# 10.20: Log-based Pressure Prediction in the Mad Dog Field with the FES Method

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## ABSTRACT

I use wireline data and the total stresses from a geomechanical model that has been coupled with seismic velocities to predict pore pressure along several wells in the Mad Dog Field. The geomechanical model is a 2D plane-strain static drained model that calculates stresses and pressure using the FES workflow (Heidari et al, 2018). I show that by using high resolution wireline velocities instead of seismic velocities, I better capture the changes in pressure around the salt body by as much as 1.6 ppg (Fig. 1). I also show that the FES method better characterizes the non-uniaxial stresses encountered at Mad Dog than the vertical effective stress (VES) and mean effective stress (MES) methods, and reveal how this improves pressure prediction by as much as 1.2 ppg (Fig. 2).

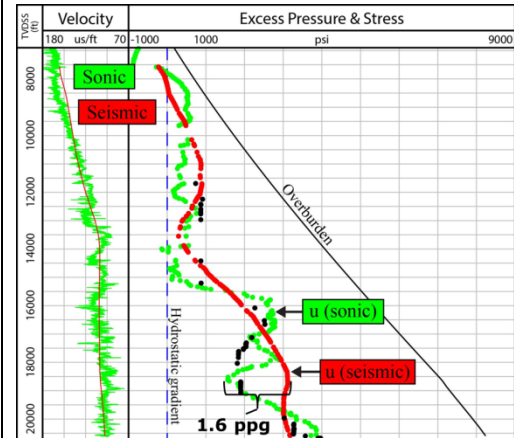**CLICK ON IMAGE FOR LARGER VIEW**



**Fig 1:** Pressure prediction along well 826-1: wireline sonic (green dots) vs. seismic (red dots). The Sonic log (green curve) provides higher resolution velocities than seismic (red curve), which improves pressure prediction by as much as 1.6 ppg.
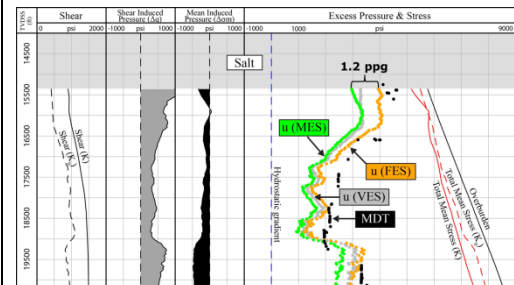


Fig 2: Pressure prediction along well 782-1. The FES method (orange dots) employs the stress results from the updated geomechanical model, which provides an improved characterization of the non-uniaxial stresses encounter at Mad Dog.
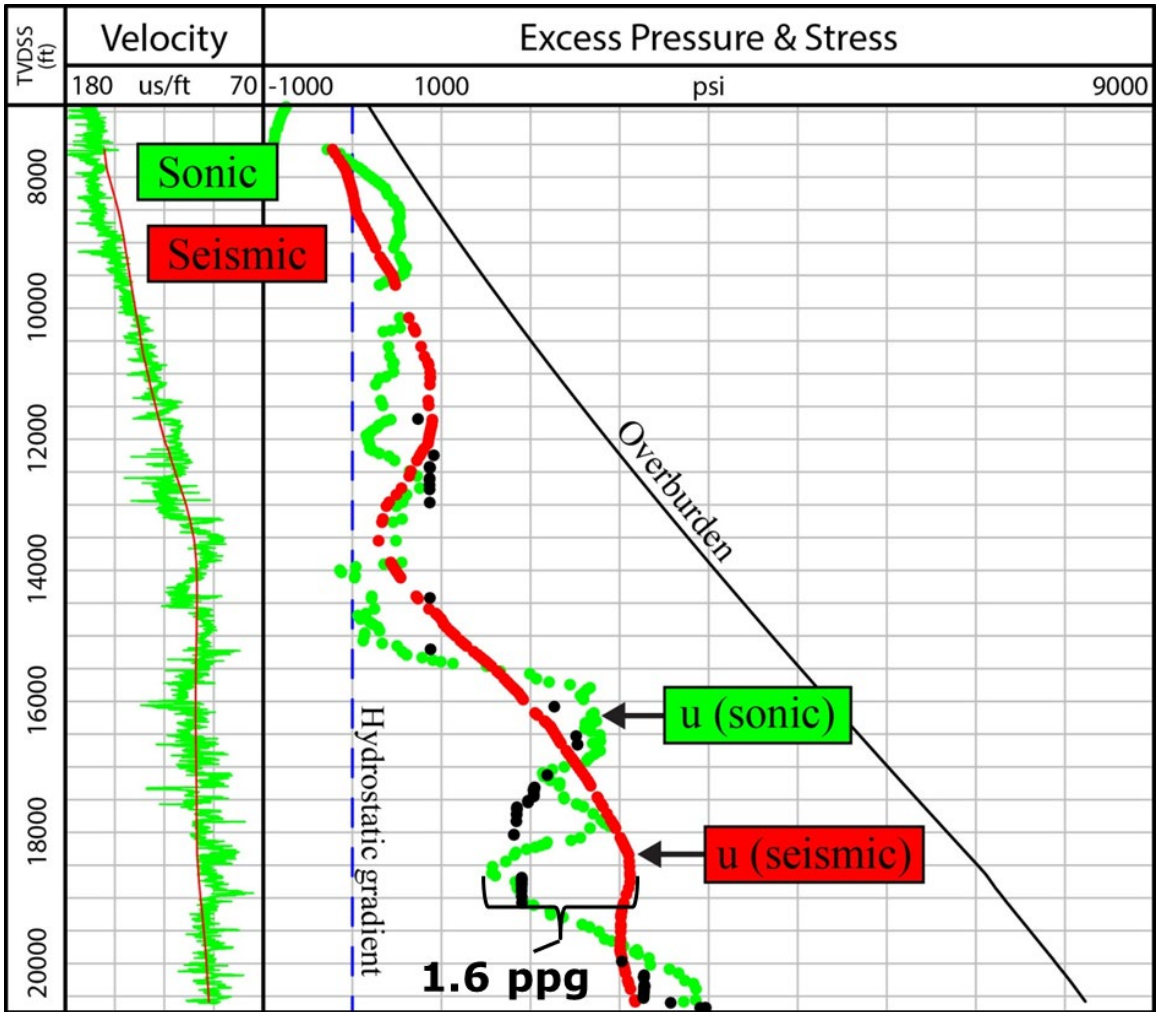
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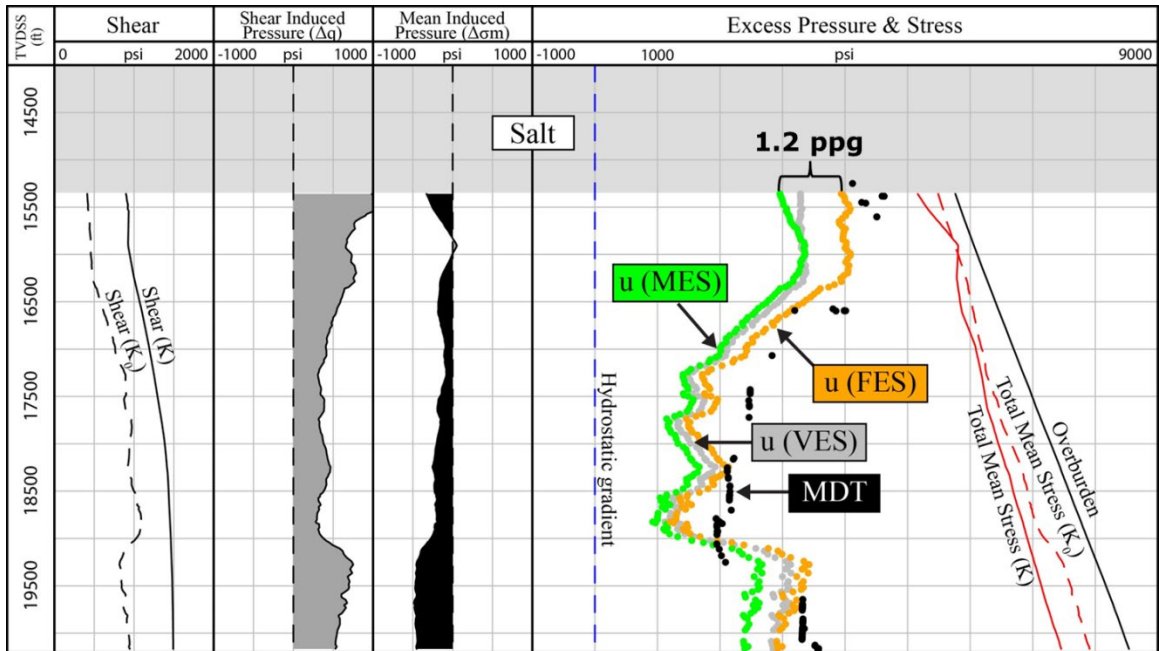
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