

CASE HISTORY

Lodestone IMPROVES FRAC ZONE IN COALBED METHANE

APPLICATION

Multi-lateral, Pad Drilling, Collision Avoidance, Coalbed Methane, Active Ranging

TECHNOLOGY

Sci-Gamma, Sci-GAIN Gamma Ray and Inclination, Lodestone Active Magnetic Ranging

LOCATION

San Juan Basin, La Plata County, Colorado

CUSTOMER CHALLENGE

The customer wanted to place 3 lateral wellbores into a previously fracked zone, at predetermined perf locations in close proximity to a common drainage well, for improved production of the zone.

Drilling at close proximity would not be possible due to anti-collision concerns and the need for accurate relative distance for placement into the frac perf zones. All surveying sensors have associated with them uncertainty of measurement. When this error model is mathematically expressed, the true position of the wellbore is output as a most likely position within that ellipse of uncertainty. This ellipsoid of uncertainty is what leads to collision concerns when drilling in close proximity to existing wellbores.

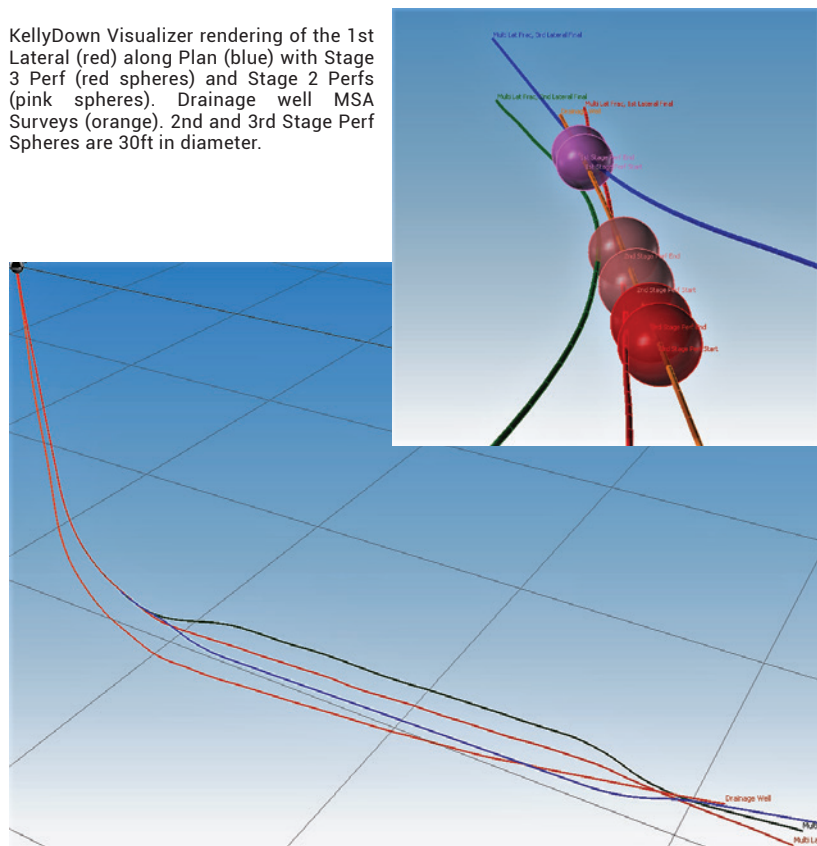
SCIENTIFIC SOLUTION

Magnetic ranging tools can be deployed to generate a downhole relative total distance and direction between two wellbores. These measurements, often referred to as "magnetic ranging surveys", do not suffer from the errors previously described. The Magnetic Ranging Survey is the most accurate survey type for wellbore placement, because it provides an absolute position relative to a known point.

The Lodestone active magnetic ranging system is an innovative long distance at bit ranging solution that is ideal for precision wellbore placement and intentional wellbore intersections. The ranging data provides an inclination and azimuth at the bit for each ranging measurement. This system has the greatest detection range on the market at 420ft.

The multi-lateral project consists of one drainage well and three lateral wellbores coming off whipstocks from an exploratory well or "Pilot well" positioned above the drainage well. Utilizing this industry leading ranging tool, Lodestone provided the ability to drill within the 15ft planned intersection point proximities. Each wellbore successfully intersected each frac perforation on the drainage well within 15-17ft, providing the customer with the most optimal production opportunity.

KellyDown Visualizer rendering of the 1st Lateral (red) along Plan (blue) with Stage 3 Perf (red spheres) and Stage 2 Perfs (pink spheres). Drainage well MSA Surveys (orange). 2nd and 3rd Stage Perf Spheres are 30ft in diameter.



CUSTOMER VALUE

In theory, the additional lateral wells, placed at close proximity to the perf zones will yield improved production from the formation asset.

The 3 lateral wellbores can be drilled into separate coal seams and then all intersect with the single drainage well. This saves the customer time and money by not having to drill multiple vertical wells.