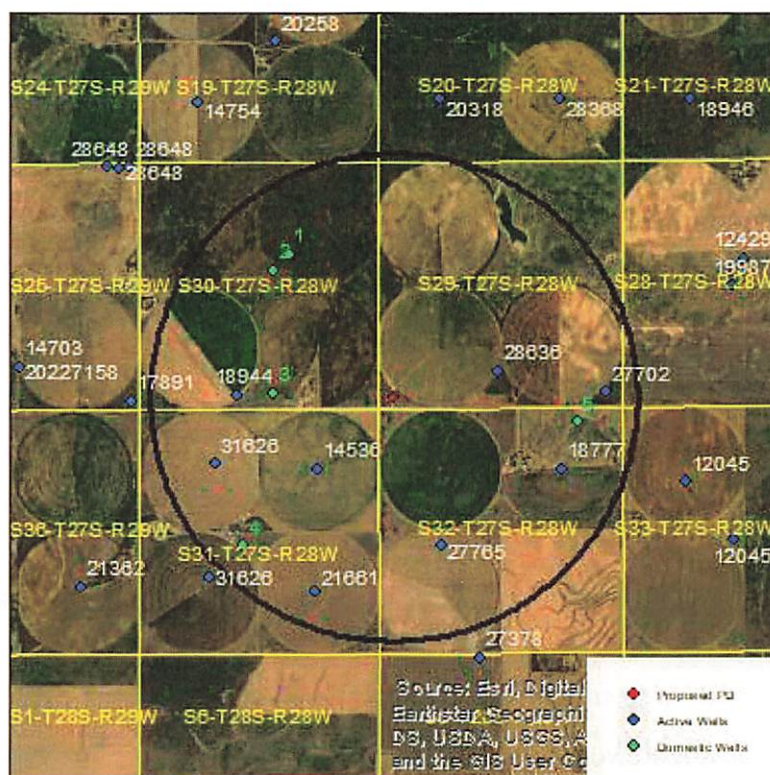**Evaluation of proposed move for Water Right No. 14536**

Proposed: Move water right no. 14536 to a new well location, 2,267 ft to the northeast.

Wells within 1 mile: 18944, 28636, 27702, 31626, 21661, 27765, 18777, and five domestic wells, numbered on the above map.

The saturated thickness at the proposed well location is estimated to be 60 ft, based on the driller's log and an observation well in section 30-27-28. For saturated thickness between than 50 ft and 75 ft, the drawdown allowance is 1.5 ft.

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

$S = 0.203$, $T = 2720$ ft^2/day, $tp_{current} = 205$ days, $Q_{current} = 50$ gpm, $tp_{proposed} = 61$ days, $Q_{proposed} = 930$ gpm

Theis drawdowns were calculated as follows:

18944:	Drawdown from current location = 0.76 ft
	Drawdown from proposed location = 3.53 ft
	Net drawdown = **2.8 ft**
28636:	Drawdown from current location = 0.54 ft
	Drawdown from proposed location = 4.51 ft
	Net drawdown = **4.0 ft**

27702:	Drawdown from current location = 0.42 ft
	Drawdown from proposed location = 2.90 ft
	Net drawdown = **2.5 ft**
31626:	Drawdown from current location = 0.80 ft
	Drawdown from proposed location = 3.12 ft
	Net drawdown = **2.3 ft**
21661:	Drawdown from current location = 0.72 ft
	Drawdown from proposed location = 2.92 ft
	Net drawdown = **2.2 ft**
27765:	Drawdown from current location = 0.66 ft
	Drawdown from proposed location = 3.53 ft
	Net drawdown = **2.9 ft**
18777:	Drawdown from current location = 0.48 ft
	Drawdown from proposed location = 3.19 ft
	Net drawdown = **2.7 ft**
Domestic 1:	Drawdown from current location = 0.52 ft
	Drawdown from proposed location = 3.27 ft
	Net drawdown = **2.8 ft**
Domestic 2:	Drawdown from current location = 0.54 ft
	Drawdown from proposed location = 3.30 ft
	Net drawdown = **2.8 ft**
Domestic 3:	Drawdown from current location = 0.86 ft
	Drawdown from proposed location = 4.17 ft
	Net drawdown = **3.3 ft**
Domestic 4:	Drawdown from current location = 0.78 ft
	Drawdown from proposed location = 2.91 ft
	Net drawdown = **2.1 ft**

Domestic 5:   Drawdown from current location = 0.45 ft

                                  Drawdown from proposed location = 3.17 ft

                                  Net drawdown = **2.7 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:

18944:

Water Column = 81 ft

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

DE = 31.9 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 12.2 ft (S = 0.2097, T = 5738 ft^2/day, Q = 200 gpm, tp = 149 days, efficiency = 70%)

DT = 46.9 ft

Economic Drawdown Constraint (EDC) = 0.4 * 81 ft = 32.4 ft

Physical Drawdown Constraint (PDC) = 81 ft – 60 ft = 21.0 ft

Total drawdown of 46.9 ft is greater than the EDC and the PDC, so this well **is critical.**

28636:

Water Column = 80 ft

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

DE = 27.5 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 49.5 ft (S = 0.203, T = 2720 ft^2/day, Q = 400 gpm, tp = 158 days, efficiency = 70%)

DT = 81.0 ft

Total drawdown of 81.0 ft exceeds the remaining water column, so this well **is critical.**

27702:

Water Column = 80 ft

DP = 2.5 ft (Net drawdown from the proposal indicated above)

DE = 27.5 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 53.1 ft (S = 0.203, T = 2720 ft^2/day, Q = 450 gpm, tp = 87 days, efficiency = 70%)

DT = 83.1 ft

Total drawdown of 83.1 ft exceeds the remaining water column, so this well **is critical.**

31626:

Water Column = 62 ft

DP = 2.3 ft (Net drawdown from the proposal indicated above)

DE = 27.8 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 2.7 ft (S = 0.2937, T = 6520 ft^2/day, Q = 50 gpm, tp = 172 days, efficiency = 70%)

DT = 32.8 ft

Economic Drawdown Constraint (EDC) = 0.4 * 62 ft = 24.8 ft

Physical Drawdown Constraint (PDC) = 62 ft – 60 ft = 2.0 ft

Total drawdown of 32.8 ft is greater than the EDC and the PDC, so this well **is critical.**

21661:

Water Column = 62 ft

DP = 2.2 ft (Net drawdown from the proposal indicated above)

DE = 27.8 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 1.1 ft (S = 0.2937, T = 6520 ft^2/day, Q = 20 gpm, tp = 232 days, efficiency = 70%)

DT = 31.1 ft

Economic Drawdown Constraint (EDC) = 0.4 * 62 ft = 29.2 ft

Physical Drawdown Constraint (PDC) = 62 ft – 60 ft = 2.0 ft

Total drawdown of 31.1 ft is greater than the EDC and the PDC, so this well **is critical.**

27765:

Water Column = 73 ft

DP = 2.9 ft (Net drawdown from the proposal indicated above)

DE = 24.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

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

DT = 27.5 ft

Economic Drawdown Constraint (EDC) = 0.4 * 73 ft = 29.2 ft

Physical Drawdown Constraint (PDC) = 73 ft – 60 ft = 13.0 ft

Total drawdown of 27.5 ft is greater than the EDC and the PDC, so this well **is critical.**

18777:

Water Column = 73 ft

DP = 2.7 ft (Net drawdown from the proposal indicated above)

DE = 24.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 46.7 ft (S = 0.2621, T = 3384 ft²/day, Q = 480 gpm, tp = 119 days, efficiency = 70%)

DT = 74.0 ft

Total drawdown of 74.0 ft is greater than the remaining water column, so this well **is critical.**

Domestic 1:

Water Column = 81 ft

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

DE = 31.9 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 34.7 ft

Economic Drawdown Constraint (EDC) = 0.4 * 81 ft = 32.4 ft

Physical Drawdown Constraint (PDC) = 81 ft – 20 ft = 61.0 ft

Total drawdown of 34.7 ft is greater than the EDC, so this well **is critical.**

Domestic 2:

Water Column = 81 ft

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

DE = 31.9 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 34.7 ft

Economic Drawdown Constraint (EDC) = 0.4 * 81 ft = 32.4 ft

Physical Drawdown Constraint (PDC) = 81 ft – 20 ft = 21.0 ft

Total drawdown of 34.7 ft is greater than the EDC, so this well **is critical.**

Domestic 3:

Water Column = 81 ft

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

DE = 31.9 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 35.2 ft

Economic Drawdown Constraint (EDC) = 0.4 * 81 ft = 32.4 ft

Physical Drawdown Constraint (PDC) = 81 ft – 20 ft = 61.0 ft

Total drawdown of 35.2 ft is greater than the EDC, so this well **is critical.**

Domestic 4:

Water Column = 62 ft

DP = 2.1 ft (Net drawdown from the proposal indicated above)

DE = 27.8 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 29.9 ft

Economic Drawdown Constraint (EDC) = 0.4 * 62 ft = 24.8 ft

Physical Drawdown Constraint (PDC) = 62 ft – 20 ft = 42.0 ft

Total drawdown of 29.9 ft is greater than the EDC, so this well **is critical.**

Domestic 5:

Water Column = 73 ft

DP = 2.7 ft (Net drawdown from the proposal indicated above)

DE = 24.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 27.3 ft

Economic Drawdown Constraint (EDC) = 0.4 * 73 ft = 29.2 ft

Physical Drawdown Constraint (PDC) = 73 ft – 20 ft = 53.0 ft

Total drawdown of 27.3 ft is less than the EDC and PDC, so this well **is not critical.**

Conclusion:

The proposed move is in a depleted aquifer area. If the proposed well is operated at its full rate and quantity, drawdown effects to all neighboring wells are likely to exceed 2 ft. These effects are small, but may be noticeable in an area like this, where some well yields are already diminished, and pumping capacity will likely soon be much lower than it is today. Concerned neighbors should contact GMD3 at (620) 275-7147 or the Division of Water Resources at (620) 276-2901.
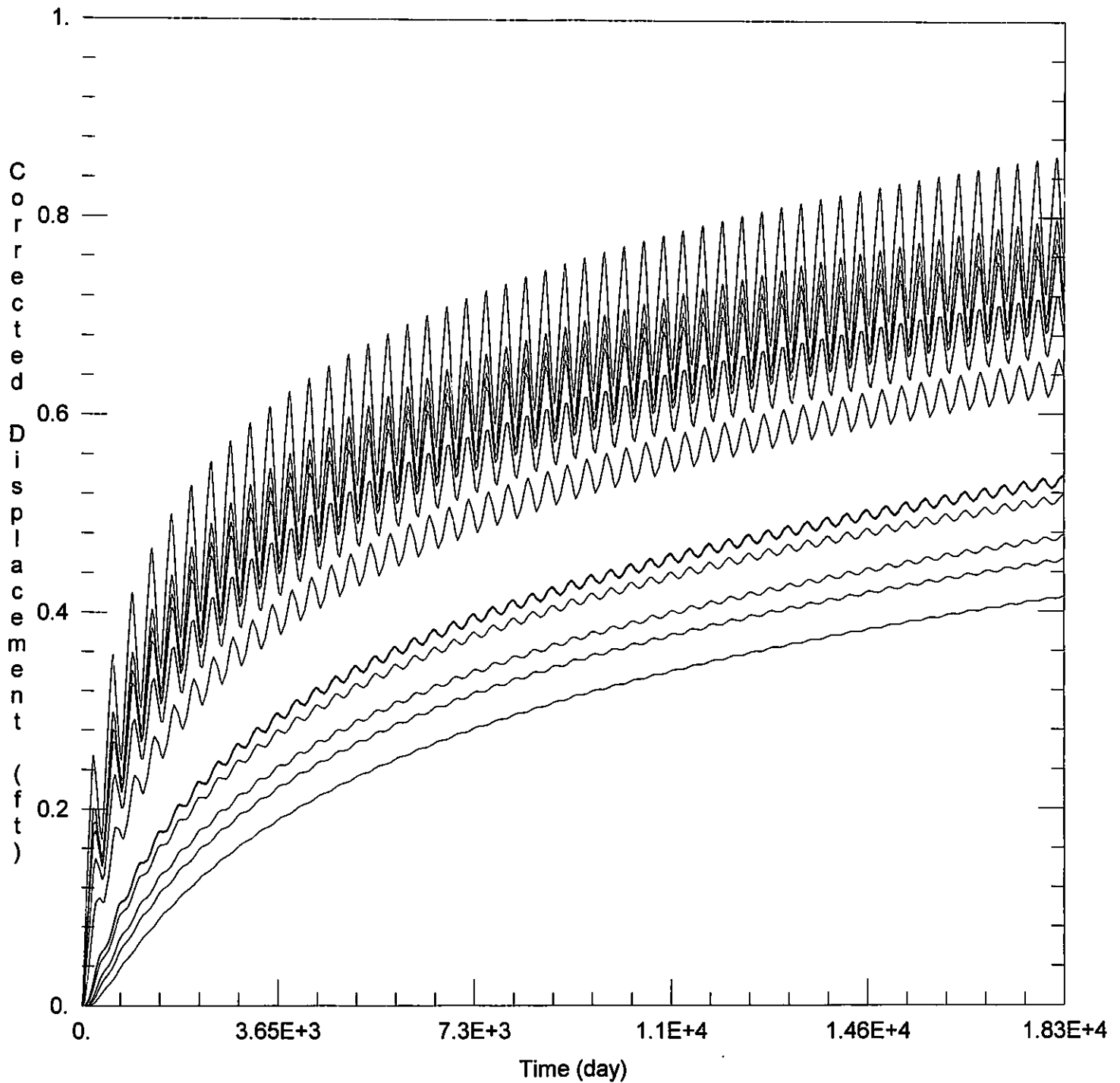
WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2023_moves\14536\14536 Current.aqt
Date: 09/20/23   Time: 11:39:40

PROJECT INFORMATION

Company: GMD 3
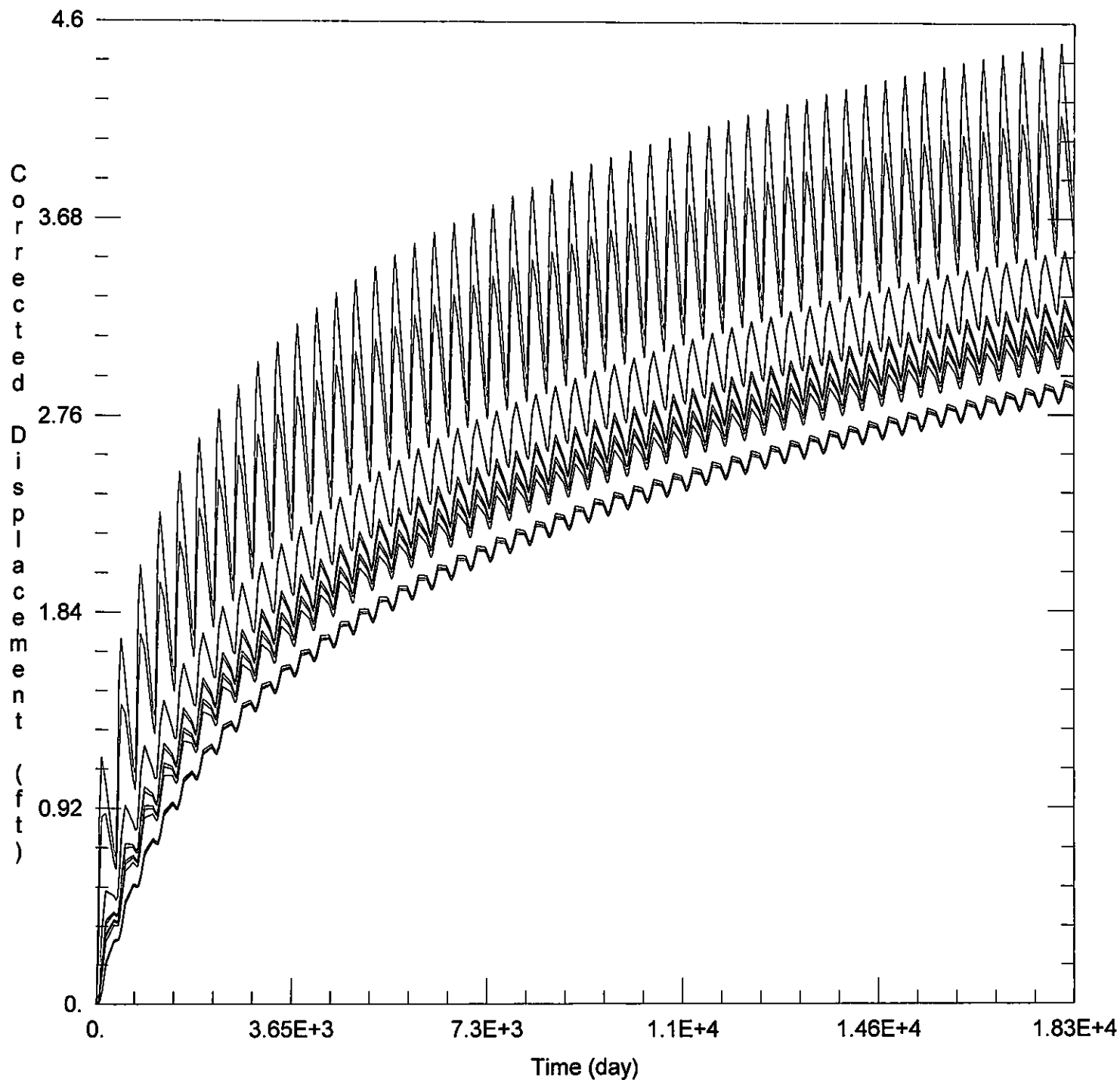Project: 14536
Location: Gray County

WELL DATA

Pumping Wells		
Well Name	X (ft)	Y (ft)
14536	109784	286293

Observation Wells		
Well Name	X (ft)	Y (ft)
▫	109784	286293
▫ 18944	108041	287918

WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2023_moves\14536\14536 Proposed.aqt
Date: 09/20/23   Time: 11:39:33

PROJECT INFORMATION

Company: GMD 3
Project: 14536
Location: Gray County

WELL DATA

Pumping Wells			Observation Wells		
Well Name	X (ft)	Y (ft)	Well Name	X (ft)	Y (ft)
14536	111425	287858	▫	111425	287858
			▫ 18944	108041	287918