WOS New 3-1/4” Motor Improves Drillout Efficiency in Deep Marcellus Drillout Application

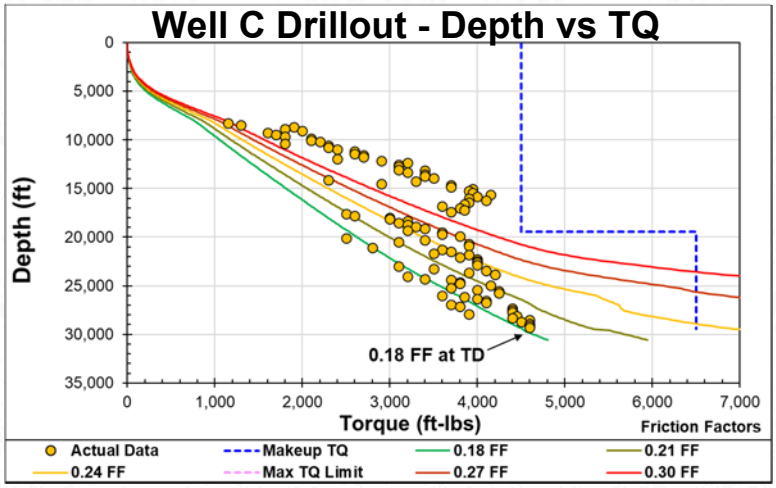
June 2025

WOS created a new downhole motor design in the 3-1/4” size that upgrades several aspects of its successful 3-1/8” size POWR Motor. The new motor design was utilized in a field trial by a WV Marcellus operator for frac plug drillout operation on a five-well pad. In this application, the high plug count in the long lateral section posed a significant challenge to bit and tool life.

3-1/4” motor was utilized first on Well A due to its shallow TD. It drilled out all 37 plugs successfully to 21,500’ TD. On Well B, 3-1/8” motor was utilized first but tripped at plug 47 for a bit change due to tight spot in the casing. 3-1/4” motor was utilized next to drillout 71 remaining plugs to 30,455’ TD. On Well C, 3-1/4” motor was utilized to drill out 81 plugs successfully to 30,455’ TD. The 3-1/8” motor was utilized on the other two wells D and C drilled out. Overall, the 3-1/4” motor showed improved plug drill times, wash times, and operational efficiency compared to 3-1/8” motor.

Pad Performance Metrics by Motor Size

Motor Size	Well Count	Avg MD Reached (ft)	Plugs Tagged	Avg Mill Time per plug (min)	Avg Wash Time per plug (min)	Avg Total 'No Tags'	Avg Plug Spacing (ft)	Open to Close Time (hrs)	KP to TD Time (hrs)	Open to Close Hrs /1000ft Lateral	Avg Plugs Washed per Hr
3-1/8”	3	31,245	107	15.99	67.34	12	197	186.8	150.5	8.01	0.80
3-1/4”	2	27,075	63	9.65	53.06	17	278	98.1	67.3	7.98	1.04



Application Overview

Target Formation:	NWV Marcellus Shale
Operation:	frac plug drillout
Date:	June 2025
Tool Conveyance:	2-7/8” jointed stickpipe
Production Casing:	5-1/2” OD 23 lb/ft
Plug MFR’s:	Nine, Yellow Jacket, SLB
Plug Types:	Composites, Dissolvables
Avg Plug Count:	112
TVD Avg:	7,093 ft
Fluid:	Freshwater

Application Challenges

- Long lateral sections (24,116 ft)
- High plug counts (124 composite plugs)
- Potential high friction and hole cleaning issues

WOS Solutions – 3-1/4” Motor

- Increased torque output and torsional yield strength
- Reduced internal wear on radial bearings, driveshaft, and flexshaft
- Improved durability from fewer housing connections

Product Details – 3-1/4” Motor

Tools Size, in	3.25
Makeup length, ft	14.83
Lobes	4 / 5
Stages	3.0
Flow rate, bpm	4 to 8
Full Load Differential, psi	750
TQ Output	2,400
Full Load Bit Speed, rpg	1.58
Weight, lbs	269
Top Connection	2-3/8” REG Box
Bottom Connection	2-3/8” REG Box