

## Merritt, Allen

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**From:** Greg Sullivan [greg.sullivan@brockwayeng.com]  
**Sent:** Friday, January 08, 2010 3:35 PM  
**To:** Merritt, Allen  
**Subject:** FW: Devries  
**Attachments:** Theis-Drawdown Estimation\_S0.01.pdf; Theis-Drawdown Estimation\_S0.07.pdf

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**From:** Greg Sullivan  
**Sent:** Wednesday, January 06, 2010 3:42 PM  
**To:** 'ameritt@idwr.state.id.us'  
**Subject:** Devries

Allen,

I did find one issue with my spreadsheet. In Table 2, I had entered in incomplete "HOURS" values stopping at 37 instead of 17760. The "HOURS" values should be the same on Table 2 and Table 2 continued. I ran the spreadsheet with  $S = 0.01$  and  $S = 0.07$  and attached both to this email. The result with my updated values is that the protestants well may be effected by 0.2 feet after 2 years of continues pumping with  $S = 0.01$ . It is anticipated that the 0.25 cfs (112.21 gpm) will not be pumped continually but will be pumped as needed up to the maximum of 0.25 cfs. No harmful effects should occur to the protestants well.

Give me a call if you have any more questions.

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Table 2

## Greg DeVries Stock and Commerical Well Analysis

## Well Interference Analysis

Brockway Engr, PLLC

Greg Sullivan 8/21/09

Pumping Rate (cfs)=

0.25

Proposed Diversion

Pumping Rate (gpm)=

112.21

Proposed Diversion

## AQUIFER PROPERTIES BASED ON WELL LOGS AND CALCULATED AQUIFER CHARACTERISTICS

USING THEIS FORMULA  $S=114.6 \cdot Q/T \cdot W(U)$ 

Q= PUMPING RATE GPM

T= COEFFICIENT OF TRANSMISSIBILITY GPD/FT

W(U)= WELL FUNCTION OF 'U'

 $W(U) = -5.772 - \log_e U + U \cdot U^{0.5} / (2 \cdot (2 \cdot 2)^{0.5}) + U^{1.5} / (3 \cdot (3 \cdot 3)^{0.5}) - U^{2.5} / (4 \cdot (4 \cdot 4)^{0.5}) + \dots$  $U = 1.87 \cdot r^2 \cdot S / (T \cdot t)$ 

r=DISTANCE IN FT. FROM CENTER OF PUMPED WELL TO DRAWDOWN POINT

S=COEFFICIENT OF STORAGE

T=COEFFICIENT OF TRANSMISSIBILITY, GPD/FT

t= TIME SINCE PUMPING STARTED, DAYS

INPUT

r1= 0.500 FT 0.5 ft K= 37.50 FT/DAY

r2= 100 FT 100 ft K= 0.000434 CFS/FT^2

r3= 1000 FT 1000 ft K= 2.80E+02 GPD/FT^2

r4= 5280 FT 1 mile SAT. DEPTH EST.= 98.40 FT

r5= 26400 FT 5 mile TRANSMISSIVITY= 27527 GPD/FT

S= 0.01 TRANSMISSIVITY= 4.26E-02 FT^2/SEC

T= 27527 GPD/FT TRANSMISSIVITY= 3680.1 FT^2/DAY

Q/WELL 112.2 GPM = 0.250 CFS

| TIME  | TIME   | Radius 1  |         |        |        |           | Radius 2 |          |           |          |          | Radius 3 |          |          |           |        | Radius 4 |        |      |  |  | Radius 5 |        |       |  |  |
|-------|--------|-----------|---------|--------|--------|-----------|----------|----------|-----------|----------|----------|----------|----------|----------|-----------|--------|----------|--------|------|--|--|----------|--------|-------|--|--|
|       |        | U         | WELL    | DRAW   | SPEC.  |           | U        | WELL     | DRAW      |          |          | U        | WELL     | DRAW     |           |        | U        | WELL   | DRAW |  |  | U        | WELL   | DRAW  |  |  |
| HOURS | DAYS   | WU1       | FUNCT.  | DOWN   | CAP    |           | WU2      | FUNCT.   | DOWN      |          |          | WU3      | FUNCT.   | DOWN     |           |        | WU4      | FUNCT. | DOWN |  |  | WU4      | FUNCT. | DOWN  |  |  |
|       |        | 0.500     | WU1     | 0.5 ft | 0.5 ft |           | 100      | WU2      | 100       |          |          | 1000     | WU3      | 1000     |           |        | 5280     | WU4    | 5280 |  |  | 26400    | WU4    | 26400 |  |  |
| 1     | 0.04   | 4.076E-06 | 11.8332 | 5.53   | 20     | 1.630E-01 | 1.39E+00 | 6.51E-01 | 1.630E+01 | 0.00E+00 | 0.00E+00 | 4.55E+02 | 0.00E+00 | 0.00E+00 | 1.136E+04 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 2     | 0.08   | 2.038E-06 | 12.5284 | 5.85   | 19     | 8.152E-02 | 2.01E+00 | 9.39E-01 | 8.152E+00 | 0.00E+00 | 0.00E+00 | 2.27E+02 | 0.00E+00 | 0.00E+00 | 5.682E+03 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 3     | 0.13   | 1.359E-06 | 12.9318 | 6.04   | 19     | 5.435E-02 | 2.39E+00 | 1.12E+00 | 5.435E+00 | 0.00E+00 | 0.00E+00 | 1.52E+02 | 0.00E+00 | 0.00E+00 | 3.788E+03 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 10    | 0.42   | 4.076E-07 | 14.1358 | 6.60   | 17     | 1.630E-02 | 3.56E+00 | 1.66E+00 | 1.630E+00 | 8.26E-02 | 3.86E-02 | 4.55E+01 | 0.00E+00 | 0.00E+00 | 1.136E+03 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 24    | 1.00   | 1.698E-07 | 15.0113 | 7.01   | 16     | 6.793E-03 | 4.42E+00 | 2.07E+00 | 6.793E-01 | 3.89E-01 | 1.82E-01 | 1.89E+01 | 0.00E+00 | 0.00E+00 | 4.735E+02 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 48    | 2.00   | 8.492E-08 | 15.7044 | 7.34   | 15     | 3.397E-03 | 5.11E+00 | 2.39E+00 | 3.397E-01 | 8.15E-01 | 3.81E-01 | 9.47E+00 | 0.00E+00 | 0.00E+00 | 2.367E+02 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 96    | 4.00   | 4.246E-08 | 16.3976 | 7.66   | 15     | 1.698E-03 | 5.80E+00 | 2.71E+00 | 1.698E-01 | 1.36E+00 | 6.35E-01 | 4.73E+00 | 0.00E+00 | 0.00E+00 | 1.184E+02 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 120   | 5.00   | 3.397E-08 | 16.6207 | 7.76   | 14     | 1.359E-03 | 6.03E+00 | 2.81E+00 | 1.359E-01 | 1.55E+00 | 7.24E-01 | 3.79E+00 | 8.58E-04 | 4.01E-04 | 9.469E+01 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 288   | 12.00  | 1.415E-08 | 17.4962 | 8.17   | 14     | 5.661E-04 | 6.90E+00 | 3.22E+00 | 5.661E-02 | 2.35E+00 | 1.10E+00 | 1.58E+00 | 8.91E-02 | 4.16E-02 | 3.946E+01 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 960   | 40.00  | 4.246E-09 | 18.7001 | 8.74   | 13     | 1.698E-04 | 8.10E+00 | 3.79E+00 | 1.698E-02 | 3.52E+00 | 1.64E+00 | 4.73E-01 | 5.83E-01 | 2.77E-01 | 1.184E+01 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 1632  | 68.00  | 2.498E-09 | 19.2308 | 8.98   | 12     | 9.990E-05 | 8.63E+00 | 4.03E+00 | 9.990E-03 | 4.04E+00 | 1.89E+00 | 2.79E-01 | 9.61E-01 | 4.49E-01 | 6.963E+00 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 2304  | 96.00  | 1.769E-09 | 19.5756 | 9.14   | 12     | 7.076E-05 | 8.98E+00 | 4.19E+00 | 7.076E-03 | 4.38E+00 | 2.05E+00 | 1.97E-01 | 1.23E+00 | 5.76E-01 | 4.932E+00 | 0.0000 | 0.00     |        |      |  |  |          |        |       |  |  |
| 2976  | 124.00 | 1.370E-09 | 19.8315 | 9.26   | 12     | 5.478E-05 | 9.23E+00 | 4.31E+00 | 5.478E-03 | 4.64E+00 | 2.17E+00 | 1.53E-01 | 1.45E+00 | 6.77E-01 | 3.818E+00 | 0.0003 | 0.00     |        |      |  |  |          |        |       |  |  |
| 3648  | 152.00 | 1.117E-09 | 20.0351 | 9.36   | 12     | 4.469E-05 | 9.44E+00 | 4.41E+00 | 4.469E-03 | 4.84E+00 | 2.26E+00 | 1.25E-01 | 1.63E+00 | 7.60E-01 | 3.115E+00 | 0.0108 | 0.01     |        |      |  |  |          |        |       |  |  |
| 4320  | 180.00 | 9.435E-10 | 20.2042 | 9.44   | 12     | 3.774E-05 | 9.61E+00 | 4.49E+00 | 3.774E-03 | 5.01E+00 | 2.34E+00 | 1.05E-01 | 1.78E+00 | 8.30E-01 | 2.630E+00 | 0.0209 | 0.01     |        |      |  |  |          |        |       |  |  |
| 4992  | 208.00 | 8.165E-10 | 20.3488 | 9.51   | 12     | 3.268E-05 | 9.75E+00 | 4.56E+00 | 3.268E-03 | 5.15E+00 | 2.41E+00 | 9.11E-02 | 1.91E+00 | 8.91E-01 | 2.276E+00 | 0.0336 | 0.02     |        |      |  |  |          |        |       |  |  |
| 5664  | 236.00 | 7.196E-10 | 20.4751 | 9.56   | 12     | 2.878E-05 | 9.88E+00 | 4.61E+00 | 2.878E-03 | 5.28E+00 | 2.46E+00 | 8.02E-02 | 2.02E+00 | 9.46E-01 | 2.006E+00 | 0.0485 | 0.02     |        |      |  |  |          |        |       |  |  |
| 6336  | 264.00 | 6.433E-10 | 20.5872 | 9.62   | 12     | 2.573E-05 | 9.99E+00 | 4.67E+00 | 2.573E-03 | 5.39E+00 | 2.52E+00 | 7.17E-02 | 2.13E+00 | 9.94E-01 | 1.793E+00 | 0.0653 | 0.03     |        |      |  |  |          |        |       |  |  |
| 7008  | 292.00 | 5.816E-10 | 20.6880 | 9.66   | 12     | 2.326E-05 | 1.01E+01 | 4.71E+00 | 2.326E-03 | 5.49E+00 | 2.56E+00 | 6.49E-02 | 2.22E+00 | 1.04E+00 | 1.621E+00 | 0.0837 | 0.04     |        |      |  |  |          |        |       |  |  |
| 7680  | 320.00 | 5.307E-10 | 20.7796 | 9.71   | 12     | 2.123E-05 | 1.02E+01 | 4.76E+00 | 2.123E-03 | 5.58E+00 | 2.61E+00 | 5.92E-02 | 2.31E+00 | 1.08E+00 | 1.480E+00 | 0.1031 | 0.05     |        |      |  |  |          |        |       |  |  |
| 8352  | 348.00 | 4.880E-10 | 20.8635 | 9.75   | 12     | 1.952E-05 | 1.03E+01 | 4.80E+00 | 1.952E-03 | 5.66E+00 | 2.65E+00 | 5.44E-02 | 2.39E+00 | 1.12E+00 | 1.361E+00 | 0.1234 | 0.06     |        |      |  |  |          |        |       |  |  |
| 9024  | 376.00 | 4.517E-10 | 20.9409 | 9.78   | 11     | 1.807E-05 | 1.03E+01 | 4.83E+00 | 1.807E-03 | 5.74E+00 | 2.68E+00 | 5.04E-02 | 2.46E+00 | 1.15E+00 | 1.259E+00 | 0.1443 | 0.07     |        |      |  |  |          |        |       |  |  |
| 9696  | 404.00 | 4.204E-10 | 21.0127 | 9.82   | 11     | 1.681E-05 | 1.04E+01 | 4.87E+00 | 1.681E-03 | 5.81E+00 | 2.72E+00 | 4.69E-02 | 2.53E+00 | 1.18E+00 | 1.172E+00 | 0.1657 | 0.08     |        |      |  |  |          |        |       |  |  |
| 10368 | 432.00 | 3.931E-10 | 21.0797 | 9.85   | 11     | 1.573E-05 | 1.05E+01 | 4.90E+00 | 1.573E-03 | 5.88E+00 | 2.75E+00 | 4.38E-02 | 2.59E+00 | 1.21E+00 | 1.096E+00 | 0.1872 | 0.09     |        |      |  |  |          |        |       |  |  |
| 11040 | 460.00 | 3.692E-10 | 21.1425 | 9.88   | 11     | 1.477E-05 | 1.05E+01 | 4.93E+00 | 1.477E-03 | 5.94E+00 | 2.78E+00 | 4.12E-02 | 2.65E+00 | 1.24E+00 | 1.029E+00 | 0.2089 | 0.10     |        |      |  |  |          |        |       |  |  |
| 11712 | 488.00 | 3.480E-10 | 21.2016 | 9.90   | 11     | 1.392E-05 | 1.06E+01 | 4.95E+00 | 1.392E-03 | 6.00E+00 | 2.80E+00 | 3.88E-02 | 2.71E+00 | 1.27E+00 | 9.702E-01 | 0.2307 | 0.11     |        |      |  |  |          |        |       |  |  |
| 12384 | 516.00 | 3.291E-10 | 21.2574 | 9.93   | 11     | 1.317E-05 | 1.07E+01 | 4.98E+00 | 1.317E-03 | 6.06E+00 | 2.83E+00 | 3.67E-02 | 2.76E+00 | 1.29E+00 | 9.176E-01 | 0.2524 | 0.12     |        |      |  |  |          |        |       |  |  |
| 13056 | 544.00 | 3.122E-10 | 21.3102 | 9.95   | 11     | 1.249E-05 | 1.07E+01 | 5.00E+00 | 1.249E-03 | 6.11E+00 | 2.85E+00 | 3.48E-02 | 2.82E+00 | 1.32E+00 | 8.703E-01 | 0.2740 | 0.13     |        |      |  |  |          |        |       |  |  |
| 13728 | 572.00 | 2.969E-10 | 21.3604 | 9.98   | 11     | 1.188E-05 | 1.08E+01 | 5.03E+00 | 1.188E-03 | 6.16E+00 | 2.88E+00 | 3.31E-02 | 2.86E+00 | 1.34E+00 | 8.277E-01 | 0.2955 | 0.14     |        |      |  |  |          |        |       |  |  |
| 14400 | 600.00 | 2.831E-10 | 21.4082 | 10.00  | 11     | 1.132E-05 | 1.08E+01 | 5.05E+00 | 1.132E-03 | 6.21E+00 | 2.90E+00 | 3.16E-02 | 2.91E+00 | 1.36E+00 | 7.891E-01 | 0.3168 | 0.15     |        |      |  |  |          |        |       |  |  |
| 15072 | 628.00 | 2.704E-10 | 21.4538 | 10.02  | 11     | 1.082E-05 | 1.09E+01 | 5.07E+00 | 1.082E-03 | 6.25E+00 | 2.92E+00 | 3.02E-02 | 2.95E+00 | 1.38E+00 | 7.539E-01 | 0.3379 | 0.16     |        |      |  |  |          |        |       |  |  |
| 15744 | 656.00 | 2.589E-10 | 21.4974 | 10.04  | 11     | 1.036E-05 | 1.09E+01 | 5.09E+00 | 1.036E-03 | 6.30E+00 | 2.94E+00 | 2.89E-02 | 3.00E+00 | 1.40E+00 | 7.217E-01 | 0.3588 | 0.17     |        |      |  |  |          |        |       |  |  |
| 16416 | 684.00 | 2.483E-10 | 21.5392 | 10.06  | 11     | 9.932E-06 | 1.09E+01 | 5.11E+00 | 9.932E-04 | 6.34E+00 | 2.96E+00 | 2.77E-02 | 3.04E+00 | 1.42E+00 | 6.922E-01 | 0.3794 | 0.18     |        |      |  |  |          |        |       |  |  |
| 17088 | 712.00 | 2.385E-10 | 21.5793 | 10.08  | 11     | 9.541E-06 | 1.10E+01 | 5.13E+00 | 9.541E-04 | 6.38E+00 | 2.98E+00 | 2.66E-02 | 3.08E+00 | 1.44E+00 | 6.650E-01 | 0.3997 | 0.19     |        |      |  |  |          |        |       |  |  |
| 17760 | 740.00 | 2.295E-10 | 21.6179 | 10.10  | 11     | 9.180E-06 | 1.10E+01 | 5.15E+00 | 9.180E-04 | 6.42E+00 | 3.00E+00 | 2.56E-02 | 3.11E+00 | 1.45E+00 | 6.398E-01 | 0.4198 | 0.20     |        |      |  |  |          |        |       |  |  |

Table 2 continued

| Hours | Years | Greg DeVries Stock and Commerical Well Analysis |      |      |      |      |                                             |      |      |      |      |
|-------|-------|-------------------------------------------------|------|------|------|------|---------------------------------------------|------|------|------|------|
|       |       | Aquifer Drawdown Analysis Using Theis Equation  |      |      |      |      | R= 100 ft R= 1000 ft R= 5280 ft R= 26400 ft |      |      |      |      |
| 0.00  | 0.0   | 0.00                                            | 0    | 0    | 0    | 0    | 0                                           | 0    | 0    | 0    | 0    |
| 1     | 0.0   | 0.04                                            | -0.7 | 0.0  | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 2     | 0.0   | 0.08                                            | -0.9 | 0.0  | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 3     | 0.0   | 0.13                                            | -1.1 | 0.0  | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 10    | 0.0   | 0.42                                            | -1.7 | 0.0  | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 24    | 0.0   | 1.00                                            | -2.1 | -0.2 | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 48    | 0.0   | 2.00                                            | -2.4 | -0.4 | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 96    | 0.0   | 4.00                                            | -2.7 | -0.6 | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 120   | 0.0   | 5.00                                            | -2.8 | -0.7 | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 288   | 0.0   | 12.00                                           | -3.2 | -1.1 | 0.0  | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 960   | 0.1   | 40.00                                           | -3.8 | -1.6 | -0.3 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 1632  | 0.2   | 68.00                                           | -4.0 | -1.9 | -0.4 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 2304  | 0.3   | 96.00                                           | -4.2 | -2.0 | -0.6 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 2976  | 0.3   | 124.00                                          | -4.3 | -2.2 | -0.7 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 3648  | 0.4   | 152.00                                          | -4.4 | -2.3 | -0.8 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 4320  | 0.5   | 180.00                                          | -4.5 | -2.3 | -0.8 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 4992  | 0.6   | 208.00                                          | -4.6 | -2.4 | -0.9 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 5664  | 0.6   | 236.00                                          | -4.6 | -2.5 | -0.9 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 6336  | 0.7   | 264.00                                          | -4.7 | -2.5 | -1.0 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 7008  | 0.8   | 292.00                                          | -4.7 | -2.6 | -1.0 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 7680  | 0.9   | 320.00                                          | -4.8 | -2.6 | -1.1 | 0.0  | 0.0                                         | 0.0  | 0.0  | 0.0  | 0.0  |
| 8352  | 1.0   | 348.00                                          | -4.8 | -2.7 | -1.1 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 9024  | 1.0   | 376.00                                          | -4.8 | -2.7 | -1.2 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 9696  | 1.1   | 404.00                                          | -4.9 | -2.7 | -1.2 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 10368 | 1.2   | 432.00                                          | -4.9 | -2.8 | -1.2 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 11040 | 1.3   | 460.00                                          | -4.9 | -2.8 | -1.3 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 11712 | 1.3   | 488.00                                          | -5.0 | -2.8 | -1.3 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 12384 | 1.4   | 516.00                                          | -5.0 | -2.9 | -1.3 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 13056 | 1.5   | 544.00                                          | -5.0 | -2.9 | -1.3 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 13728 | 1.6   | 572.00                                          | -5.1 | -2.9 | -1.4 | -0.1 | -0.1                                        | -0.1 | -0.1 | -0.1 | -0.1 |
| 14400 | 1.6   | 600.00                                          | -5.1 | -2.9 | -1.4 | -0.2 | -0.2                                        | -0.2 | -0.2 | -0.2 | -0.2 |
| 15072 | 1.7   | 628.00                                          | -5.1 | -2.9 | -1.4 | -0.2 | -0.2                                        | -0.2 | -0.2 | -0.2 | -0.2 |
| 15744 | 1.8   | 656.00                                          | -5.1 | -2.9 | -1.4 | -0.2 | -0.2                                        | -0.2 | -0.2 | -0.2 | -0.2 |
| 16416 | 1.9   | 684.00                                          | -5.1 | -3.0 | -1.4 | -0.2 | -0.2                                        | -0.2 | -0.2 | -0.2 | -0.2 |
| 17088 | 1.9   | 712.00                                          | -5.1 | -3.0 | -1.4 | -0.2 | -0.2                                        | -0.2 | -0.2 | -0.2 | -0.2 |
| 17760 | 2.0   | 740.00                                          | -5.1 | -3.0 | -1.4 | -0.2 | -0.2                                        | -0.2 | -0.2 | -0.2 | -0.2 |

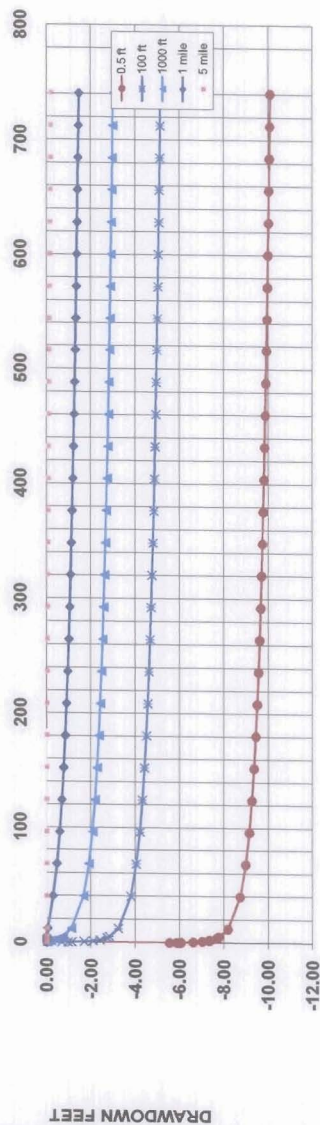
IDWR Values

.5 ft -10.08

1 mile -1.45

5 mile -0.19

Greg DeVries Stock and Commerical Well Analysis



CONTINUOUS PUMPING TIME IN DAYS



Table 2 continued

|       |       | Greg DeVries Stock and Commerical Well Analysis |           |            |            |             |           |           |            |            |             |
|-------|-------|-------------------------------------------------|-----------|------------|------------|-------------|-----------|-----------|------------|------------|-------------|
|       |       | Aquifer Drawdown Analysis Using Theis Equation  |           |            |            |             |           |           |            |            |             |
| Hours | Years | R= 0.5 ft                                       | R= 100 ft | R= 1000 ft | R= 5280 ft | R= 26400 ft | R= 0.5 ft | R= 100 ft | R= 1000 ft | R= 5280 ft | R= 26400 ft |
| 0     | 0.0   | 0.00                                            | 0         | 0          | 0          | 0           | 0         | 0         | 0          | 0          | 0           |
| 1     | 0.0   | 0.04                                            | -4.6      | -0.1       | 0.0        | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 2     | 0.0   | 0.08                                            | -4.9      | -0.2       | 0.0        | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 3     | 0.0   | 0.13                                            | -5.1      | -0.3       | 0.0        | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 10    | 0.0   | 0.42                                            | -5.7      | -0.8       | 0.0        | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 24    | 0.0   | 1.00                                            | -6.1      | -1.2       | 0.0        | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 48    | 0.0   | 2.00                                            | -6.4      | -1.5       | 0.0        | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 96    | 0.0   | 4.00                                            | -6.8      | -1.8       | -0.1       | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 120   | 0.0   | 5.00                                            | -6.9      | -1.9       | -0.1       | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 288   | 0.0   | 12.00                                           | -7.3      | -2.3       | -0.3       | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 960   | 0.1   | 40.00                                           | -7.8      | -2.9       | -0.8       | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 1632  | 0.2   | 68.00                                           | -8.1      | -3.1       | -1.0       | 0.0         | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 2304  | 0.3   | 96.00                                           | -8.2      | -3.3       | -1.2       | -0.1        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 2976  | 0.3   | 124.00                                          | -8.4      | -3.4       | -1.3       | -0.1        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 3648  | 0.4   | 152.00                                          | -8.5      | -3.5       | -1.4       | -0.1        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 4320  | 0.5   | 180.00                                          | -8.6      | -3.6       | -1.4       | -0.2        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 4992  | 0.6   | 208.00                                          | -8.6      | -3.6       | -1.5       | -0.2        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 5664  | 0.6   | 236.00                                          | -8.7      | -3.7       | -1.6       | -0.2        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 6336  | 0.7   | 264.00                                          | -8.7      | -3.8       | -1.6       | -0.3        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 7008  | 0.8   | 292.00                                          | -8.8      | -3.8       | -1.7       | -0.3        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 7680  | 0.9   | 320.00                                          | -8.8      | -3.8       | -1.7       | -0.3        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 8352  | 1.0   | 348.00                                          | -8.8      | -3.9       | -1.7       | -0.3        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 9024  | 1.0   | 376.00                                          | -8.9      | -3.9       | -1.8       | -0.4        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 9696  | 1.1   | 404.00                                          | -8.9      | -4.0       | -1.8       | -0.4        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 10368 | 1.2   | 432.00                                          | -8.9      | -4.0       | -1.8       | -0.4        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 11040 | 1.3   | 460.00                                          | -9.0      | -4.0       | -1.9       | -0.4        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 11712 | 1.3   | 488.00                                          | -9.0      | -4.0       | -1.9       | -0.5        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 12384 | 1.4   | 516.00                                          | -9.0      | -4.1       | -1.9       | -0.5        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 13056 | 1.5   | 544.00                                          | -9.0      | -4.1       | -1.9       | -0.5        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 13728 | 1.6   | 572.00                                          | -9.1      | -4.1       | -2.0       | -0.5        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 14400 | 1.6   | 600.00                                          | -9.1      | -4.1       | -2.0       | -0.5        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 15072 | 1.7   | 628.00                                          | -9.1      | -4.2       | -2.0       | -0.6        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 15744 | 1.8   | 656.00                                          | -9.1      | -4.2       | -2.0       | -0.6        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 16416 | 1.9   | 684.00                                          | -9.2      | -4.2       | -2.1       | -0.6        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 17088 | 1.9   | 712.00                                          | -9.2      | -4.2       | -2.1       | -0.6        | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |
| 17760 | 2.0   | 740.00                                          | -9.2      | -4.24      | -2.09      | -0.61       | 0.0       | 0.0       | 0.0        | 0.0        | 0.0         |

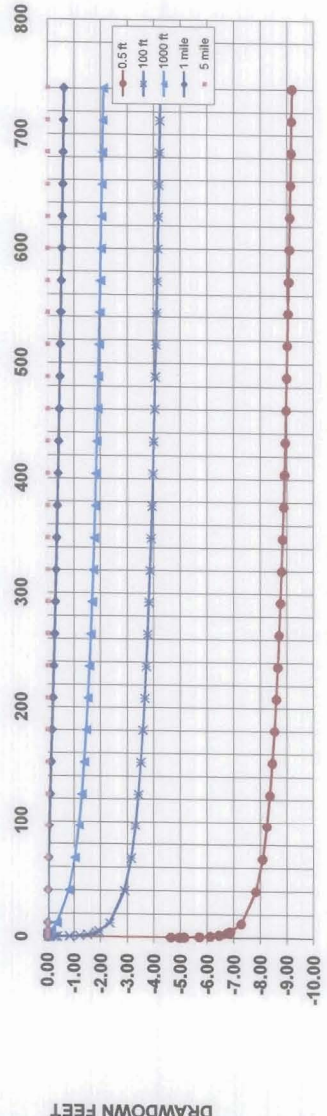
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