

Simulation of water and gas coning using the ECLIPSE 100 model

This exercise continues the use of ECLIPSE 100 for simulation of a production well situation, including both water and gas coning. The problem to be studied is one described in the second SPE comparative solution project, found in Weinstein, H.G., et al.: "The Second Comparative Solution Project: A Three Phase Coning Study", JPT, March 1986 (SPE paper 10489). The input file for ECLIPSE to be used is named CHAP.DATA. (download the input file and the paper from the course's home page).

Assignment

1. Read the article so that you understand the physics of the reservoir and the grid system used.
2. Run the ECLIPSE model using the data set and plot the results in order to reproduce the curves presented in the article.
3. Make runs with 3 different oil production rates (2000, 1000, 500) for a period of 3 years, and plot water cut and GOR vs. time for all cases on the same figure. Select suitable rates (use a constant rate for the entire time period) to get a variation in performance.
4. Run cases with one constant oil rate (1000), but with different well completion locations. In the article blocks (1,7) og (1,8) are perforated. Make a run with perforations in blocks (1,5) and (1,6), and one run with perforations in blocks (1,9) and (1,10). Plot water cut and GOR for all cases on the same figure in order to study the effect of completion interval on performance.