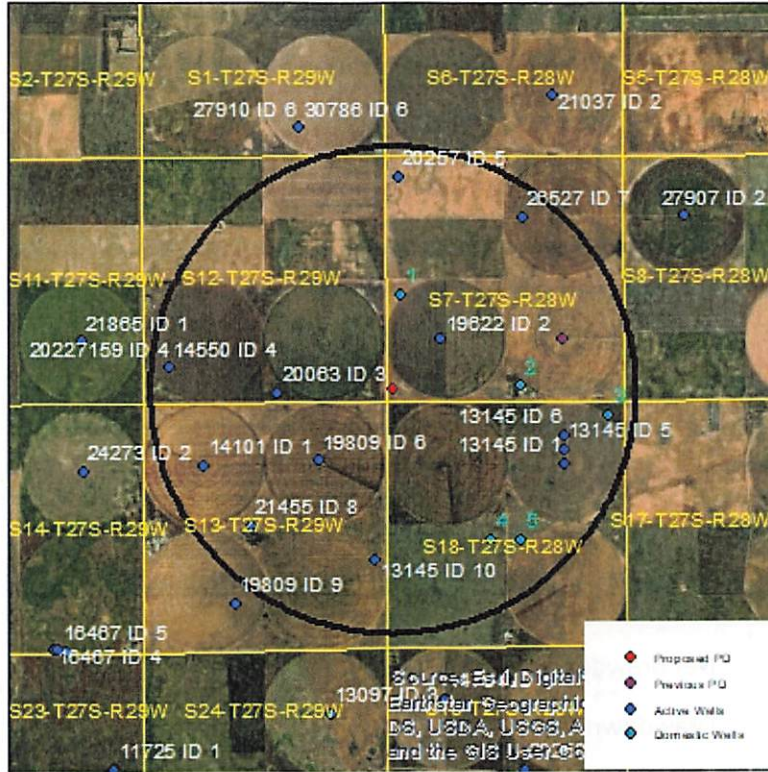


Evaluation of proposed move for Water Right No. 19622

Proposed: Move water right no. 19622 to a new well location, 1,631 ft to the southwest. Note that the right has never been operated from its current well location, so its previous location, 2,640 ft to the east, was used for this analysis.



Wells within 1 mile: 14550, 20063, 20257, 26527, 14101, 19809, 21455, 13145 ID10, 13145 ID5, and five domestic wells, numbered on the above map.

The saturated thickness at the proposed well location is estimated to be 87 ft, based upon the GMD3 model. For saturated thickness between than 75 ft and 100 ft, the drawdown allowance is 2.0 ft.

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

$S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $tp_{\text{current}} = 37 \text{ days}$, $Q_{\text{current}} = 100 \text{ gpm}$, $tp_{\text{proposed}} = 70 \text{ days}$, $Q_{\text{proposed}} = 840 \text{ gpm}$

Theis drawdowns were calculated as follows:

14550: Drawdown from current location = 0.25 ft
Drawdown from proposed location = 3.42 ft
Net drawdown = **3.2 ft**

20063:	Drawdown from current location = 0.29 ft Drawdown from proposed location = 4.27 ft Net drawdown = 4.0 ft
20257:	Drawdown from current location = 0.33 ft Drawdown from proposed location = 3.50 ft Net drawdown = 3.2 ft
26527:	Drawdown from current location = 0.41 ft Drawdown from proposed location = 3.47 ft Net drawdown = 3.1 ft
14101:	Drawdown from current location = 0.25 ft Drawdown from proposed location = 3.55 ft Net drawdown = 3.3 ft
19809:	Drawdown from current location = 0.30 ft Drawdown from proposed location = 4.41 ft Net drawdown = 4.1 ft
21455:	Drawdown from current location = 0.26 ft Drawdown from proposed location = 3.59 ft Net drawdown = 3.3 ft
13145 ID10:	Drawdown from current location = 0.29 ft Drawdown from proposed location = 3.77 ft Net drawdown = 3.5 ft
13145 ID5:	Drawdown from current location = 0.44 ft Drawdown from proposed location = 3.69 ft Net drawdown = 3.2 ft
Domestic 1:	Drawdown from current location = 0.37 ft Drawdown from proposed location = 4.51 ft Net drawdown = 4.1 ft

Domestic 2: Drawdown from current location = 0.52 ft
Drawdown from proposed location = 4.13 ft
Net drawdown = **3.6 ft**

Domestic 3: Drawdown from current location = 0.47 ft
Drawdown from proposed location = 3.45 ft
Net drawdown = **3.0 ft**

Domestic 4: Drawdown from current location = 0.34 ft
Drawdown from proposed location = 3.70 ft
Net drawdown = **3.4 ft**

Domestic 5: Drawdown from current location = 0.34 ft
Drawdown from proposed location = 3.58 ft
Net drawdown = **3.2 ft**

Net drawdown exceeds the drawdown allowance for all wells within 1 mile of the proposed location. Critical well analysis is necessary on those wells.

Critical Well Evaluation:

14550:

Water Column = 93 ft

DP = 3.2 ft (Net drawdown from the proposal indicated above)

DE = 29.2 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 8.3 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 349 \text{ gpm}$, $t_p = 120 \text{ days}$, efficiency = 70%)

DT = 40.7 ft

Economic Drawdown Constraint (EDC) = $0.4 * 93 \text{ ft} = 37.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $93 \text{ ft} - 60 \text{ ft} = 33 \text{ ft}$

Total drawdown of 40.7 ft is greater than the EDC and the PDC, so this well is **critical**.

20063:

Water Column = 93 ft

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

DE = 29.2 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 7.6 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 321 \text{ gpm}$, $tp = 1202 \text{ days}$, efficiency = 70%)

DT = 40.8 ft

Economic Drawdown Constraint (EDC) = $0.4 * 93 \text{ ft} = 37.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $93 \text{ ft} - 60 \text{ ft} = 33 \text{ ft}$

Total drawdown of 40.8 ft exceeds the EDC and the PDC, so this well is critical.

20257:

Water Column = 87 ft

DP = 3.2 ft (Net drawdown from the proposal indicated above)

DE = 33.3 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 0 ft (Well has not been operated in last 10 years.)

DT = 36.5 ft

Economic Drawdown Constraint (EDC) = $0.4 * 87 \text{ ft} = 34.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $87 \text{ ft} - 60 \text{ ft} = 27 \text{ ft}$

Total drawdown of 36.5 ft exceeds the EDC and the PDC, so this well is critical.

26257:

Water Column = 87 ft

DP = 3.1 ft (Net drawdown from the proposal indicated above)

DE = 33.3 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 4.7 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 200 \text{ gpm}$, $tp = 81 \text{ days}$, efficiency = 70%)

DT = 41.1 ft

Economic Drawdown Constraint (EDC) = $0.4 * 87 \text{ ft} = 34.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $87 \text{ ft} - 60 \text{ ft} = 27 \text{ ft}$

Total drawdown of 41.1 ft is greater than the EDC and the PDC, so this well is critical.

14101:

Water Column = 110 ft

DP = 3.3 ft (Net drawdown from the proposal indicated above)

DE = 33.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 13.4 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 570 \text{ gpm}$, $tp = 86 \text{ days}$, efficiency = 70%)

DT = 50.3 ft

Economic Drawdown Constraint (EDC) = $0.4 * 110 \text{ ft} = 44 \text{ ft}$

Physical Drawdown Constraint (PDC) = $110 \text{ ft} - 60 \text{ ft} = 50 \text{ ft}$

Total drawdown of 50.3 ft is greater than the EDC and the PDC, so this well is **critical**.

19809:

Water Column = 110 ft

DP = 4.1 ft (Net drawdown from the proposal indicated above)

DE = 33.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 11.8 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 500 \text{ gpm}$, $tp = 104 \text{ days}$, efficiency = 70%)

DT = 49.5 ft

Economic Drawdown Constraint (EDC) = $0.4 * 110 \text{ ft} = 44.0 \text{ ft}$

Physical Drawdown Constraint (PDC) = $110 \text{ ft} - 60 \text{ ft} = 50 \text{ ft}$

Total drawdown of 49.5 ft is greater than the EDC, so this well is **critical**.

21455:

Water Column = 110 ft

DP = 3.3 ft (Net drawdown from the proposal indicated above)

DE = 33.6 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 15.3 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 665 \text{ gpm}$, $tp = 62 \text{ days}$, efficiency = 70%)

DT = 52.2 ft

Economic Drawdown Constraint (EDC) = $0.4 * 110 \text{ ft} = 44.0 \text{ ft}$

Physical Drawdown Constraint (PDC) = $110 \text{ ft} - 60 \text{ ft} = 50 \text{ ft}$

Total drawdown of 52.2 ft is greater than the EDC and PDC, so this well is **critical**.

13145 ID10:

Water Column = 110 ft

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

DE = 33.6 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 12.7 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 530 \text{ gpm}$, $tp = 133 \text{ days}$, efficiency = 70%)

DT = 49.8 ft

Economic Drawdown Constraint (EDC) = $0.4 * 110 \text{ ft} = 44.0 \text{ ft}$

Physical Drawdown Constraint (PDC) = $110 \text{ ft} - 60 \text{ ft} = 50 \text{ ft}$

Total drawdown of 49.8 ft is greater than the EDC, so this well is **critical**.

13145 ID5:

Water Column = 103 ft

DP = 3.2 ft (Net drawdown from the proposal indicated above)

DE = 34.8 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 3.1 ft ($S = 0.001403$, $T = 20,300 \text{ ft}^2/\text{day}$, $Q = 129 \text{ gpm}$, $tp = 120 \text{ days}$, efficiency = 70%)

DT = 41.1 ft

Economic Drawdown Constraint (EDC) = $0.4 * 103 \text{ ft} = 41.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $103 \text{ ft} - 60 \text{ ft} = 43 \text{ ft}$

Total drawdown of 41.1 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 1:

Water Column = 87 ft

DP = 4.1 ft (Net drawdown from the proposal indicated above)

DE = 33.3 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 37.4 ft

Economic Drawdown Constraint (EDC) = $0.4 * 87 \text{ ft} = 34.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $87 \text{ ft} - 20 \text{ ft} = 67 \text{ ft}$

Total drawdown of 37.4 ft is greater than the EDC, so this well is **critical**.

Domestic 2:

Water Column = 87 ft

DP = 3.6 ft (Net drawdown from the proposal indicated above)

DE = 33.3 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 36.9 ft

Economic Drawdown Constraint (EDC) = $0.4 * 87 \text{ ft} = 34.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $87 \text{ ft} - 20 \text{ ft} = 67 \text{ ft}$

Total drawdown of 36.9 ft is greater than the EDC, so this well is **critical**.

Domestic 3:

Water Column = 103 ft

DP = 3.0 ft (Net drawdown from the proposal indicated above)

DE = 34.8 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 37.8 ft

Economic Drawdown Constraint (EDC) = $0.4 * 103 \text{ ft} = 41.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $103 \text{ ft} - 20 \text{ ft} = 83 \text{ ft}$

Total drawdown of 37.8 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 4:

Water Column = 103 ft

DP = 3.4 ft (Net drawdown from the proposal indicated above)

DE = 34.8 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 38.2 ft

Economic Drawdown Constraint (EDC) = $0.4 * 103 \text{ ft} = 41.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $103 \text{ ft} - 20 \text{ ft} = 83 \text{ ft}$

Total drawdown of 38.2 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 5:

Water Column = 103 ft

DP = 3.2 ft (Net drawdown from the proposal indicated above)

DE = 34.8 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 38.0 ft

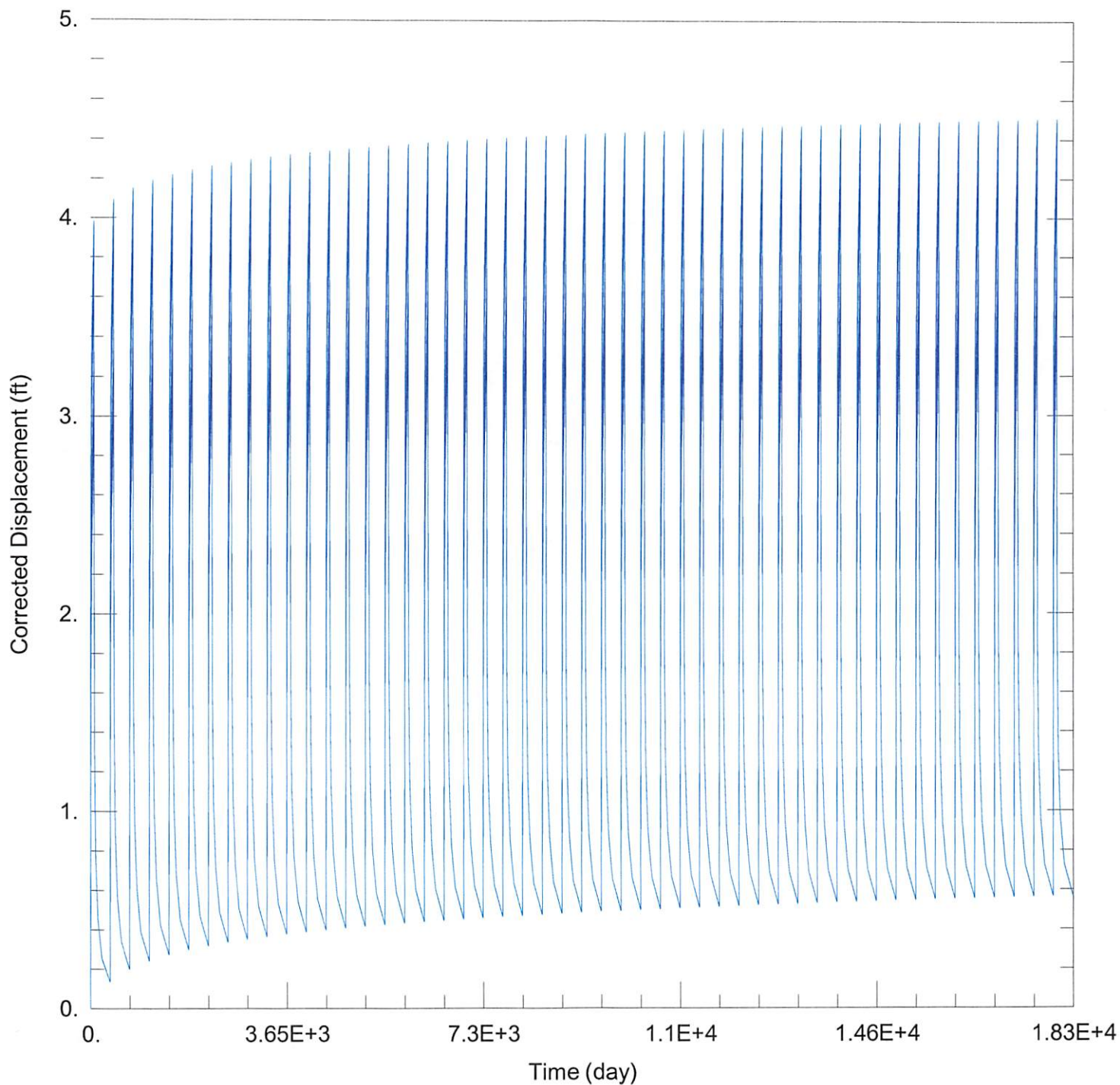
Economic Drawdown Constraint (EDC) = $0.4 * 103 \text{ ft} = 41.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $103 \text{ ft} - 20 \text{ ft} = 83 \text{ ft}$

Total drawdown of 38.0 ft is less than the EDC and PDC, so this well is **not critical**.

Conclusion:

The proposed move is in a depleted aquifer area with a little less than 100 ft of remaining saturated thickness. The analysis shows that net well-to-well effects are likely to be noticeable, due to the limited amount of remaining aquifer. It should be noted that the right that is proposed to be moved has not been operated much over the past 10 years, and had the well been running more frequently, the net effects from the move would be much lower. Concerned neighbors should 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\2023_moves\19622\19622 Proposed.aqt

Date: 05/22/23

Time: 11:10:52

PROJECT INFORMATION

Company: GMD 3

Project: 19622

Location: Gray County

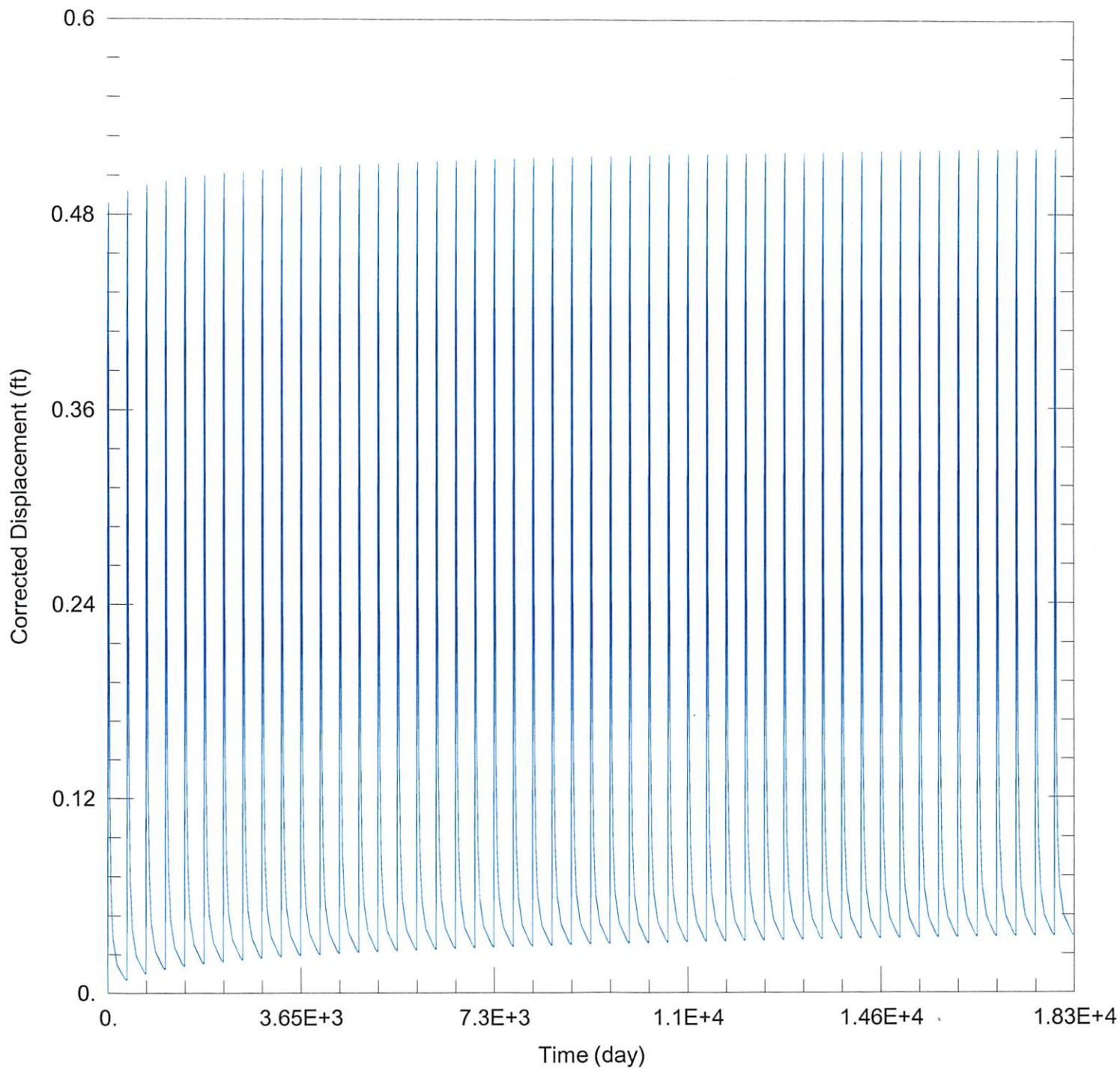
WELL DATA

Pumping Wells

Observation Wells

Well Name	X (ft)	Y (ft)
19622 303812	106010	303812

Well Name	X (ft)	Y (ft)
□	106010	303812



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2023_moves\19622\19622 Current.aqt

Date: 05/22/23

Time: 11:10:59

PROJECT INFORMATION

Company: GMD 3

Project: 19622

Location: Gray County

WELL DATA

Pumping Wells

Observation Wells

Well Name	X (ft)	Y (ft)
19622	109726	304890

Well Name	X (ft)	Y (ft)
□	109726	304890