

CEMENTING & DRILLING SOLUTIONS

WOC Times Reduced to Less Than 8 Hours, Saving Approximately \$8,000 in NPT Per Well



OPERATOR STOPS WAITING AND STARTS PRODUCING

Challenge: Optimize operational efficiency by increasing speed of cement jobs across a multitude of wells being developed in the Delaware Basin.

Solution: Utilize Nine's Rapid Set 1, a cement specifically formulated to speed set times, allowing the operator to meet or exceed drill-out time expectations.

Results:

- Achieved compressive strength at 500 psi up to 3 hours sooner.
- Reducing wait time to minimum regulatory requirements.

A MAJOR OPERATOR IN THE DELAWARE BASIN NEEDED TO SPEED THE TIME TO 500 PSI ON INTERMEDIATE TAIL SLURRIES TO OPTIMIZED OPERATIONAL EFFICIENCY

Achieving faster set times presented a prime opportunity to boost efficiency on each well, as it would allow the operator to drill out the intermediate shoe at the 8-hour regulated time, or earlier. Thus, downtime due to waiting on cement would be eliminated.

The operator had been running a conventional Class H tail slurry at 15.6 lb/gal, which was reaching 500 psi in 10-13 hours, causing a 2-3 hour wait per intermediate casing job prior to shoe drill-out. At a spread rate of \$3,200 per hour, this was adding up quickly.

Nine innovates and breaks the 8-hour barrier.

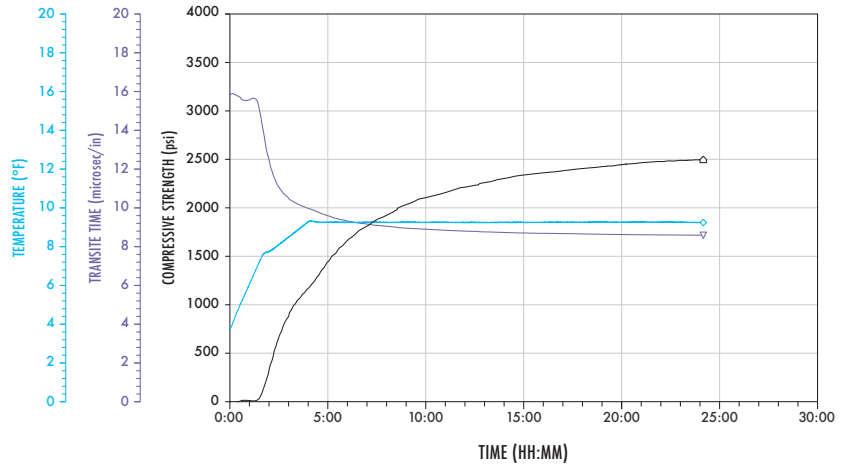
Nine's engineering team answered the challenge by innovating the Rapid Set 1 line of cement. This cement is designed to achieve adequate thickening time and fluid properties for an intermediate tail slurry while consistently reaching 500 psi in under 8 hours by using a combination of cementitious materials and specialty additives. The first slurry tested and run on a job was at a density of 15.6 lb/gal, which consistently reached 500 psi in under 6 hours after a dynamic conditioning time equal to the placement time on the job, usually 2 hours.

Nine continued to develop the Rapid Set 1 line, creating formulations at densities of 13.5 lb/gal to 14.2 lb/gal for formations requiring a lighter weight tail slurry, while still maintaining time to 500 psi under 8 hours.

UNCOMPROMISING DENSITY QUALITY CONTROL

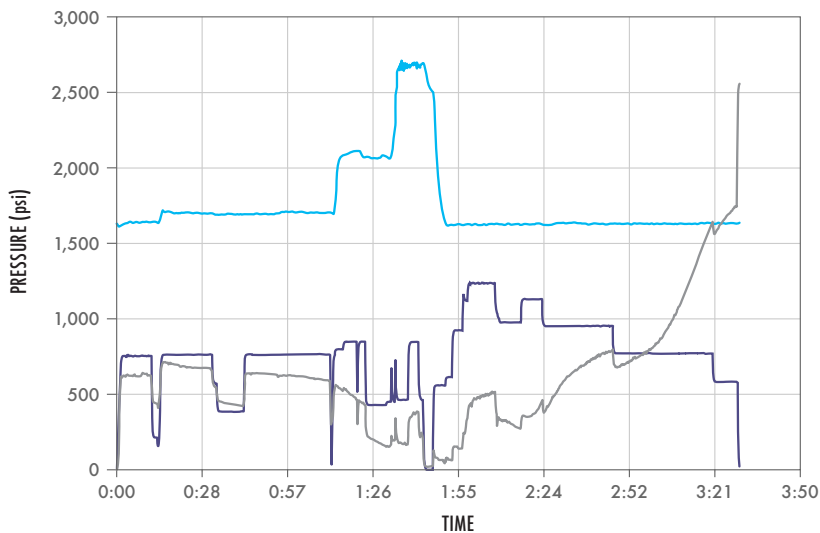
Slurries with conventional strength-enhancing additives can result in high viscosities due to the small particle size and increased surface area of the components. Rapid Set 1 solves these issues. It is designed for easy mixing on location to maintain density consistency. Nine regularly mixes and pumps these slurries at 4 to 6 lb/gal/min and can be mixed faster if needed. Like all Nine slurries, density control is maintained and confirmed with a Micro-Motion densometer, radioactive densometer and pressurized mud scales while mixing and pumping.

Rapid Set 1 at 15.6 lb/gal Density



Density Consistency Throughout Run

— Pressure — Rate — Density
Cobalt 32 State 707H Intermediate Casing



OPTIMAL CONSISTENCY THROUGHOUT RUN

Nine has successfully run over 150 jobs since the Rapid Set 1 line was introduced, saving operators approximately \$8,000 in NPT per job by reducing wait on cement time by hours.

Rapid Set 1 maintains consistent density throughout the job as PSI levels increase. Uniform density allows operators to achieve successful isolations and helps to prevent short and long-term failures.