

QUICK NOTES

LIMITLESS SLEEVES ENABLE HIGH-RATE STIMULATION IN LONG LATERAL

In September 2023, an operator completed a Cardium formation well in Alberta, Canada. A hybrid frac design was chosen using Stage Completions Bowhead valves in the toe portion of the well to achieve high pumping rates and resulting operational efficiency in the ~ 4400m lateral in addition to reducing coil associated costs and risks.

BOWHEAD SYSTEM

BY THE NUMBERS

29

Bowhead Valves



100%

Valve-Opening Rate

20 T per Stage
of Proppant Pumped



Maximum Slurry Rate of
9 m³/min

12 HOURS
to Complete Toe 30 Stages (incl. toe port)



DESIGN DETAILS

The frac design for the well was **89** total stages of **20-T** slickwater fracs located along a **4400 m** lateral wellbore. **29** Stage Completions Bowhead valves were installed in the toe section of the lateral with **60** conventional coil shiftable sleeves run in the heel of the well on a **114.3 mm** cemented liner. The key objectives for running the Bowhead valves:

- Enable optimal zonal stimulation at high pump rates (**9 m³/min**) to the entire toe section by eliminating the friction loss associated with annular fracturing treatments
- Reduce the overall wellbore risk and cost associated with coil in long laterals

JOB EXECUTION

Following the perforation of the toe port, **29 Bowhead valves** were sequentially opened and each zone fraced by launching corresponding collets with dissolvable balls between each frac. The launching operations were done on the fly with no requirement to shut down. The entire toe section (including all **29 Bowhead stages**) were fraced in **under 12 hours**. The collets were pumped through the lateral at full pump rate, slowing only ahead of their target landing valve, which aided the efficiency. Operational certainty was maintained by monitoring with high-resolution acoustic and pressure sensors which confirmed the exact location of the collet as it traversed the lateral, passing through the coil shiftable sleeves in the heel section. This monitoring also provided a unique signature of collet seat and subsequent valve shift.

BOWHEAD is a multistage single point entry frac system offering a near limitless number of fracs per well. Cemented or uncemented, this system allows operators to target optimal spacing and distribution while providing unprecedented confidence in valve-opening accuracy.

01

Single Point Entry

A cementable multi-stage single point entry frac valve system offering near limitless fracs.

02

Continual Pumping

Individually profiled collets pumped with dissolvable balls result in continual pumping.

03

Safer, Smaller

Large-bore, fluid-conveyed collets eliminate the need for wireline, coiled tubing and perforating guns at the wellsite.

