

Geostatistical Modelling of the Deep Panuke Gas Reservoir, Nova Scotia, Canada

Rick Wierzbicki, Robert Riddy
PanCanadian Energy Inc.

and

Robert Wytsma
Landmark Graphics Corporation

The Deep Panuke field is in the early stage of development and has limited amounts of well and production data. The reservoir appears to be quite heterogeneous as indicated by well test results, petrography, and petrophysics.

Porosity development falls into two classes, one of high porosity, high permeability, cavernous leached porosity, and the second being low porosity, low permeability matrix rock. The 3-D seismic volume over the pool images high porosity areas as narrow linear trends.

As a result of the reservoir heterogeneity, a conventional evaluation utilising petrophysical parameters from the well bores and assuming a drainage radius and radial flow does not model the pool adequately. Maximum use has to be made of the data from all disciplines in order to determine the geometry of the Deep Panuke reservoir, and to develop a geological model of the reservoir that can be loaded into a reservoir flow simulator.

Geostatistical methods and computer modelling techniques (Landmark Stratamodel Software) were used to generate probabilistic models of reservoir geometry at Deep Panuke.

The models were loaded into a flow simulator to generate production test simulations. Models that came closest to matching the well tests were adjusted to match the well tests and then used to estimate well productivity and ultimate recovery from the pool.