

## Wellbore Service Tools

# Halliburton successfully performs single-trip post-perforation cleanout and deburr run for water injector well

Location: Offshore Canada

### Overview

A major operator in Canada planned to install Halliburton's intelligent completion technology for a water injector well. Halliburton was also tasked to perform the post-perforation cleanout and deburr run in a single trip. The post-perforation run presented a significant challenge with 1,500 ft of perforations over two intervals, the first at a 75-degree inclination and the second interval being horizontal. The cleanout run was further complicated by heavy fluid losses after perforation, severely limiting the flow rate during the job and effectively eliminating the possibility of removing debris hydraulically.

Halliburton proposed the CleanWell® technology with an emphasis on mechanical debris removal. The proposed string had a debris recovery capacity higher than the estimated 800 lb (363 kg) of debris calculated by the tubing-conveyed perforating (TCP) provider. Four PowerMag® magnets were chosen as the primary debris recovery solution to provide high recovery capacity with as few assemblies as possible.

The PowerMag magnet is designed to assist in collecting large quantities of ferrous or non-ferrous materials that have become magnetically charged due to pipe rotation or movement during displacement, drilling, or intervention runs. The tool is built from integral drill collar bar stock to provide both high tensile and torsional values with a large ID, while also providing recessed, flat magnet sections with more than 2,800-in.<sup>2</sup> of surface collection area. The tool is equipped with high-energy, extremely strong neodymium bar magnets. These features provide a consistently proven debris recovery capacity in excess of 250 lb (114 kg).

The string included a Drill Tech® deburr mill to remove burrs left on the casing from the perforating operation. This operation is critical to ensure that completion packers will not be damaged while being run through perforations. The Drill Tech deburr mill is a specialized version of the CleanWell system's standard Drill Tech® casing scraper designed with milling stabilizer sleeves and carburized sawtooth blades to address burrs from perforations to restore the ID of the casing. The post-perforation cleanout and deburr runs were completed successfully.



HAL41004



HAL41005

*PowerMag® magnets with over 250 lb of debris*

*Drill Tech® deburr mill*



HAL41006

*Perforation debris collected by PowerMag® magnets*

**Benefits**

More than 835 lb (379 kg) of debris were recovered on the post-perforation run alone, including plastic gun debris found in the Vali Tech® filter that the TCP provider did not anticipate surviving the perforating operation. As expected, the flow rate was limited (400 gpm max.) during the post-perforation cleanout due to fluid losses, making the success of the mechanical recovery all the more critical. After the post-perforation cleanout, the intelligent completion was successfully installed and run, indicating that the Drill Tech deburr mill had cleared out casing burrs and obstructions as intended. Total debris recovery from this job, which involved more than five runs (including a cleanout and displacement run), was 1,069 lb (485 kg).

CHALLENGE	SOLUTION	RESULTS
Perform the <b>post-perforation cleanout and deburr</b> run in a single trip	Cleanout system with emphasis on <b>mechanical debris removal</b> using CleanWell® technology that included PowerMag® magnets, Drill Tech® deburr mill, Vali Tech® filter, and Mag Tech® magnets	<b>Total debris recovery</b> from this job was <b>1,069 lb (485 kg)</b>  After the post-perforation cleanout, the <b>Drill Tech deburr mill cleared out casing burrs and obstructions</b>

Debris Report – Post-Perforation Cleanout (Run 4)			
Tool	Tool Size in. (mm)	Recovery lb (kg)	Debris Description
Vali Tech® Filter	10 3/4 (273)	33.07 (15.00)	Blue plastic (perf guns) / rubber / O-ring
Mag Tech® Magnet	10 3/4 (273)	14.33 (6.50)	Sludge / metal fines / shavings
Mag Tech Magnet	9 5/8 (244)	6.39 (2.90)	Sludge / metal fines / shavings
Mag Tech Magnet	9 5/8 (244)	8.82 (4.00)	Sludge / metal fines / shavings
Vali Tech Filter	9 5/8 (244)	11.46 (5.20)	Sludge / pipe dope
PowerMag® Magnet	9 5/8 (244)	130.29 (59.10)	Metal pieces / sludge
PowerMag Magnet	9 5/8 (244)	140.21 (63.60)	Metal pieces / sludge
PowerMag Magnet	9 5/8 (244)	240.52 (109.10)	Metal pieces
PowerMag Magnet	9 5/8 (244)	250.45 (113.60)	Metal pieces
<b>Total Weight</b>		<b>835.54 (379)</b>	