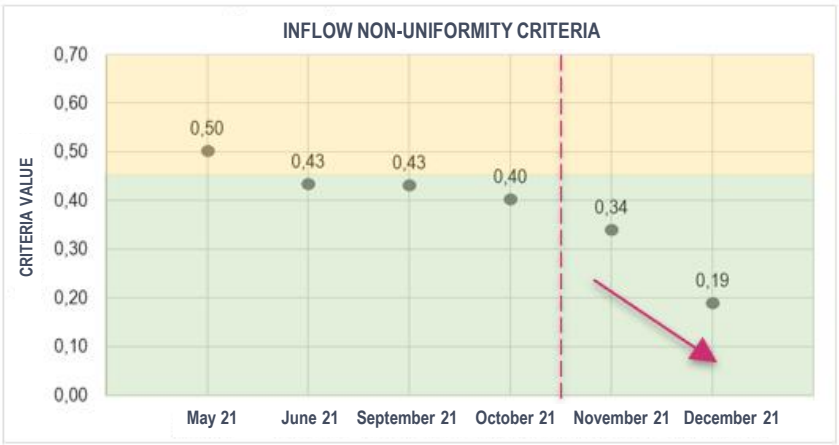
Location
Russian Federation

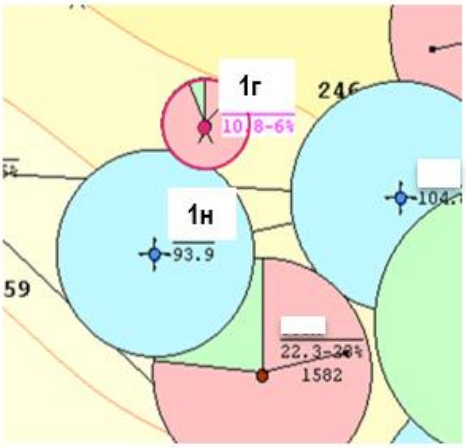
Oil field
Western Siberia

Type of well
Horizontal
with 3-stage hydraulic fracturing

Special conditions
Incomplete flooding system







Conclusion

The technology of tracer-based production profile surveillance can be used to timely substantiate well intervention measures aimed at conformance control in wells, which helps boost the reserves recovery around the horizontal wellbore and enhance the oil recovery coefficient.