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Please fill in your abstract title.	Factory Model Approach for Successful Coil Tubing Unit Drillout Operations in Unconventional Horizontal Wells

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Abstract

Objectives/Scope:
As drilling and fracturing operations improve and wells have longer laterals, there is a need to innovate current Coil Tubing Unit Drillout (CTUDO) process for a more fit-for-purpose approach applicable in any area, regardless of lateral length, number of plugs, and reservoir target. This paper presents the CTUDO methodology developed and implemented with case study results on the successful engineering design and implementation of new technologies to improve performance and eliminate large nonproductive time events, via the utilization of a successful, repeatable, and operationally safe process.

Methods, Procedures, Process:
A thorough evaluation of the CTUDO process was conducted to gain a better understanding of the critical factors that provided the greatest influence on improving performance. The results indicated that the main influencing factors were: wellbore trajectory, plug type, coil tubing size, bottom hole assembly (BHA) selection, fluid rheology QA/QC, real-time modeling, and communication. Rather than instituting and optimizing the critical factors all at once, a step-by-step road map was created. Over a five-month trial period, the factors were fully implemented and analyzed. Once the methodology was validated with predictable, repeatable, and successful consistent outcomes, it became the new standard for CTUDO's.

Results, Observations, Conclusions:
Full implementation of this Factory Model CTUDO methodology has been successfully utilized for over three years and continues to be the standard process. The well performance impact realized by optimizing the main factors, along with other technological advancements has been substantial. Appropriate engineering design led to better understanding the fluid rheology system and optimal chemical usage and dosage during CTUDO's. Coupled with proper CTU size and BHA optimization, pump rate capability and annular velocity are optimized, while minimizing plug debris size, aided in hole cleaning, which lead to greater efficiency. The use of data analytics to identify trends in downhole tool data, used in conjunction with real-time data allowed for procedure optimization. Operational enhancements include removing short trips and effectively eliminating stuck CTU events. Since the inception of this methodology 330+ horizontal wells ranging from 5,000' to 10,000'+ have been successfully completed, with well plug counts ranging from 19 to 102. The average time and cost savings realized are 66% and 61% respectively. The implementation of this proven process has provided additional cost savings benefits and reduced Put-On-Production cycle times by eliminating the need of dedicated post drillout flowback.

Novel/Additive Information:
This paper details the utilization of a simple, effective method for successfully executing and improving performance on CTUDO's. This paper also incorporates lessons learned and best practices from field execution, real-time data analysis and interpretation, and technology implementation. Furthermore, this methodology is designed to be a plug-and-play system, with minimal or no modifications needed to be applied in any unconventional basin across the world.