

DESCRIPTION OF FINAL PROJECT

Posted on Tuesday, November 28, 2023

Due on Thursday, December 12, 2023 (or earlier!)

PGE385K (Unique No. 20274)

Fall Semester 2023

Advanced Multi-Well Formation Evaluation

Instructor: Carlos Torres-Verdín, PhD, Professor

FINAL PROJECT

INSTRUCTIONS:

- (1) Final projects should be e-mailed to me on Tuesday, December 12, 2023, or earlier.**
- (2) Each team will prepare one final report.**

Important Request Concerning Data Used For This Exam

The data used for the final exam have been generously provided by an operating company but only for educational purposes related to this class. You are requested to delete all the data after completing your exam and not to distribute any part or all of it by any means of communication to anyone outside PGE385K Fall 2021. Failure to comply with this request may cause significant damage to future students who could otherwise use the data as part of their education. Please be proactive and observant of this very important request.

REPORT DESCRIPTION:

The objectives of the project are: (a) to perform a complete petrophysical/elastic assessment for the 2 wells included in the data set provided to students following the steps covered in Homework Projects 1 through 3, (b) to perform spatial correlation of flow units and fluid boundaries within flow units, and (c) to diagnose vertical and lateral limits of pressure compartments.

The following is a list of items that should be included in your report:

1. Executive summary, background, and introduction.
2. Plots of the main logs organized by well.
3. Quality control of multi-well measurements via depth matching and log balancing.
4. Description of lithology.
5. Description of the sedimentary environment.
6. Identification of porous and permeable units.
7. Identification of fluids saturating the porous and permeable units.
8. Rock classification based on porosity-permeability relations.
9. Quantitative assessment of porosity with adherence to core measurements.
10. Quantitative assessment of water/hydrocarbon saturation with adherence to (a) capillary-pressure and (b) core measurements.

- 11. Quantitative assessment of permeability with adherence to core measurements.**
- 12. Well-to-well correlation of lithology, flow units, and saturating fluids.**
- 13. Sketch of fluid contacts on the well-to-well correlation and structural plots from the previous item.**
- 14. Assess whether P-wave and/or S-wave impedances could be used to identify lithology, porosity, and fluids.**
- 15. Biot-Gassmann fluid substitution equations and sensitivity analysis of elastic/petrophysical correlations.**
- 16. Conclusions and recommendations.**