

SUBSIDE - THERMAL HISTORY MODELING

The Bass Basin thermal history was modeled to help evaluate timing of oil expulsion within the basin. The interval thicknesses used in the model are based on the new structural configuration interpretation presented in this report and illustrated on Enclosures 18 and 19. The age of the intervals are based on Roger Morgans's palynologic age dating and presented on the stratigraphic chart of Enclosure 2. The geothermal gradient used in the modeling is 1.75°F per 100 feet or 31.9°C per 1000 meters as established by the comparison of theoretical to measured vitrinite data. The modeling used Lopatin's thermal maturation algorithm. The maturation values are expressed in TTI.

Three areas were investigated through this thermal history modeling. The large central Bass Basin model, and two out-of-basin models, the Durroon area and the Anglesea to Konkon area.

The Bass Basin model is an 86 point model covering the center of the basin. The location of each model data point is shown on Enclosure 49. The central basin model investigates the maturation of the T. lillieii interval through to the younger N. asperus interval. The L. balmei through N. asperus interval thicknesses are based on the interpreted basin configuration across the basin. However, the T. longus and older interval thicknesses are less well known due to the limited number of well penetrations to these palynologic intervals in the center of the basin. It was considered valuable, however, to speculate on the maturation timing of these intervals. Therefore, the T. longus and T. lillieii interval was each considered to be 1000 feet thick across the entire basin for this model. This was based on the average thicknesses in the few well penetrations in and out of the central basin. The maturation characteristics for the top of T. lillieii and base of T. lillieii are more speculative than the younger intervals of the model.

The results of the SUBSIDE modeling are presented in cross section on Enclosures 50 through 54 and in map form on Enclosures 55 through 57. Three ages, 55 m.y.a., 42 m.y.a., and present day, were investigated to determine maturation at that age and by extrapolation the intermediate periods. An age of 55 m.y.a. represents the end of Paleocene L. balmei deposition and appears to be a time during which structures were developed upthrown to the major graben expansions, as at Pelican-3, Yolla-1 and possibly upthrown to Cormorant-1. An age of 42 m.y.a. represents the end of Eastern View Coal Measures deposition and the end of reservoir deposition. The structures seen at the top of the Eastern View Coal Measures are expressed in younger sediments as well, and therefore the second major deformational event occurred between 42 m.y.a. and present day. The broad deformation of the post Eocene sediments is often seen on seismic lines at least half way into the thickness of the younger sediments. Assuming constant deposition since the Eastern View there seems to have been regional deformation at roughly 20 million years ago. The speculative age of this deformation is coincident with the age of the basin intrusives and could be genetically related. In addition,