Creating Potentiometric Surfaces from Combined Water Well and Oil Well Data in the Midcontinent of the United States

Nicholas J. Gianoutsos and Philip H. Nelson

US Geological Survey – Denver, CO

Geological Society of America, 2013 Annual Meeting Paper No. 301-10









≥USGS science for a changing world















West



Many Drillstem tests measure pressure lower than formation pressure

- 1. Drillstem test does not seal properly.
- 2. Drillstem test not run for sufficient amount of time.
- 3. Pressure drawdown from formation production.



West



Many Drillstem tests measure pressure lower than formation pressure

- 1. Drillstem test does not seal properly.
- 2. Drillstem test not run for sufficient amount of time.
- 3. Pressure drawdown from formation production.



East

Wells in Formations of Mississippian Age



Ē







Plan View











Vertical Exaggeration 100x





Potentiometric surface (in feet) for formations of Mississippian age.

Putting It All Together



Conclusions

- In this demonstration we have presented an interactive method for selecting pre-production values of hydraulic head from an erratic data set to create a potentiometric surface.
- In the past, we've tried algorithm-based methods but the human interpretation through 3D visualization analysis of the data has proven more effective.

ngianoutsos@usgs.gov and pnelson@usgs.gov

Questions and comments are encouraged.

