

**Date: 5/19/2017**

**To: Investment Equipment**

**From: Chad Counts**

**Subject: Trade Winds 2-21 Recompletion Recommendation and Procedure**

**Summary of Proposed Work:**

The Left Hand Field was assessed for future oil potential via electric log analysis, and reservoir mapping. The evaluation revealed possible commercial production in the Lower Kansas City formation, and the second break of Pawnee Limestone.

The Trade Winds 2-21 is suited at the best structural position within the reservoir extent for both intervals, and all producing well offsets had shows within both formations. The Trade Winds 1-21 was tested through perforations in the Lower Kansas City formation that recovered water, and the Tres Hombres was drill stem tested that recovered oil and water in the test. The structural position here is 10' higher than the Trade Winds 1-21, and 29' higher than the Tres Hombres at the Kansas City horizon. The significant change in structural position and apparent reservoir continuity allows for the opportunity to increase overall reserves within the Left Hand Field.

A note for the second break of the Pawnee is that some water may be encountered, and the impermeable seal is a dense two foot thick micro-crystalline limestone. Therefore, if the formation is fractured, the upper zone could be depleting this zone as well. The micro log, sonic, and density logs all suggest the formation is not connected across the vertical section. The procedure for completing this work is as follows.

**Procedure:**

1. MICT.
2. Lay out tubing and rods.
3. Rig up perforators.
4. Perforate Lower Kansas City from **4232'-4235'** KB, and Pawnee second break from **4280'-4282'** KB with 4spf, and 21 or 23 gram normal charge. (Correlated to Cement Bond Log)
5. Run in plug, packer, and tubing.
6. Isolate lower Pawnee break. There is only 2' between upper perforations. Will need to run a collar counter, and tally in last joint to isolate zone. Current perforations are 4272'-4278' in the upper Pawnee.
7. Swab formation naturally.
8. Depending on fluid entry, and if isolation is possible, determine acid order then. Some water was recovered in the drill stem test over this interval. Owing to proximity of above formation, keep rate and pressure low as communication is likely. If the formation does not "gravity" acid, then slowly stage formation.

- a. If the formation communicates, run a salt plug to stimulate zone. This should only be done if limited water is observed swabbing naturally, or formation did not give up fluid naturally.
9. Move tools to isolate Kansas City perforations at 4232'-4235'.
10. Swab formation naturally.
11. Determine acid order after swabbing naturally. Porosity, and permeability appear high, therefore a larger job may not be needed. I expect 250-500 gallon 15% NEFE acid treatment.
  - a. Note: poor cement bond two feet above formation (70-80% amplitude). Keep in mind when treating.
  - b. Retreat with larger acid job if fluid entry is not sufficient.
12. Release plug and packer. Lay out tubing. Run T&R.