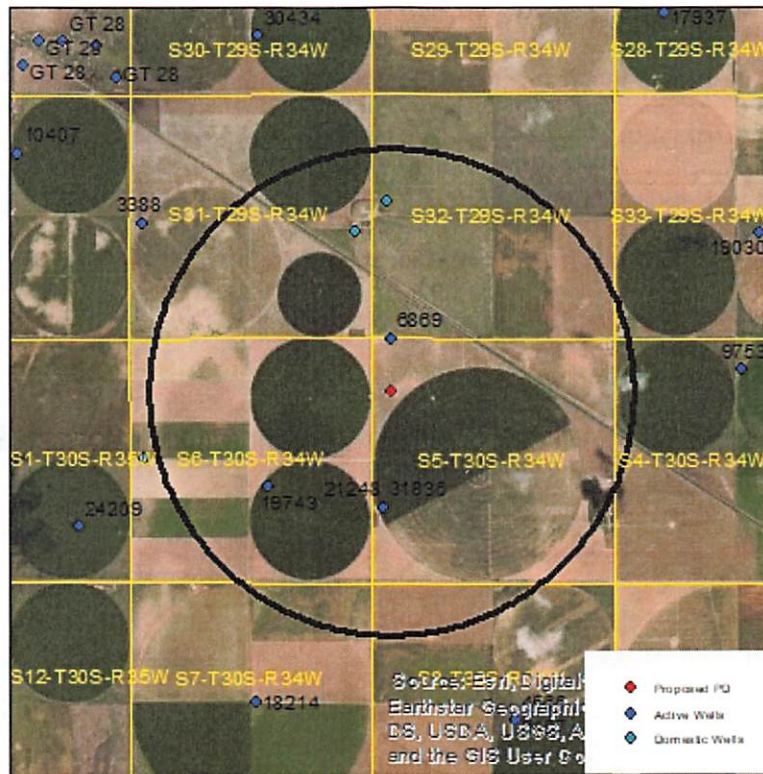**Evaluation of proposed move for Water Right No 6869**

Proposed: Move water right no. 6869 a distance of 1,122 ft to the south.

Wells within 1 mile: 212418 & 31836, 19743, a domestic well in section 31-29-34, and a domestic well in section 32-29-34.

The saturated thickness at the proposed well location is estimated to be 261 ft, based upon the driller's log and an observation well in section 5-30-34. For saturated thickness greater than 200 ft, the drawdown allowance is 4.0 ft. The saturated thickness in section 6-30-34 is estimated to be 189 ft, based upon the GMD3 model. For saturated thickness between 150 ft and 200 ft, the drawdown allowance is 3.5 ft.

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

$S = 0.2257$, $T = 13,985$ ft^2/day, $tp_{current} = 157$ days (based upon average use and observed rate), $Q_{current} = 473$ gpm (based upon 2019 field inspection), $tp_{proposed} = 146$ days, $Q_{proposed} = 1925$ gpm

Theis drawdowns were calculated as follows:

212418 & 31836:   Drawdown from current location = 1.33 ft

Drawdown from proposed location = 6.27 ft

Net drawdown = **4.9 ft**

19743:	Drawdown from current location = 1.23 ft
	Drawdown from proposed location = 5.32ft
	Net drawdown = **4.1 ft**
Domestic 31-29-34:	Drawdown from current location = 1.66 ft
	Drawdown from proposed location = 5.18 ft
	Net drawdown = **3.5 ft**
Domestic 32-29-34:	Drawdown from current location = 1.49 ft
	Drawdown from proposed location = 5.18 ft
	Net drawdown = **3.7 ft**

Net drawdown exceeds the drawdown allowance for water right numbers 212418 & 31836 and 19743. Critical well analysis is necessary on those wells.

Critical Well Evaluation:

212418 & 31836:

Water Column = 261 ft

DP = 4.93 ft

DE = 51.8 ft (Water level decline from 2020 through 2045 based upon GMD3 model)

DD = 30.4 ft (S = 0.2257, T = 104,609 gpd/ft, Q = 1179 gpm, tp = 103 days, efficiency = 70%)

DT = 87 ft

Economic Drawdown Constraint (EDC) = 261 ft * 0.4 = 104 ft

Physical Drawdown Constraint (PDC) = 261 ft – 60 ft = 201 ft

Total drawdown (87 ft) is less than both the EDC and PDC, so the well is **not critical.**

19743:

Water Column = 189 ft

DP = 4.09 ft

DE = 55.4 ft

DD = 46.53 ft (S = 0.2297, T = 73,103 gpd/ft, Q = 1303 gpm, tp = 88 days, efficiency = 70%)

DT = 106 ft

Economic Drawdown Constraint (EDC) = 189 ft * 0.4 = 75.6 ft

Physical Drawdown Constraint (PDC) = 189 ft – 60 ft = 129 ft

Total drawdown (106 ft) is greater than the EDC, so the well **is critical.**

Conclusion:

This move as proposed is likely to cause a noticeable effect on a nearby critical well. In order to prevent future impairment, GMD3 staff recommends limiting the applicant to a rate of 900 gpm and an annual quantity of 1240 AF from the proposed well location. This would create the following net effects at neighboring critical wells:

212418 & 31836:   Net Drawdown = **3.9 ft**

19743:   Net Drawdown = **3.5 ft**

Domestic 31-29-34:   Net Drawdown = **3.0 ft**

Domestic 32-29-34:   Net Drawdown = **2.8 ft**
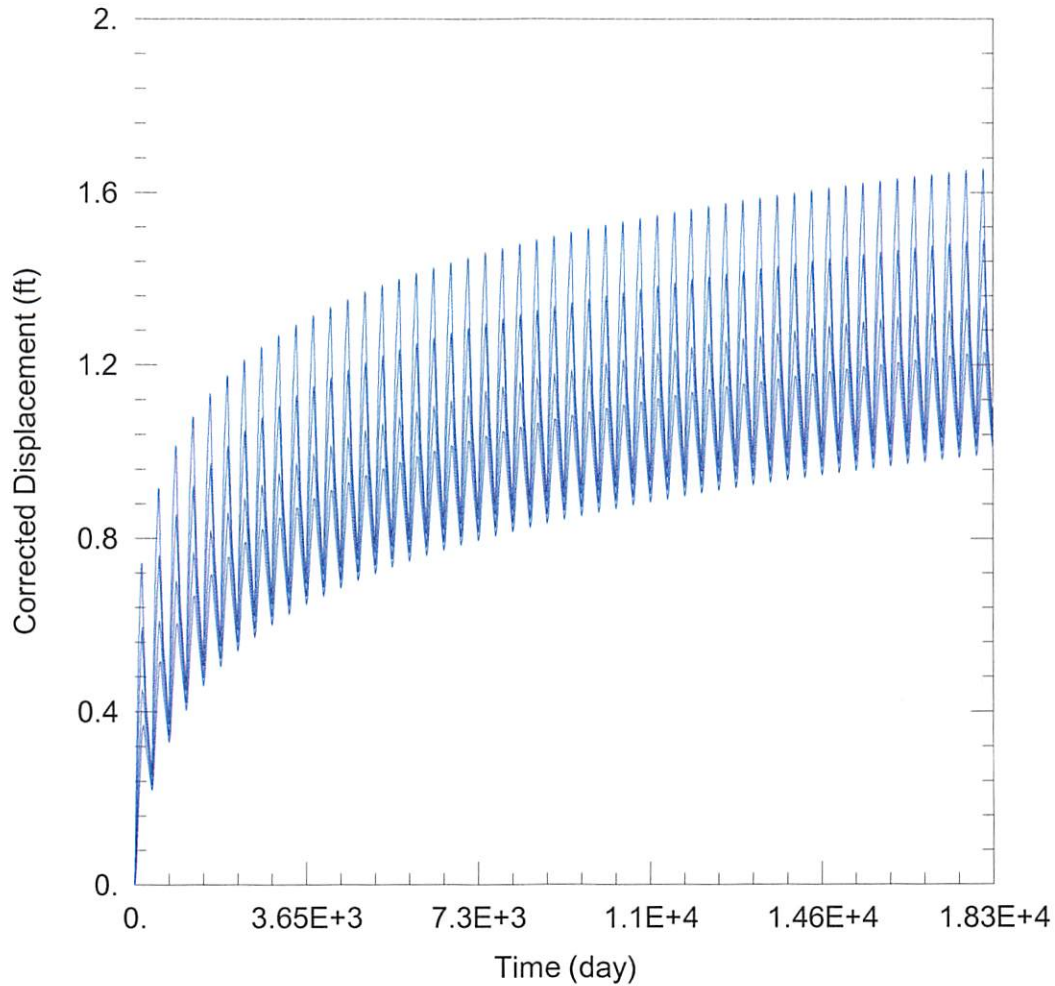
WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021_Moves\6869\6869 Current.aqt
Date: 01/21/21   Time: 16:12:57

PROJECT INFORMATION

Company: GMD 3
Project: 6869
Location: Haskell County
Test Well: 6869

WELL DATA

Pumping Wells				Observation Wells		
Well Name	X (ft)	Y (ft)		Well Name	X (ft)	Y (ft)
6869	-78519	218549		▫	-78519	218549
				▫ 21248 & 31836	-78677	214905
				▫ 19743	-81206	215368
				▫ Domestic 31-29-34	-79268	220897
				▫ Domestic 32-29-34	-78603	221559

SOLUTION

Aquifer Model: Unconfined   Solution Method: Theis
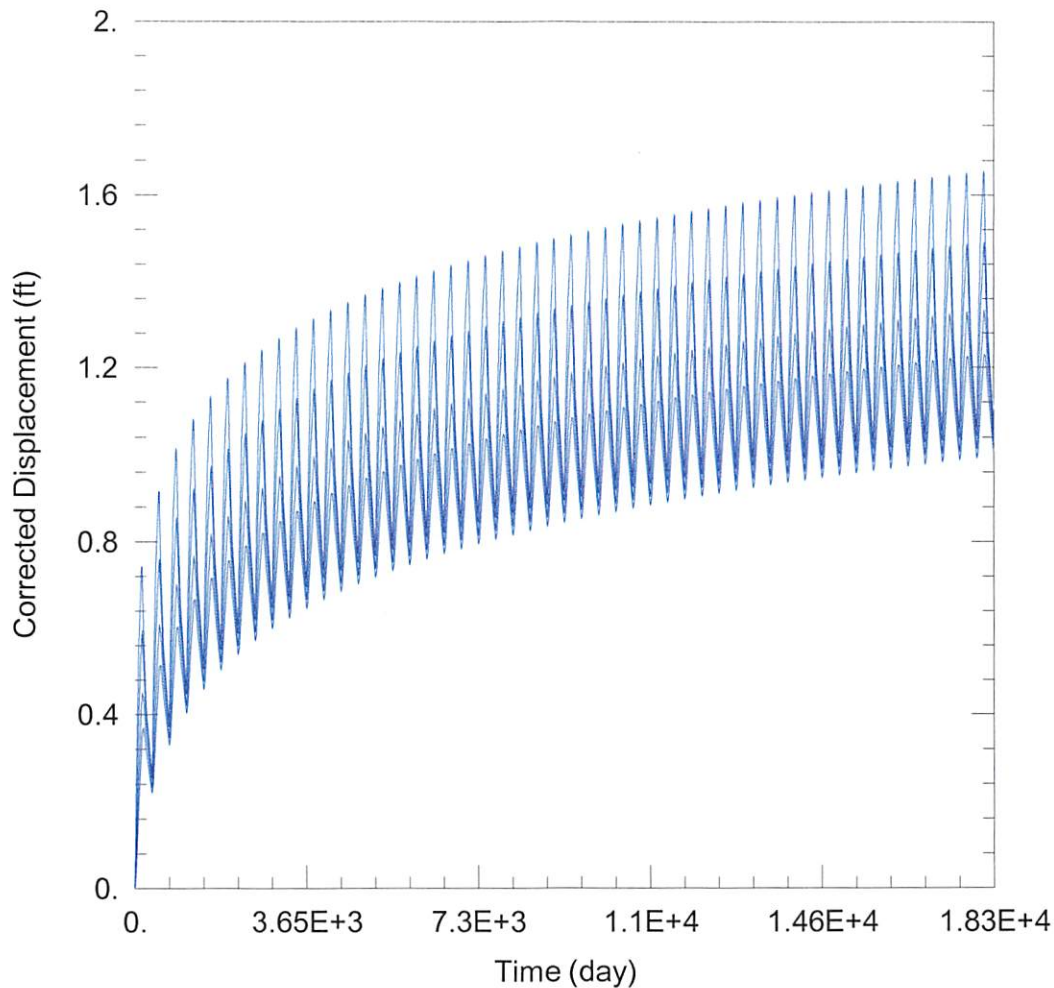
T   = 1.399E+4 ft^2/day   S   = 0.2257
Kz/Kr = 1.   b   = 138. ft

WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2021_Moves\6869\6869 Proposed.aqt
Date: 01/21/21   Time: 16:13:04

PROJECT INFORMATION

Company: GMD 3
Project: 6869
Location: Haskell County
Test Well: 6869

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
6869	-78519	218549	☐	-78519	218549
			☐ 21248 & 31836	-78677	214905
			☐ 19743	-81206	215368
			☐ Domestic 31-29-34	-79268	220897
			☐ Domestic 32-29-34	-78603	221559

SOLUTION

Aquifer Model: Unconfined   Solution Method: Theis

T   = 1.399E+4 ft^2/day   S   = 0.2257
Kz/Kr = 1.   b   = 138. ft