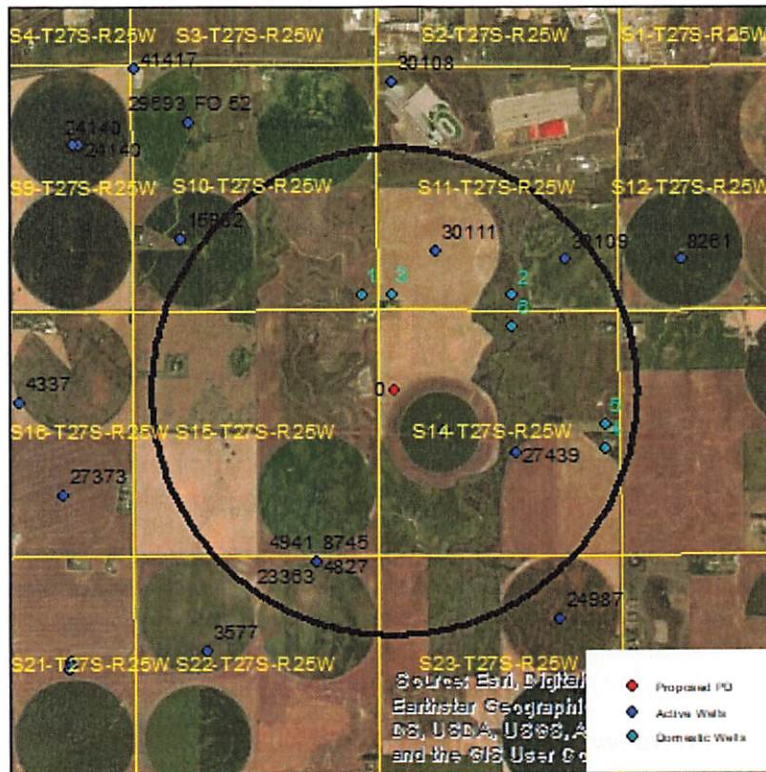


Evaluation of proposed move for Water Right No. 27804

Proposed: Move water right no. 27804 to a new well location a distance of 1,384 ft to the northwest.



Wells within 1 mile: 27439, 30111, 30109, 4827 & 4941 & 8745 & 23363, and 6 domestic wells, numbered on the above map.

The saturated thickness at the proposed well location is estimated to be 107 ft, based upon the driller's log and an observation well in section 9-27-25. For saturated thickness between 100 ft and 125 ft, the drawdown allowance is 2.5 ft.

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

$S = 0.1983$, $T = 2183.5 \text{ ft}^2/\text{day}$, $tp_{\text{current}} = 35 \text{ days}$, $Q_{\text{current}} = 701 \text{ gpm}$, $tp_{\text{proposed}} = 83 \text{ days}$,
 $Q_{\text{proposed}} = 710 \text{ gpm}$

These drawdowns were calculated as follows:

27439: Drawdown from current location = 2.94 ft
 Drawdown from proposed location = 4.66 ft
 Net drawdown = **1.7 ft**

30111: Drawdown from current location = 1.64 ft
 Drawdown from proposed location = 4.45 ft
 Net drawdown = **2.8 ft**

30109: Drawdown from current location = 1.48 ft
Drawdown from proposed location = 3.48 ft
Net drawdown = **2.0 ft**

4827 & 4941 & 87458 & 23363:
Drawdown from current location = 1.62 ft
Drawdown from proposed location = 3.83 ft
Net drawdown = **2.2 ft**

Domestic 1: Drawdown from current location = 1.76 ft
Drawdown from proposed location = 5.59 ft
Net drawdown = **3.8 ft**

Domestic 2: Drawdown from current location = 1.80 ft
Drawdown from proposed location = 4.34 ft
Net drawdown = **2.5 ft**

Domestic 3: Drawdown from current location = 1.85 ft
Drawdown from proposed location = 5.81 ft
Net drawdown = **4.0 ft**

Domestic 4: Drawdown from current location = 1.73 ft
Drawdown from proposed location = 3.45 ft
Net drawdown = **1.7 ft**

Domestic 5: Drawdown from current location = 1.74 ft
Drawdown from proposed location = 3.50 ft
Net drawdown = **1.8 ft**

Domestic 6: Drawdown from current location = 2.04 ft
Drawdown from proposed location = 4.68 ft
Net drawdown = **2.6 ft**

Net drawdown exceeds the drawdown allowance of 2.5 ft for water right number 30111 and domestic wells 1, 3, and 6. Critical well analysis is necessary on those wells.

Critical Well Evaluation:

30111:

Water Column = 107 ft (no log available, assumed to have same water column as proposed location)

DP = 2.8 ft (Net drawdown from the proposal indicated above)

DE = 14.9 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DD = 0 ft (Well has not been operated since being purchased by Dodge City in 2016. The city has indicated that they have future plans for the water right, but are unlikely to use it at its present location.)

DT = 17.7 ft

Economic Drawdown Constraint (EDC) = $0.4 * 107 \text{ ft} = 42.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $107 \text{ ft} - 60 \text{ ft} = 47 \text{ ft}$

Total drawdown of 17.7 ft is less than both the EDC and PDC, so this well is **not critical**.

Domestic 1:

Water Column = 102 ft

DP = 3.8 ft (Net drawdown from the proposal indicated above)

DE = 16.3 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DT = 20.1 ft

Economic Drawdown Constraint (EDC) = $0.4 * 102 \text{ ft} = 40.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $102 \text{ ft} - 20 \text{ ft} = 82 \text{ ft}$

Total drawdown of 20.1 ft is less than both the EDC and PDC, so this well is **not critical**.

Domestic 3:

Water Column = 54 ft

DP = 4.0 ft (Net drawdown from the proposal indicated above)

DE = 14.9 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DT = 18.9 ft

Economic Drawdown Constraint (EDC) = $0.4 * 54 \text{ ft} = 21.6 \text{ ft}$

Physical Drawdown Constraint (PDC) = $54 \text{ ft} - 20 \text{ ft} = 34 \text{ ft}$

Total drawdown of 18.9 ft is less than both the EDC and PDC, so this well is **not critical**.

Domestic 6:

Water Column = 66 ft

DP = 2.6 ft (Net drawdown from the proposal indicated above)

DE = 8.9 ft (Water level decline from 2021 through 2046 based upon GMD3 model)

DT = 11.5 ft

Economic Drawdown Constraint (EDC) = $0.4 * 66 \text{ ft} = 26.4 \text{ ft}$

Physical Drawdown Constraint (PDC) = $66 \text{ ft} - 20 \text{ ft} = 46 \text{ ft}$

Total drawdown of 11.5 ft is less than both the EDC and PDC, so this well is **not critical**.

Conclusion:

The proposed move is located in an area without much saturated thickness and if operated at its full proposed rate and quantity, may produce noticeable effects on neighboring wells. Critical well analysis, based upon aquifer properties provided by the GMD3 groundwater model, shows that the neighboring wells most affected by the proposal are unlikely to lose more than 40% of water column over the next 25 years and are likely to remain operable. GMD3 staff recommends approval of the application.