Through-Tubing Gravel Pack Revives Sanded Marginal Well in Unconsolidated Formation

Case study: Recompleted well produces at 180 bbl/d of sand-free oil after 9 months of continuous production

Challenge
Economically reflow a well that had been shut in for 4 years because of sand production in unconsolidated formation with marginal reserves.

Solution
Use rigless technique that allows the gravel pack to be placed through existing completion tubing.

Results
Revived the well and produced at 180 bbl/d of oil after 9 months of consistent flow.

Well is shut in by severe sanding
Sand production is a major problem in the oil and gas industry. Loss of production, sand disposal issues, the need for routine cleanouts, damage to well jewelry, and stuck well accessories are the most common reasons for setbacks caused by sand production.

An offshore well producing since 1982 had been shut in for 4 years. Even after a series of coiled tubing runs to clean out the sand, the well could not be reflowed for even a single day. The operator asked Schlumberger to find a solution.

Well is recompleted with through-tubing gravel pack
The most common solution for mitigating sand production in cased holes is gravel packing. The success of a gravel-pack job depends on effectively packing the perforation tunnels, which act as conduits between the reservoir and the wellbore. However, for wells that start producing sand after production has begun and for which reserves are only marginal, a costly workover to install a gravel-pack completion is not always economically justifiable.

The well was recompleted with a rigless through-tubing gravel-pack technique that allows the gravel-pack assembly to be installed through the existing completion tubing. This vent screen and isolation packer method uses two screen assemblies separated by blank pipes placed and packed in the casing. Production enters the lower screens only, ensuring the best possible perforation packing efficiency and annulus pack quality.
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Because of the high cost of mobilizing a workover rig to perform a conventional gravel-pack completion, the operator chose to recom Complete the well using a rigless through-tubing gravel-pack technique that allowed the gravel-pack assembly to be installed through the existing completion tubing. This vent screen and isolation packer method, which uses two screen assemblies separated by blank pipes placed and packed in the casing, allows production to enter the lower screens only and ensures the best possible perforation packing efficiency and annulus pack quality. Low cost, simple, and effective, this technique has been used for many years in conditions requiring remedial sand control, though never before in this part of the world.

Particle-size distribution analysis of a sand sample taken from the well indicated that a gravel pack would prevent sand from being produced and also would provide support in retaining the near-wellbore formation. Simulations indicated that production could be increased by making additional perforations and increasing the communication path between the reservoir and the wellbore.

The vent screen assembly was run on coiled tubing through the production tubing and deployed with a fluid column as a barrier. After completion of the gravel-pack pumping operation, the coiled tubing was run in the hole to clean out the excess gravel. A slickline was run to retrieve the vent plug. An isolation packer and production overshot were then run and set to isolate the annulus from the tubing. This process was to prevent fluidization and producing of the pack around the screen and the consequential loss of the sand control barrier.

**Sanding problem is resolved and production restarted**

After the through-tubing gravel-pack operation, the well was put back on production, and after 9 months of consistent flow, it was producing at 180 bbl/d of oil (above the predictions set before this operation) with no trace of sand. Because of the success of this solution, the operator is considering this system for recompletion of its other wells that have been shut in as a result of sand production, particularly when only marginal reserves are available.

The Transcend® family of openhole sand management services includes screens and injection and inflow control devices, AquaPac® integrated water packing technologies, OptiPac® Alternate Path® gravel-pack systems, and IntelliPac® measurements in real time.

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