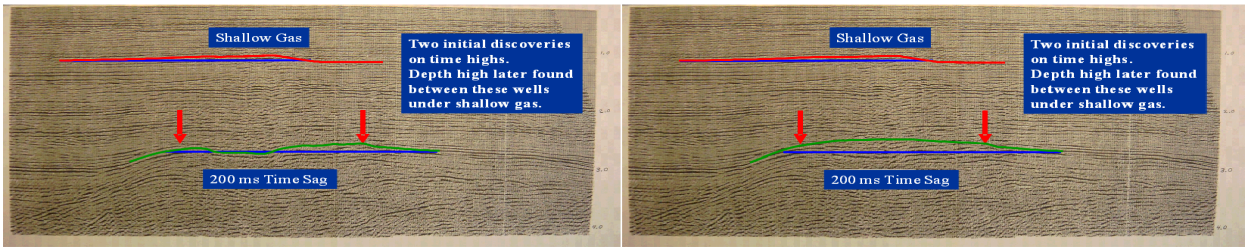

Figure 1: North Sea Billion Barrel Val hall Field with a 200 ms Shallow Gas Velocity Sag

Seismic Velocities as an Exploration Tool

TMI-07 uses seismic velocities as an exploration tool. A classic example is the Valhal Field in the North Sea, discovered in 1975. The left side of Figure 1 shows the original seismic travel-time concept. Today there are two unmanned flank platforms, both about 6 kilometers from the center of the field. These platforms were built to exploit the "independent" geologic structures. As more wells were drilled, operators realized the depth structure continued to rise towards the center. The top of the structure was eventually recognized at the center of a travel-time low, as illustrated on the right side of Figure 1. The true structure of the field was hidden by a gas cloud, which slowed down seismic velocities, and created a false travel-time low over the center of the field. The Val hall Field is over a billion barrels of oil and is expected to produce through 2050.

DRC has extensive experience with similar seismic velocity issues, particularly in the U.S. Gulf Coast and similar siliciclastic environments. DRC has a prospect which is a direct analog to the Val hall Field, prospects which are hidden because of 200 millisecond velocity pull-up from faster velocities tied to shaling out of shallower sediments, and prospects tied to velocity anomalies from fault shadows. With fault shadow prospects there are non-linear fault propagation distortions from gas charged muds in the fault zone which can not be removed. Check shots in fault gouge have shown a 50% drop in seismic velocity. Seismic delays from shallow gas against a fault can cause 300 milliseconds of delay on deeper beds, creating the impression these beds turn down at the fault, when they actually continue up at the same dip until they reach the fault. These hidden traps can hold hundreds of billion cubic feet of gas. It is amazing to DRC to see these opportunities come up again and again, since the basics of this technology are over 30 years old. Many young interpreters do not know to look for tilted flatspots, where the tilting is due to seismic velocity slow down as a gas reservoir thickens. DRC has a tilted flatspot AMI in Europe which has the potential of 50 trillion cubic feet of gas.

A fairly recent and exciting seismic processing technology is pre-stack depth migration (PSDM). The key to getting PSDM to work is to understand the geologic model, to adjust the model and the velocities each PSDM iteration in order to better remove the kind of velocity anomalies discussed above. DRC is currently managing PSDM of a 100 Federal Lease Block 3-D seismic survey. TMI-07 technologies have resulted in significant improvements by removing seismic velocity effects. DRC estimates 72 mapped structures (which have amplitude anomalies which match the PSDM results) have over 25 TCF of natural gas.

DML proposes an investment of $200,000 to study Investor identified projects in siliciclastic basins, where there are likely to be the kinds of velocity problems described above occurring. Alternatively, DRC proposes Investors put up $20 million to buy out 50% of DRC's partner in the Gulf Coast project by paying for 50% of out-of-pocket-costs and drilling the first two wells to test the PSDM results. Dr. Richard L. Coons and H. Roice Nelson, Jr. are the technical team leads on TMI-07.

