

Case History

Surface Data Logging

LaserStrat® In-Field Service Helps Deliver Vastly Higher Production in Unconventional Shale Oil Wells

Location: Eagle Ford, South Texas

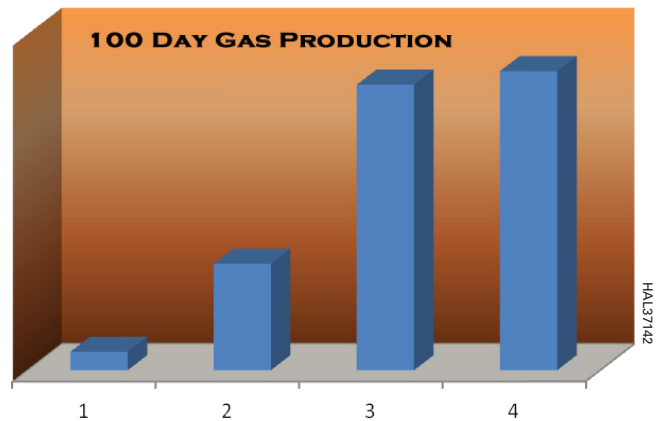
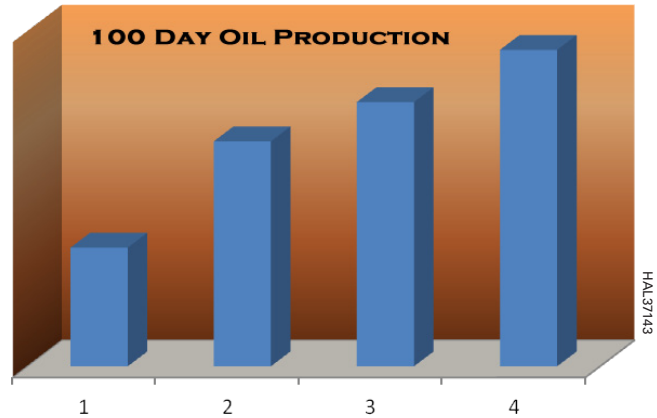
OPERATOR’S CHALLENGE – In this unconventional gas shale play, where the practice of staging fractures at regular intervals along the lateral wellbores has proved inefficient, the operator’s challenge was to obtain detailed reservoir information for optimum hydraulic fracturing along the lateral to improve the percentage of fractured intervals that would contribute to production.

HALLIBURTON’S SOLUTION – Sperry Drilling services recommended the LaserStrat® In-Field Service to economically provide detailed reservoir information from direct elemental measurement of drill cuttings along the full length of the lateral wellbore. This data would then be used to construct a LaserStrat Development Log comprised of the LWD Gamma Ray, LaserStrat ChemoGamma, Spectro Gamma, Elemental and Redox metal concentration, clay content, mineralogy, RBI (Relative Brittleness Index) and Gas values.

Of the four wells, Well 1 had the highest average clay content, while Well 2 had zones of both low and high clay content across the lateral.

While both wells were completed with a similar proppant plan, during the first 100 days of production Well 1 produced one-half of the oil and one-quarter of the gas produced from Well 2.

Based on the oil and gas production difference between Wells 1 and 2, and from the LaserStrat Development Log information about clay, the operator decided to change the target for Wells



3 and 4, locating fracture sleeves based on clay content and gas shows indicated by the LaserStrat log. The result was that, over the first 100 days of production, Well 4 produced two and one-half times more oil and 16 times more natural gas than Well 1, and one and one-half times more oil and almost three times more gas than Well 2.

Well 3, drilled parallel to Well 4, was completed across a distance of 4,950 feet (1,509 meters) and after 100 days of production, produced two and one-quarter times more oil and 15 times more natural gas than Well 1, and 17 percent more oil and two and one-half times more natural gas than Well 2.

ECONOMIC VALUE CREATED – The LaserStrat In-Field Service was able to economically deliver a development log to the client that extended the full length of the lateral. High ductile clay-rich sections were delineated, gas data shown, and RBI, GR/ChemoGR® analysis, Redox data, and available mineralogy were used in reservoir analysis to identify a new target within the Eagle Ford shale. With this new target information from LaserStrat analysis, the operator was able to optimize positioning of fracture sleeves and stages over the course of four wells, resulting in an oil production increase of two and one-half times.