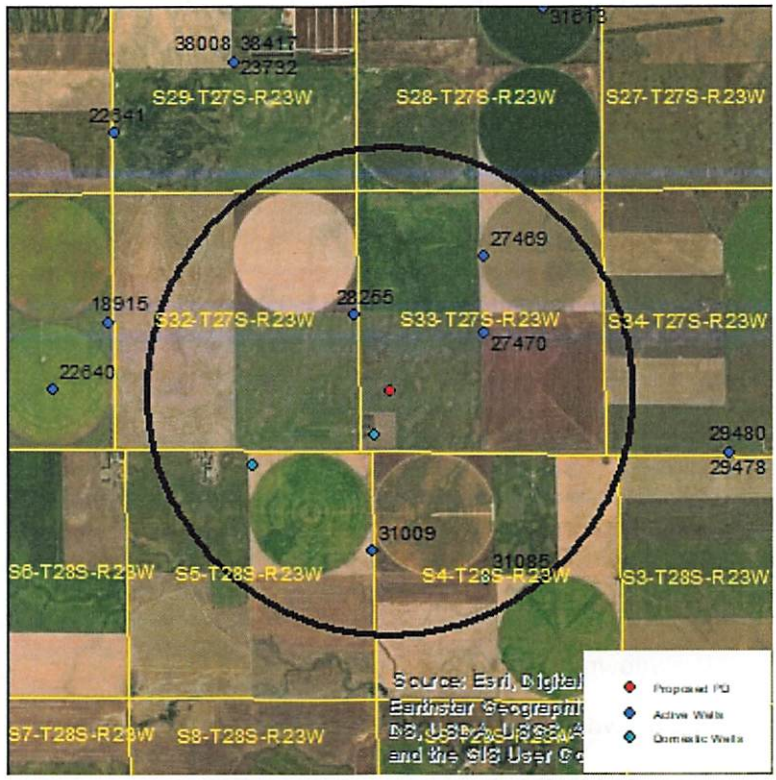
Evaluation of proposed move for Water Right Nos. 27469 and 27470

Proposed: Move water right no. 27469 to the well location currently authorized under water right no. 27470, 1643 ft to the south. Move water right no. 27470 to a new well location, 2412 ft to the southwest.



Wells within 1 mile: 28255, 31009, 31085, a domestic well in section 33-27-23, and a domestic well in section 5-28-23.

The saturated thickness at surrounding well locations ranges from 67 ft to 118 ft, based on the GMD3 model. For saturated thickness between 50 ft and 75 ft, the drawdown allowance is 1.5 ft. For saturated thickness between 100 ft and 125 ft, the drawdown allowance is 2.5 ft.

50 year Theis Analysis: The well location currently authorized under water right no. 27470 is not losing pumping authority and is expected to continue its current operations, so the current conditions below reflect water right no. 27469 and the proposed conditions reflect the proposed location for water right no. 27470. The following values were used to run the analysis:

S = 0.2525, T = 7374 ft^2/day, $tp_{current}$ = 98 days, $Q_{current}$ = 240 gpm, $tp_{proposed}$ = 102 days, $Q_{proposed}$ = 930 gpm

Theis drawdowns were calculated as follows:

28255:	Saturated thickness = 105 ft
	Drawdown allowance = 2.5 ft
	Drawdown from current location = 0.73 ft
	Drawdown from proposed location = 4.21 ft
	Net drawdown = **3.5 ft**
31009:	Saturated thickness = 118 ft
	Drawdown allowance = 2.5 ft
	Drawdown from current location = 0.44 ft
	Drawdown from proposed location = 2.70 ft
	Net drawdown = **2.3 ft**
31085:	Saturated thickness = 105 ft
	Drawdown allowance = 2.5 ft
	Drawdown from current location = 0.44 ft
	Drawdown from proposed location = 2.28 ft
	Net drawdown = **1.8 ft**
Domestic 33-27-23:	Saturated thickness = 67 ft
	Drawdown allowance = 1.5 ft
	Drawdown from current location = 0.57 ft
	Drawdown from proposed location = 6.06 ft
	Net drawdown = **5.5 ft**
Domestic 5-28-23:	Saturated thickness = 118 ft
	Drawdown allowance = 2.5 ft
	Drawdown from current location = 0.45 ft
	Drawdown from proposed location = 2.76 ft
	Net drawdown = **2.3 ft**

Net drawdown exceeds the drawdown allowance for water right no. 28255 and the domestic well in section 33-27-23. Critical well analysis was performed on those wells.

Critical Well Evaluation:

28255:

Water Column = 105 ft

DP = 3.5 ft (Net drawdown from the proposal indicated above)

DE = 14.2 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 25.8 ft (S = 0.1742, T = 54,166 gpd/ft, Q = 548 gpm, tp = 61.5 days, efficiency = 70%)

DT = 43.5 ft

Economic Drawdown Constraint (EDC) = 0.4 * 105 ft = 42 ft

Physical Drawdown Constraint (PDC) = 105 ft – 60 ft = 45 ft

Total drawdown of 43.5 ft is greater than the EDC, so this well **is critical.**

Domestic 33-27-23:

Water Column = 67 ft

DP = 5.5 ft (Net drawdown from the proposal indicated above)

DE = 13.6 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 19.1 ft

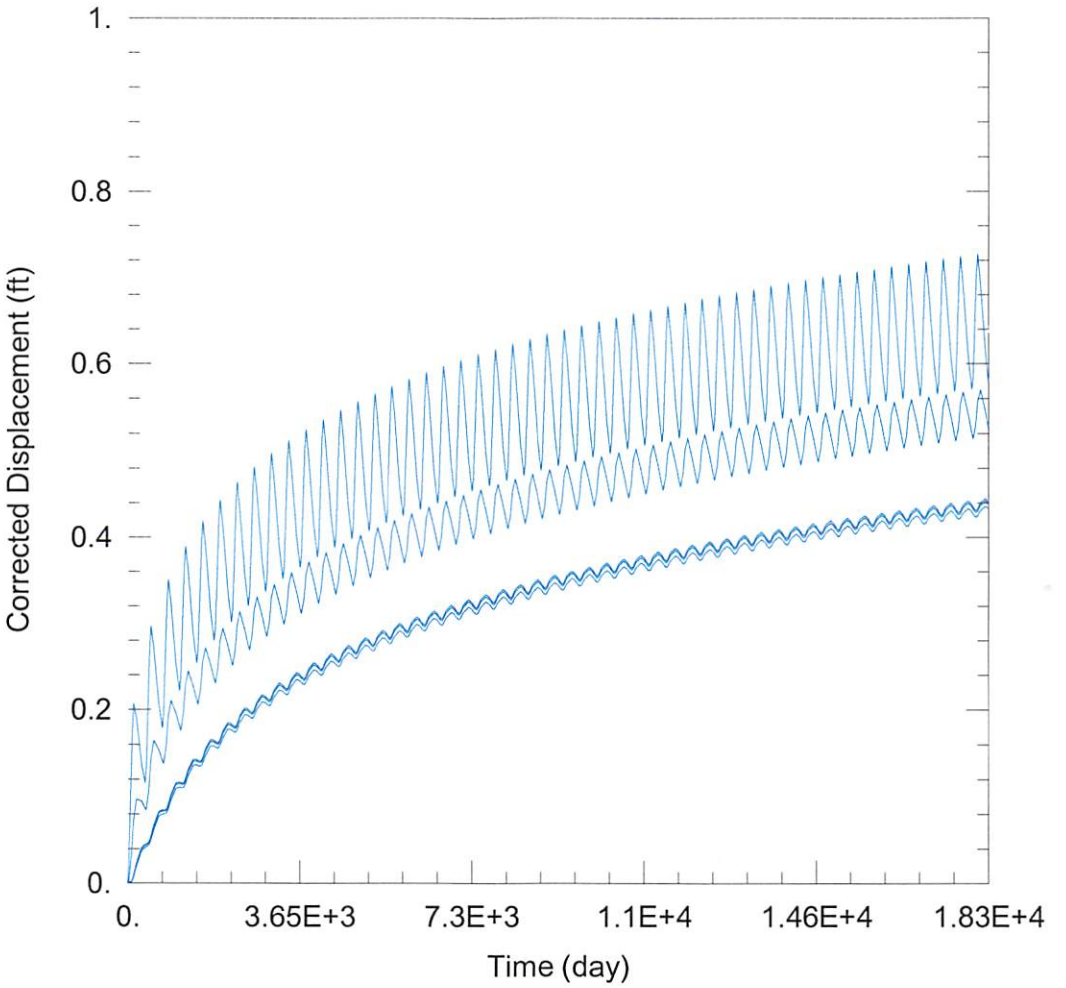
Economic Drawdown Constraint (EDC) = 0.4 * 67 ft = 26.8 ft

Physical Drawdown Constraint (PDC) = 67 ft – 20 ft = 47 ft

Total drawdown of 19.1 ft is less than the EDC and PDC, so this well **is not critical.**

Conclusion:

The proposed move is in an area with limited saturated thickness. Aquifer properties still allow for some productive wells, but these well may be in peril if aquifer depletion accelerates. If the proposed well were to pump its full authorized authority, there would likely be a noticeable drawdown effect on the well authorized under water right no. 28255 and the domestic well in section 33-27-23. Critical well analysis shows that the well under water right no. 28255 is critical because after accounting for drawdown effects from its own pumping and the proposed change, the remaining saturated thickness is expected to deplete by more than 40% in 25 years, making it likely for the well to have diminished pumping capacity within that timeframe. Drawdown effects were greater on the domestic well in section 33-27-23, but this well was not flagged as critical due to assumptions that domestic wells can operate functionally with less saturated thickness than irrigation wells. Concerned neighbors can contact GMD3 at (620) 275-7147 or the Division of Water Resources at (620) 276-2901.



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2022_moves\27469_27470\27469 Current.aqt
Date: 06/27/22 Time: 16:34:44

PROJECT INFORMATION

Company: GMD 3
Project: 27469 & 27470
Location: Ford County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
27469	276916	286499

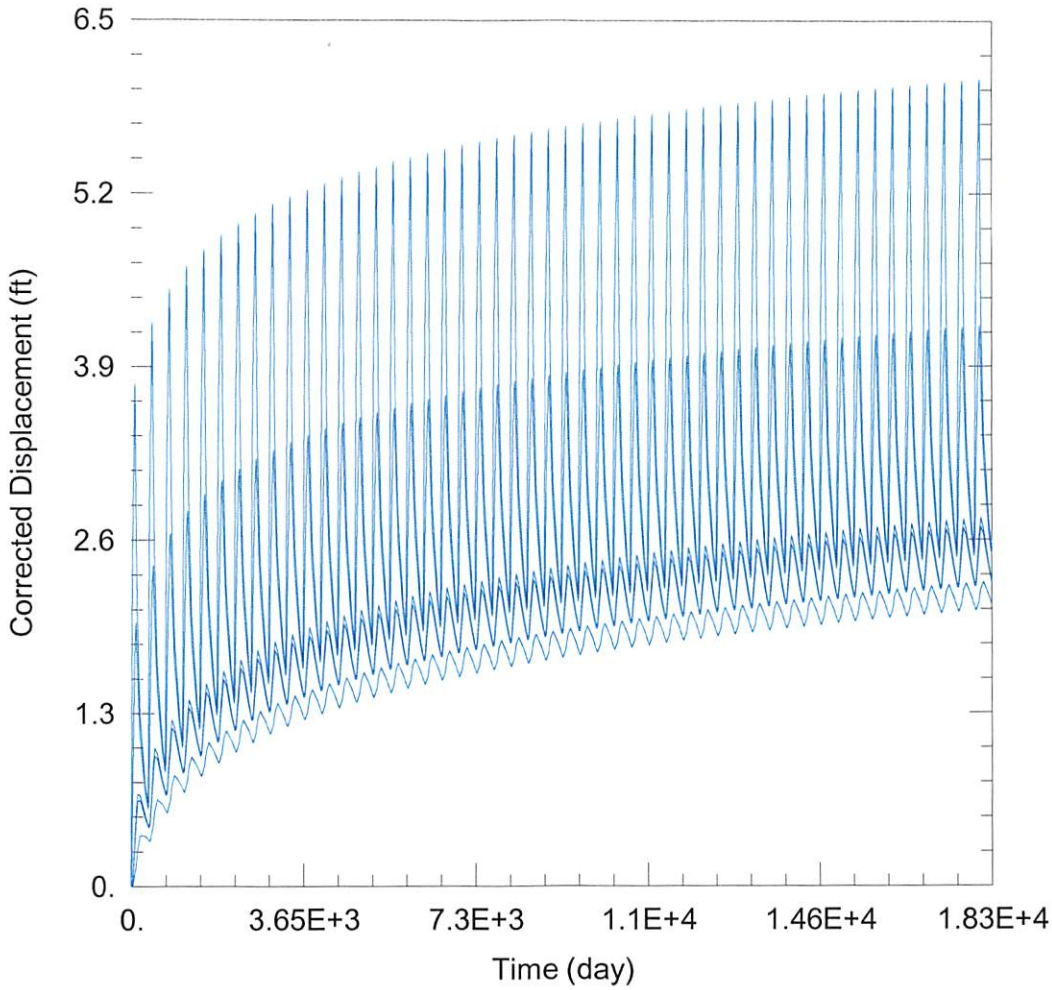
Observation Wells

Well Name	X (ft)	Y (ft)
▫	276916	286499
▫ 28255	274089	285244
▫ 31009	274462	280124
▫ 31085	276927	279511
▫ Domestic 33-27-23	274519	282641
▫ Domestic 5-28-23	271883	281981

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 7374. ft^2/day
S = 0.2528
Kz/Kr = 1.
b = 67. ft



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2022_moves\27469_27470\27469 Proposed.aqt
Date: 06/27/22 Time: 16:34:35

PROJECT INFORMATION

Company: GMD 3
Project: 27469 & 27470
Location: Ford County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
27469	274845	283605

Observation Wells

Well Name	X (ft)	Y (ft)
▫	274845	283605
▫ 28255	274089	285244
▫ 31009	274462	280124
▫ 31085	276927	279511
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