WWT NRPs Reduce Torque in Challenging Geothermal Lateral

Executive Summary

A geothermal operator experienced high torque and buckling while drilling the horizontal section of the wellbore for an enhanced geothermal system (EGS) in Nevada. WWT's Non-Rotating Protectors (NRPs) were installed and mitigated these issues successfully eliminating signs of significant buckling and reducing torque by more than 14%. NRPs were deployed for subsequent wells in the area as a solution to reduce torque and buckling by protecting the build and highly deviated sections.

NRP Performance

WWT Non-Rotating Protectors (NRPs) were installed in the vertical section of the well covering a major dogleg and the build section while drilling the 9-7/8" lateral section. With bottom hole temperatures up to 300°F, WWT model HT-500 and HT3-500 NRPs were installed to provide maximum tool joint stand-off between the casing and drill pipe.

Torque backmodeling after drilling indicates that NRPs reduced the torque by more than 14%. Image 1 compares the backmodeled torque values with and without NRPs and plots against the average actual torque generated while drilling illustrating the torque reduction. Image 2 shows the wellbore schematic with the NRP locations at TD highlighted in the blue and green regions. NRPs were positioned to target areas of high side force where more torque is generated.

After drilling, NRPs showed little to no signs of wear and the drill pipe had little to no signs of buckling.

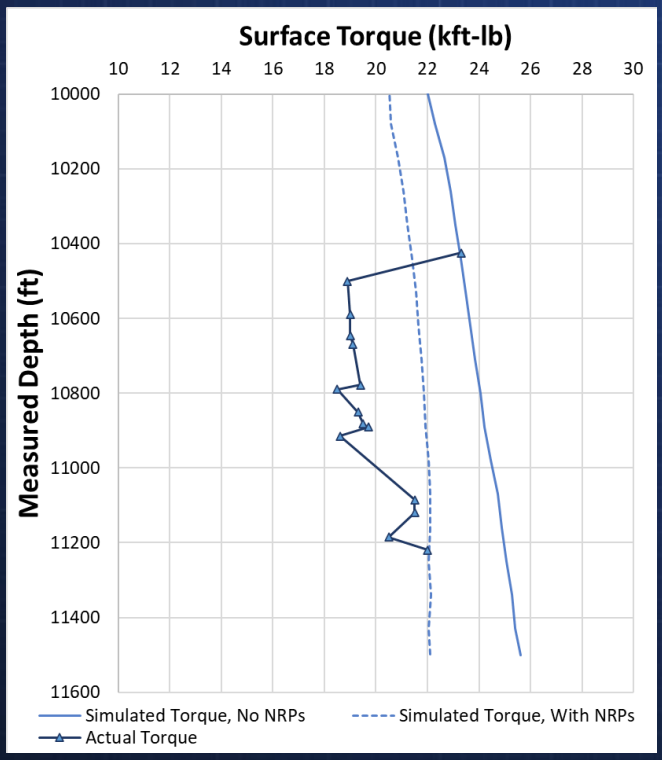

Image 1: Torque from Backmodel and Drilling

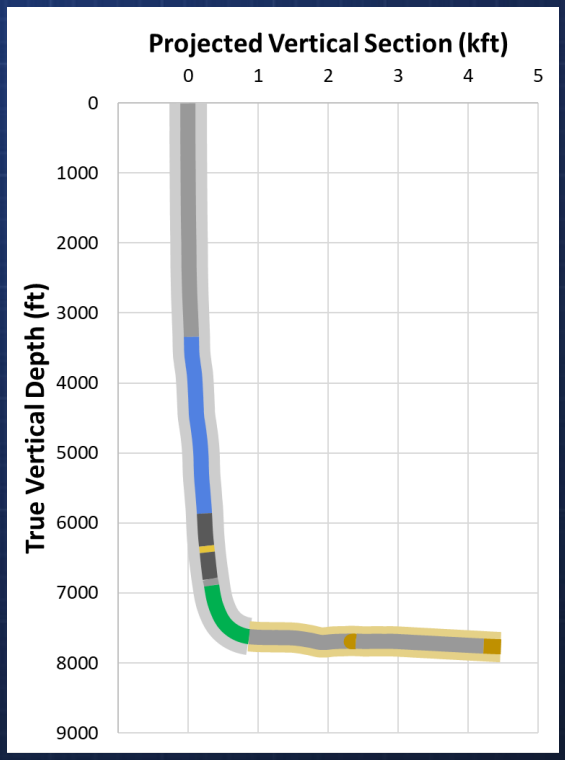

Image 2: Wellbore Schematic with NRPs Highlighted