Amirkabir University of Technology

Department of Petroleum Engineering

Advanced NFR Engineering Course

HW#2

Consider the attached SPE paper entitled "**Pressure Transient Analysis of Naturally Fractured Reservoirs with Uniform Fracture Distribution**" in which the authors have put in a great deal of efforts into modeling naturally fractured reservoirs. Now, perform the items accentuated in the following:

1. Assume the data pertinent to Case 1 (See Table 1) and compute flowing bottomhole pressure (FBHP) over 1000 hours using both Kazemi and Warren/Root models. Then, compare the results and justify any prospective discrepancy you encounter.
2. Assume the data pertinent to Case 3 (See Table 1), however, with oil FVF being equal to 1.2 bbl/STB and matrix porosity being equal to 0.2. Now, perform sensitivity analysis on the fracture width and compare FBHP versus time using Kazemi model. Elaborate on your findings.
3. Assume the data pertinent to part 2 and construct two Kazemi models; one in which the production well is completed solely within the fracture layer and the other in which the so-called well is being fully-penetrating. Compare FBHP versus time in these two circumstances and elaborate on the findings that you encounter.
4. Saphir is a worldwide industry-accepted software package for analyzing pressure transient analysis (PTA) field data. Assume the data pertinent to part 2 and analyze the corresponding FBHP data using Saphir.

Notes

1. Attach only *.DATA files (not the simulation-generated files) while turning in your homework.
2. Your report should be succinct and prepared in a carefully arranged way.
3. Part 4 is optional, and will be considered a bonus point if properly carried out and answered.

Hints:

1. To regenerate Warren/Root model, make use of your class notes.
2. To regenerate Kazemi model, you will be required to create a radial model in ECLIPSE. In this regard, you are advised to base your model on the default radial model (named radial.DATA) located in \ecl\2010.1\eclipse\data, and make the necessary changes to conform to the circumstances illuminated in this assignment.