LBG-GUYTON ASSOCIATES
TECHNICAL MEMORANDUM

TO: Dirk Aaron, General Manager

FROM: Michael Keester, P.G. and Brant Konetchy

SUBJECT: Potential Effects on Lower Trinity Aquifer Water Levels due to Proposed Groundwater Production Scenarios

DATE: July 11, 2016

Growing population in Central Texas is creating a corresponding growing demand for water. To meet the water demands, entities are exploring production from the deep Lower Trinity aquifer in eastern Bell County. While some public water supply systems have been using the aquifer for many years, relatively recent pumping tests from wells completed in the Lower Trinity Aquifer have shown the existence of a higher transmissivity zone in eastern Bell County than currently exists in the Texas Water Development Board (TWDB) approved Northern Trinity / Woodbine Groundwater Availability Model (NTWGAM). To evaluate the potential effects of the proposed production on the Lower Trinity Aquifer in the Clearwater Underground Water Conservation District (CUWCD) we conducted a series of model runs with various potential production amounts.

MODEL SCENARIO DESCRIPTIONS

The model scenarios reflect variations of potential production from two areas. The first area is located in Williamson County and represents proposed production from the Lower Trinity by the Brazos River Authority (BRA) near Lake Granger. We set the second area south of Little River Academy near the center of the area identified as having a much higher transmissivity. The attached Location Map illustrates the areas associated with the model run scenarios.

The pumping scenarios involved six possible configurations of pumping varying from a total of 10,000 acre-feet per year to 40,000 acre-feet per year. For all of the pumping configurations, we used Groundwater Management Area 8 Run 10 as the base pumping file (Beach, et al., 2016). To evaluate the range of potential effects, our initial runs applied the TWDB approved version of the NTWGAM ("A" Scenarios) and a revised version with increased transmissivity values ("B" Scenarios) as discussed in our February 5, 2016 Technical Memorandum (Keester & Konetchy, 2016). However, both of these versions are setup with the aquifer to be always simulated as a confined aquifer even if water levels fall below the top of the aquifer. Since initial runs with these two versions of the model indicated simulated water levels falling below the top, and in some cases the bottom, of the aquifer, we also performed simulations with versions of the model, with changes in the assumptions and model setup, that allow the aquifer to convert to unconfined conditions when the water level in a cell drops below the top of the aquifer ("C" and "D" Scenarios). We believe this is a more appropriate way to simulate the actual conditions that would occur in the aquifer. Table 1 identifies the model scenarios executed during this evaluation.

Table 1. Model Scenario Descriptions.

Scenario ID	Model Version	CUWCD Potential Well Field (AFY)	BRA Potential Well Field (AFY)	Total Pumping (AFY)
A-001	TWDB Approved	10,000	0	10,000
A-002		0	10,000	10,000
A-003		20,000	0	20,000
A-004		0	20,000	20,000
A-005		10,000	20,000	30,000
A-006		20,000	20,000	40,000
B-001	CUWCD Lower Trinity Increased Transmissivity	10,000	0	10,000
B-002		0	10,000	10,000
B-003		20,000	0	20,000
B-004		0	20,000	20,000
B-005		10,000	20,000	30,000
B-006		20,000	20,000	40,000
C-001	TWDB Approved Modified to Convert to Unconfined	10,000	0	10,000
C-002		0	10,000	10,000
C-003		20,000	0	20,000
C-004		0	20,000	20,000
C-005		10,000	20,000	30,000
C-006		20,000	20,000	40,000
D-001	CUWCD Lower Trinity Increased Transmissivity Modified to Convert to Unconfined	10,000	0	10,000
D-002		0	10,000	10,000
D-003		20,000	0	20,000
D-004		0	20,000	20,000
D-005		10,000	20,000	30,000
D-006		20,000	20,000	40,000

MODEL SCENARIO RESULTS

Under all of the scenarios, the proposed pumping adds more than about 100 feet of average drawdown within the District. In several cases the simulated water level falls below the bottom of the aquifer and the average drawdown calculation is not applicable. Similarly, for "A" and "B" Scenarios, when the simulated water level falls below the top of the aquifer the calculation of average drawdown is questionable due to the storage properties assigned to the aquifer. Table 2 provides a summary of the Lower Trinity average drawdown within the District for each scenario along with the number of model cells in the District that have simulated water levels fall below the top or bottom of the aquifer. Attachment 1 provides a chart comparing the average drawdown from each scenario with the proposed Lower Trinity DFC.

Table 2. Summary of Lower Trinity Average Drawdown per Scenario.

Scenario ID	CUWCD Average Drawdown (feet)	Difference from Proposed DFC (feet)	Model Cells with Water Level Below Top of Aquifer	Model Cells with Water Level Below Bottom of Aquifer
A-001	662	332	1	0
A-002	499	169	0	0
A-003	978	648	3,434	562
A-004	667	337	0	0
A-005	999	669	2,513	53
A-006	1,262	932	10,454	5,767
B-001	452	122	0	0
B-002	429	99	0	0
B-003	650	320	0	0
B-004	605	275	0	0
B-005	805	475	837	0
B-006	1,002	672	7,041	1,576
C-001	667	337	8	0
C-002	503	173	0	0
C-003	784	454	300	0
C-004	666	336	0	0
C-005	902	572	285	0
C-006	947	617	598	0
D-001	449	119	0	0
D-002	427	97	0	0
D-003	642	312	0	0
D-004	598	268	0	0
D-005	787	457	0	0
D-006	941	611	843	0

Attached are maps of the remaining artesian head (that is, water level above the top of the aquifer) and total drawdown in the Lower Trinity aquifer after 30 and 50 years of production. Also attached are hydrographs of the effects of the simulated production on nearby wells identified on the maps. The attachments, listed in Table 3, are grouped by the version of the model used to generate results.

Table 3. Attached Figures Illustrating the Results of the Model Scenarios.

Attachment	Scenarios	Description
1	All	Location Map and Chart comparing the average drawdown from each scenario
2	A	Artesian head and drawdown after 30 and 50 years of production
3		Hydrographs of simulated water level compared to existing well construction
4	B	Artesian head and drawdown after 30 and 50 years of production
5		Hydrographs of simulated water level compared to existing well construction
6	C	Artesian head and drawdown after 30 and 50 years of production
7		Hydrographs of simulated water level compared to existing well construction
8	D	Artesian head and drawdown after 30 and 50 years of production
9		Hydrographs of simulated water level compared to existing well construction

"A" Scenarios Results – TWDB Approved NTWGAM

The TWDB approved NTWGAM is the model that is used for assessment of the aquifer desired future conditions (DFCs) to determine the modeled available groundwater (MAG) that meets the DFCs. This model is designed with all layers except model layer 1 to be always confined with a very low storage coefficient. The model configuration means that even if the simulated water levels fall below the top of the aquifer, the model treats the calculation as pressure reduction in the aquifer rather than a direct removal of water from drainable storage (that is, specific yield).

Under the minimum production amount of 10,000 acre-feet per year from a potential CUWCD well field (Scenario A-001), the artesian head drops to less than about 200 feet in the well field area after 50 years. Also, drawdown corresponding with Scenario A-001 is over 1,800 feet in the potential well field. With only production from BRA (Scenario A-002), the artesian head remains over 1,000 feet in most of the existing wells though total drawdown is about 700 feet. There is some additional effect with increased BRA production (Scenario A-004), but water levels remain well above the top of the aquifer. However, in Scenario A-003 where CUWCD production is increased to 20,000 acre-feet per year, the water levels fall below the top of the aquifer in a large area.

In several of the wells we observed that water levels would fall below the available drawdown in the well (see Attachment A-003). For example, in the recently completed Armstrong WSC Well #2, the simulated water level from Scenarios A-003, A-005, and A-006 would all be below the top of the liner. Similarly, based on the proposed well construction for the Central Texas Water Supply Corporation (CTWSC) System Split well the water level would fall below the top of the liner after about nine years of maximum production from the potential well fields (Scenario A-006).

"B" Scenarios Results – CUWCD Transmissivity Modified NTWGAM

As discussed in our Technical Memorandum dated February 5, 2016, the TWDB approved version of the NTWGAM uses transmissivity values in the Lower Trinity Aquifer that are much lower than the results from recent pumping tests. To evaluate the impact of the lower transmissivity values, we developed a version of the model with the transmissivity values

more closely reflecting the pumping tests results (Keester & Konetchy, 2016). We used this version of the model to provide a comparison with the TWDB approved NTWGAM.

The effect of the higher transmissivity is that the drawdown associated with the production is spread out over a larger area. Under the minimum production amount of 10,000 acre-feet per year from a potential CUWCD well field (Scenario B-001), the artesian head remains about 1,500 feet in the well field area after 50 years. Also, drawdown corresponding with Scenario B-001 is about 600 feet in the potential well field which is about three times less than in Scenario A-001. With only production from BRA (Scenario B-002), the artesian head and drawdown are similar to Scenario B-001 illustrating how the higher transmissivity spreads out the effects of the production. Only under the scenarios with both well fields pumping (Scenario B-005 and B-006) do water levels fall below the top of the aquifer with the areas where it occurs located in the western portions of the District.

In only one of the wells did we observe that water levels would fall below the available drawdown in the well (see Attachment 5). With the higher transmissivity, but low storage coefficient due to the aquifer not the model configuration, the drawdowns extend to the west and draw water levels down noticeably in Lower Trinity wells in the western portion of the District. Of the wells we reviewed, only the CTWSC Doc Curb well would have water levels below the top of the liner in Scenario B-005 and B-006.

"C" Scenarios Results – TWDB Approved NTWGAM Modified to Convert to Unconfined Conditions

Due to the water levels falling below the top of the aquifer in the TWDB approved NTWGAM, we used a modified version of the NTWGAM that applied a specific yield value of 0.1 to the groundwater flow equation rather than a low storage coefficient value more typical of an unconfined aquifer. Using the specific yield value means that more water is released from aquifer storage per unit area of the aquifer per foot of drawdown. In the NTWGAM case for the Lower Trinity, the result of converting to using specific yield when water levels fall below the top of the aquifer is that 1 foot of drawdown releases about 1,000 times as much water; more simply, there is less drawdown with the same amount of production once the water level reaches the top of the aquifer. This version of the NTWGAM is the same as the one used for Groundwater Management Area 8 Run 9 (Keester & Beach, 2015).

As expected, many of the results are similar to Scenarios A-001 through A-006. Under the minimum production amount of 10,000 acre-feet per year from a potential CUWCD well field (Scenario C-001), the artesian head drops to less than about 200 feet in the well field area after 50 years. Also, drawdown corresponding with Scenario C-001 is over 1,800 feet in the potential well field. With only production from BRA (Scenario A-002), the artesian head remains over 1,000 feet in most of the existing wells though total drawdown is about 700 feet.

The differences from Scenarios A-001 through A-006 are most evident in the higher production amounts. Water levels are below the top of the aquifer in Scenarios C-003, C-005, and C-006, but the extent of the loss of artesian pressure is not as great. Also, the total

drawdown of about 2,000 feet in the CUWCD potential production area is similar in all of the scenarios.

We continue to observe that in several of the wells the simulated water levels fall below the available drawdown in the well (see Attachment 7). For example, in the recently completed Armstrong WSC Well #2, the simulated water level from Scenarios C-003, C-005, and C-006 would all be below the top of the liner. Similarly, water levels in the Bell Co. WCID #2 well would be at or near the top of the liner under all of the CUWCD Potential Well Field production scenarios (Scenarios C-001, C-003, C-005, C-006).

"D" Scenarios Results – CUWCD Transmissivity Modified NTWGAM Modified to Convert to Unconfined Conditions

We applied the same modification to the TWDB approved NTWGAM to the version with the modified transmissivity values. In addition to the drawdown being more spread out due to the higher transmissivity, it will now be decreased when it reaches the top of the aquifer due to the application of the specific yield. Similar to the previously discussed results, the simulated effects from Scenarios D-001 through D-006 are not much different from those discussed for Scenarios B-001 through B-006 except for when production draws the water levels down to the top of the aquifer. Based on the results from recent pumping tests and our understanding of how the aquifer may act if water levels were drawn into the aquifer, Scenarios D-001 through D-006 provide our best estimate of the potential effects of production from the areas.

Under the minimum production amount of 10,000 acre-feet per year from a potential CUWCD well field (Scenario D-001), the artesian head remains about 1,500 feet in the well field area after 50 years. Also, drawdown corresponding with Scenario D-001 is about 600 feet in the potential well field. With production from the CUWCD potential well field increasing to 20,000 acre-feet per year, the drawdown increases to about 1,000 feet and water levels remain about 1,000 feet above the top of the aquifer.

Under the maximum production scenario (Scenario D-006) the water levels remain about 500 feet above the top of the aquifer within the potential well field area. Along the major fault to the west of the potential well field area, water levels drop to below the top of the aquifer; however, the faulting, as modeled, limits the effects to the west of the fault and water levels remain mostly artesian except for an area in the far western portion of the District. Drawdown associated with Scenario D-006 exceeds 1,500 feet in both of the well field areas.

Like in Scenarios B-001 through B-006, in only one of the wells did we observe that water levels would fall below the available drawdown in the well (see Attachment 9). Of the wells we reviewed, only the CTWSC Doc Curb well would have water levels below the top of the liner in Scenario D-006. In both Armstrong WSC wells, the Scenario D-006 water levels are near the top of the liner, but do not fall below.

CONCLUSIONS

The identification of a high transmissivity zone in the Lower Trinity Aquifer in eastern Bell County has contributed to its being targeted as a location for relatively large-scale production well fields. In addition, the BRA has a planned well field for production of up to 20,000 acre-feet per year from the Lower Trinity Aquifer near Lake Granger in Williamson County. This evaluation was designed to evaluate the potential effects from production of up to 40,000 acre-feet per year from the BRA well field and a potential well field in eastern Bell County.

Our evaluation showed that the TWDB approved model was not capable of reasonably simulating the potential production. Results for the maximum production scenario using the TWDB approved NTWGAM were physically impossible with several locations having simulated water levels below the bottom of the aquifer. The simulation results were somewhat better with the modified transmissivity model, but there remained several areas where the water levels were below the bottom of the aquifer under the maximum production scenario.

To address the problem with the physically impossible results, we used a modified version of the model that would convert from confined to unconfined conditions when water levels fall below the top of the aquifer. Using the TWDB approved version of the NTWGAM set to convertible layers, the results were more reasonable but the declines were much more focused around the pumping centers than recent pumping tests would suggest. However, several permitted wells near the production area would have water levels that decline to near or below the top of the liner or screen.

The final set of scenarios were simulated using a modified version of the NTWGAM with Lower Trinity Aquifer transmissivity values that more closely reflect recent pumping test results and is set to convert to unconfined conditions when water levels fall below the top of the aquifer. Based on the results from recent pumping tests and our understanding of how the aquifer may act if water levels declined below the top aquifer, Scenarios D-001 through D-006 provide our best estimate of the potential effects of production from the areas. Under maximum production Scenario D-006, water levels remain about 500 feet above the top of the aquifer. Also, in only one of the permitted wells we evaluated did water levels fall below the top of the liner under maximum production.

The modified transmissivity NTWGAM with the layers set to convert to unconfined shows that, though there would be large water level declines, the Lower Trinity Aquifer in eastern Bell County would not go dry under the potential production of 20,000 acre-feet per year from a potential well field in CUWCD and 20,000 acre-feet per year of production from the BRA in Williamson County. Under the maximum production of 40,000 acre-feet per year, all Lower Trinity Aquifer permittees would need to lower pumps and potentially re-drill wells to maintain production. While production from the Lower Trinity Aquifer will continue to be possible, the costs of production may become a concern for some entities with wells completed in the Lower Trinity Aquifer in the District if the full amount of potential production occurs. We are not aware of a location where water levels have dropped below the top of the aquifer in the deep confined portions of the Trinity aquifer, but we expect that production could decrease as the available drawdown decreases and as the pumps are

lowered closer to the bottom of the well and as overall water level in the aquifer decreases. This potential decrease in production is due mainly to the reduction in the gradient in water levels (that is, the difference in the water level in the well and that of the aquifer) and corresponding flow through the aquifer toward the well that pumping is able to induce. Reductions in production capability associated with water level declines have been observed in other aquifers, such as the Ogallala, where the ability to create a water level gradient, and induce flow to the well, between the deepest pump setting in the well and the aquifer has decreased over time.

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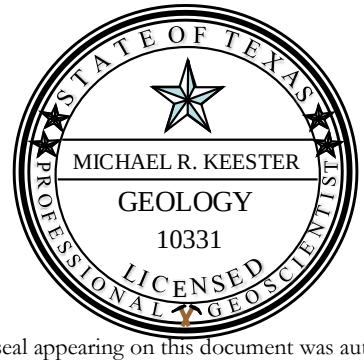


Michael R. Keester, P.G.
Associate

The seal appearing on this document was authorized by Michael R. Keester, P.G. on July 11, 201.

REFERENCES

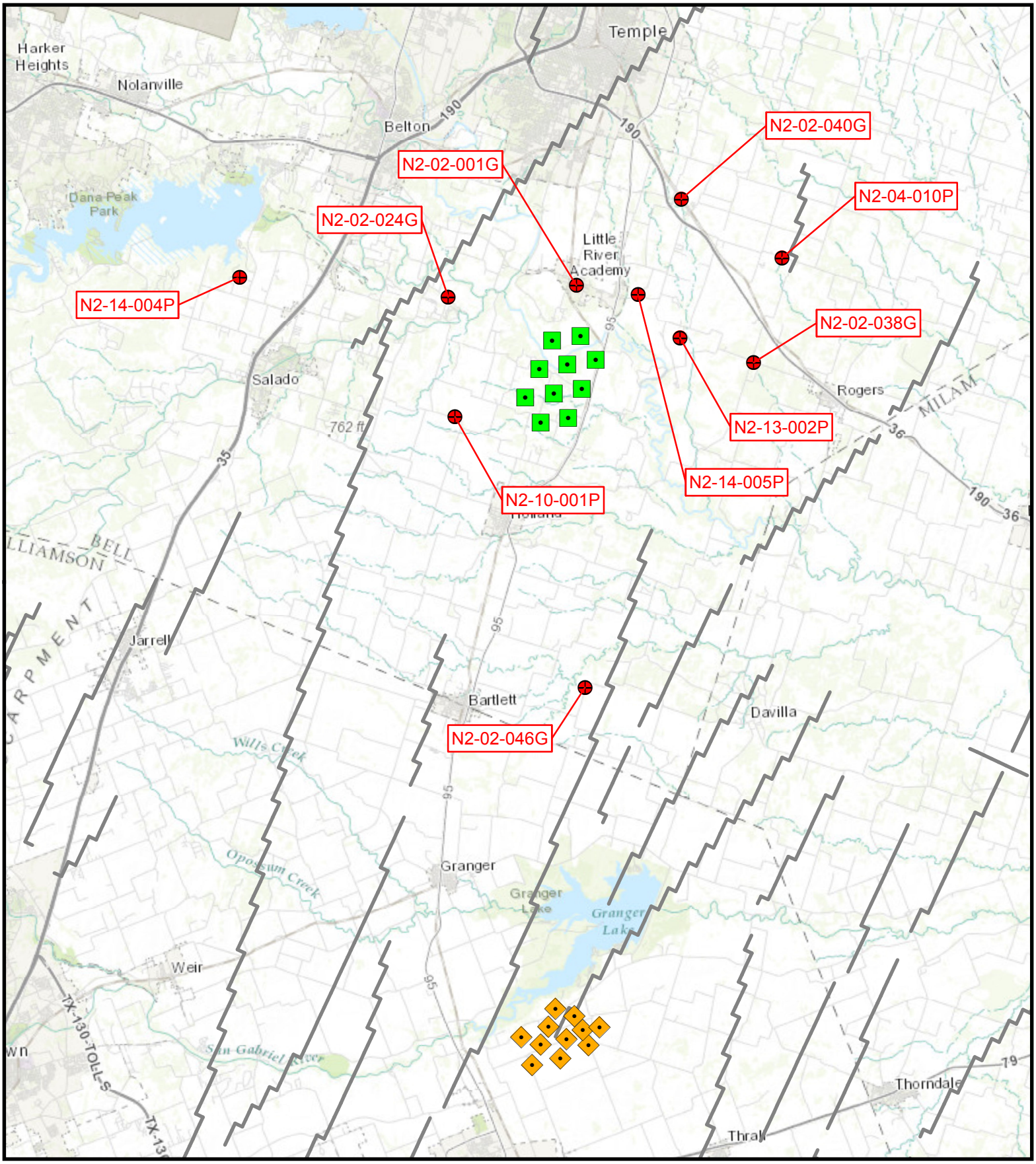
Beach, J., Keester, M. & Konetchy, B., 2016. *Results of Predictive Simulation in Support of GMA 8 Joint Planning – NTGCD GMA 8 Run 10,* Austin: LBG-Guyton Associates.

Keester, M. & Beach, J., 2015. *Technical Memorandum - Results of Predictive Simulation in Support of GMA 8 Joint Planning — South GMA 8 Run 9 (December 1, 2015),* Austin: LBG-Guyton Associates.

Keester, M. & Konetchy, B., 2016. *Technical Memorandum: Results of Northern Trinity / Woodbine Groundwater Availability Model Simulations using a Modified Lower Trinity Transmissivity Distribution,* Austin: LBG-Guyton Associates.

Kelley, V. A. et al., 2014. *Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers.* Austin(Texas): INTERA Incorporated.

Attachment 1 —
Location Map and
Chart Comparing the Average Drawdown from each Scenario



Location Map - Lower Trinity Aquifer Potential Production Areas

CUWCD Potential Well Field

BRA Potential Well Field

Hydrograph Location – Lower Trinity Active/Proposed PWS Well

Modeled Fault

Average Drawdown Comparison to Proposed DFC

TWDB Approved Model

Modified Transmissivity Model

TWDB Convertible Layer Model

Modified Transmissivity Convertable Layer Model

Average Drawdown (ft)

1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0

A−001 A−002 A−003 A−004 A−005 A−006 B−001 B−002 B−003 B−004 B−005 B−006 C−001 C−002 C−003 C−004 C−005 C−006 D−001 D−002 D−003 D−004 D−005 D−006

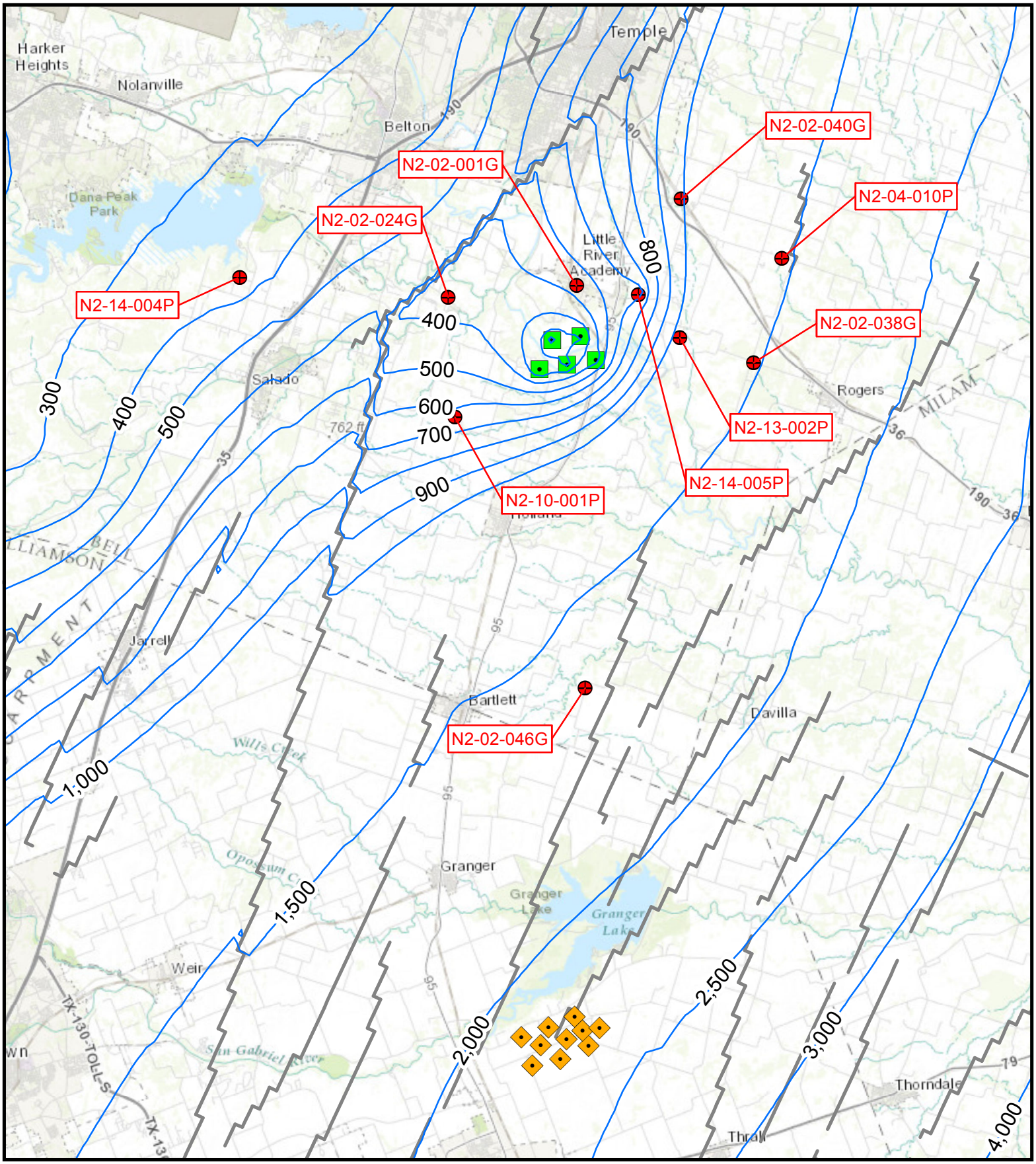
Scenario

Proposed DFC (GMA 8 Run 10)

Years of Pumping

30
50
61 (GMA 8 Run 10)

Attachment 2 —
"A" Scenarios
TWDB Approved NTWGAM
Artesian Head and Drawdown after 30 and 50 Years of Production



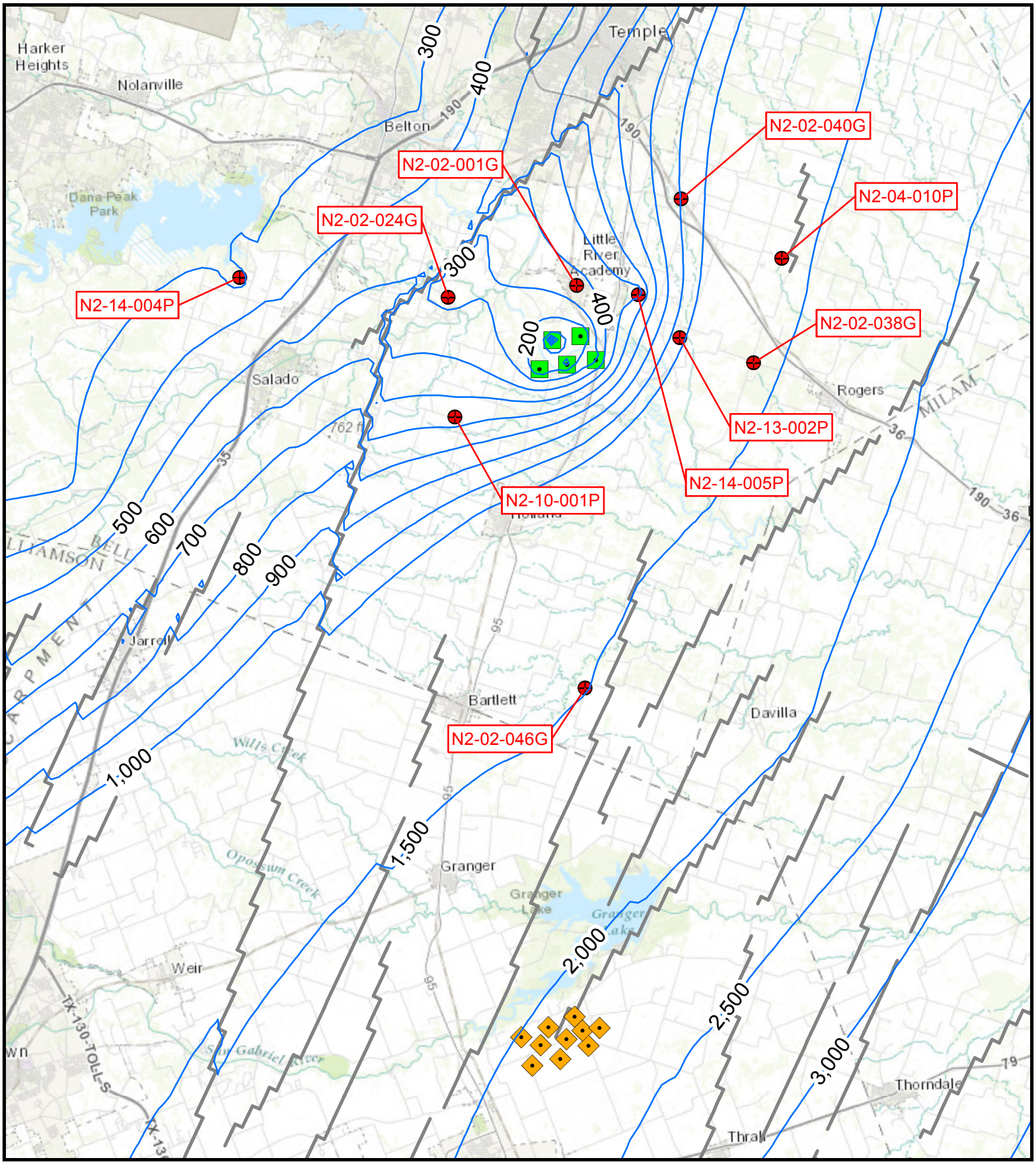
Lower Trinity Artesian Head- Scenario A-001 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario A-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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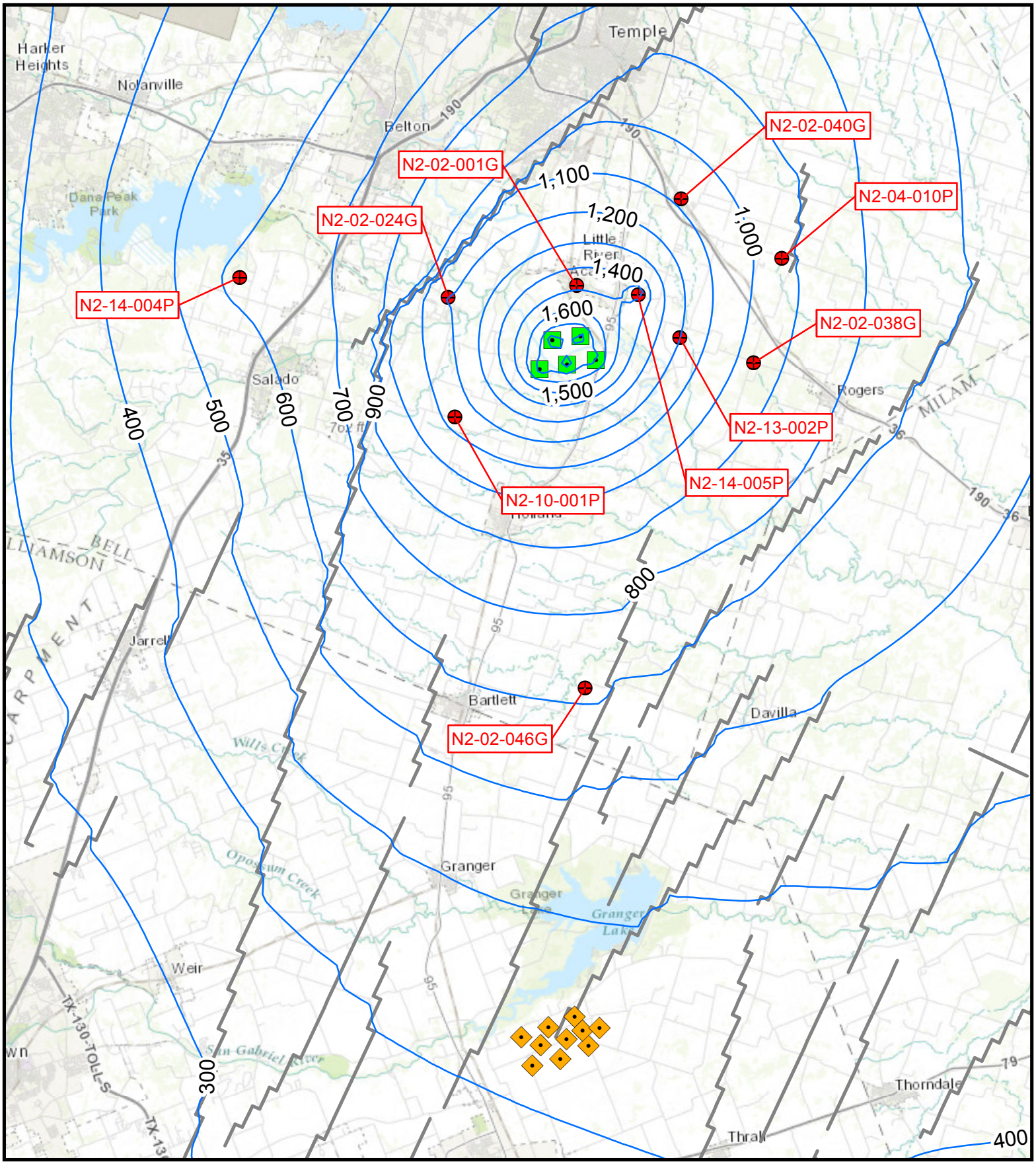
Scenario A-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM



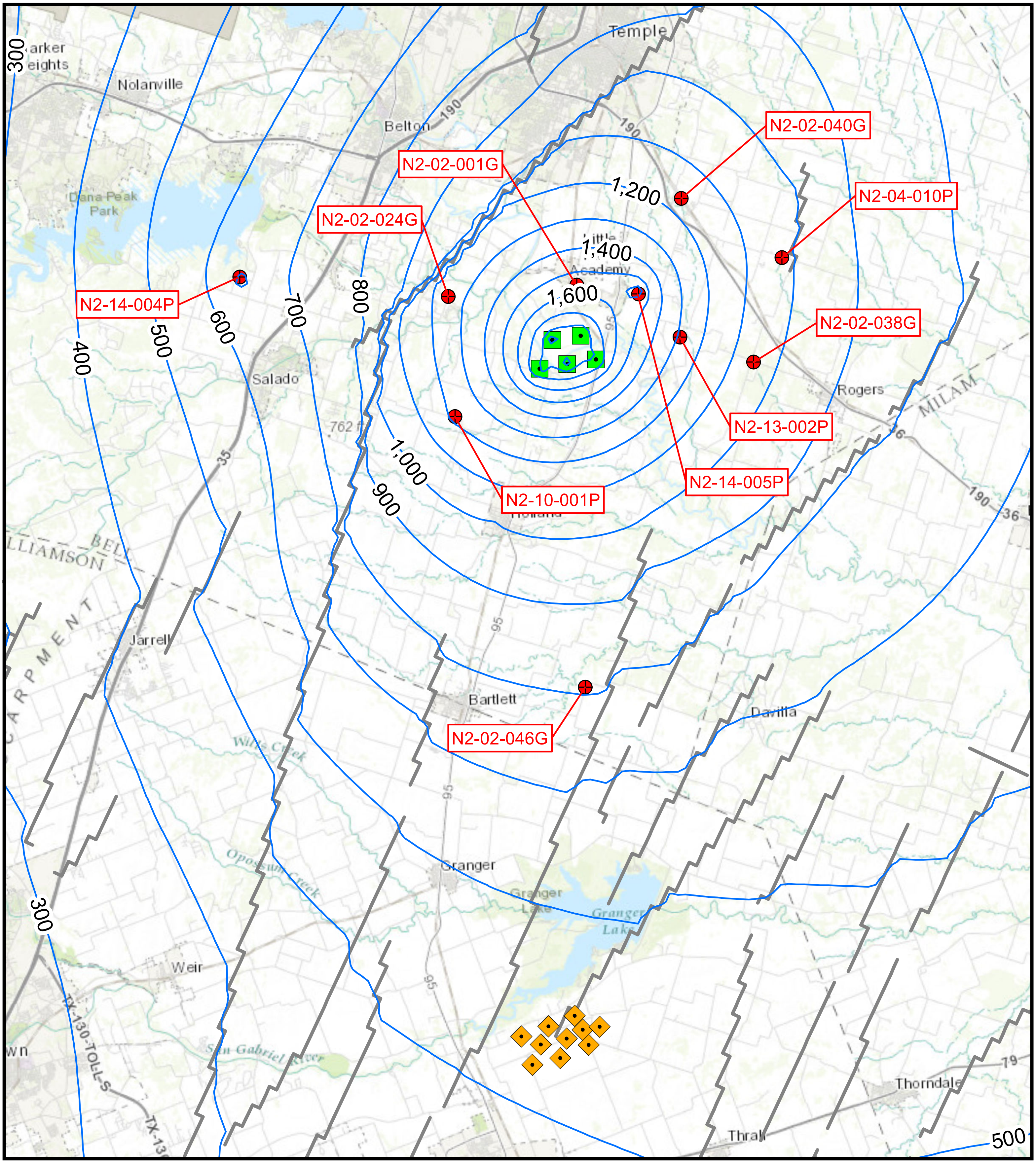
Lower Trinity Drawdown- Scenario A-001 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM



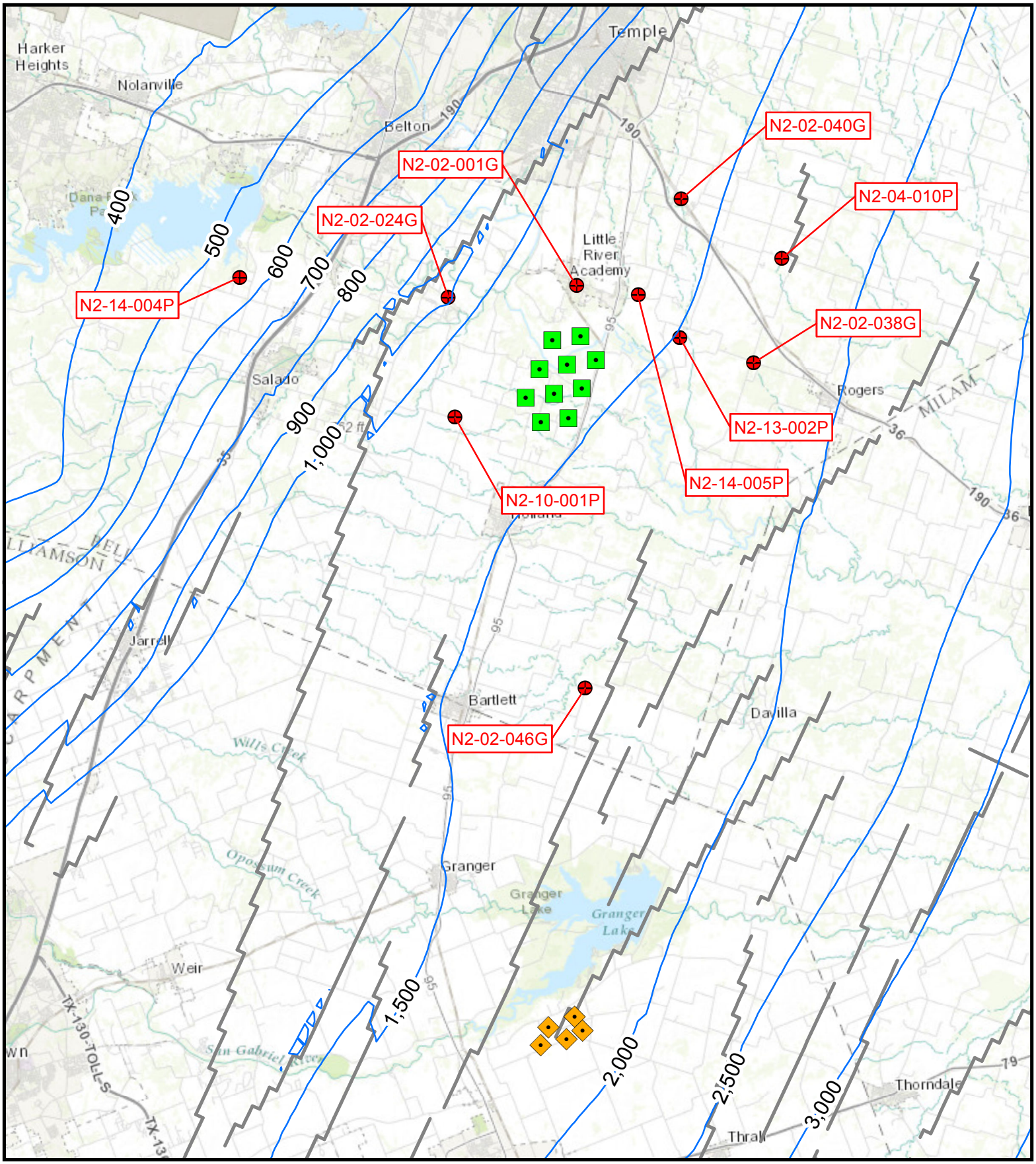
Lower Trinity Drawdown- Scenario A-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-002 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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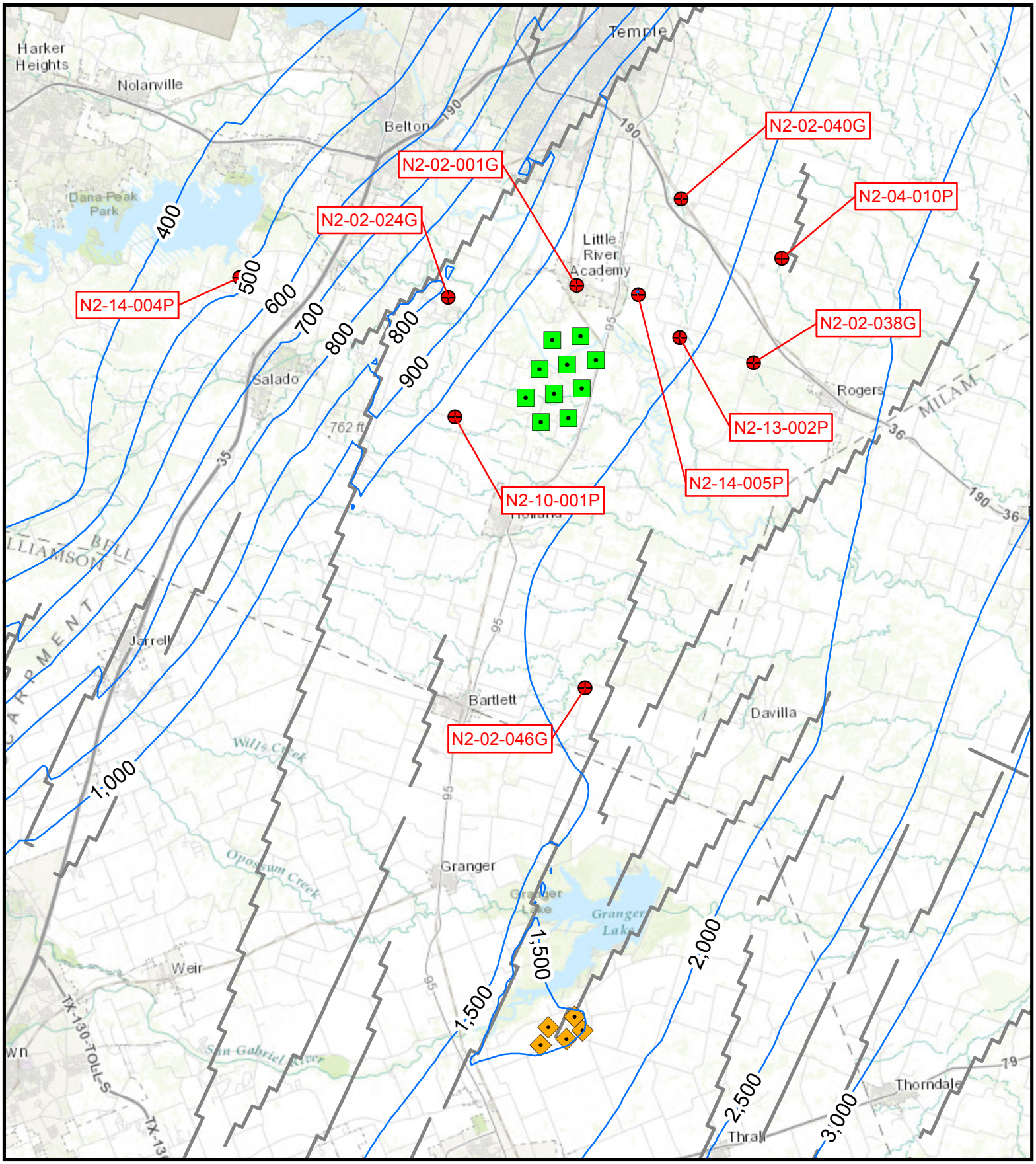
Scenario A-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-002 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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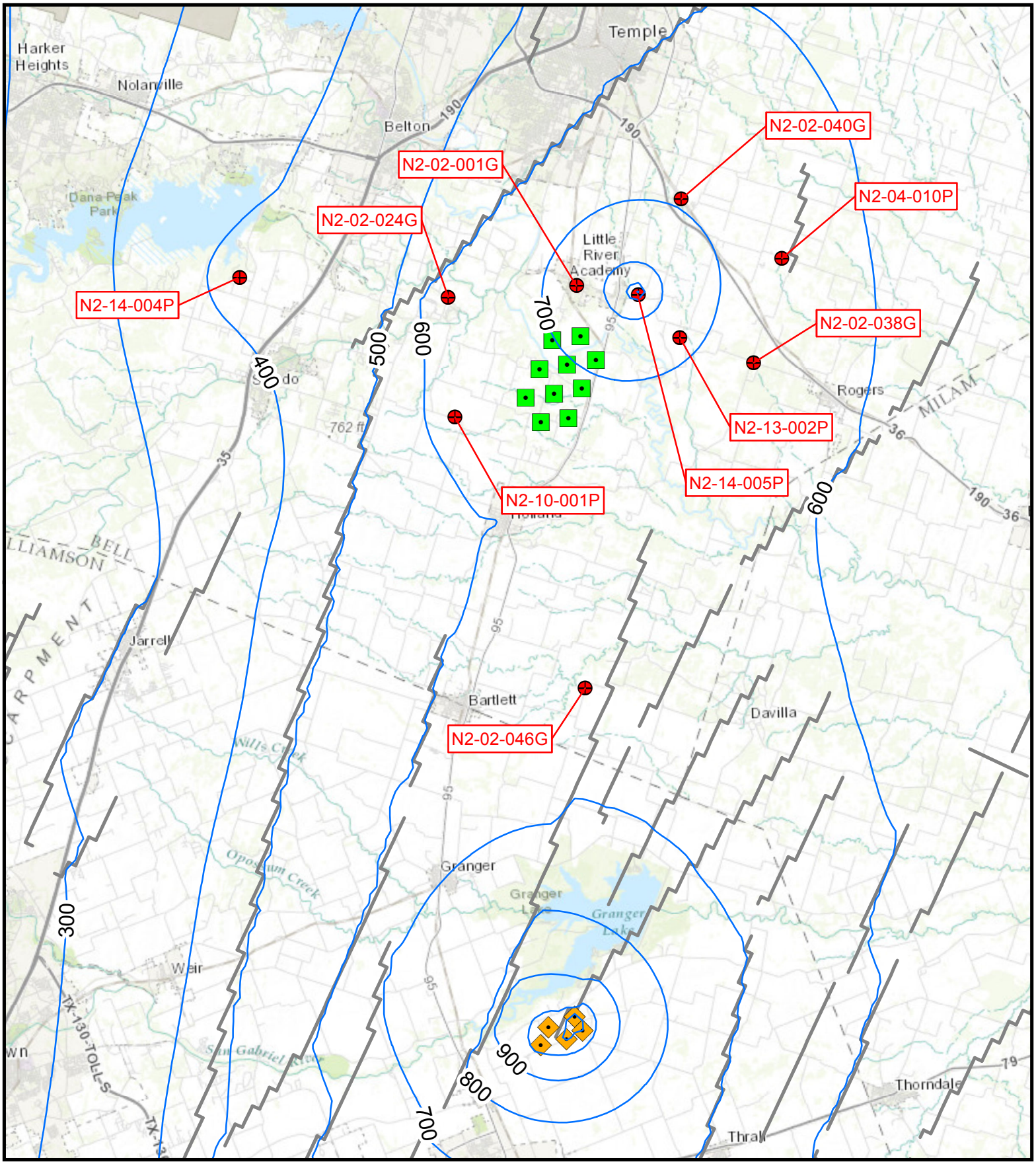
Scenario A-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM



Lower Trinity Drawdown- Scenario A-002 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

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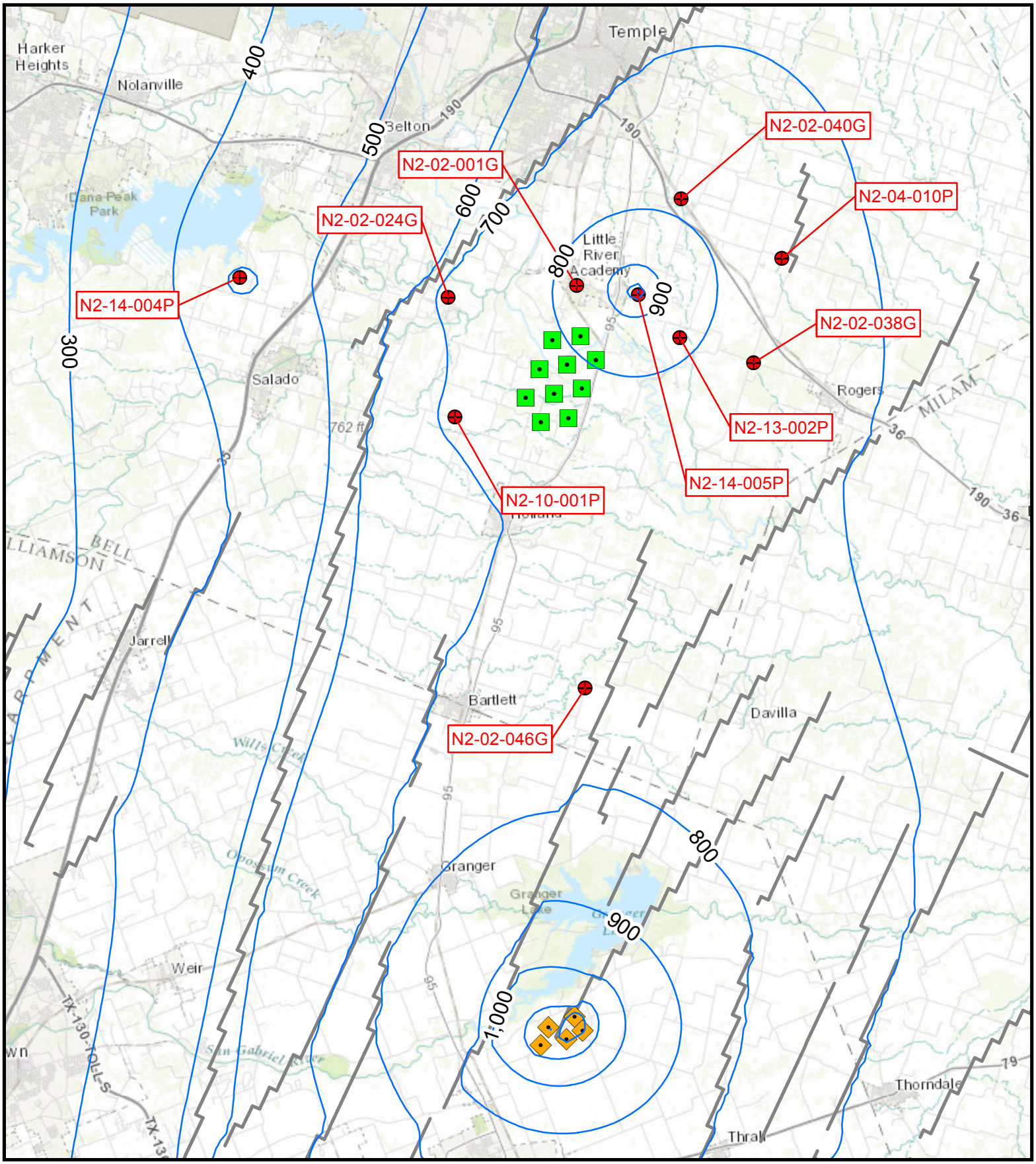
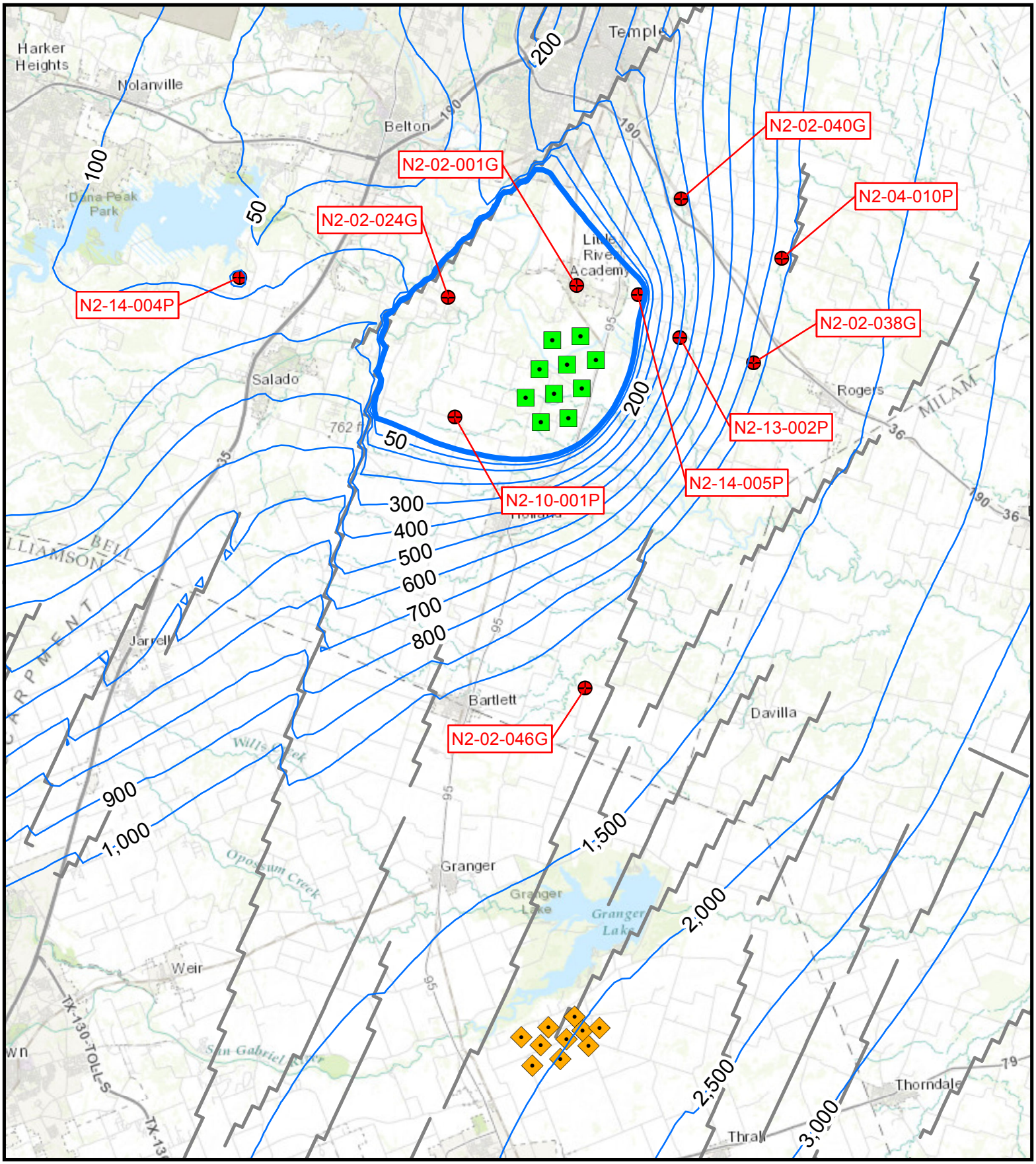
Scenario A-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM



Lower Trinity Drawdown- Scenario A-002 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

Scenario A-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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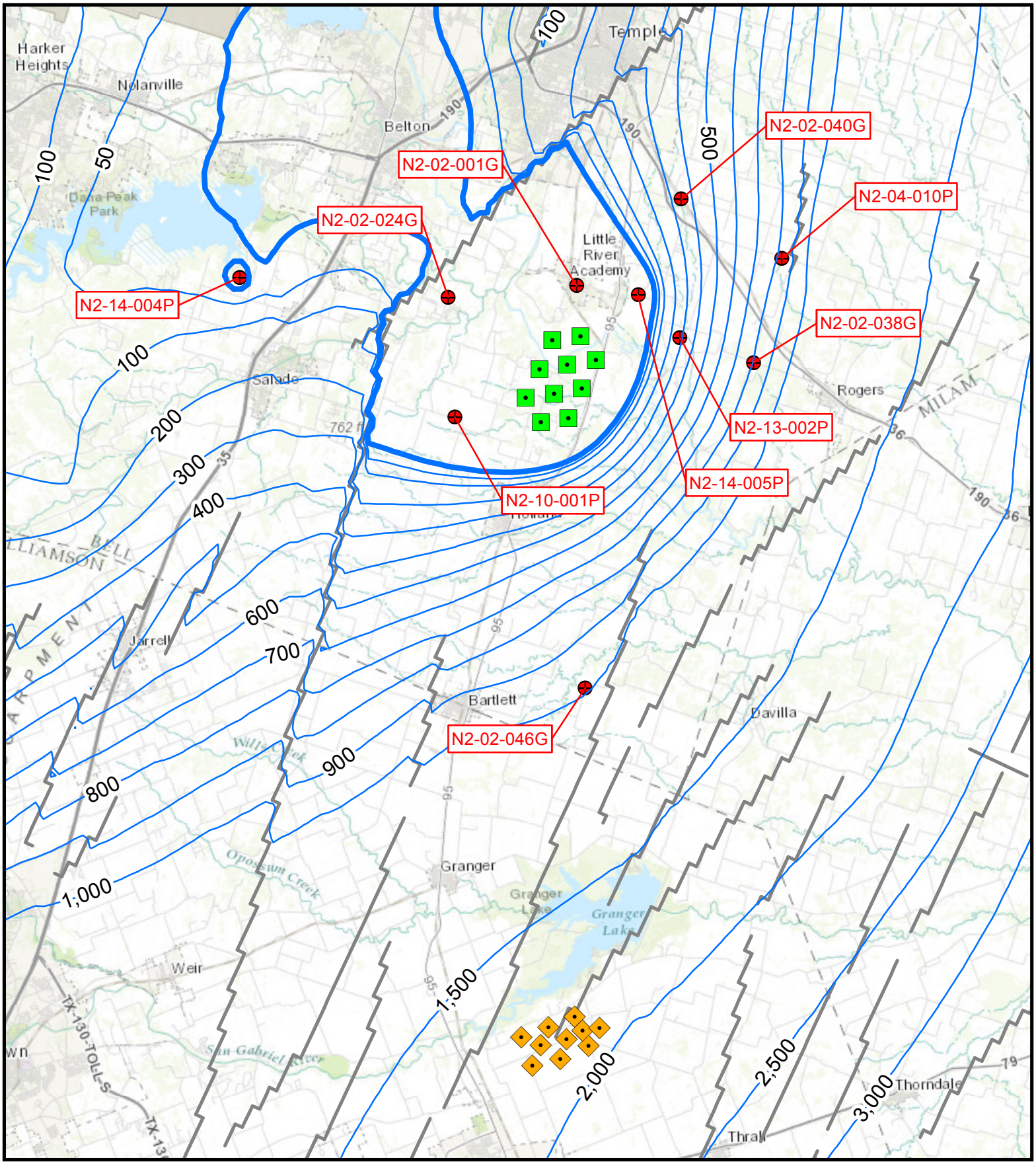
Scenario A-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM



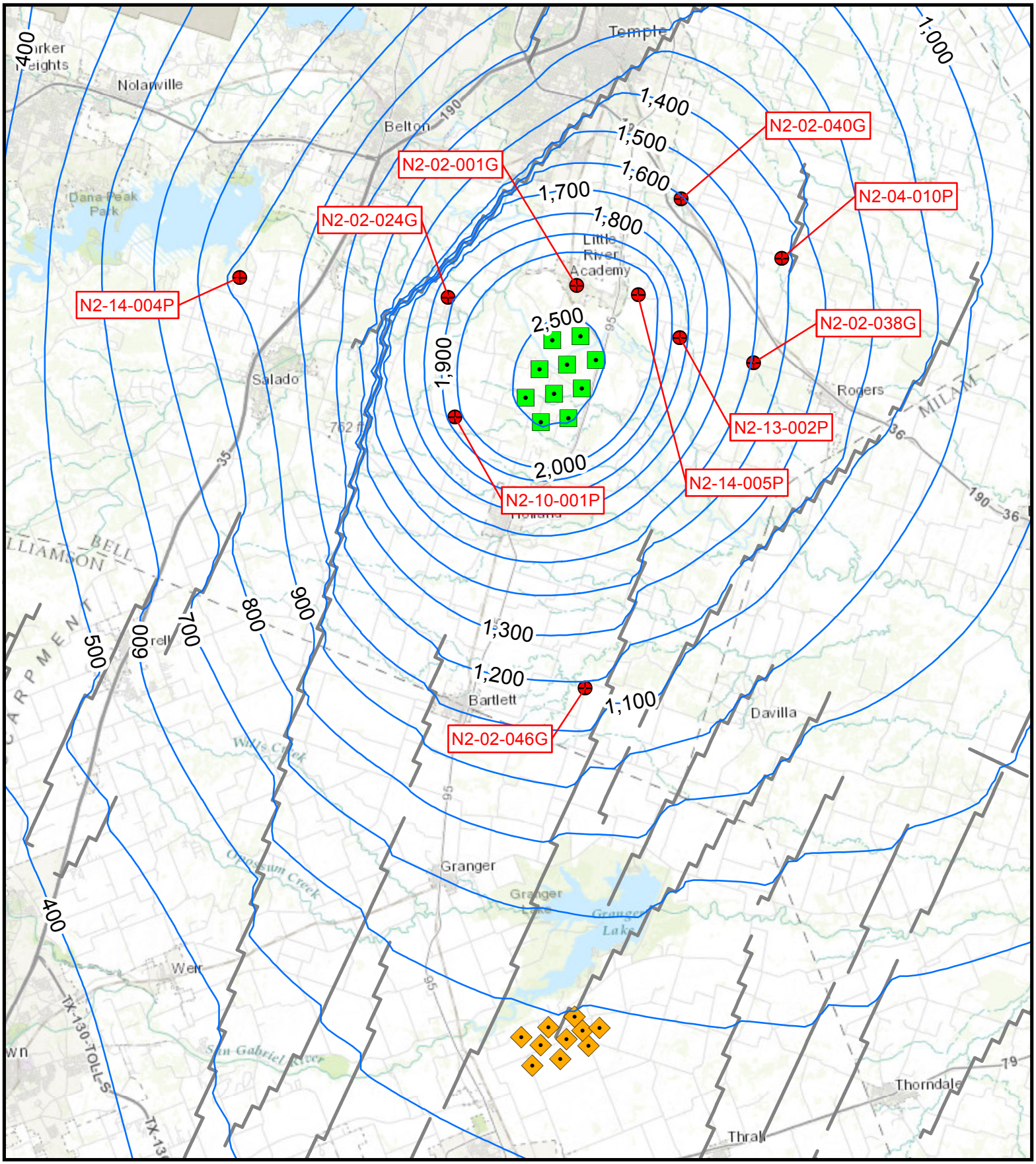
Lower Trinity Artesian Head- Scenario A-003 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario A-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM



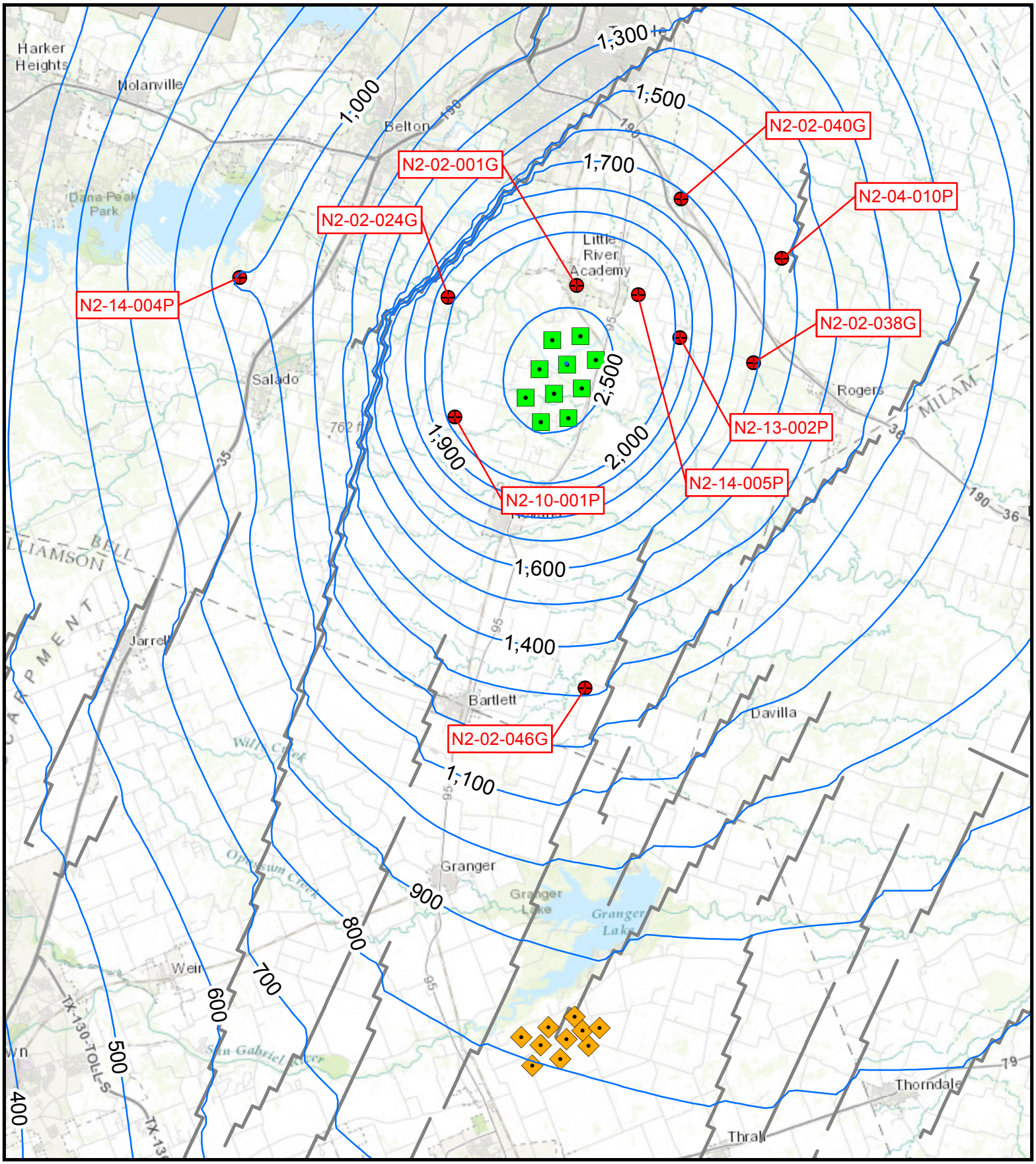
Lower Trinity Drawdown- Scenario A-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM



Lower Trinity Drawdown- Scenario A-003 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

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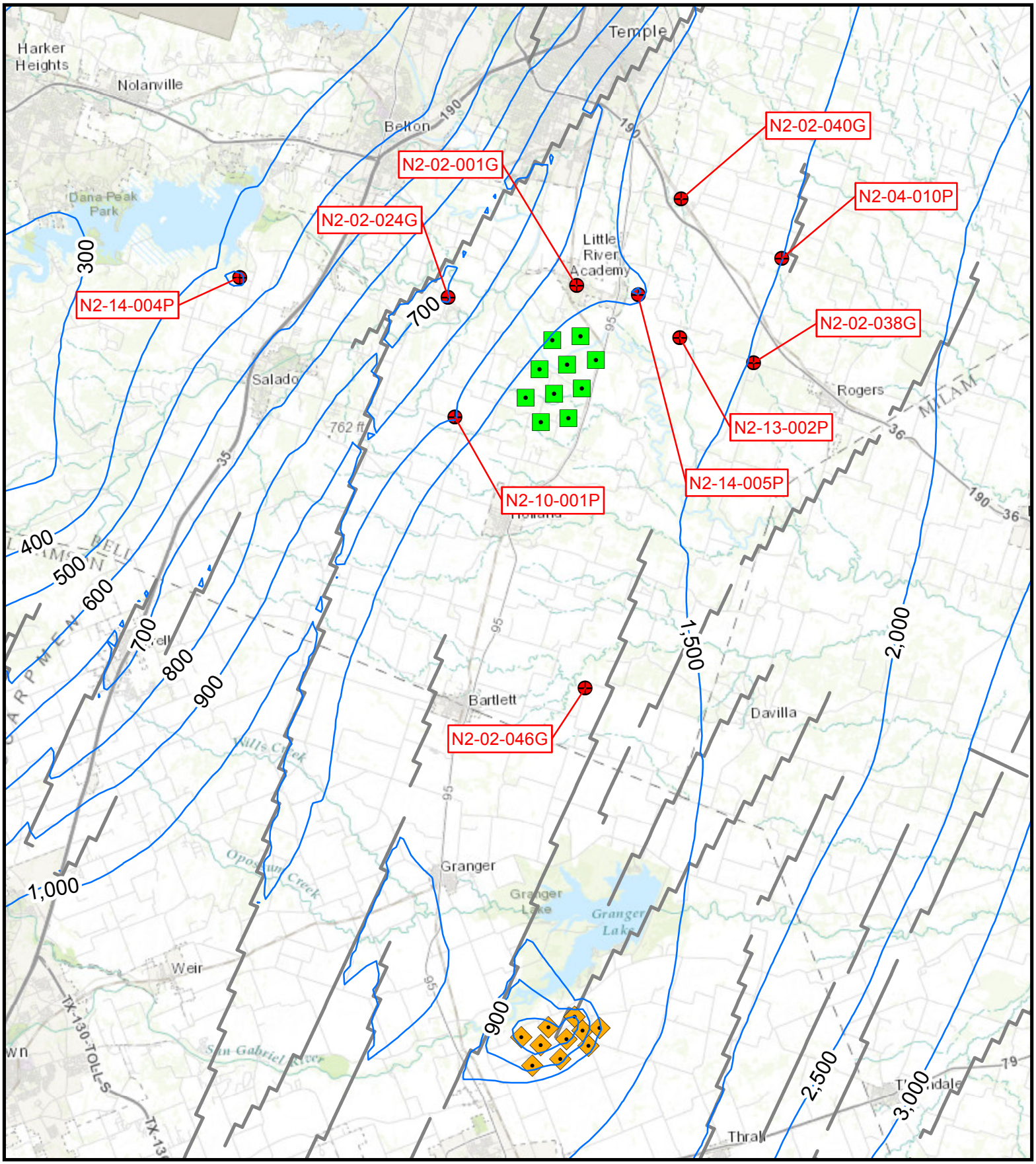
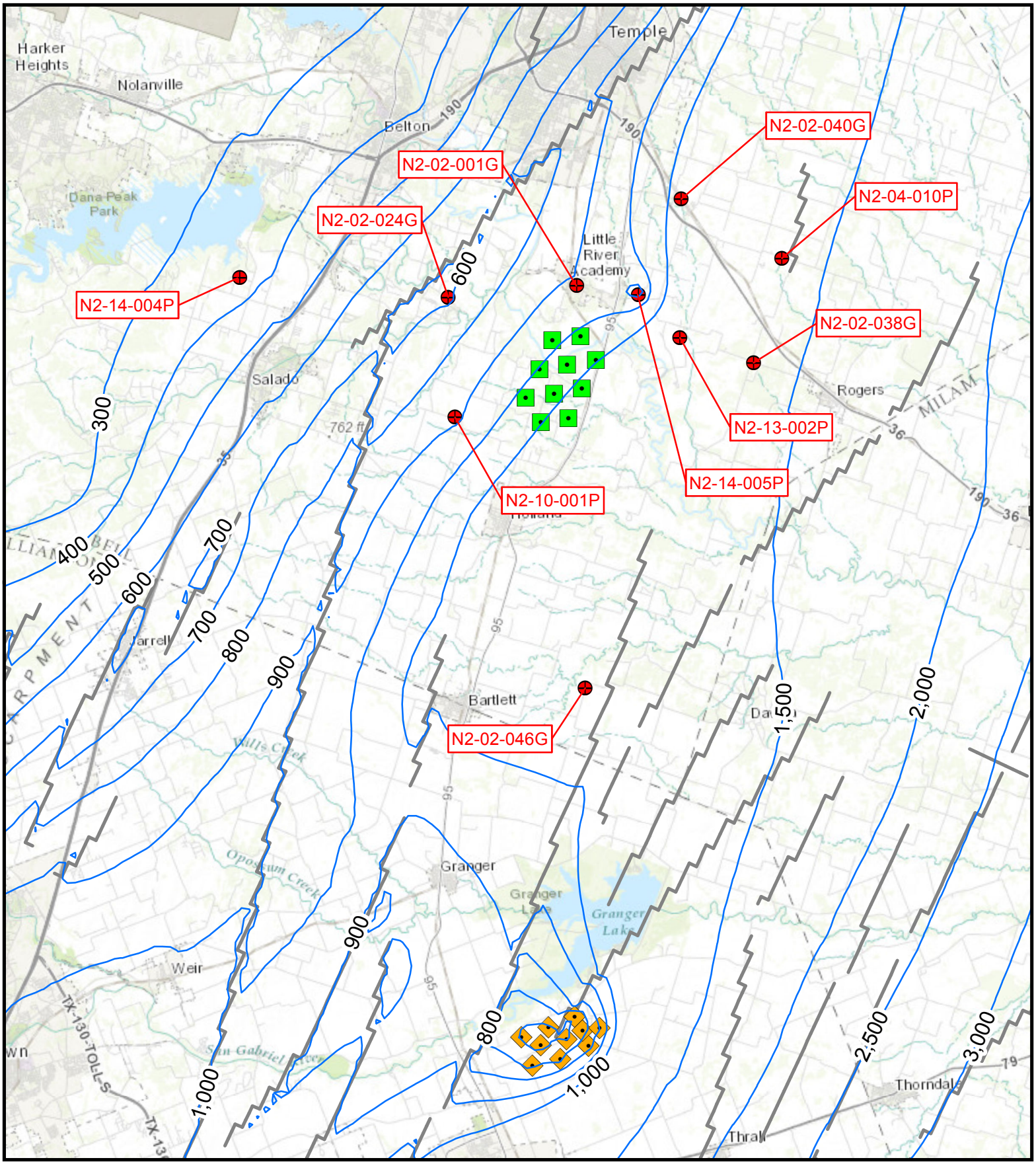
Scenario A-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

Scenario A-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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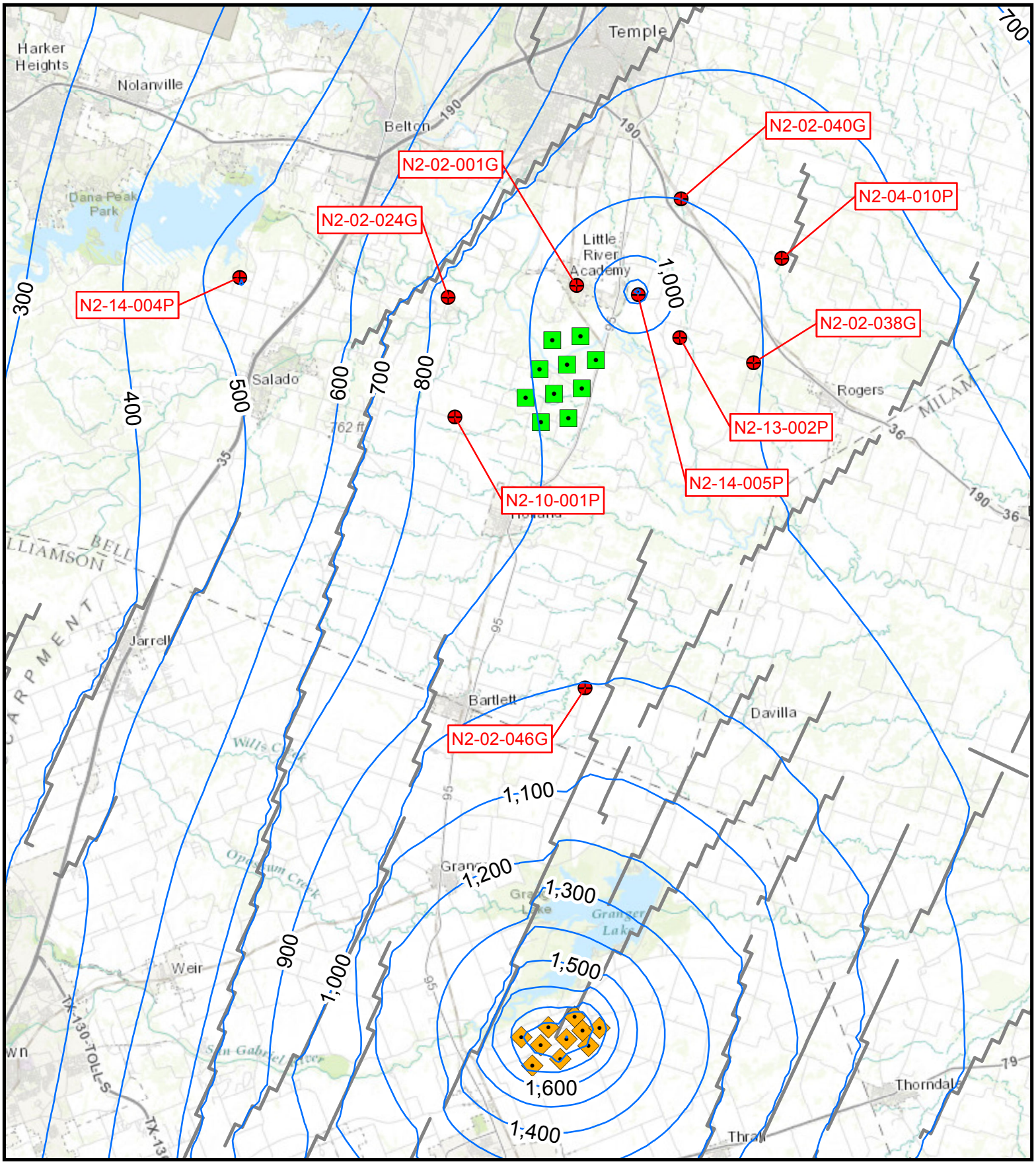
Scenario A-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM



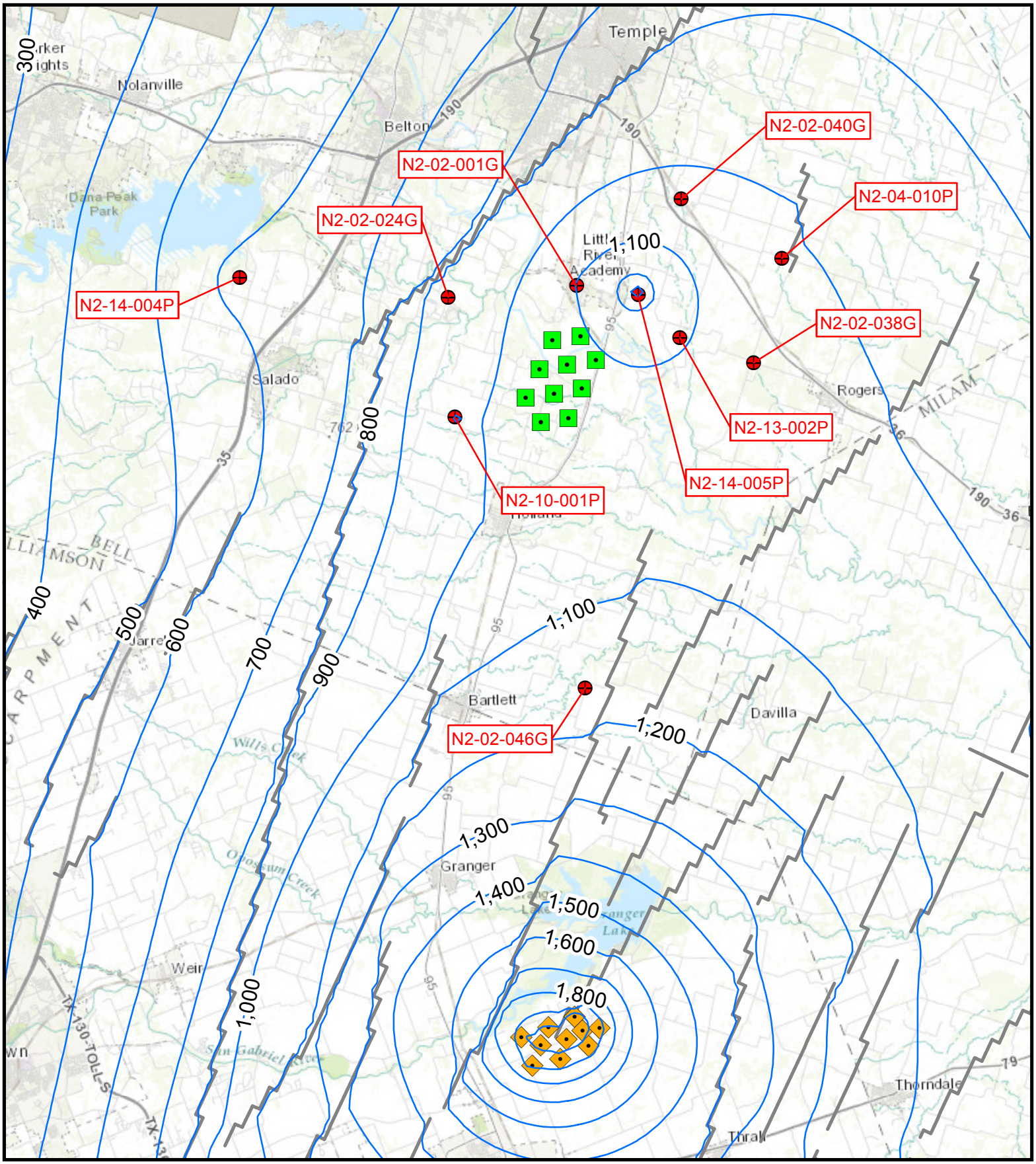
Lower Trinity Drawdown- Scenario A-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM



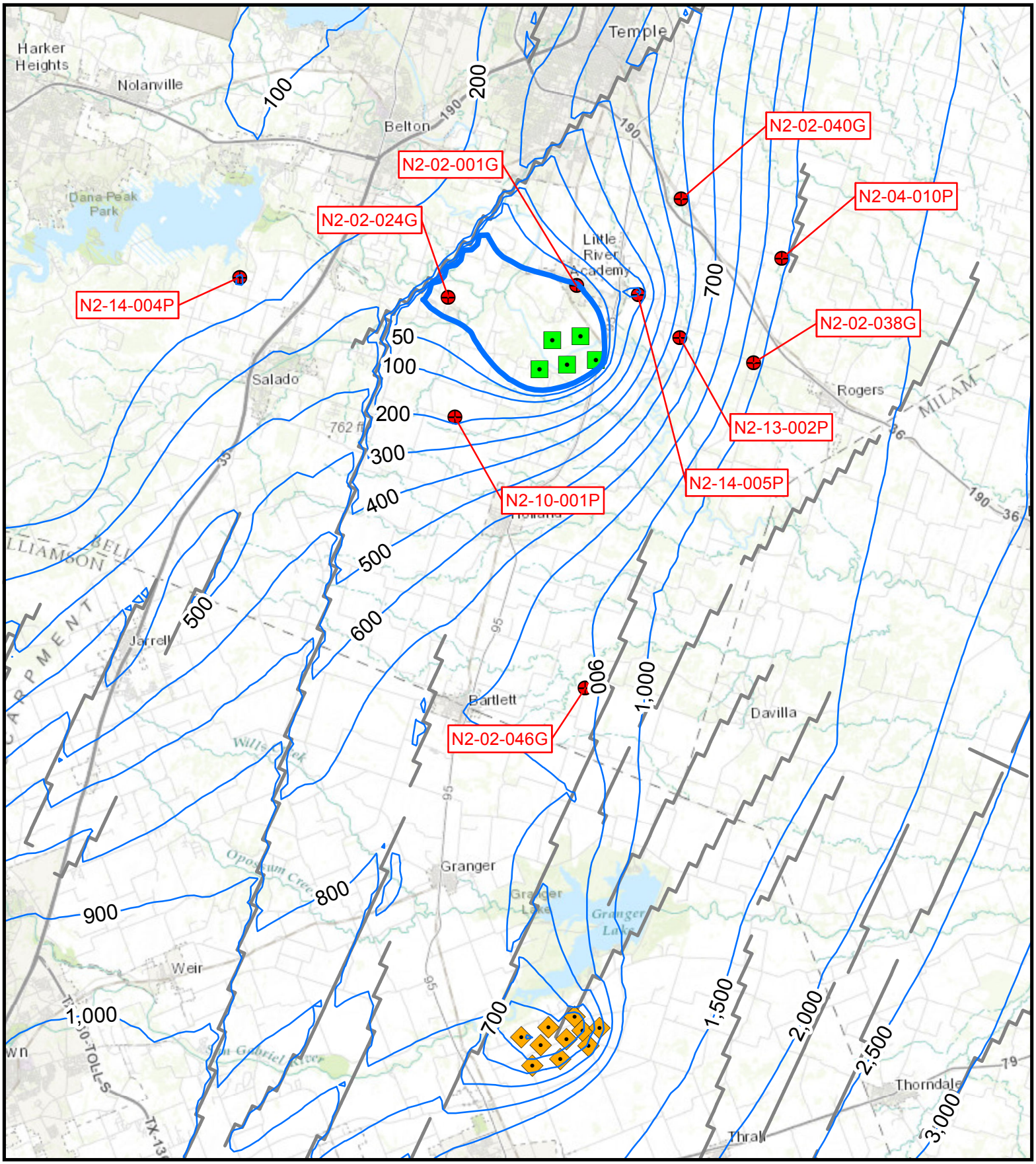
Lower Trinity Drawdown- Scenario A-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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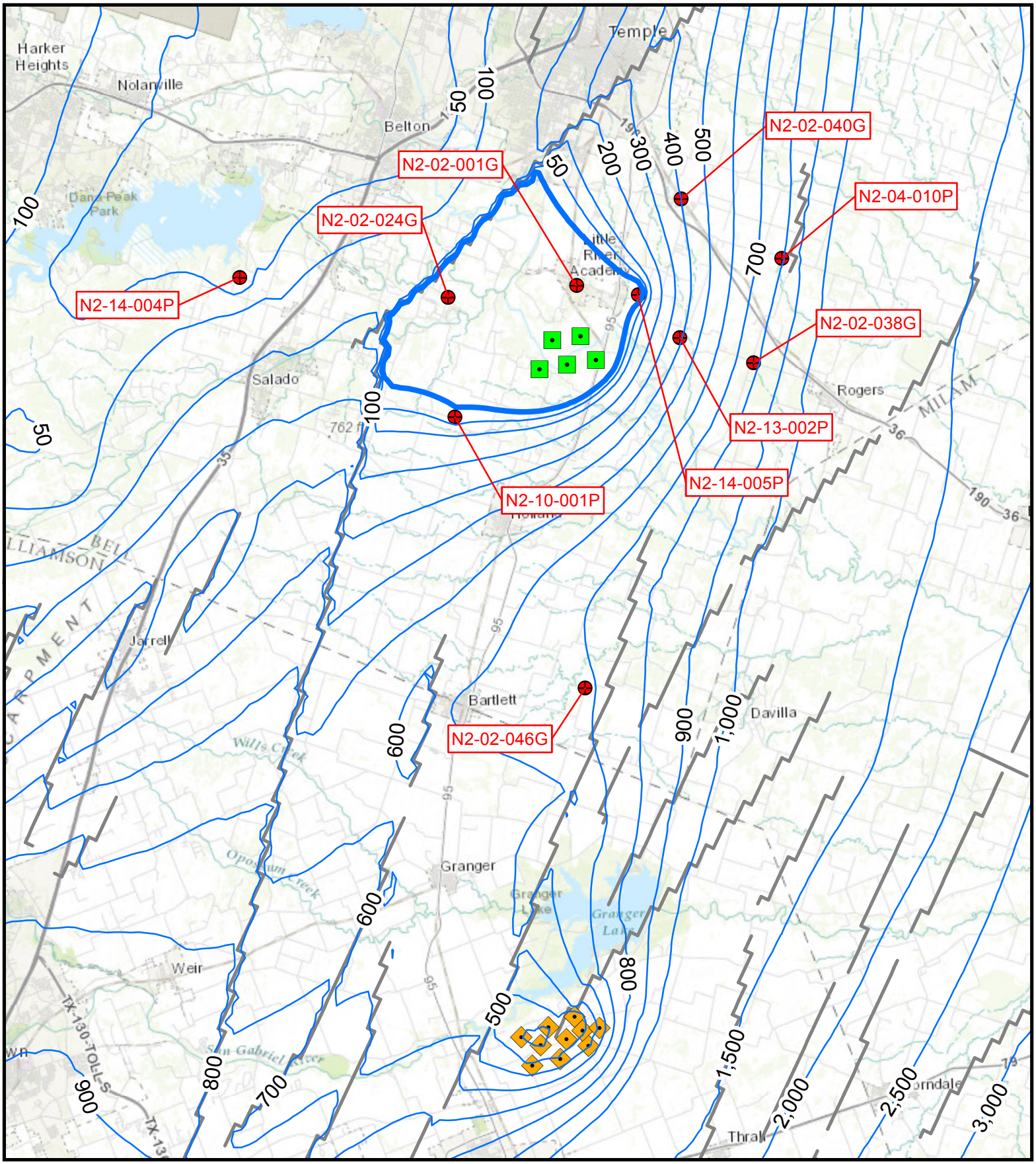
Scenario A-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM



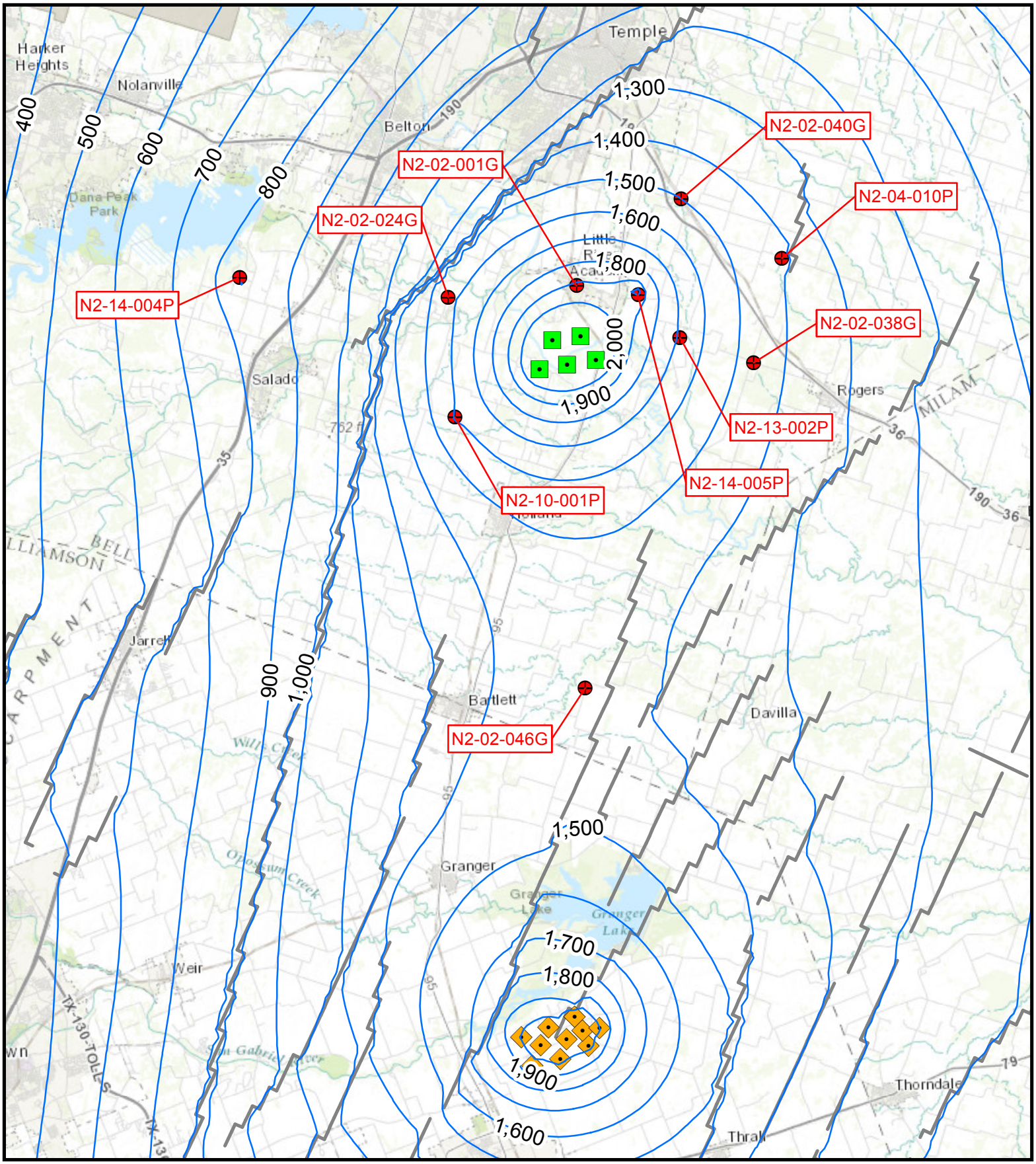
Lower Trinity Artesian Head- Scenario A-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario A-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM



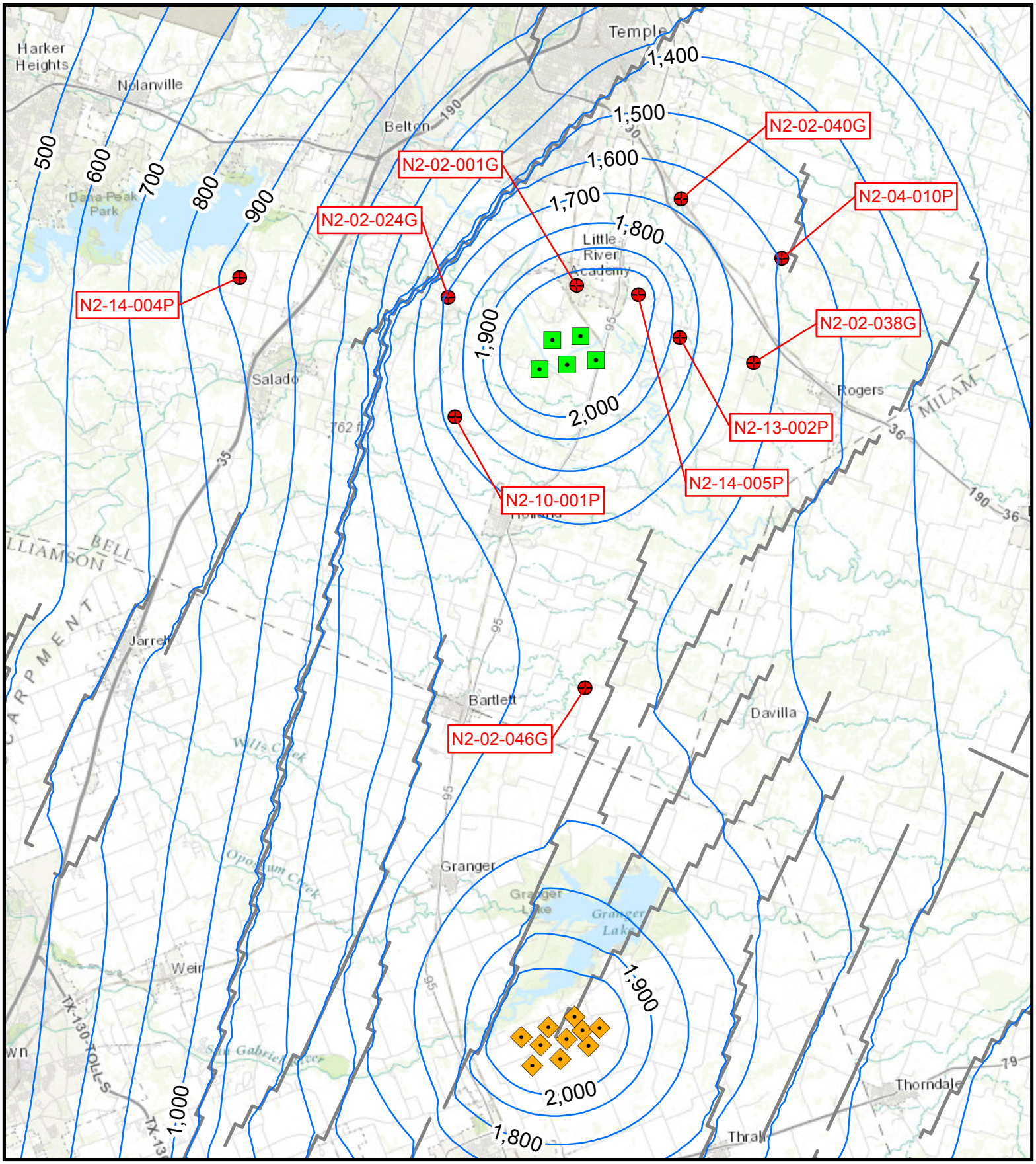
Lower Trinity Drawdown- Scenario A-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM



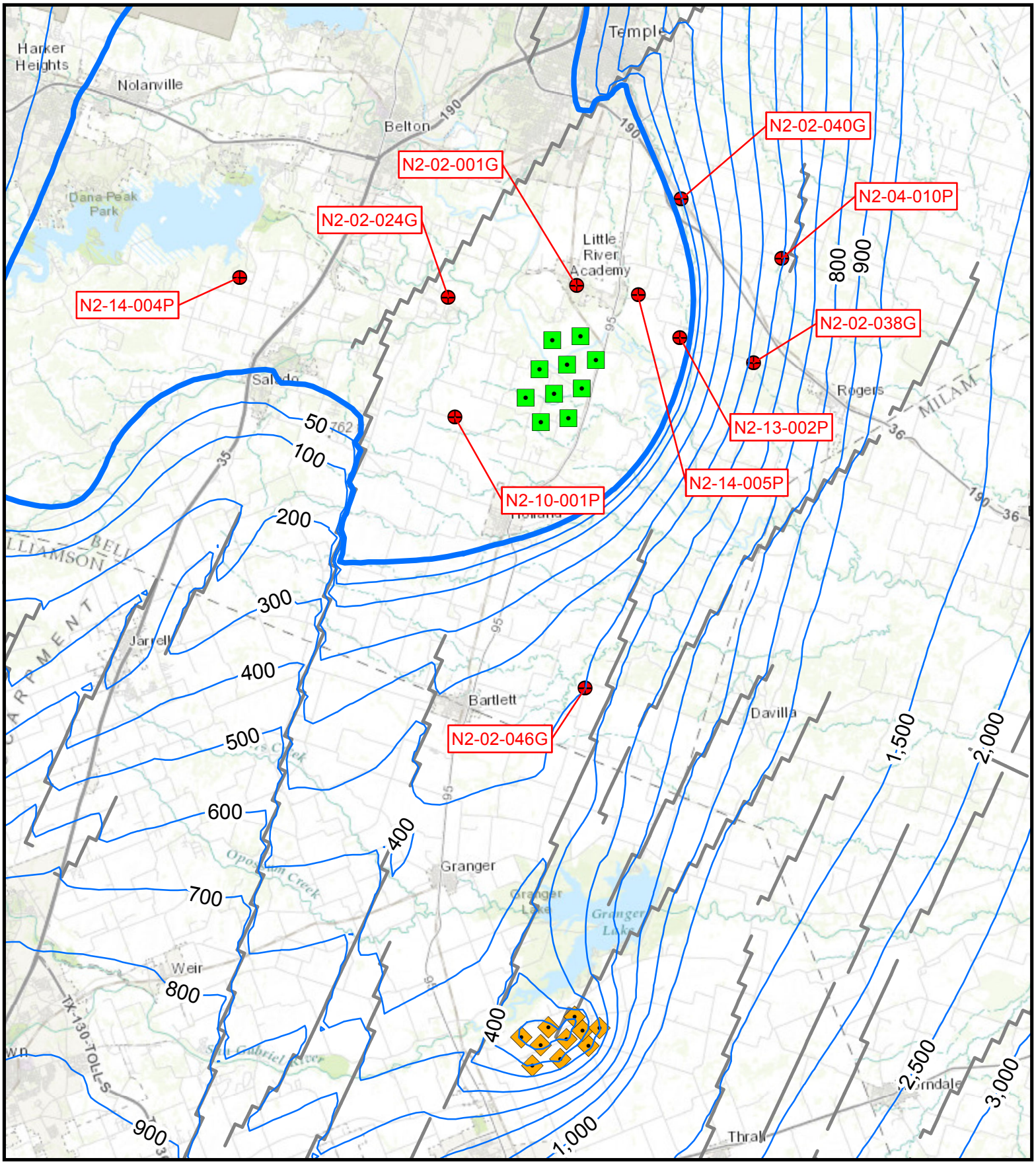
Lower Trinity Drawdown- Scenario A-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario A-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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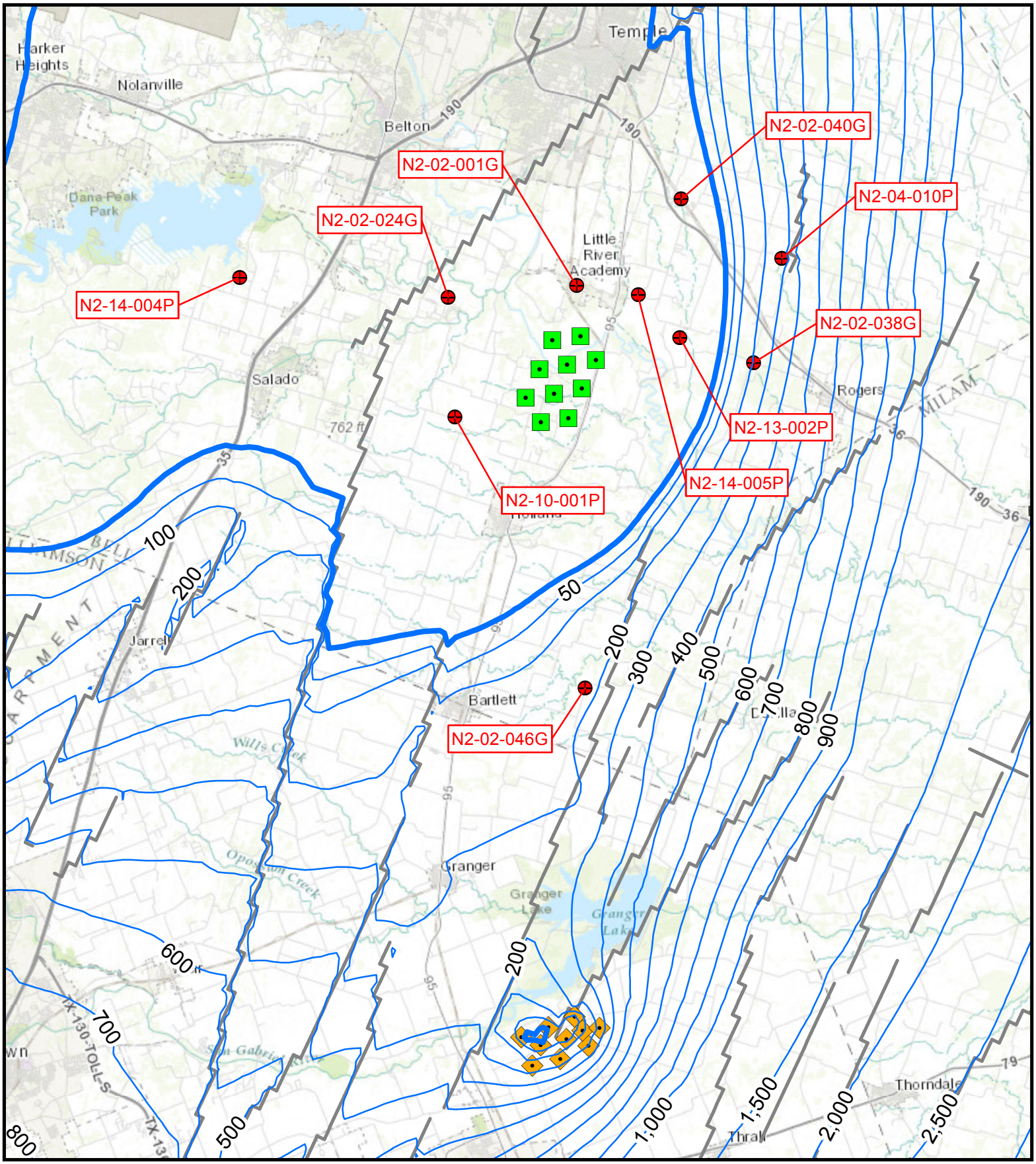
Scenario A-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM



Lower Trinity Artesian Head- Scenario A-006 - 50 Years

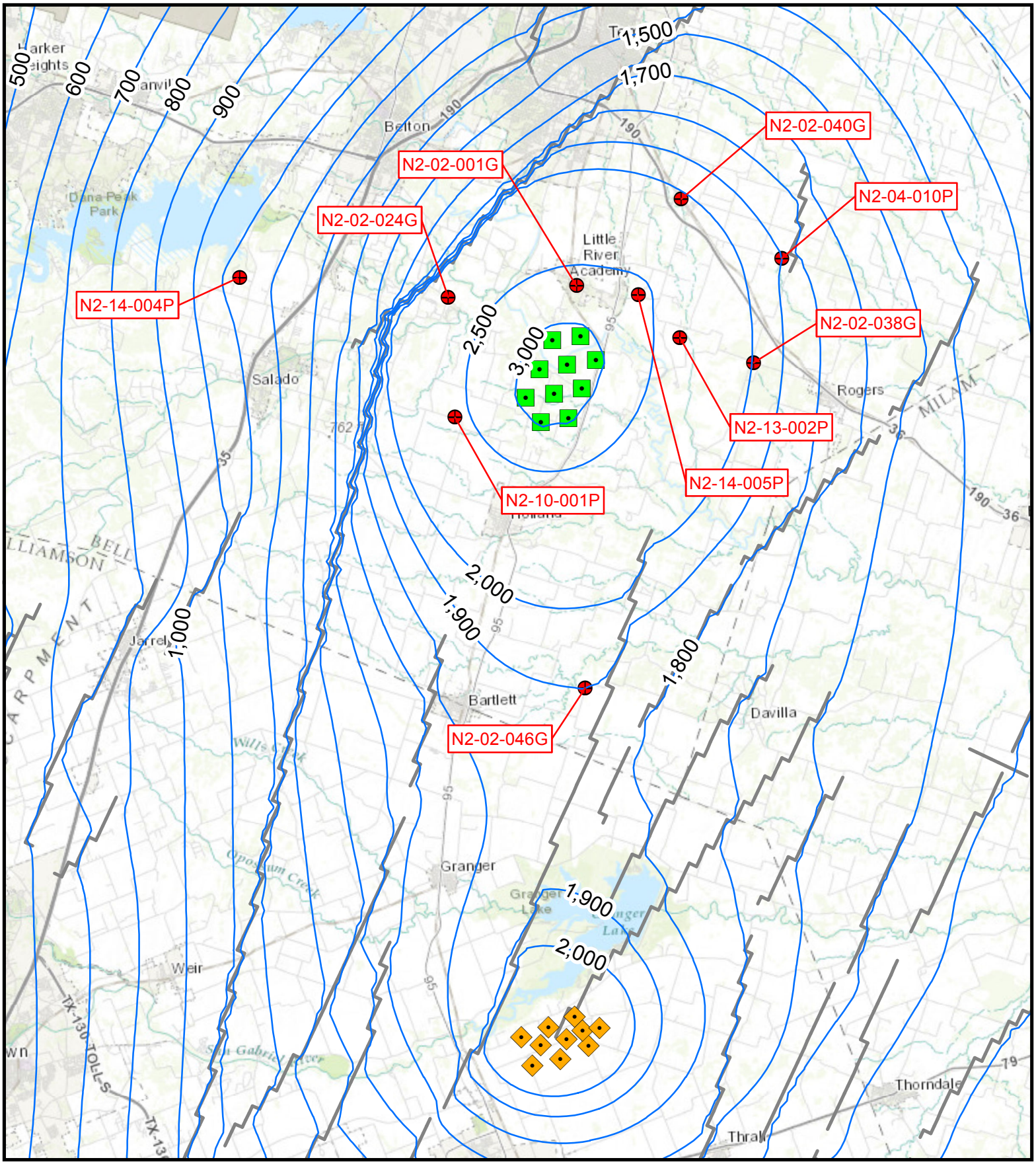
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario A-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM



Lower Trinity Drawdown- Scenario A-006 - 30 Years

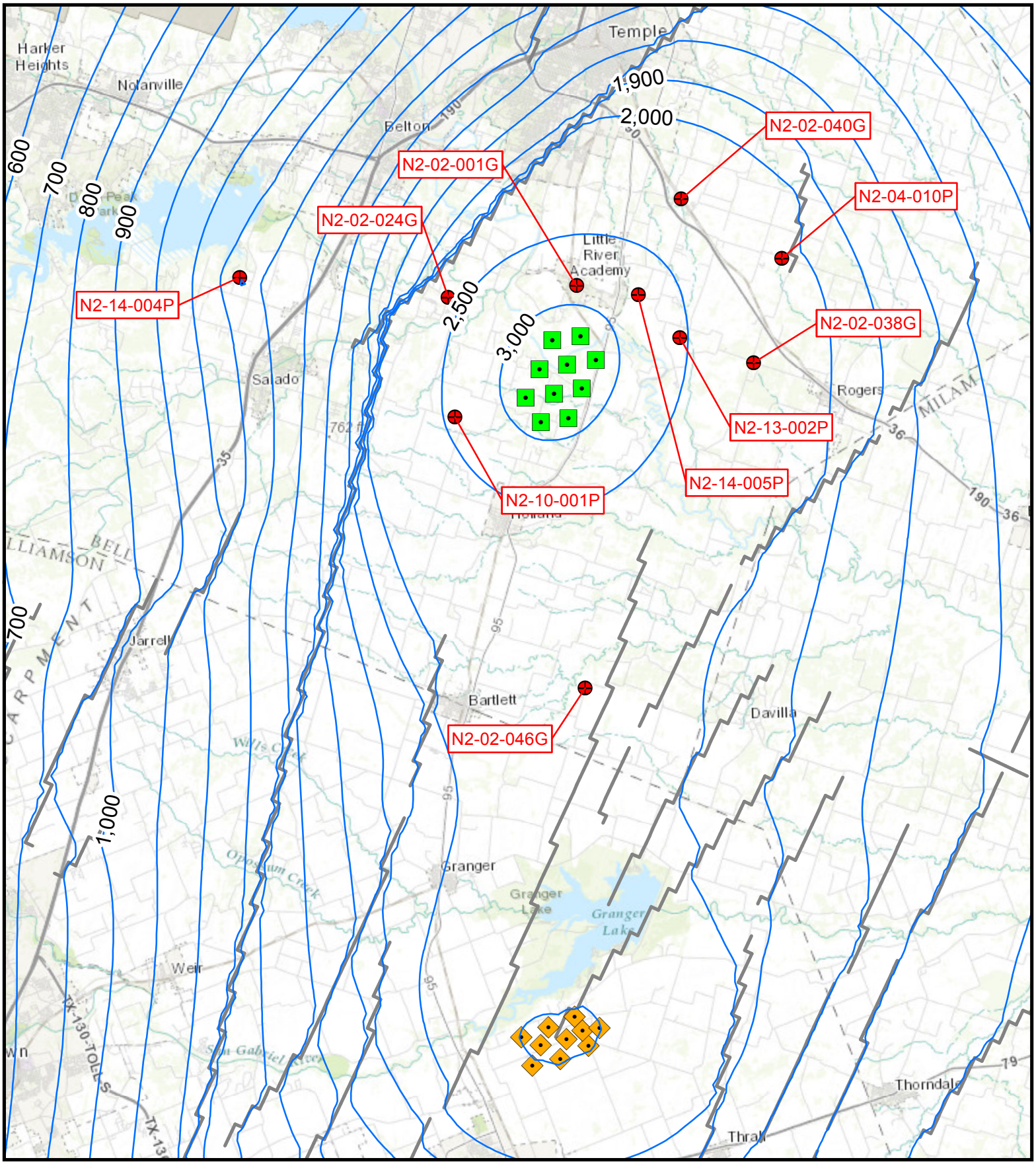
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario A-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM



Lower Trinity Drawdown- Scenario A-006 - 50 Years

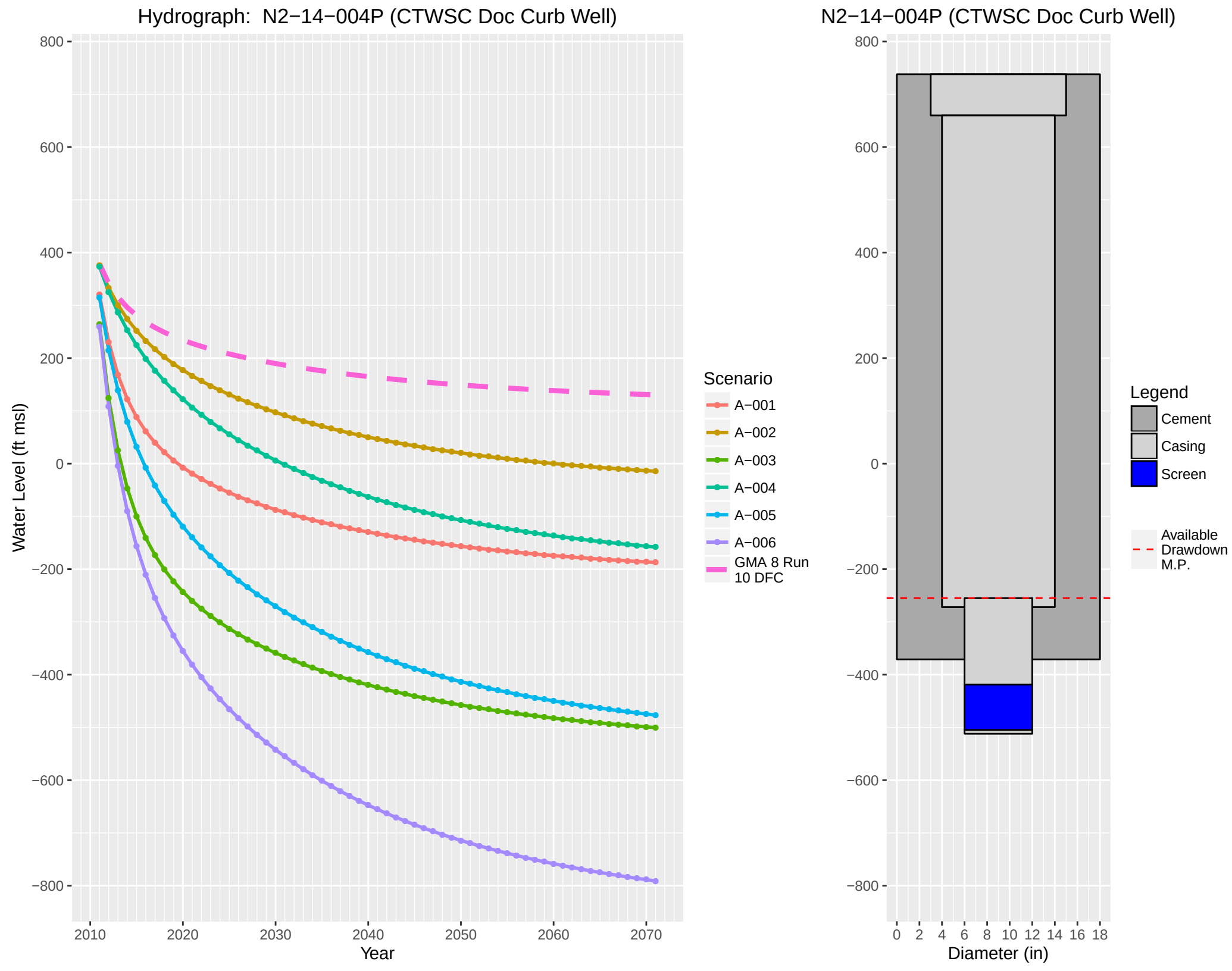
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

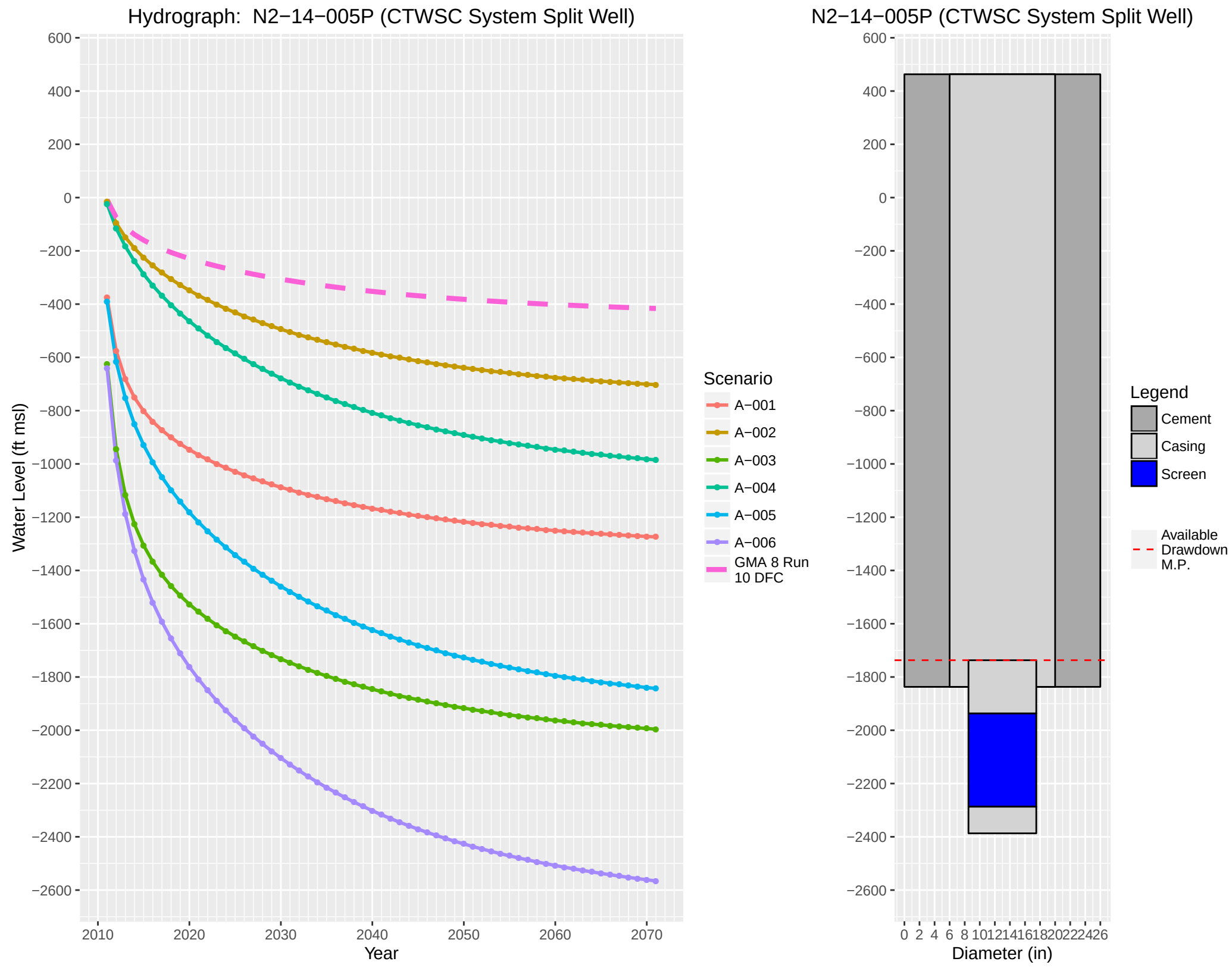
N

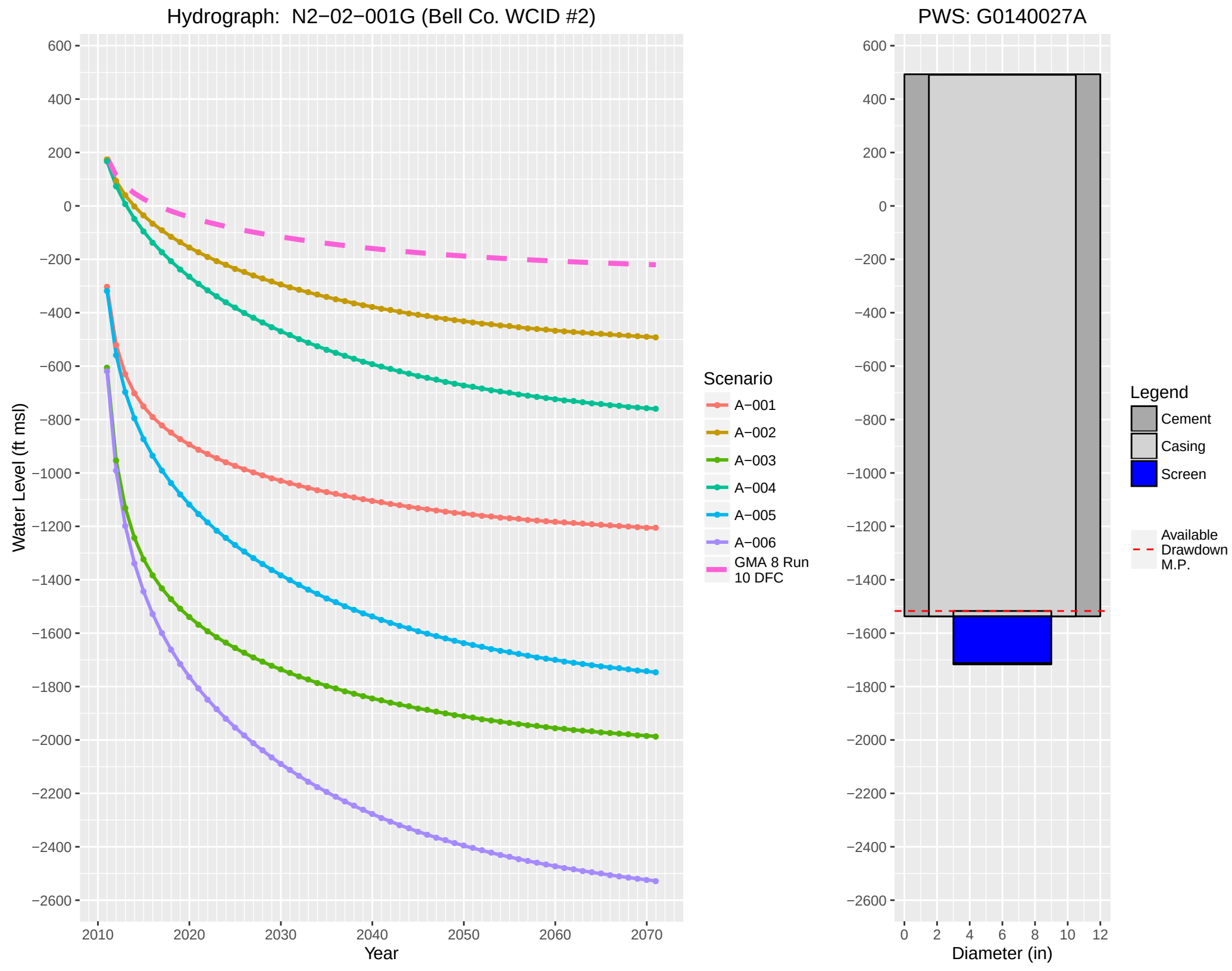
0 2 4 Miles

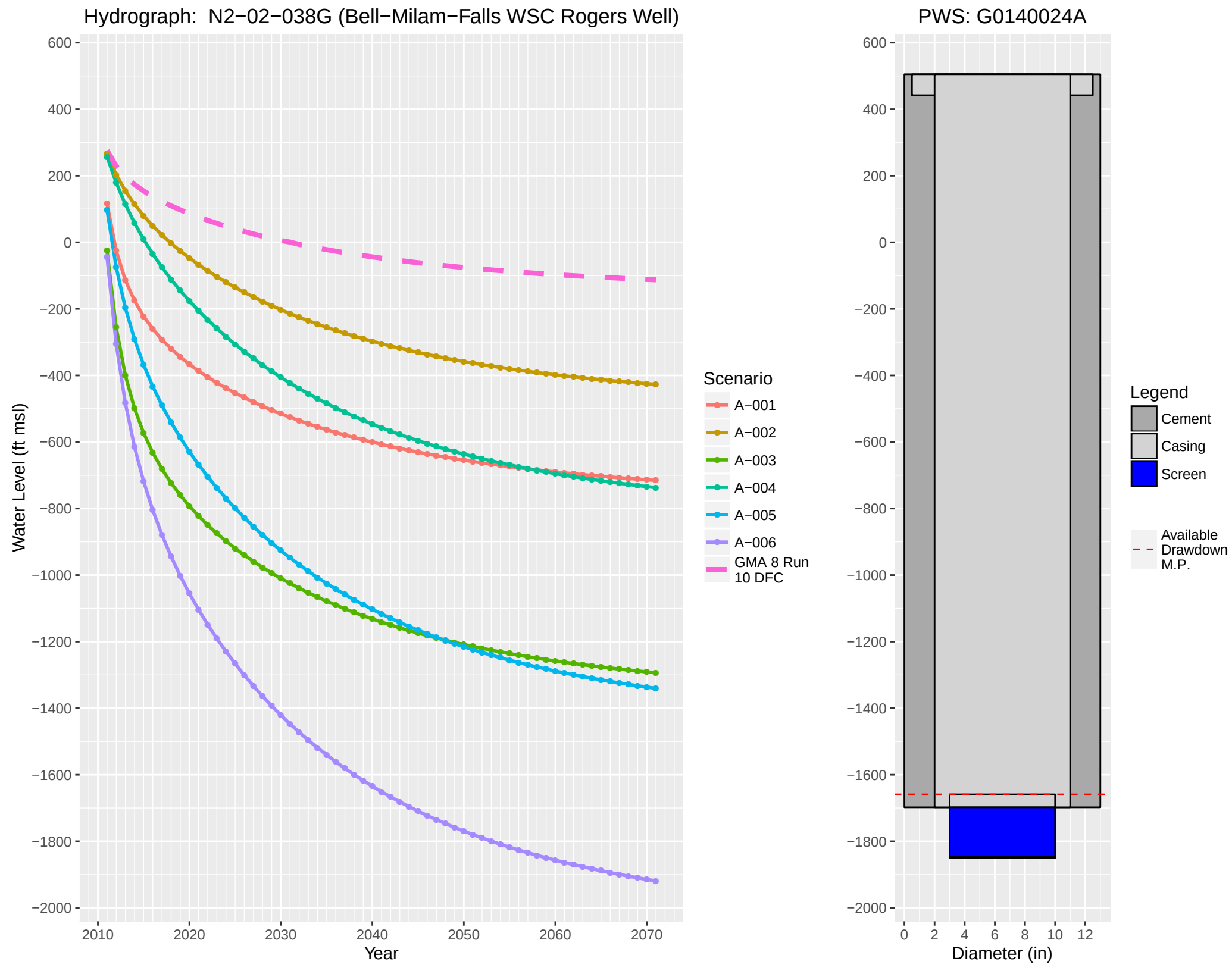
Scenario A-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM

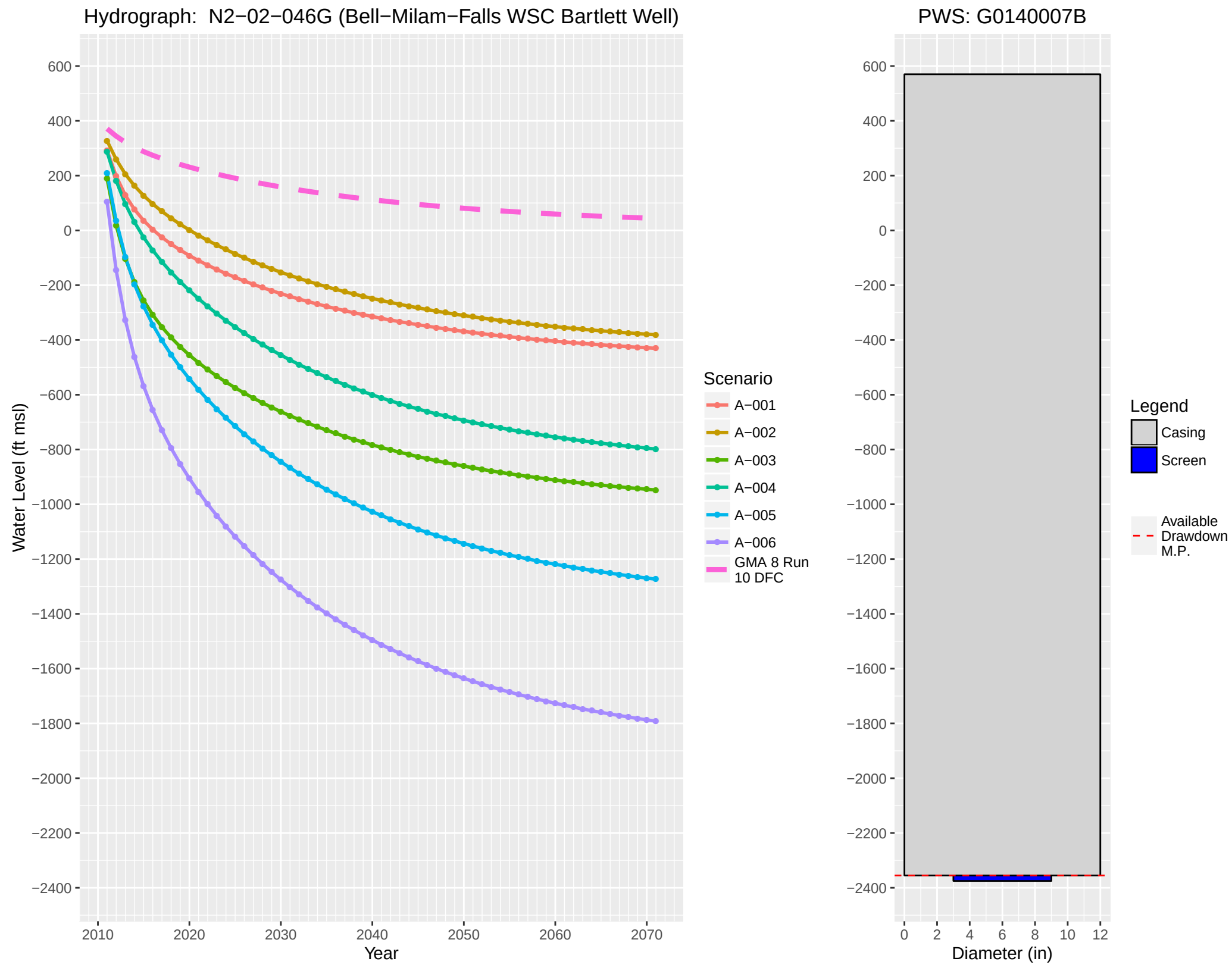
Attachment 3 —
"A" Scenarios
TWDB Approved NTWGAM
Hydrographs of Simulated Water Level Compared to Existing Well Construction

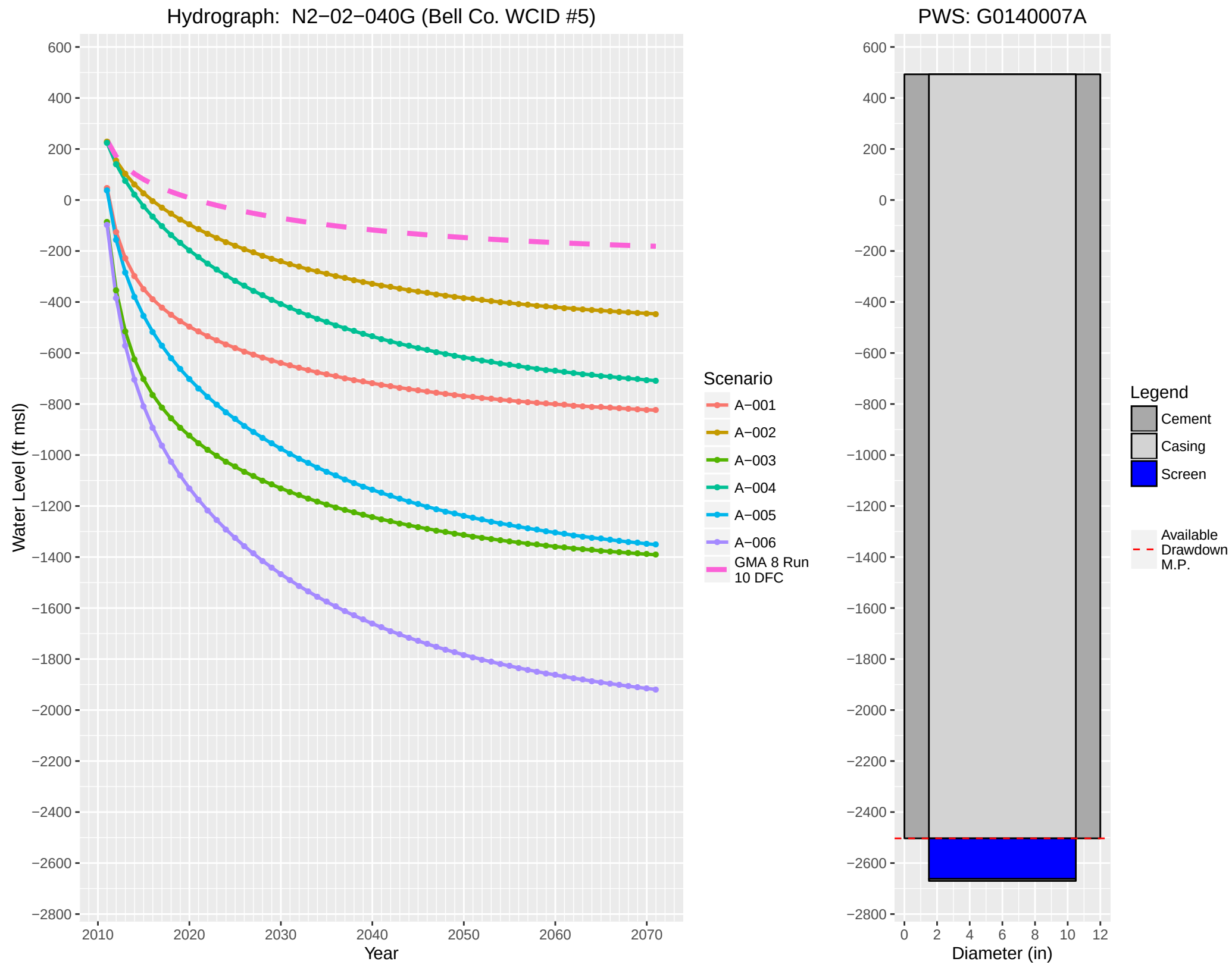

Hydrograph: N2−14−004P (CTWSC Doc Curb Well)
Water Level (ft msl)
800
600
400
200
0
−200
−400
−600
−800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
N2−14−004P (CTWSC Doc Curb Well)
0
2
4
6
8
10
12
14
16
18
Diameter (in)
Legend
Cement
Casing
Screen
Available Drawdown M.P.

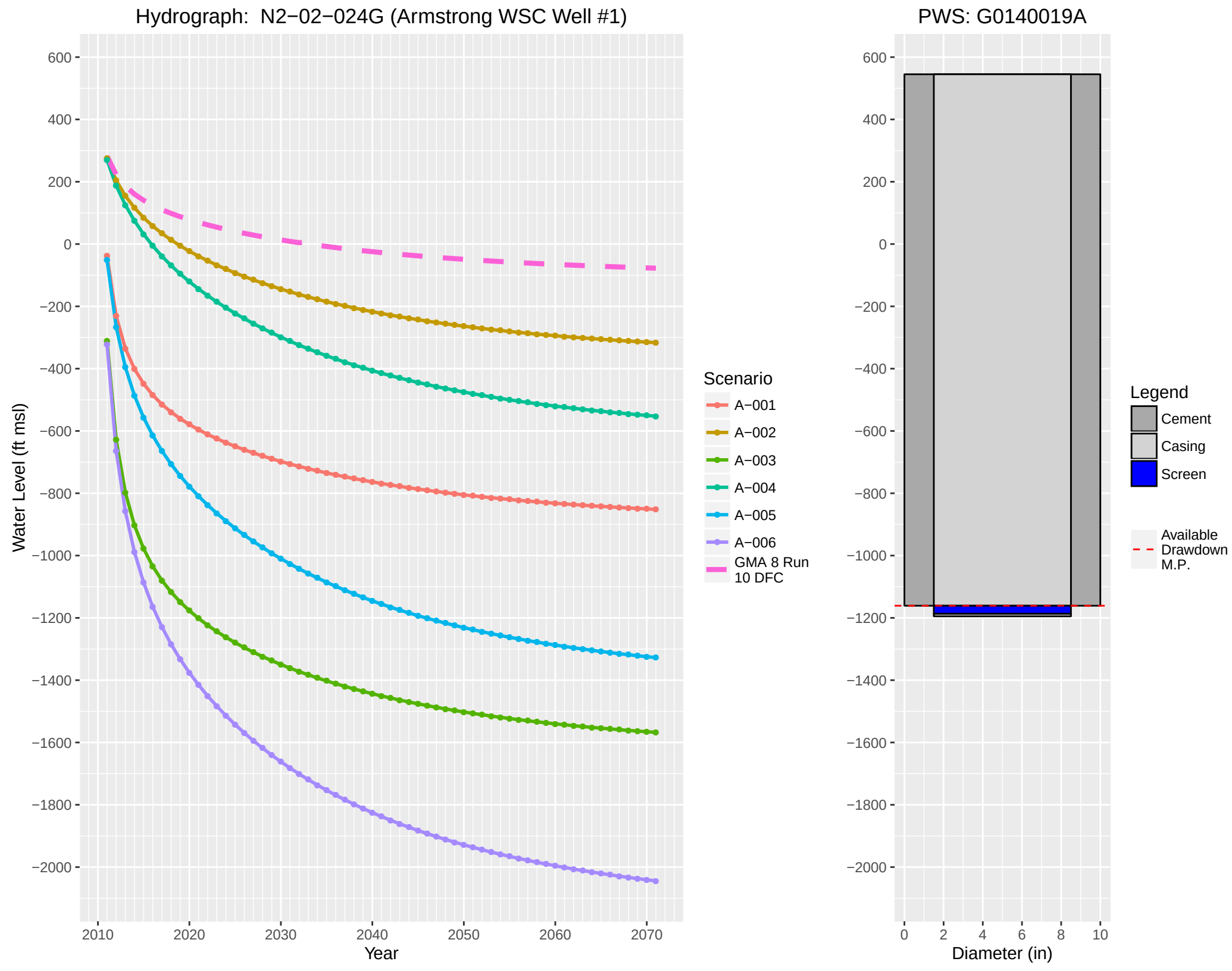

Hydrograph: N2−14−005P (CTWSC System Split Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
N2−14−005P (CTWSC System Split Well)
0 2 4 6 8 10 12 14 16 18 20 22 24 26
Diameter (in)
Legend
Cement
Casing
Screen
Available Drawdown
M.P.

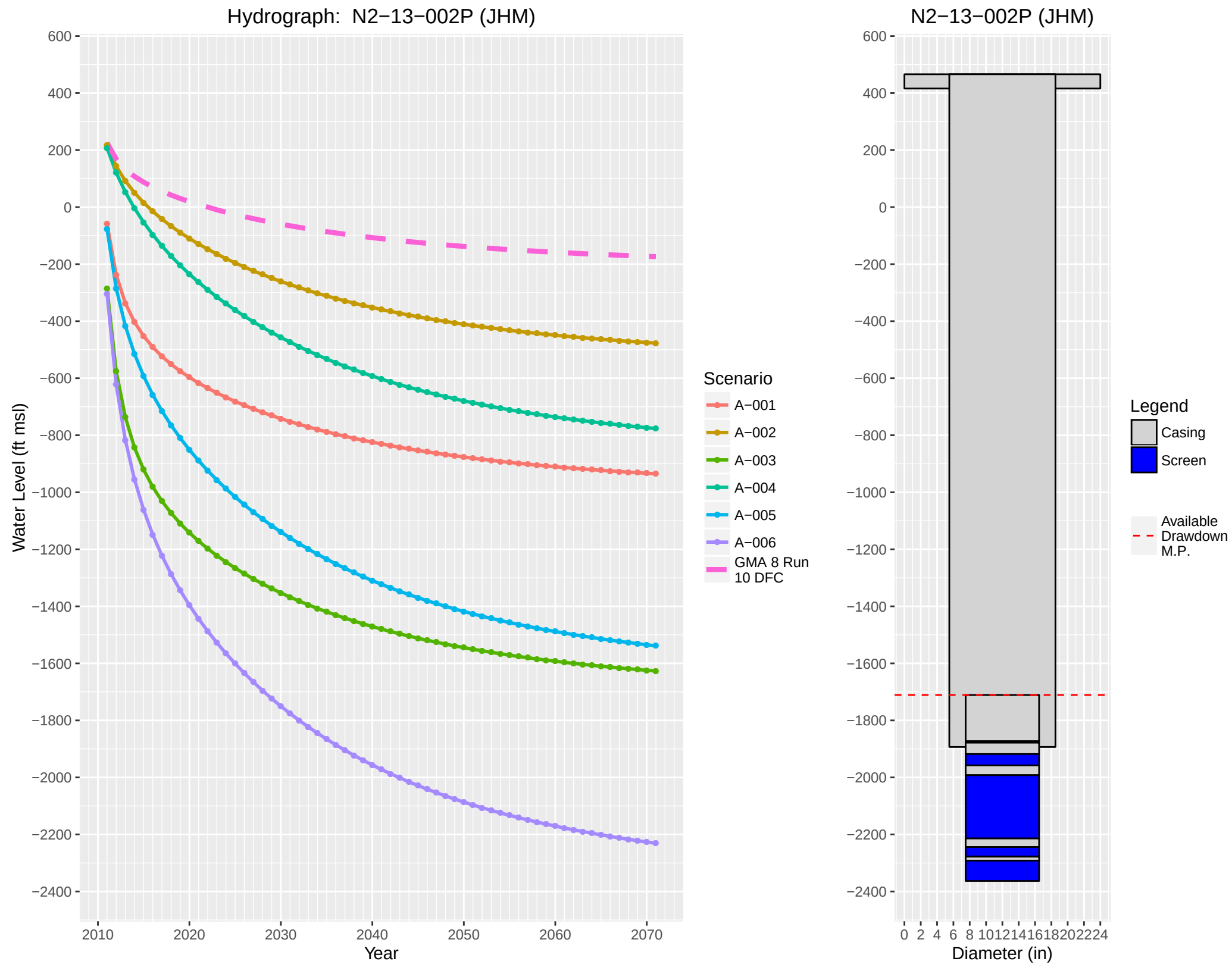

Hydrograph: N2−02−001G (Bell Co. WCID #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
PWS: G0140027A
0
2
4
6
8
10
12
Diameter (in)
Legend
Cement
Casing
Screen
Available Drawdown
M.P.

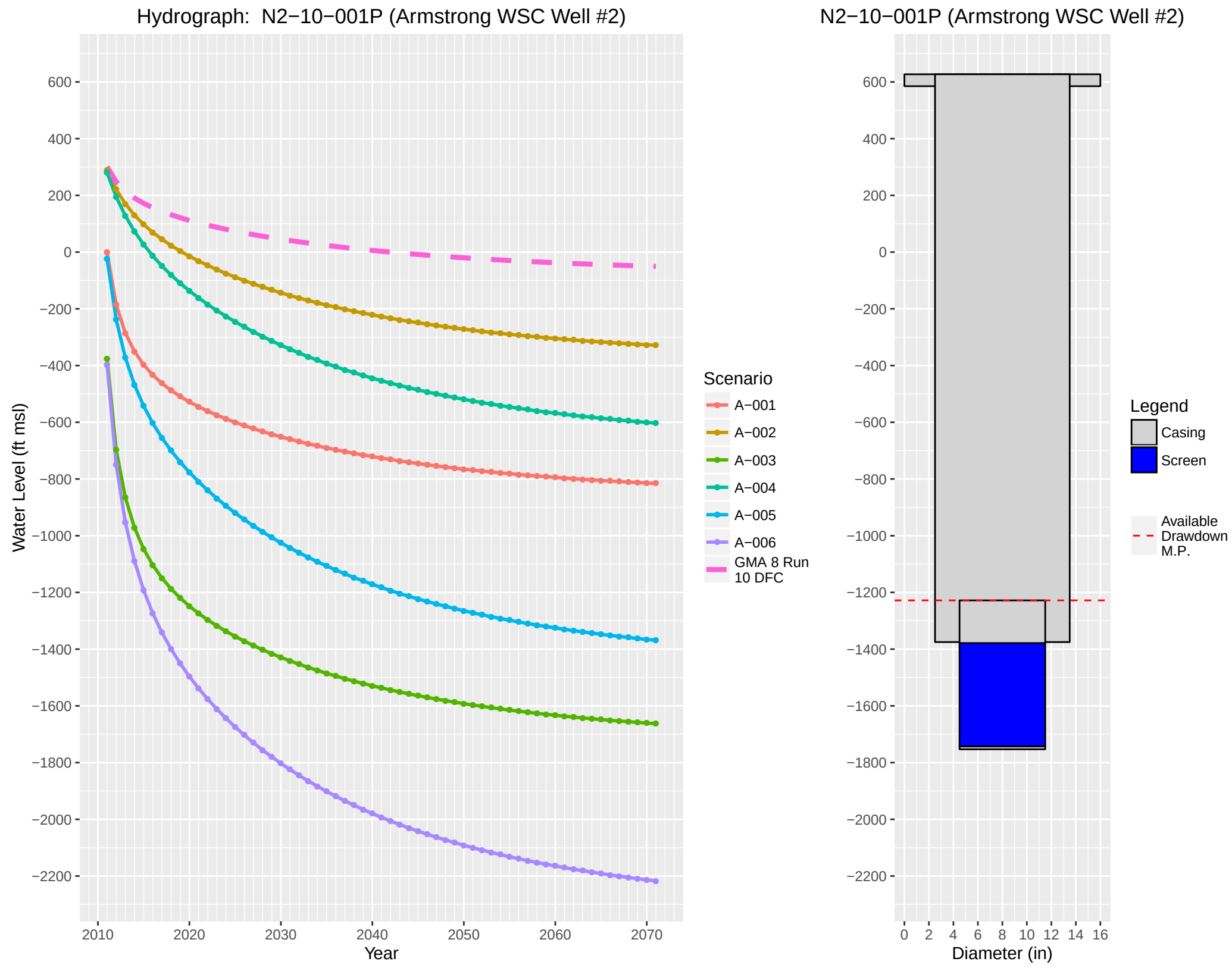

Hydrograph: N2−02−038G (Bell−Milam−Falls WSC Rogers Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
PWS: G0140024A
0
2
4
6
8
10
12
Diameter (in)
Legend
Cement
Casing
Screen
Available Drawdown M.P.

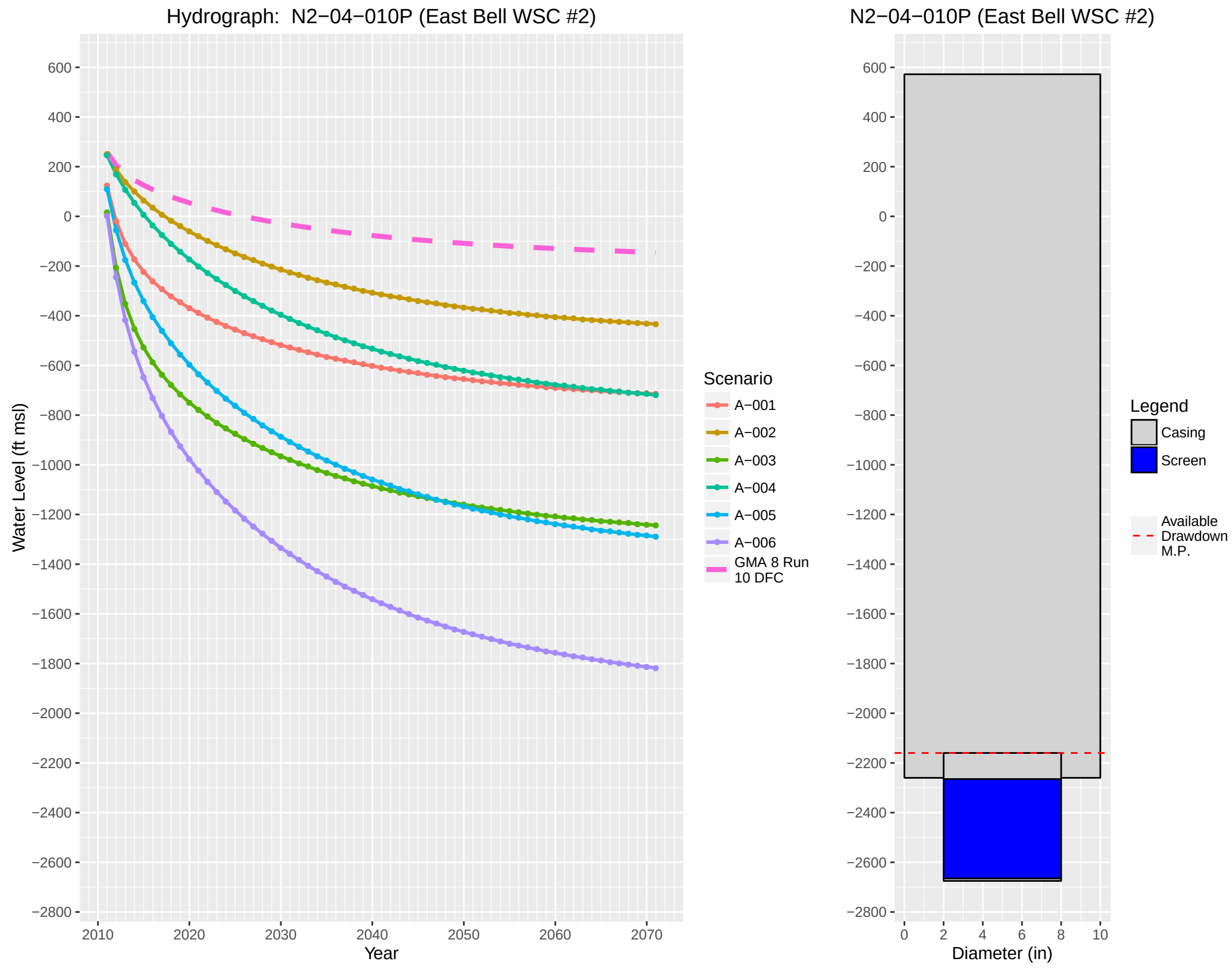

Hydrograph: N2−02−046G (Bell−Milam−Falls WSC Bartlett Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
PWS: G0140007B
0
2
4
6
8
10
12
Diameter (in)
Legend
Casing
Screen
Available Drawdown M.P.


Hydrograph: N2−02−040G (Bell Co. WCID #5)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
PWS: G0140007A
Diameter (in)
0
2
4
6
8
10
12
Legend
Cement
Casing
Screen
Available Drawdown
M.P.

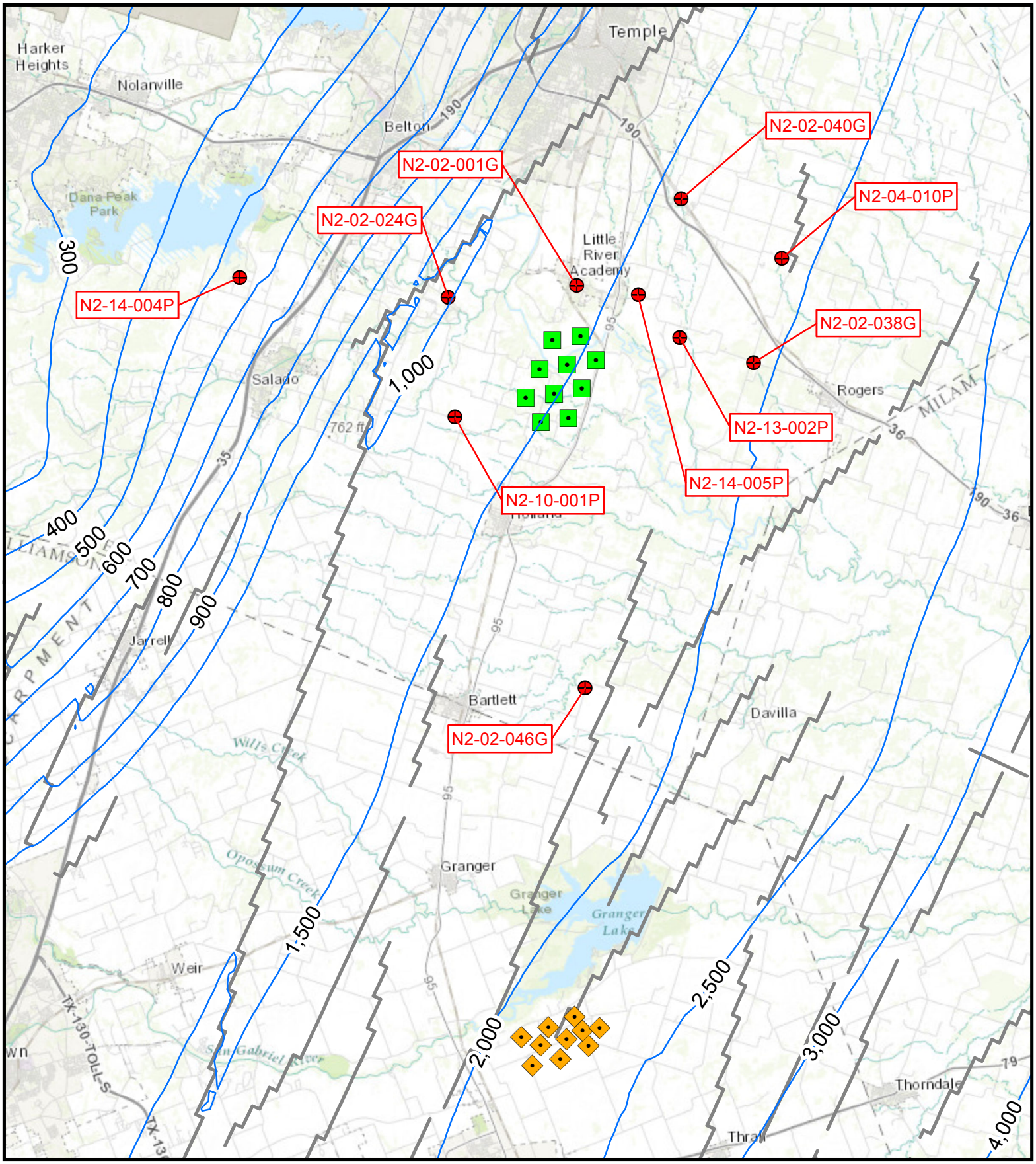

Hydrograph: N2−02−024G (Armstrong WSC Well #1)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
PWS: G0140019A
0
2
4
6
8
10
Diameter (in)
Legend
Cement
Casing
Screen
Available Drawdown
M.P.


Hydrograph: N2−13−002P (JHM)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
N2−13−002P (JHM)
0 2 4 6 8 10 12 14 16 18 20 22 24
Diameter (in)
Legend
Casing
Screen
Available Drawdown M.P.


Hydrograph: N2−10−001P (Armstrong WSC Well #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
N2−10−001P (Armstrong WSC Well #2)
0
2
4
6
8
10
12
14
16
Diameter (in)
Legend
Casing
Screen
Available Drawdown M.P.


Hydrograph: N2−04−010P (East Bell WSC #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
A−001
A−002
A−003
A−004
A−005
A−006
GMA 8 Run 10 DFC
N2−04−010P (East Bell WSC #2)
0
2
4
6
8
10
Diameter (in)
Legend
Casing
Screen
Available Drawdown M.P.

Attachment 4 —
"B" Scenarios
CUWCD Transmissivity Modified NTWGAM
TWDB Approved NTWGAM
Artesian Head and Drawdown after 30 and 50 Years of Production



Lower Trinity Artesian Head- Scenario B-001 - 30 Years

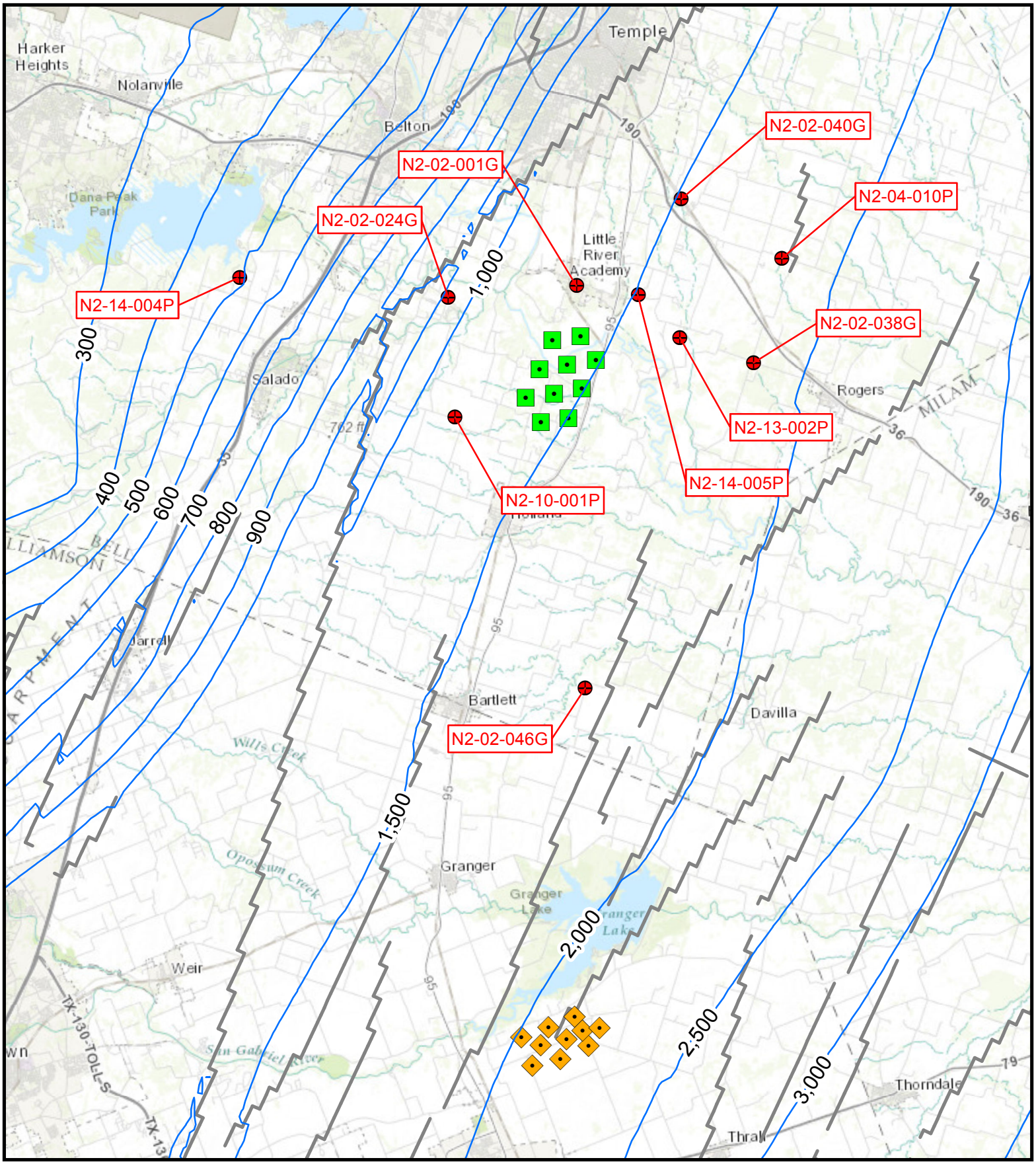
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

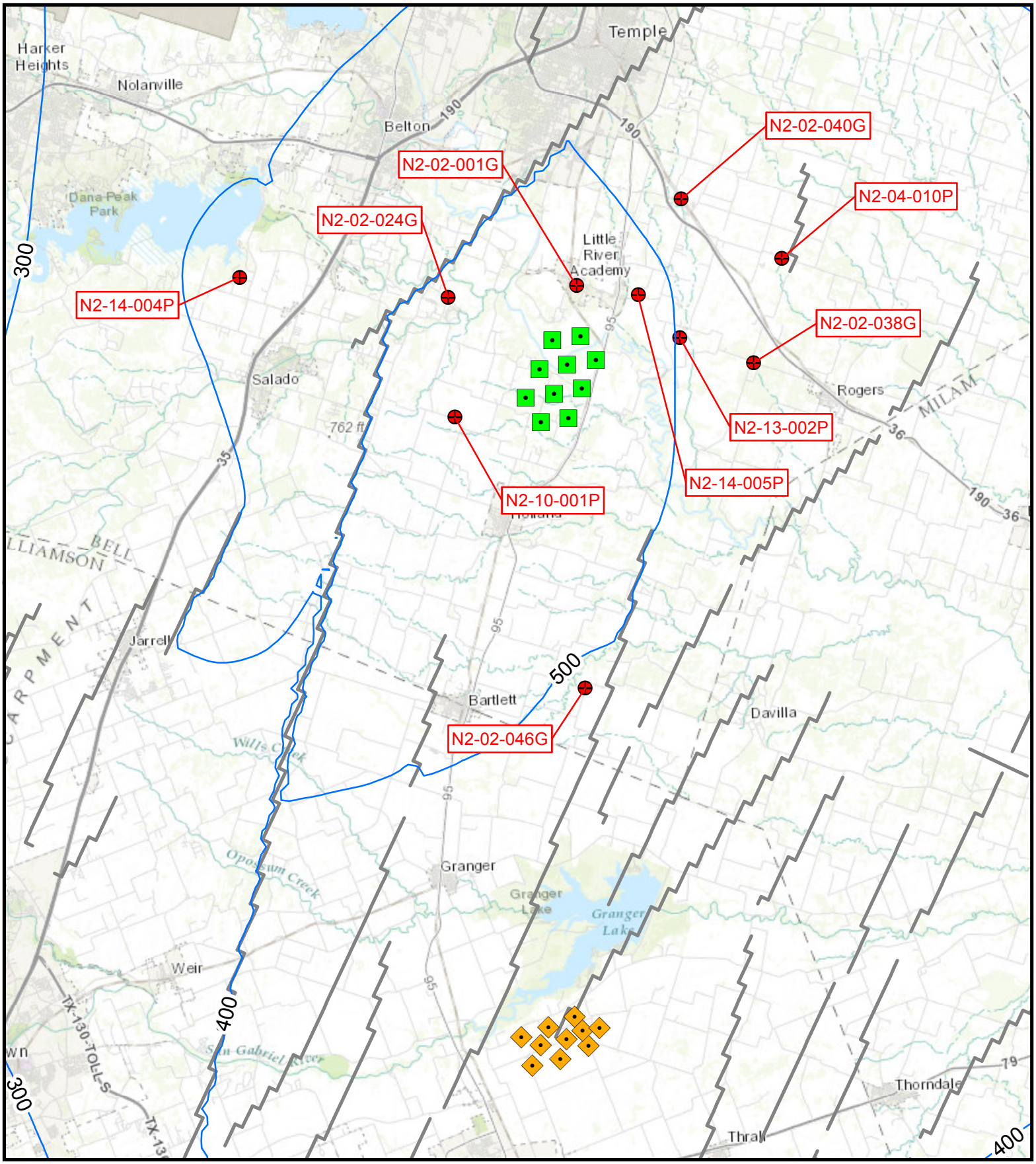
Scenario B-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



Lower Trinity Artesian Head- Scenario B-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

Scenario B-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



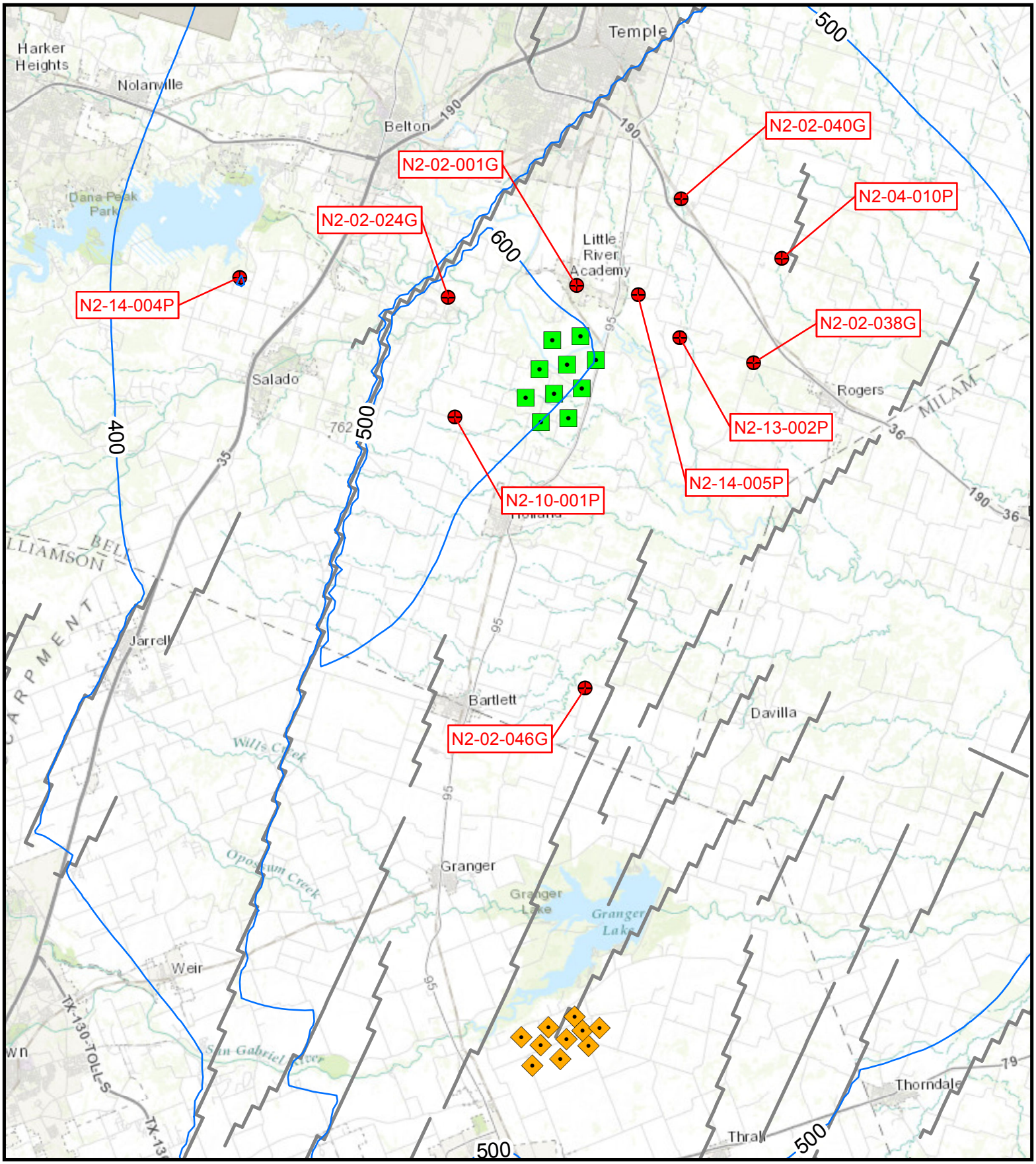
Lower Trinity Drawdown- Scenario B-001 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario B-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-001 - 50 Years

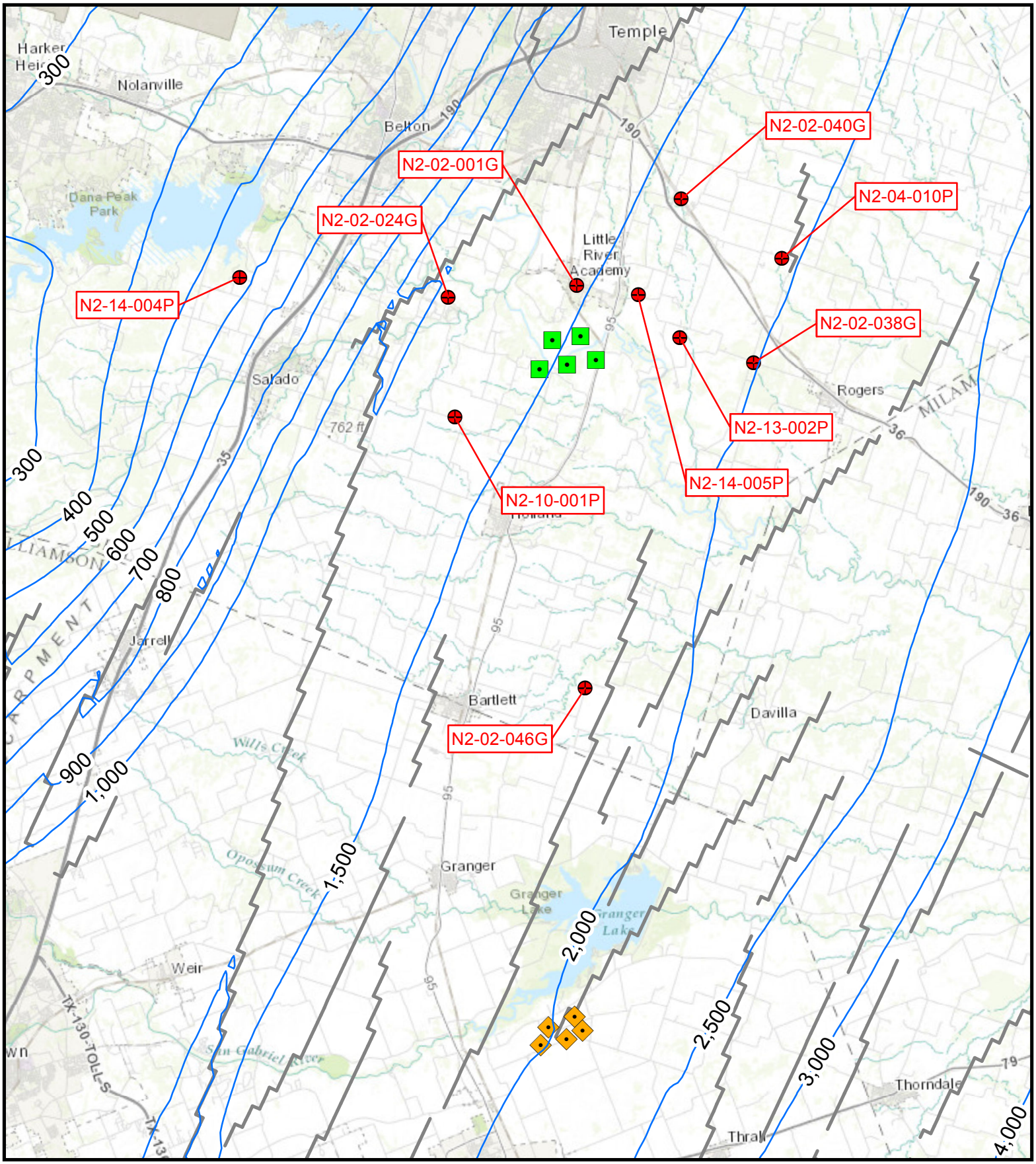
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



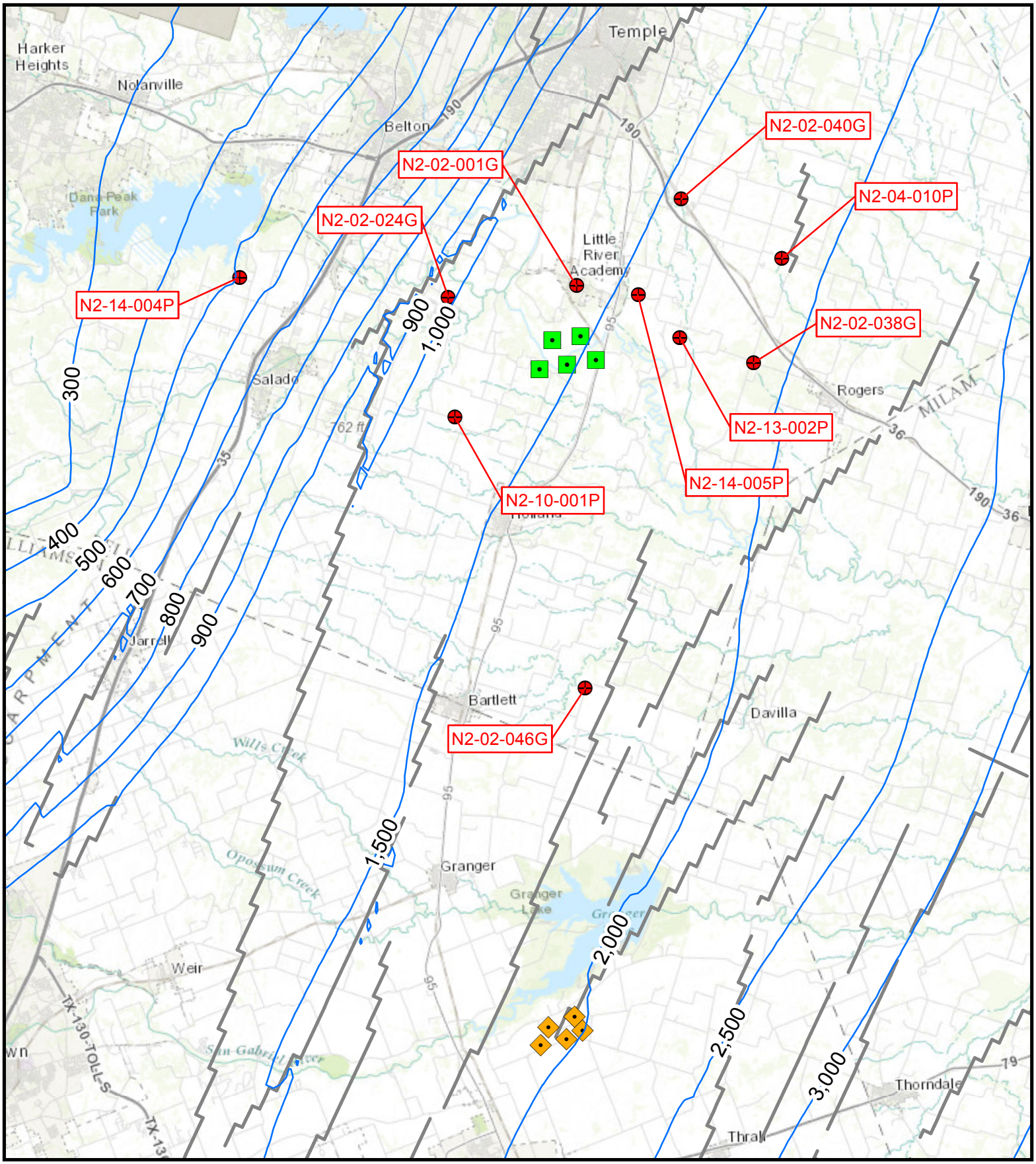
Lower Trinity Artesian Head- Scenario B-002 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario B-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



Lower Trinity Artesian Head- Scenario B-002 - 50 Years

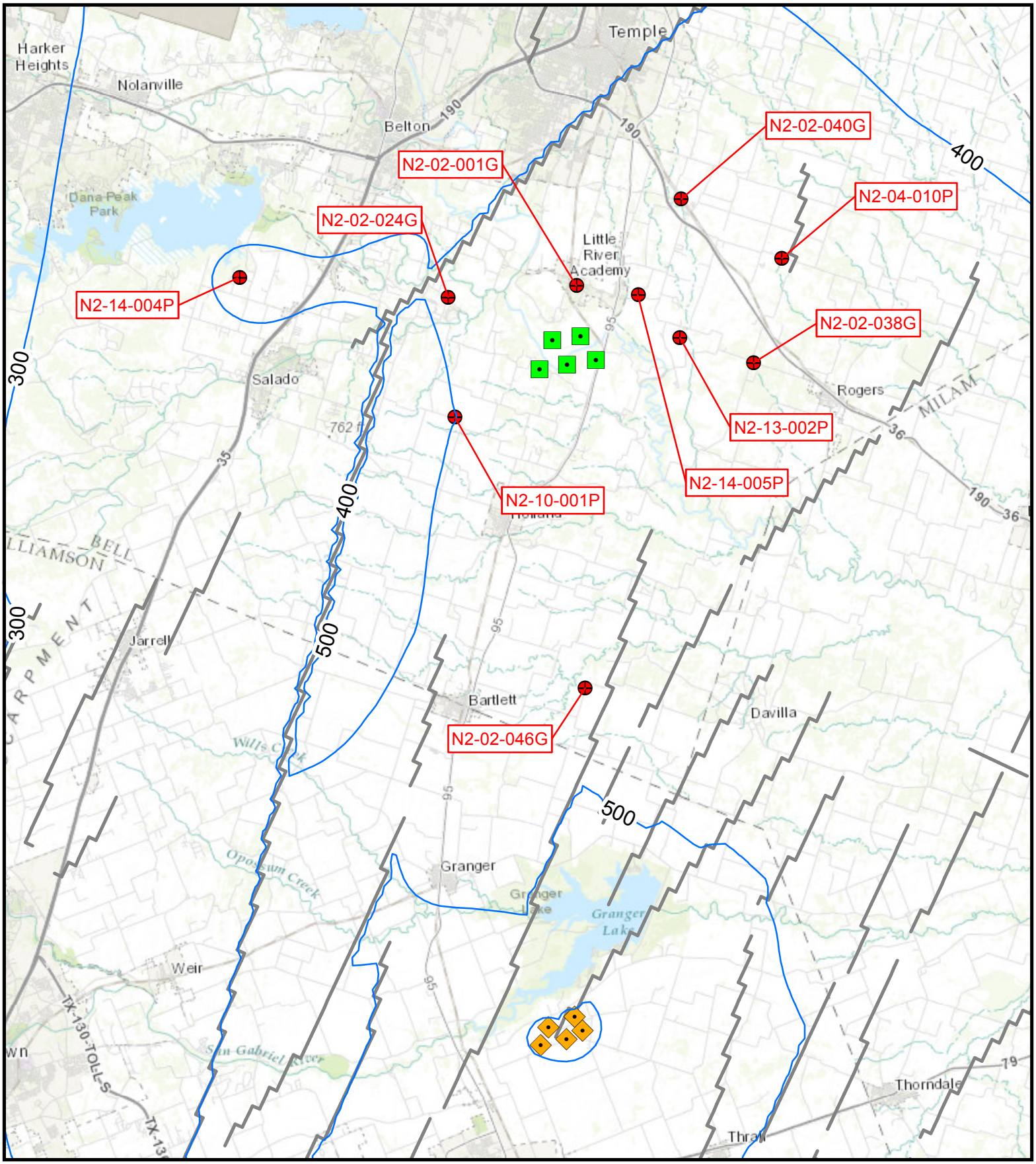
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-002 - 30 Years

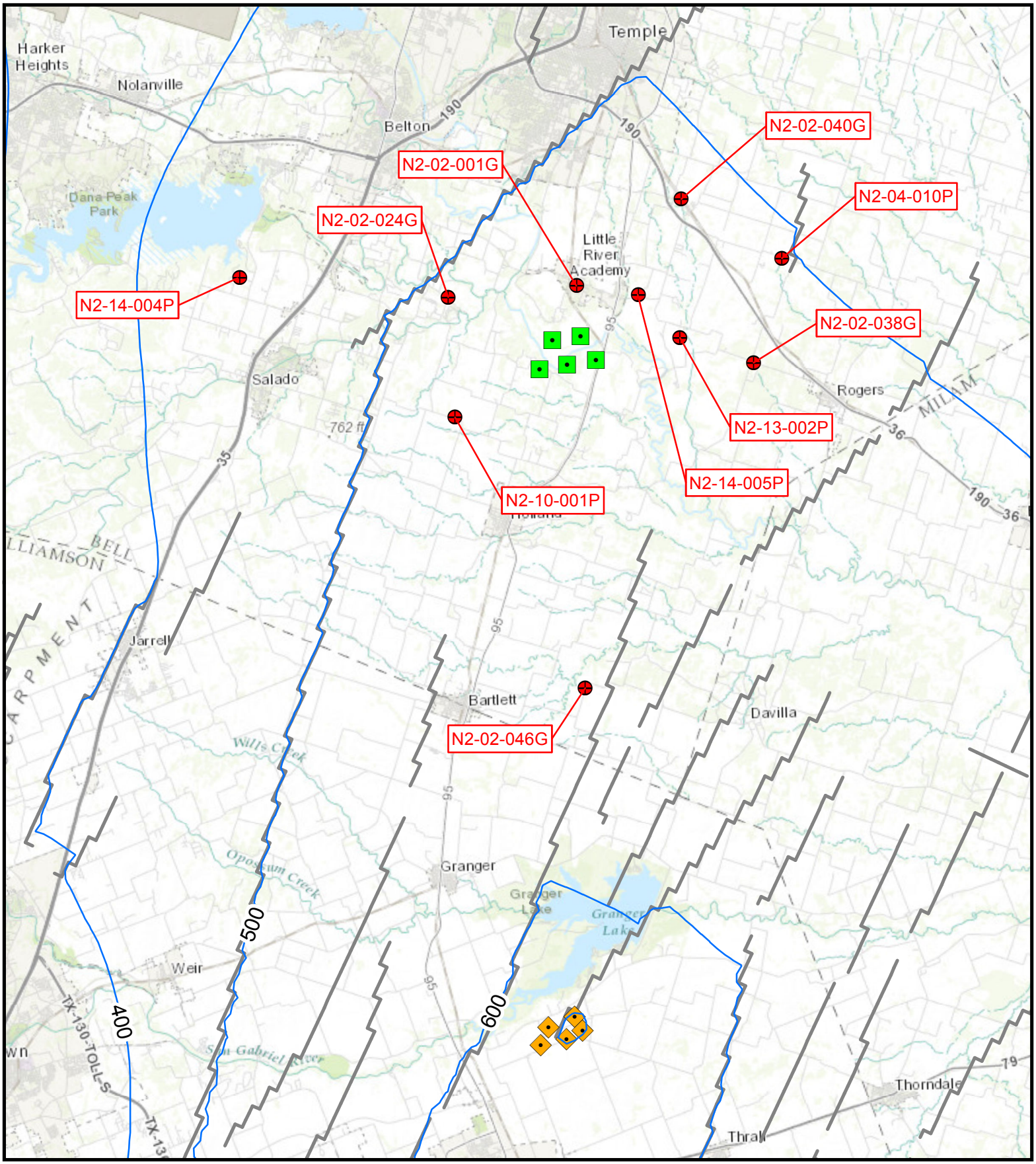
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-002 - 50 Years

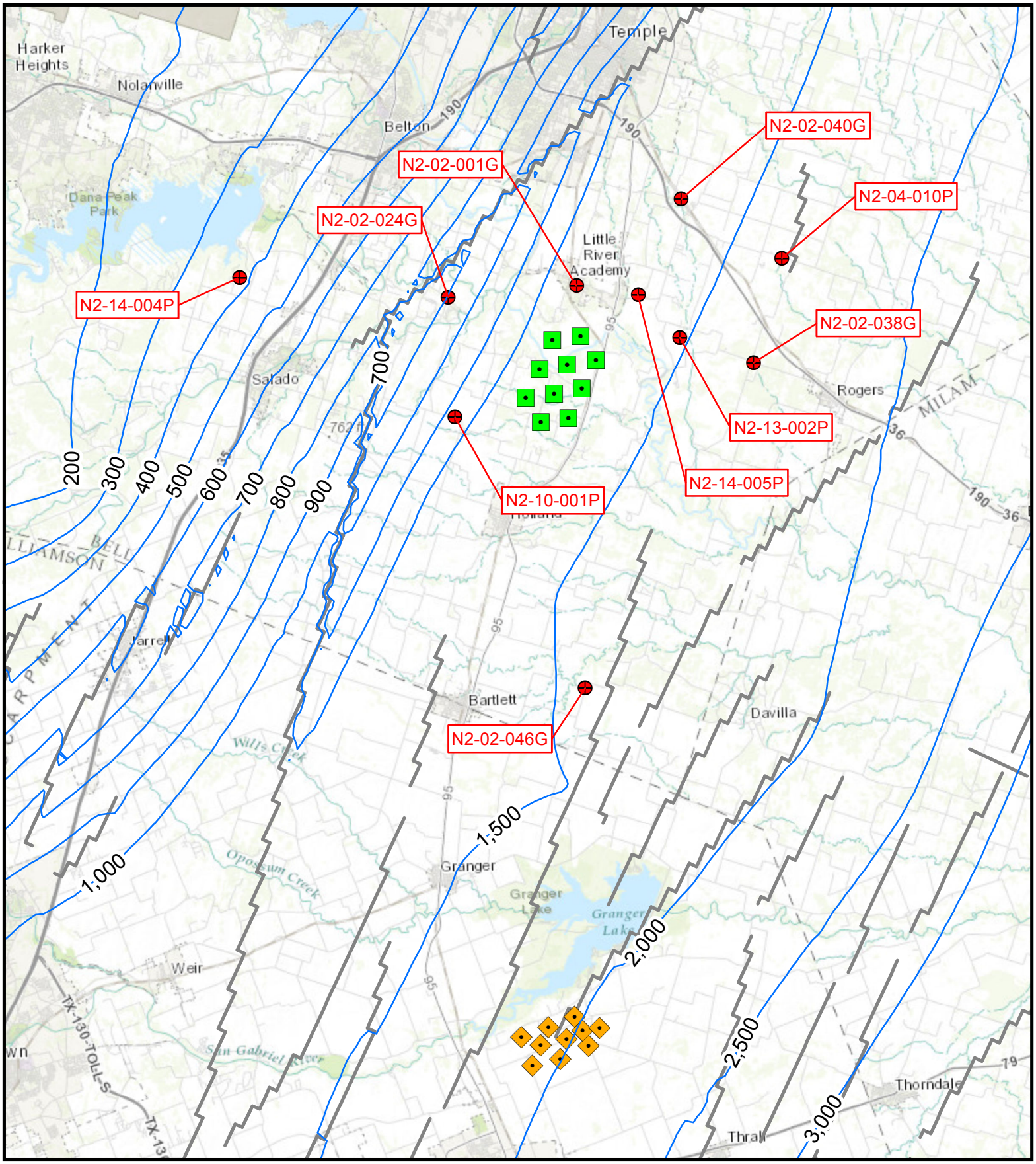
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

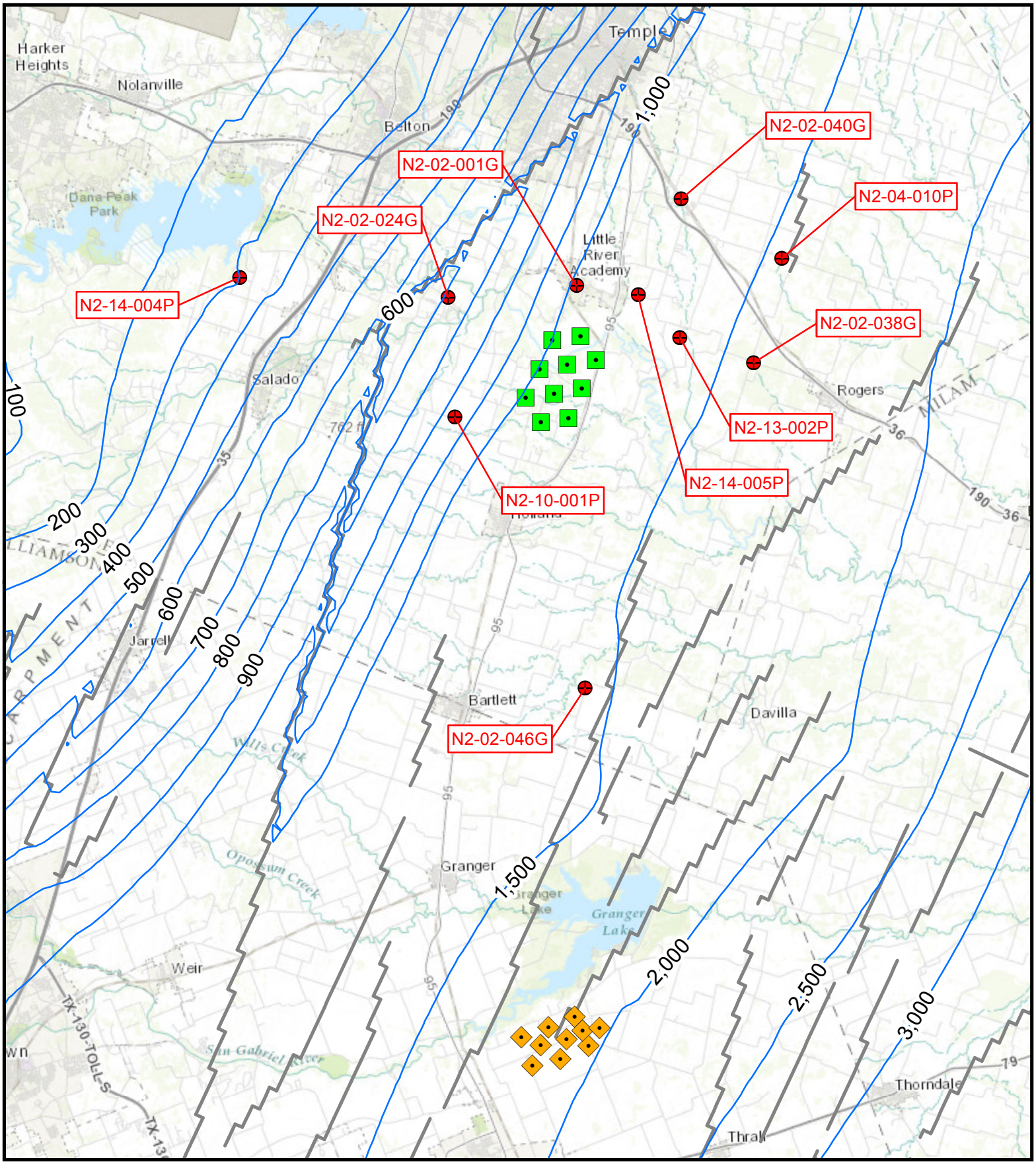
Scenario B-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model



Lower Trinity Artesian Head- Scenario B-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

Scenario B-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



Lower Trinity Artesian Head- Scenario B-003 - 50 Years

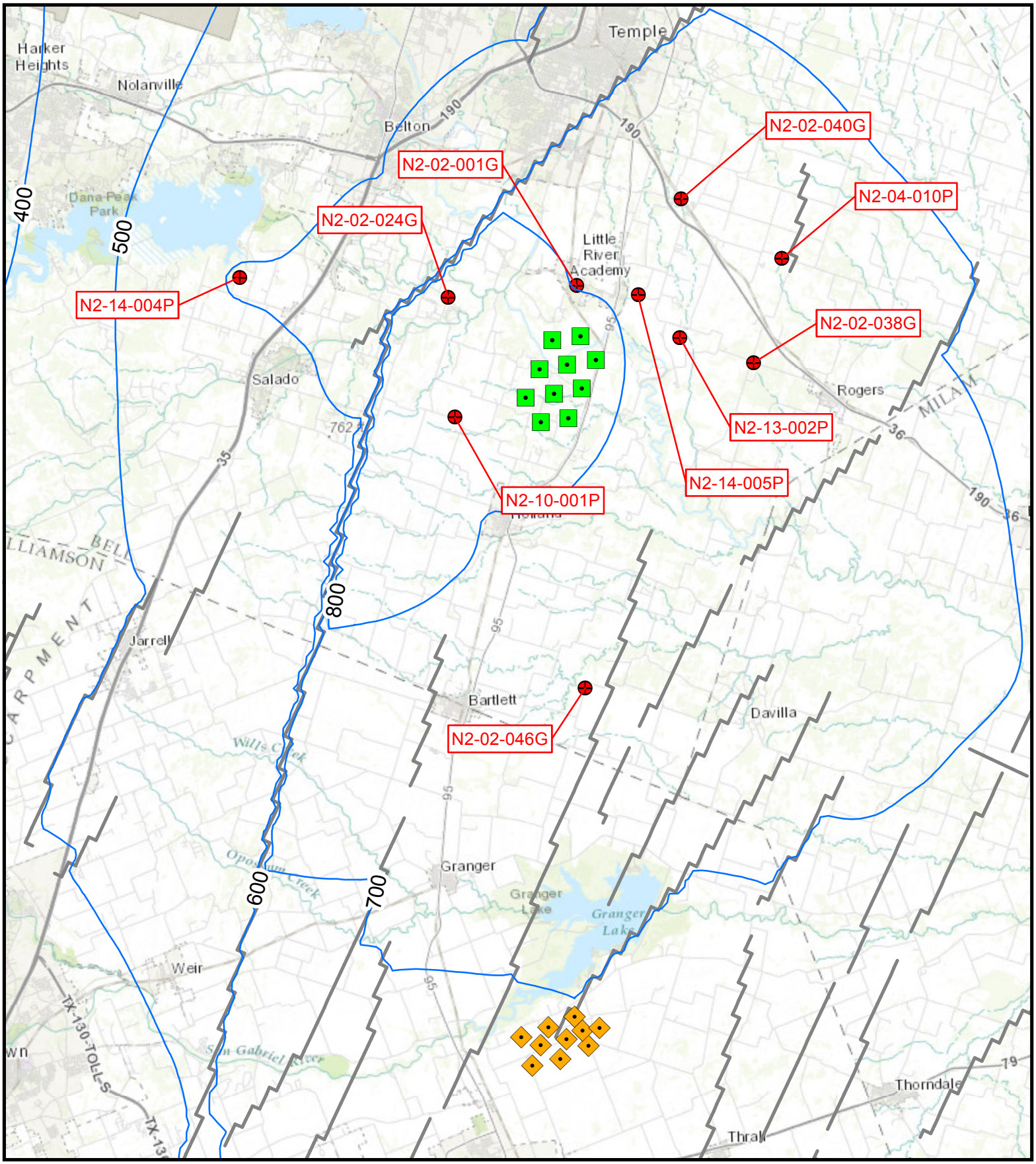
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-003 - 30 Years

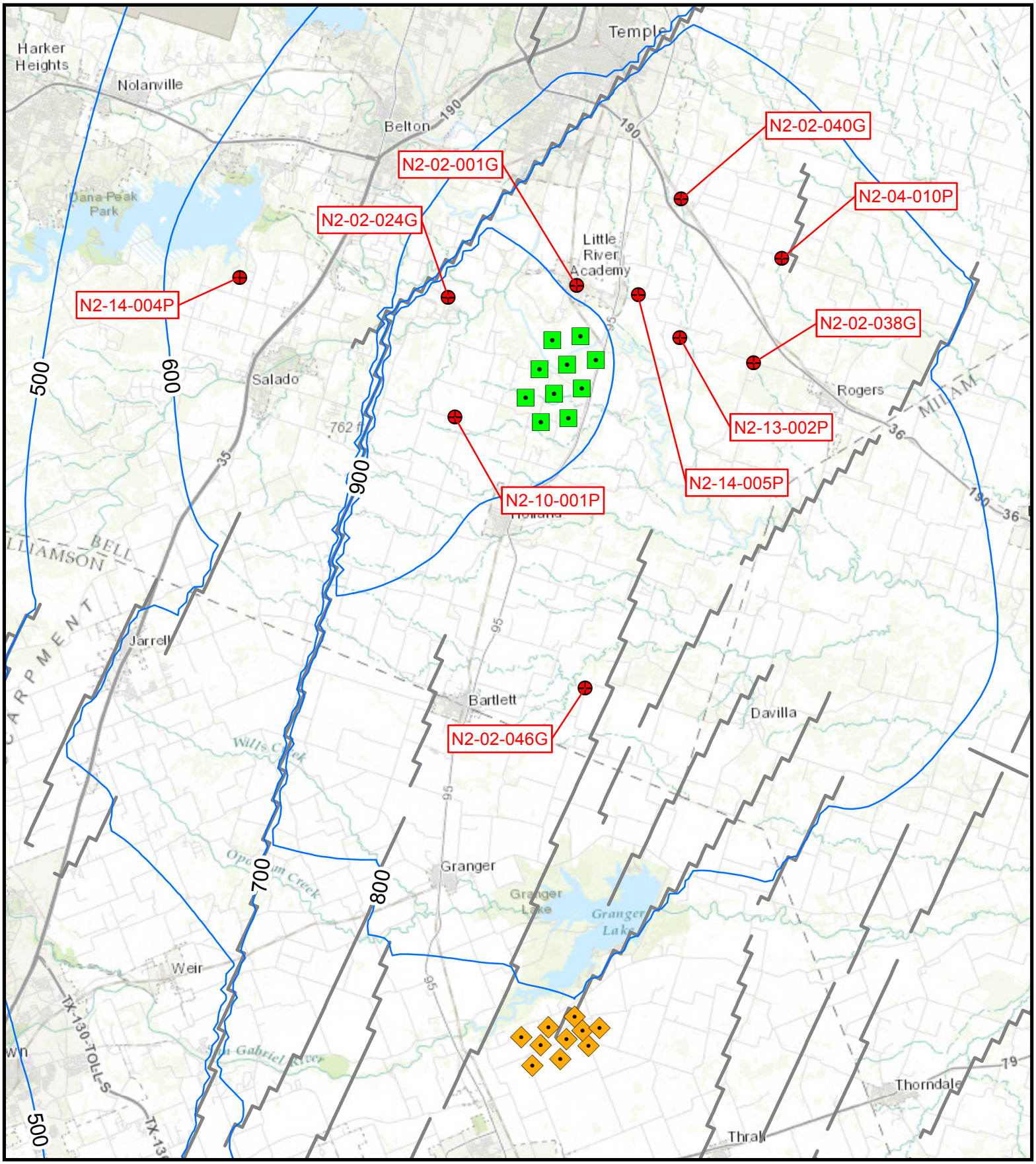
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-003 - 50 Years

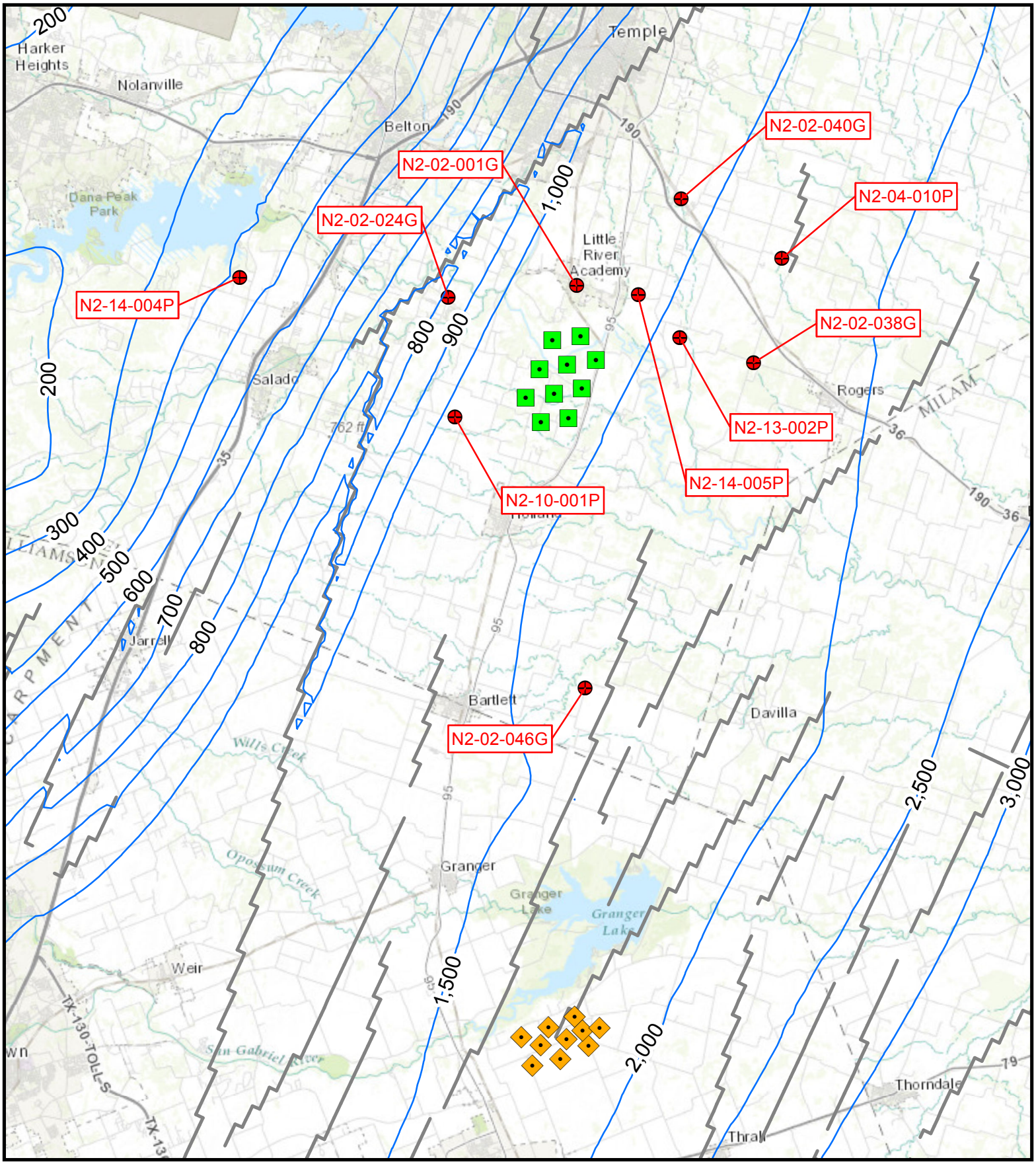
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



Lower Trinity Artesian Head- Scenario B-004 - 30 Years

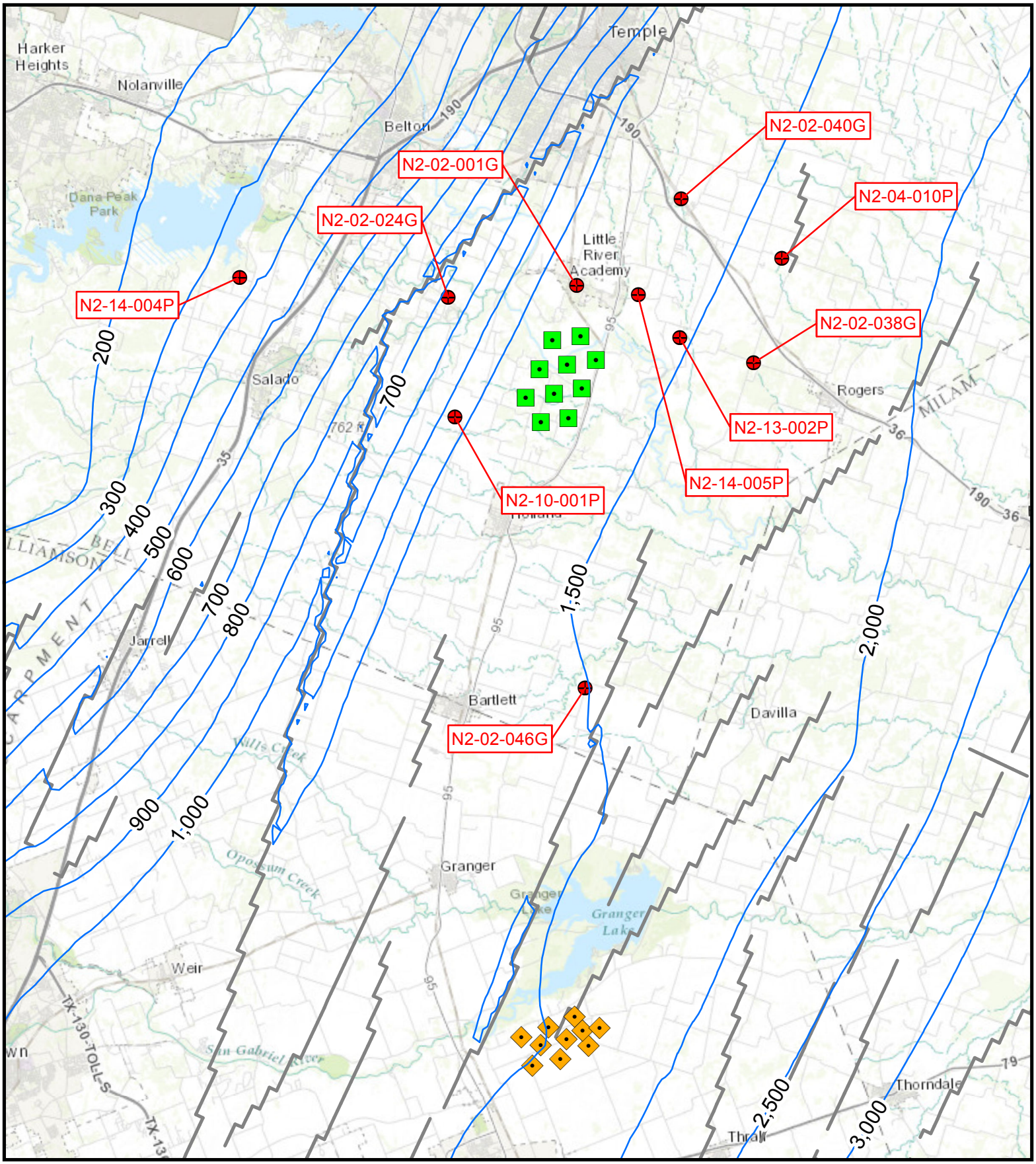
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



Lower Trinity Artesian Head- Scenario B-004 - 50 Years

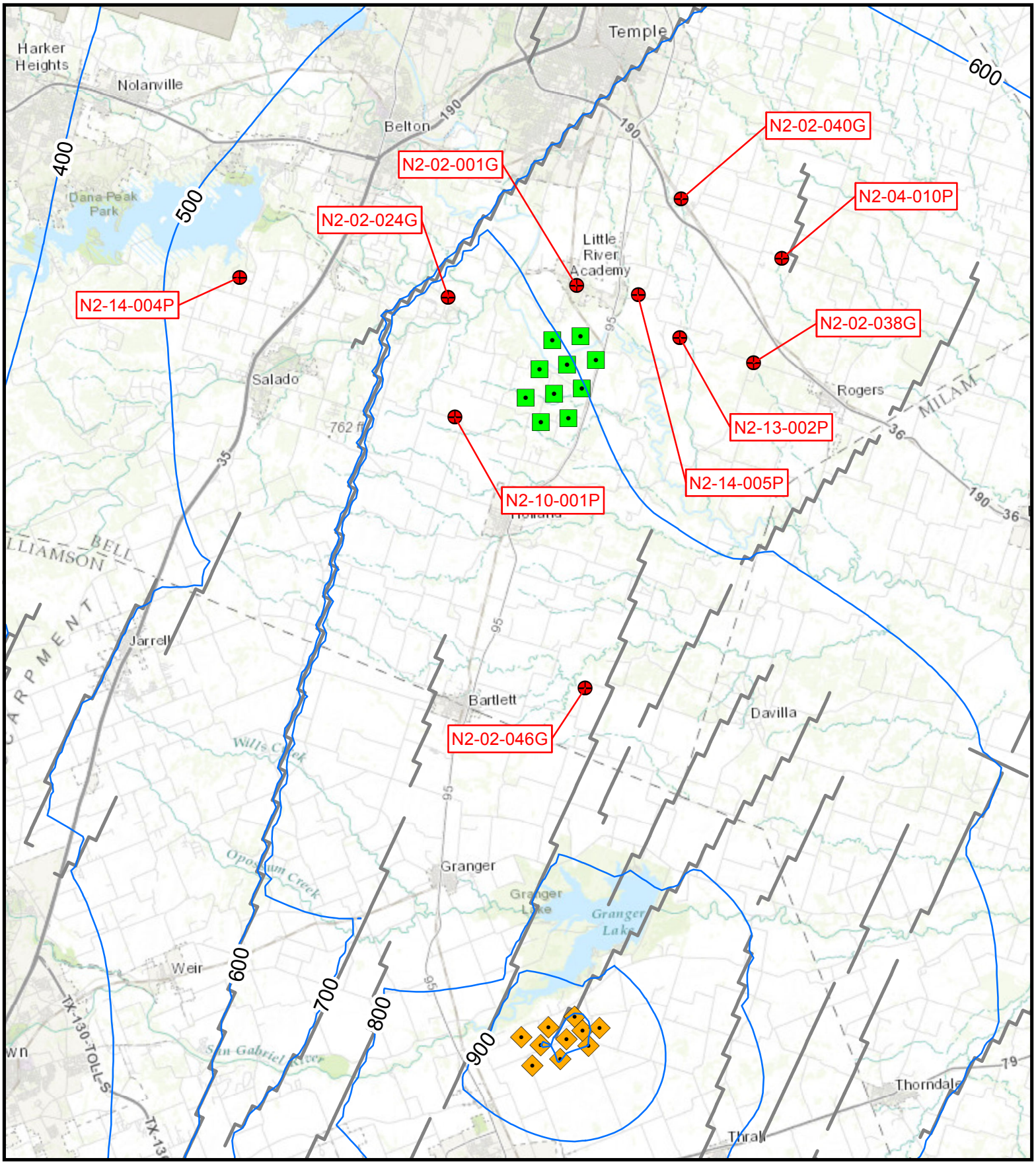
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model

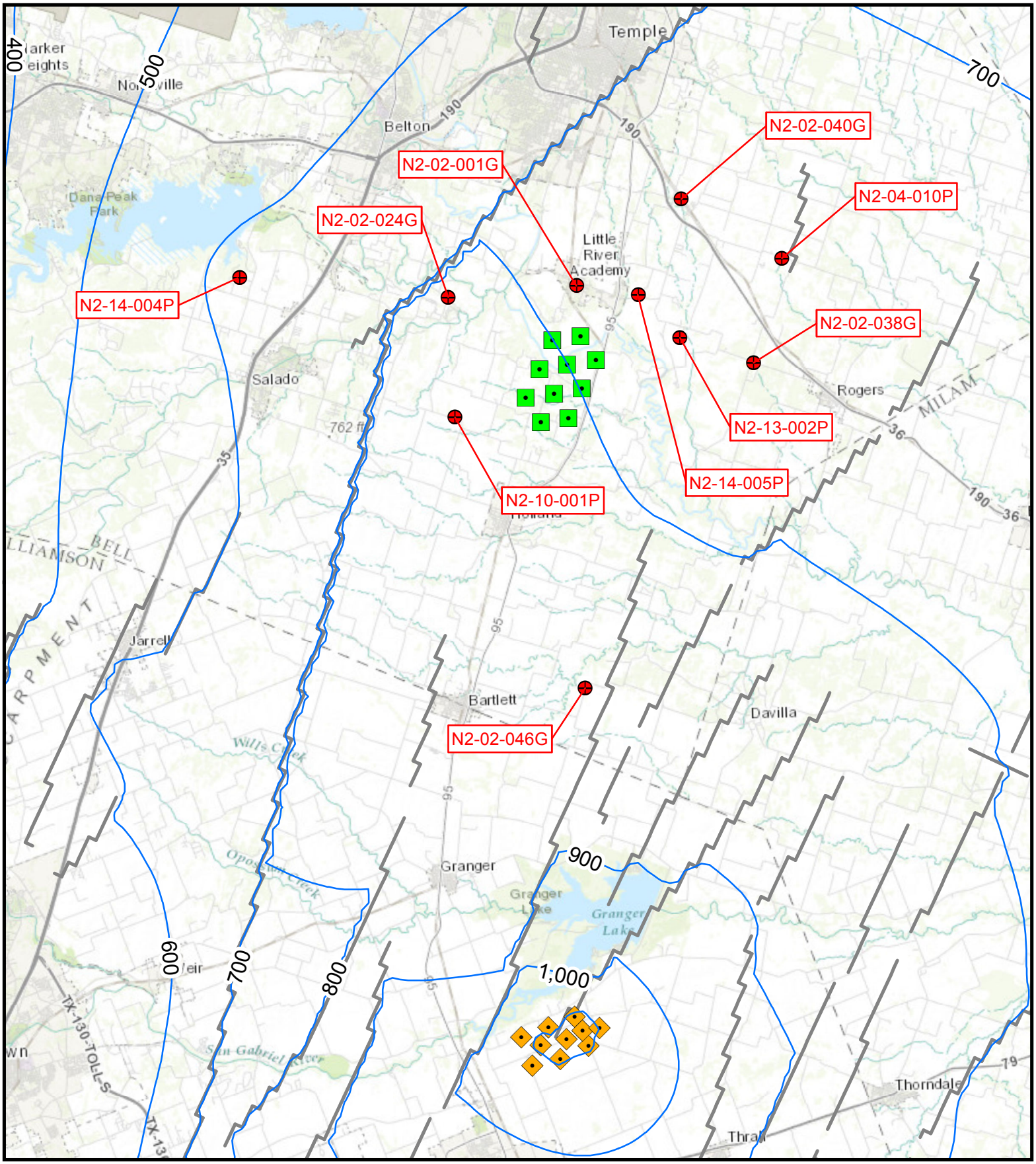


Lower Trinity Drawdown- Scenario B-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

0 2 4 Miles

Scenario B-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



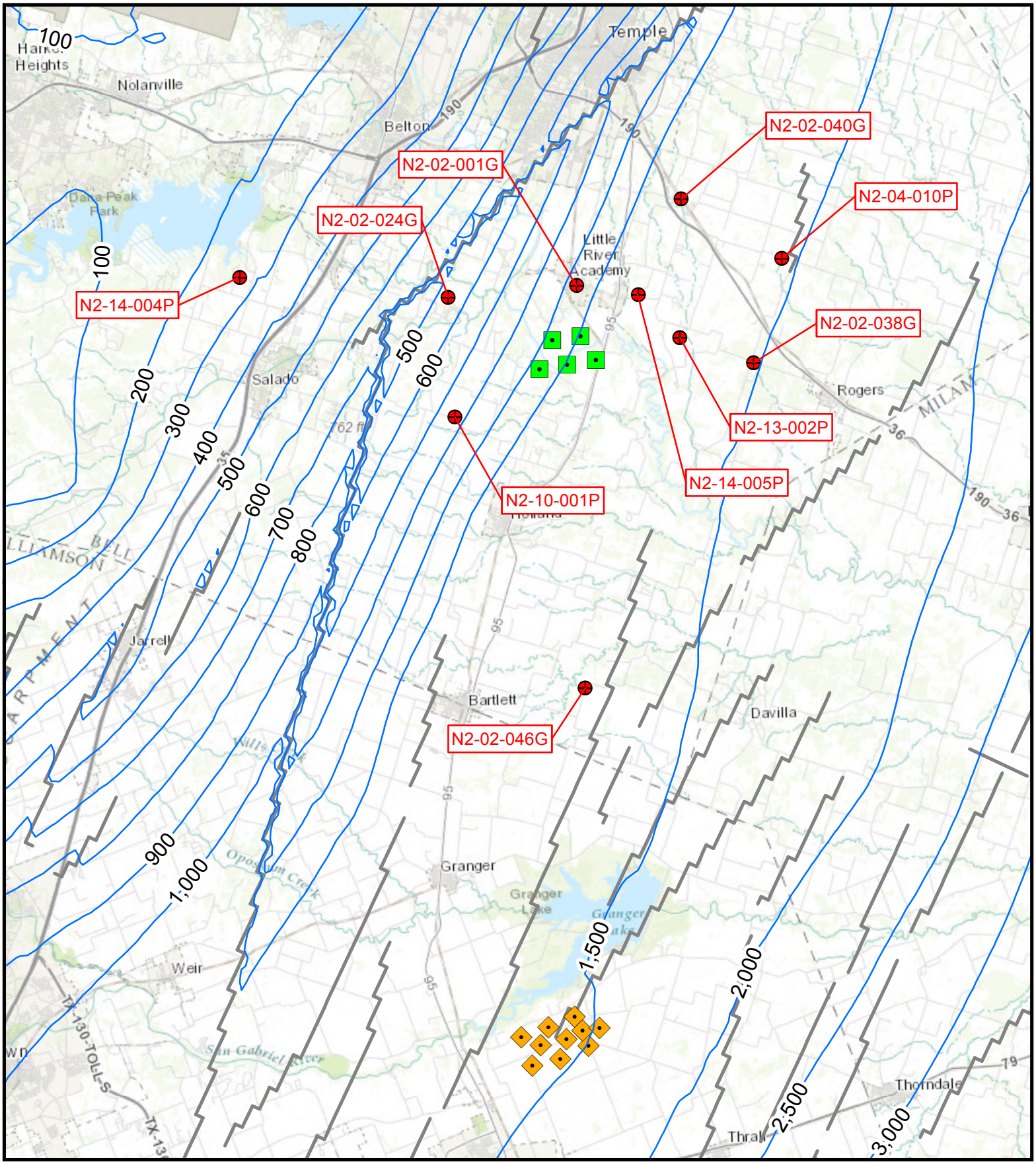
Lower Trinity Drawdown- Scenario B-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario B-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model



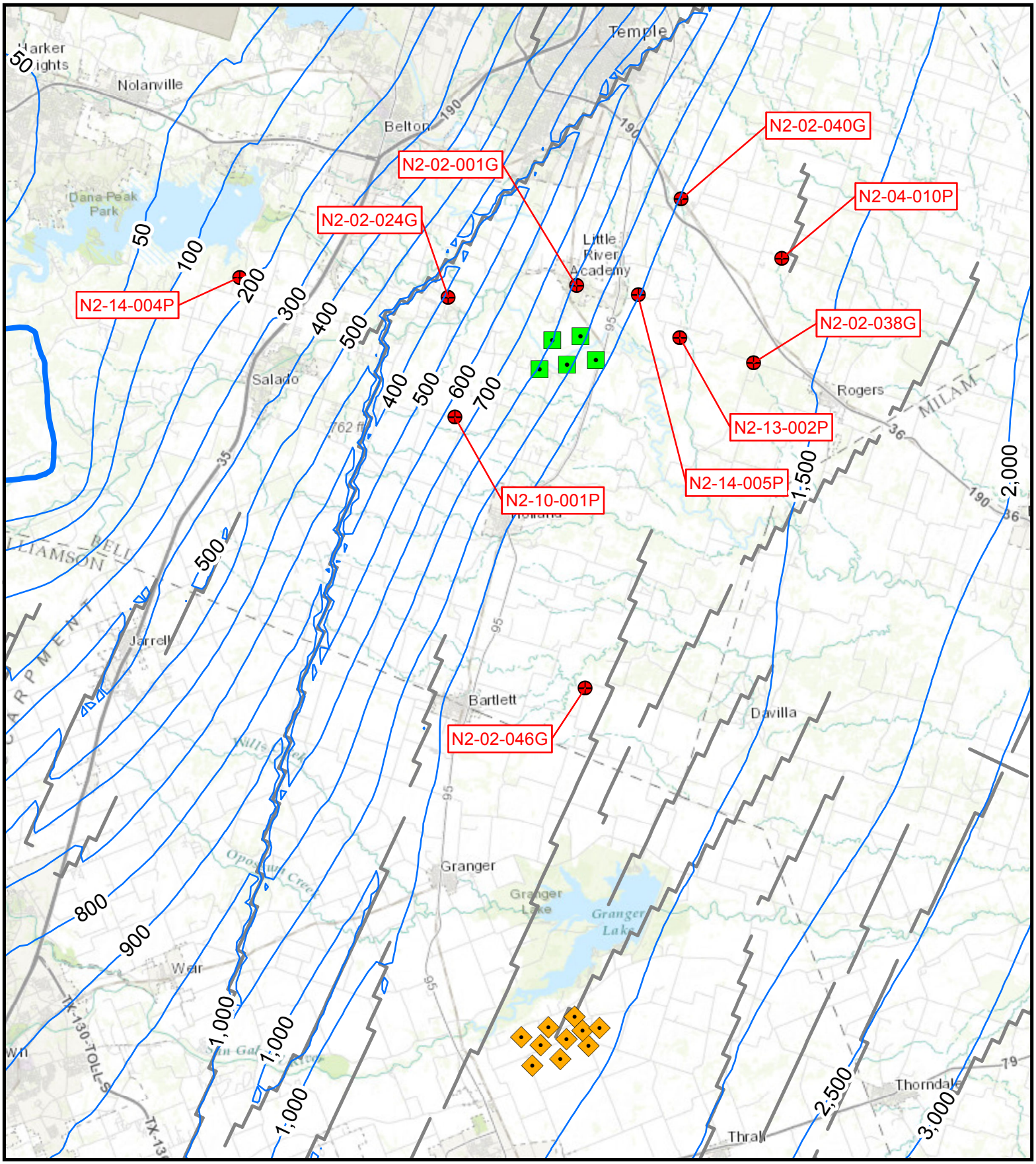
Lower Trinity Artesian Head- Scenario B-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario B-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model



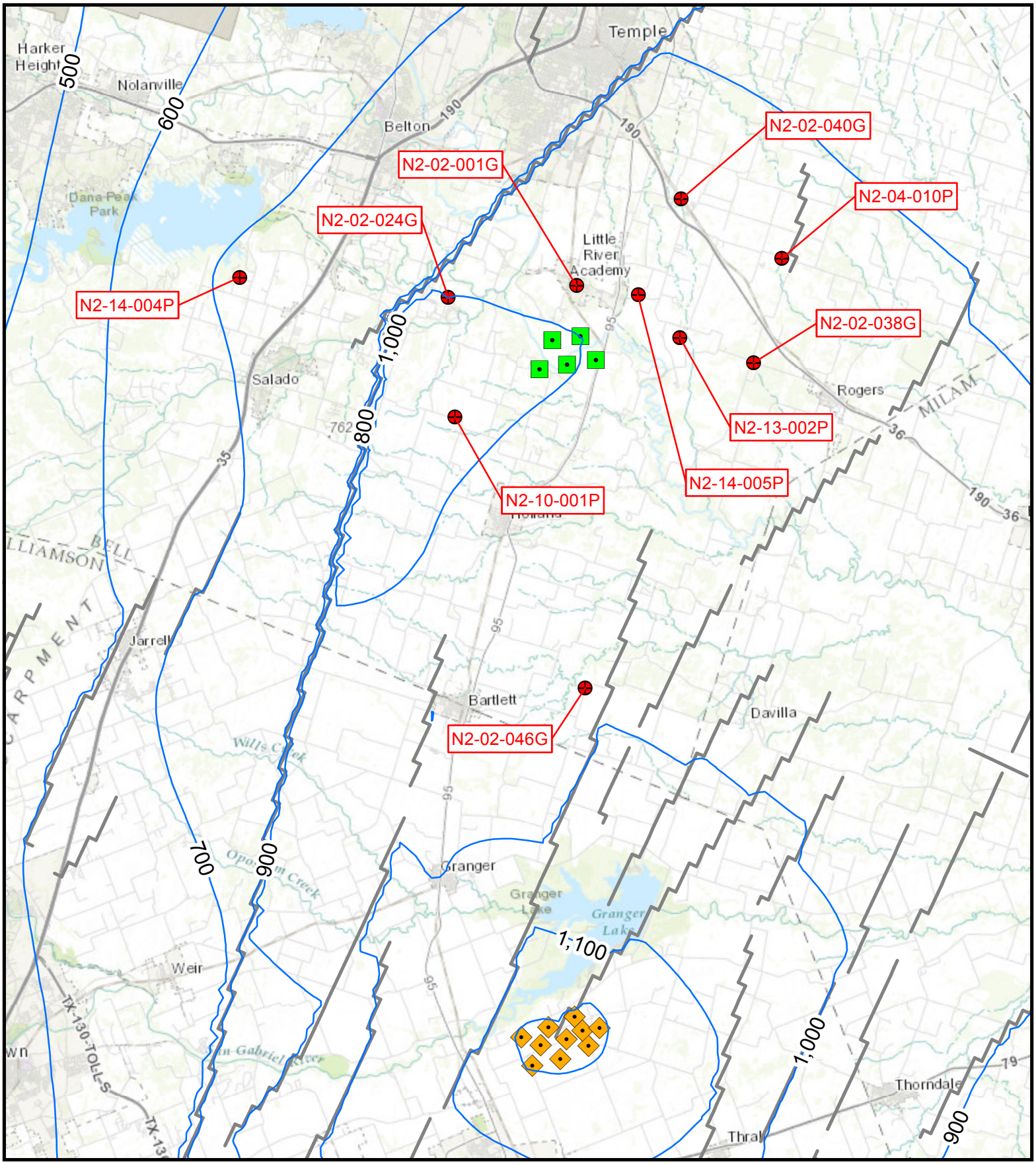
Lower Trinity Artesian Head- Scenario B-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario B-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-005 - 30 Years

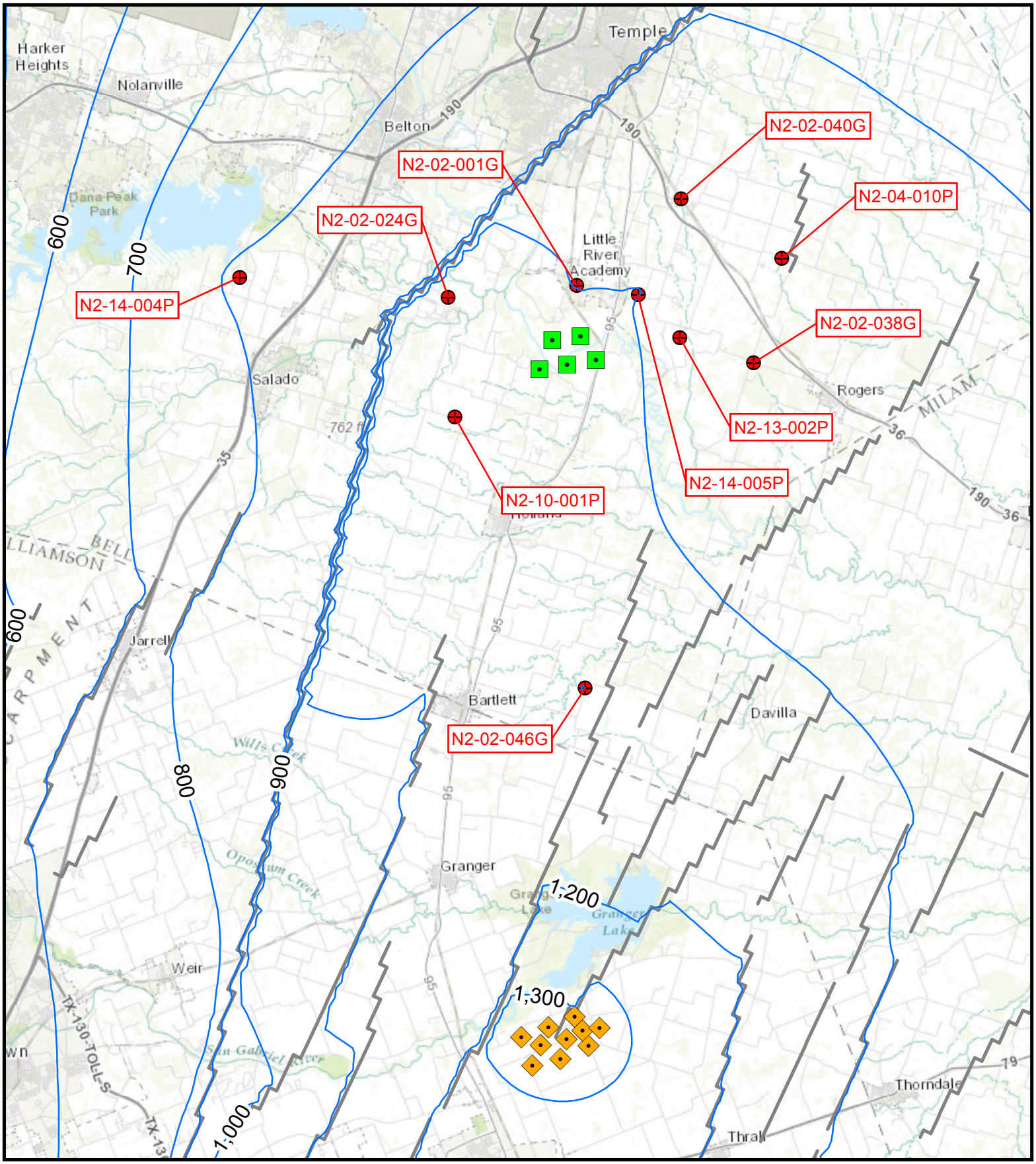
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-005 - 50 Years

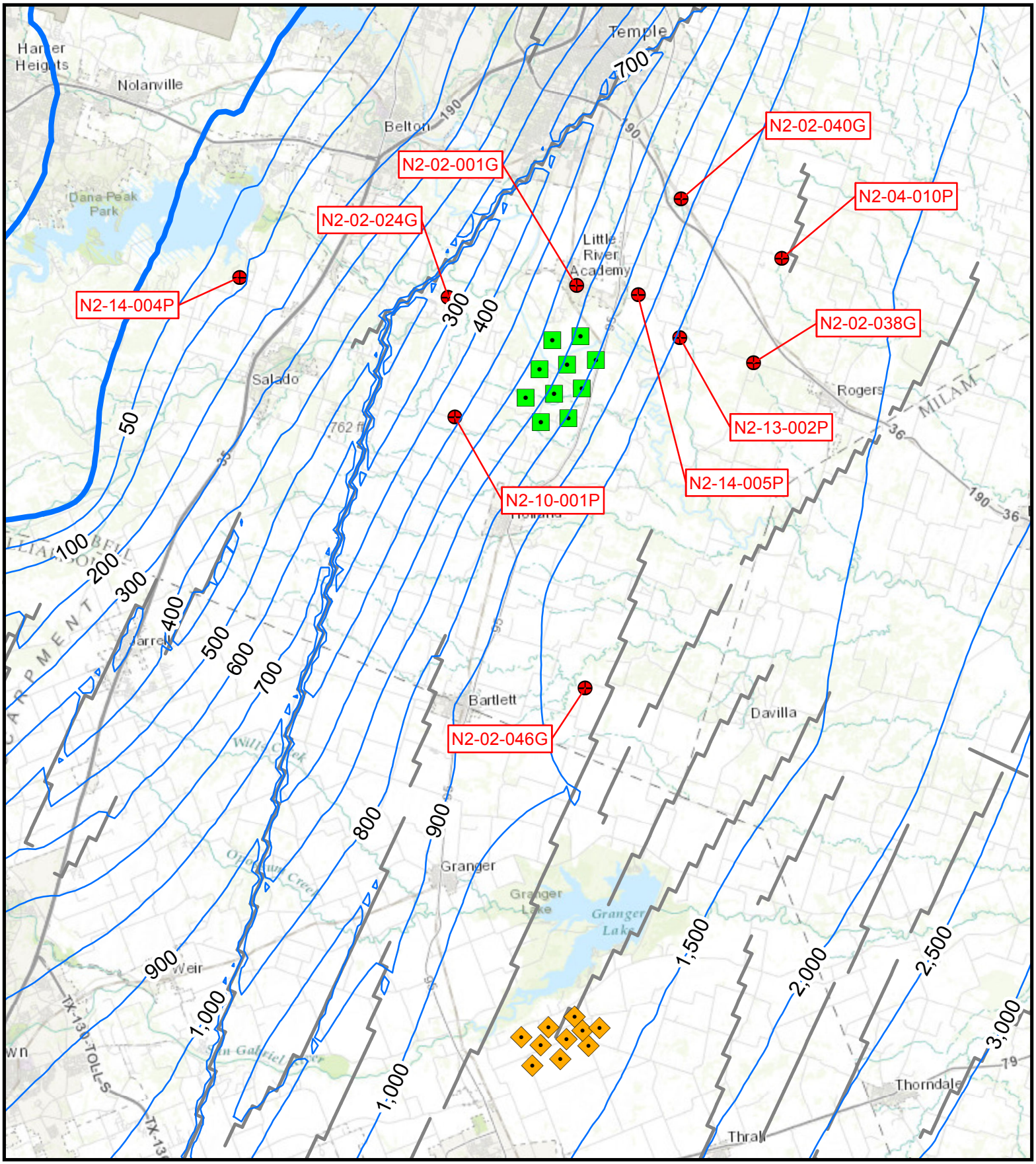
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario B-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model



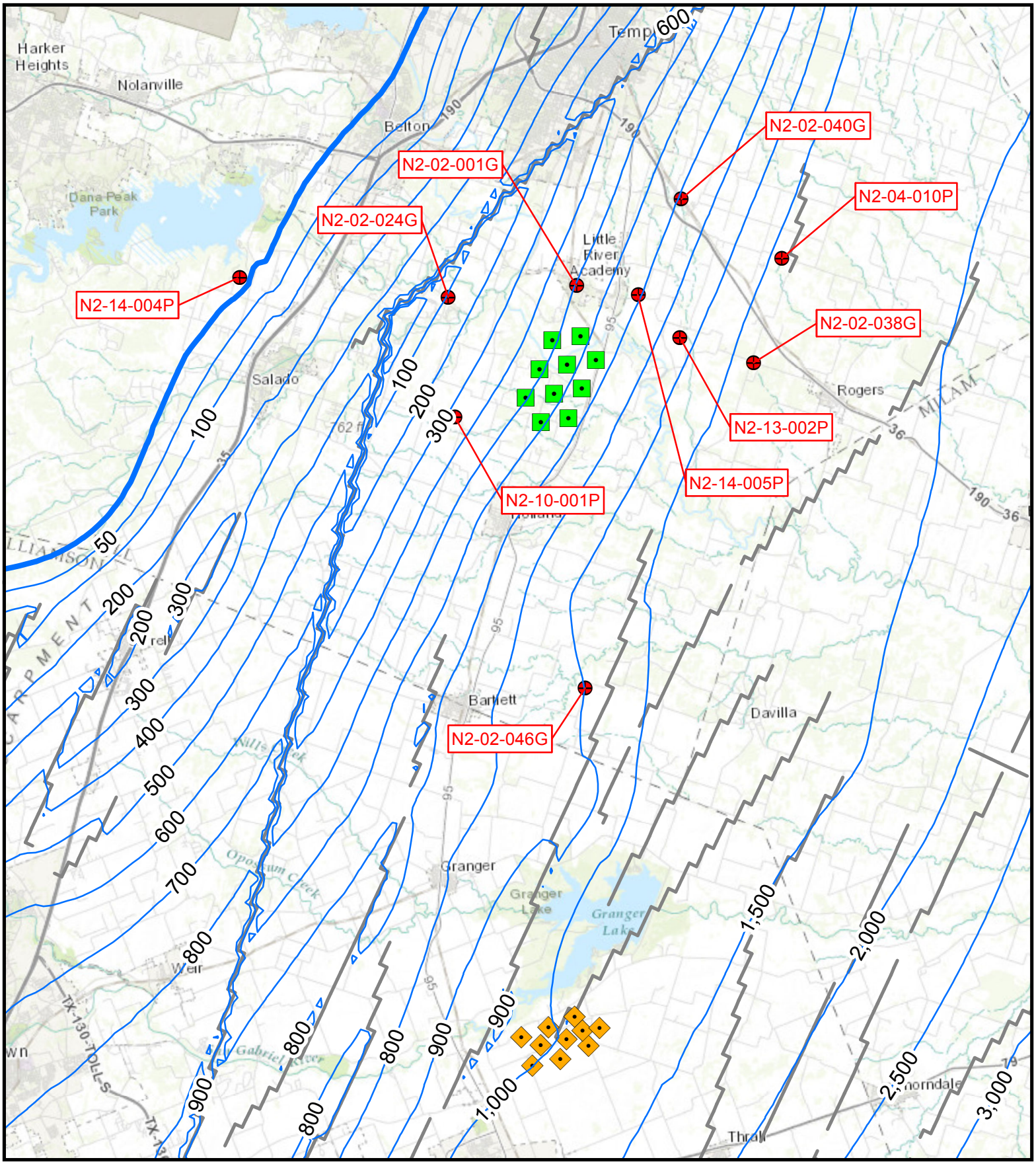
Lower Trinity Artesian Head- Scenario B-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario B-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model



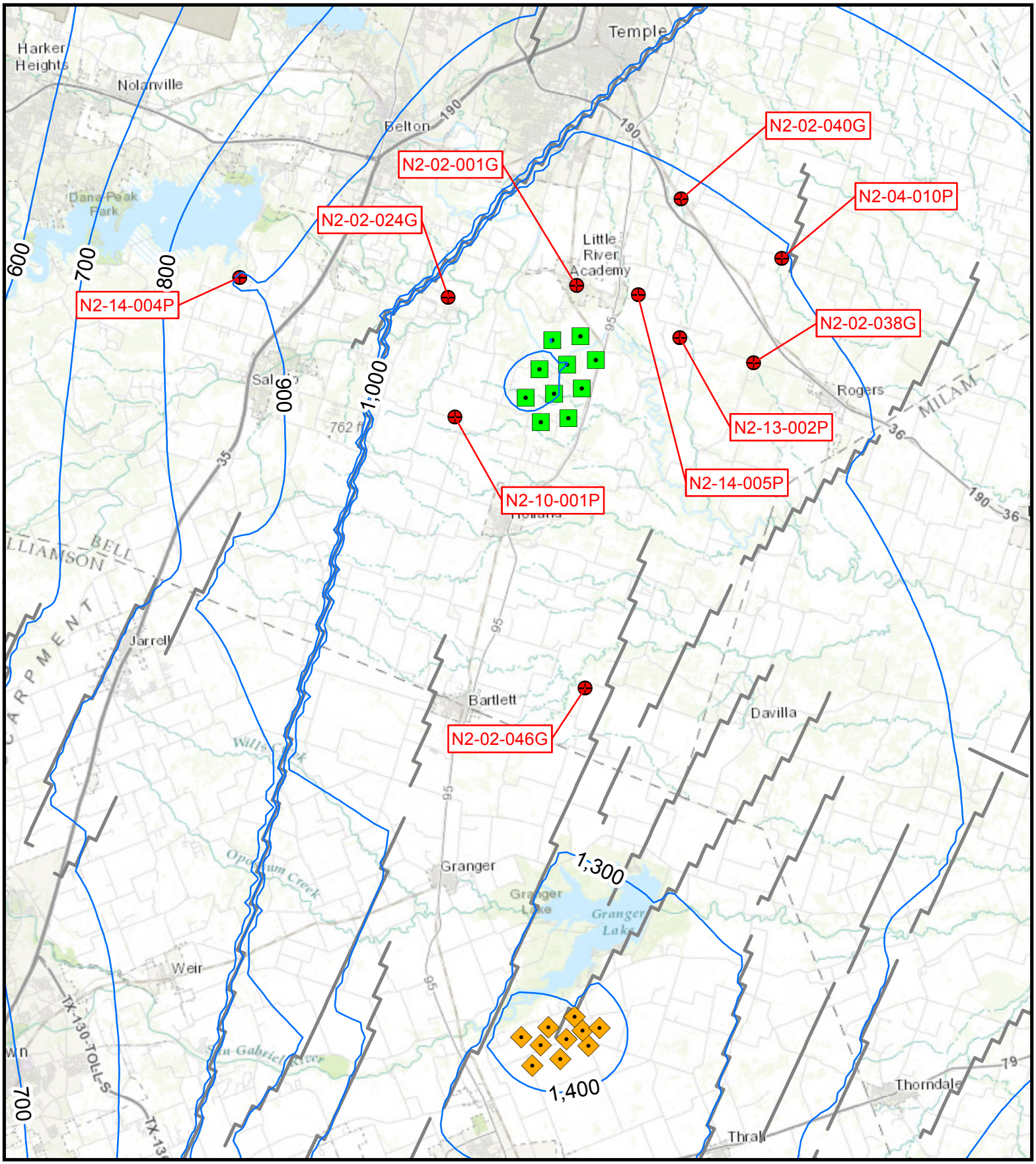
Lower Trinity Artesian Head- Scenario B-006 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario B-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model



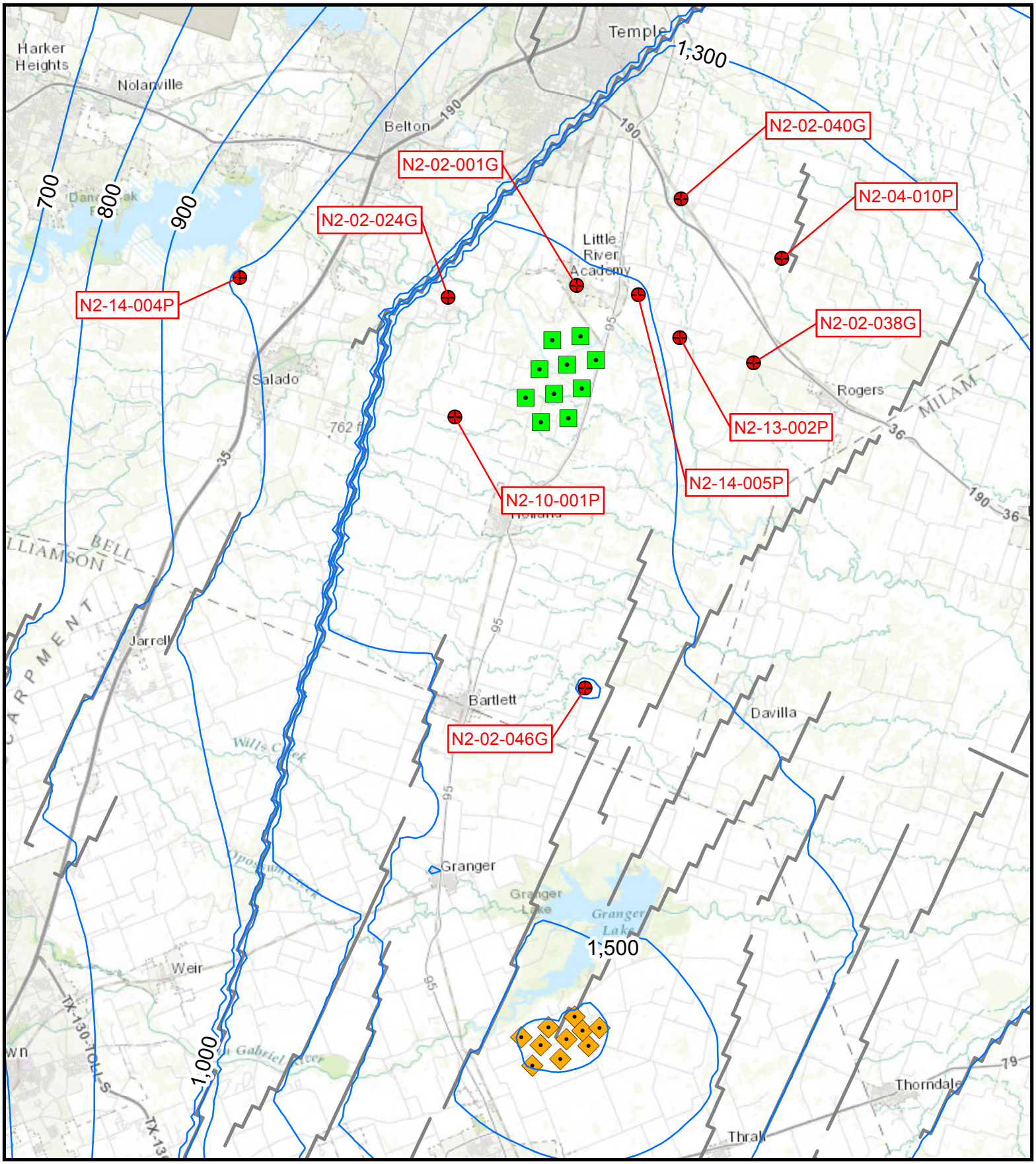
Lower Trinity Drawdown- Scenario B-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario B-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model



Lower Trinity Drawdown- Scenario B-006 - 50 Years

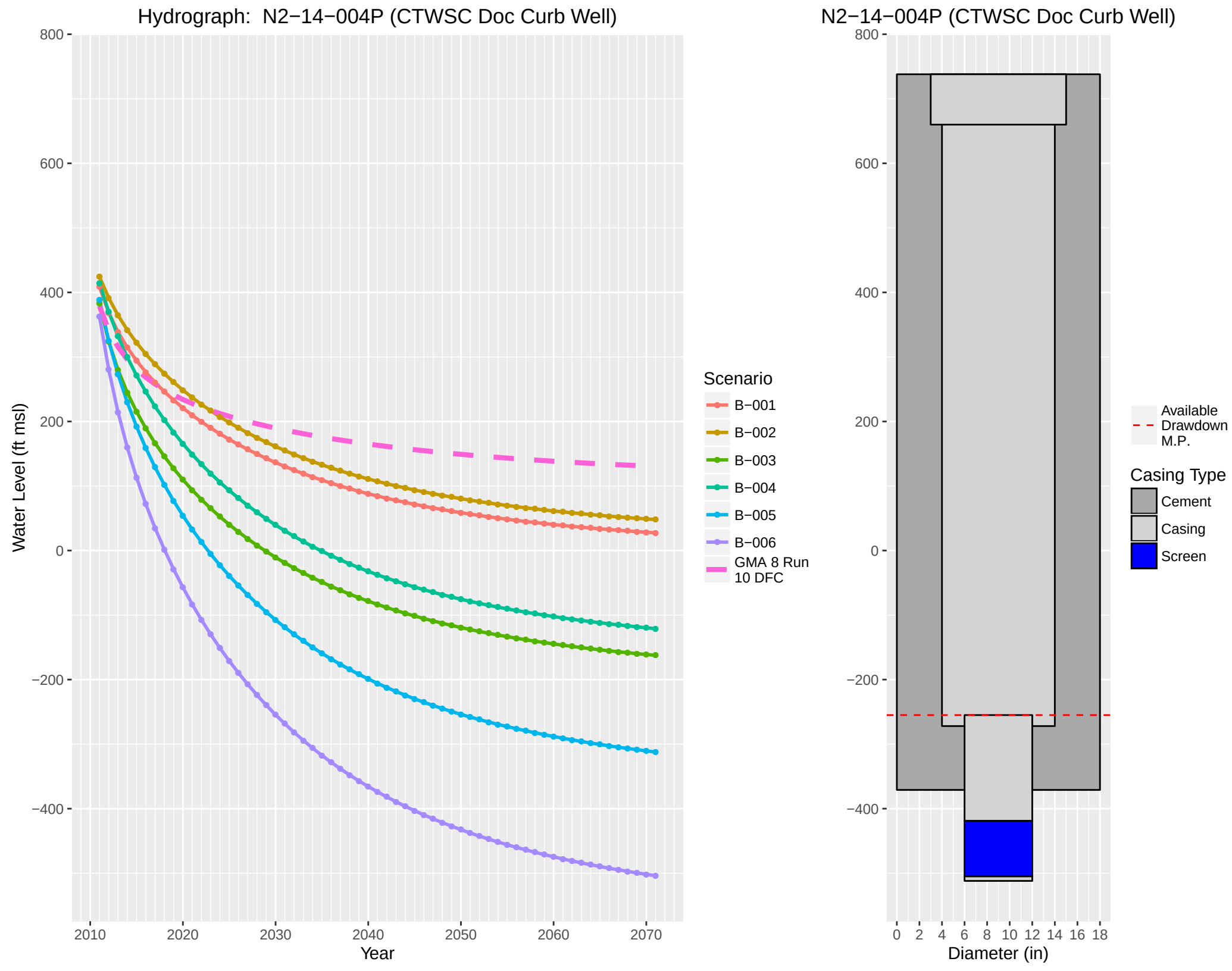
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

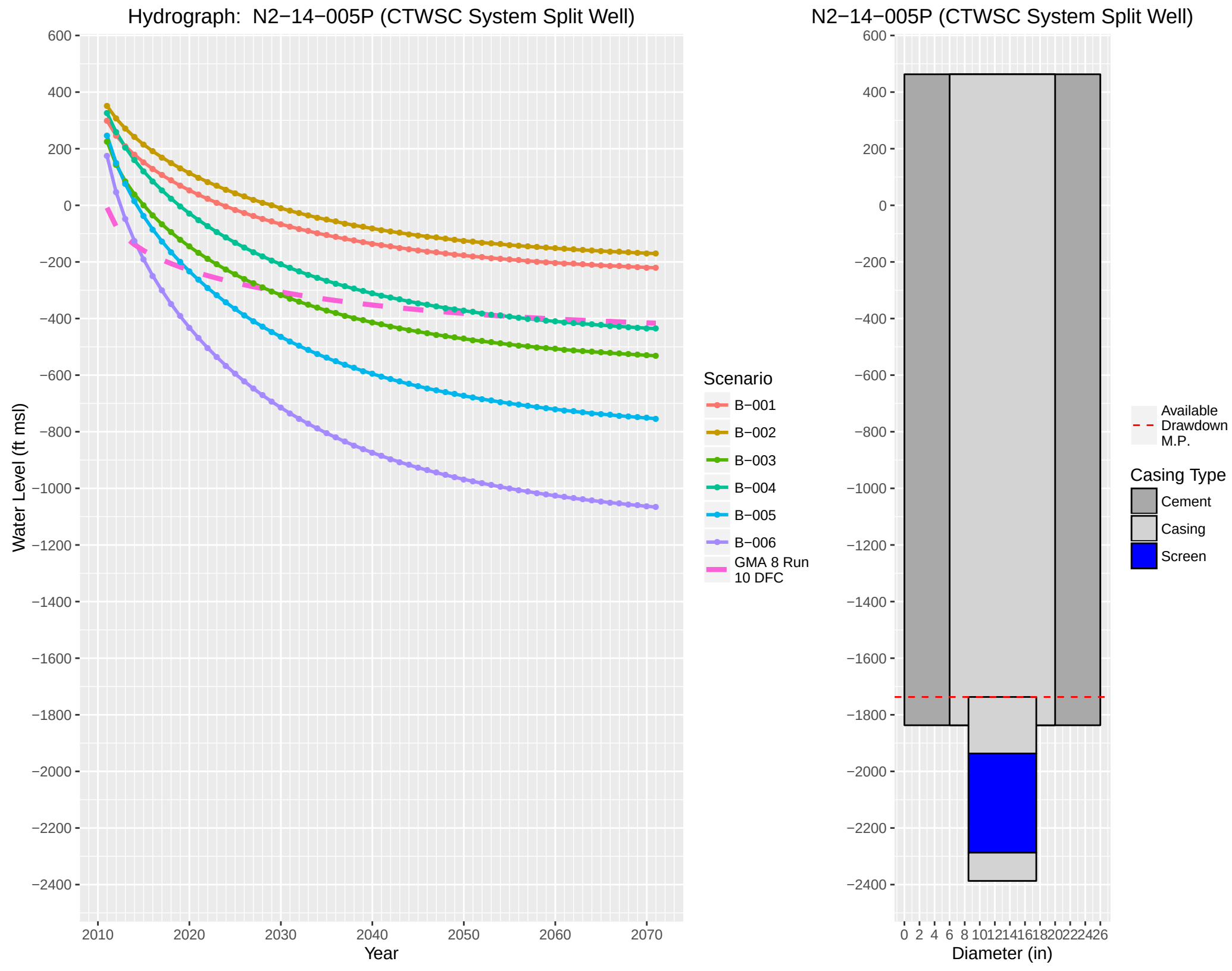
N

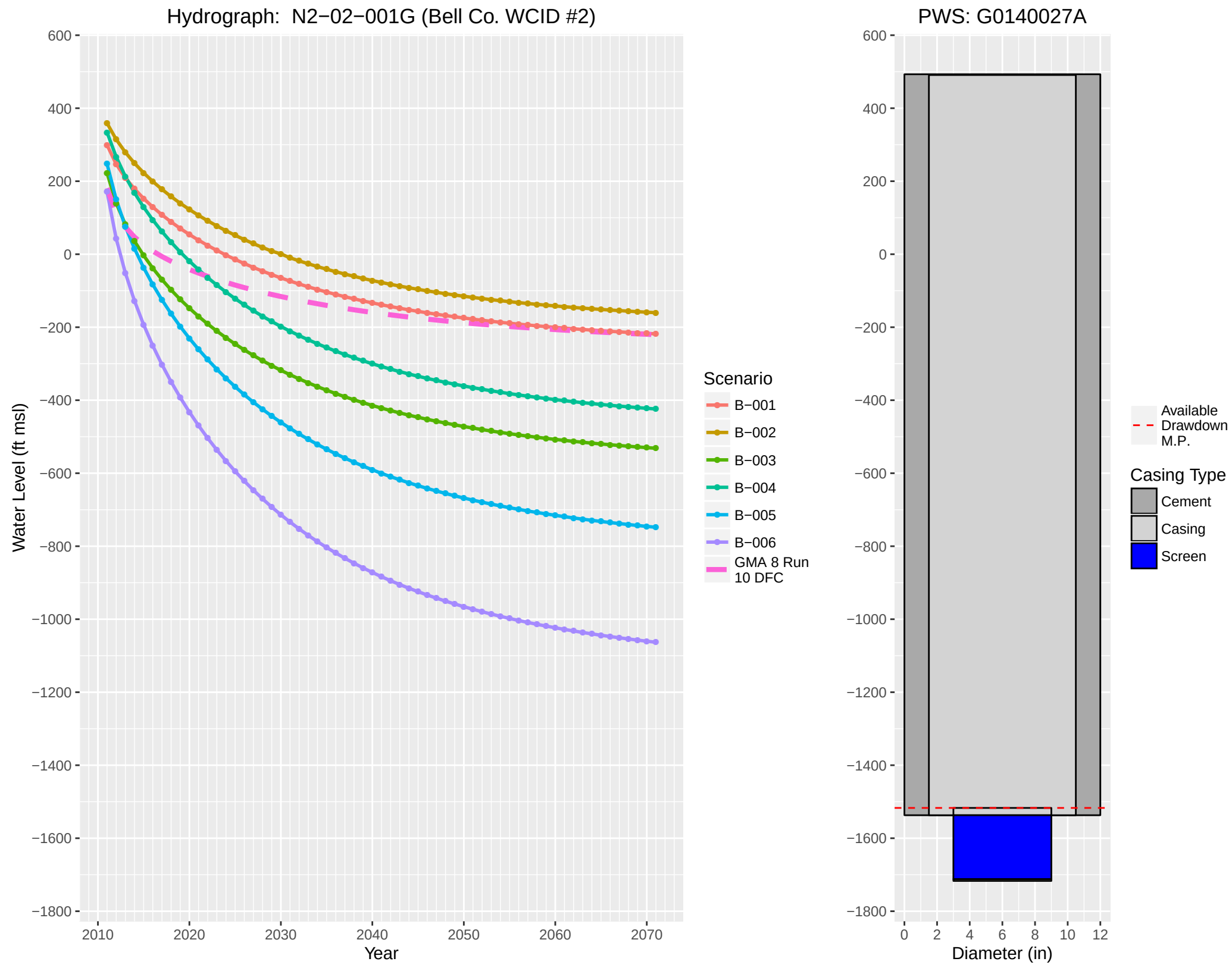
0 2 4 Miles

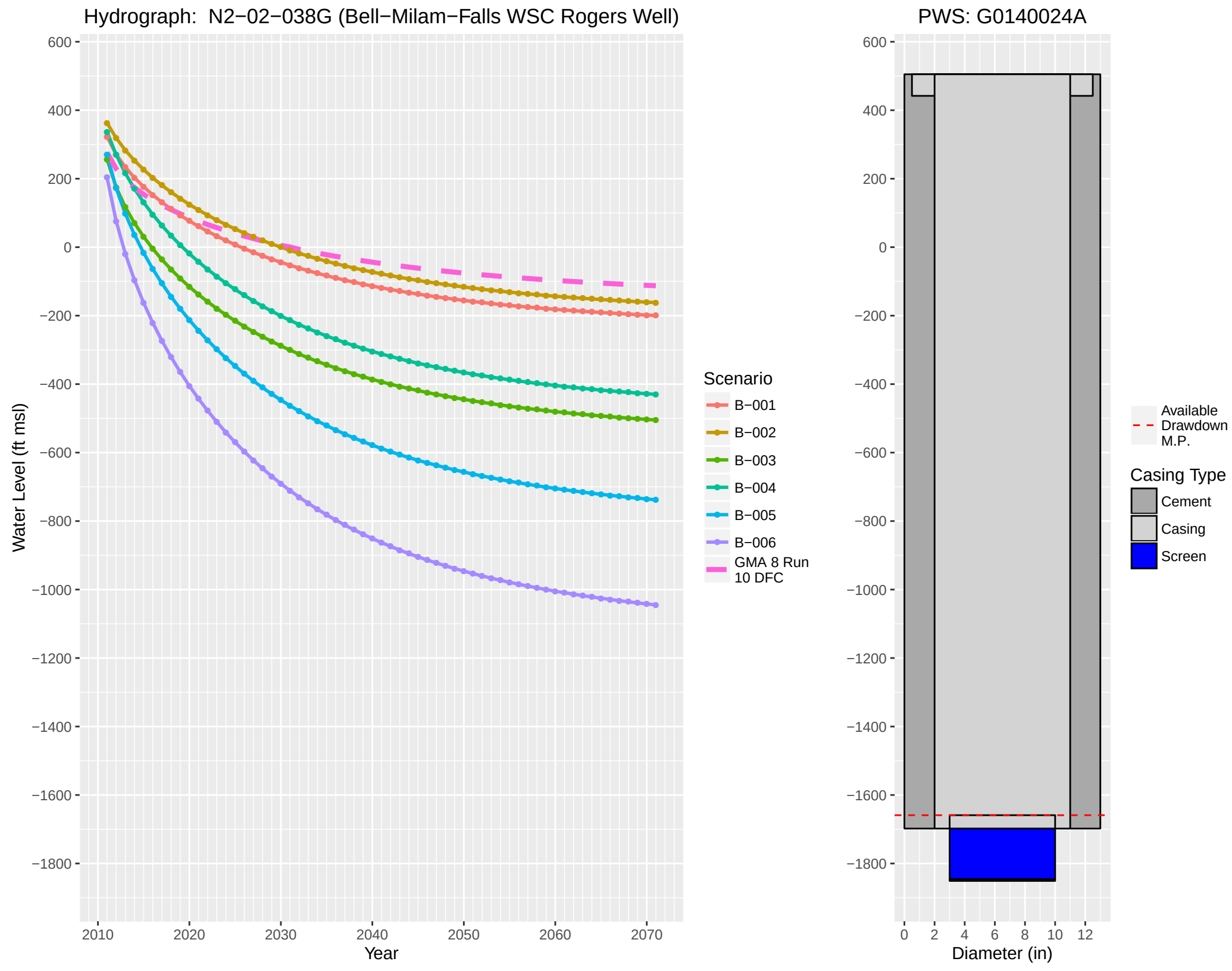
Scenario B-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model

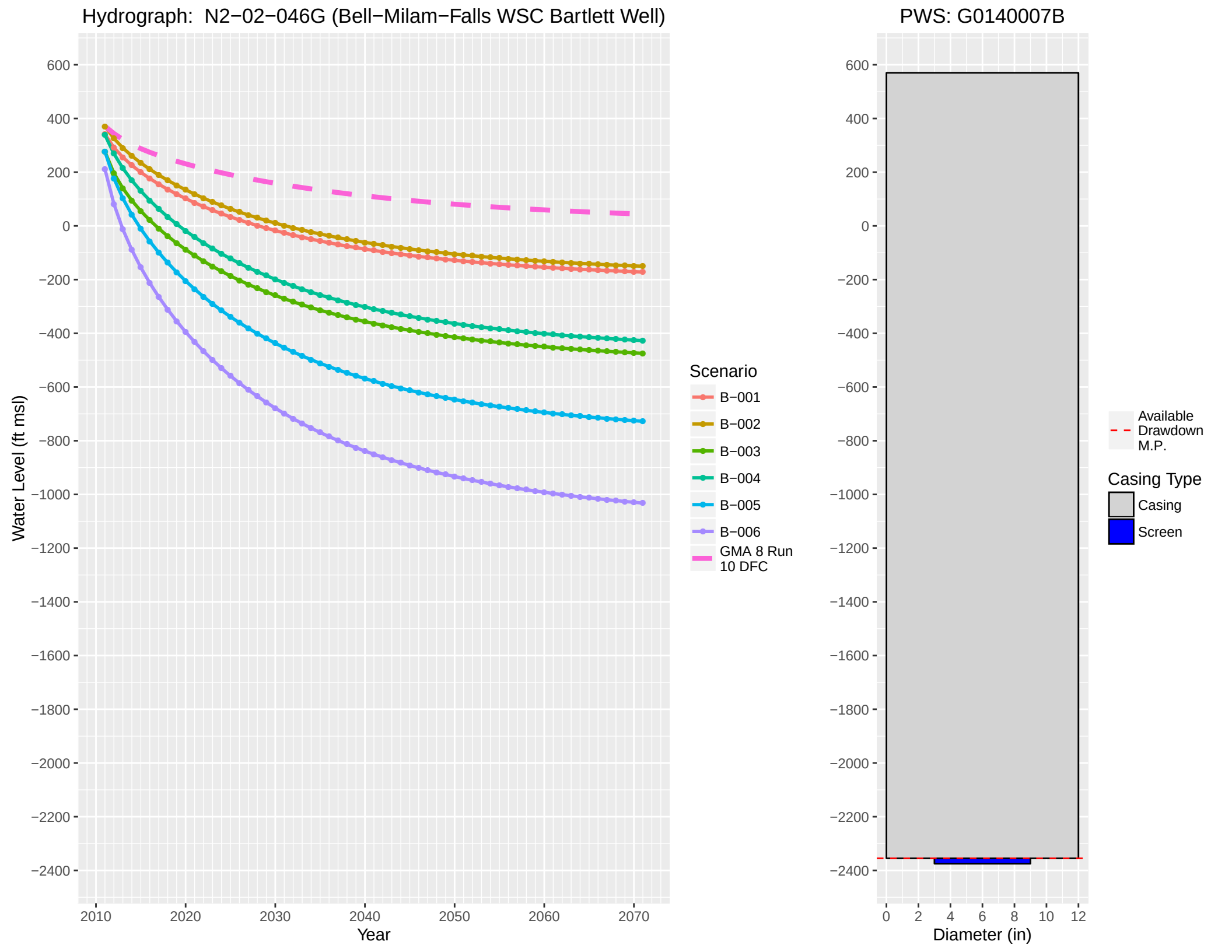
Attachment 5 —
"B" Scenarios
CUWCD Transmissivity Modified NTWGAM
Hydrographs of Simulated Water Level Compared to
Existing Well Construction

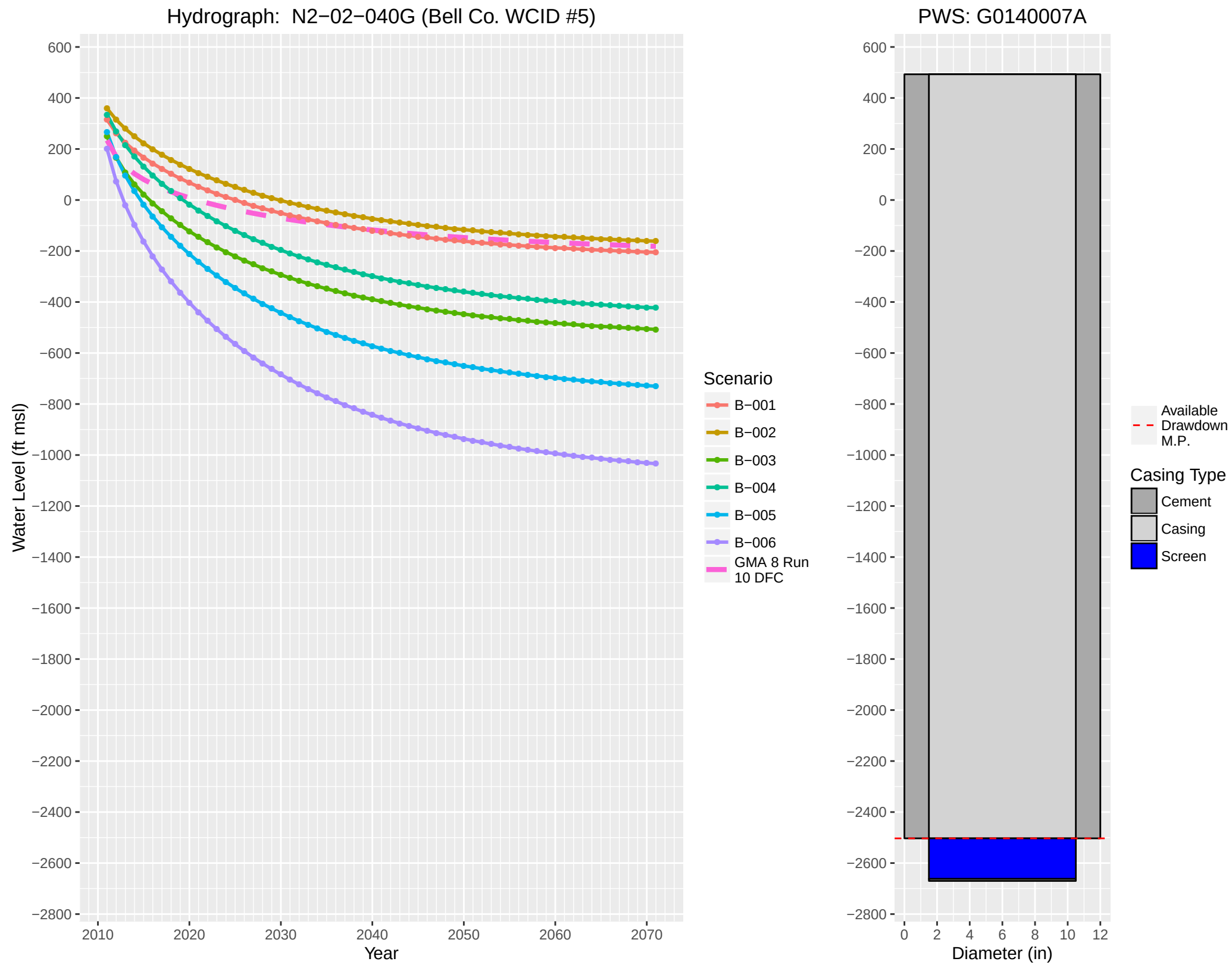

Hydrograph: N2−14−004P (CTWSC Doc Curb Well)
Water Level (ft msl)
800
600
400
200
0
−200
−400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
N2−14−004P (CTWSC Doc Curb Well)
0
2
4
6
8
10
12
14
16
18
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

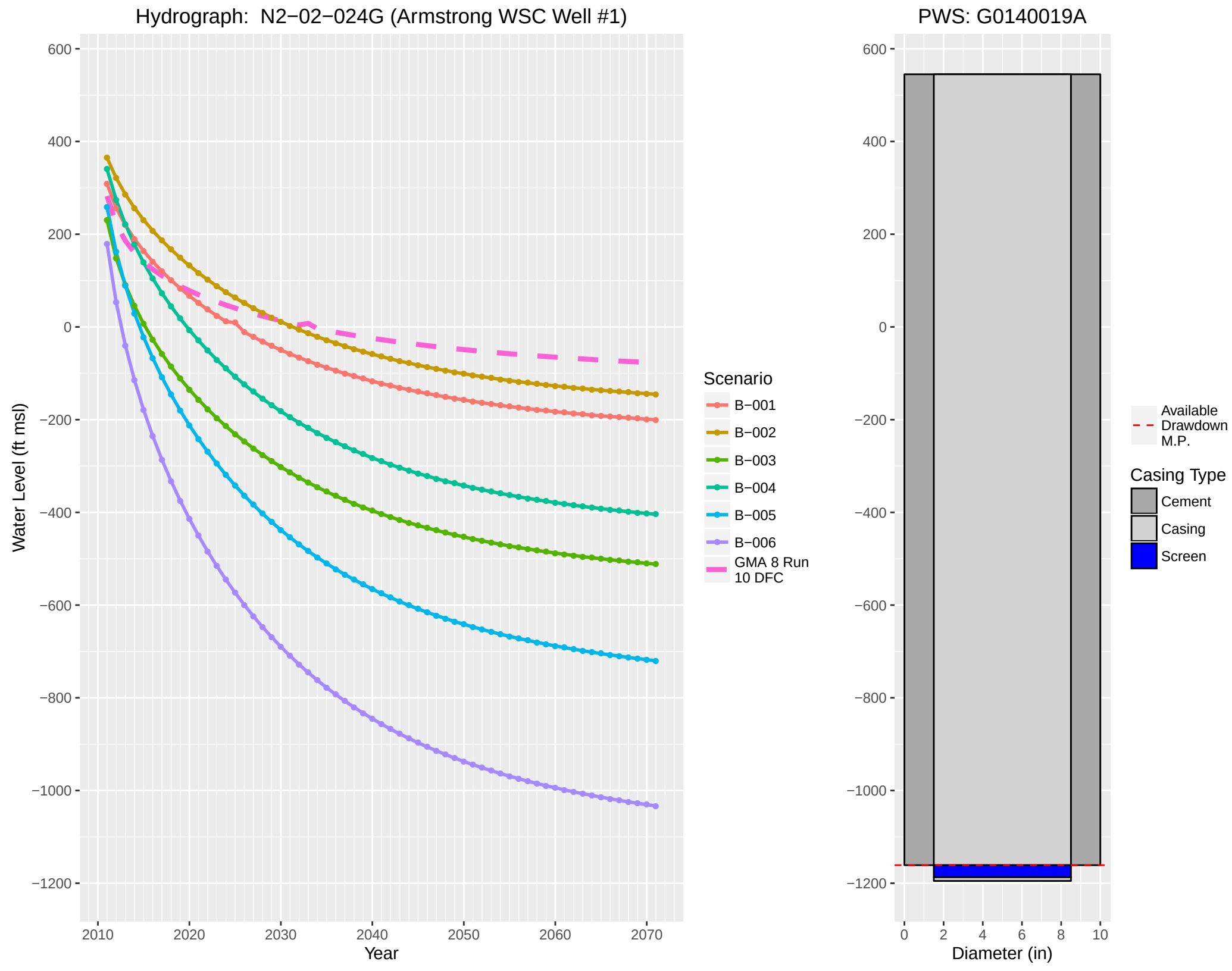

Hydrograph: N2−14−005P (CTWSC System Split Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
N2−14−005P (CTWSC System Split Well)
0 2 4 6 8 10 12 14 16 18 20 22 24 26
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

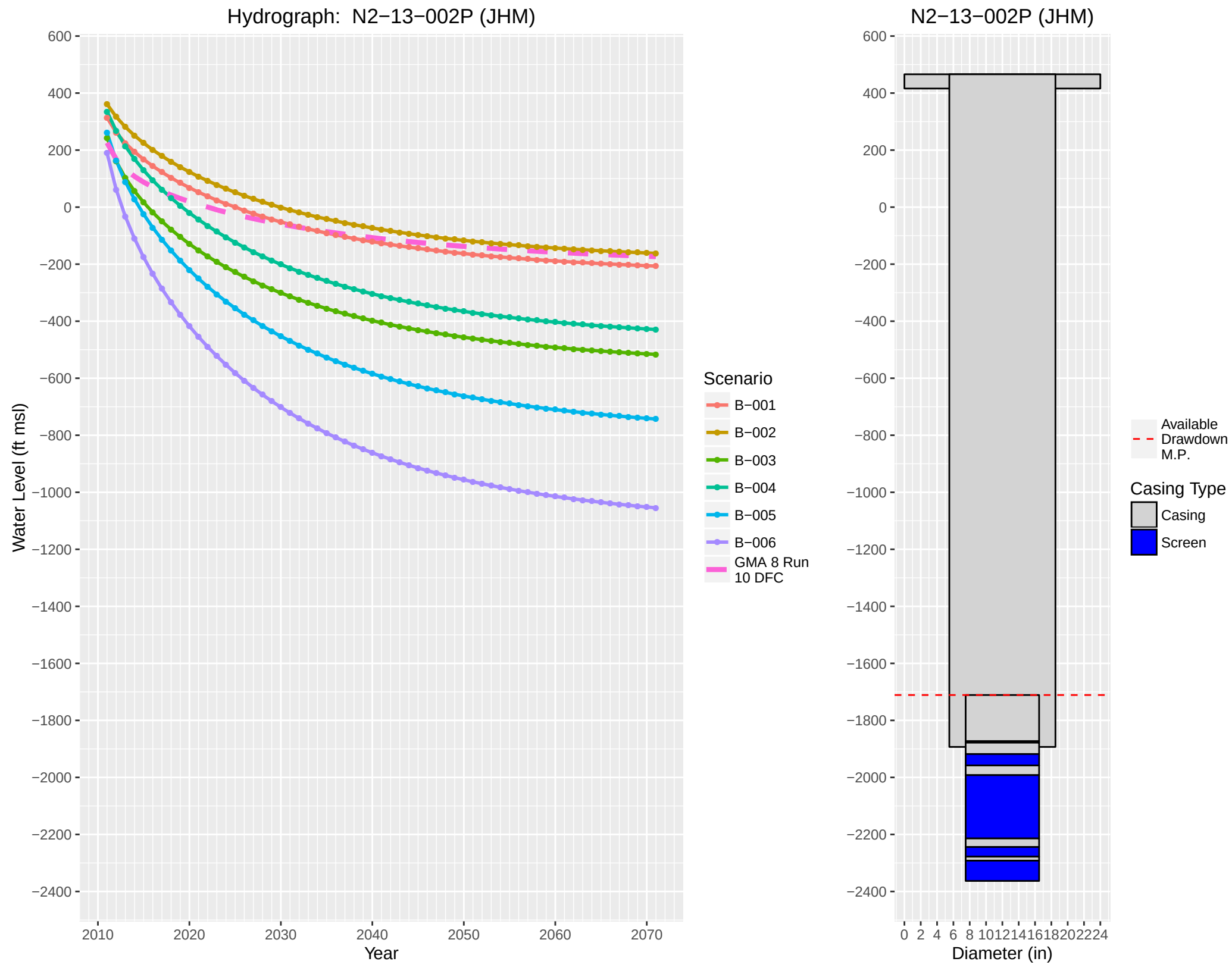

Hydrograph: N2−02−001G (Bell Co. WCID #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
PWS: G0140027A
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

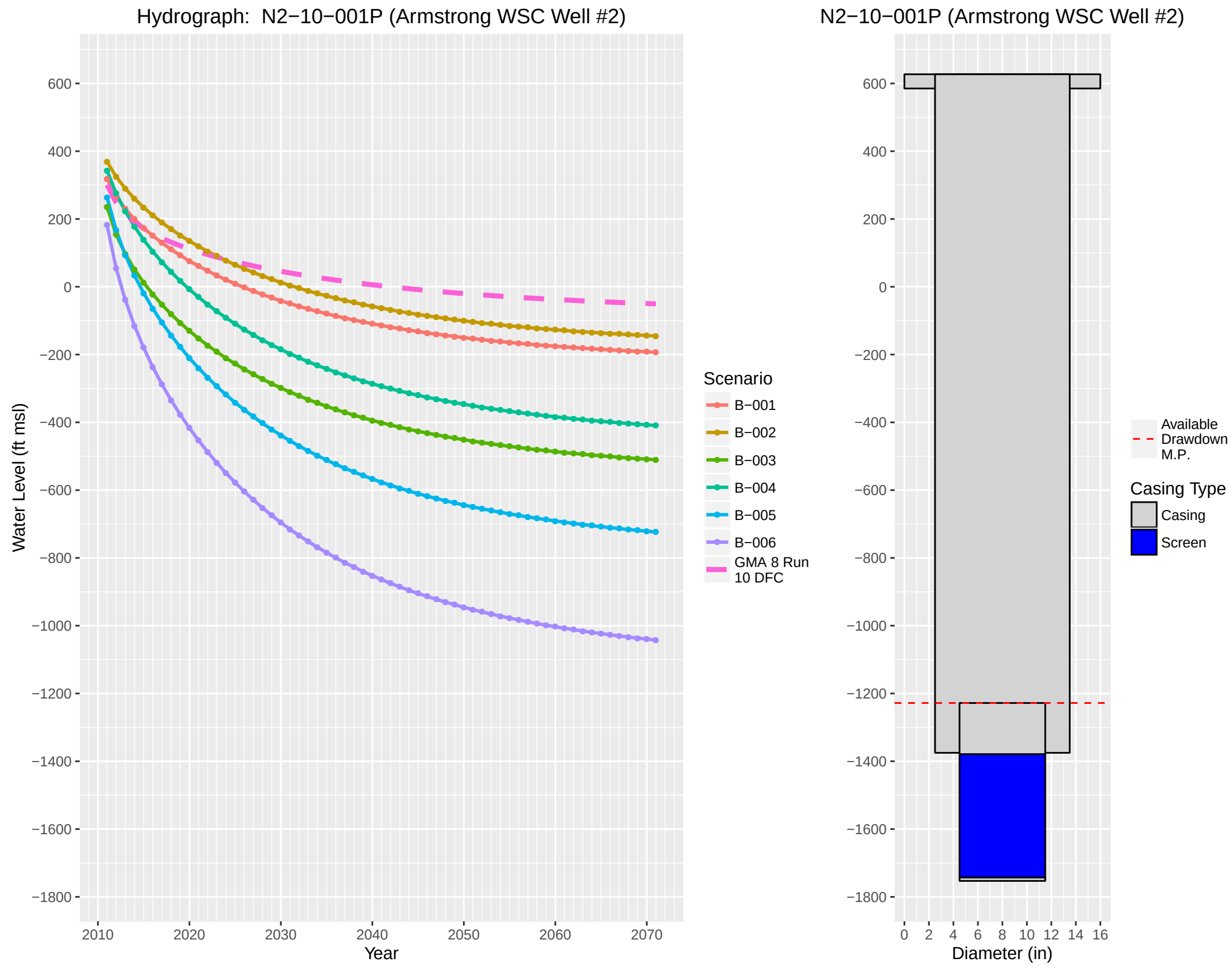

Hydrograph: N2−02−038G (Bell−Milam−Falls WSC Rogers Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
PWS: G0140024A
Diameter (in)
0
2
4
6
8
10
12
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

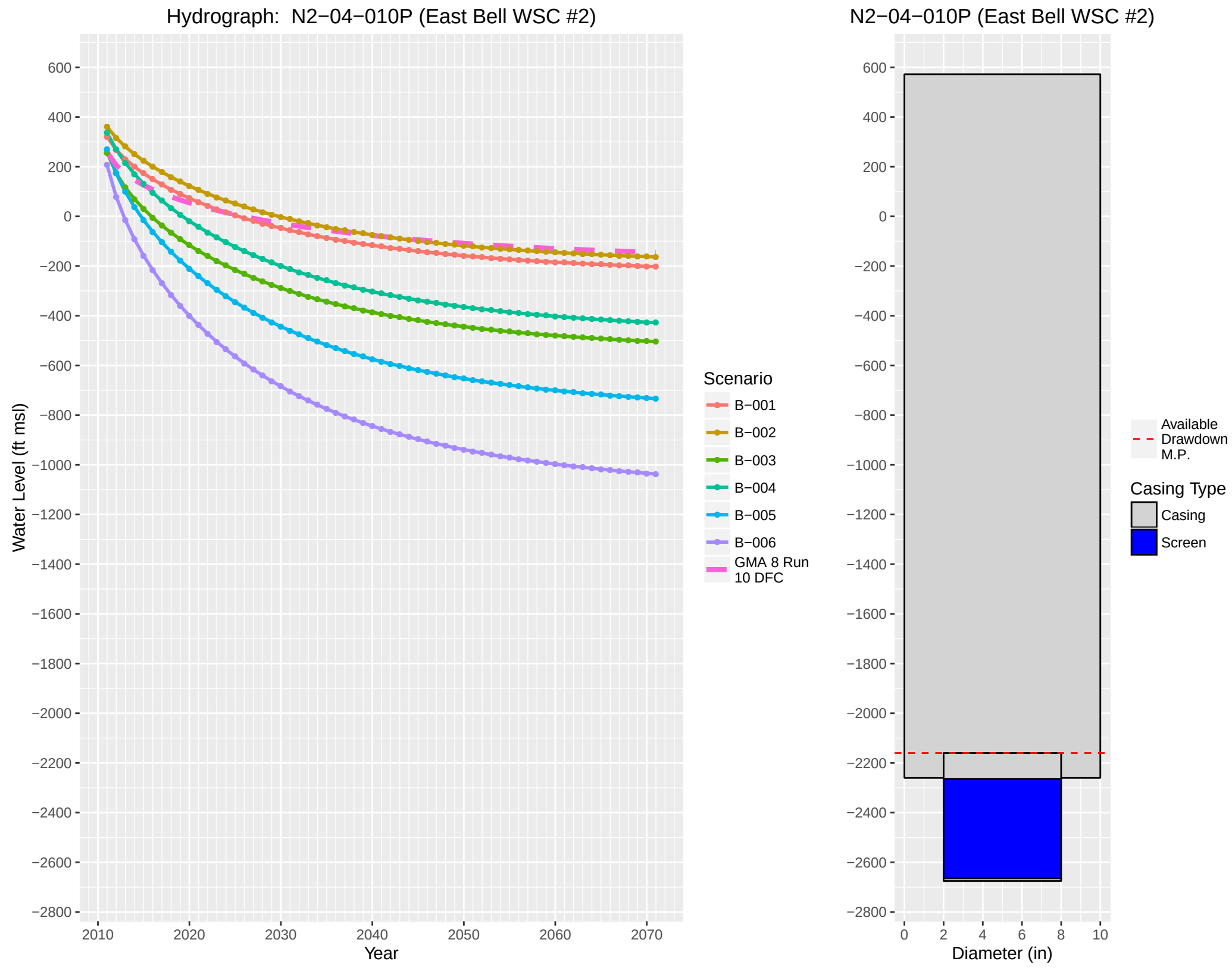

Hydrograph: N2−02−046G (Bell−Milam−Falls WSC Bartlett Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
PWS: G0140007B
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−02−040G (Bell Co. WCID #5)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
PWS: G0140007A
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

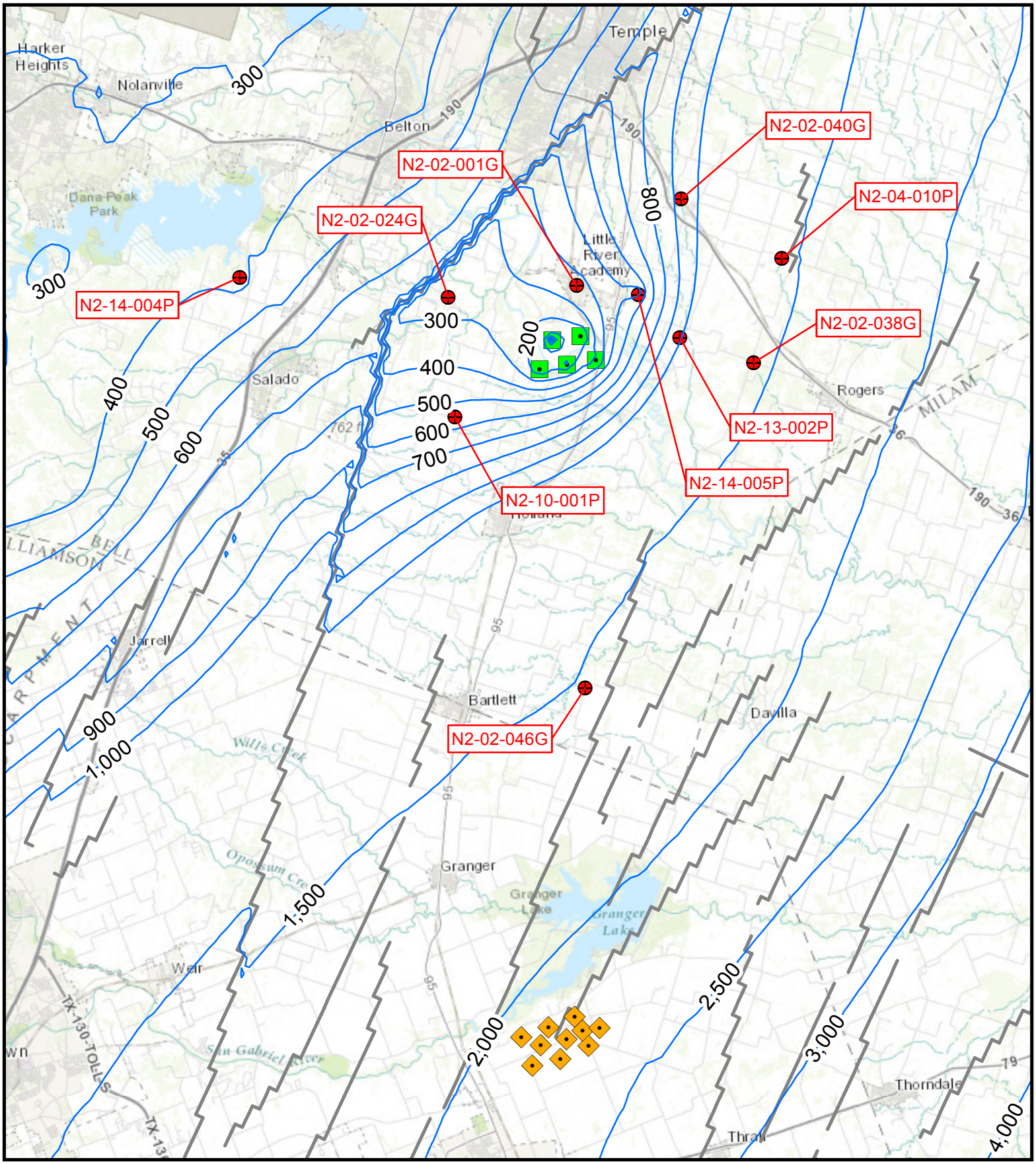

Hydrograph: N2−02−024G (Armstrong WSC Well #1)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
PWS: G0140019A
600
400
200
0
−200
−400
−600
−800
−1000
−1200
0
2
4
6
8
10
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen


Hydrograph: N2−13−002P (JHM)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
N2−13−002P (JHM)
0 2 4 6 8 10 12 14 16 18 20 22 24
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−10−001P (Armstrong WSC Well #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
N2−10−001P (Armstrong WSC Well #2)
0
2
4
6
8
10
12
14
16
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−04−010P (East Bell WSC #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
B−001
B−002
B−003
B−004
B−005
B−006
GMA 8 Run 10 DFC
N2−04−010P (East Bell WSC #2)
0
2
4
6
8
10
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen

Attachment 6 —
"C" Scenarios
TWDB Approved NTWGAM
Modified to Convert to Unconfined Conditions
Artesian Head and Drawdown after 30 and 50 Years of Production



Lower Trinity Artesian Head- Scenario C-001 - 30 Years

CUWCD Potential Well Field

BRA Potential Well Field

Hydrograph Location – Lower Trinity Active/Proposed PWS Well

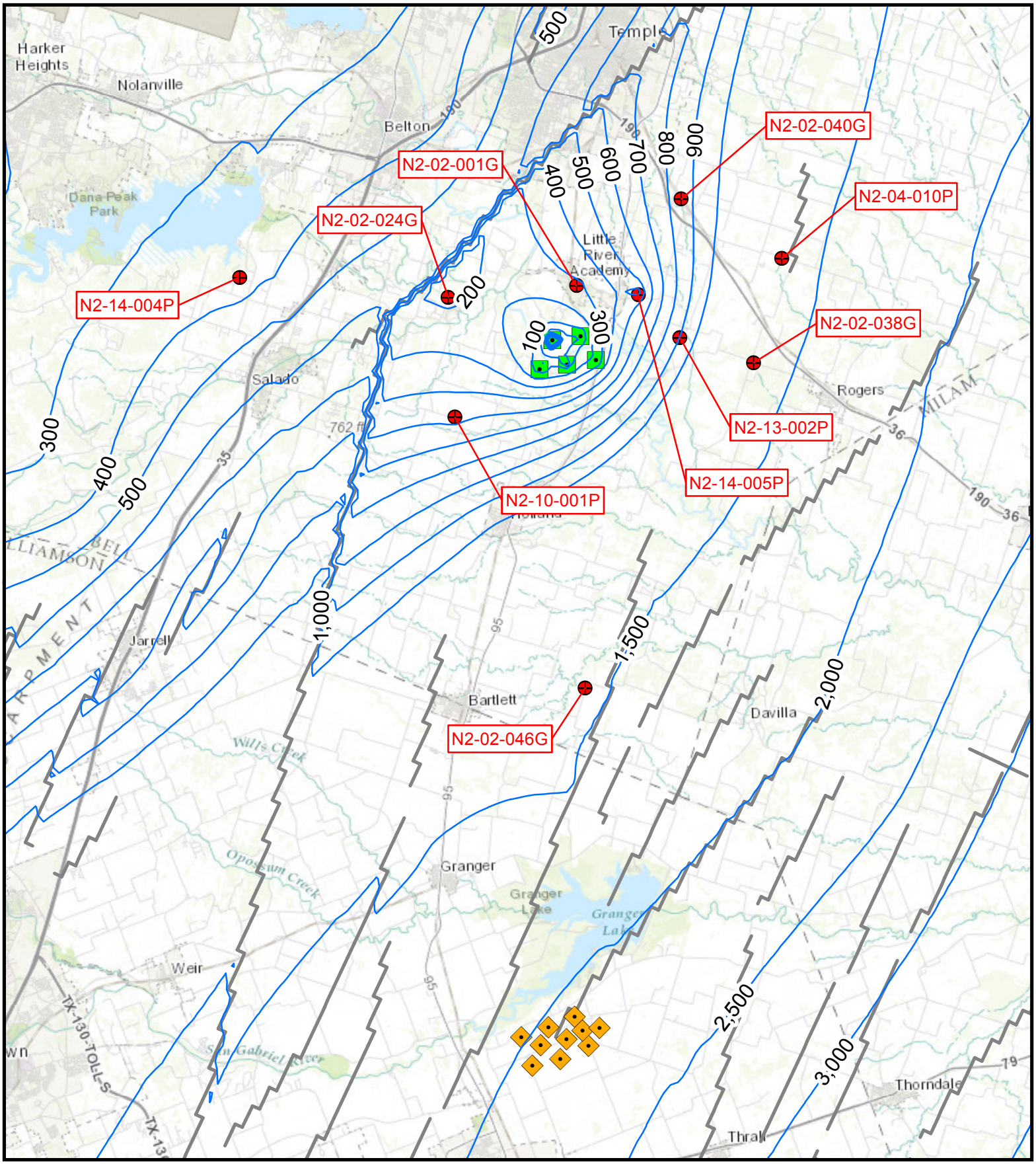
Simulated Artesian Head

Modeled Fault

N

0 2 4 Miles

Scenario C-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



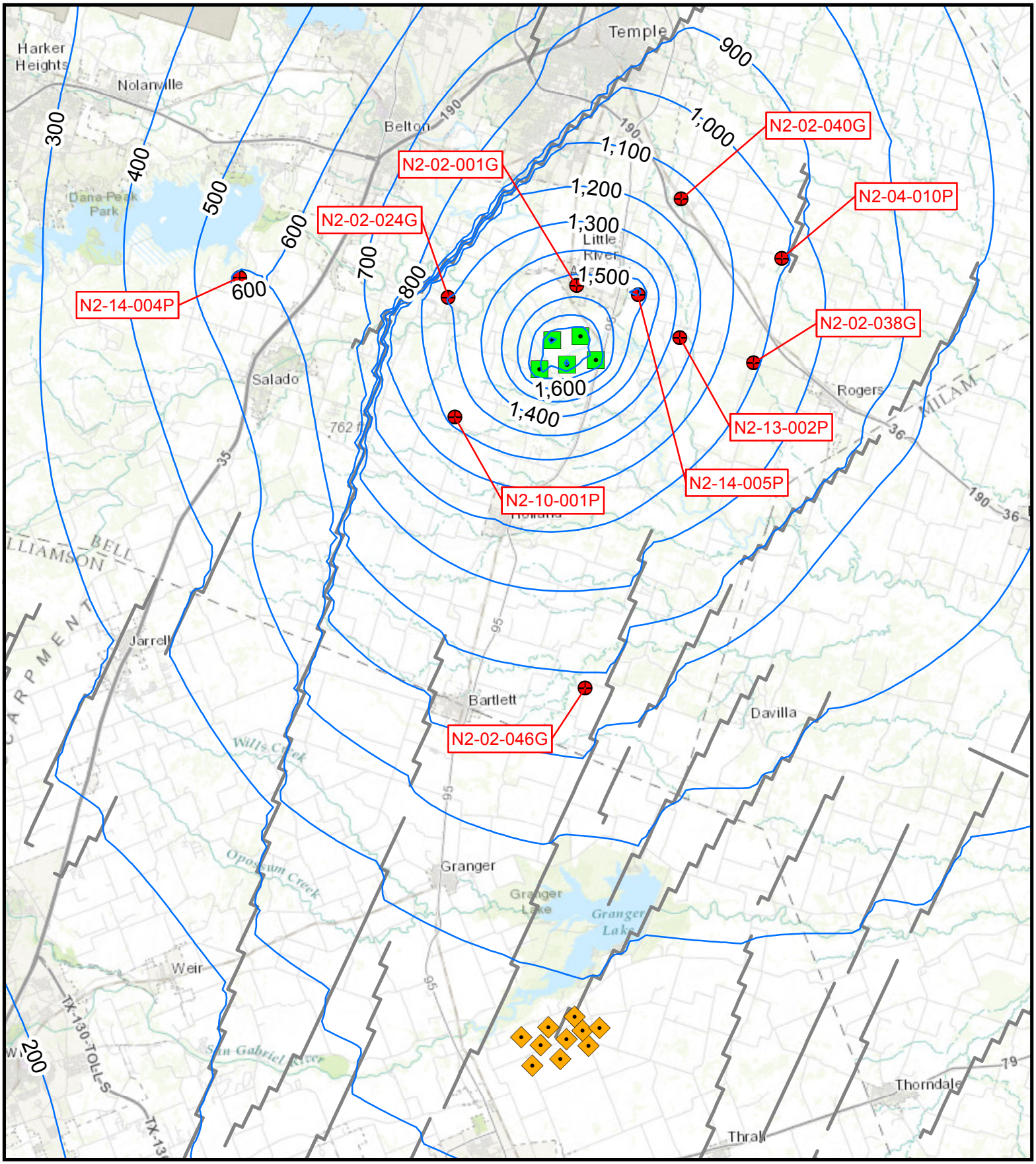
Lower Trinity Artesian Head- Scenario C-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



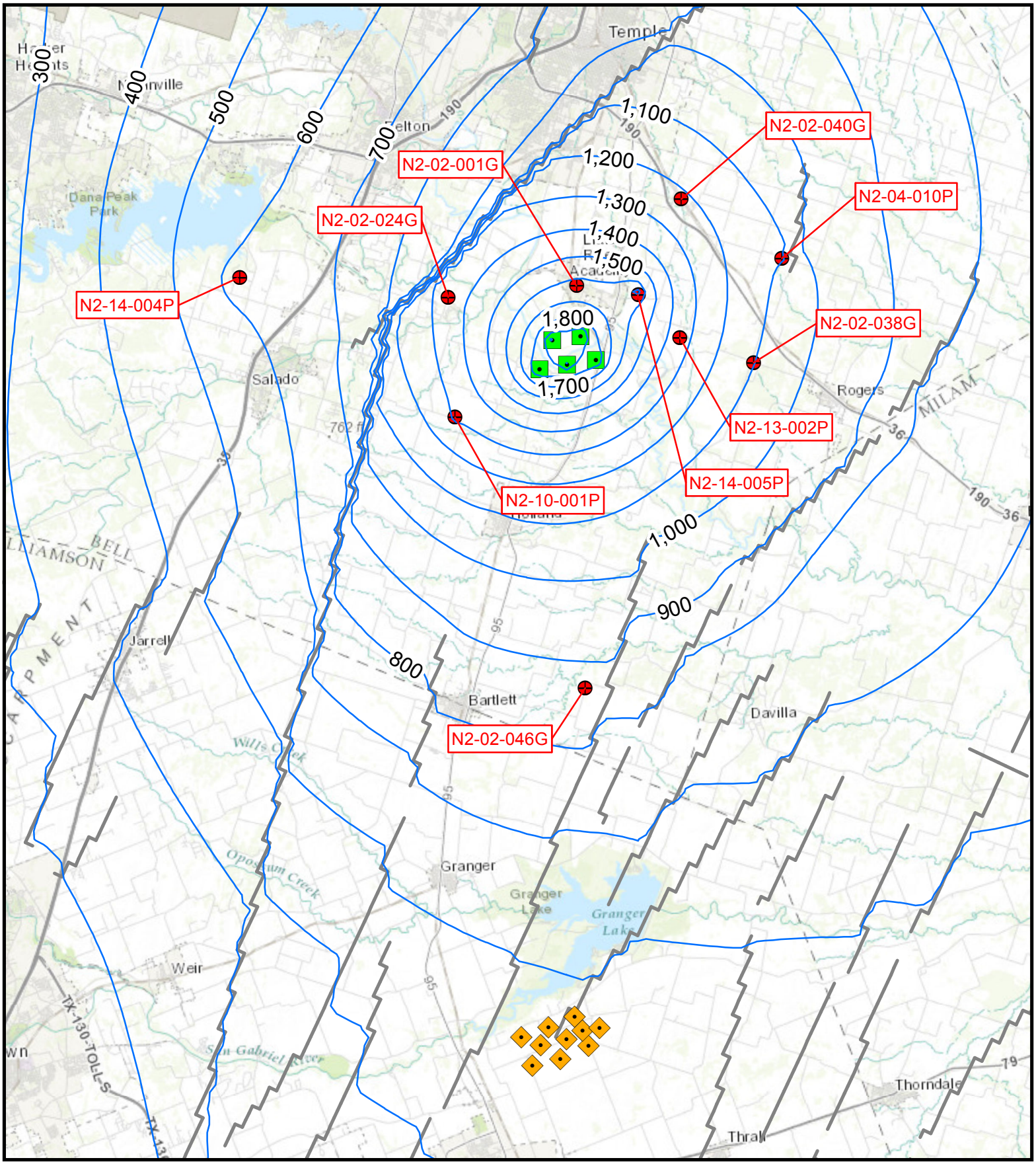
Lower Trinity Drawdown- Scenario C-001 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



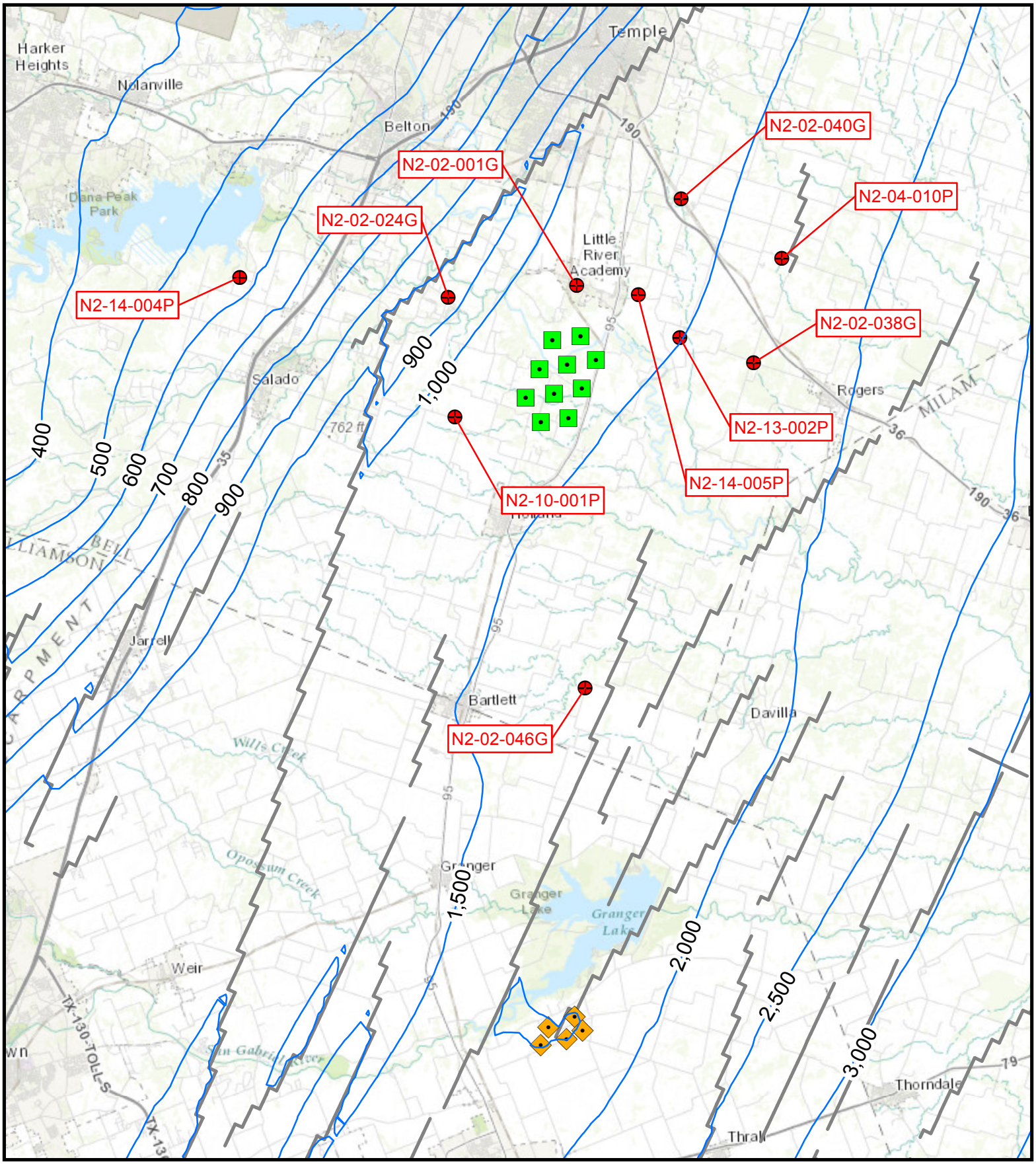
Lower Trinity Drawdown- Scenario C-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

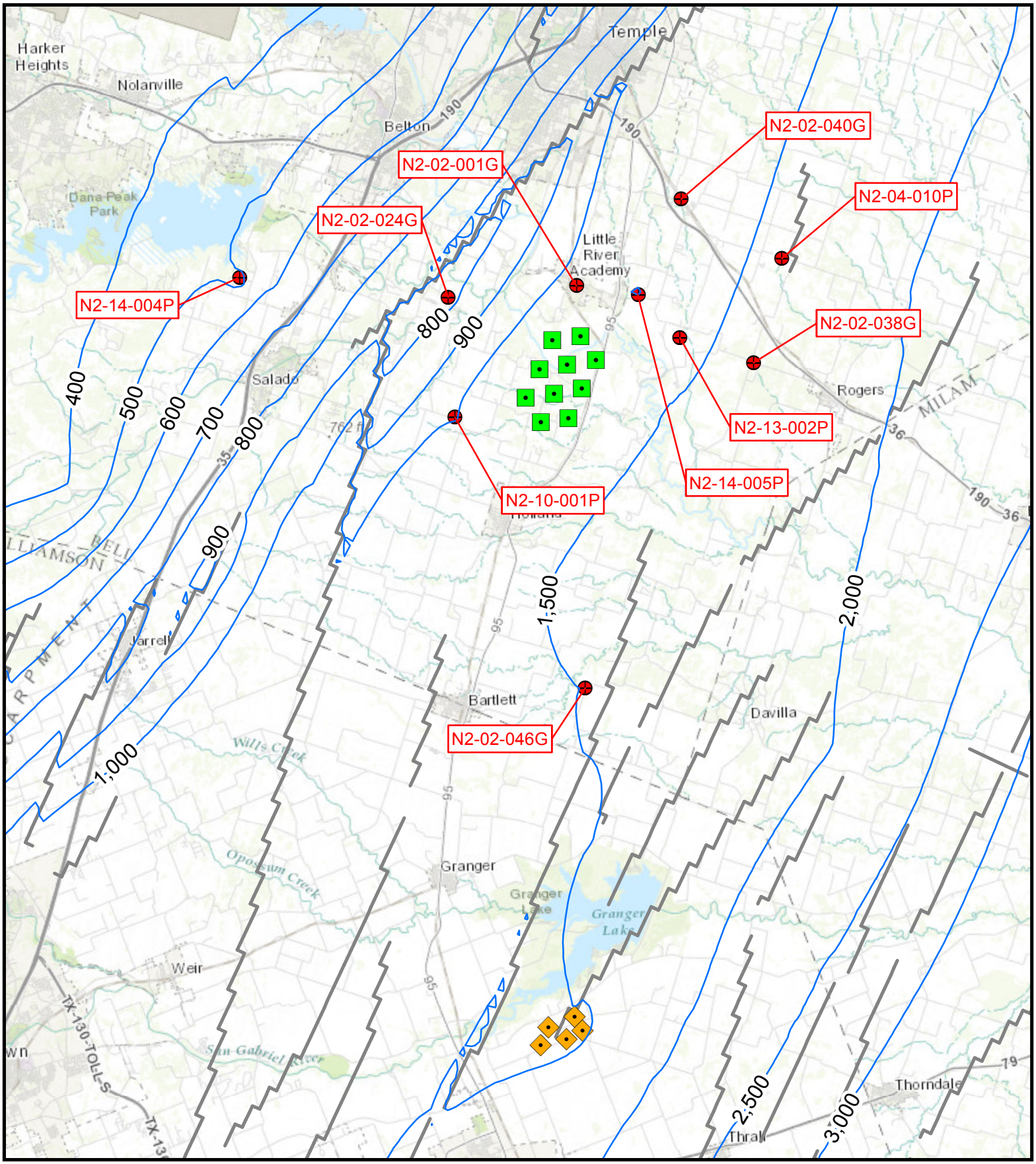
Scenario C-001: 5 CUWCD Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



Lower Trinity Artesian Head- Scenario C-002 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

Scenario C-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



Lower Trinity Artesian Head- Scenario C-002 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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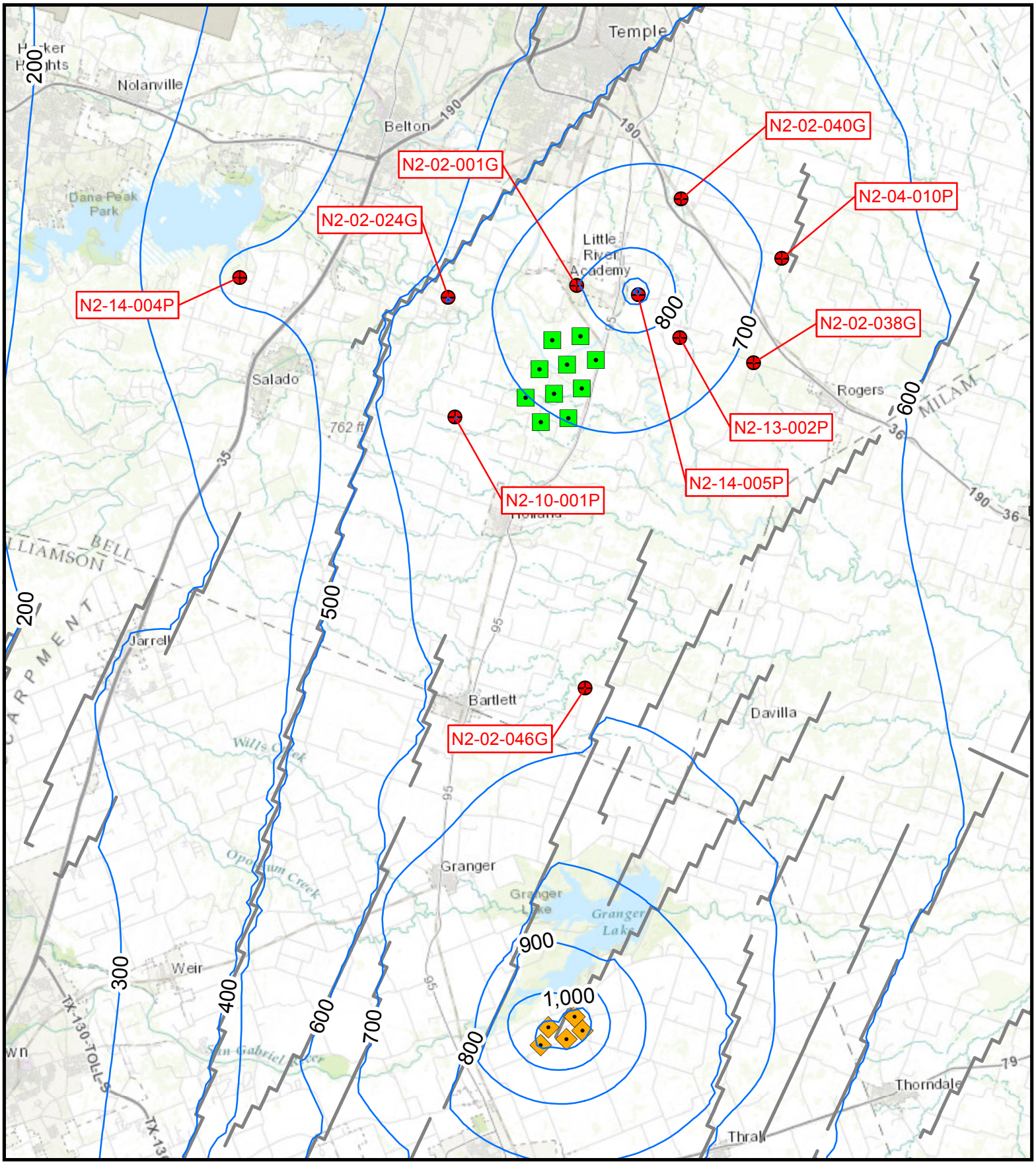
Scenario C-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



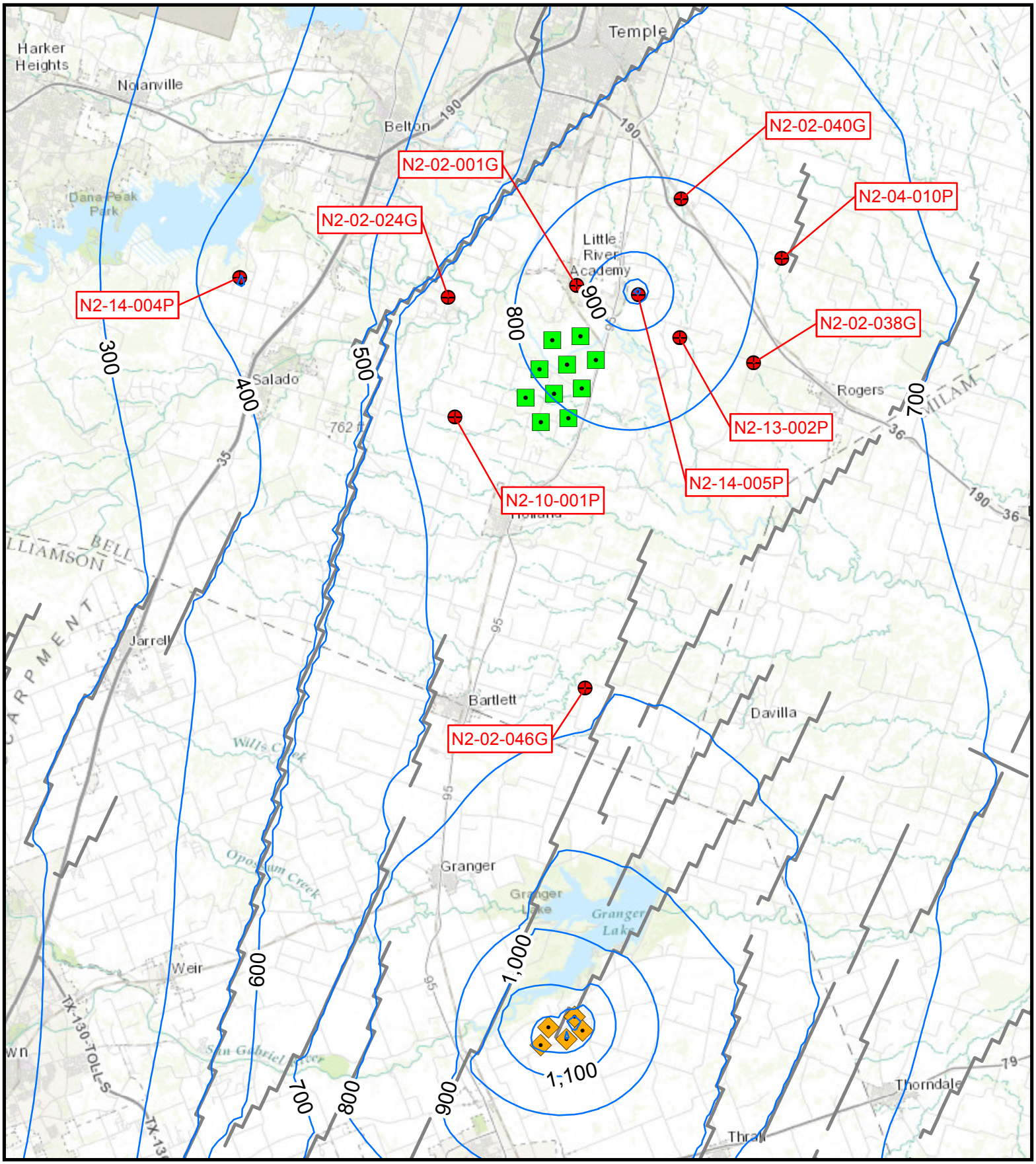
Lower Trinity Drawdown- Scenario C-002 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



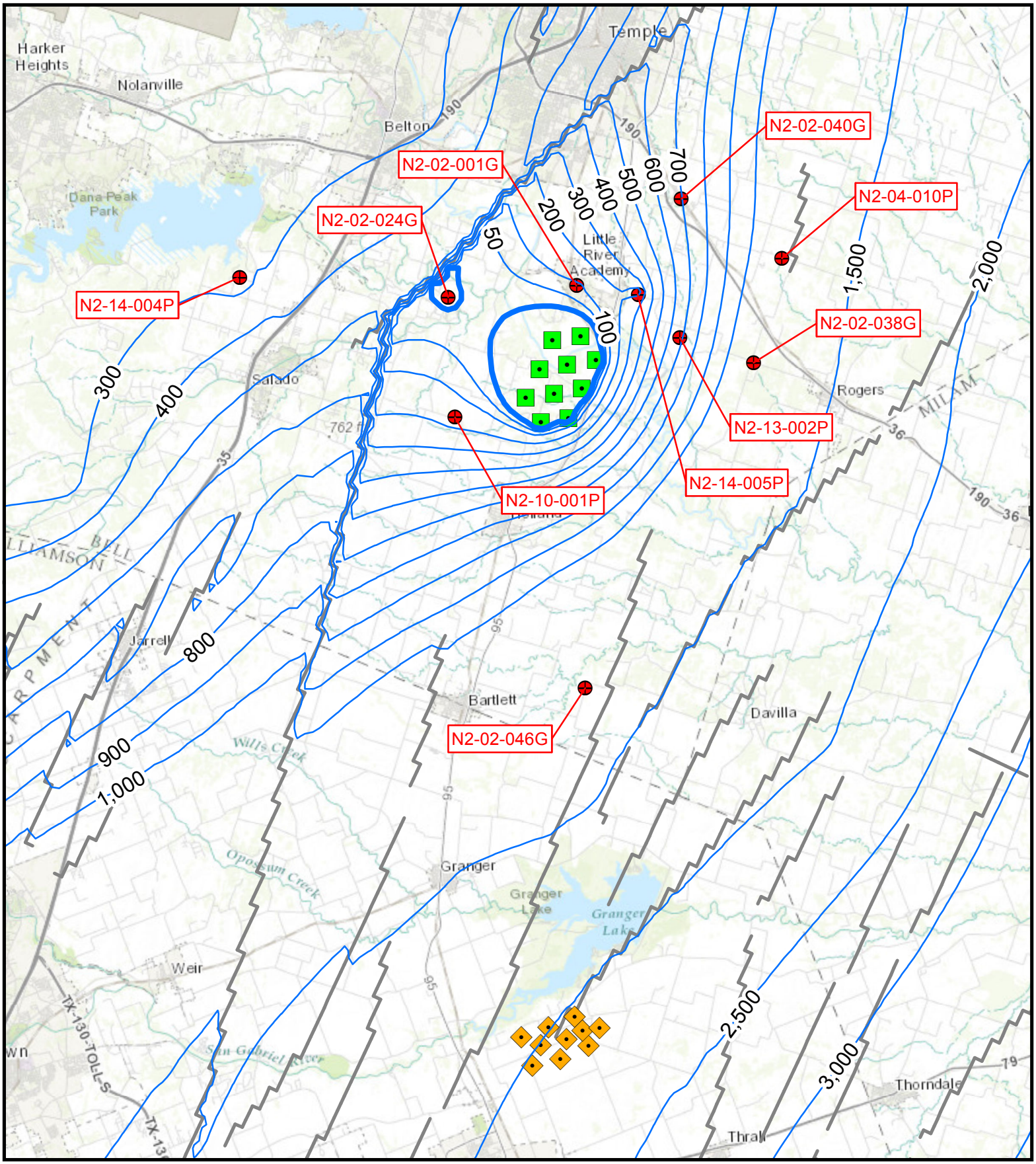
Lower Trinity Drawdown- Scenario C-002 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-002: 5 BRA Wells pumping total at 10,000 AFY using TWDB GAM modified to convertible



Lower Trinity Artesian Head- Scenario C-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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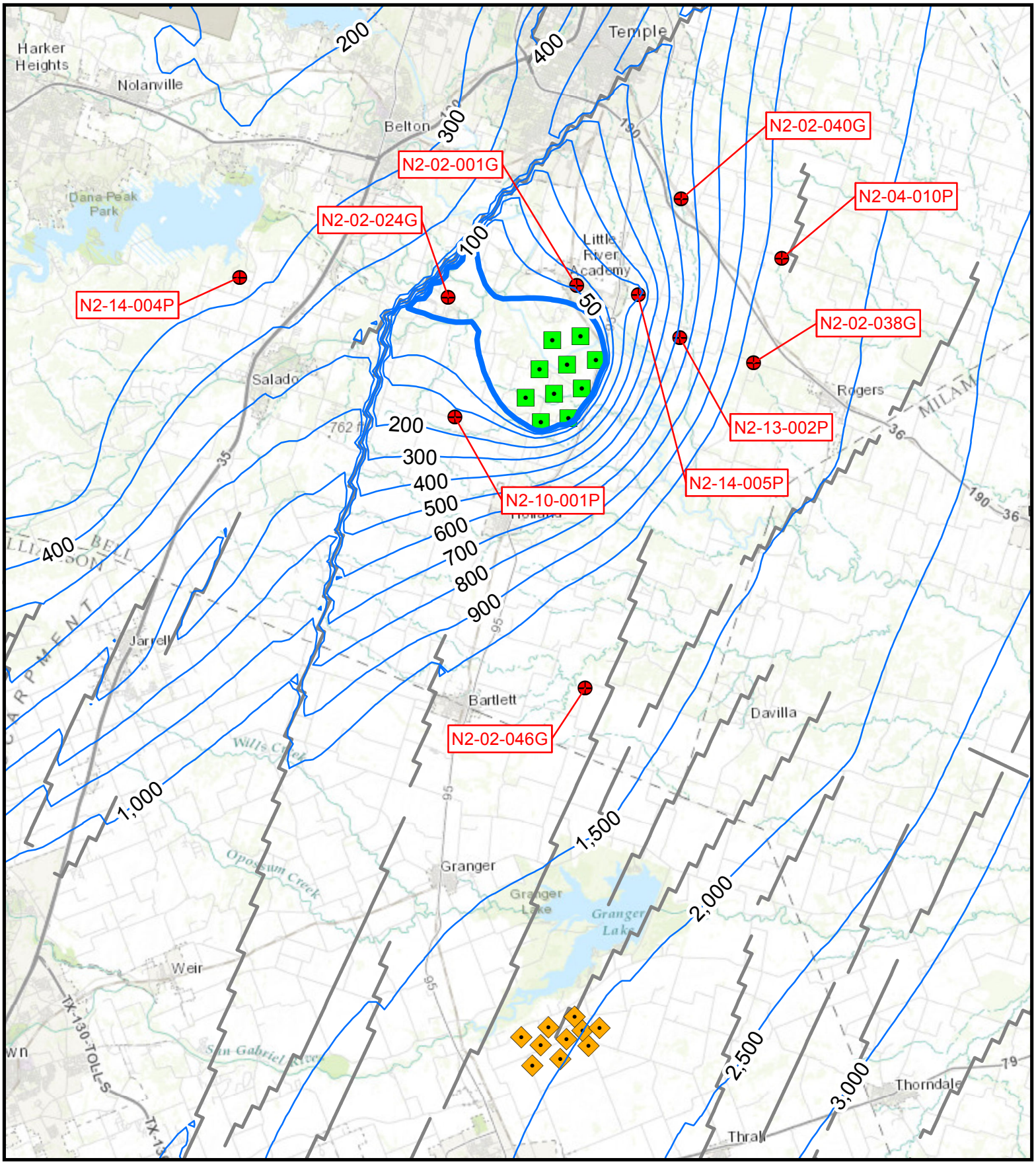
Scenario C-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



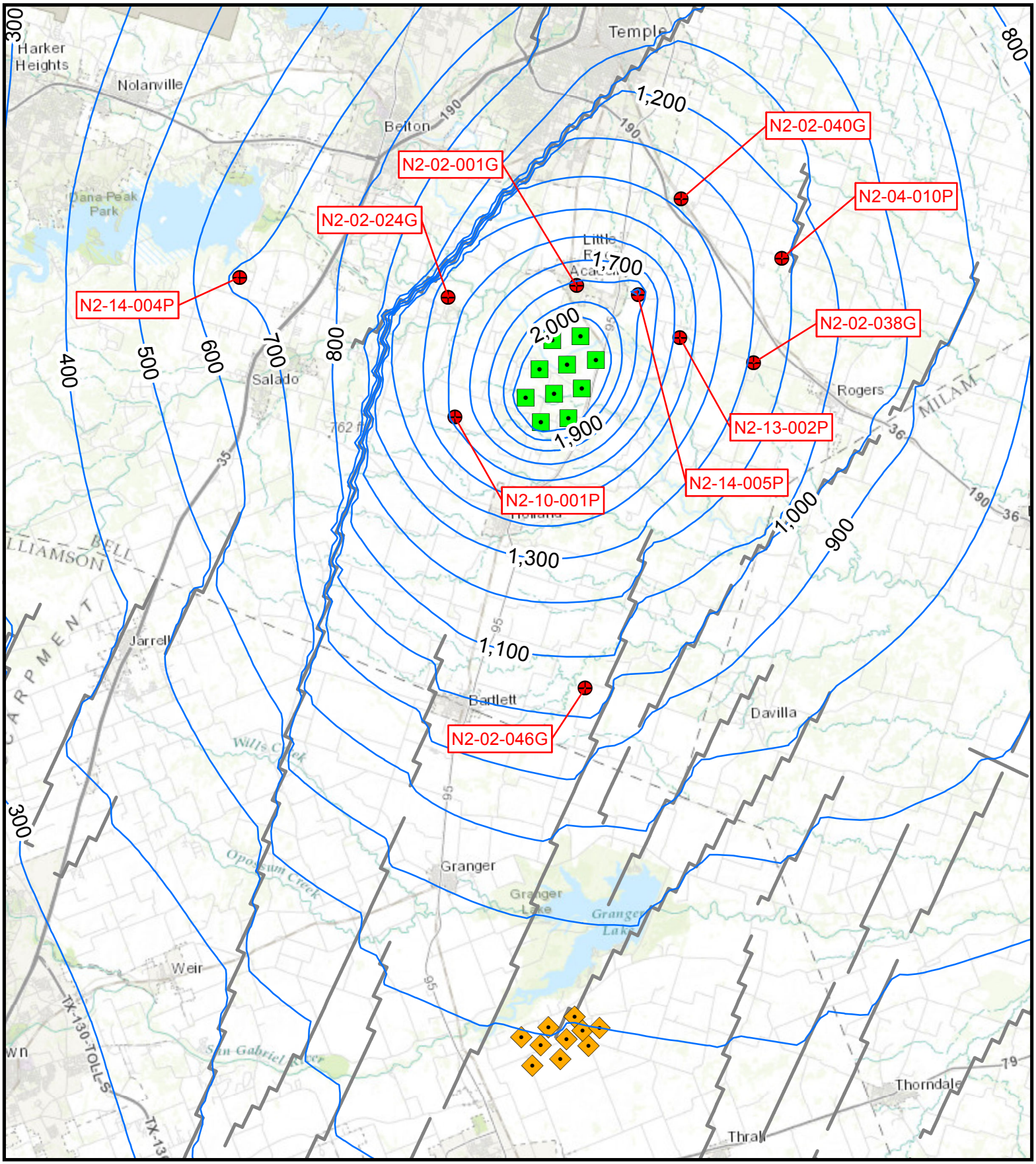
Lower Trinity Artesian Head- Scenario C-003 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



Lower Trinity Drawdown- Scenario C-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

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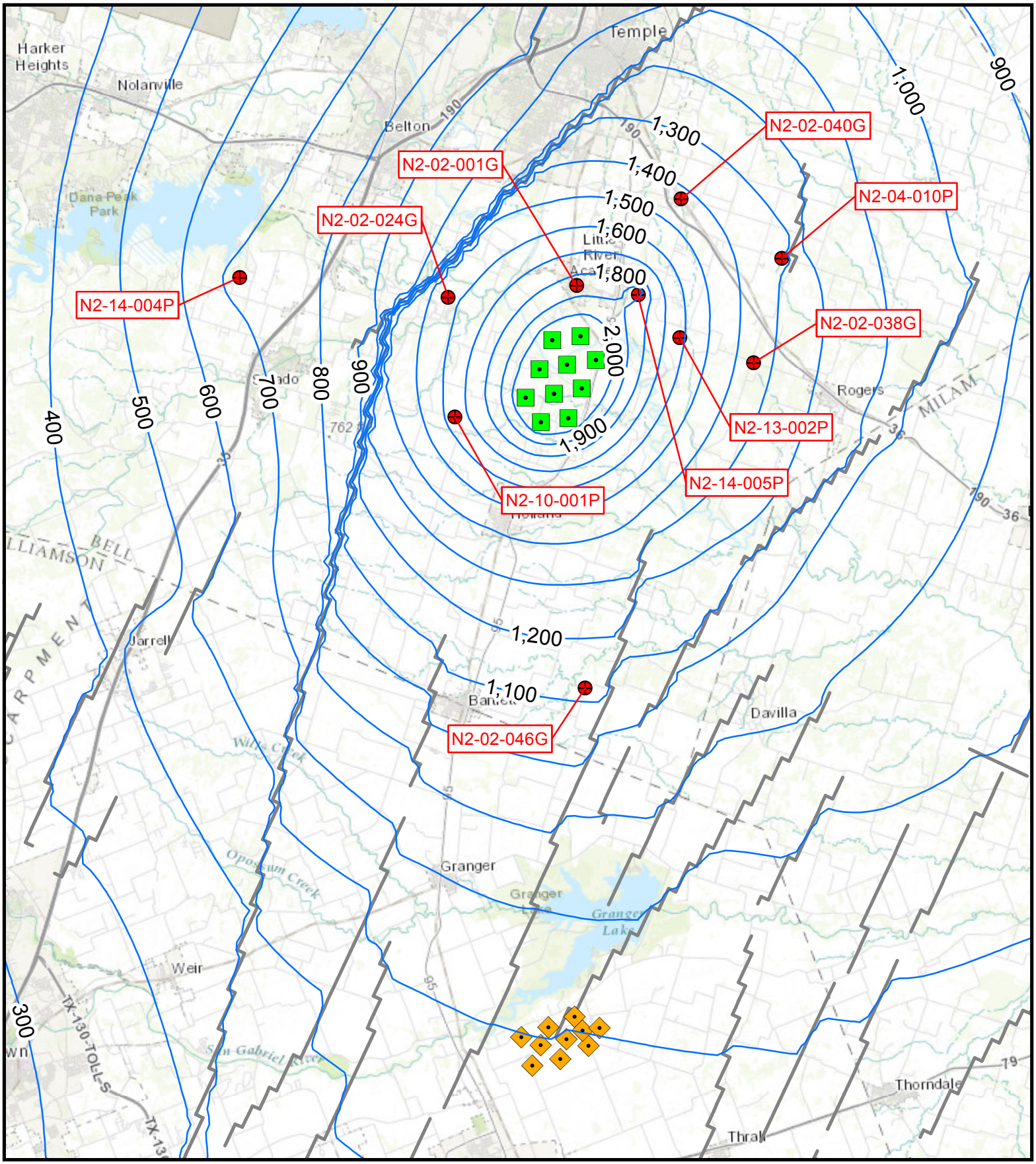
Scenario C-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



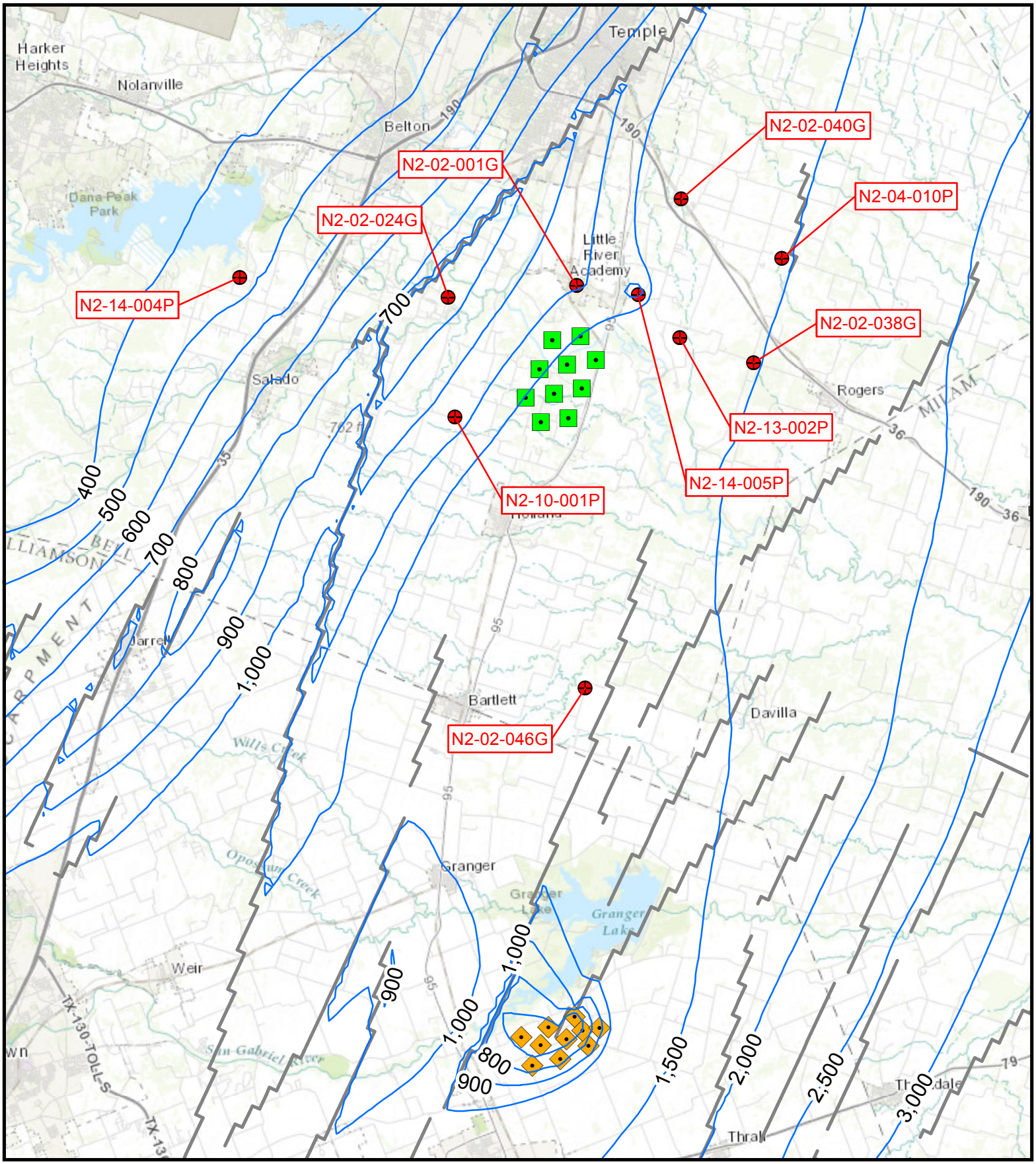
Lower Trinity Drawdown- Scenario C-003 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-003: 10 CUWCD Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



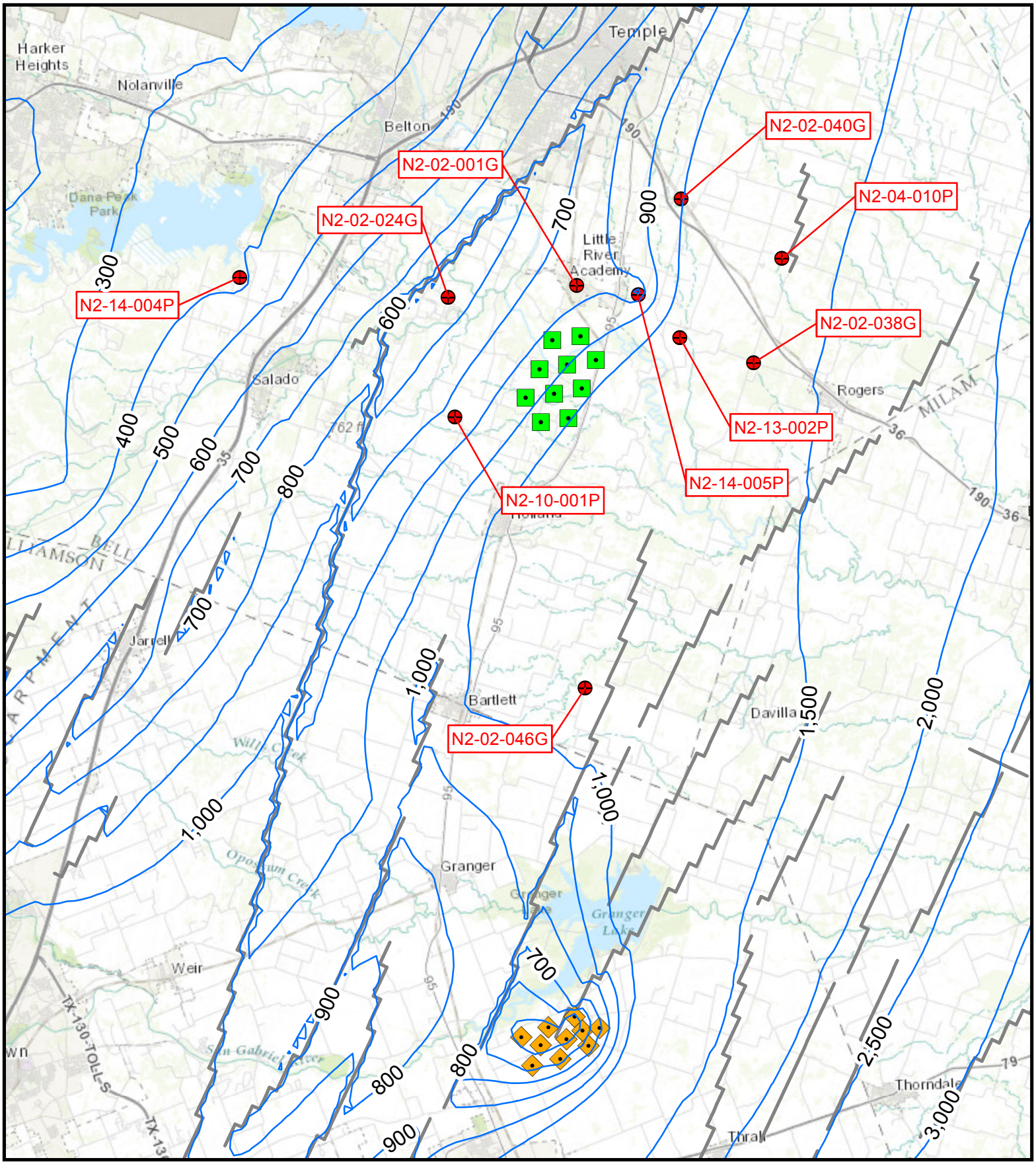
Lower Trinity Artesian Head- Scenario C-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



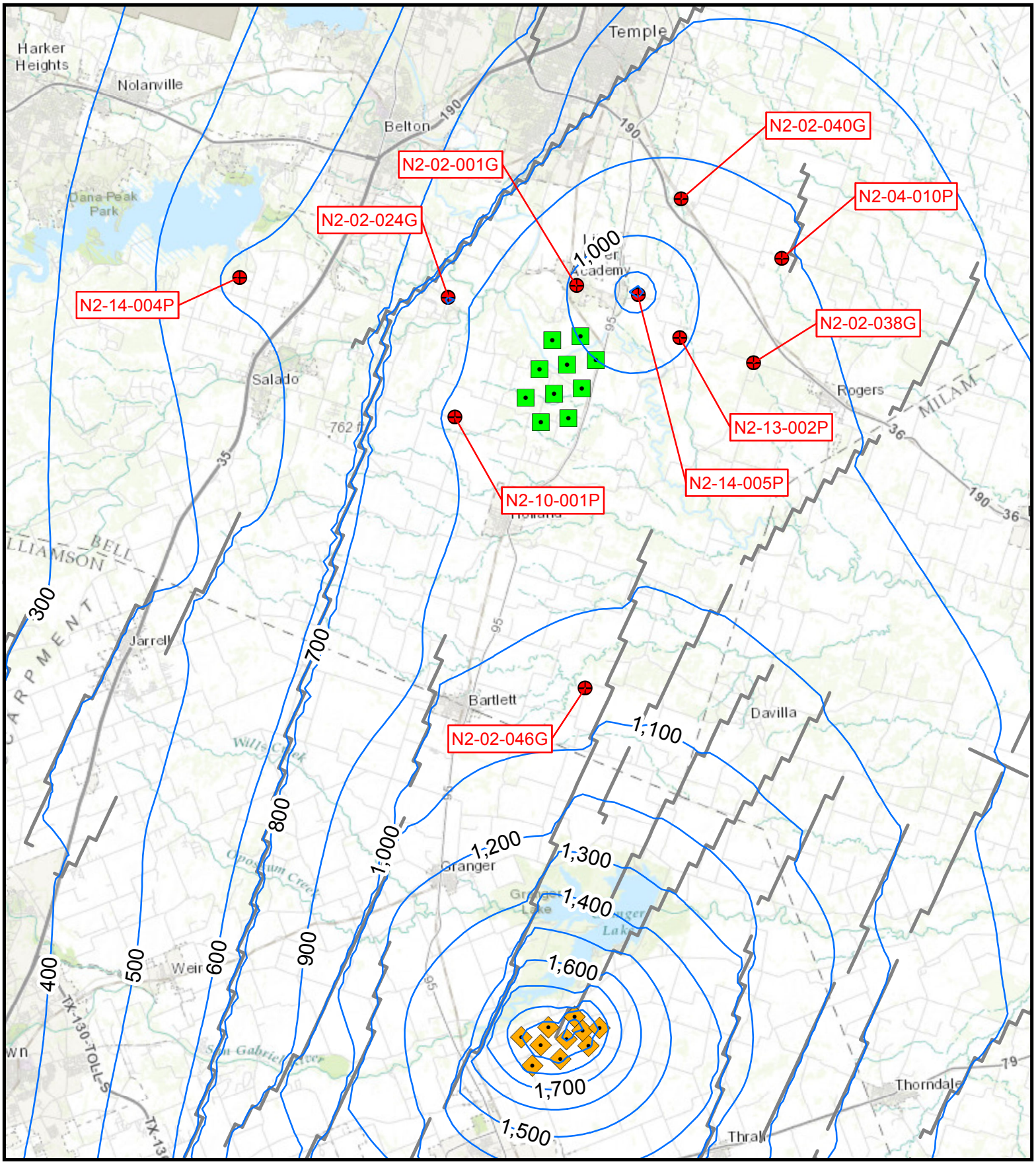
Lower Trinity Artesian Head- Scenario C-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



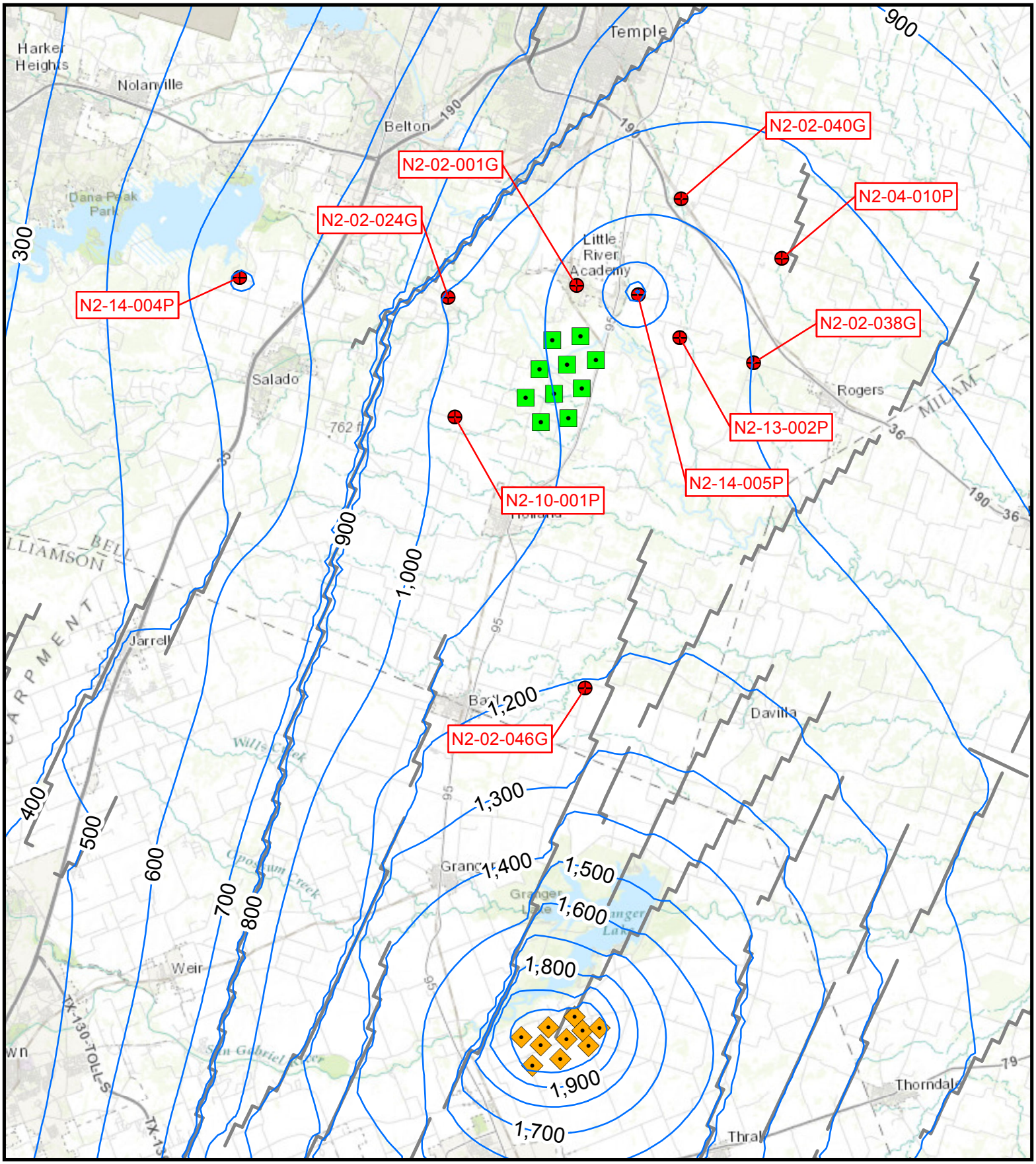
Lower Trinity Drawdown- Scenario C-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



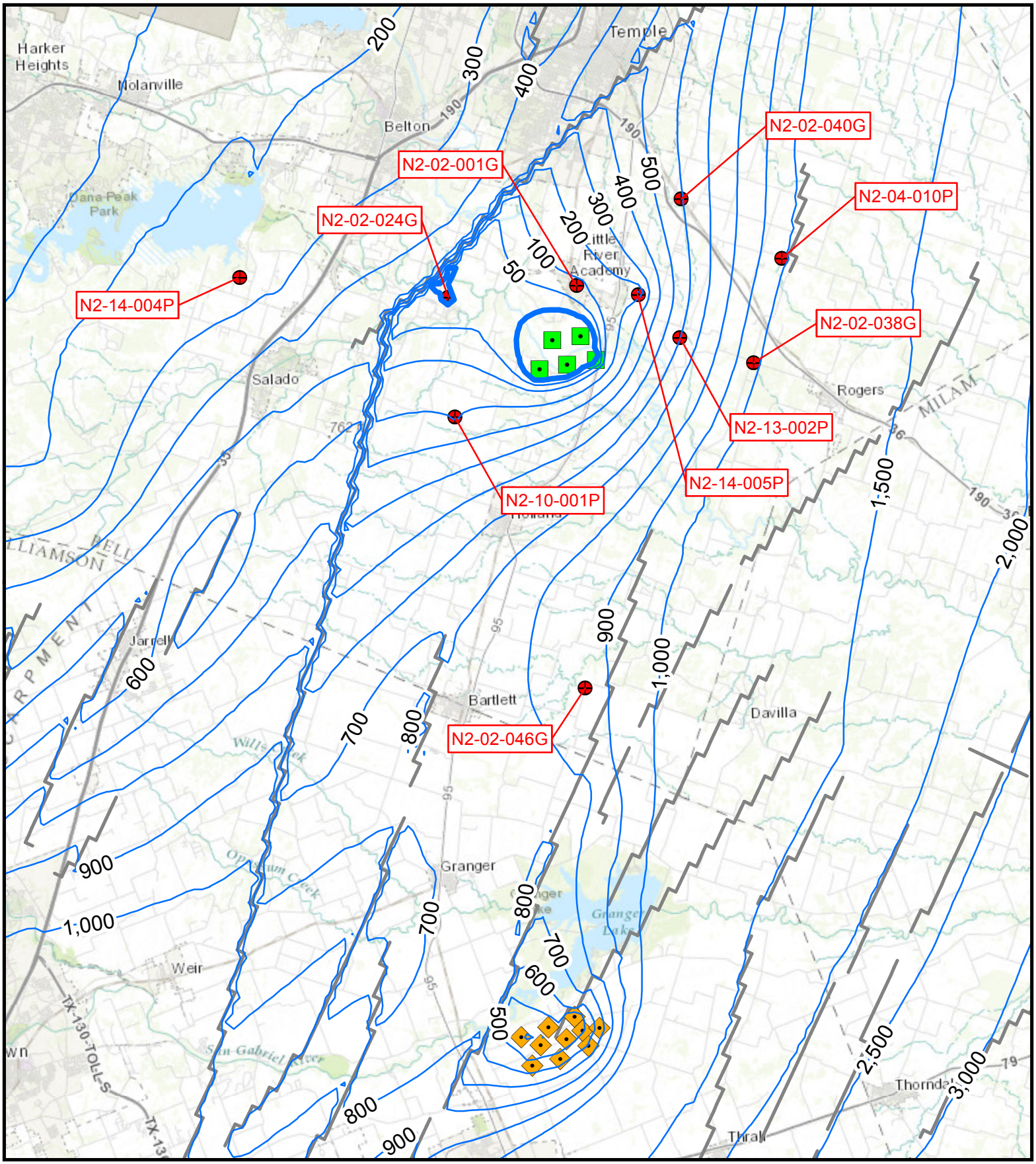
Lower Trinity Drawdown- Scenario C-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-004: 10 BRA Wells pumping total at 20,000 AFY using TWDB GAM modified to convertible



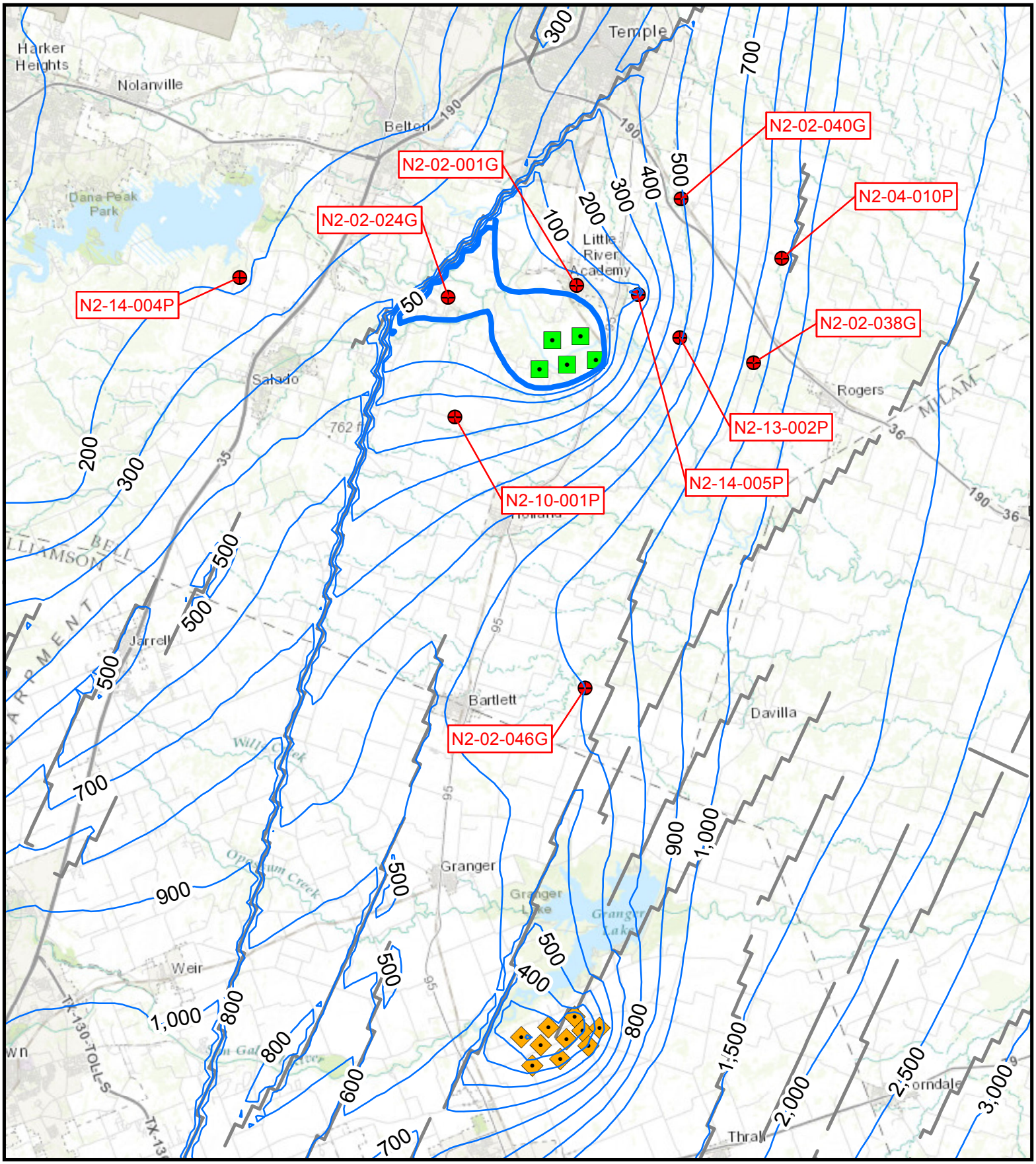
Lower Trinity Artesian Head- Scenario C-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM modified to convertible



Lower Trinity Artesian Head- Scenario C-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

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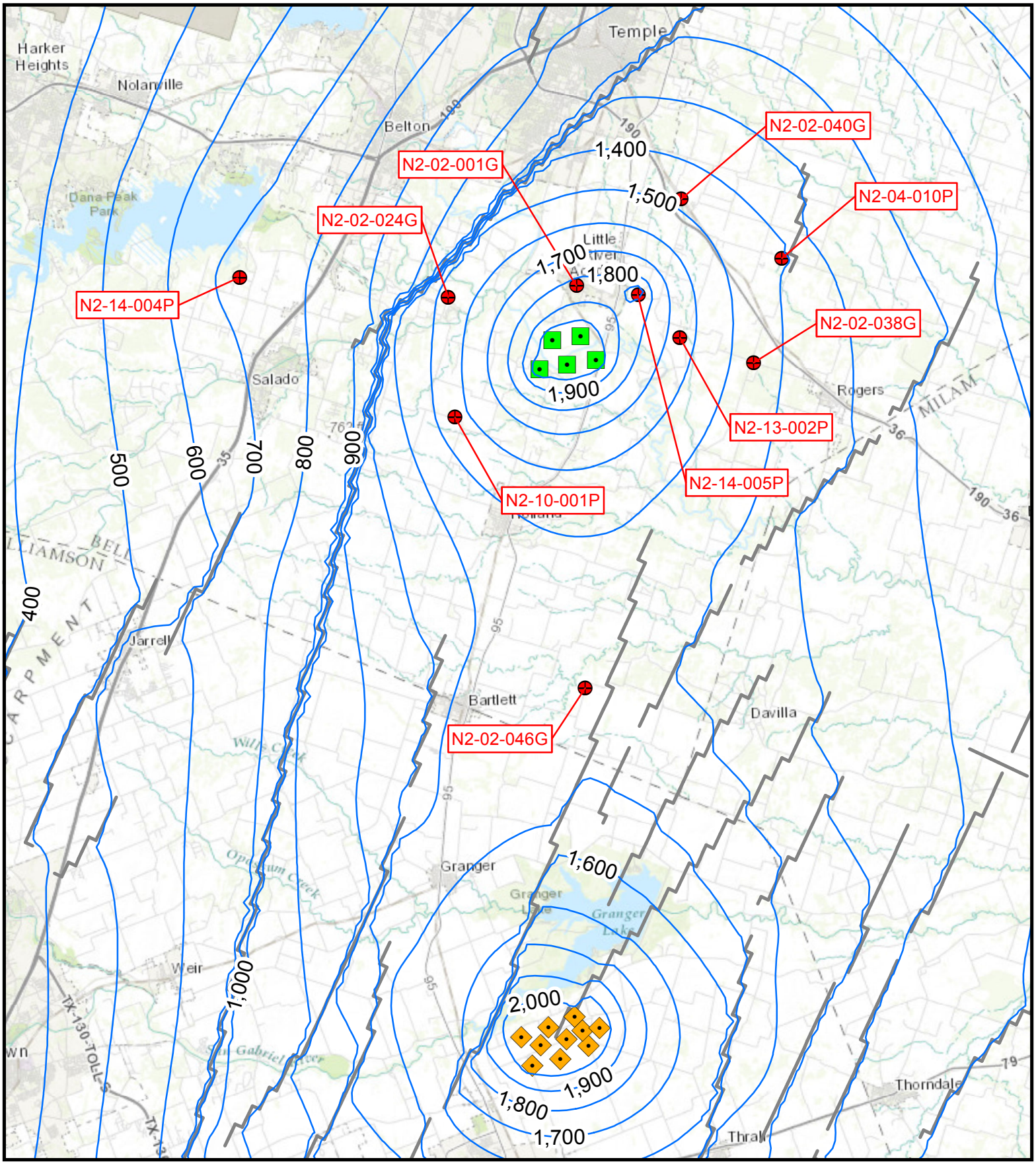
Scenario C-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM modified to convertible



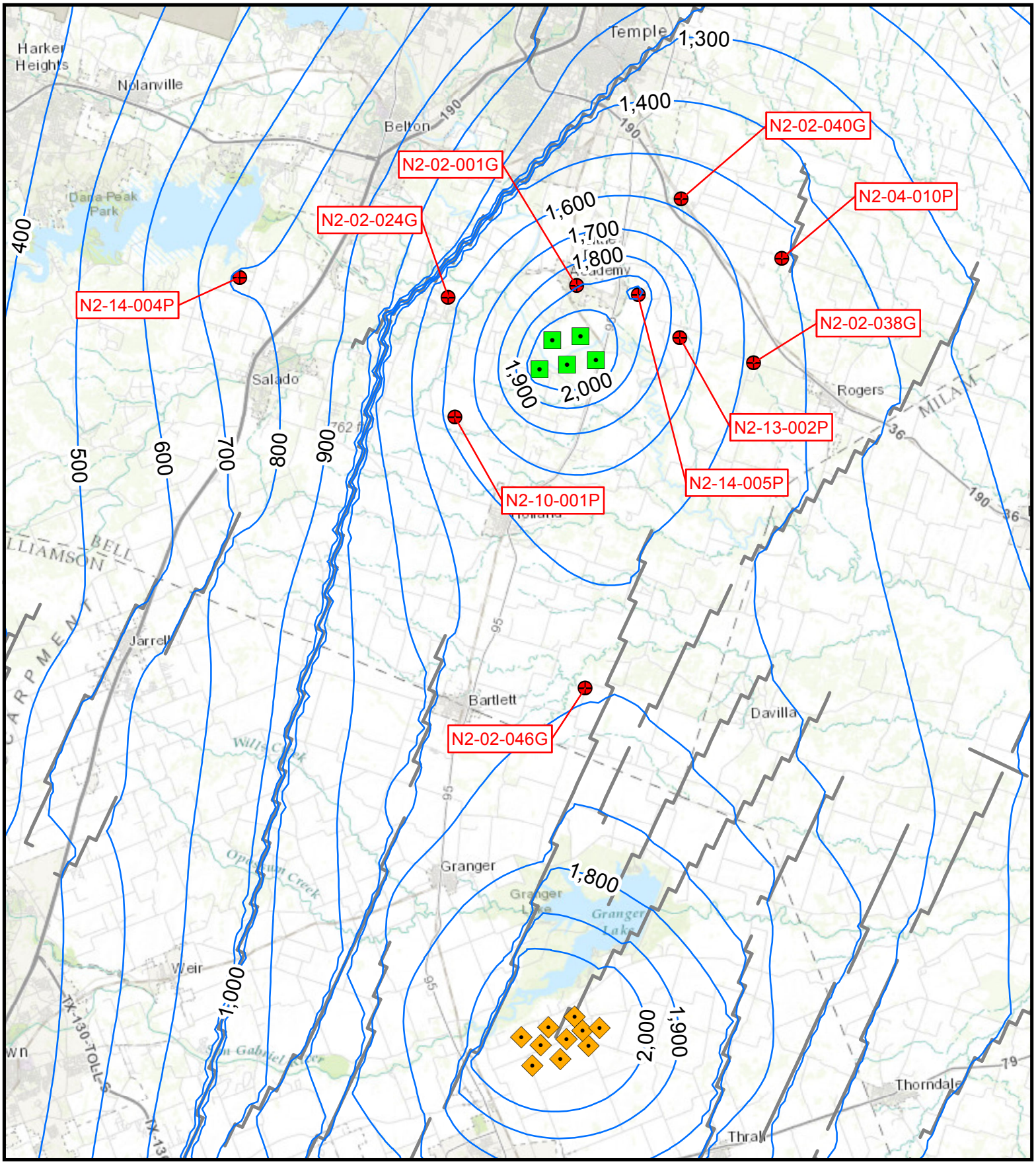
Lower Trinity Drawdown- Scenario C-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM modified to convertible



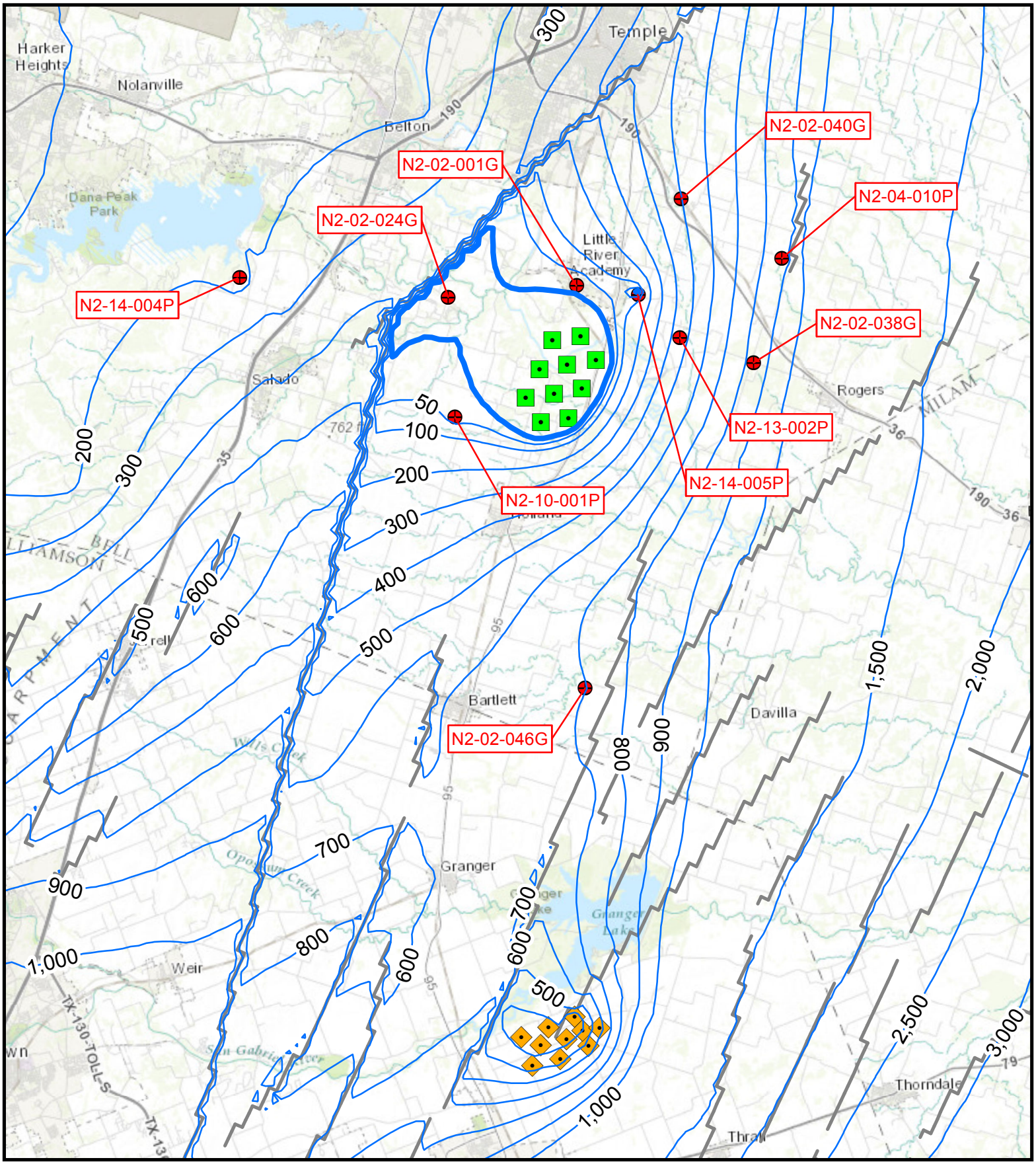
Lower Trinity Drawdown- Scenario C-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario C-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using TWDB GAM modified to convertible



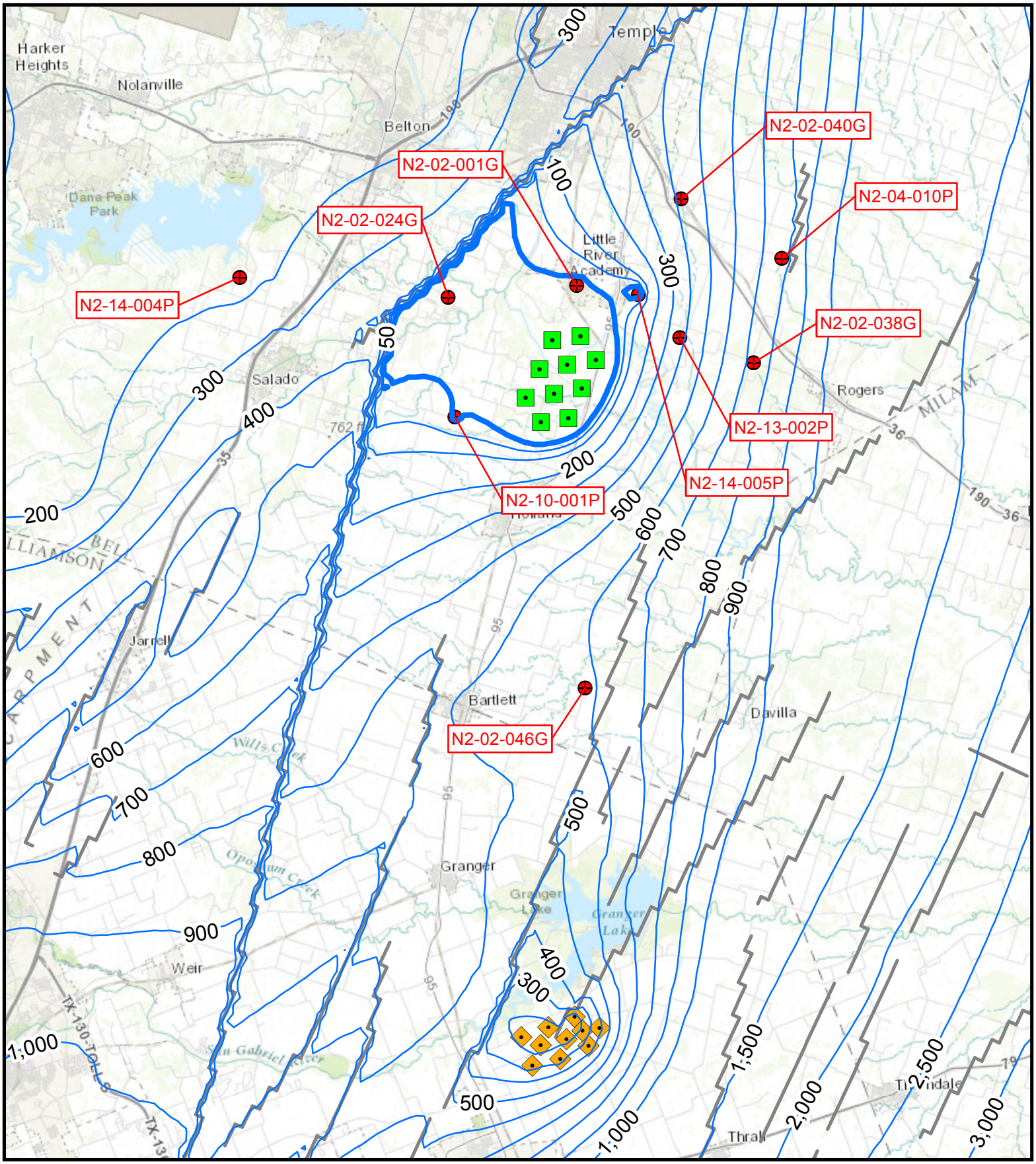
Lower Trinity Artesian Head- Scenario C-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM modified to convertible



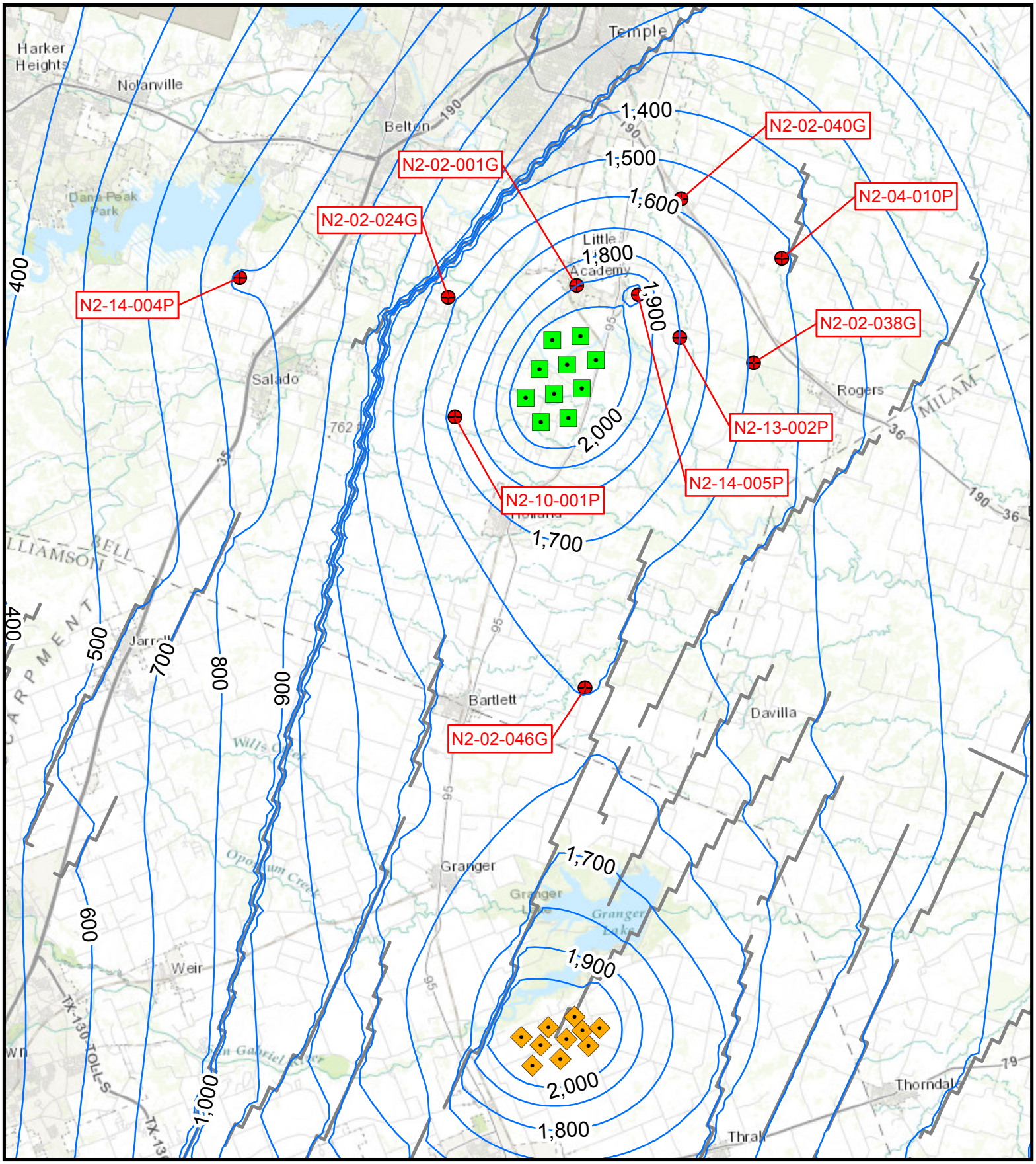
Lower Trinity Artesian Head- Scenario C-006 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario C-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM modified to convertible



Lower Trinity Drawdown- Scenario C-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

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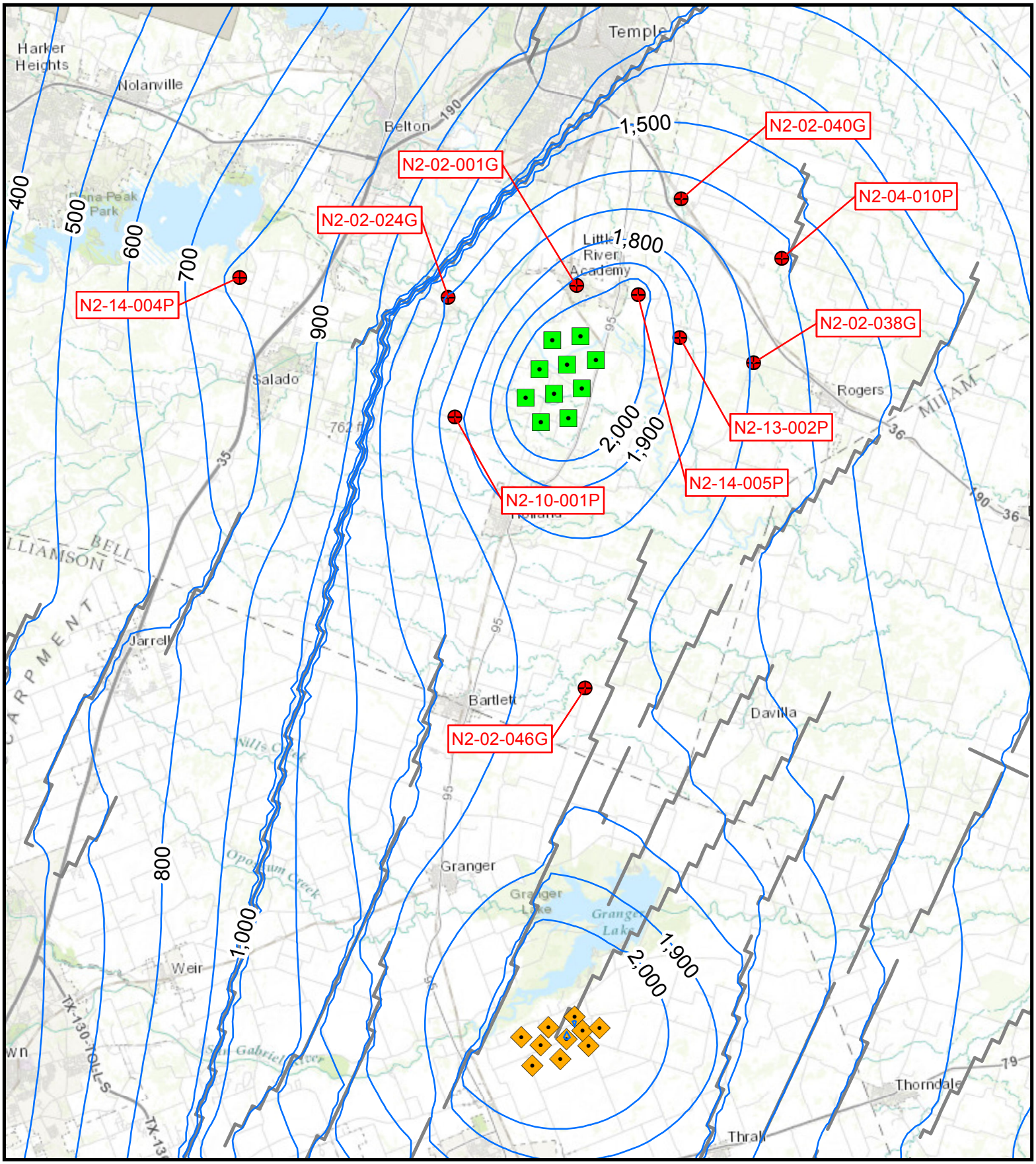
Scenario C-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM modified to convertible

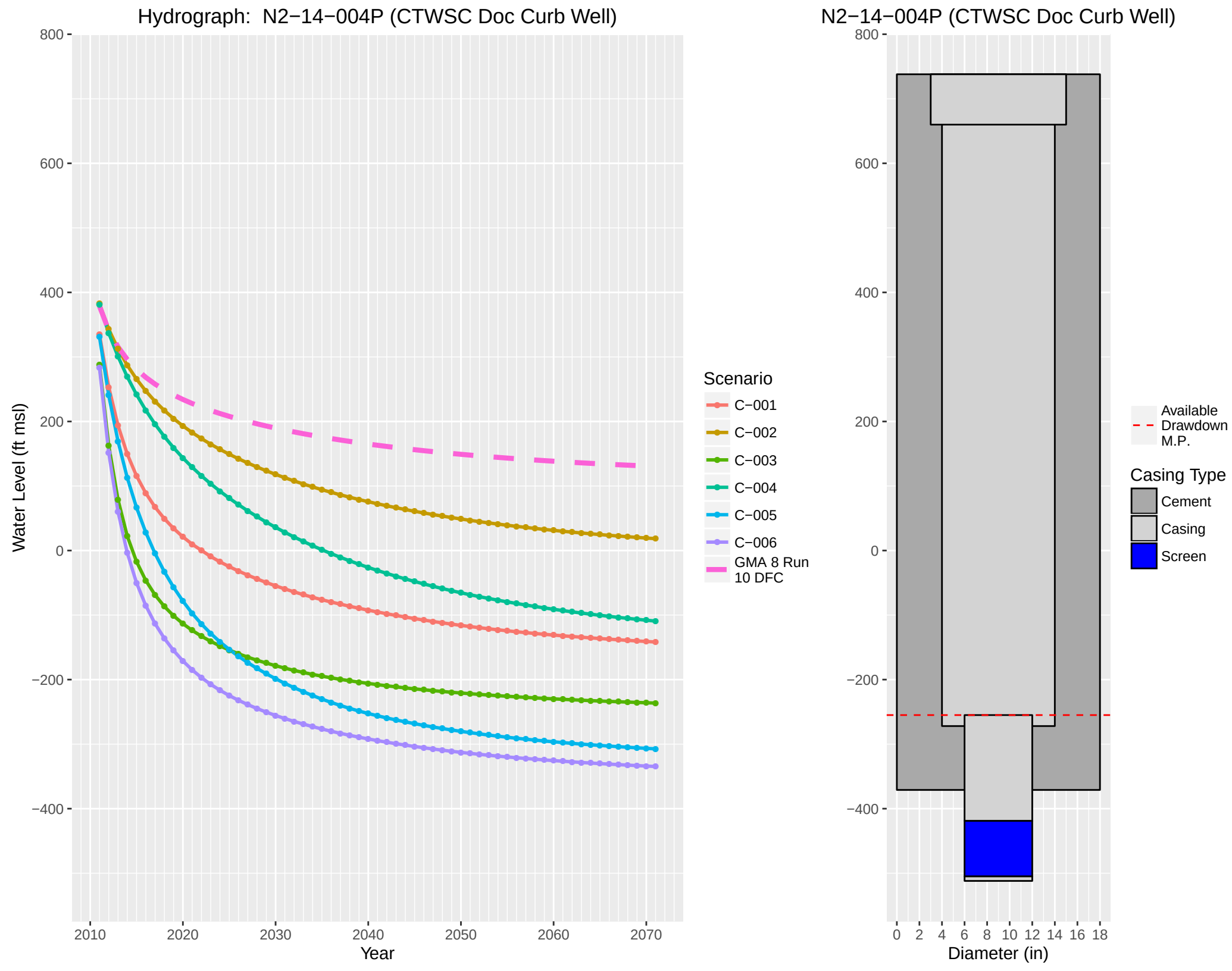


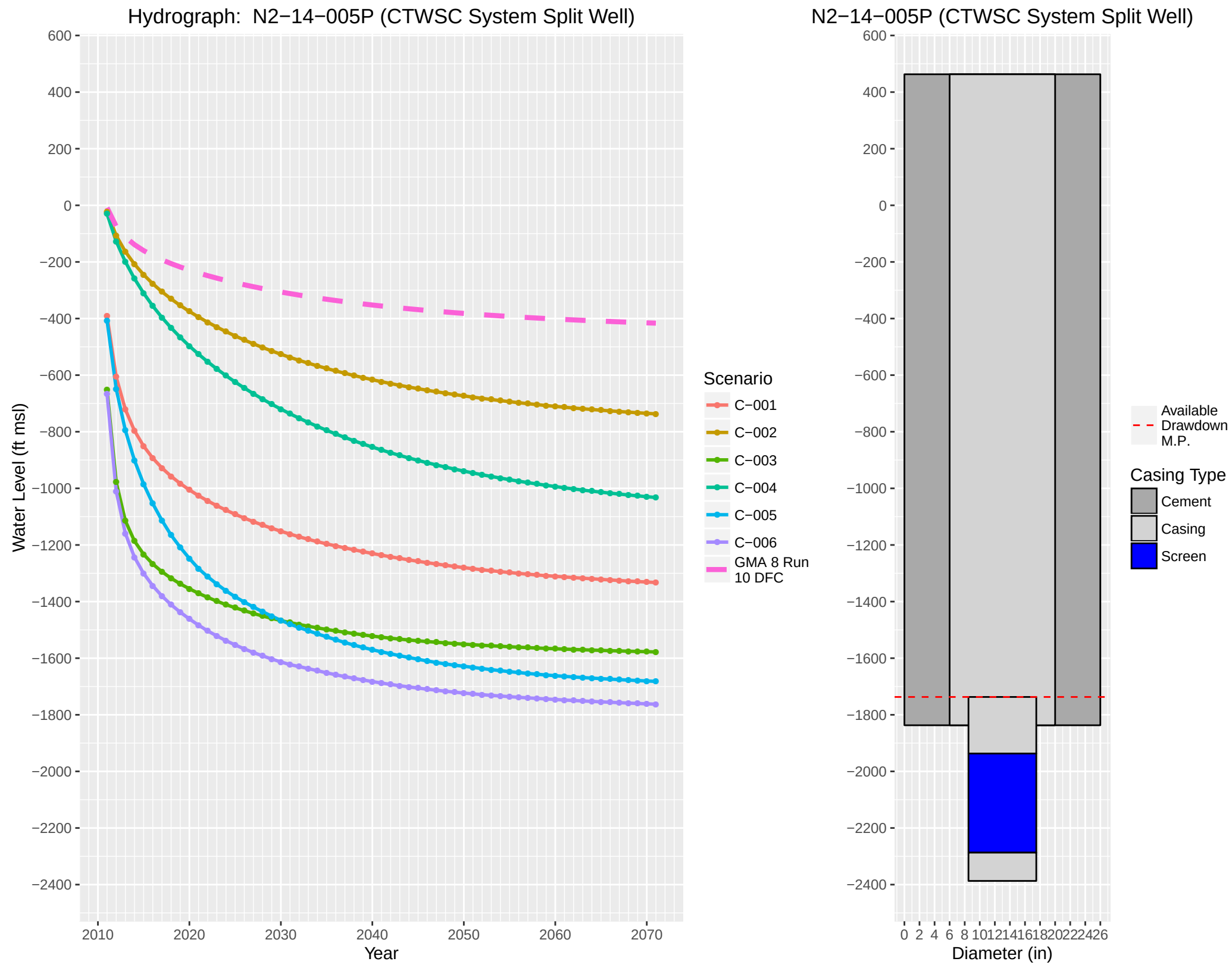
Lower Trinity Drawdown- Scenario C-006 - 50 Years

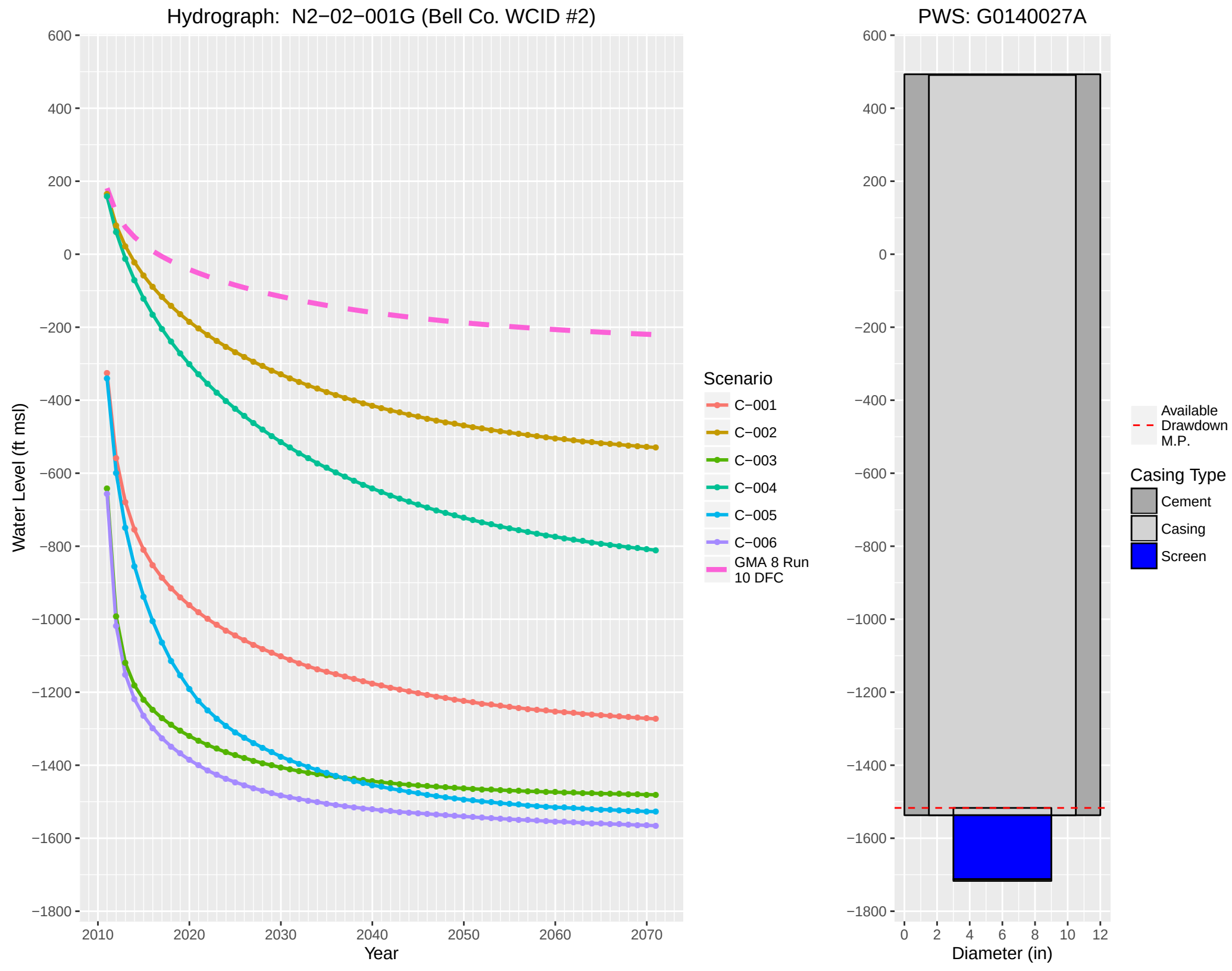
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

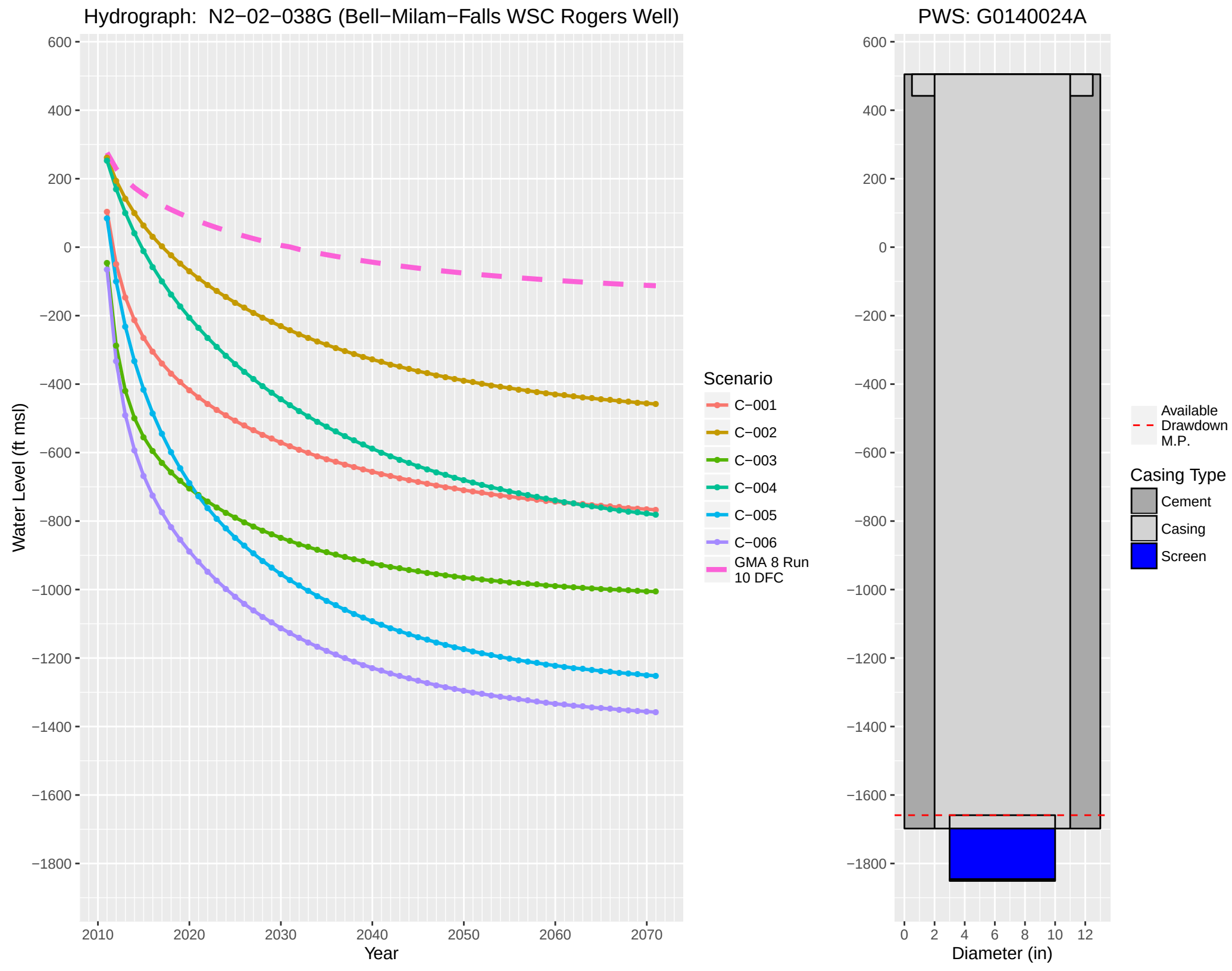
Scenario C-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using TWDB GAM modified to convertible

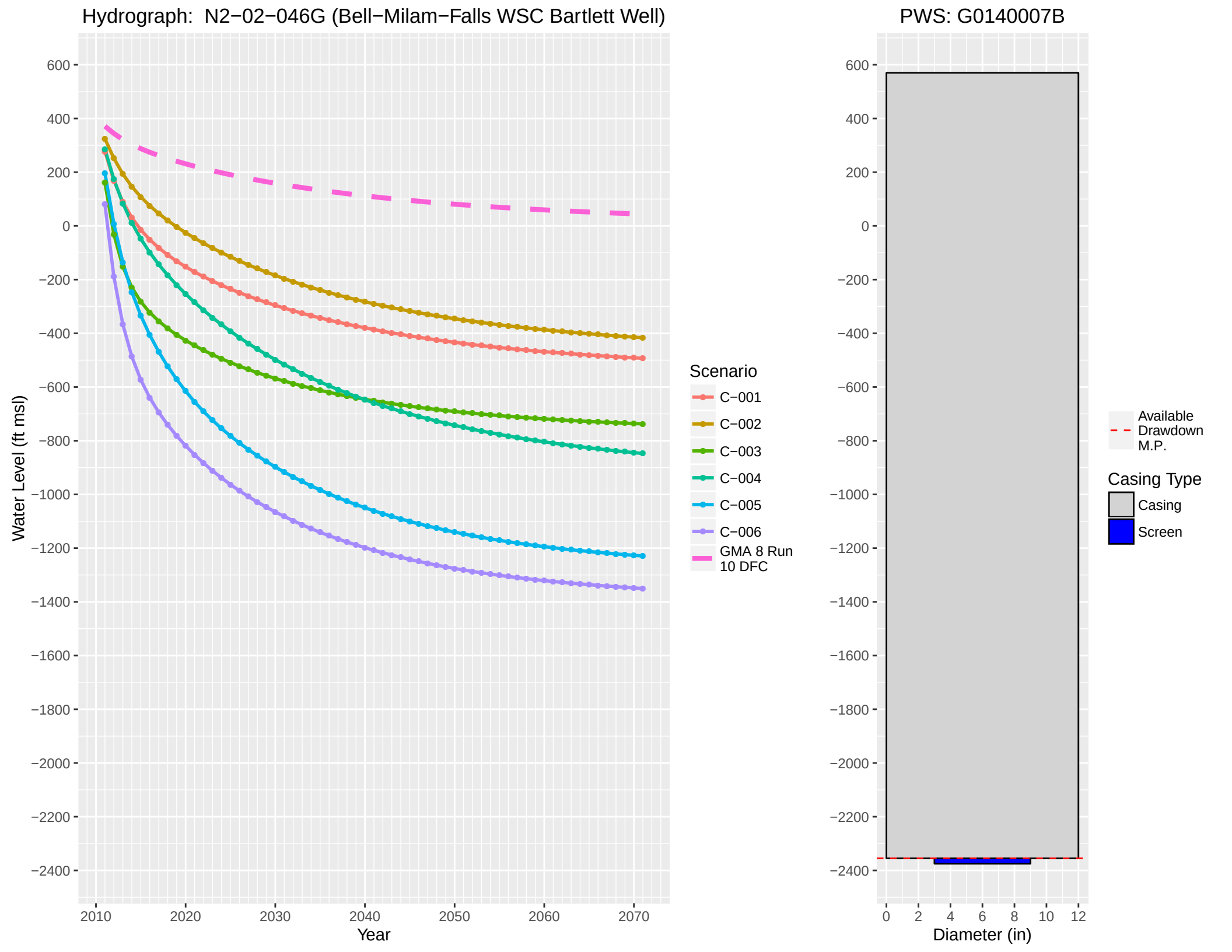
Attachment 7 —
"C" Scenarios
TWDB Approved NTWGAM
Modified to Convert to Unconfined Conditions
Hydrographs of Simulated Water Level Compared to Existing Well Construction

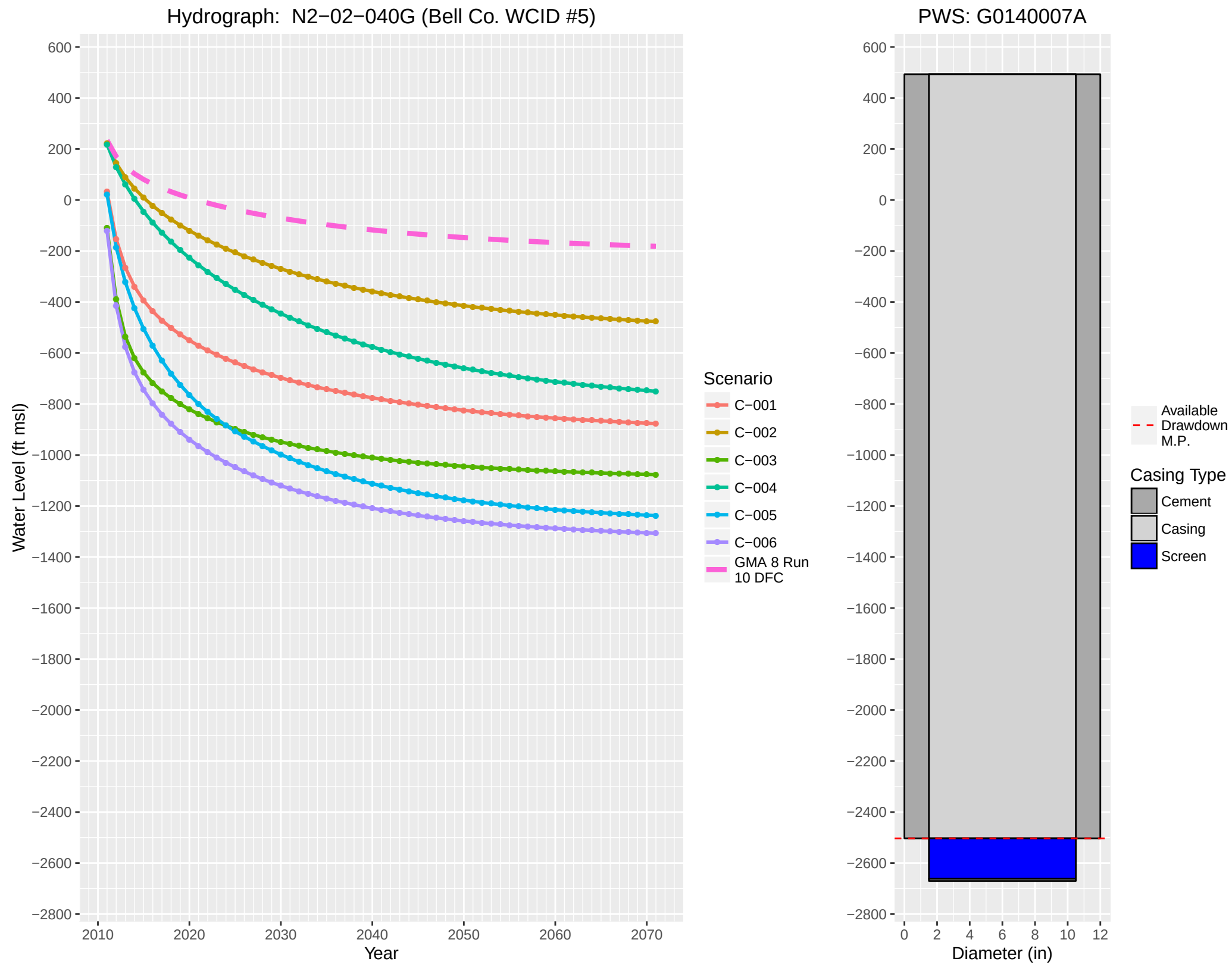

Hydrograph: N2−14−004P (CTWSC Doc Curb Well)
Water Level (ft msl)
800
600
400
200
0
−200
−400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
N2−14−004P (CTWSC Doc Curb Well)
0
2
4
6
8
10
12
14
16
18
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

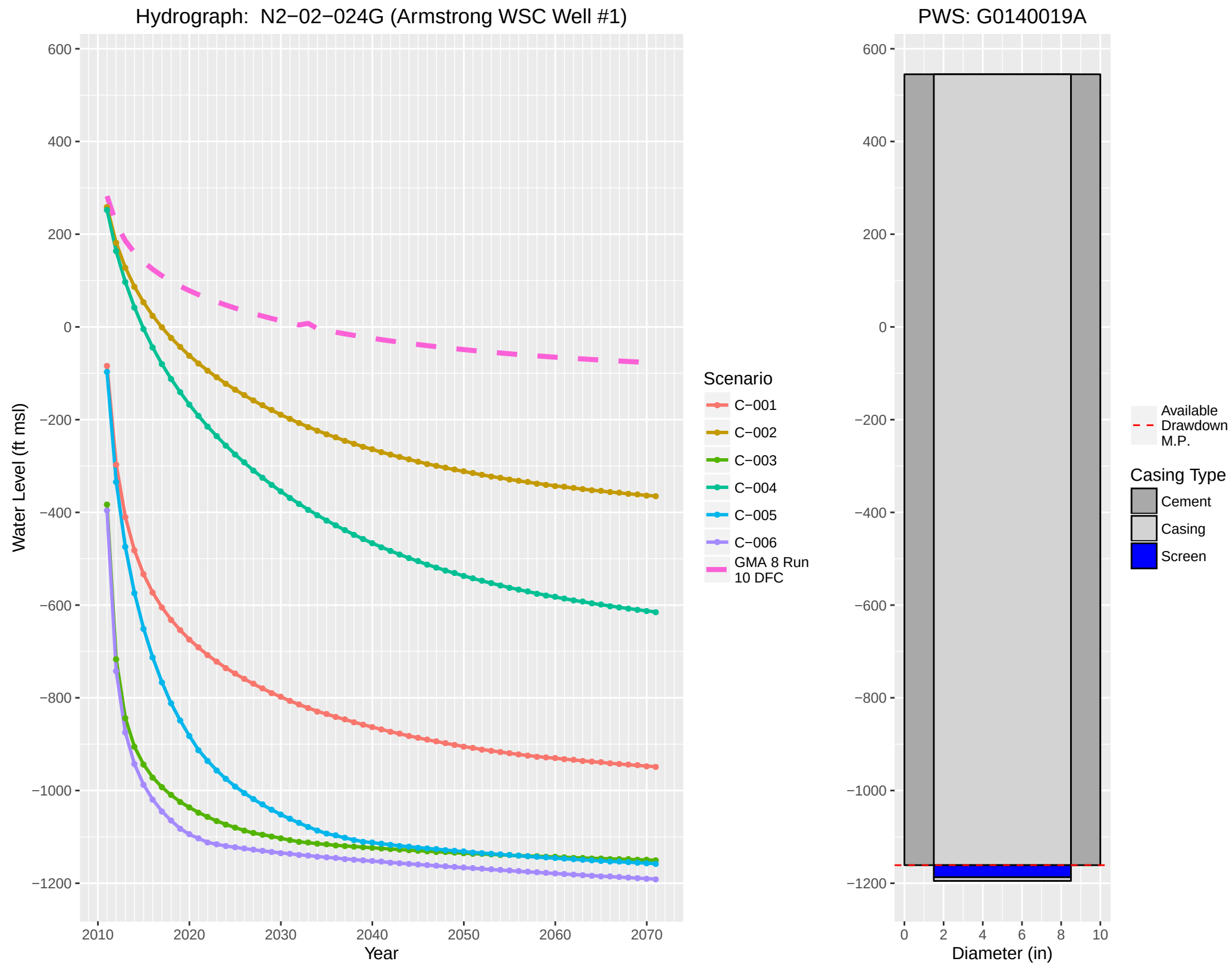

Hydrograph: N2−14−005P (CTWSC System Split Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
N2−14−005P (CTWSC System Split Well)
0 2 4 6 8 10 12 14 16 18 20 22 24 26
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

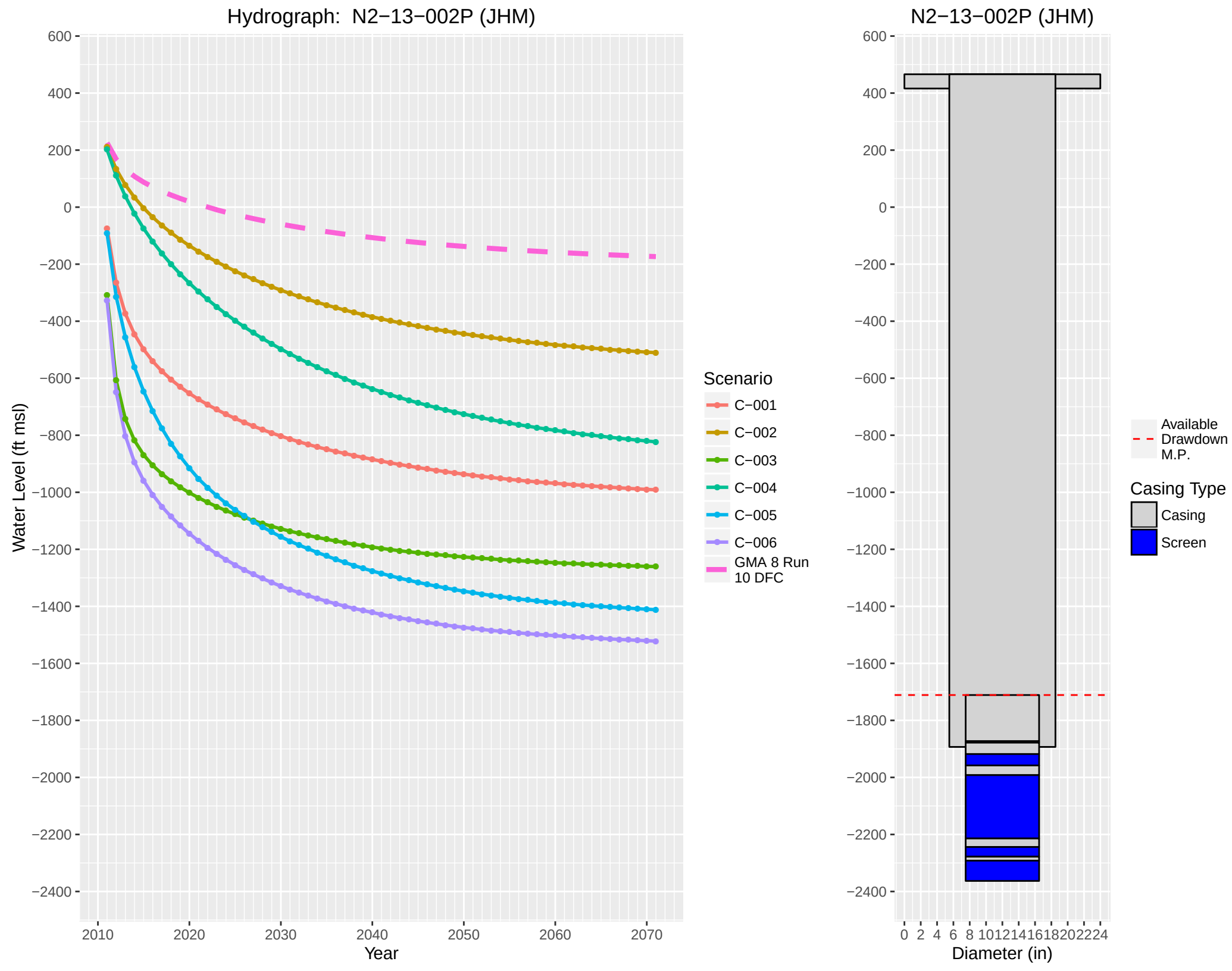

Hydrograph: N2−02−001G (Bell Co. WCID #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
PWS: G0140027A
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

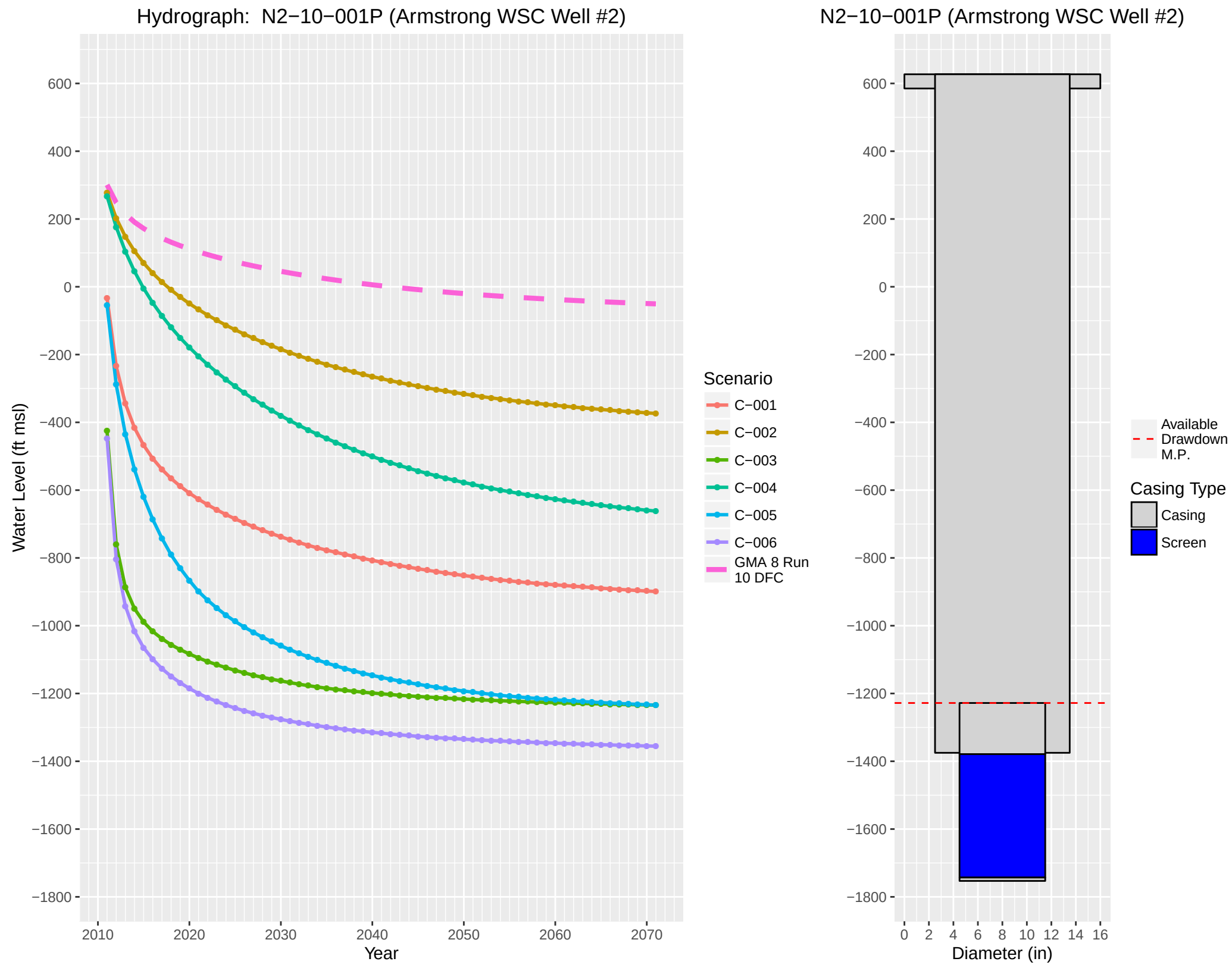

Hydrograph: N2−02−038G (Bell−Milam−Falls WSC Rogers Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
PWS: G0140024A
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

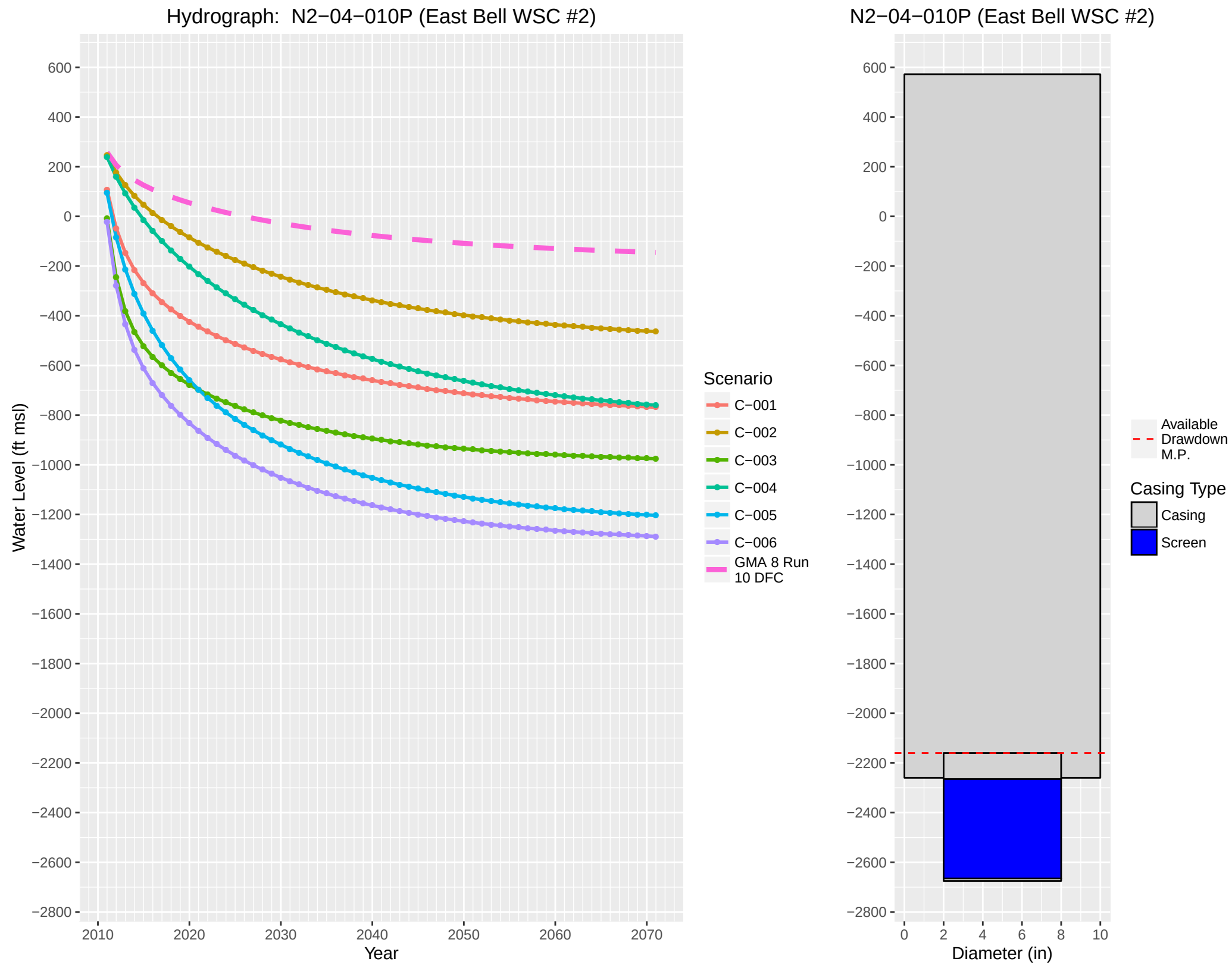

Hydrograph: N2−02−046G (Bell−Milam−Falls WSC Bartlett Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
PWS: G0140007B
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−02−040G (Bell Co. WCID #5)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
PWS: G0140007A
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

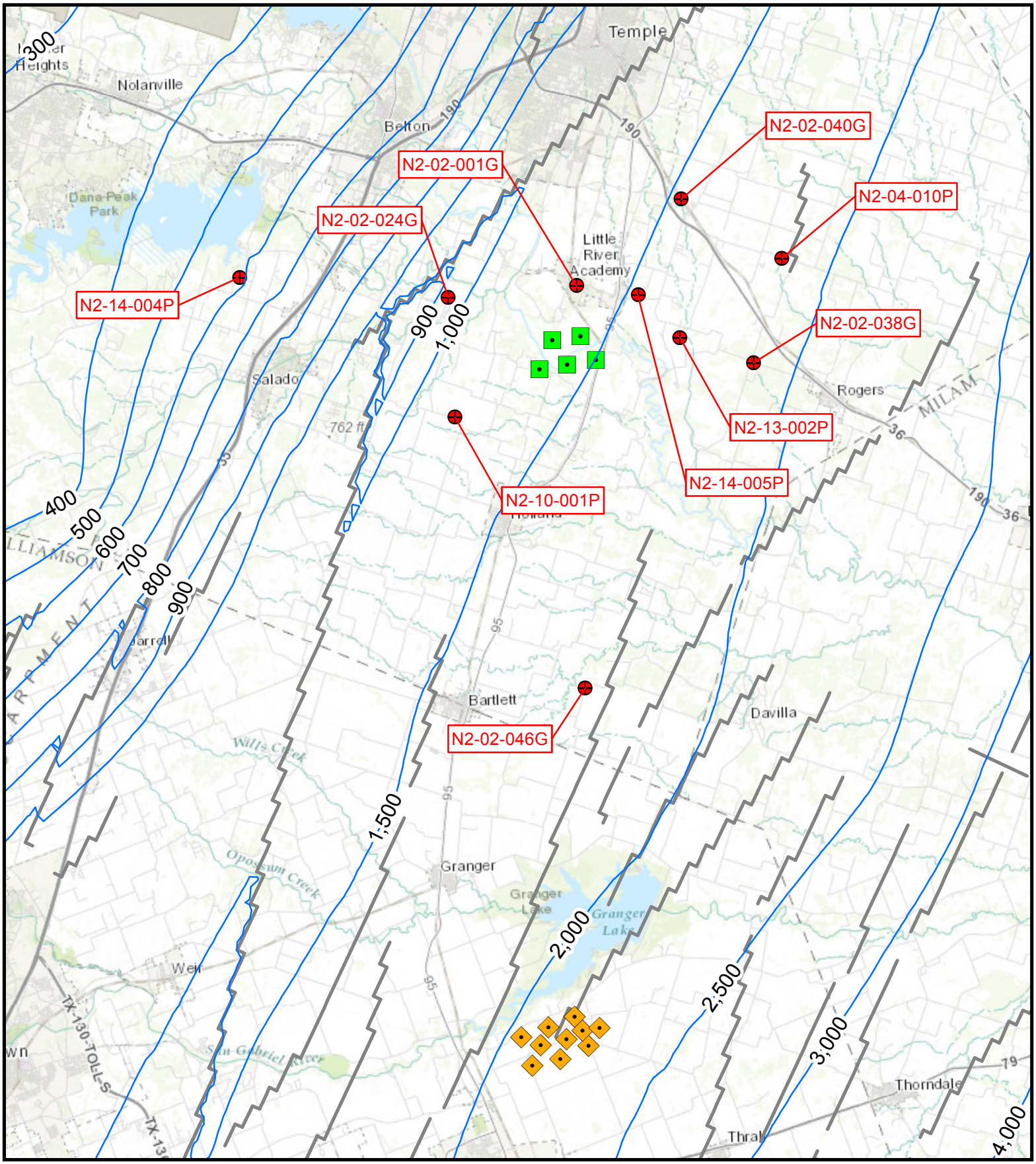

Hydrograph: N2−02−024G (Armstrong WSC Well #1)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
PWS: G0140019A
600
400
200
0
−200
−400
−600
−800
−1000
−1200
0
2
4
6
8
10
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen


Hydrograph: N2−13−002P (JHM)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
N2−13−002P (JHM)
0 2 4 6 8 10 12 14 16 18 20 22 24
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−10−001P (Armstrong WSC Well #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
N2−10−001P (Armstrong WSC Well #2)
0
2
4
6
8
10
12
14
16
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−04−010P (East Bell WSC #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
C−001
C−002
C−003
C−004
C−005
C−006
GMA 8 Run 10 DFC
N2−04−010P (East Bell WSC #2)
0
2
4
6
8
10
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen

Attachment 8 —
"D" Scenarios
CUWCD Transmissivity Modified NTWGAM
Modified to Convert to Unconfined Conditions
Artesian Head and Drawdown after 30 and 50 Years of Production



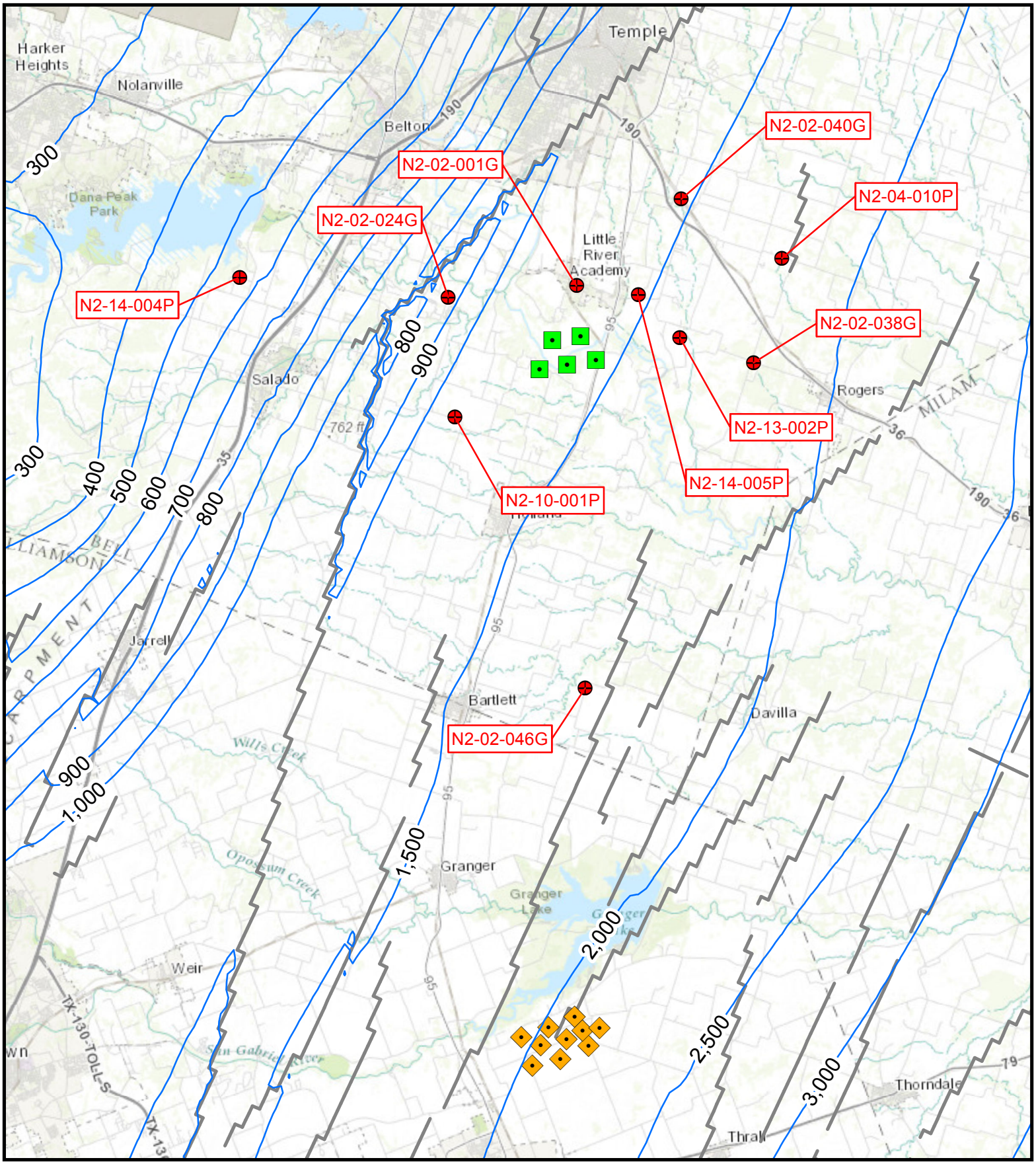
Lower Trinity Artesian Head- Scenario D-001 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

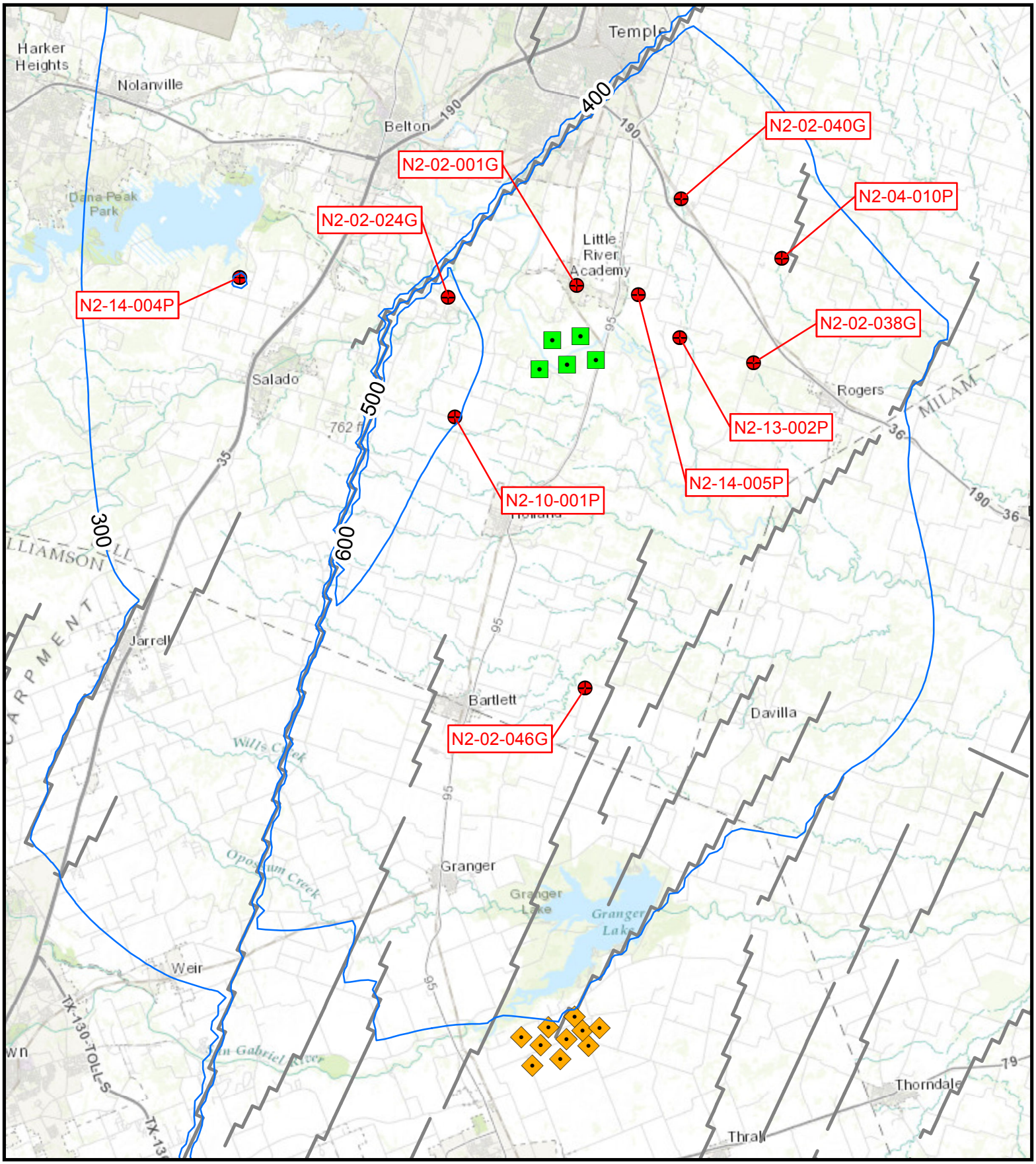
Scenario D-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



Lower Trinity Artesian Head- Scenario D-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

Scenario D-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



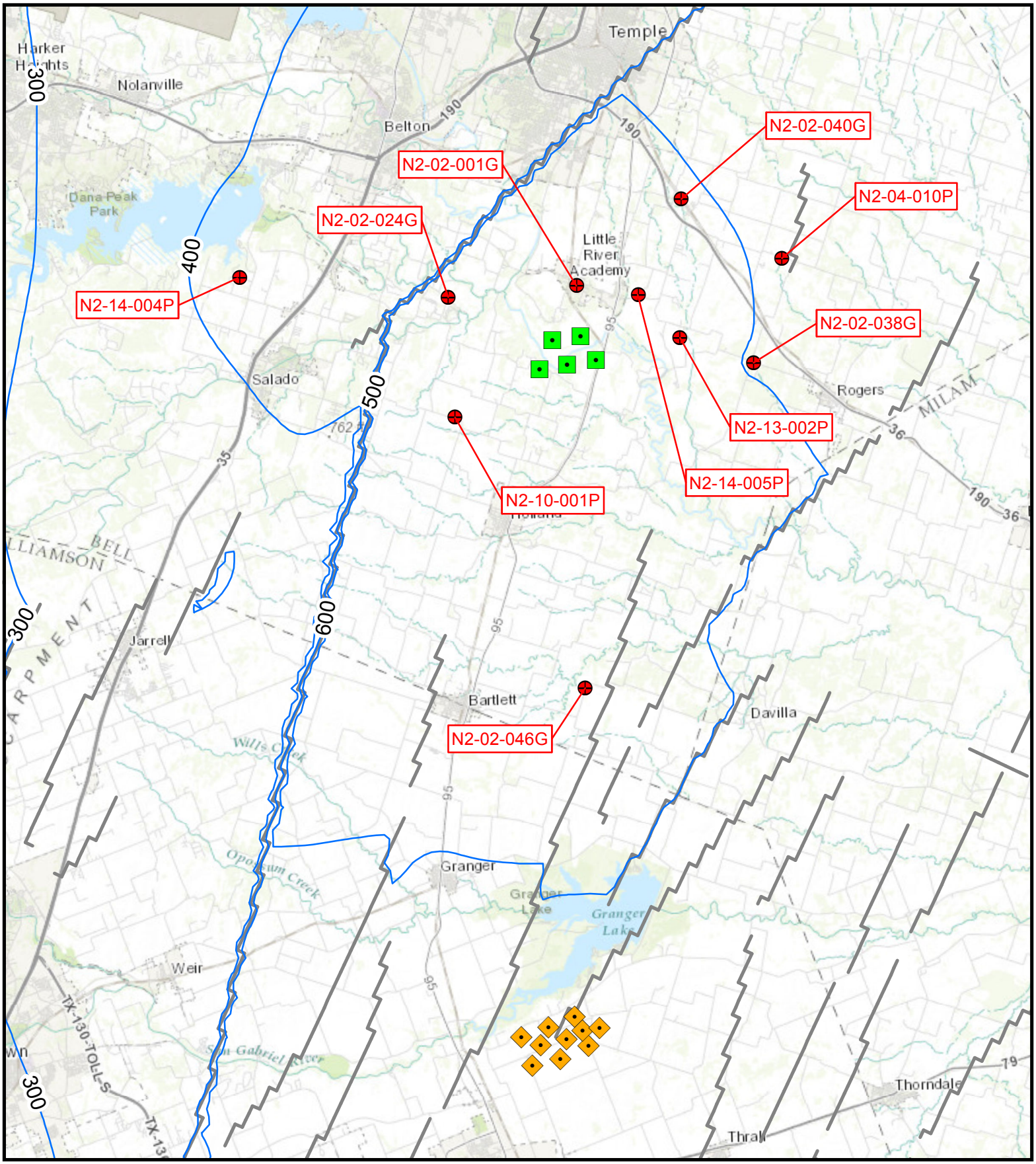
Lower Trinity Drawdown- Scenario D-001 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



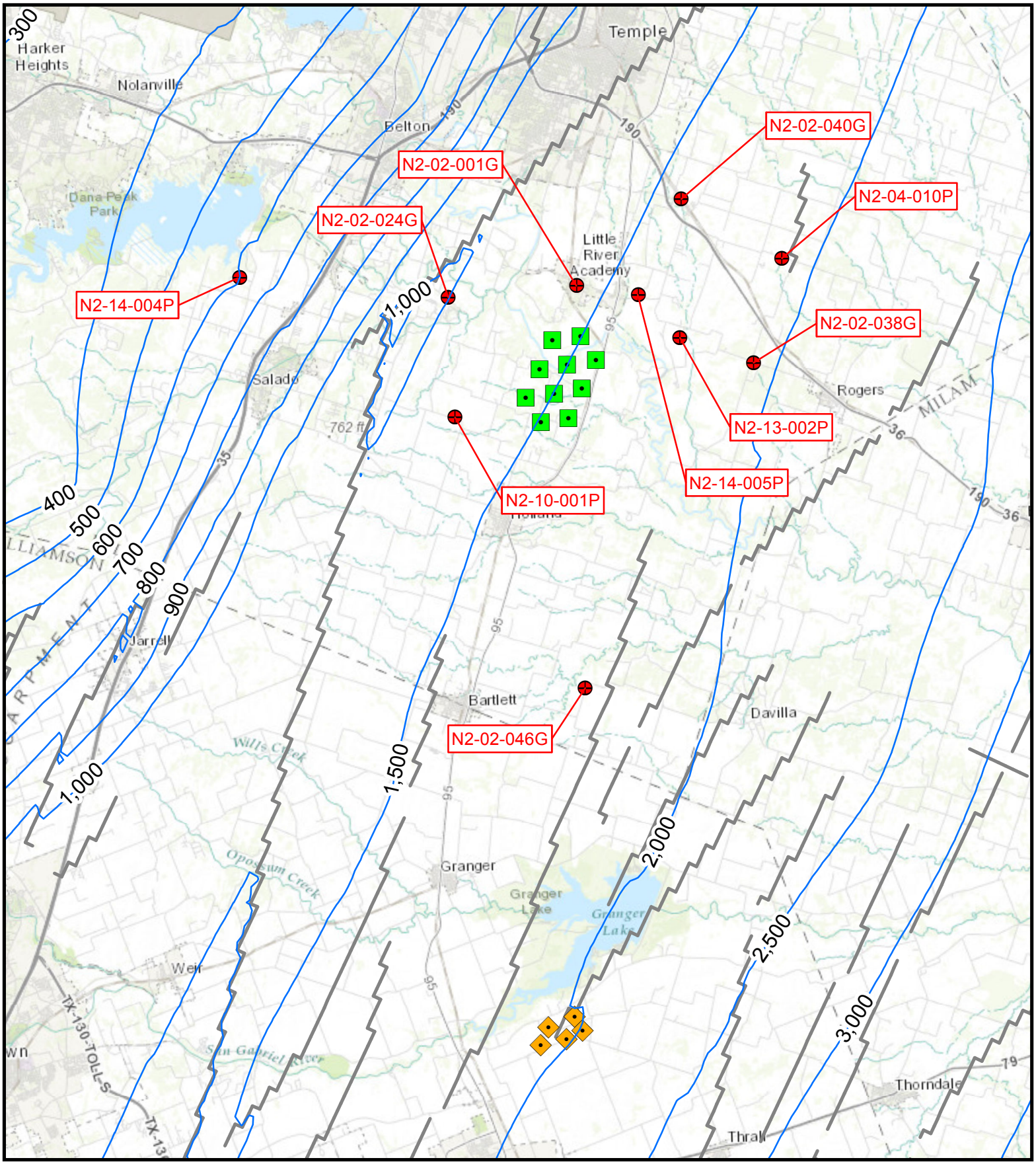
Lower Trinity Drawdown- Scenario D-001 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-001: 5 CUWCD Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



Lower Trinity Artesian Head- Scenario D-002 - 30 Years

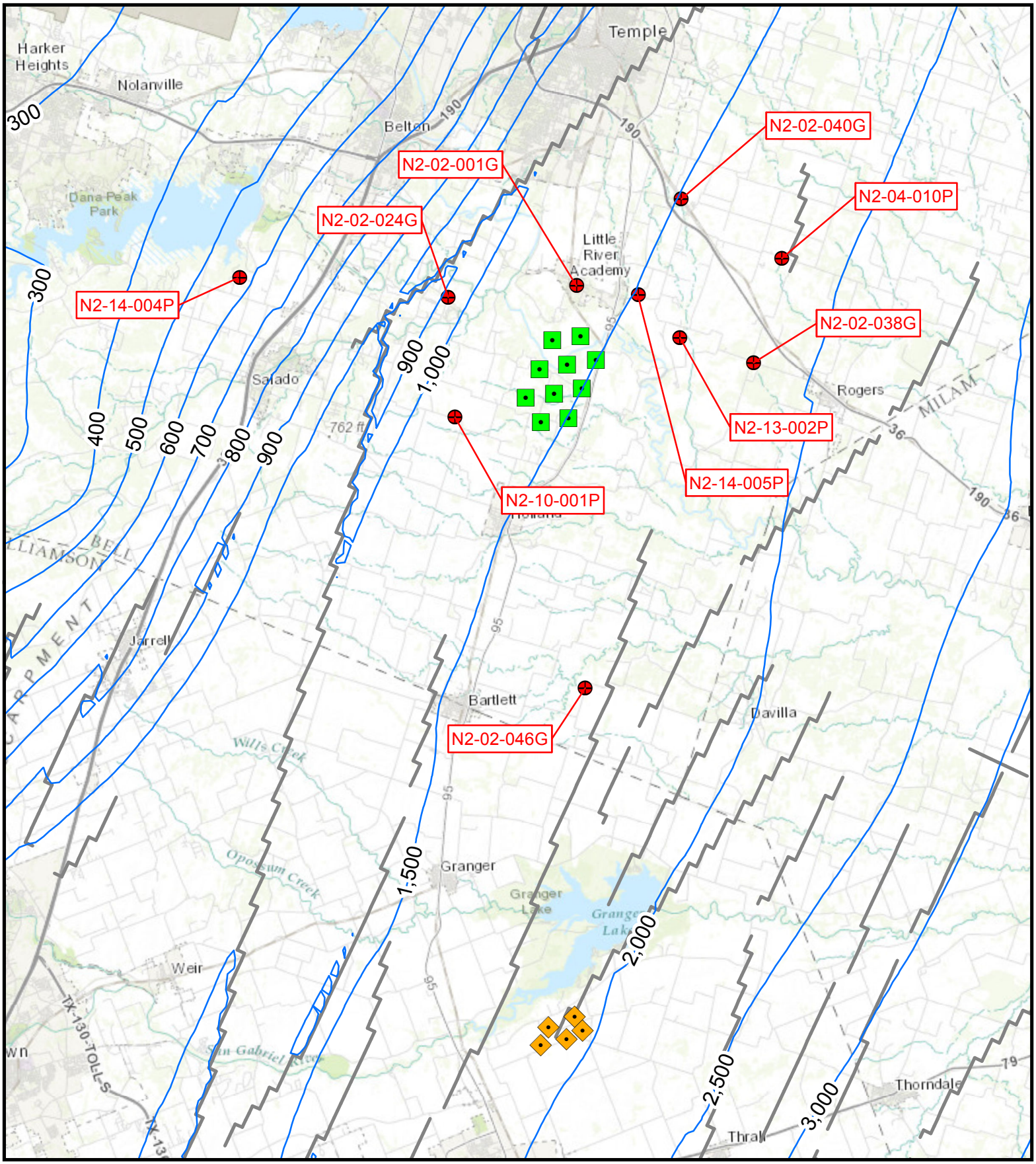
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

LBG GUYTON

Scenario D-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



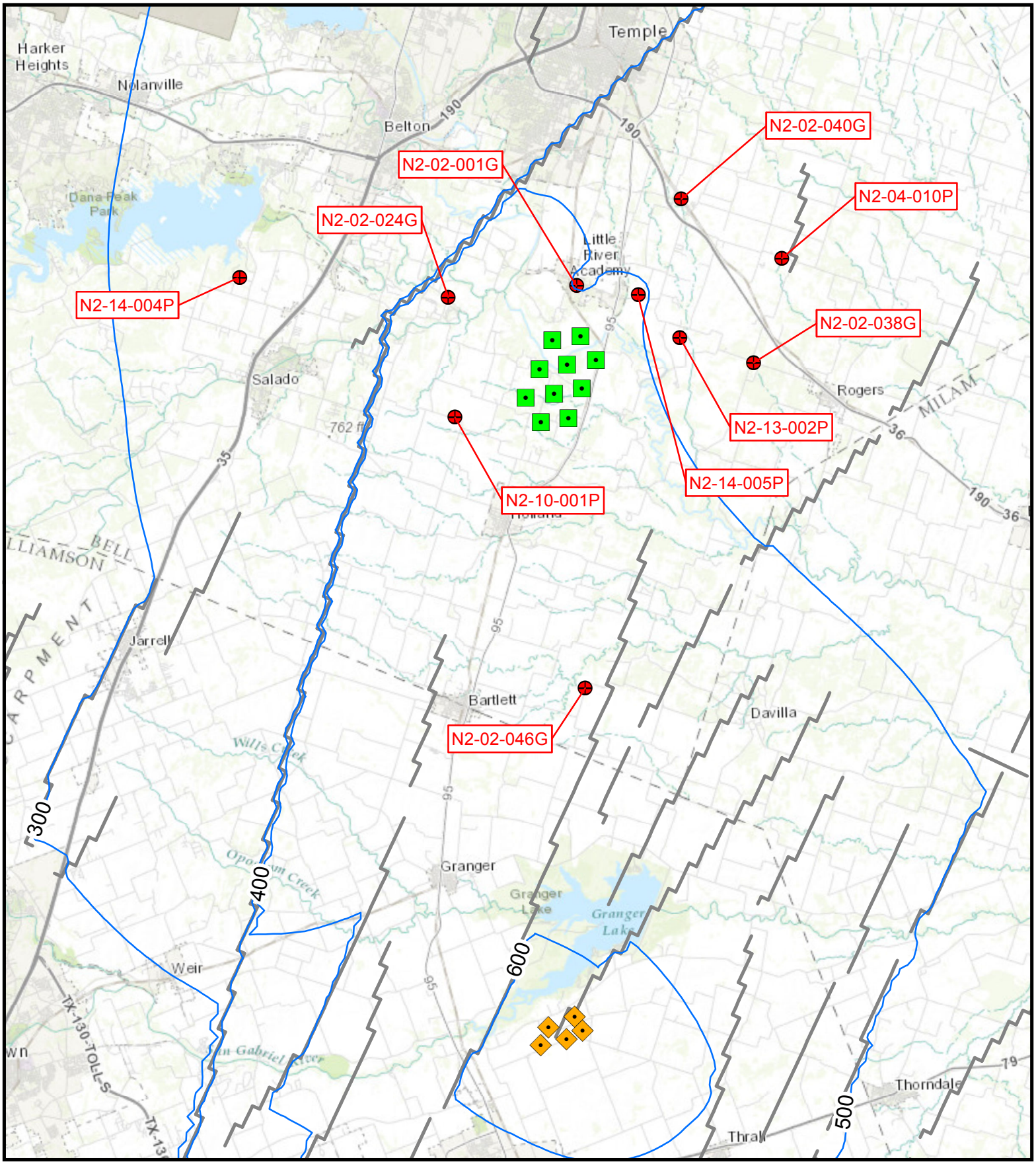
Lower Trinity Artesian Head- Scenario D-002 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



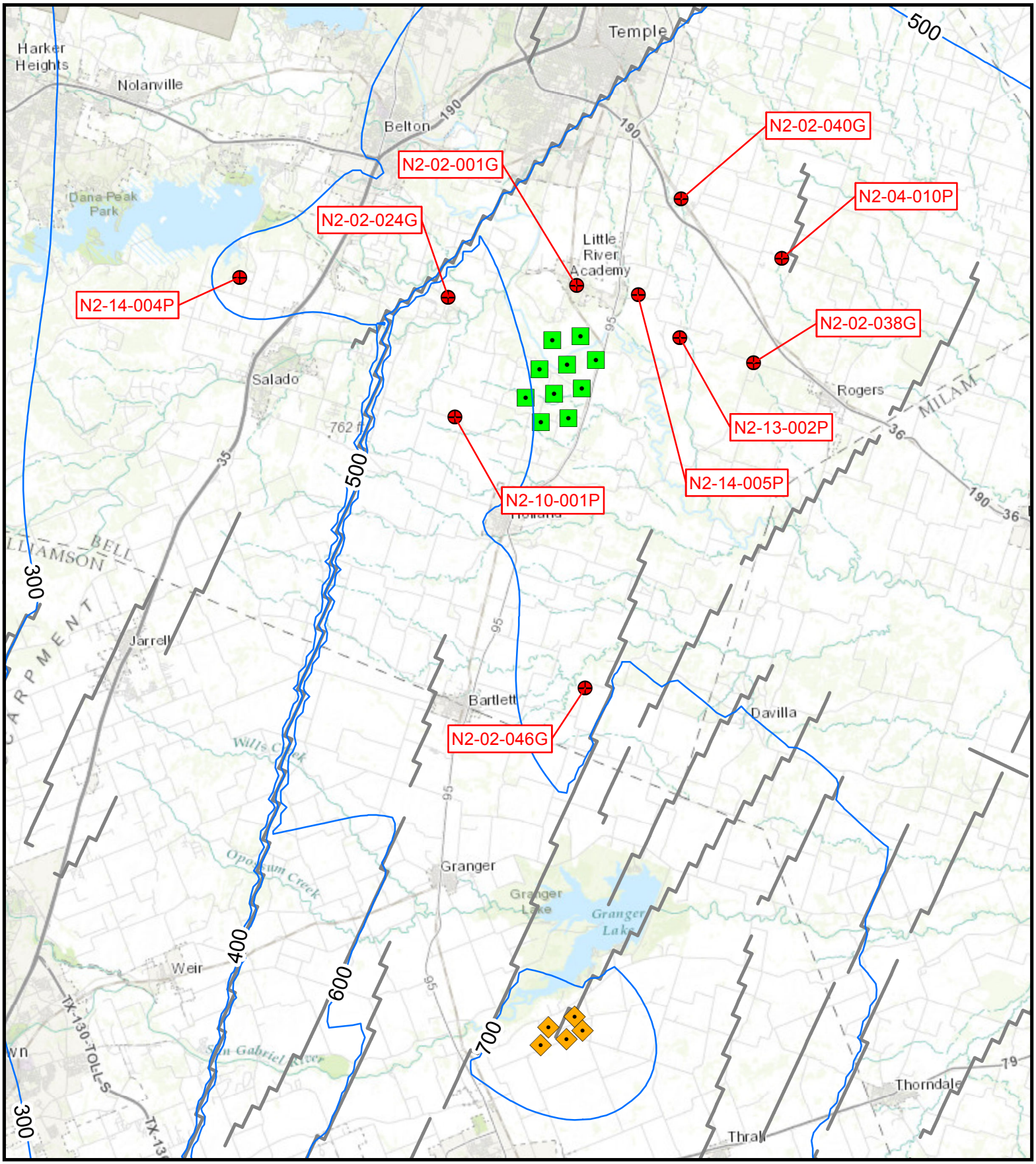
Lower Trinity Drawdown- Scenario D-002 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



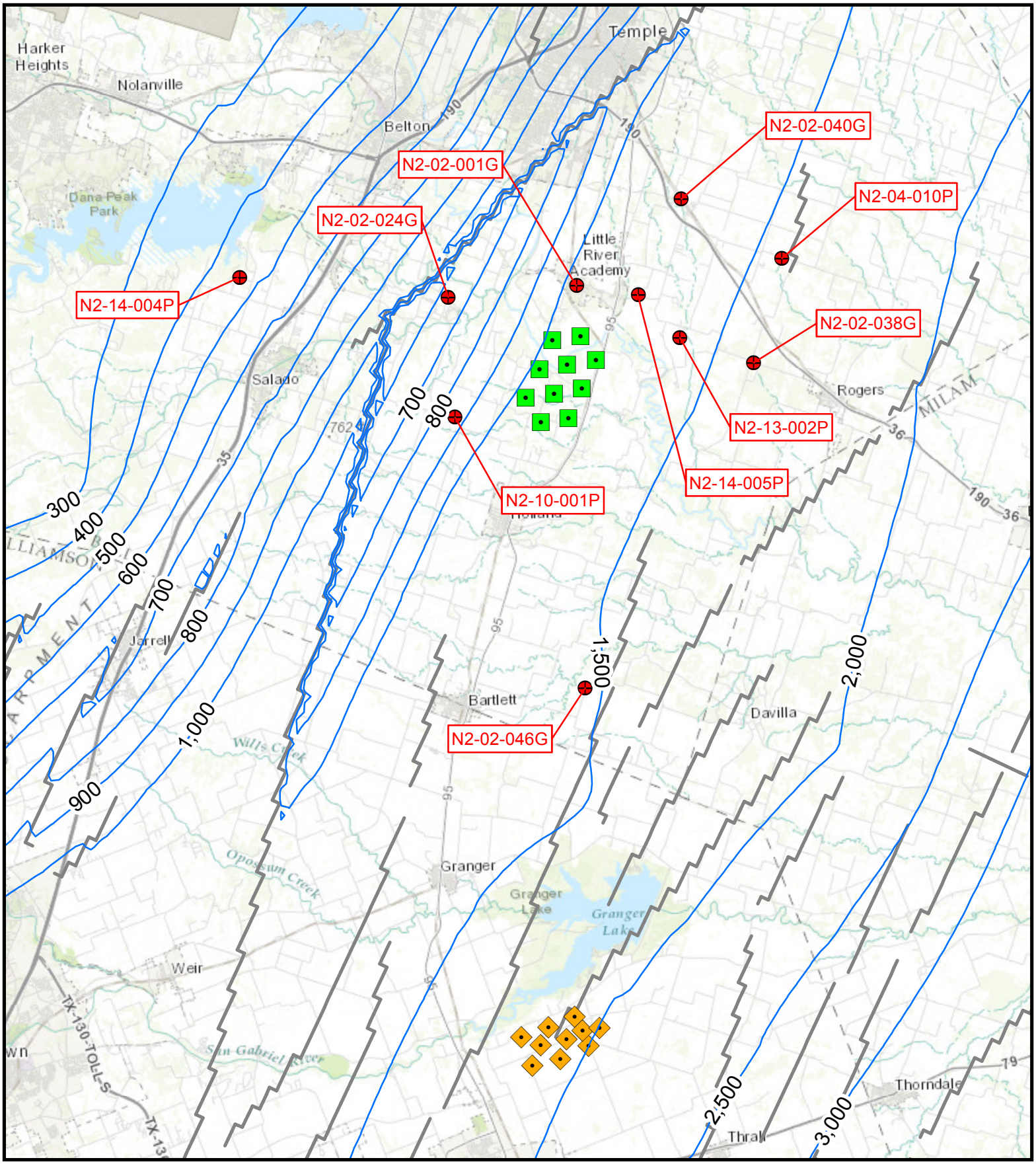
Lower Trinity Drawdown- Scenario D-002 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-002: 5 BRA Wells pumping total at 10,000 AFY using Modified Layer 8 K Model modified to convertible



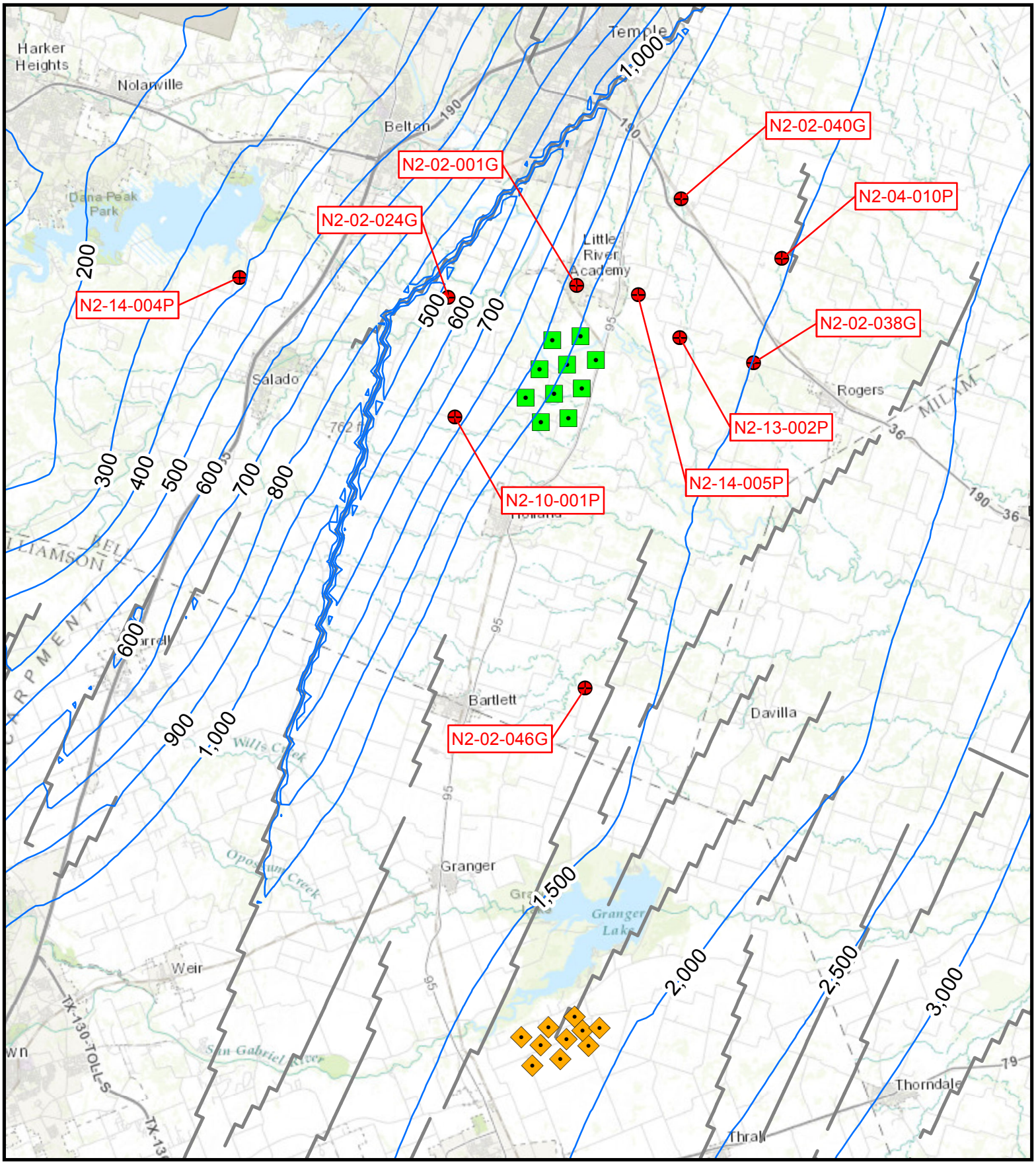
Lower Trinity Artesian Head- Scenario D-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



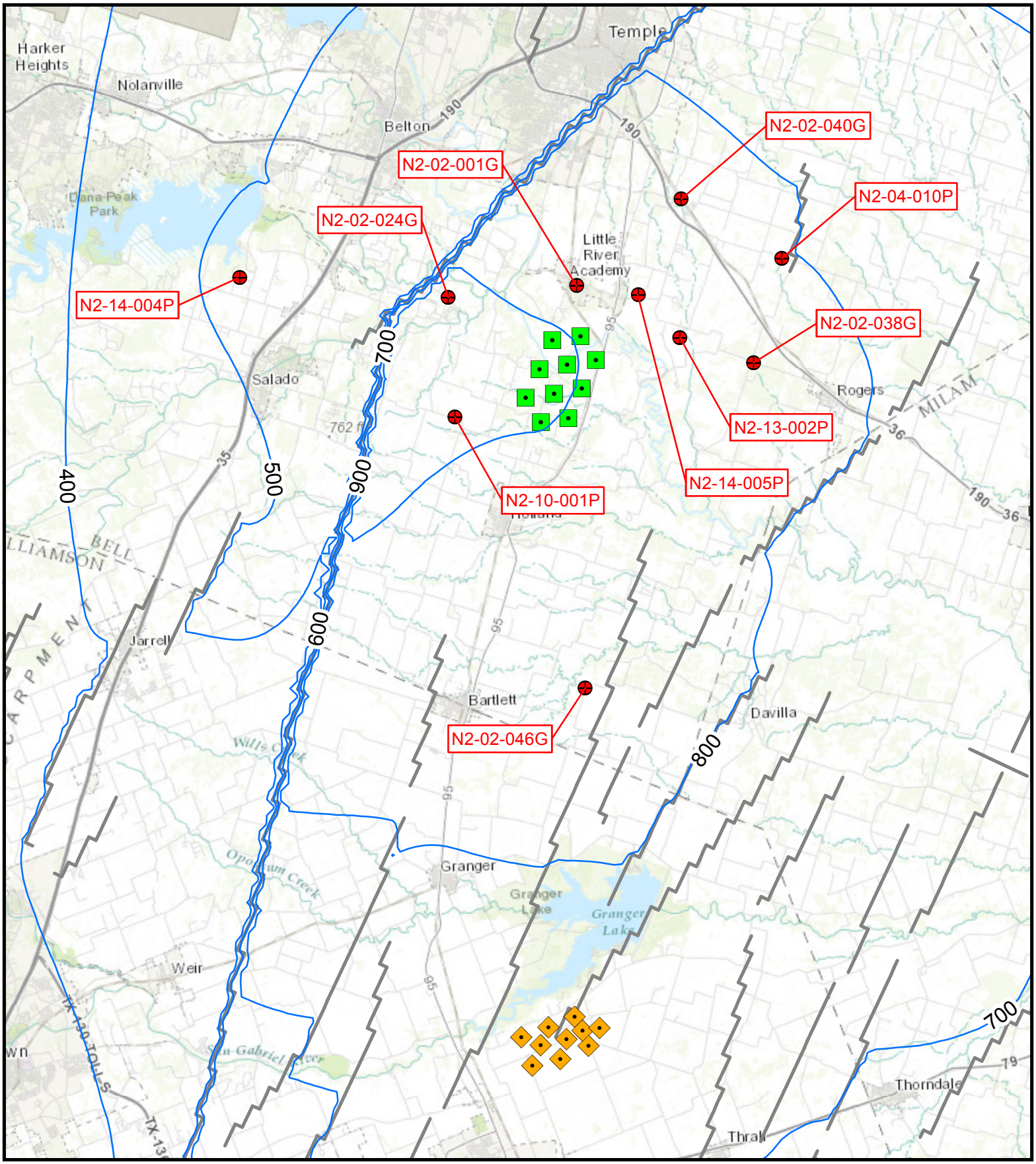
Lower Trinity Artesian Head- Scenario D-003 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



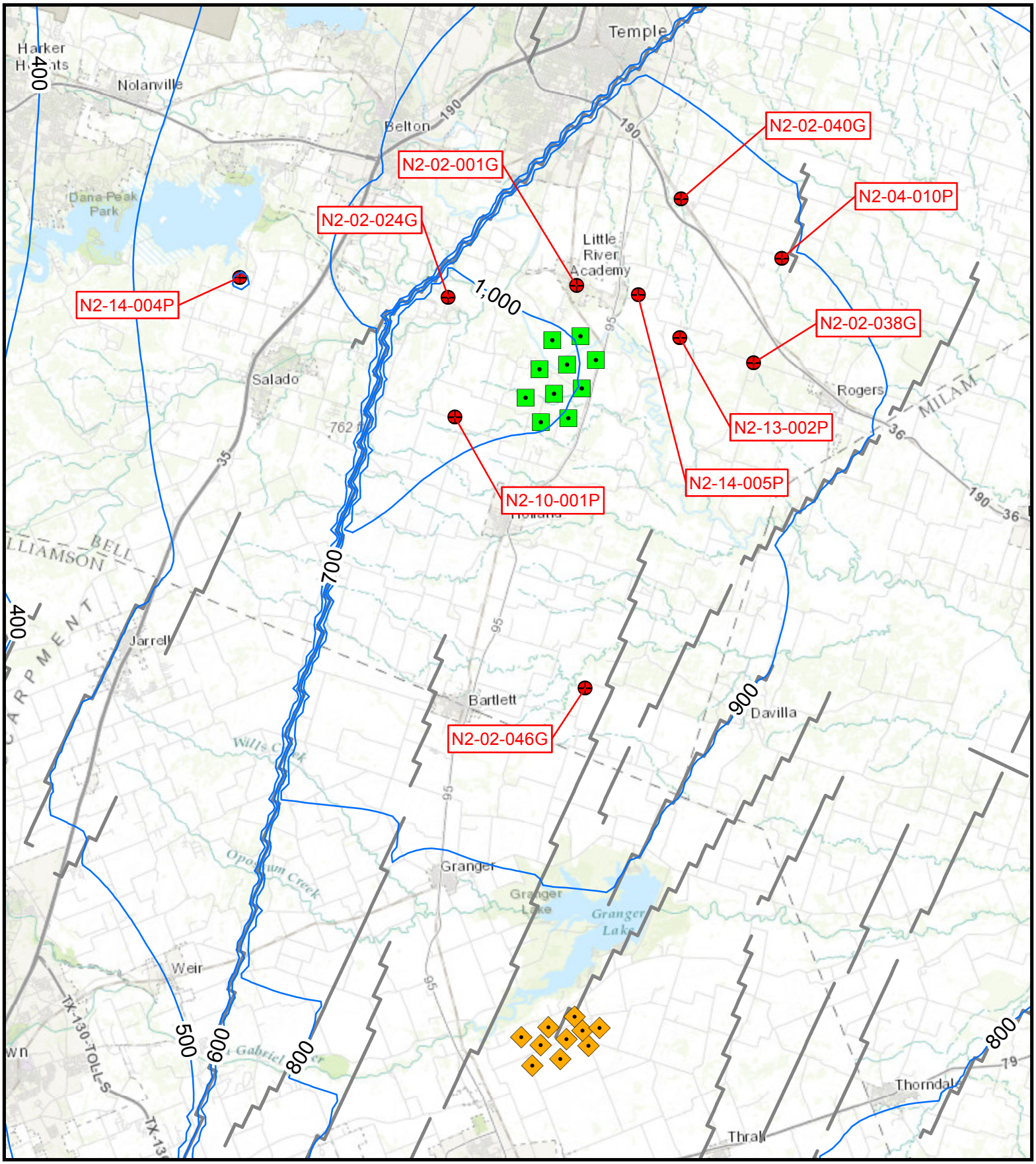
Lower Trinity Drawdown- Scenario D-003 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



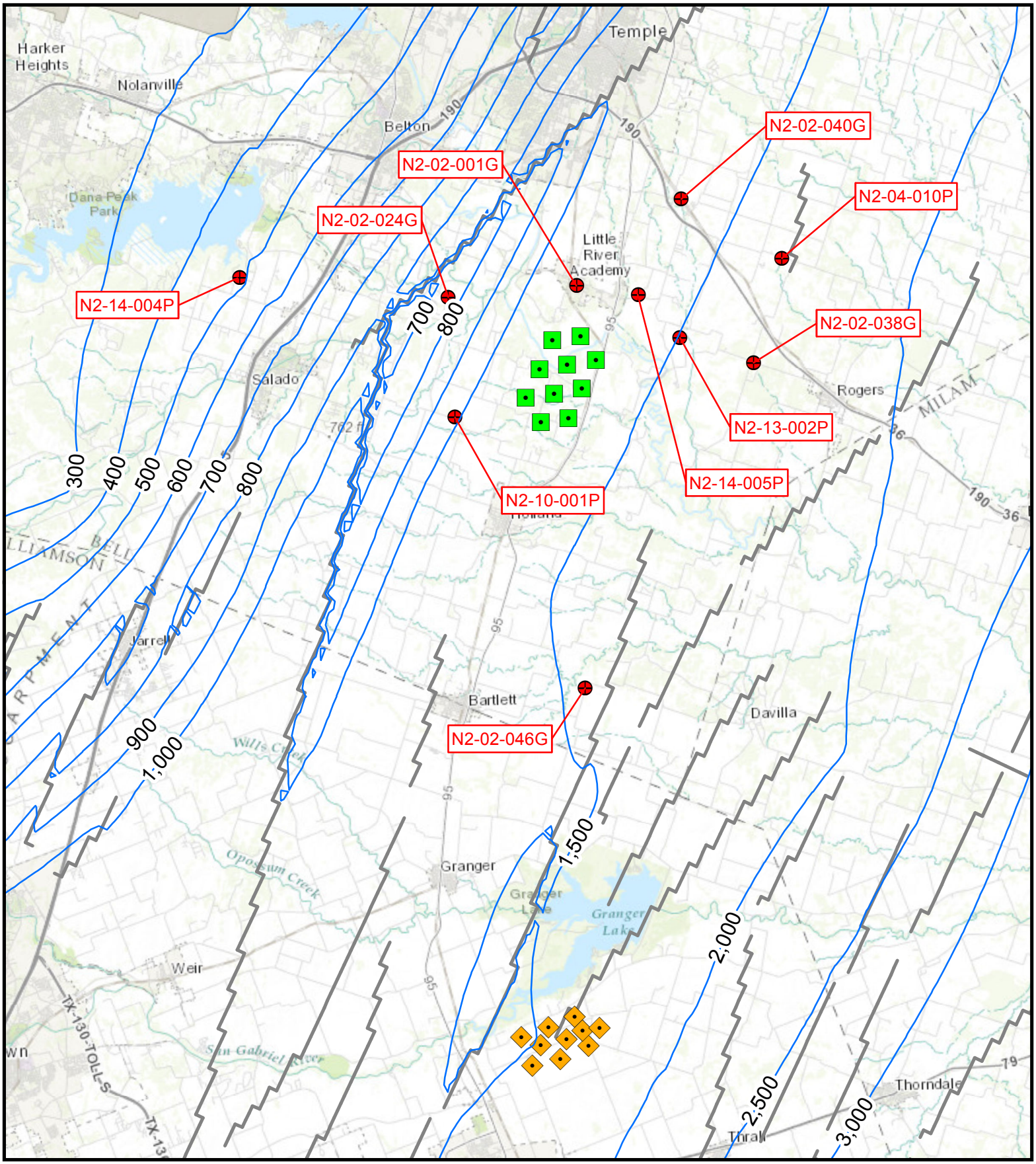
Lower Trinity Drawdown- Scenario D-003 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-003: 10 CUWCD Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



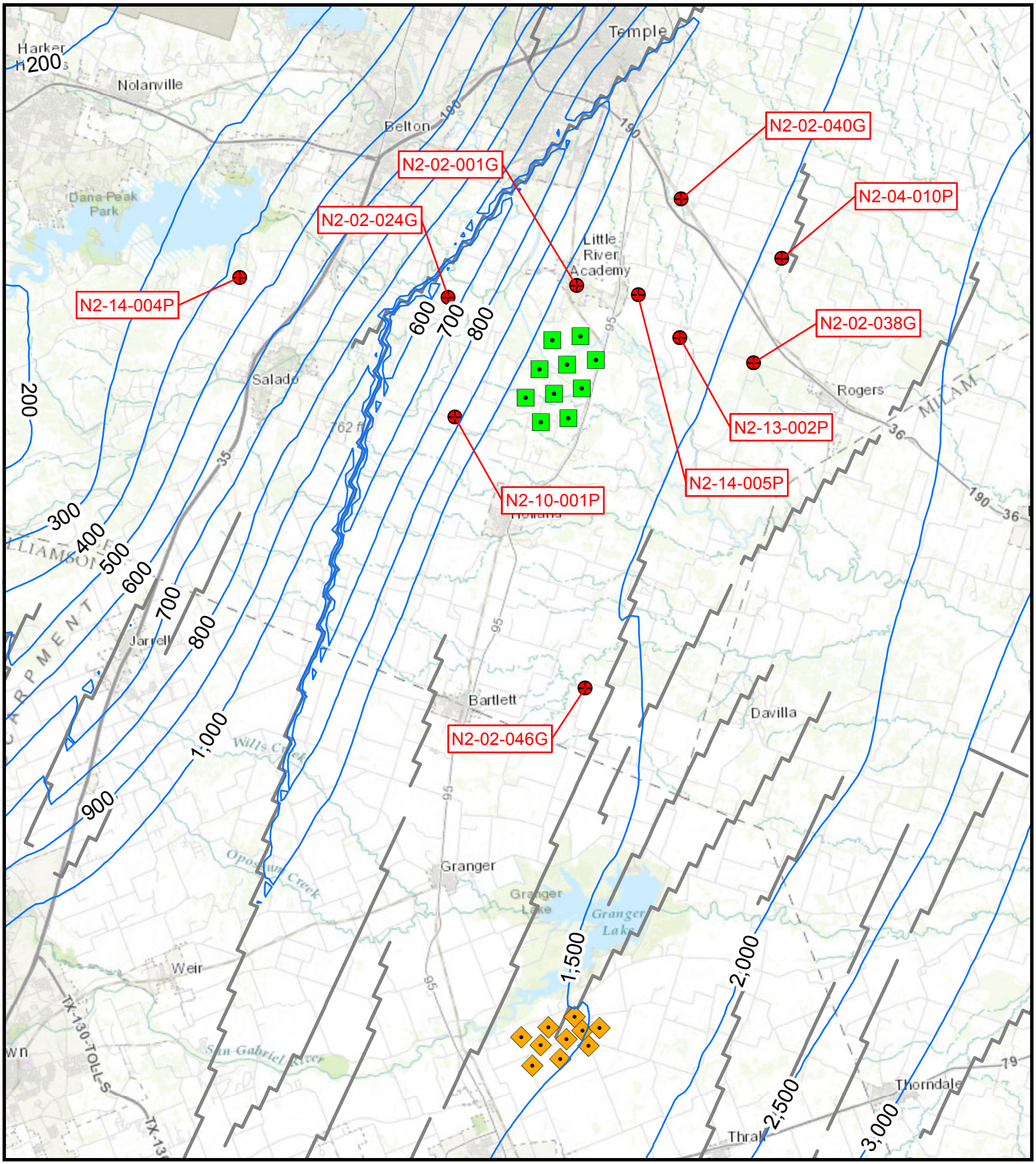
Lower Trinity Artesian Head- Scenario D-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



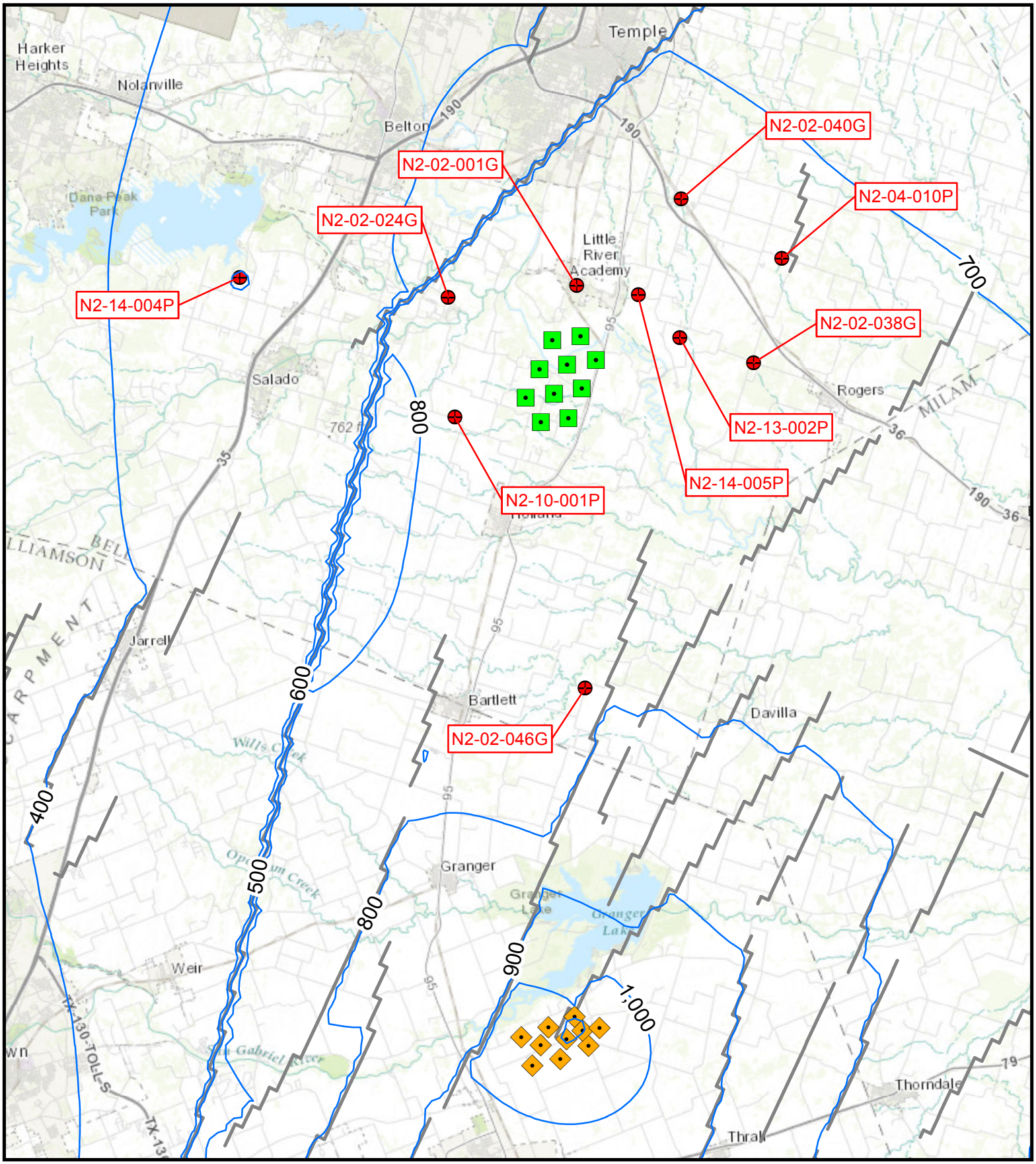
Lower Trinity Artesian Head- Scenario D-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



Lower Trinity Drawdown- Scenario D-004 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

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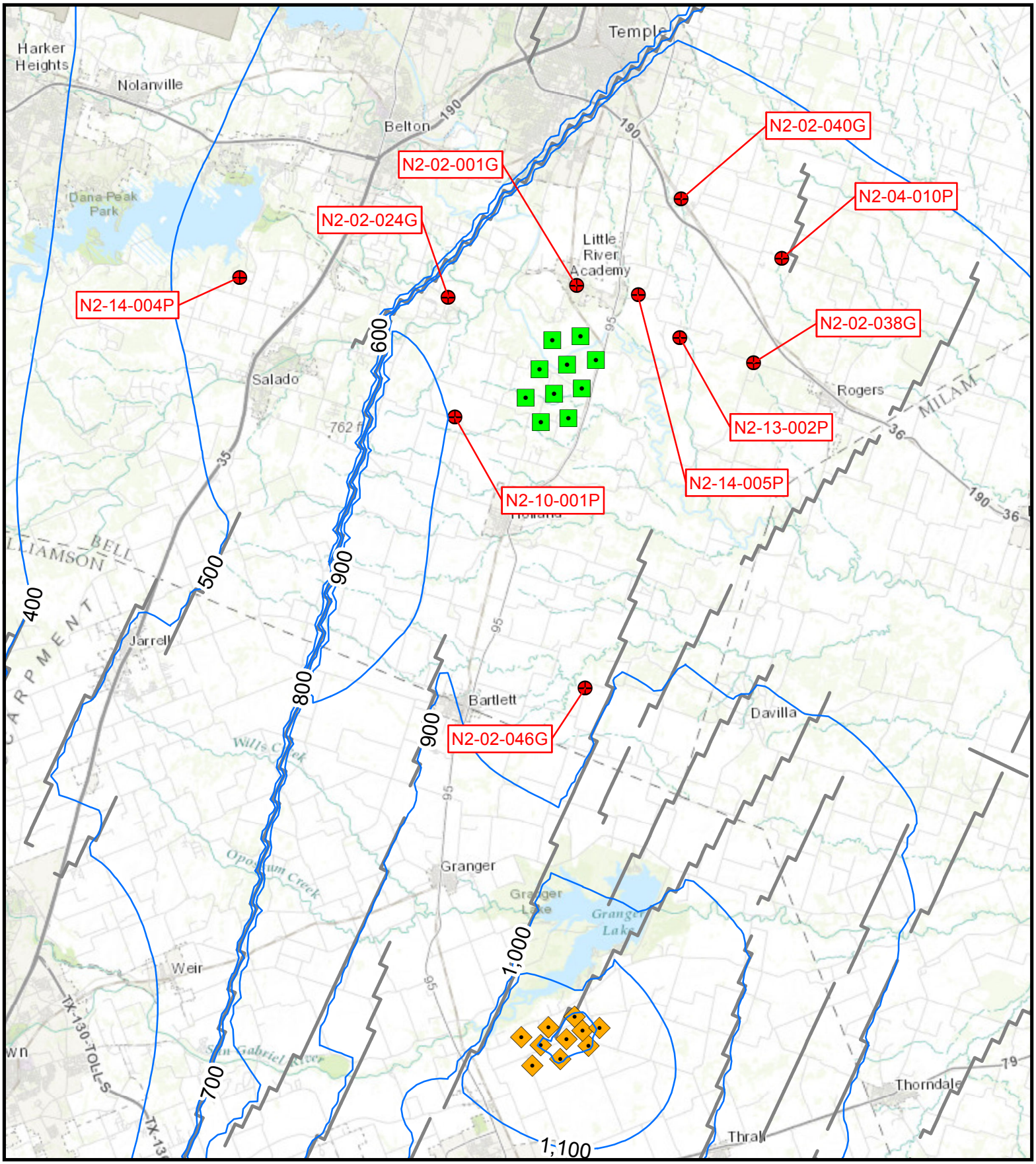
Scenario D-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



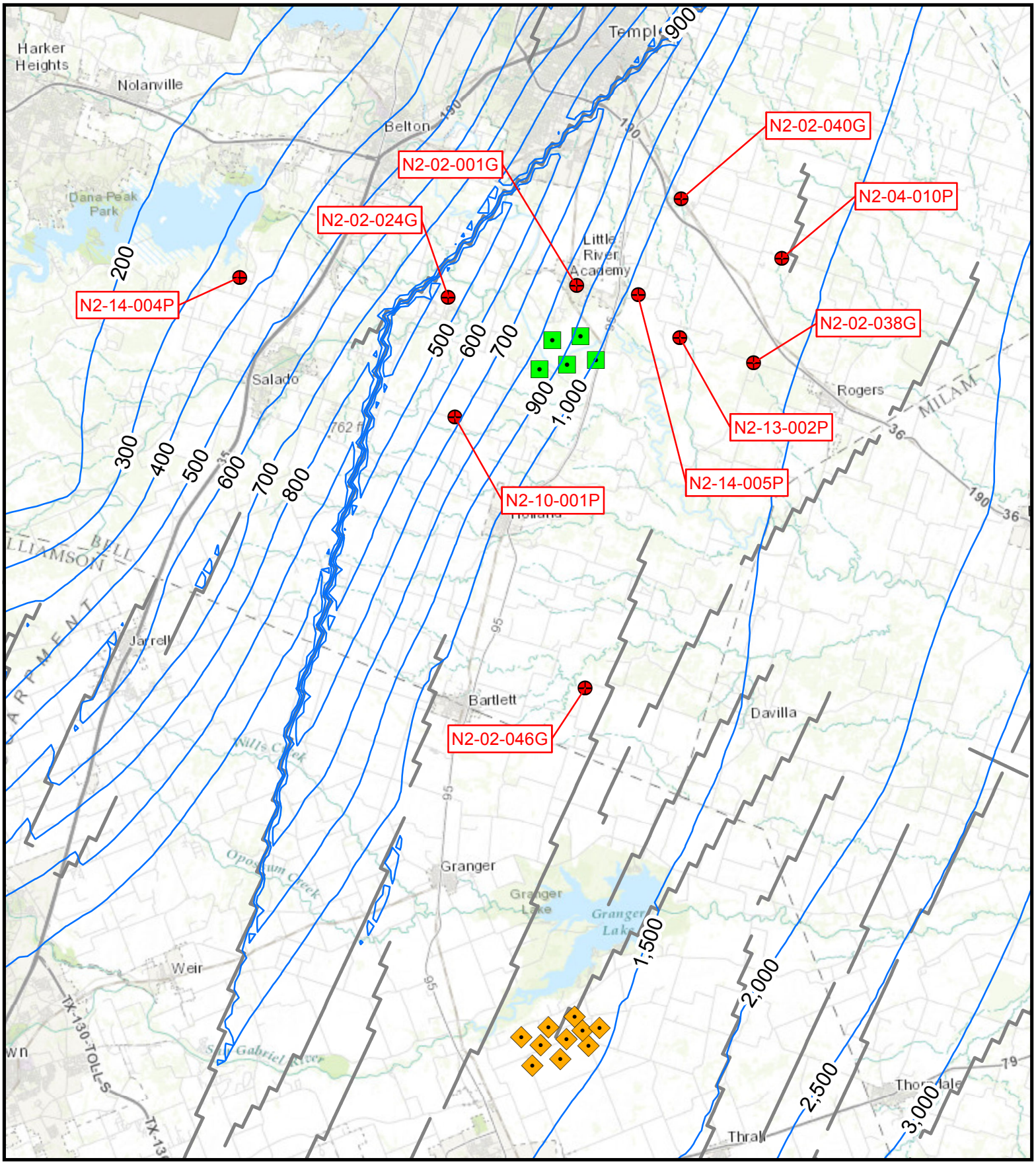
Lower Trinity Drawdown- Scenario D-004 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-004: 10 BRA Wells pumping total at 20,000 AFY using Modified Layer 8 K Model modified to convertible



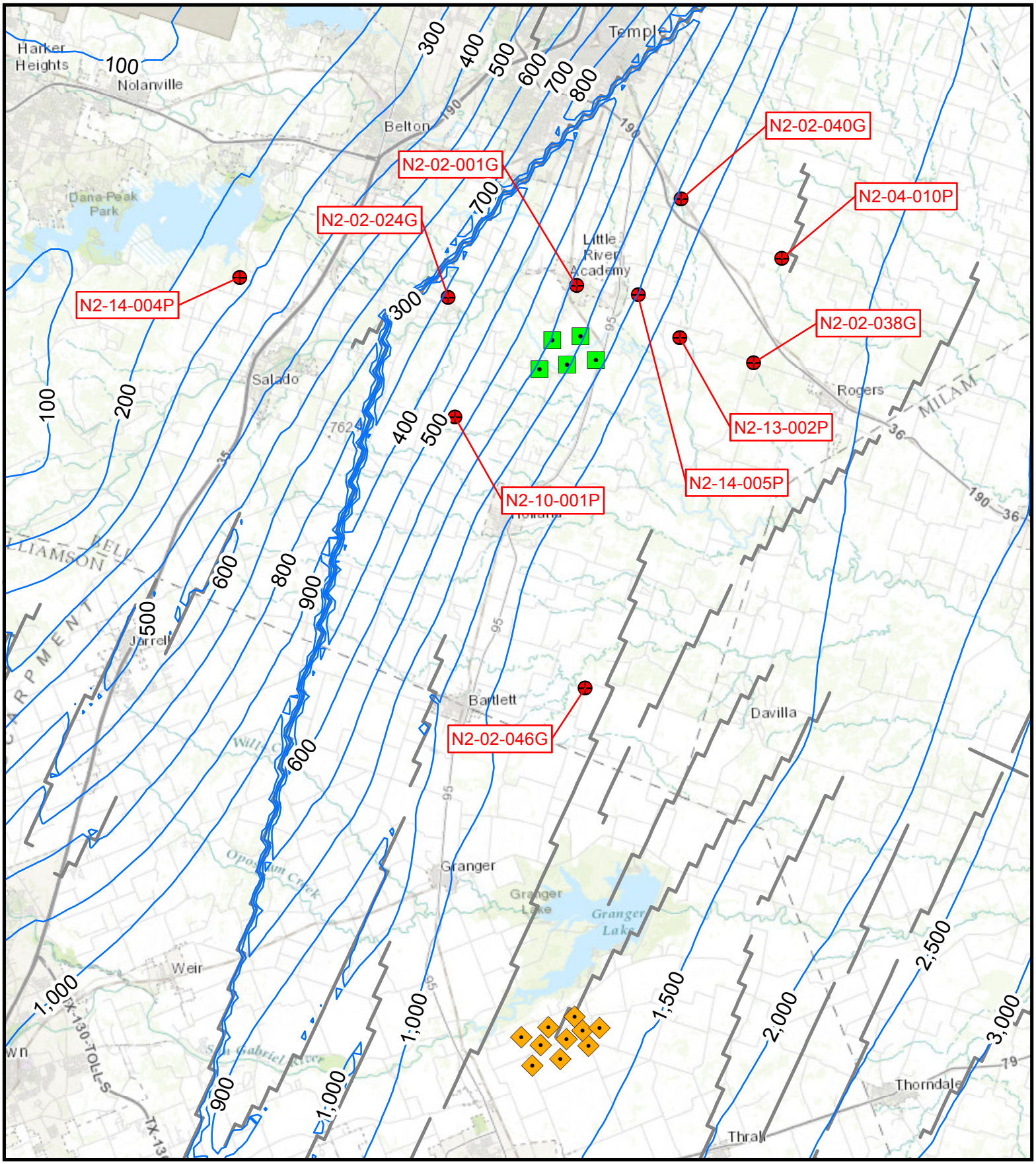
Lower Trinity Artesian Head- Scenario D-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model modified to convertible



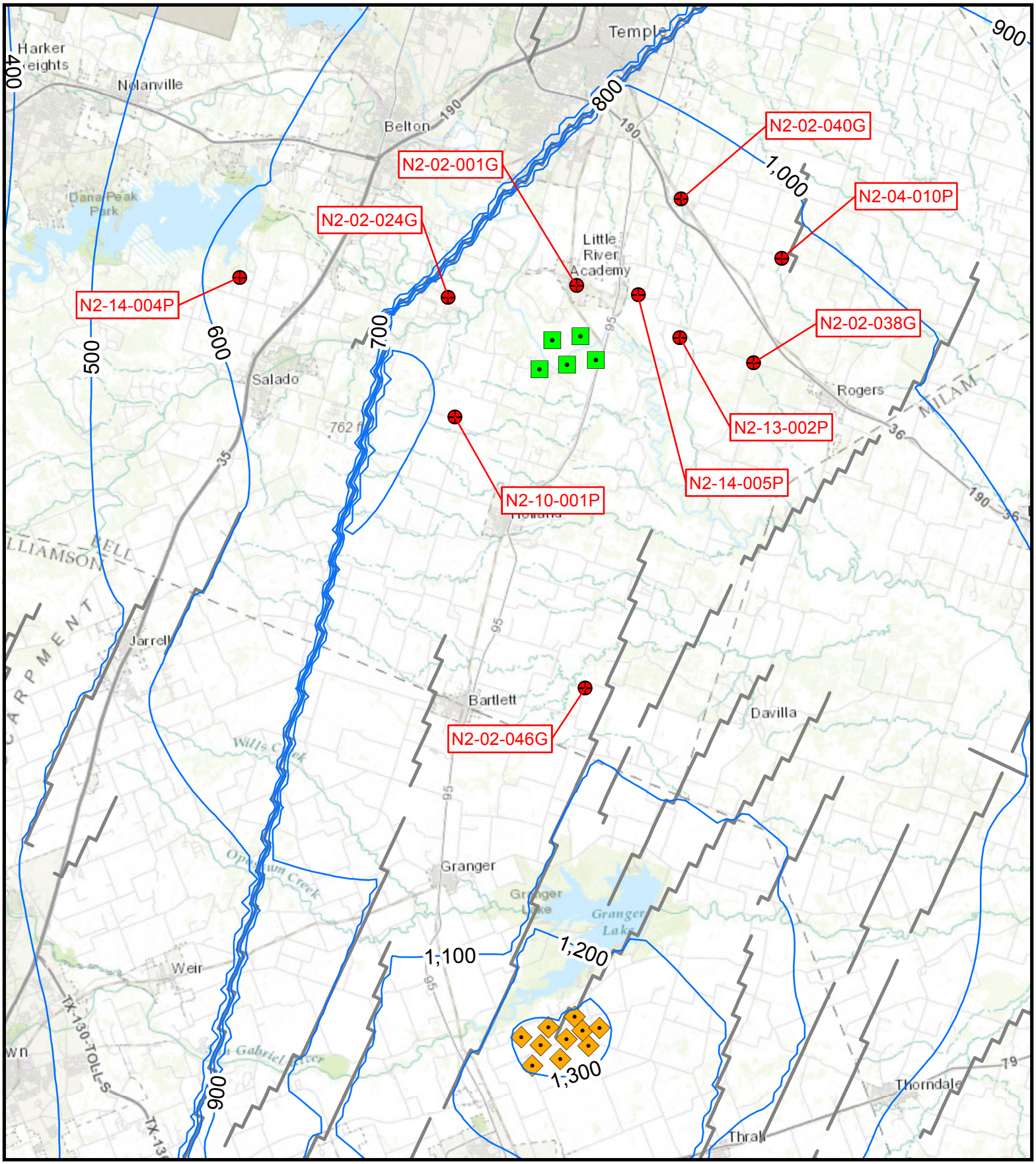
Lower Trinity Artesian Head- Scenario D-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model modified to convertible



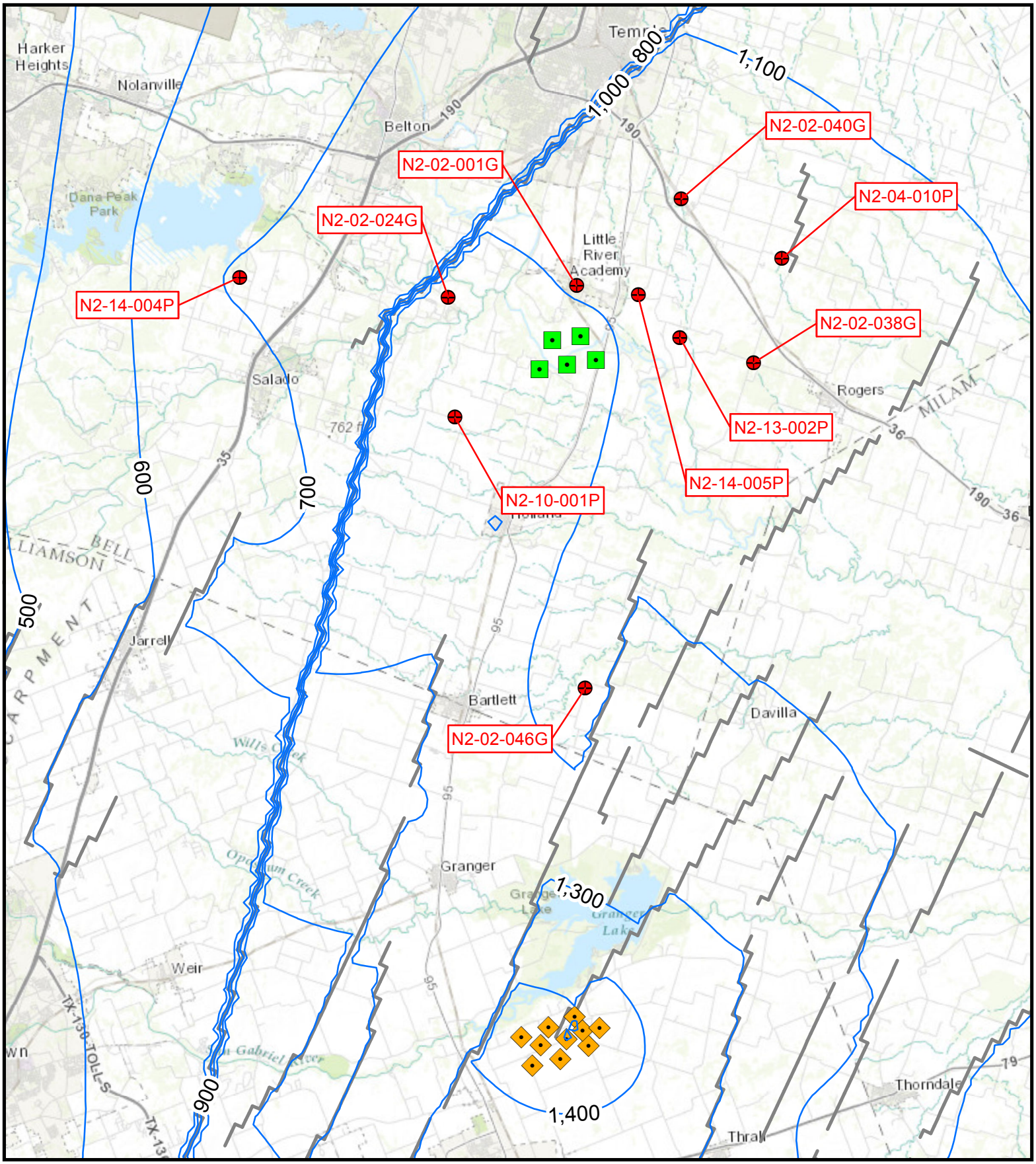
Lower Trinity Drawdown- Scenario D-005 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model modified to convertible



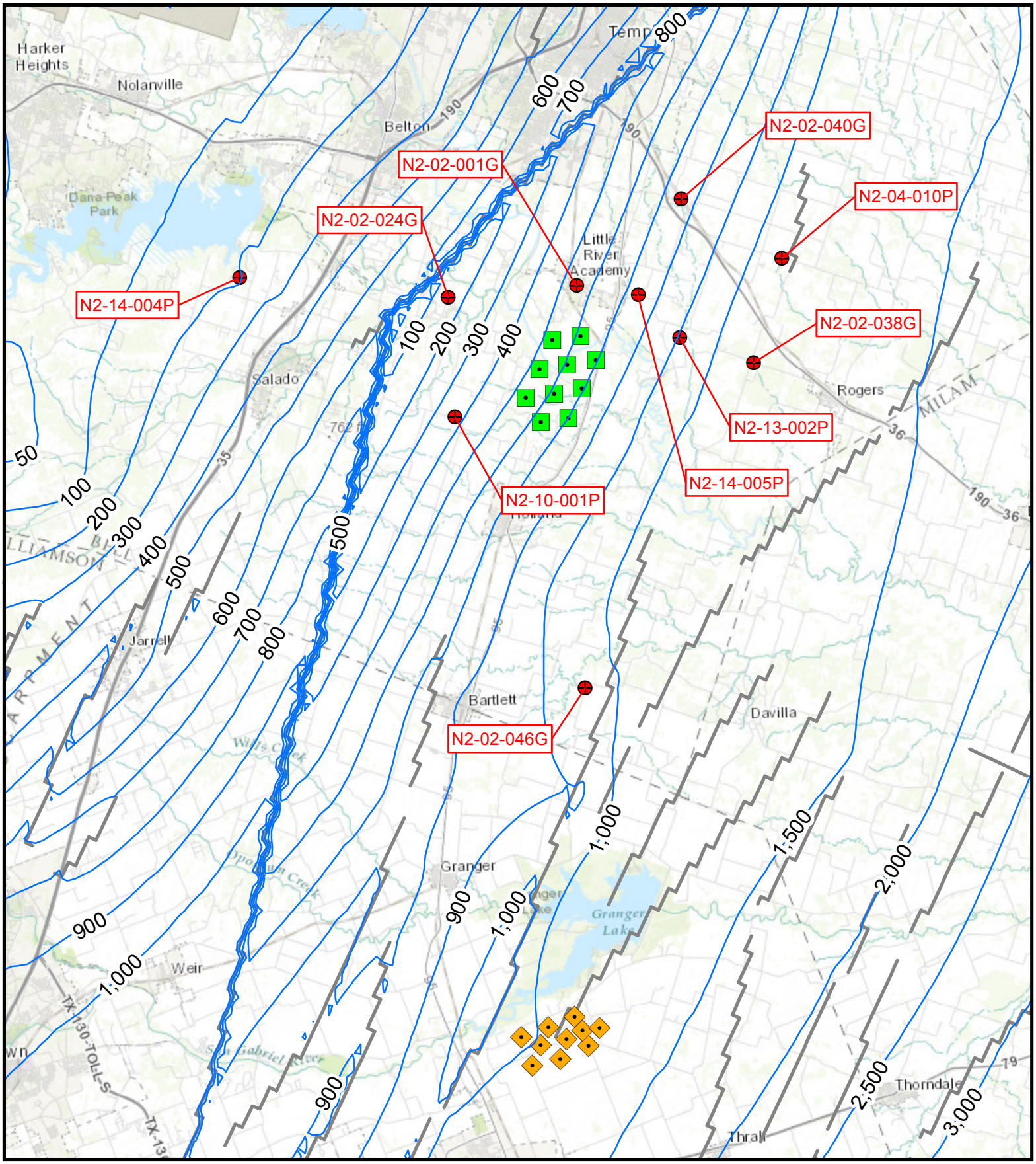
Lower Trinity Drawdown- Scenario D-005 - 50 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-005: 5 CUWCD and 10 BRA Wells pumping total at 30,000 AFY using Modified Layer 8 K Model modified to convertible



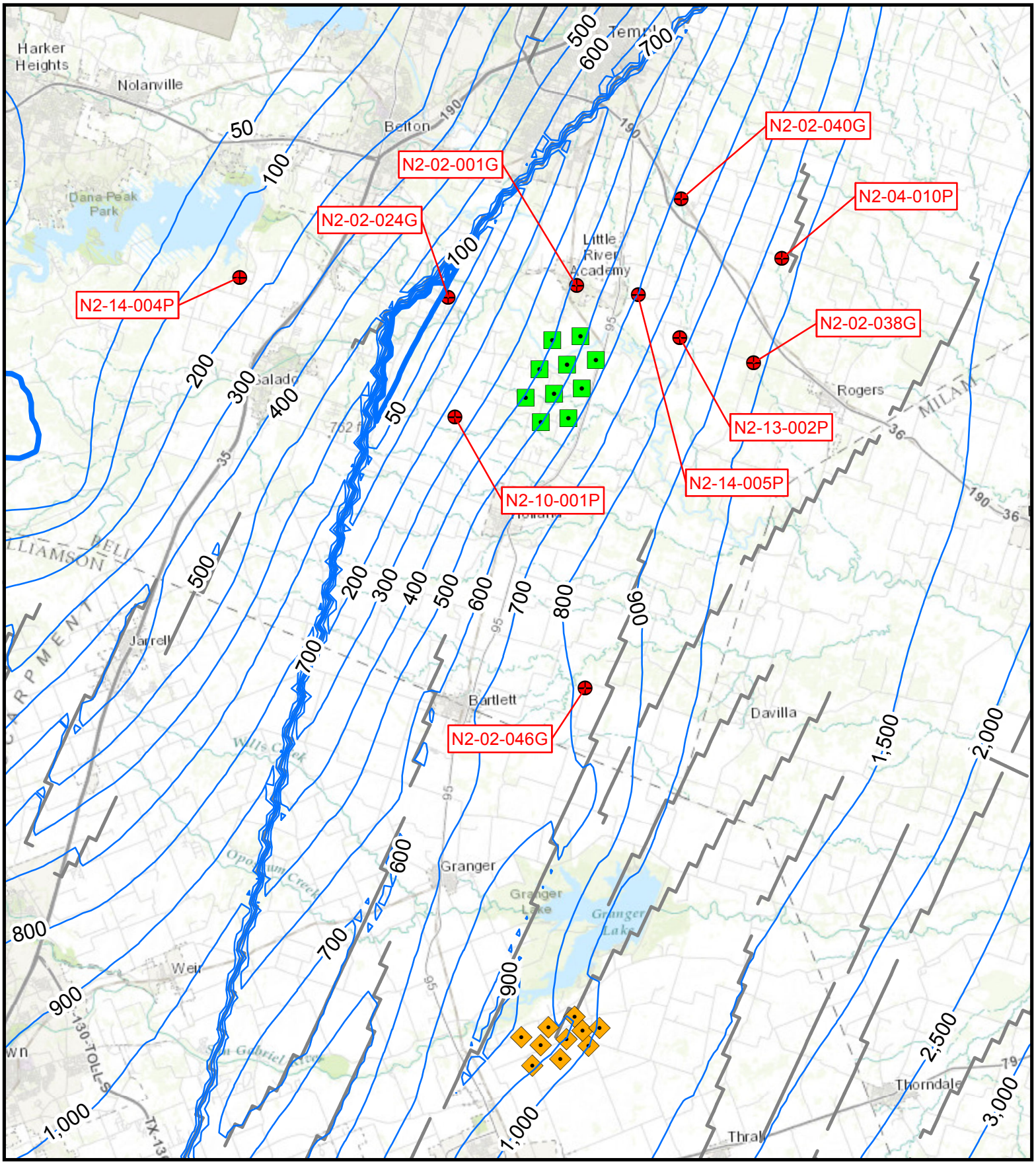
Lower Trinity Artesian Head- Scenario D-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Artesian Head
- Modeled Fault

N

0 2 4 Miles

Scenario D-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model modified to convertible



Lower Trinity Artesian Head- Scenario D-006 - 50 Years

CUWCD Potential Well Field

BRA Potential Well Field

Hydrograph Location – Lower Trinity Active/Proposed PWS Well

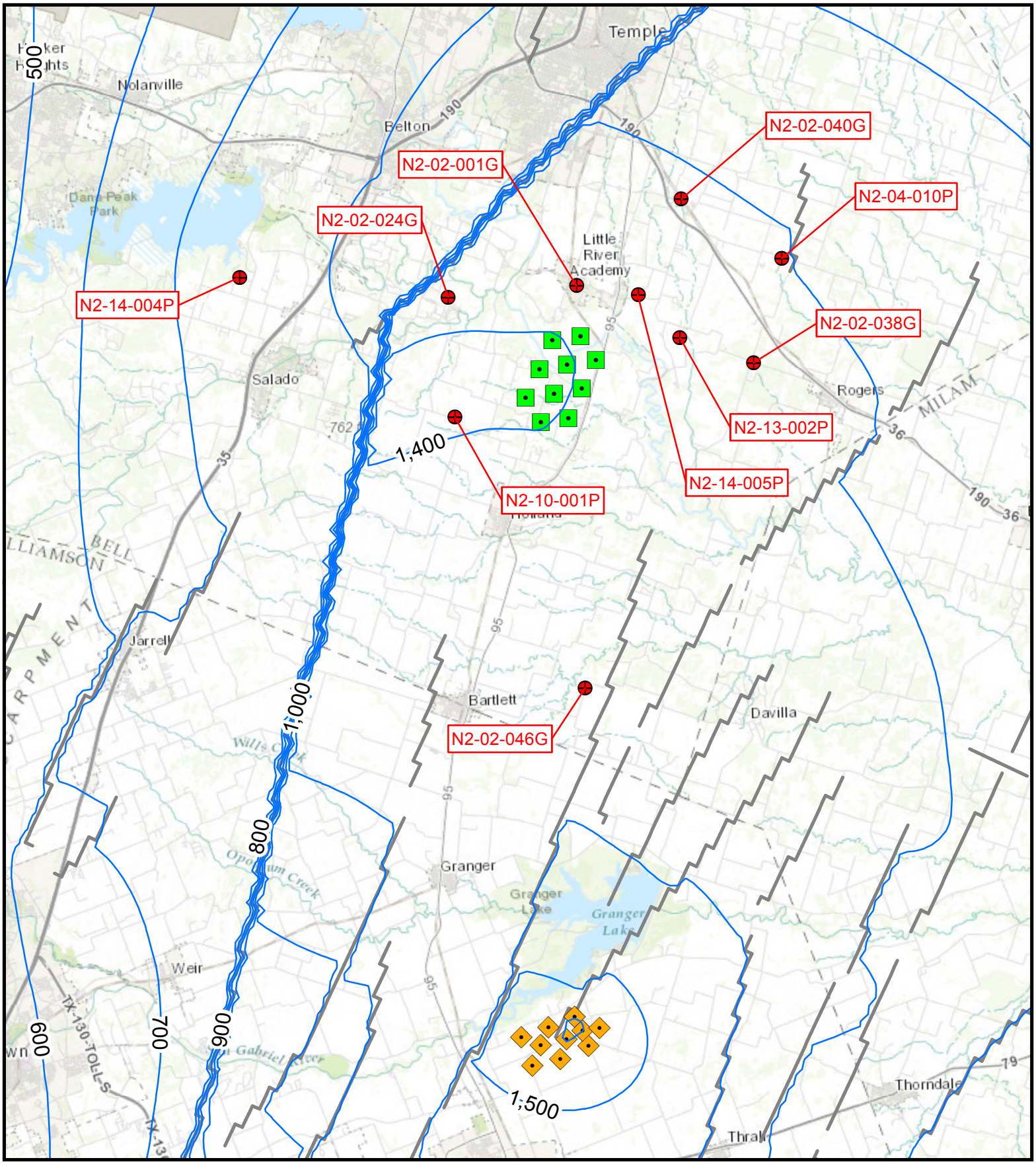
Simulated Artesian Head

Modeled Fault

N

0 2 4 Miles

Scenario D-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model modified to convertible



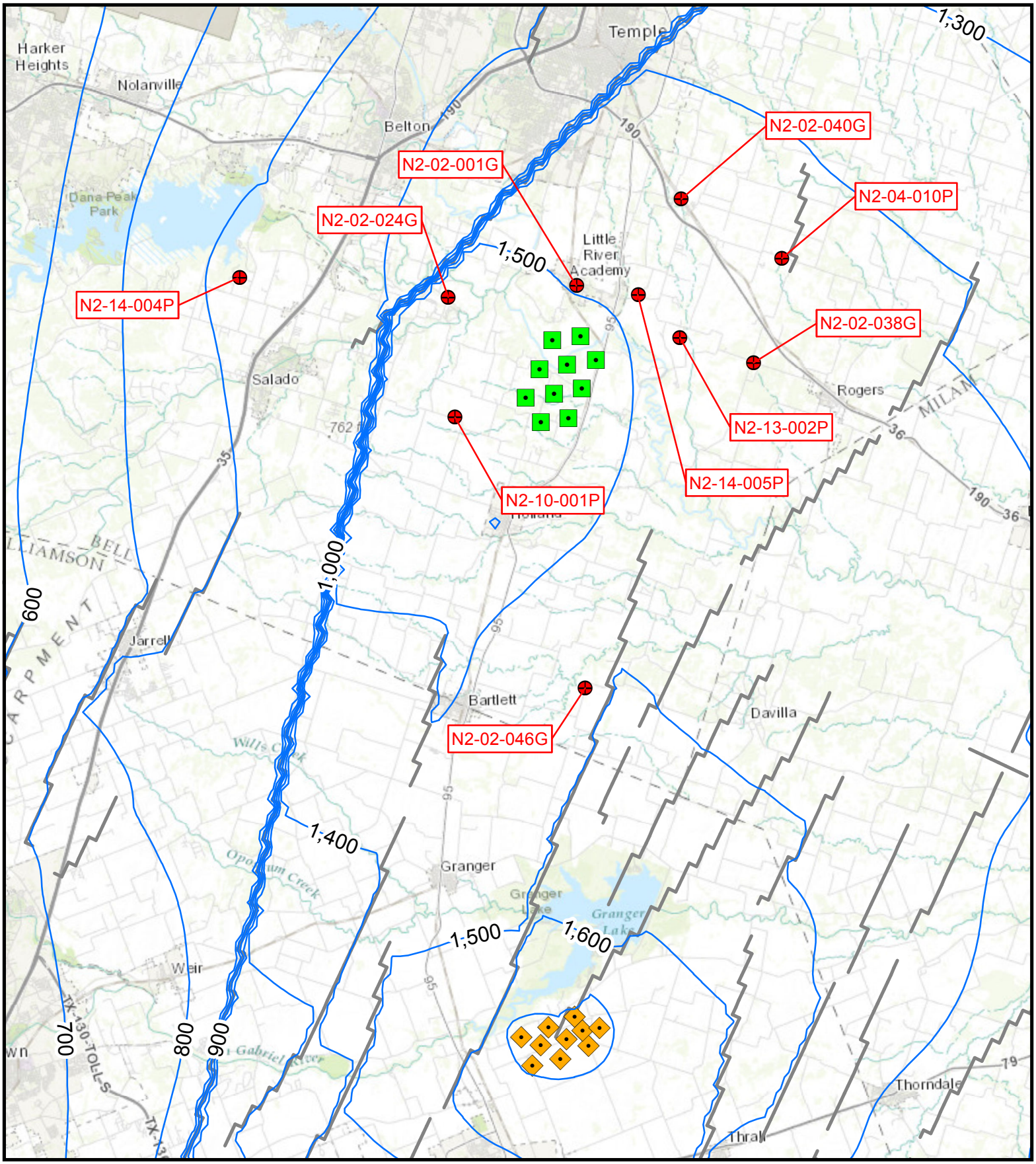
Lower Trinity Drawdown- Scenario D-006 - 30 Years

- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

N

0 2 4 Miles

Scenario D-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model modified to convertible



Lower Trinity Drawdown- Scenario D-006 - 50 Years

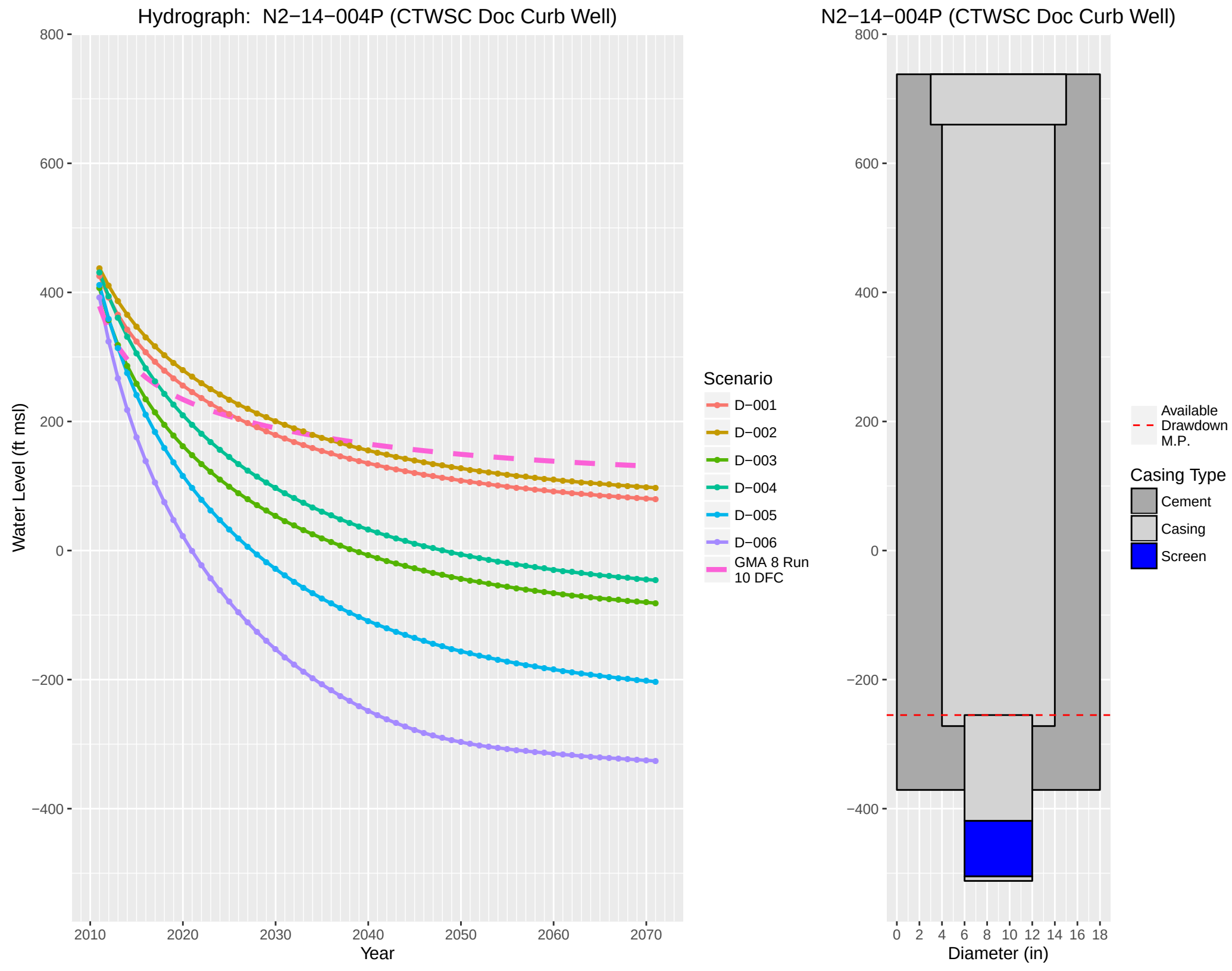
- CUWCD Potential Well Field
- BRA Potential Well Field
- Hydrograph Location – Lower Trinity Active/Proposed PWS Well
- Simulated Drawdown
- Modeled Fault

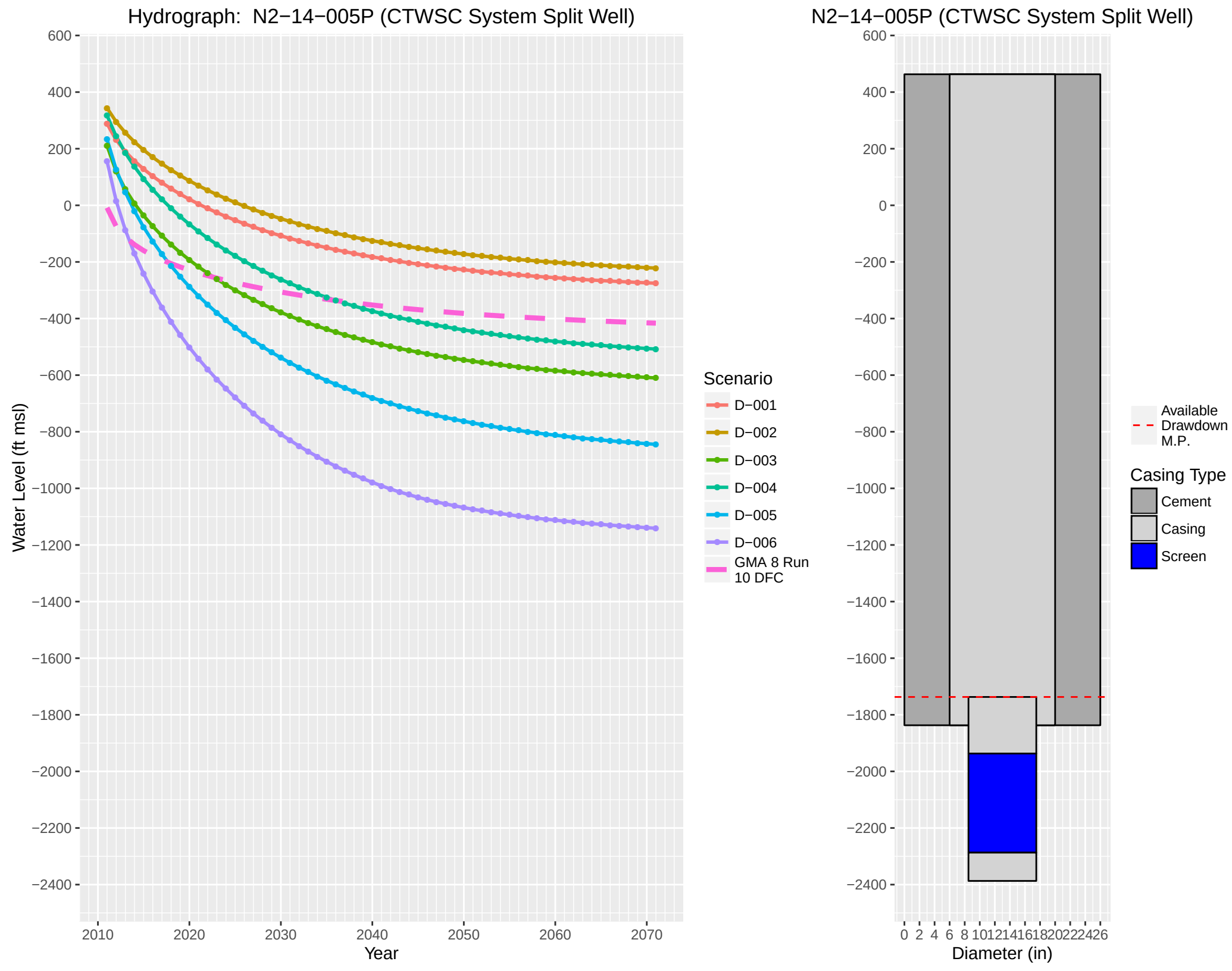
N

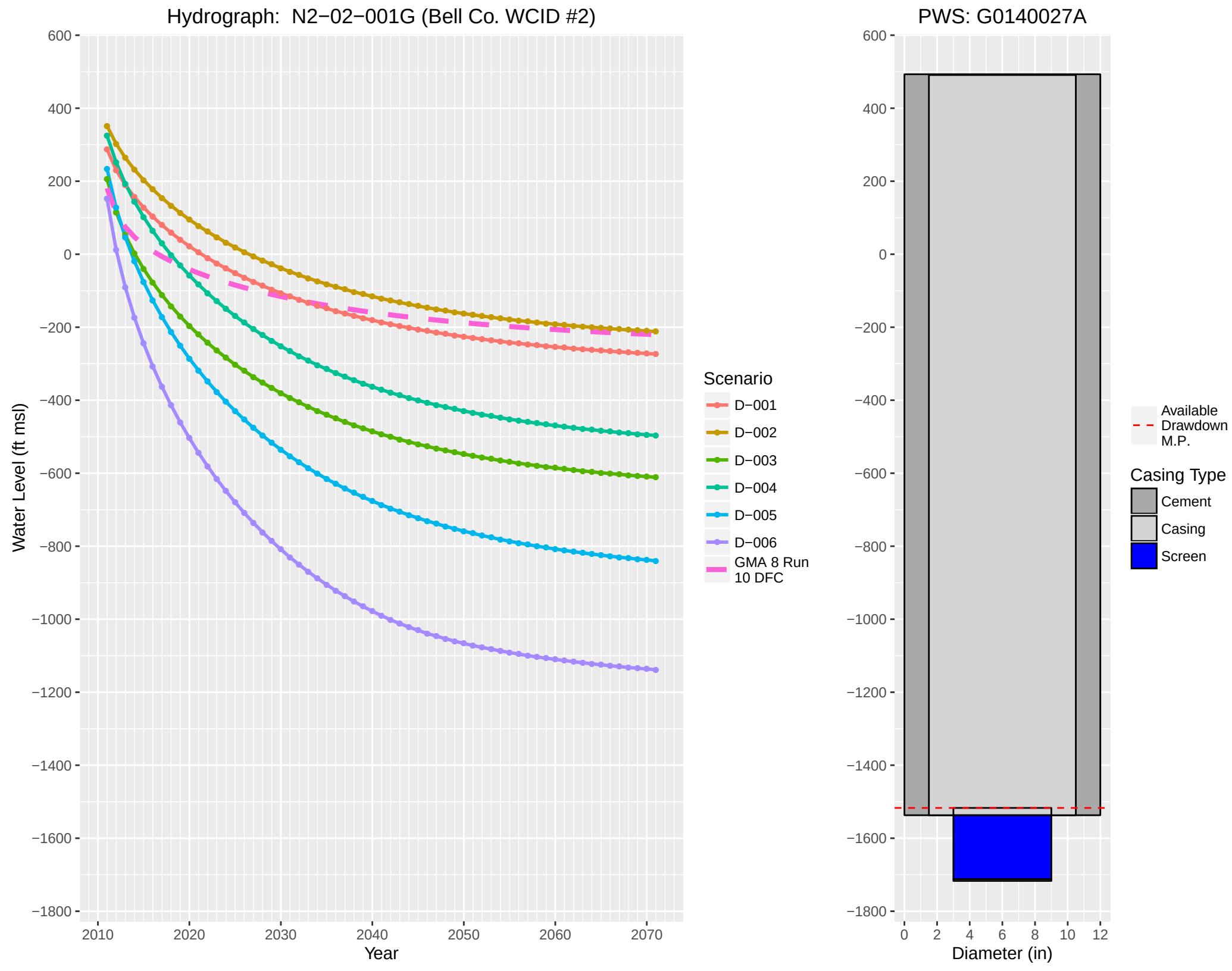
0 2 4 Miles

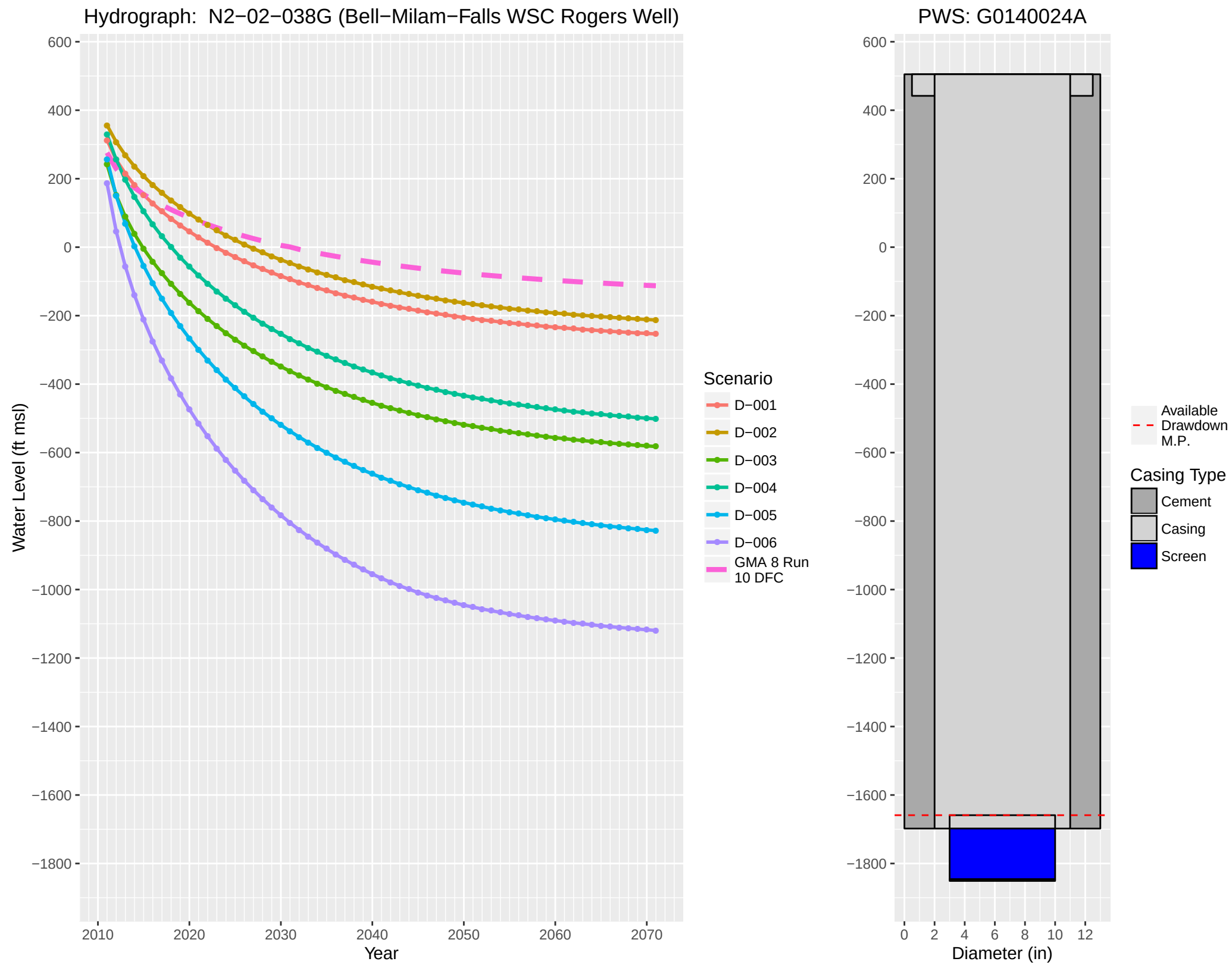
Scenario D-006: 10 CUWCD and 10 BRA Wells pumping total at 40,000 AFY using Modified Layer 8 K Model modified to convertible

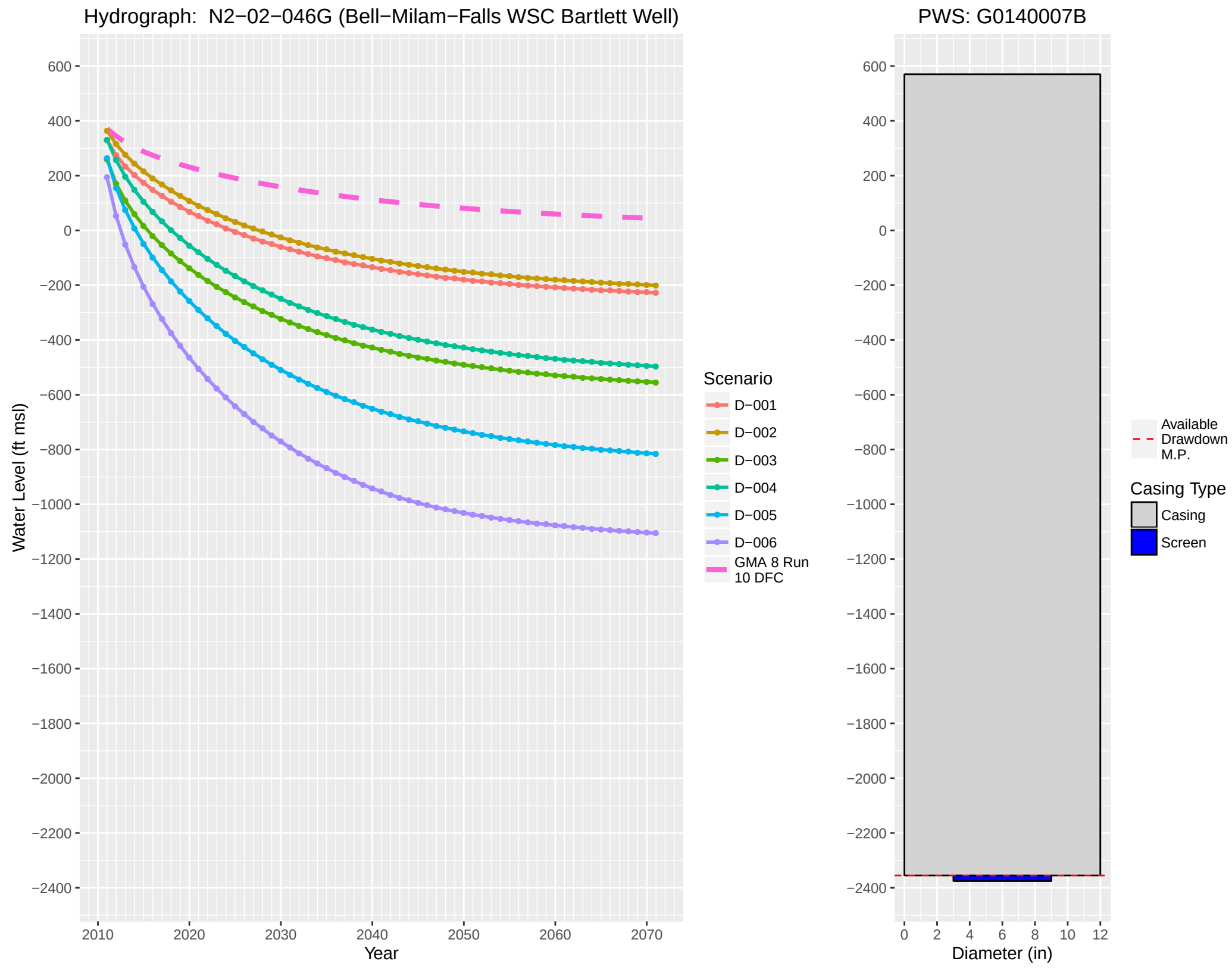
Attachment 9 —
"D" Scenarios
CUWCD Transmissivity Modified NTWGAM
Modified to Convert to Unconfined Conditions
Hydrographs of Simulated Water Level Compared to Existing Well Construction

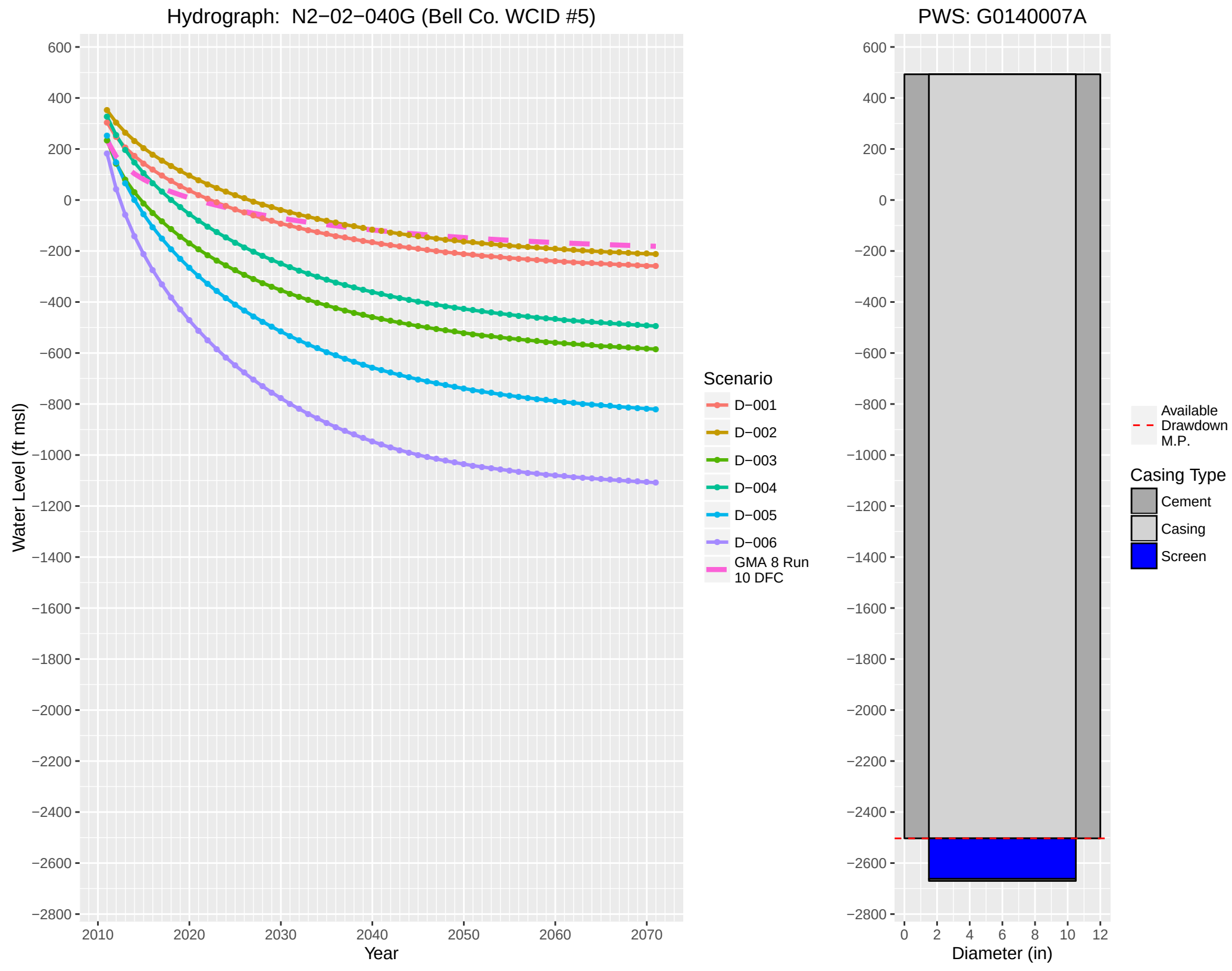

Hydrograph: N2−14−004P (CTWSC Doc Curb Well)
Water Level (ft msl)
800
600
400
200
0
−200
−400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
N2−14−004P (CTWSC Doc Curb Well)
0
2
4
6
8
10
12
14
16
18
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

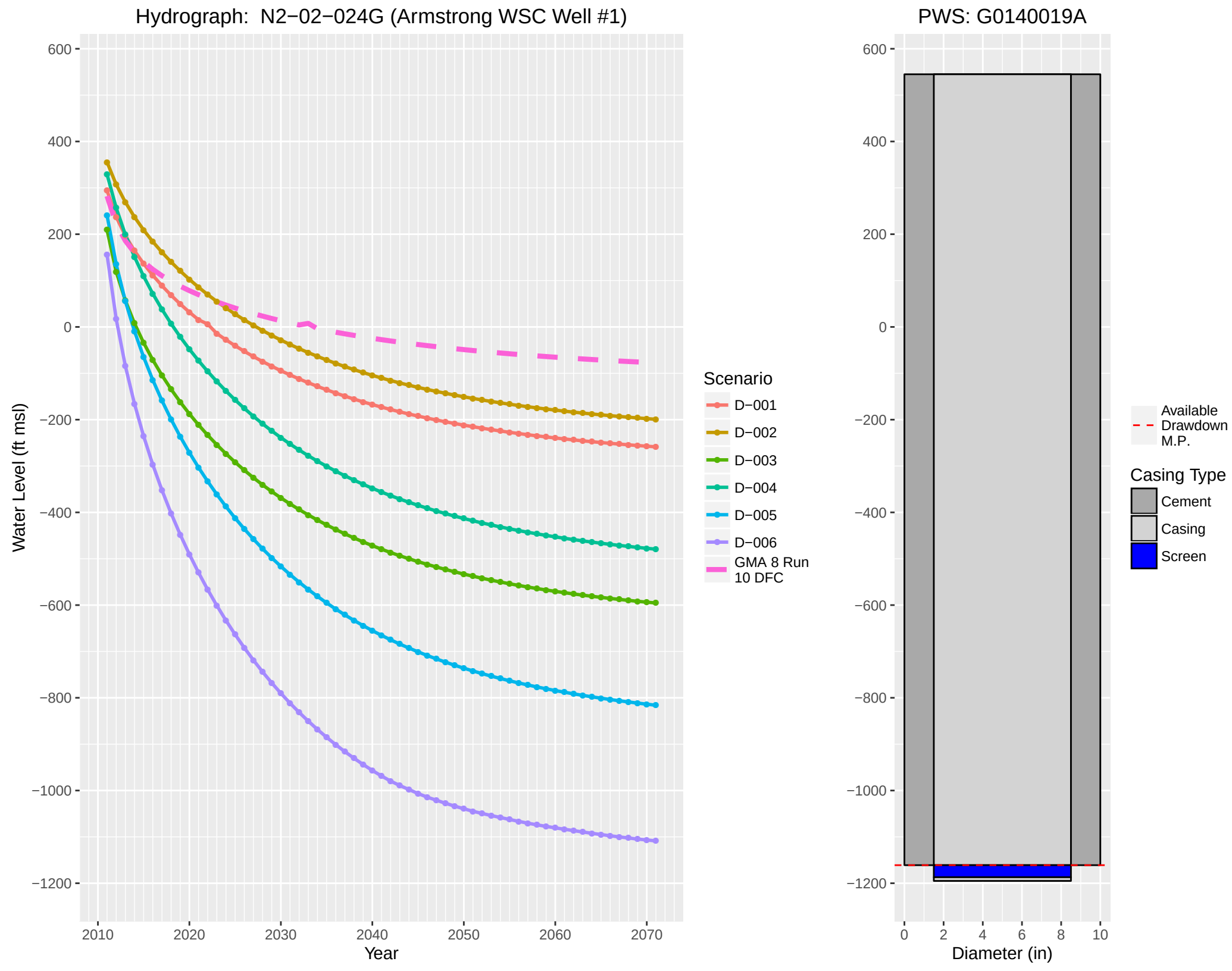

Hydrograph: N2−14−005P (CTWSC System Split Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
N2−14−005P (CTWSC System Split Well)
0 2 4 6 8 10 12 14 16 18 20 22 24 26
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

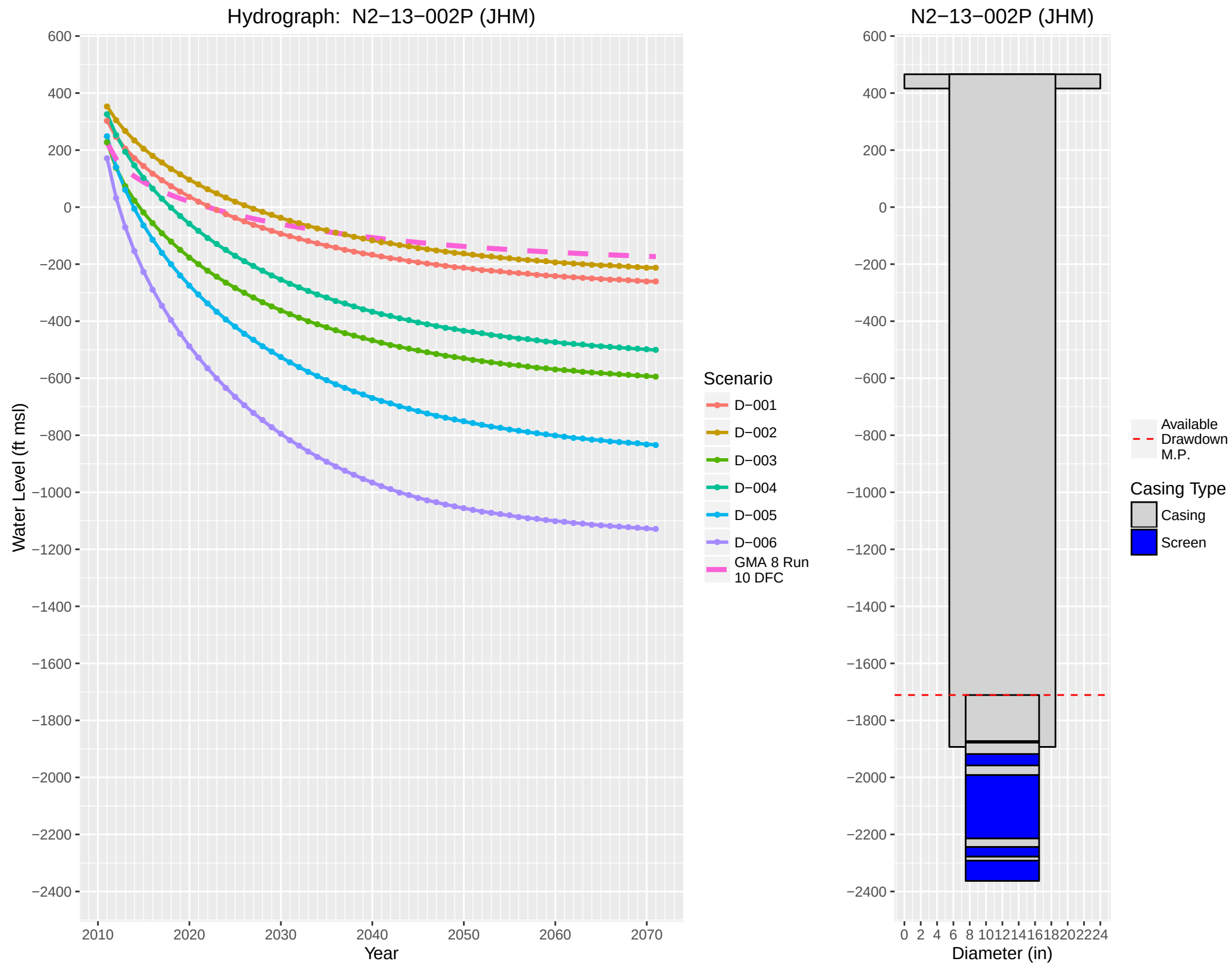

Hydrograph: N2−02−001G (Bell Co. WCID #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
PWS: G0140027A
Diameter (in)
0
2
4
6
8
10
12
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

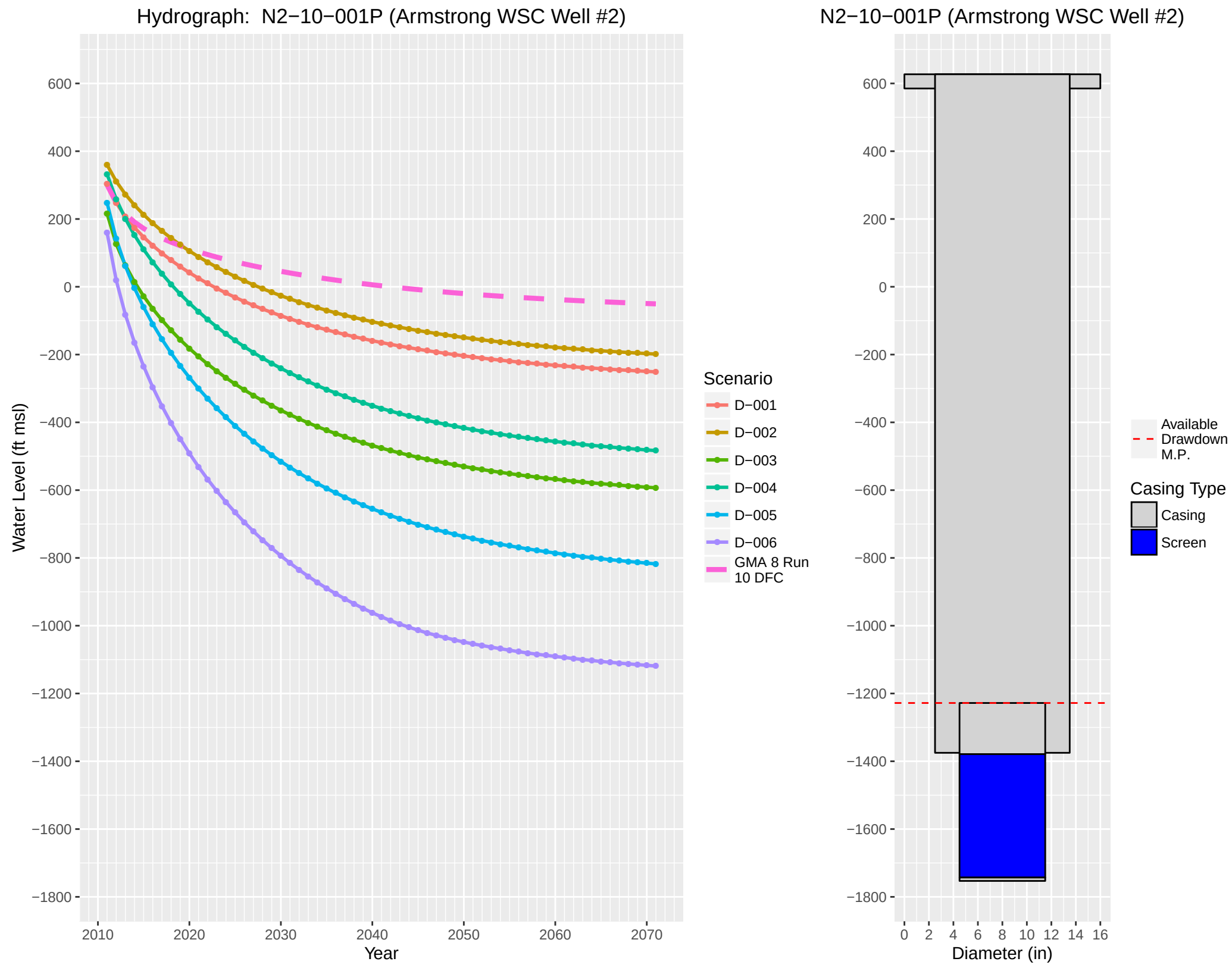

Hydrograph: N2−02−038G (Bell−Milam−Falls WSC Rogers Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
PWS: G0140024A
Diameter (in)
0
2
4
6
8
10
12
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen

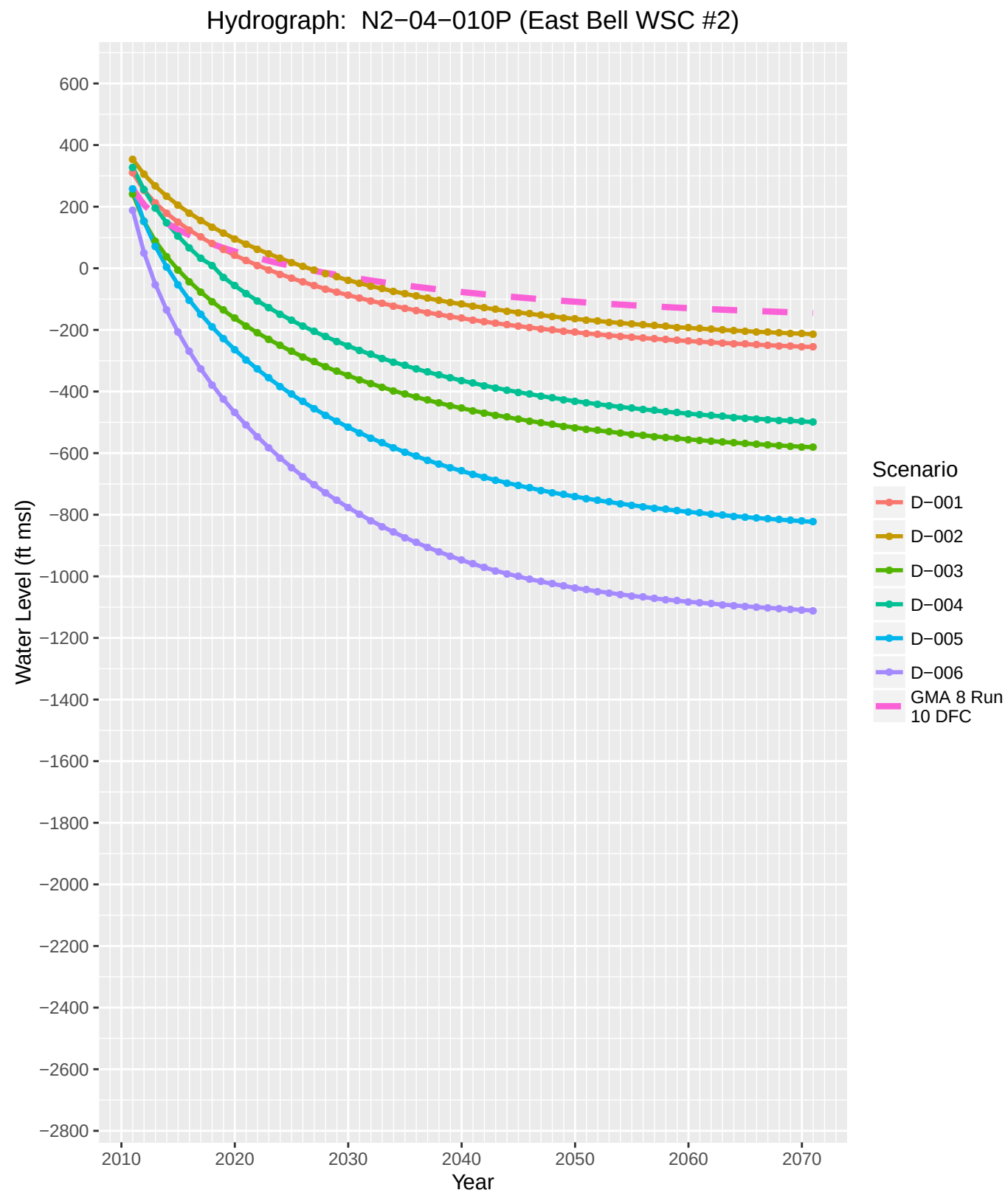

Hydrograph: N2−02−046G (Bell−Milam−Falls WSC Bartlett Well)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
PWS: G0140007B
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen

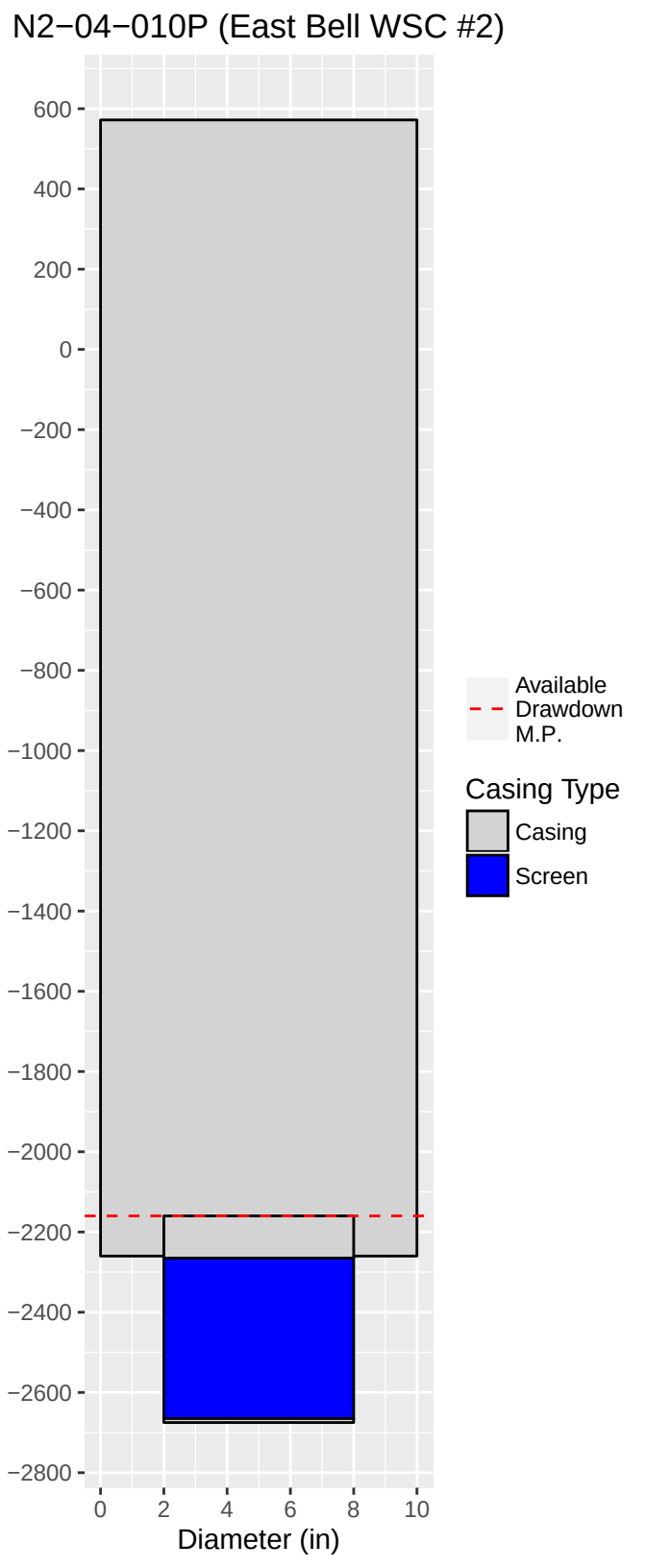

Hydrograph: N2−02−040G (Bell Co. WCID #5)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
PWS: G0140007A
0
2
4
6
8
10
12
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen


Hydrograph: N2−02−024G (Armstrong WSC Well #1)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
PWS: G0140019A
0
2
4
6
8
10
Diameter (in)
Available Drawdown M.P.
Casing Type
Cement
Casing
Screen


Hydrograph: N2−13−002P (JHM)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
N2−13−002P (JHM)
0 2 4 6 8 10 12 14 16 18 20 22 24
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−10−001P (Armstrong WSC Well #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC
N2−10−001P (Armstrong WSC Well #2)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
0
2
4
6
8
10
12
14
16
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen


Hydrograph: N2−04−010P (East Bell WSC #2)
Water Level (ft msl)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
2010
2020
2030
2040
2050
2060
2070
Year
Scenario
D−001
D−002
D−003
D−004
D−005
D−006
GMA 8 Run 10 DFC


N2−04−010P (East Bell WSC #2)
600
400
200
0
−200
−400
−600
−800
−1000
−1200
−1400
−1600
−1800
−2000
−2200
−2400
−2600
−2800
0
2
4
6
8
10
Diameter (in)
Available Drawdown M.P.
Casing Type
Casing
Screen