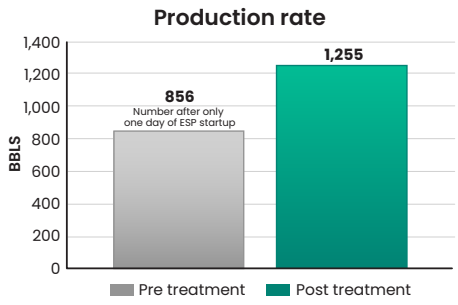
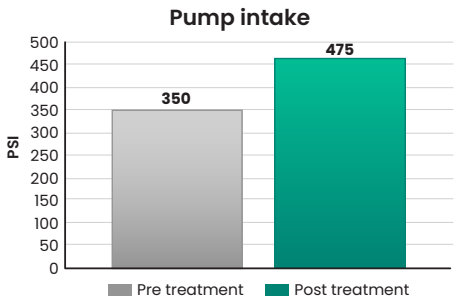
Case study: West Kuwait

MICRO-CURE E2 remediation system increased oil production rates

Kuwait Oil Company was producing crude oil in Um Ghadeir field in west Kuwait from 1998 to 2015 but production was declining after seven work over operations including water shut off and replacing ESP. The production decreased more leading to low fluid level in wellbore leading to tripping in newly installed ESP after only 4 to 5 days of starting due to low ESP pressure intake. It was suspected that formation was blocked by solids migrated into the perforation and emulsion blockage was formed from work over operations and several failed attempts to stimulate the well, the operator sought alternative remediation solutions. Also, since ESP was installed already it was undesirable to perform acid stimulation job as it will damage ESP and the other alternative was to get work over rig to pull out the ESP, perform acid stimulation job and then install ESP again and all this operation will cause more cost to the client, and delay in production.

Baker Hughes supplied the **MICRO-CURE™ E2** cased-hole remediation system to help with this underperforming well. The MICRO-CURE E2 system was bullheaded through production tubing and existing ESP then squeezed across the damaged zone. This Mesophase technology, with ultra-low interfacial tension, promotes high diffusion rates through the rock matrix to increase the flow mobility of reservoir fluids. MICRO-CURE E2 diffused instantaneously through the rock matrix as 350 PSI drop in pressure was observed while displacing MICRO-CURE E2. MICRO-CURE E2 was left to soak and further diffuse for 24 hours. ESP was started again to find pressure intake to be stable at 470 PSI and ESP pump is working efficiently and without tripping. After 12 days ESP was running with stable pressure, Portable Gas Oil Ratio (PGOR) test was performed and found production increased from 856 BPD to be 1255 BPD. In only six days of production, all of the costs associated with the remediation of this well were fully recovered due to increase in production.





Challenges

- Underperforming oil well in 15-year-old field in West Kuwait
- Suspected emulsion damage from work over operations
- Bullheading through ESP only treatment option to avoid expensive work over operations

Results

- MICRO-CURE E2 cased-hole remediation system
- Removed suspected emulsion damage
- Increased pump pressure intake
- Increased crude oil production