Addendum to the 2021 Annual Report of Water Level Monitoring

Lost Pines Groundwater Conservation District

Prepared for

Lost Pines Groundwater Conservation District

Prepared by

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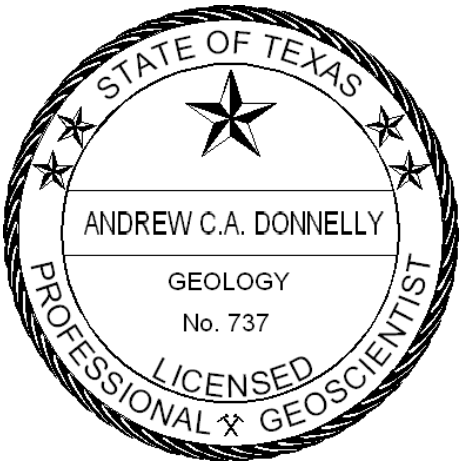
Certification



September 20, 2022

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ADDENDUM

Desired future condition (DFC) compliance methodology has not been approved by the Lost Pines Groundwater Conservations District (GCD) board. In order to assess DFC compliance for the calendar year 2021, the water level data presented in this report was evaluated to determine DFC compliance based on a proposed methodology.

The DFCs adopted by the District and Groundwater Management Area (GMA) 12 in 2021 are summarized in Table 1. These DFCs are the average drawdown in each aquifer across the entire District from 2011 until the end of 2070.

Table 1. Desired Future Conditions adopted by the Lost Pines GCD and GMA 12 in 2021.

Aquifer	Average Aquifer Drawdown (ft) Measured from January 2011 through December 2070
Sparta	22
Queen City	28
Carrizo	134
Calvert Bluff	132
Simsboro	240
Hooper	138

The methodology used for this addendum was to identify all District monitoring wells in each of the six aquifers that had observed water levels for 2011 and 2022, and to assess the change in water levels at each of these wells for comparison to the overall aquifer-specific DFC. Water levels are defined as the water level at the beginning of each calendar year, and generally may be a water level measured within a few months of January 1. DFC compliance for each of the six aquifers is presented in the sections below.

Sparta Aquifer

Three of the 10 Sparta Aquifer monitoring wells have data in both 2011 and 2022. These wells are:

- 58-56-9-0015 in Lee County
- 59-41-7-0025 in Lee County
- 59-42-2-0003 in Lee County

Water levels in 2011 and 2022 in these three wells are summarized in Table 2. Water level changes are shown in Figure 1. As shown in Table 2 and Figure 1, all three Sparta Aquifer monitoring wells indicate an increase in water levels from 2011 to 2022. Therefore, the Lost Pines GCD is not out of compliance with the DFC of 22 feet of drawdown in the Sparta Aquifer based on the available data described in this addendum.

Table 2. Water level changes in the Sparta Aquifer monitoring wells from 2011 to 2022.

Well ID	2011 Water Level (feet bgl)	2022 Water Level (feet bgl)	Water Level Change from 2011 to 2022 (feet)
58-56-9-0015	135.75	134.40	+1.35
59-41-7-0025	60.00	59.23	+0.77
59-42-2-0003	84.59	80.20	+4.39

Queen City Aquifer

Four of the 20 Queen City Aquifer monitoring wells have data in both 2011 and 2022. These wells are:

- 58-40-9-0027 in Lee County
- 58-48-2-0014 in Lee County
- 58-48-5-0037 in Lee County
- 59-42-1-0012 in Lee County

Water levels in 2011 and 2022 in these 4 wells are summarized in Table 3. Water level changes are shown in Figure 2. As shown in Table 3 and Figure 2, all four Queen City Aquifer monitoring wells with water levels both in 2011 and 2022 showed an increase in water levels from 2011 to 2022. Therefore, the Lost Pines GCD is not out of compliance with the DFC of 28 feet of drawdown in the Queen City Aquifer based on the available data as described in this addendum.

Table 3. Water level changes in the Queen City Aquifer monitoring wells from 2011 to 2022.

Well ID	2011 Water Level (feet bgl)	2022 Water Level (feet bgl)	Water Level Change from 2011 to 2022 (feet)
58-40-9-0027	82.85	77.10	+5.75
58-48-2-0014	53.16	51.17	+1.99
58-48-5-0037	82.71	80.92	+1.79
59-42-1-0012	82.29	77.90	+4.39

Carrizo Aquifer

Six of the 47 Carrizo Aquifer monitoring wells have data in both 2011 and 2022. These wells are:

- 58-40-9-0003 in Lee County
- 58-63-6-0014 in Bastrop County
- 67-06-9-0019 in Bastrop County
- 67-07-2-0026 in Bastrop County
- 67-07-2-0027 in Bastrop County
- 67-14-5-0024 in Bastrop County

Water levels in 2011 and 2022 in these 6 wells are summarized in Table 4. Water level changes are shown in Figure 3. As shown in Table 4 and Figure 3, all but one of the Carrizo Aquifer monitoring wells with water levels both in 2011 and 2022 showed a decrease in water levels from 2011 to 2022. It should be noted that well 58-40-9-0003 is located within the proposed northern Lee County management zone.

Table 4. Water level changes in the Carrizo Aquifer monitoring wells from 2011 to 2022.

Well ID	2011 Water Level (feet bgl)	2022 Water Level (feet bgl)	Water Level Change from 2011 to 2022 (feet)
58-40-9-0003	131.80	196.60	-64.80
58-63-6-0014	58.22	64.20	-5.98
67-06-9-0019	87.56	91.19	-3.63
67-07-2-0026	54.86	59.30	-4.44
67-07-2-0027	95.00	90.49	+4.51
67-14-5-0024	126.00	128.90	-2.90

The average water level change in the six Carrizo Aquifer wells with data in both 2011 and 2022 is 12.9 feet of decline over the 11 years between 2011 and 2022. The vast majority of this recorded decline is due to the Lexington well (58-40-9-0003), which is within the area affected by pumping from the Vista Ridge project. The calculated average rate of decline is a little over one foot per year, which is less than the nearly 2 feet per year that would need to occur in order for the DFC to be exceeded. In addition, the calculated average drawdown of 12.9 feet is less than the DFC of 134 feet. Therefore, the Lost Pines GCD is not out of compliance with the DFC of 134 feet of drawdown in the Carrizo Aquifer based on the available data described in this addendum.

Calvert Bluff Aquifer

Three of the 17 Calvert Bluff Aquifer monitoring wells have data in both 2011 and 2022. These wells are:

- 58-62-208 in Bastrop County
- 58-55-7-0025 in Bastrop County
- 58-62-5-0059 in Bastrop County

Water levels in 2011 and 2022 in these 3 wells are summarized in Table 5. Water level changes are shown in Figure 4. As shown in Table 5 and Figure 4, all three Calvert Bluff monitoring wells with water levels both in 2011 and 2022 showed an increase in water levels from 2011 to 2022. Therefore, the Lost Pines GCD is not out of compliance with the DFC of 132 feet of drawdown in the Calvert Bluff Aquifer based on the available data described in this addendum.

Table 5. Water level changes in the Calvert Bluff Aquifer monitoring wells from 2011 to 2022.

Well ID	2011 Water Level (feet bgl)	2022 Water Level (feet bgl)	Water Level Change from 2011 to 2022 (feet)
58-62-208 (TWDB)	213.97	211.49	+2.48
58-55-7-0025	53.80	51.35	+2.45
58-62-5-0059	73.24	61.72	+11.53

Simsboro Aquifer

Seven of the 17 Simsboro Aquifer monitoring wells have data in both 2011 and 2022. These wells are:

- 58-40-4-0041 in Lee County
- 58-46-3-0029 in Bastrop County
- 58-46-5-0054 in Bastrop County
- 58-55-2-0036 in Bastrop County
- 58-55-4-0007 in Bastrop County
- 58-62-1-0053 in Bastrop County
- 59-33-4-0021 in Lee County

Water levels in 2011 and 2022 in these seven wells are summarized in Table 6. Water level changes are shown in Figure 5.

Table 6. Water level changes in the Simsboro Aquifer monitoring wells from 2011 to 2022.

Well ID	2011 Water Level (feet bgl)	2022 Water Level (feet bgl)	Water Level Change from 2011 to 2022 (feet)
58-40-4-0041	130.58	196.80	-66.22
58-46-3-0029	51.99	53.51	-1.52
58-46-5-0054	42.67	37.13	+5.54
58-55-2-0036	202.63	272.10	-69.47
58-55-4-0007	334.78	395.60	-60.82
58-62-1-0053	39.63	68.34	-28.71
59-33-4-0021	102.26	213.75	-111.49

As shown in Table 6 and Figure 5, Simsboro Aquifer monitoring wells across the District show a wide variation in water level changes between 2011 and 2022. Observed water levels for the two wells in the Simsboro outcrop area (58-46-3-0029 and 58-46-5-0054) show relatively small changes over the 11-year time period. Downdip Simsboro Aquifer monitoring wells all show larger declines in observed water levels.

- The Bastrop SCADA well (58-62-1-0053) shows the least amount of water level decline in the downdip wells, declining approximately 29 feet between 2011 and 2022. This is the Simsboro Aquifer monitoring well located the furthest south within the District.
- The GLR SCADA well (58-55-4-0007) experienced slightly more than 60 feet of water level decline in 11 years.
- The Barespot SCADA well (58-55-2-0036) experienced nearly 70 feet of water level decline in 11 years. The Barespot SCADA well is located near a new irrigation well producing groundwater from the Simsboro Aquifer, which may have some effect on water levels in the well.
- The Heart of Texas SCADA well (58-40-4-0041) experienced approximately 66 feet of water level decline. This well is located within the periphery of the area affected by the Vista Ridge project, but is also only a few hundred feet from an active public water supply well operated by the City of Hutto.
- The LP SCADA well (59-33-4-0021) experienced more than 110 feet of water level decline between 2011 and 2022. This well is clearly within the area affected by the Vista Ridge project, and the majority of the water-level decline observed in this well has occurred since April 2020, when the Vista Ridge project pumping began.

Based on the observed data, water levels in the Simsboro Aquifer outcrop area appear to be relatively stable. In the downdip areas, however, water level declines are occurring across the District. The declines are greatest in the area affected by the Vista Ridge project, with declines in excess of 110 feet observed in the LP well in northern Lee County since 2011. Most of the observed water-level decline in the LP well occurred during the past two years, and appear to be directly tied to Vista Ridge project pumping.

Observed water-level declines are smallest in the southernmost portion of the Simsboro Aquifer, with declines of slightly less than 30 feet at the Bastrop well. Declines in the other Simsboro Aquifer monitoring wells with data for both 2011 and 2022 are between 60 and 70 feet. The declines observed in some of these wells may be partly in response to local pumping from the Simsboro Aquifer. For example, pumping from the Thomas Turfgrass irrigation well may affect the Barespot SCADA well 58-55-2-0036, and pumping from the City of Hutto well may affect the Heart of Texas SCADA well (58-40-4-0041). However, part of these observed declines may also be more regional in nature, resulting from the combined pumping from wells such as from the LCRA power plant well field and numerous public water supply wells in Bastrop County.

None of the observed declines exceed the Simsboro Aquifer DFC for the Lost Pines GCD, which is 240 feet by the end of 2070. Whether or not the average annual decline rate exceeds a rate that would be considered to be out of compliance by the District will depend on the methodology established by the District to determine whether the DFCs are in in compliance.

Hooper Aquifer

One of the 3 Hooper Aquifer monitoring wells have data in both 2011 and 2022. This is well 58-38-9-0028 in Bastrop County. Water levels in 2011 and 2022 in this well are summarized in Table 7. Water level changes are shown in Figure 6.

Table 7. Water level changes in the Calvert Bluff Aquifer monitoring wells from 2011 to 2022.

Well ID	2011 Water Level (feet bgl)	2022 Water Level (feet bgl)	Water Level Change from 2011 to 2022 (feet)
58-38-9-0028	150.33	154.96	-4.63

As shown in Table 7 and Figure 6, the only Hooper Aquifer monitoring well with water levels both in 2011 and 2022 showed a decrease in water level of more than 4.5 feet over this time period. However, this is not an amount that is sufficient to cause the Hooper Aquifer to be out of compliance with the DFC of 138 feet of drawdown between January 2011 and December 2070. In addition, water levels in this well have generally been stable over the last 8 to 10 years, and have only declined approximately 20 feet over the last 40 years (a plot of water levels is provided in Appendix L of the annual water level report). Also, two additional Hooper Aquifer monitoring wells (not listed here because they do not have data in 2011 and 2022) indicate stable or increasing water levels over time. Therefore, the Lost Pines GCD is not out of compliance with the DFC of 138 feet of drawdown in the Hooper Aquifer based on the available data described in this addendum.

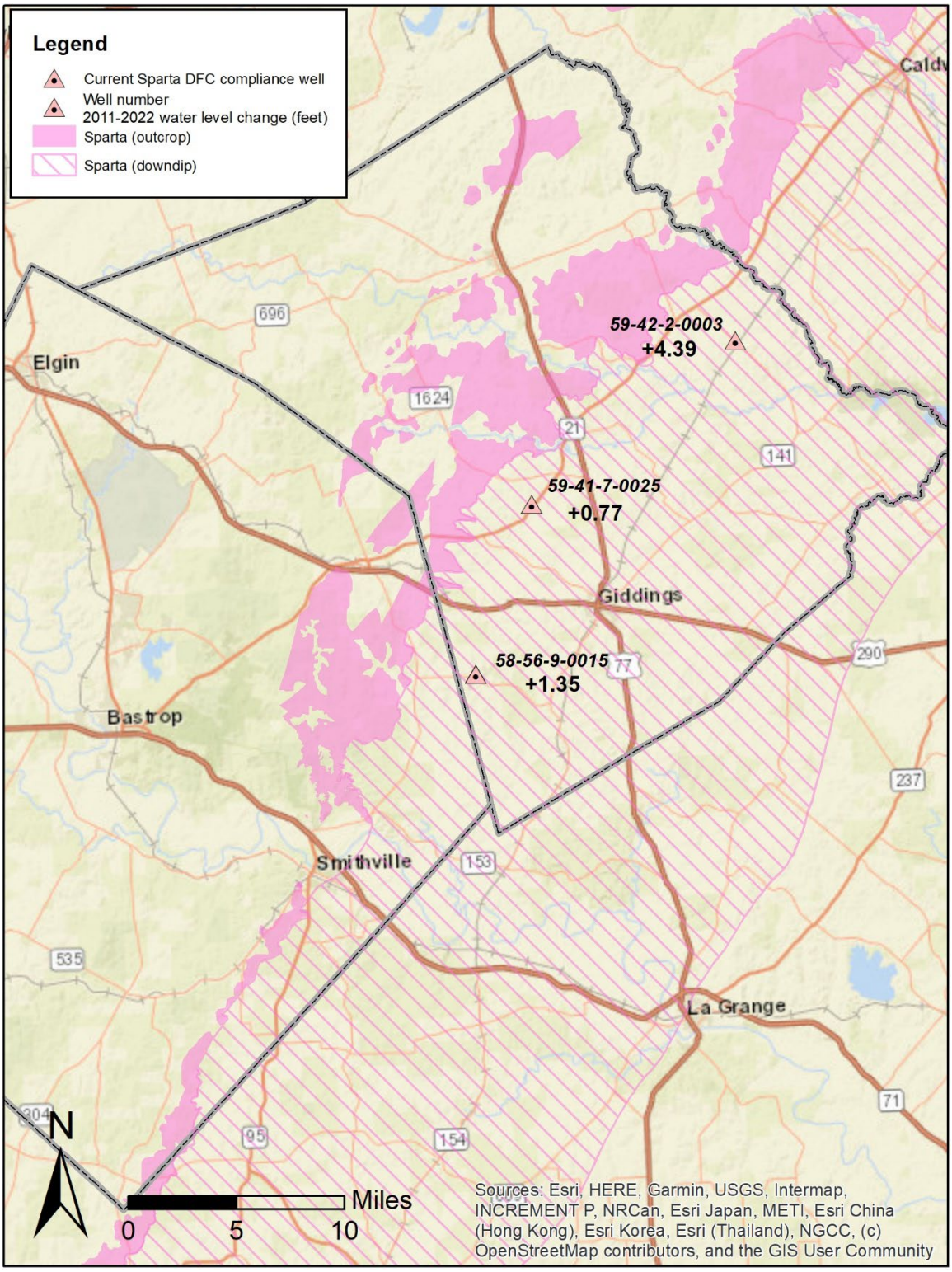

Figure 1. Water level changes in the Sparta Aquifer from 2011 to 2022. Positive number is water level rise, and negative number is water level decline.

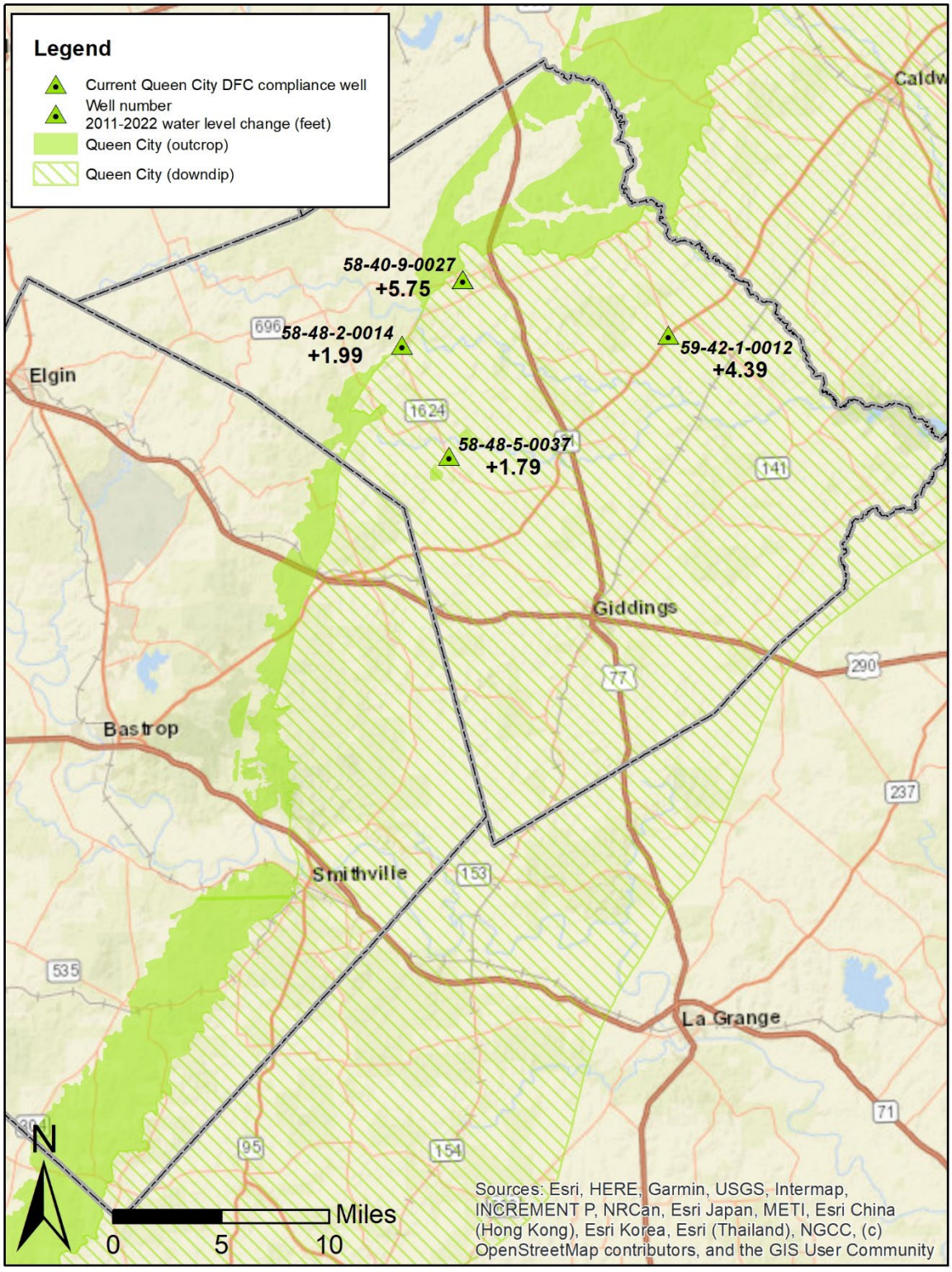

Figure 2. Water level changes in the Queen City Aquifer from 2011 to 2022. Positive number is water level rise, and negative number is water level decline.

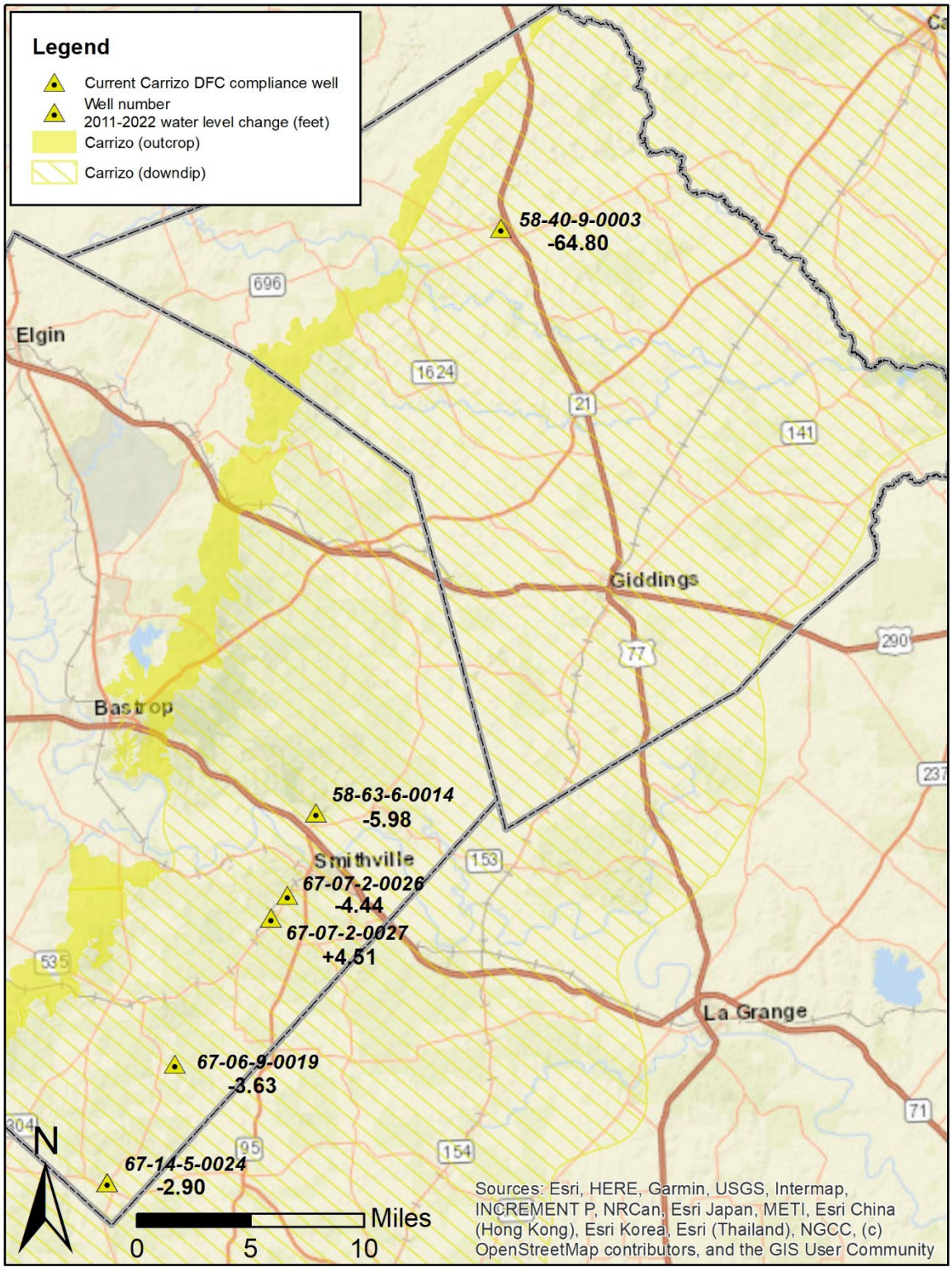

Figure 3. Water level changes in the Carrizo Aquifer from 2011 to 2022. Positive number is water level rise, and negative number is water level decline.

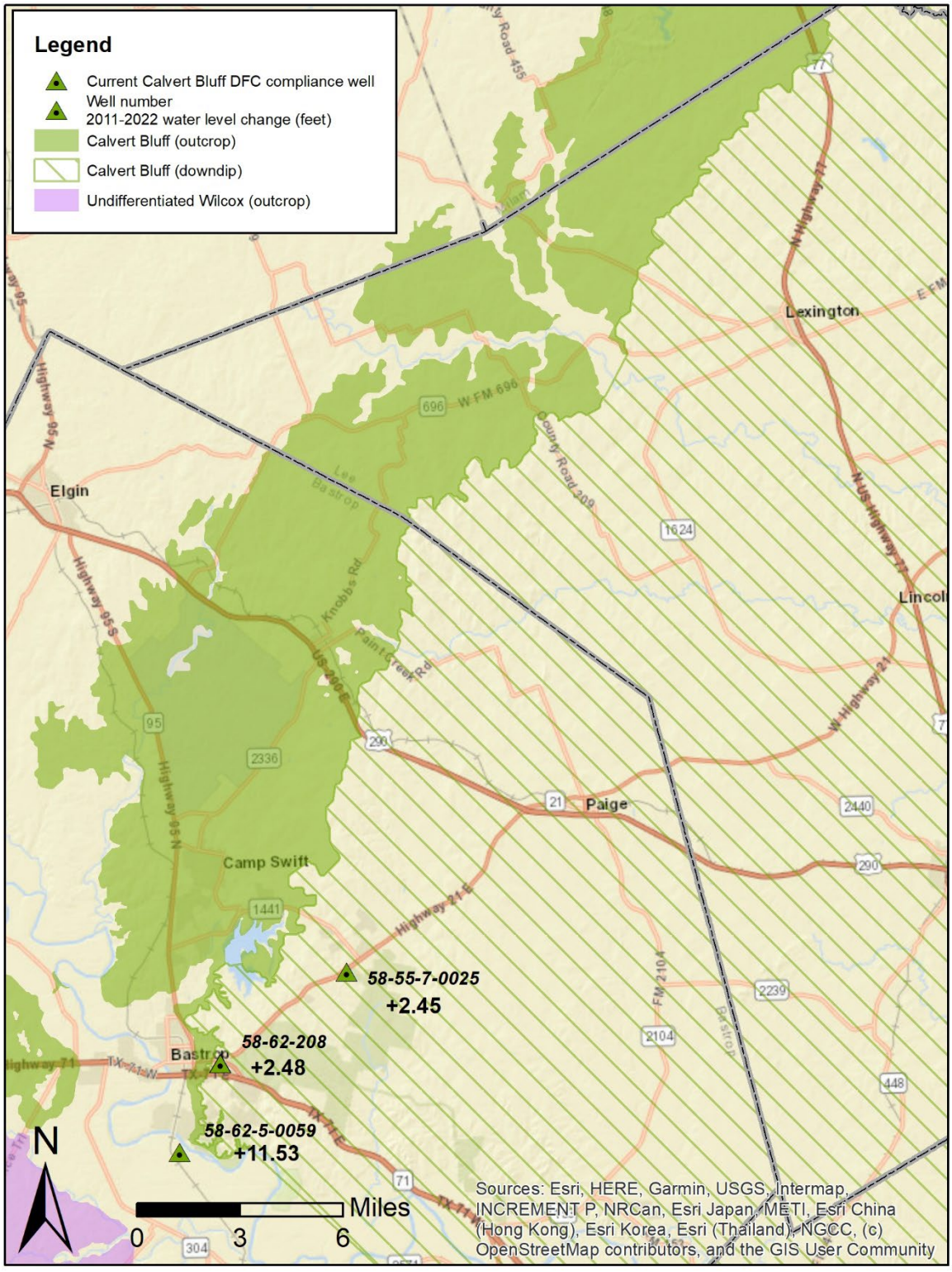

Figure 4. Water level changes in the Calvert Bluff Aquifer from 2011 to 2022. Positive number is water level rise, and negative number is water level decline.

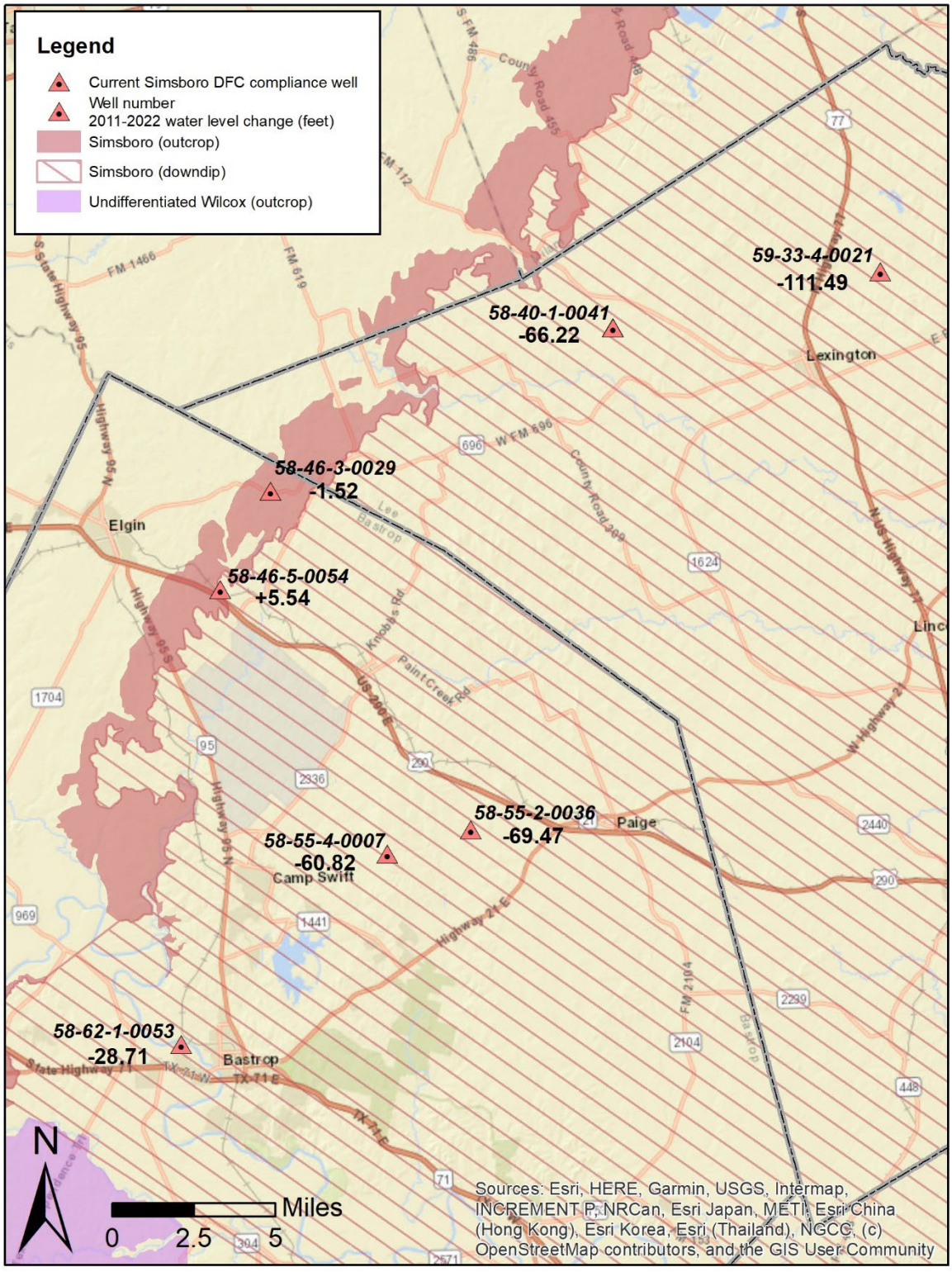

Figure 5. Water level changes in the Simsboro Aquifer from 2011 to 2022. Positive number is water level rise, and negative number is water level decline.

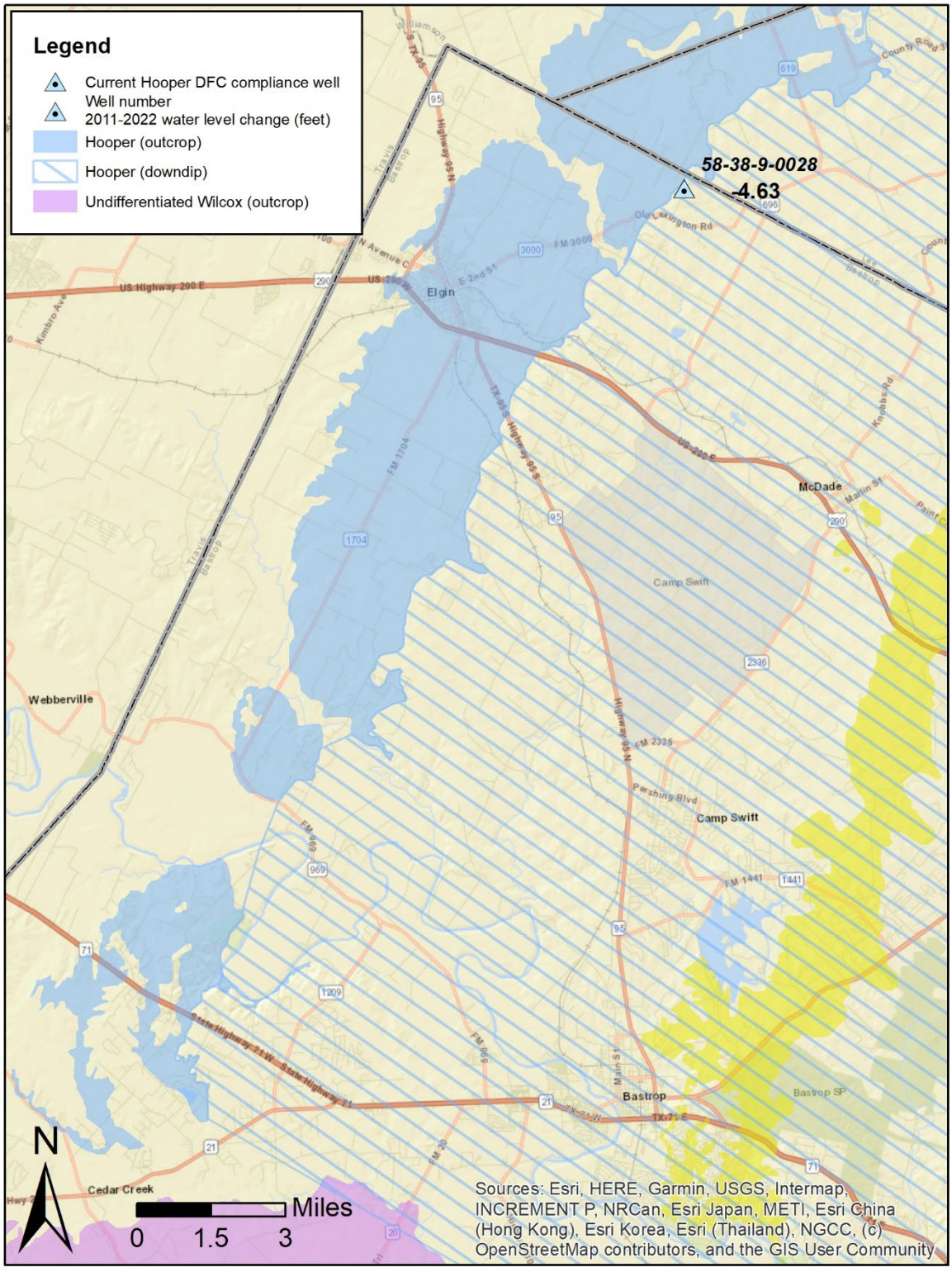

Figure 6. Water level changes in the Hooper Aquifer from 2011 to 2022. Positive number is water level rise, and negative number is water level decline.