

Trican Thermal Acid

Business Needs

Our customer requested a stimulation that would be economical, and effectively remove the calcite scaling that is often present on the long horizontal slotted liner in Steam Assisted Gravity Drainage (SAGD) thermal operations. Aggravating the scaling situation is an emulsion of low API oil and water being deposited in between layers of scale, making cleanup even more difficult. The oil in these emulsion samples is often so heavy that, at ambient surface temperatures, it exhibits characteristics of containing solid fines. The combination of the thick oil emulsion and the calcite scaling causes a reduction of heat transfer from the steam injector to the producer, exacerbating liner plugging, and inducing a pressure drop that limits inflow into the horizontal producer leg. Previous treatments using 1% HCl acid or 5% Acetic have addressed the issue with scaling, however, the issue with the heavy oil emulsion remained unresolved.

Trican Solution

Trican developed and applied a highly effective Thermal Acid System, consisting of a proprietary blend of wax and asphaltene solvents, surfactants and corrosion inhibitors. The key advantage is that the system works cohesively by treating the low API oil/water emulsion and enabling the acid to reach and remediate the scaling through successive layers of blockage. At the same time, the inhibitor protects against corrosion by organic acids during treatment, even in the high-temperature environments that are characteristic of thermal wells.

The Trican Thermal Acid System was used to successfully deliver uniform clean-outs of the scale and organic deposits along the length of the horizontal slotted liner, which vastly improved production. The blend is injected with Trican's pin-point, high pressure jetting technology (HydroStim or StoneAge) conveyed through coiled tubing, applicable in temperatures up to 200°C (390°F), which is suitable for thermal stimulation operations.

The Trican Advantage

This customer employed the Trican Thermal Acid System on three of their wells. Following treatment, each well exhibited significant improvement in production compared with pre-stimulation metrics. Well #1 saw a 79% increase in production rate for the 90 days following treatment and continued to exceed pre-stimulation rates for 10 months. Well #2 saw a 127% increase for 90 days and continued improvement for 7 months. Well #3 was produced much more aggressively than the others, leading to a high but brief production peak before falling to rates similar to pre-stimulation.



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Well #	30-Day Average Prior to Treatment (scm/scf of opd)	Peak Production After Treatment (scm/scf opd)	Stabilized Rate (scm/scf opd)	Percentage Stabilized production gain	Duration Treatment Effective (at time of writing)	Payout Achieved (Days)
1	28/990	70/2472	59/2084 for 90 days after treatment	79%	10+ months	12
2	22/777	--	50/1765 for 90 days after treatment	127%	7+ months	15
3 (1 st Treatment)	17/600	109/3849	35/1236 for 4 months	224%	4 months	21
3 (2 nd Treatment)	23/812	65/2295	44/1554	47%	2+ months	10

Case Study Snapshot

Date: 2009 **Customer:** Calgary-based integrated energy company **Location:** Lloydminster, SK **Service Line:** Acidizing **Product:** Trican Thermal Acid

Challenges:

- Thermal heavy oil wells often exhibit calcite scaling and an emulsion of heavy oil.
- Conventional treatments using organic acid are of limited effectiveness due to the emulsion of heavy oil.

Trican Innovation:

- The Trican Thermal Acid System combined with high pressure jetting placement.
- Effective in remediating scaling and organic deposit build-up.

Results:

- At the three wells where the treatment was applied, production rose considerably.
- There was typically an 80% stabilised production rate increase, and at best 224%.
- Payout was achieved on average in a month, and at one well within days.



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