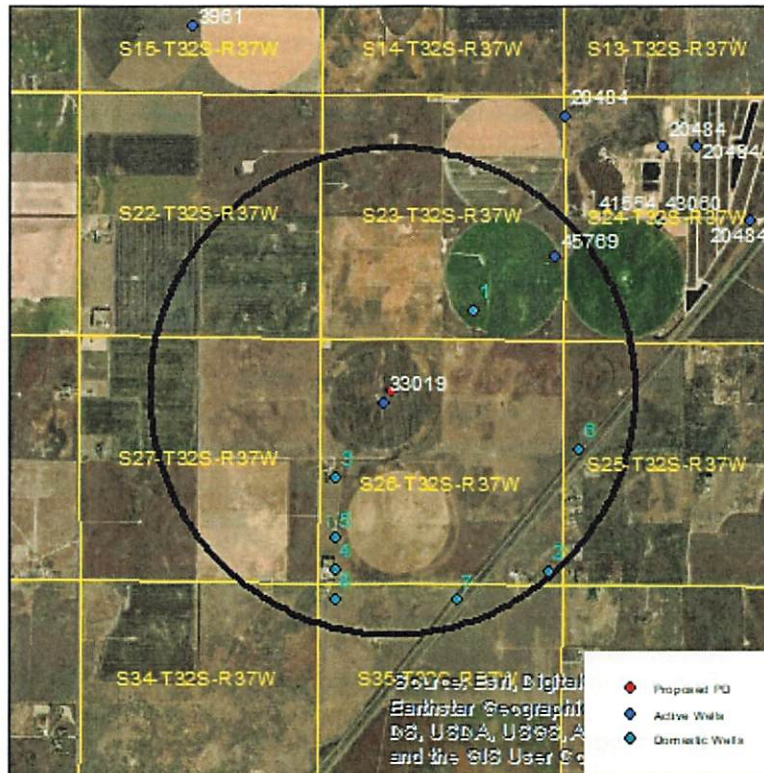


Evaluation of proposed move for Water Right No. 33019

Proposed: Move water right no. 33019 to a new well location, 332 ft to the northeast.



Wells within 1 mile: 45769 and eight domestic wells, numbered on the above map.

The saturated thickness at the proposed well location is estimated to be 407 ft, based upon the driller's log and an observation well in section 26-32-37. For saturated thickness greater than 400 ft, the drawdown allowance is 4.0 ft.

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

$S = 0.1632$, $T = 43.1 \text{ ft}^2/\text{day}$, $tp_{\text{current}} = 138 \text{ days}$, $Q_{\text{current}} = 225 \text{ gpm}$, $tp_{\text{proposed}} = 165 \text{ days}$, $Q_{\text{proposed}} = 610 \text{ gpm}$

Theis drawdowns were calculated as follows:

- | | |
|-------------|--|
| 45769: | Drawdown from current location = 4.49 ft |
| | Drawdown from proposed location = 18.76 ft |
| | Net drawdown = 14.3 ft |
| Domestic 1: | Drawdown from current location = 20.91 ft |
| | Drawdown from proposed location = 84.86 ft |
| | Net drawdown = 64.0 ft |

Domestic 2: Drawdown from current location = 3.77 ft
Drawdown from proposed location = 11.72 ft
Net drawdown = **7.9 ft**

Domestic 3: Drawdown from current location = 38.41 ft
Drawdown from proposed location = 99.40 ft
Net drawdown = **61.0 ft**

Domestic 4: Drawdown from current location = 10.79 ft
Drawdown from proposed location = 27.83 ft
Net drawdown = **17.0 ft**

Domestic 5: Drawdown from current location = 16.89 ft
Drawdown from proposed location = 43.80 ft
Net drawdown = **26.9 ft**

Domestic 6: Drawdown from current location = 6.69 ft
Drawdown from proposed location = 23.89 ft
Net drawdown = **17.2 ft**

Domestic 7: Drawdown from current location = 5.80 ft
Drawdown from proposed location = 16.30 ft
Net drawdown = **10.5 ft**

Domestic 8: Drawdown from current location = 6.71 ft
Drawdown from proposed location = 17.18 ft
Net drawdown = **10.5 ft**

Net drawdown exceeds the drawdown allowance of 4.0 ft for all wells within 1 mile of the proposed location. Critical well analysis is necessary on those wells.

Critical Well Evaluation:

45769:

Water Column = 272 ft

DP = 14.3 ft (Net drawdown from the proposal indicated above)

DE = 25.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DD = 50.4 ft ($S = 0.2427$, $T = 1664.7 \text{ ft}^2/\text{day}$, $Q = 261 \text{ gpm}$, $tp = 160 \text{ days}$, efficiency = 70%)

DT = 90.3 ft

Economic Drawdown Constraint (EDC) = $0.4 * 272 \text{ ft} = 108.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $272 \text{ ft} - 60 \text{ ft} = 212 \text{ ft}$

Total drawdown of 90.3 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 1:

Water Column = 272 ft

DP = 64.0 ft (Net drawdown from the proposal indicated above)

DE = 25.6 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 89.6 ft

Economic Drawdown Constraint (EDC) = $0.4 * 272 \text{ ft} = 108.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $272 \text{ ft} - 20 \text{ ft} = 252 \text{ ft}$

Total drawdown of 89.6 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 2:

Water Column = 407 ft

DP = 7.9 ft (Net drawdown from the proposal indicated above)

DE = 0 ft (GMD3 model indicates a stable aquifer in this section)

DT = 7.9 ft

Economic Drawdown Constraint (EDC) = $0.4 * 407 \text{ ft} = 162.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $407 \text{ ft} - 20 \text{ ft} = 387 \text{ ft}$

Total drawdown of 7.9 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 3:

Water Column = 407 ft

DP = 61.0 ft (Net drawdown from the proposal indicated above)

DE = 0 ft (GMD3 model indicates a stable aquifer in this section)

DT = 61.0 ft

Economic Drawdown Constraint (EDC) = $0.4 * 407 \text{ ft} = 162.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $407 \text{ ft} - 60 \text{ ft} = 387 \text{ ft}$

Total drawdown of 61.0 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 4:

Water Column = 407 ft

DP = 17.0 ft (Net drawdown from the proposal indicated above)

DE = 0 ft (GMD3 model indicates a stable aquifer in this section)

DT = 17.0 ft

Economic Drawdown Constraint (EDC) = $0.4 * 407 \text{ ft} = 162.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $407 \text{ ft} - 20 \text{ ft} = 387 \text{ ft}$

Total drawdown of 17.0 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 5:

Water Column = 407 ft

DP = 26.9 ft (Net drawdown from the proposal indicated above)

DE = 0 ft (GMD3 model indicates a stable aquifer in this section)

DT = 26.9 ft

Economic Drawdown Constraint (EDC) = $0.4 * 407 \text{ ft} = 162.8 \text{ ft}$

Physical Drawdown Constraint (PDC) = $407 \text{ ft} - 20 \text{ ft} = 387 \text{ ft}$

Total drawdown of 26.9 ft is greater than the EDC and PDC, so this well is **not critical**.

Domestic 6:

Water Column = 250 ft

DP = 17.2 ft (Net drawdown from the proposal indicated above)

DE = 16.2 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 33.4 ft

Economic Drawdown Constraint (EDC) = $0.4 * 250 \text{ ft} = 100.0 \text{ ft}$

Physical Drawdown Constraint (PDC) = $250 \text{ ft} - 20 \text{ ft} = 230 \text{ ft}$

Total drawdown of 33.4 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 7:

Water Column = 333 ft

DP = 10.5 ft (Net drawdown from the proposal indicated above)

DE = 1.2 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 11.7 ft

Economic Drawdown Constraint (EDC) = $0.4 * 333 \text{ ft} = 133.2 \text{ ft}$

Physical Drawdown Constraint (PDC) = $333 \text{ ft} - 20 \text{ ft} = 313 \text{ ft}$

Total drawdown of 11.7 ft is less than the EDC and PDC, so this well is **not critical**.

Domestic 8:

Water Column = 333 ft

DP = 10.5 ft (Net drawdown from the proposal indicated above)

DE = 1.2 ft (Water level decline from 2023 through 2048 based upon GMD3 model)

DT = 11.7 ft

Economic Drawdown Constraint (EDC) = $0.4 * 333 \text{ ft} = 133.2 \text{ ft}$

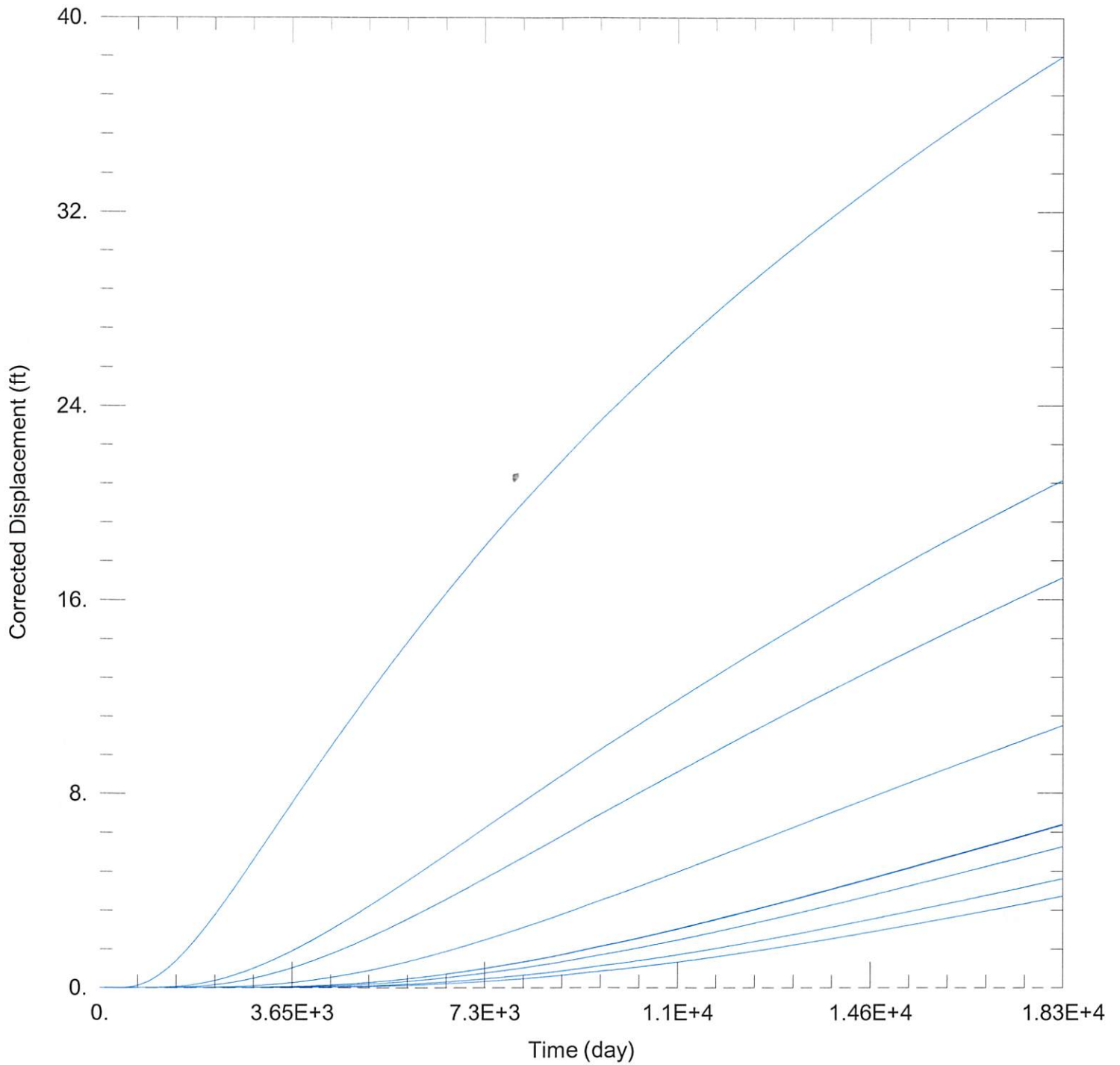
Physical Drawdown Constraint (PDC) = $333 \text{ ft} - 20 \text{ ft} = 313 \text{ ft}$

Total drawdown of 11.7 ft is less than the EDC and PDC, so this well is **not critical**.

Conclusion:

The proposed move is in an area with abundant saturated thickness, but aquifer properties are mostly clay, with most of the porous sand located in the upper portion of the remaining saturated aquifer. Modeled aquifer properties indicate large drawdown effects which will be noticeable on neighboring wells if the proposed well is operated at its full rate and quantity. Even after accounting for these large well-to-well effects, the static water level of the aquifer is declining fairly slowly, and there appears to

be sufficient remaining aquifer so that this demonstration did not flag any neighboring well as critical. This indicates that neighbors will likely still be able to access sufficient water for their authorized domestic and irrigation purposes, and impairment is unlikely. 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\33019\33019 Current.aqt
 Date: 01/19/23 Time: 14:50:47

PROJECT INFORMATION

Company: GMD 3
 Project: 33019
 Location: Stevens County

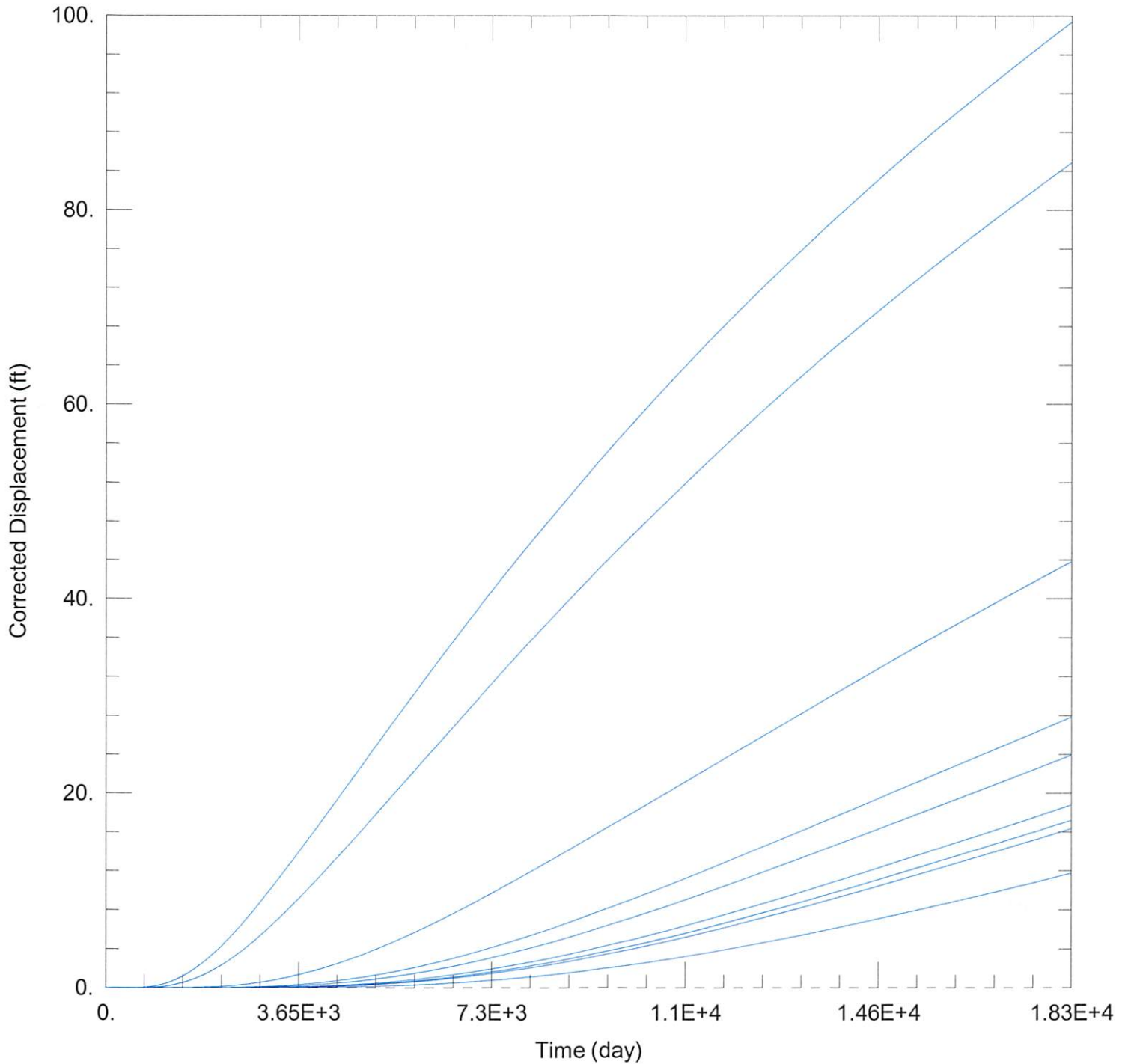
WELL DATA

Pumping Wells

| Well Name | X (ft) | Y (ft) |
|-----------|---------|--------|
| 33019 | -150466 | 132899 |

Observation Wells

| Well Name | X (ft) | Y (ft) |
|-----------|---------|--------|
| □ | -150466 | 132899 |



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2023_moves\33019\33019 Proposed.aqt
 Date: 01/19/23 Time: 14:50:42

PROJECT INFORMATION

Company: GMD 3
 Project: 33019
 Location: Stevens County

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|---------|--------|-------------------|---------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| 33019 | -150260 | 133160 | □ | -150260 | 133160 |