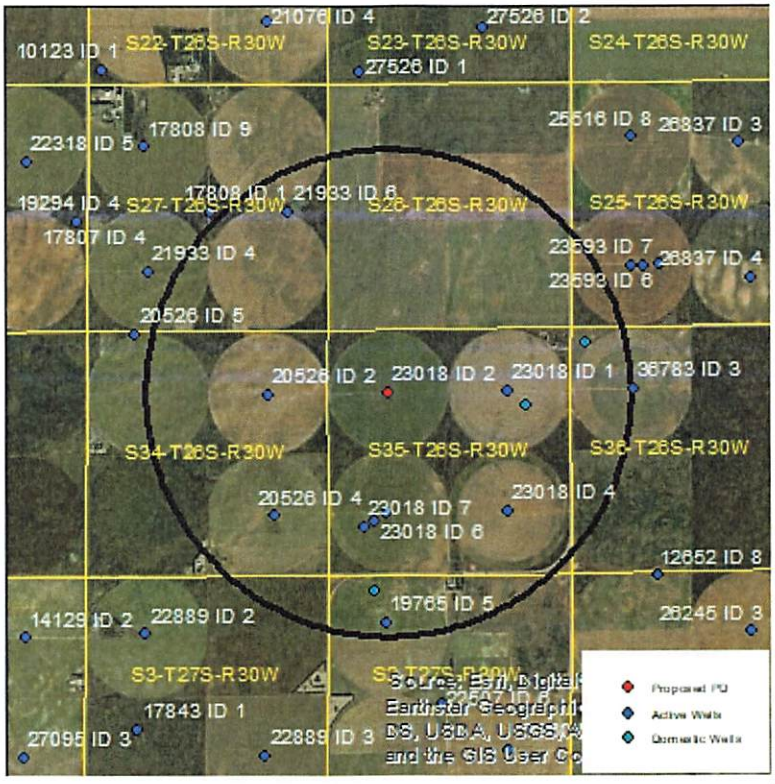
Evaluation of proposed move for Water Right No. 23018

Proposed: Move 100 AF currently authorized under water right no. 23018 ID1 to the well currently authorized under water right no. 23018 ID2.



Wells within 1 mile: 23018 ID1, 23018 ID4, 23018 ID6, 21933, 20526 ID2, 20526 ID4, 19785, a domestic well in section 35-26-30, a domestic well in section 36-26-30, and a domestic well in section 2-27-30.

The saturated thickness at the proposed well location is estimated to be 88 ft, based upon the GMD3 model. For saturated thickness between 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 = 0.1645, T = 2792.6 ft^2/day, $tp_{current}$ = 131 days, $Q_{current}$ = 375 gpm, $tp_{proposed}$ = 273 days, $Q_{proposed}$ = 375 gpm

Theis drawdowns were calculated as follows:

23018 ID1:	Drawdown from current location = 3.73 ft
	Drawdown from proposed location = 7.36 ft
	Net drawdown = **3.6 ft**
23018 ID4:	Drawdown from current location = 3.04 ft
	Drawdown from proposed location = 6.20 ft
	Net drawdown = **3.2 ft**

23018 ID6:	Drawdown from current location = 3.58 ft
	Drawdown from proposed location = 7.13 ft
	Net drawdown = **3.6 ft**
21933:	Drawdown from current location = 2.68 ft
	Drawdown from proposed location = 5.54 ft
	Net drawdown = **2.9 ft**
20526 ID2:	Drawdown from current location = 3.73 ft
	Drawdown from proposed location = 7.36 ft
	Net drawdown = **3.64 ft**
20526 ID4:	Drawdown from current location = 3.04 ft
	Drawdown from proposed location = 6.21 ft
	Net drawdown = **3.2 ft**
19785:	Drawdown from current location = 2.50 ft
	Drawdown from proposed location = 5.19 ft
	Net drawdown = **2.7 ft**
Domestic 35-26-30:	Drawdown from current location = 3.41 ft
	Drawdown from proposed location = 6.88 ft
	Net drawdown = **3.5 ft**
Domestic 36-26-30:	Drawdown from current location = 2.69 ft
	Drawdown from proposed location = 5.56 ft
	Net drawdown = **2.9 ft**
Domestic 2-27-30:	Drawdown from current location = 2.74 ft
	Drawdown from proposed location = 5.65 ft
	Net drawdown = **2.9 ft**

Net drawdown exceeds the drawdown allowance of 2.0 ft for all wells within 1 mile of the proposed location. Critical well analysis is necessary on those wells.

Critical Well Evaluation:

23018 ID1:

Water Column = 88 ft

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

DE = 18.2 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 17.1 ft (S = 0.1645, T = 20,889 gpd/ft, Q = 150 gpm, tp = 57 days, efficiency = 70%)

DT = 38.9 ft

Economic Drawdown Constraint (EDC) = 0.4 * 88 ft = 35.2 ft

Physical Drawdown Constraint (PDC) = 88 ft – 60 ft = 28.0 ft

Total drawdown of 38.9 ft is greater than the EDC and PDC, so this well **is critical.**

23018 ID4:

Water Column = 88 ft

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

DE = 18.2 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 0 ft (No use in last 10 years)

DT = 21.4 ft

Economic Drawdown Constraint (EDC) = 0.4 * 88 ft = 35.2 ft

Physical Drawdown Constraint (PDC) = 88 ft – 60 ft = 28.0 ft

Total drawdown of 21.4 ft is less than the EDC and PDC, so this well **is not critical.**

23018 ID6:

Water Column = 88 ft

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

DE = 18.2 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 29.3 ft (S = 0.1645, T = 20,889 gpd/ft, Q = 250 gpm, tp = 84 days, efficiency = 70%)

DT = 51.1 ft

Economic Drawdown Constraint (EDC) = 0.4 * 88 ft = 35.2 ft

Physical Drawdown Constraint (PDC) = 88 ft – 60 ft = 28.0 ft

Total drawdown of 51.1 ft is greater than the EDC and PDC, so this well **is critical.**

21933:

Water Column = 106 ft

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

DE = 26.0 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 70.8 ft (S = 0.1336, T = 21,244 gpd/ft, Q = 600 gpm, tp = 93 days, efficiency = 70%)

DT = 99.7 ft

Economic Drawdown Constraint (EDC) = 0.4 * 106 ft = 42.4 ft

Physical Drawdown Constraint (PDC) = 106 ft – 60 ft = 46.0 ft

Total drawdown of 99.7 ft is greater than the EDC and PDC, so this well **is critical.**

20526 ID2:

Water Column = 91 ft

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

DE = 29.0 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 23.2 ft (S = 0.2125, T = 31,956 gpd/ft, Q = 300 gpm, tp = 79 days, efficiency = 70%)

DT = 55.8 ft

Economic Drawdown Constraint (EDC) = 0.4 * 91 ft = 36.4 ft

Physical Drawdown Constraint (PDC) = 91 ft – 60 ft = 31.0 ft

Total drawdown of 55.8 ft is greater than the EDC and PDC, so this well **is critical.**

20526 ID4:

Water Column = 91 ft

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

DE = 29.0 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 0 ft (No use in last 10 years)

DT = 32.2 ft

Economic Drawdown Constraint (EDC) = 0.4 * 91 ft = 36.4 ft

Physical Drawdown Constraint (PDC) = 91 ft – 60 ft = 31.0 ft

Total drawdown of 32.2 ft is greater than the PDC, so this well **is critical.**

19785:

Water Column = 79 ft

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

DE = 27.9 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DD = 37.1 ft (S = 0.1799, T = 24,637 gpd/ft, Q = 400 gpm, tp = 28 days, efficiency = 70%)

DT = 67.7 ft

Economic Drawdown Constraint (EDC) = 0.4 * 79 ft = 31.6 ft

Physical Drawdown Constraint (PDC) = 79 ft – 60 ft = 19.0 ft

Total drawdown of 67.7 ft is greater than the EDC and PDC, so this well **is critical.**

Domestic 35-26-30:

Water Column = 88 ft

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

DE = 18.2 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 21.7 ft

Economic Drawdown Constraint (EDC) = 0.4 * 88 ft = 35.2 ft

Physical Drawdown Constraint (PDC) = 88 ft – 20 ft = 68.0 ft

Total drawdown of 21.7 ft is less than the EDC and PDC, so this well **is not critical.**

Domestic 36-26-30:

Water Column = 75 ft

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

DE = 13.0 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 15.9 ft

Economic Drawdown Constraint (EDC) = 0.4 * 75 ft = 30.0 ft

Physical Drawdown Constraint (PDC) = 75 ft – 20 ft = 55.0 ft

Total drawdown of 15.9 ft is less than the EDC and PDC, so this well **is not critical.**

Domestic 2-27-30:

Water Column = 79 ft

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

DE = 27.9 ft (Water level decline from 2022 through 2047 based upon GMD3 model)

DT = 30.8 ft

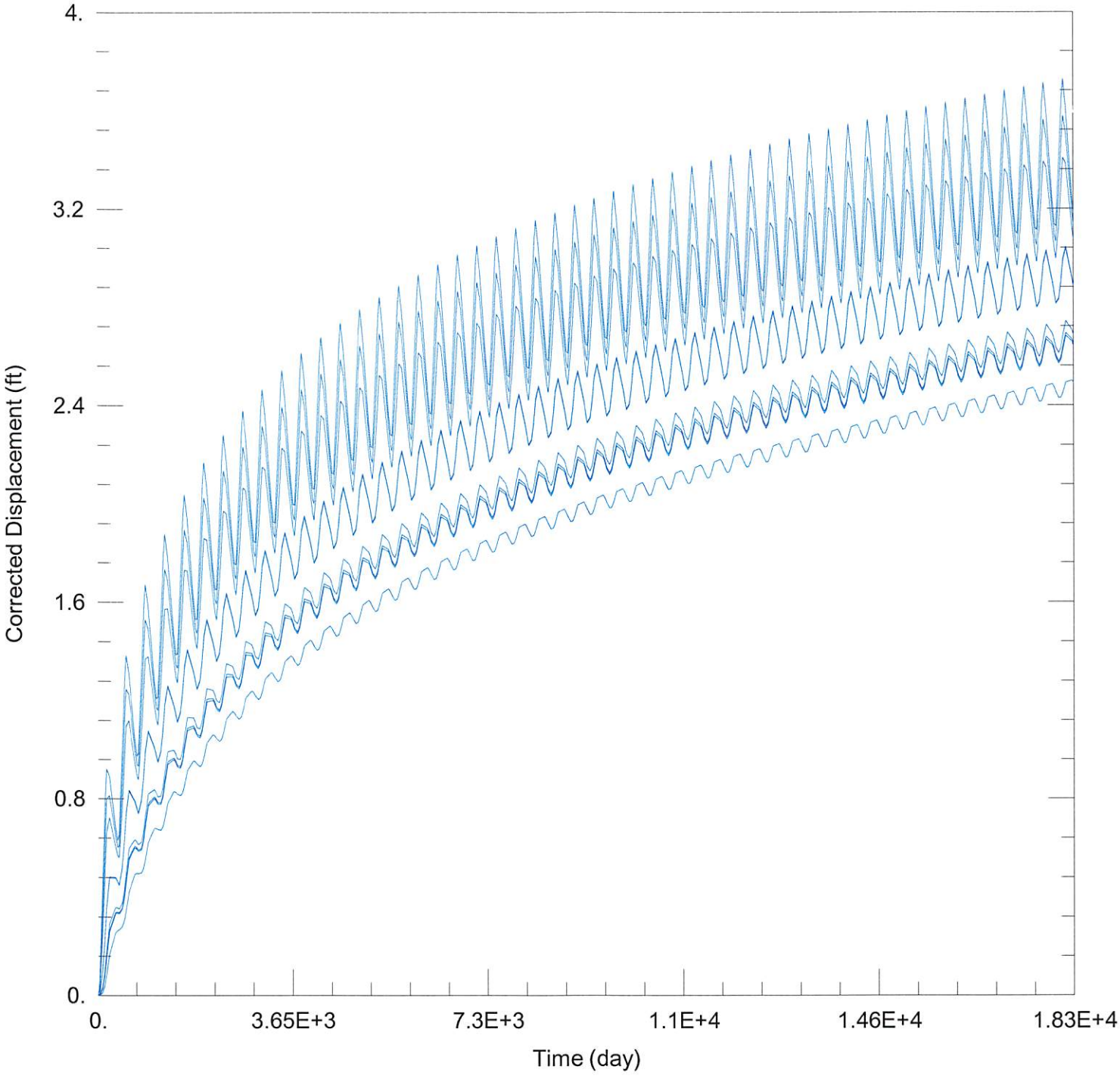
Economic Drawdown Constraint (EDC) = 0.4 * 79 ft = 31.6 ft

Physical Drawdown Constraint (PDC) = 79 ft – 20 ft – 59.0 ft

Total drawdown of 30.8 ft is less than the EDC and PDC, so this well **is not critical.**

Conclusion:

The proposed move is in an area with less than 100 ft saturated thickness. If the proposed well were to pump its full authorized authority, there would likely be a small, but noticeable drawdown effect on all neighboring wells. Critical well analysis shows that neighboring wells under water right numbers 23018 ID1, 23018 ID6, 21933, 20526 ID2, 20526 ID4, and 19785 are critical because saturated thickness, accounting for well drawdown effects, is projected to decline by more than 40% in 25 years and leave less than 60 ft remaining. 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\23018\23018 Current.aqt
Date: 07/22/22 Time: 11:00:59

PROJECT INFORMATION

Company: GMD 3
Project: 23018
Location: Gray County

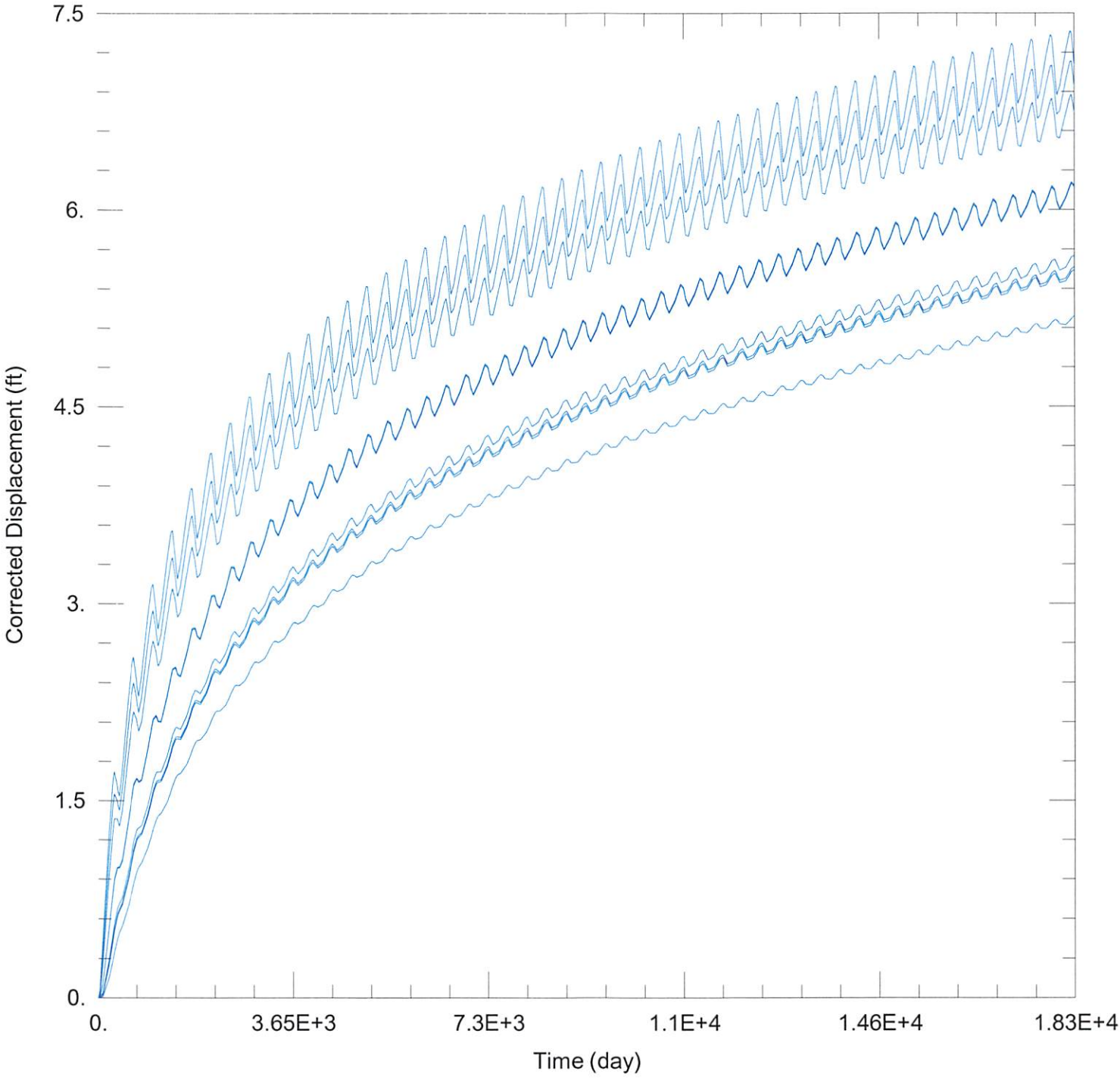
WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
23018 ID2	64955	317793

Observation Wells

Well Name	X (ft)	Y (ft)
□	64955	317793



WELL TEST ANALYSIS

Data Set: C:\Users\trevora\Documents\2022_moves\23018\23018 Proposed.aqt
Date: 07/22/22 Time: 11:00:37

PROJECT INFORMATION

Company: GMD 3
Project: 23018
Location: Gray County

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
23018 ID2	64955	317793

Observation Wells

Well Name	X (ft)	Y (ft)
□	64955	317793