

## **Using Seismic Characterization to Support a New Horizontal Program at Jonah Field, WY**

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### **Abstract**

The Jonah Field in Sublette Co., WY is a prolific gas producer that has historically been exploited with tightly spaced vertical wells that mainly targeted gas-saturated sand bodies in up-dip areas of compartmentalized fault blocks of the field. Today the same stacked fluvial sands of the Lance Formation are being tested outside of the historical field boundaries using modern horizontal drilling and completion techniques. Leveraging 3D seismic is critical for well planning and execution in the structurally and stratigraphically complex play fairways with limited well control. However, reliance on a vintage seismic data set in an area where subseismic facies changes and fracture swarms are common can lead to poor well placement and unanticipated drilling hazards. With the goal of testing remote areas and optimizing horizontal well locations for DSU development, ~150 square miles of seismic was reprocessed using pre-stack depth migration to better identify and characterize subsurface complexities. At a regional scale, the new depth volume allows updated characterization of large-scale features such as field-bounding faults and broad stratigraphic architecture. At an operational scale, the volume has proved indispensable for well planning and geosteering by accurately delineating bedding dips, structural geohazards, and stratigraphic variations. Our fault prediction methodology has proved to be accurate in areas where previous fault interpretation was unreliable or not possible, and previously unencountered stratigraphic hazards can be mapped for predictive purposes. Although limits to seismic resolution remain a challenge in and around Jonah Field, the high-quality depth volume is an example of a cost-effective tool for fairway delineation, strategic DSU development, and optimal well placement in a structurally and stratigraphically challenging system.

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