

Operator Increases Gas Production Rate by 15% with Foamer

MULTI-CHEM OPTIMIZES FOAMER APPLICATION AND SAVES OPERATOR \$1.67 MILLION PER YEAR IN CHEMICAL SPEND

ASIA PACIFIC REGION

CHALLENGE

- » High foamer treatment rates, high treatment cost and high well top-up frequencies
- » Challenging conditions: temperature of up to 180°C downhole and gas well depths up to 10,000 ft.
- » Produced water salinity ranging from 5,000 to 20,000 ppm
- » Produced condensate typically in the range of 2-5% of produced water rate

SOLUTION

- » Leverage Multi-Chem field experience and technical know-how to develop customized chemistry
- » Conduct lab simulation test and field test of custom foamer

RESULT

- » Field trial increased gas production rate by 15%
- » 39% reduction in chemical consumption
- » Once the foamer was applied across the entire field, chemical treatment costs reduced by \$1.67 million per year
- » Additional operations savings associated with reduced wellsite chemical top-up requirements

OVERVIEW

As mature wells suffer from declining reservoir pressure and increased liquid loading, they typically will not flow without the injection of a foaming agent. An operator of a mature gas field was previously applying foamer to 200 pressure-depleted sweet gas wells spread across a wide geographic area to unload liquids and maximize gas production. The incumbent chemical was an inefficient, low performing well foamer, which caused the operator to incur high injection rates, high treatment costs and high frequency well top-up.

Multi-Chem was invited to create a more effective and cost-competitive foamer for this particularly challenging environment, with the following stringent requirements.

- » Remain stable when flowing or static for a period of 28 days, without causing blockages in the capillary string, at downhole temperatures up to 180°C and well depths of 10,000 ft.
- » Formulate with a suitable preservative/biostat to ensure no bacteria growth in warehouse or wellsite storage tanks
- » Capstring approved
- » Minimum NAS Class 8 specification

Multi-Chem's technology group designed a customized foamer using systematic performance testing, formulation, compatibility and stability studies. The product was field tested and the predicted performance from the laboratory was proven in the field; the gas production of the representative wells increased by 15%, with one well achieving a 30% increase in gas production. The increase in gas production during the field trial was achieved



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while the foamer consumption was reduced by 39%. The success of the trial led the operator to apply the new foamer across the entire field, yielding an overall chemical spend savings of \$1.67 million per year.

Well	Gas Production Increase from Baseline (%)	Foamer Injection Rate Change from Baseline (L/Day)	Foamer Injection Rate Change from Baseline (%)
A	5	-78	-52
B	25	-30	-35
C	14	-46	-46
D	5	-50	-59
E	30	-40	-40
F	9	-47	-39
G	15	-25	-31
H	18	-6	-8
Total (Avg.)	(15)	-322	(-39)

Gas production increase and foamer injection rate optimization during field trial of representative wells.

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