

# ENERGY TECHNICAL BULLETIN

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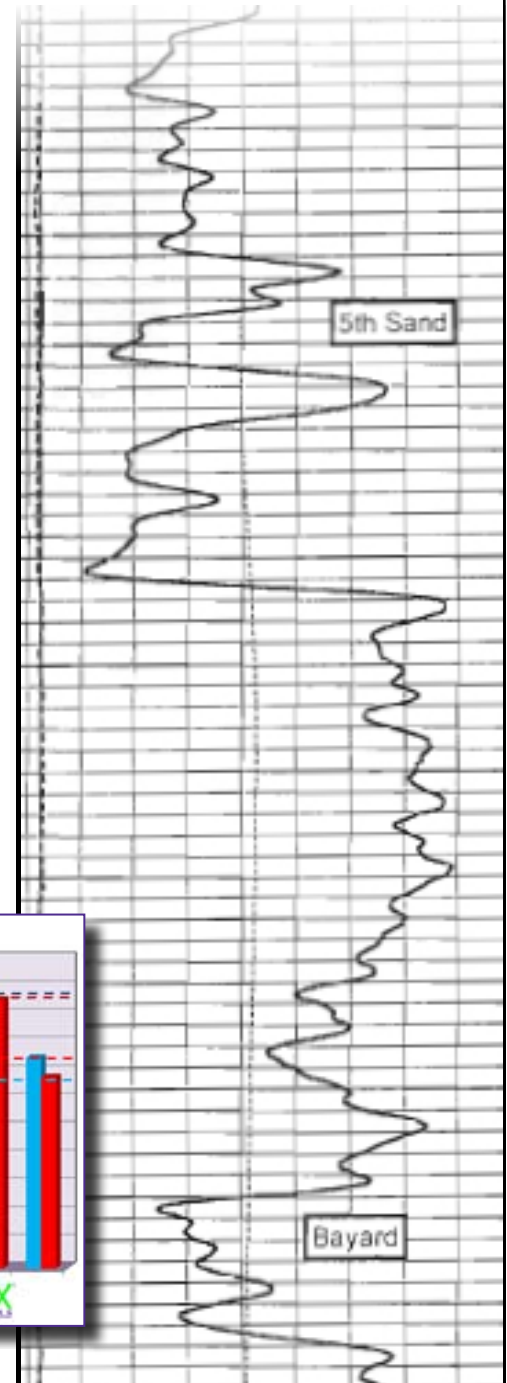
**PENNECO**  
YOUR ENERGY EXPLORATION PARTNER



**GEODynamics**<sup>®</sup>  
Engineered Perforating Solutions

## CONNEX<sup>®</sup> Perforating Study

We are continually investing time and resources toward innovating technology, ensuring that investments are used wisely. This summer, PENNECO teamed up with Titan Wireline Services and GEODynamics in applying GEODynamics' CONNEX<sup>®</sup> Perforating to the Bayard and Fifth sands of the Upper Devonian in Pennsylvania. By delivering clean, open tunnels with fractured tunnel tips, CONNEX<sup>®</sup> Perforating helps reduce breakdown and treatment pressures. By successfully applying this technology, PENNECO can now effectively treat the Bayard and Fifth sands that were previously difficult or unable to be completed. Specifically, PENNECO experienced significant reductions in breakdown and treating pressures in both zones. Treating rates were also dramatically improved, allowing for increased proppant placement which should equate to increased gas production.



This chart shows that Connex<sup>®</sup> Perforating reduced the average breakdown pressure by 675 psi (17% and the average treating pressure by 505 psi (13% compared to the use of conventional systems.

