

Vx Spectra Flowmeter Enables Real-Time Sand Quantification During Drillout in the Eagle Ford Shale

Instantaneous sand volume measurement maximizes efficiency and optimizes drillout operations, South Texas

CHALLENGE

Quantify the sand being continually produced during drillout operations to enable efficient response during the job.

SOLUTION

Deploy the Vx Spectra* surface multiphase flowmeter to measure sand rates in real time.

RESULTS

Acquired data in real time, delivering preliminary insight into produced sand and optimizing drillout operations.



Enhance operational efficiency with quantifiable data

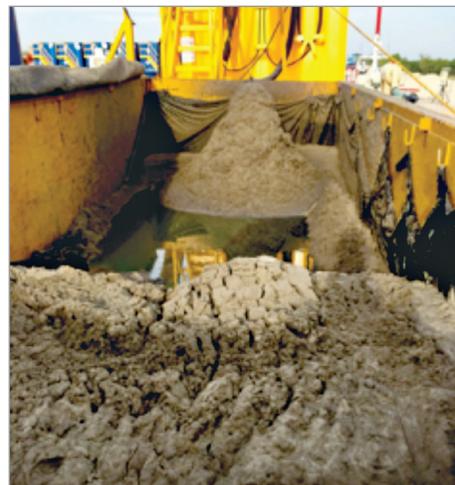
Sand quantification volumes offer critical insight for drillout and completions operations. Sand flow rates can indicate whether the drillout operation is being performed within a secure envelope of working conditions in terms of fracture stability and flowback. If the returns carry high sand rates, the sand could be coming from the fractures, resulting in unpropped zones. If the flowback volume is primarily sand, this could indicate a potential underflush during the fracturing operation. In contrast, sand rates can also be a confirmation of correctly executed drillout operations. If the sand is primarily coming from the wellbore, it indicates that the coiled tubing operations are being performed within the specified working conditions.

Acquiring sand volume data in real time can also optimize operations further upstream. Insight into how much sand is accumulating during millout can help an operator effectively handle and dispose of the sand. Procedures to manage sand can be implemented, including proper sizing of separators and other production equipment, and surface facilities design can be planned so the sand does not erode or deteriorate the equipment.

Historically, operating companies have measured sand by visually estimating the tanks after the job. However, postjob approximation alone is not as valuable as obtaining real-time sand rates during the job. Because of this, an operator sought a more effective approach to accurately quantify the volume of sand produced during its drillout operation in the Eagle Ford Shale of South Texas.

Enable real-time decisions using Vx Spectra flowmeter

The operator collaborated with Schlumberger to implement an integrated engineered flowback solution, including a request to incorporate the Vx Spectra surface multiphase flowmeter. The operation also included drillout services from Coil Tubing Services, a Schlumberger company, in addition to standard flowback equipment, including a plug catcher and hydraulic choke manifold, from Cameron, a Schlumberger company.



Sand tank postjob. Approximating sand volumes postjob is not as advantageous as real-time sand rate acquisition because produced sand can erode equipment during the operation and compromise project plans, decreasing overall efficiency.

CASE STUDY: Vx Spectra flowmeter delivers real-time sand quantification in the Eagle Ford Shale

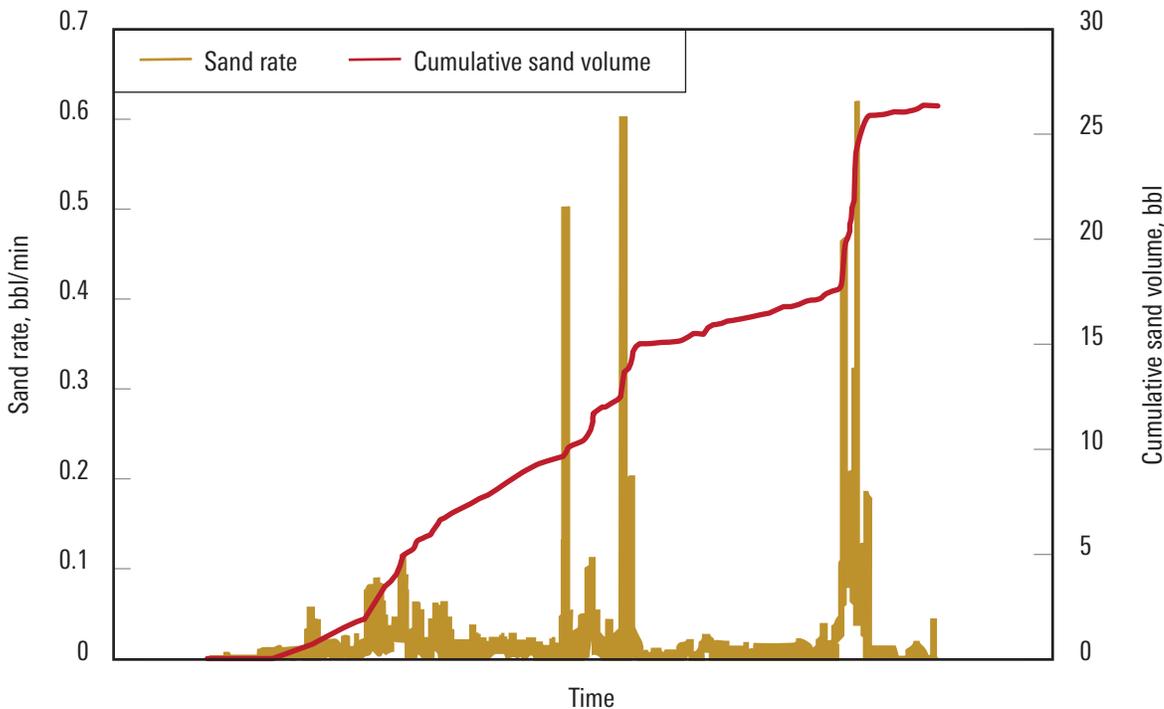
Conventional separators and other metering devices require constant basic sediments and water (BSW) sampling, which does not deliver instantaneous results. Similarly, sand-only meters require further postjob analysis for sand quantification. The Vx Spectra flowmeter makes a single-point measurement that determines phase fractions of the flow through low-energy gamma radiation measurements along with fluid dynamics models. For sand quantification, the same principle applies as the original three-phase water, oil, gas point. The configuration file still uses the nuclear, fluid dynamics, and PVT models to make computations for the phase fractions, total mass flow rates, and standard conditions. During the job, with the sand configuration file applied, instantaneous sand rates can be obtained along with water and gas flow rates.

The real-time sand quantification and water and gas rates were transmitted to the coiled tubing operators as they were measured, enabling the operator to make real-time decisions during the operation.

Maximized drillout efficiency and production potential

With the Vx Spectra flowmeter on location, communications were facilitated between the Coil Tubing Services cab and the flowback trailer, enabling Schlumberger and the operator to execute the job with more certainty by determining and quantifying what was flowing back to surface.

Confirming the secure operating window and performance efficiency in real time helped the operator determine preliminary sand rates as the plugs were drilled out and plug parts returned to surface. The productive lifetime of the reservoir can depend on decisions from the field after analyzing sand rates, and the integrated flowback strategy employed by Schlumberger and the operator facilitated the optimization of fracturing treatment design, perforation strategy, and production potential.



Sand accumulation over time. The Vx Spectra flowmeter obtained the sand rate and cumulative volume in real time, enabling the operator to optimize the drillout, completions, and production strategy.

Real-time multiphase flow rate monitoring of water, oil, gas, and sand production by the Vx Spectra surface multiphase flowmeter is a component of AvantGuard* advanced flowback services for optimizing well performance from poststimulation operations through production.

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