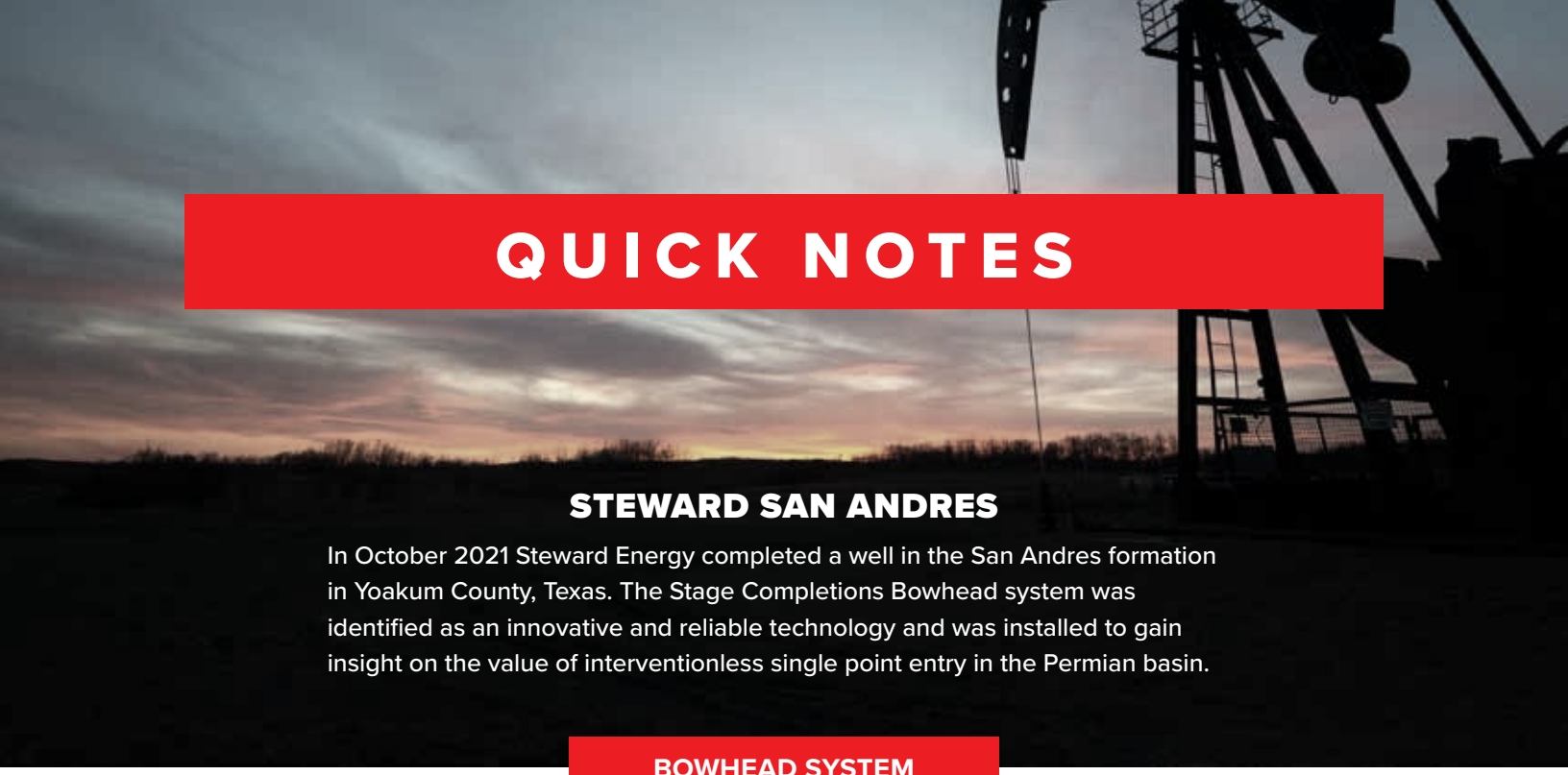

QUICK NOTES

STEWARD SAN ANDRES

In October 2021 Steward Energy completed a well in the San Andres formation in Yoakum County, Texas. The Stage Completions Bowhead system was identified as an innovative and reliable technology and was installed to gain insight on the value of interventionless single point entry in the Permian basin.

BOWHEAD SYSTEM

BY THE NUMBERS

31
Bowhead Valves

100%
Valve-Opening Rate

6,400+ m^3
of Water Saved

60,500+ L
of Diesel Saved

52% ⬇
Completion Time Savings

12% ⬇
Total Cost Savings

DESIGN DETAILS

The completion was planned for the **31 Bowhead valves** to be installed and cemented in a **1,600 m lateral**. Treatment would be **0.9 T/m crosslinked-gel fracs** pumped at a rate of **6 m^3/min** through **139.7 mm, 25.3 kg/m** casing.

JOB EXECUTION

During execution, the fracs went according to plan and the Bowhead system was an operational success. All individually profiled collets and dissolvable balls were confirmed by acoustic and pressure monitoring to have opened each corresponding valve. They were launched remotely during continuous pumping, eliminating the need to shut down between stages.

Compared to Steward Energy's standard plug and perf operations on similar wells in the area, they **reduced completion time by 52%, decreased water usage by 34%**, and **cut total well costs by 12%**. Production results from the Bowhead trial well have exceeded expectations, with an **11% increase of initial production** compared to offset wells.

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 targeted 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.

STAGE COMPLETIONS

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