

A Major Gas Discovery at the Panuke Field Jurassic Abenaki Formation Offshore, Nova Scotia

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The Panuke Field is located 250 km southeast of Halifax, Nova Scotia in 40 m of water. The initial oil pool was discovered in 1986 with the drilling of Shell Petro-Canada B-90 New Field Wildcat. Light gravity oil, 52 API, was discovered in the Early Cretaceous shallow marine shoreface sandstones within the Naskapi Member of the Lower Logan Canyon Formation.

Recent drilling in 1998 by PanCanadian Energy at Panuke was the Deep Pool Wildcat PCP-NSRL PP3C drilled to test the deep carbonate potential of the Baccaro Member of the Late Jurassic Abenaki Formation. This well resulted in a major gas discovery in what was previously considered non-productive carbonates. PP3C was drilled from the Panuke platform and was based on 3D seismic shot in 1991.

The Jurassic carbonate complex is a major reef tract that extends from Eastern Canada to the Bahamas. On the Scotian Shelf the Jurassic is an extensive carbonate bank with clastics to the east and northeast. Gas is trapped in the dolomitized and leached limestone reefal facies of the carbonate margin. A detailed sequence stratigraphic framework was completed using all available well data and incorporating both 2D and 3D seismic. As a result the Abenaki Formation was divided into seven third order sequences.

Additional drilling of seven exploratory/appraisal wells in the last three years has helped further delineate the pool. The gas pool is a combined stratigraphic and structural trap and has had a complex diagenetic history with multiple phases of dolomitization and dissolution. Three main porosity types co-exist: cavernous, vuggy and matrix which provides significant complexity to reservoir modelling. Porosities range from 3-40% with permeabilities of one md to several darcies, with net pay values ranging from 30 to 100 m.