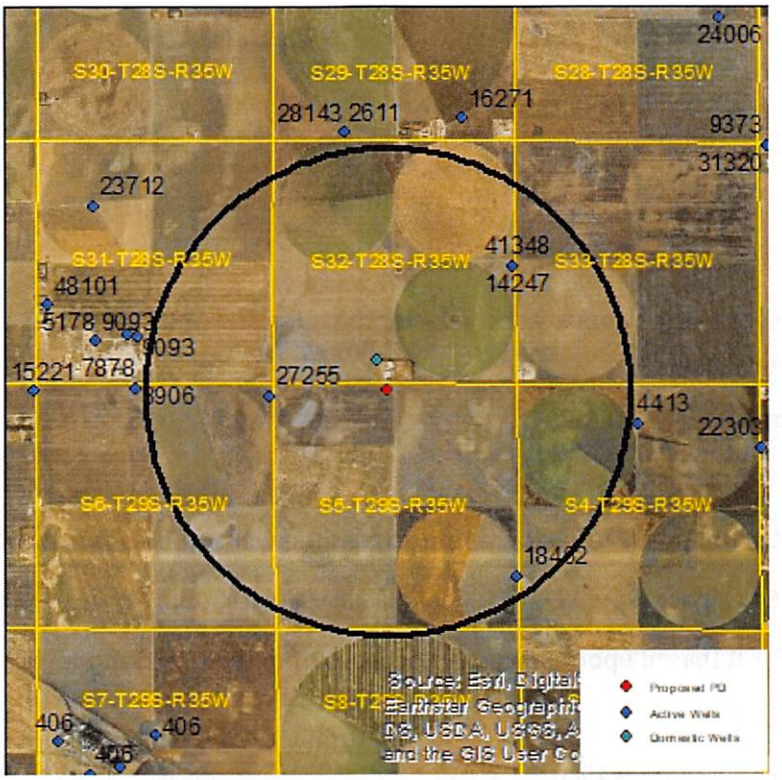
Evaluation of proposed additional well for Water Right No 27255

Proposed: Move the well authorized under water right no. 27255 a distance of 2584 ft to the east.



Wells within 1 mile: 18462, 12637 & 14247 & 41348, and a domestic well in section 32-28-35.

The saturated thickness at the proposed well location is estimated to be 146 ft, based upon the GMD3 model. For saturated thicknesses between 125 ft and 150 ft, the maximum allowable Theis drawdown to neighboring critical wells is 3.0 ft.

50 year Theis Analysis: The following values were used to run the analysis:

S = 0.2345, T = 22,692 ft^2/day, $tp_{current}$ = 63 days (based upon assumed 200 gpm rate and average quantity), $Q_{current}$ = 200 gpm (assumed because well has become inoperable in recent years), $tp_{proposed}$ = 156 days, $Q_{proposed}$ = 955 gpm.

Theis drawdowns were calculated as follows:

184625: Drawdown from current location = 0.11 ft

Drawdown from proposed location = 1.59 ft

Net drawdown = **1.5 ft**

12637 & 14247 & 41348:

Drawdown from current location = 0.12 ft

Drawdown from proposed location = 1.82 ft

Net drawdown = **1.7 ft**

Domestic 32-28-35: Drawdown from current location = 0.24 ft

Drawdown from proposed location = 3.88 ft

Net drawdown = **3.6 ft**

Net drawdown exceeds the drawdown allowance for the domestic well in section 32-28-35. Critical well evaluation is necessary on that well.

Critical Well Evaluation:

Domestic 32-28-35:

Water Column = 146 ft (no log, assumed that the well is drilled to the bottom of formation)

DP = 3.64 ft (based upon 50 year Theis calculation using the above parameters)

DE = 56.1 ft (based upon water table declines from the GMD3 model over 25 years)

DT = 59.7 ft

EDC = 0.4 * 146 ft = 58.4 ft

PDC = 146 ft – 20 ft = 126 ft

The economic drawdown constraint is more conservative, so it governs.

Total drawdown (59.7 ft) is greater than the EDC, so this well **is critical.**

Conclusion:

The proposed additional well creates 50 year drawdown affects exceeding the maximum allowable effects under the GMD3 guidelines on the following critical wells:

- Domestic 32-28-35

Annual pumping of water right number 27255 at the proposed rate and quantity is likely to cause impairment with the nearby domestic well. This effect can be mitigated so that the overall net Theis effect is with the 3.0 ft threshold if rate is limited to 700 gpm.