

Western Newfoundland petroleum exploration: where are we headed?

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The activities of the last two years in western Newfoundland have stirred the imagination of those interested in pursuing the oil shows and small discoveries which have occurred over the last 100+ years in that area. The Hunt oil discovery (Port au Port #1) has heated up leasing and seismic acquisition. Subsequent wells drilled (4) have dampened the enthusiasm of some companies. Yet drilling activity is still being planned, seismic data are adding exciting new information supportive of ideas previously held but unprovable. It appears now that the Ordovician carbonate platform does extend beneath the Long Range granites. Earlier concerns about maturation of organics increasing to the north and toward the granites can now be explained by heating associated with the thrusting of the granites over the younger Paleozoic sequences. Consistent with trends seen elsewhere in the Appalachians we can now expect the thermal maturation of organics to decrease beneath the granites. Thus the associated sedimentary section is more likely to be thermally mature than overmature. Structure seen on seismic in the north have the potential to be trapping situations. Structure to the south is exceedingly more complex and requires improved processing of seismic, improved understanding of facies, and improved understanding of the structural models in effect. The Vulcan discovery of Carboniferous oils on the east side of Bay St. George coupled with the Hunt discovery to the west puts live oil on both sides of the Bay. The abundant distribution of gas in the sediment of the Bay adds to growing awareness that hydrocarbons are ubiquitous in the region, the trick will be to find the traps that undoubtedly exist there.

Looking at the types of reservoirs to be addressed, lessons can be learned from other regions. Ordovician production in Michigan and Ohio often began at rates as high as 4000 to 10,000 bopd from depths as shallow as 1200 feet. The problem was that the production was/is from fractured dolomites sealed laterally by tight and fine fractured limestone. Gas tends to halo the oil fields. The high initial production rates were not sustainable for more than a few months after which

the rates dropped to 1000 bopd or significantly less. As well these reservoirs were water-driven and water readily coned the wells. Attempts to fracture the reservoir led to 50% of the wells increasing oil and 50% increasing water. The Albion-Scipio field produced about 130 MMBO and an indeterminate amount of gas from 30 miles of field, and up to 600 feet of gross pay interval. In reality the pay was confined to fractures so volumetric estimates were subject to tremendous variability. On a strictly gross volumetric basis the field produced only 42 bo/acre, but this value is meaningless relative to the actual fracture setting, these carbonate reservoirs have to be "babied" to produce effectively. Attempts to push production generally leads to destruction and loss of a well to water. The occurrence of karsted surfaces enhances the reservoir potential of the carbonates. Ordovician fields typically display the karst character but this type of reservoir is very erratic in the distribution of porosity and permeability, thus reservoir characterization must start early in the history of the field if production is to be efficient.

Carboniferous reservoirs are not abundant in North America in the context of rifted sequences. However in basins where such reservoirs occur there is often an initial problem with seismic interpretation. There is a great deal more information to be gained before discoveries become more regular but this is the typical learning path for any rank basin. Perseverance, innovative interpretation, good reservoir practices, and an entrepreneurial spirit will result in growth of the western Newfoundland industry. Western Newfoundland suffers from the "away" thought process that it is only a small area, that the oil occurrences are of little meaning, and that there could not be significant deposits so close to home. If this basin was in a foreign setting, with worse political conditions it would still attract considerable foreign and Northern American attention. Proper marketing on a broad front will find the funds necessary to bring this basin greater respect than it has received to date.