Aquifer Desired Future Conditions 2021 Update

Presented to

BVGCD Board of Directors

By

Ground Water Consultants, LLC

April 8, 2021

Desired Future Conditions

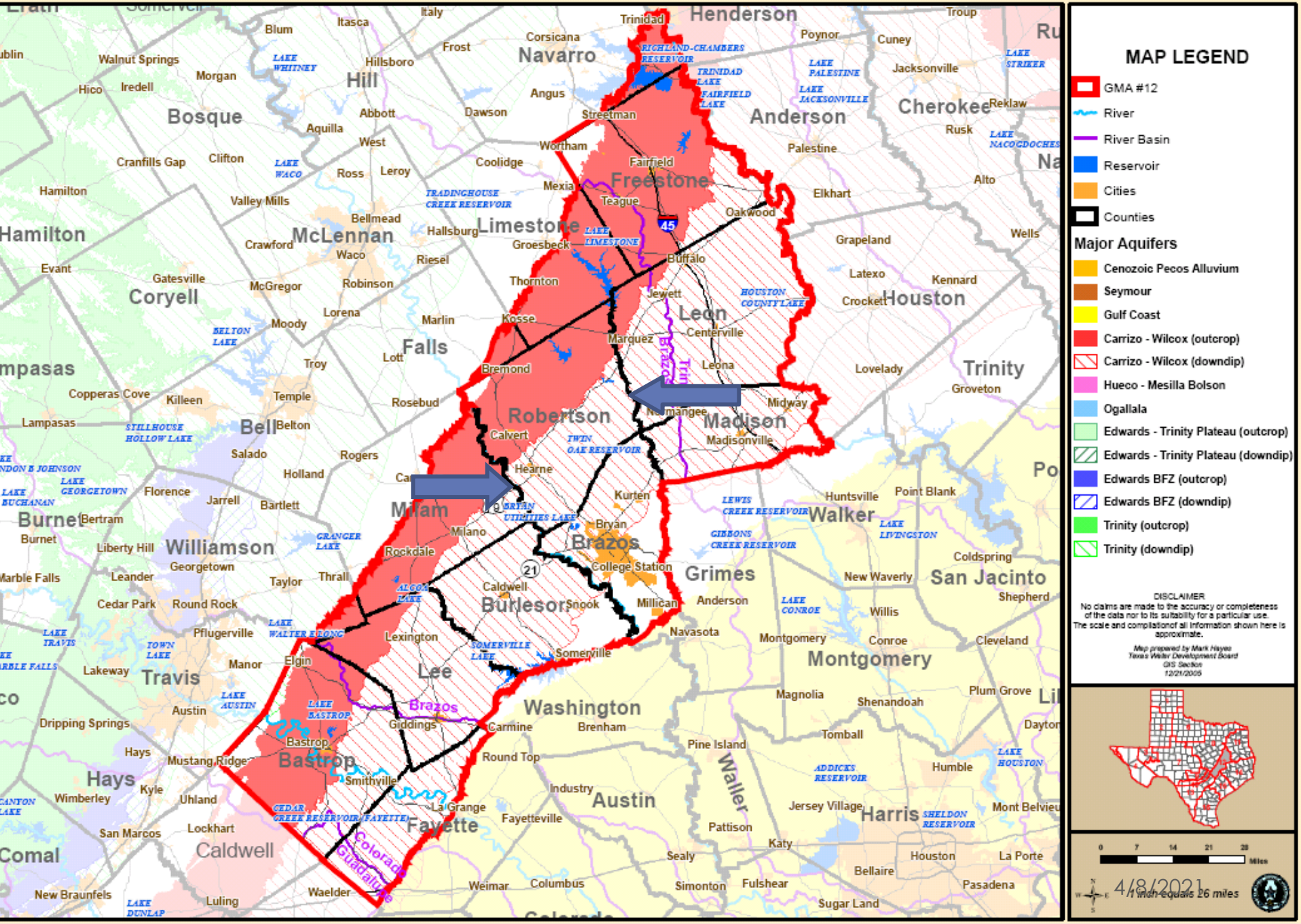
- Established for Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, Hooper, Yegua, Jackson and Brazos River Alluvium aquifers during 2021 cycle of GMA 12 planning
- Use average artesian head decline over aquifer areas as matrix for quantifying progress toward compliance with the Desired Future Conditions (DFCs). For Brazos River Alluvium matrix is percent of aquifer saturation
- Well static water-level data used to help monitor aquifer response to pumping and estimate average artesian head changes

Desired Future Conditions (cont'd)

- DFCs established based on estimates of effects of pumping in the District and the effects of pumping in other areas of GMA 12 that extend up to 75 miles from the District

  2021 cycle of GMA 12 planning has developed DFCs for 2070 as was done with the 2016 cycle of planning

Groundwater Management Area #12

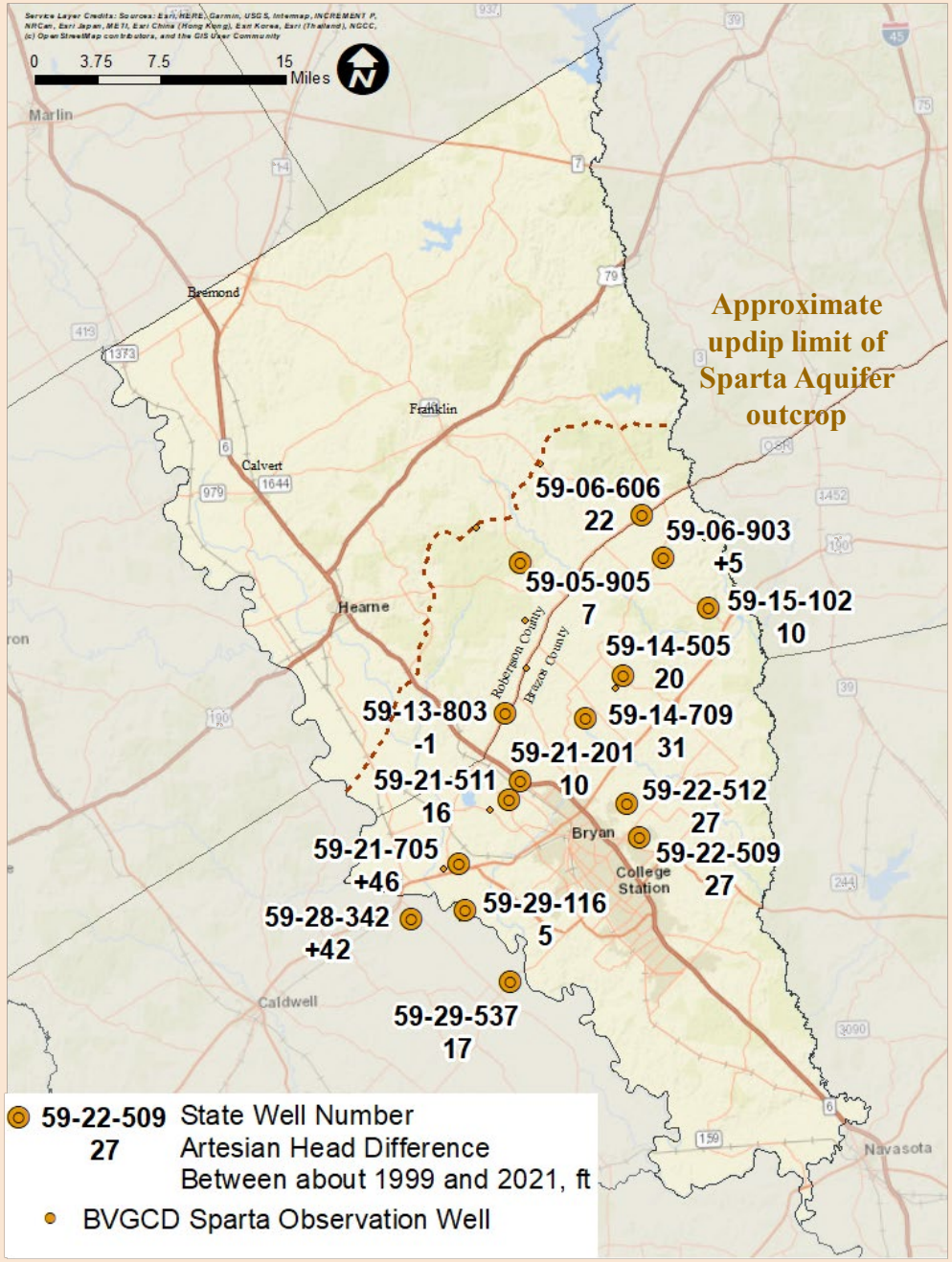


DFC Goals for 2021 Planning Cycle

Aquifer	BVGCD-DFC, ft	Planning Period
Sparta	50	2000 - Dec. 2069
Queen City	45	2000 - Dec. 2069
Carrizo	88	2000 - Dec. 2069
Calvert Bluff	122	2000 - Dec. 2069
Simsboro	274	2000 - Dec. 2069
Hooper	187	2000 - Dec. 2069
Yegua-Jackson	64	2010 - 2069

Sparta Aquifer DFC Wells

State Well Number	Owner
59-05-905	Private
59-06-606	Private
59-06-903	Private
59-13-803	Private
59-14-505	Private
59-14-709	Private
59-15-102	Private
59-21-201	City of Bryan Well 6
59-21-511	Private
59-21-705	TAMU Well 2
59-22-509	Private
59-22-512	Private
59-29-116	Private

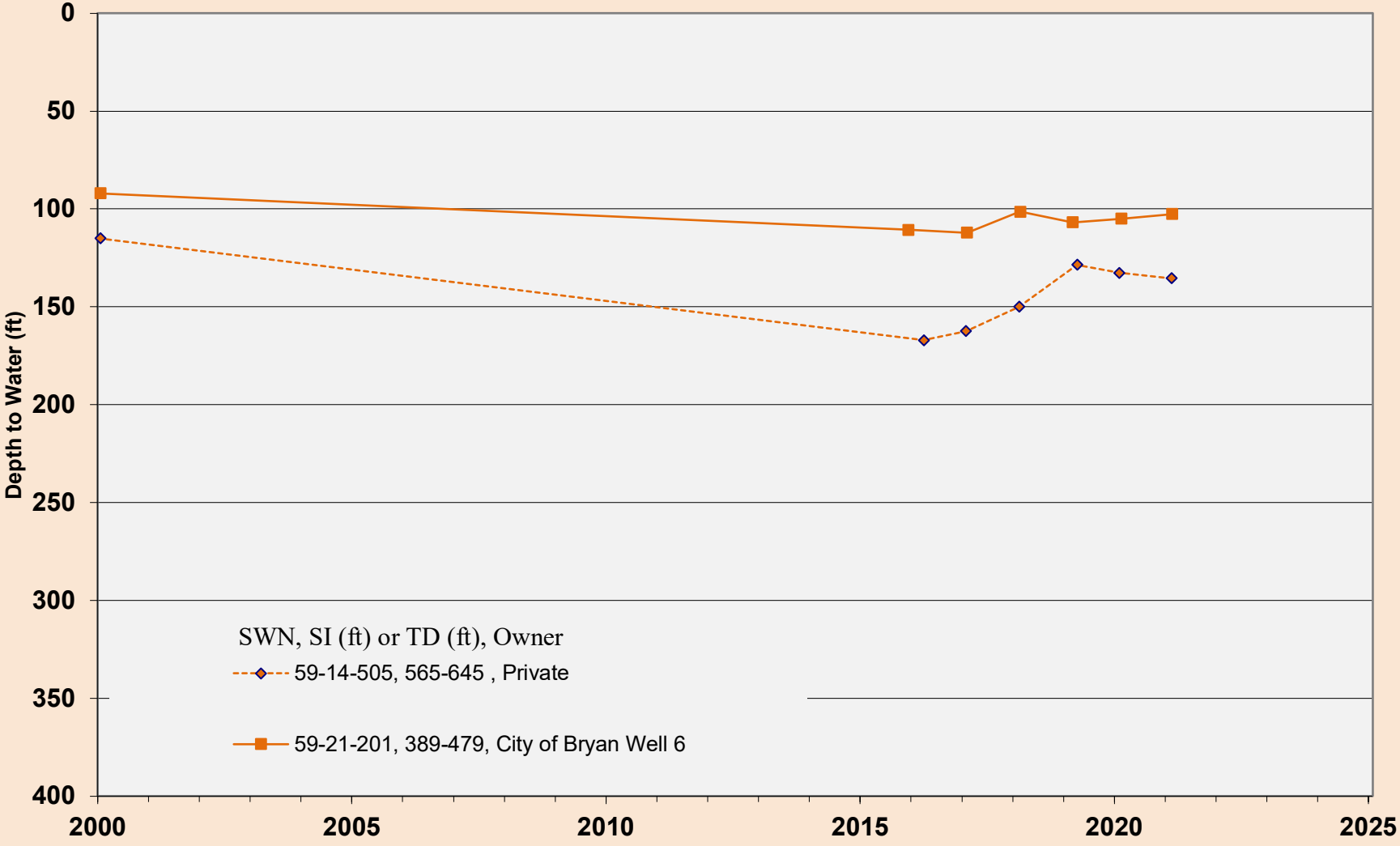


Sparta Aquifer

Average Artesian Head Change 1999-2020 = 9 feet

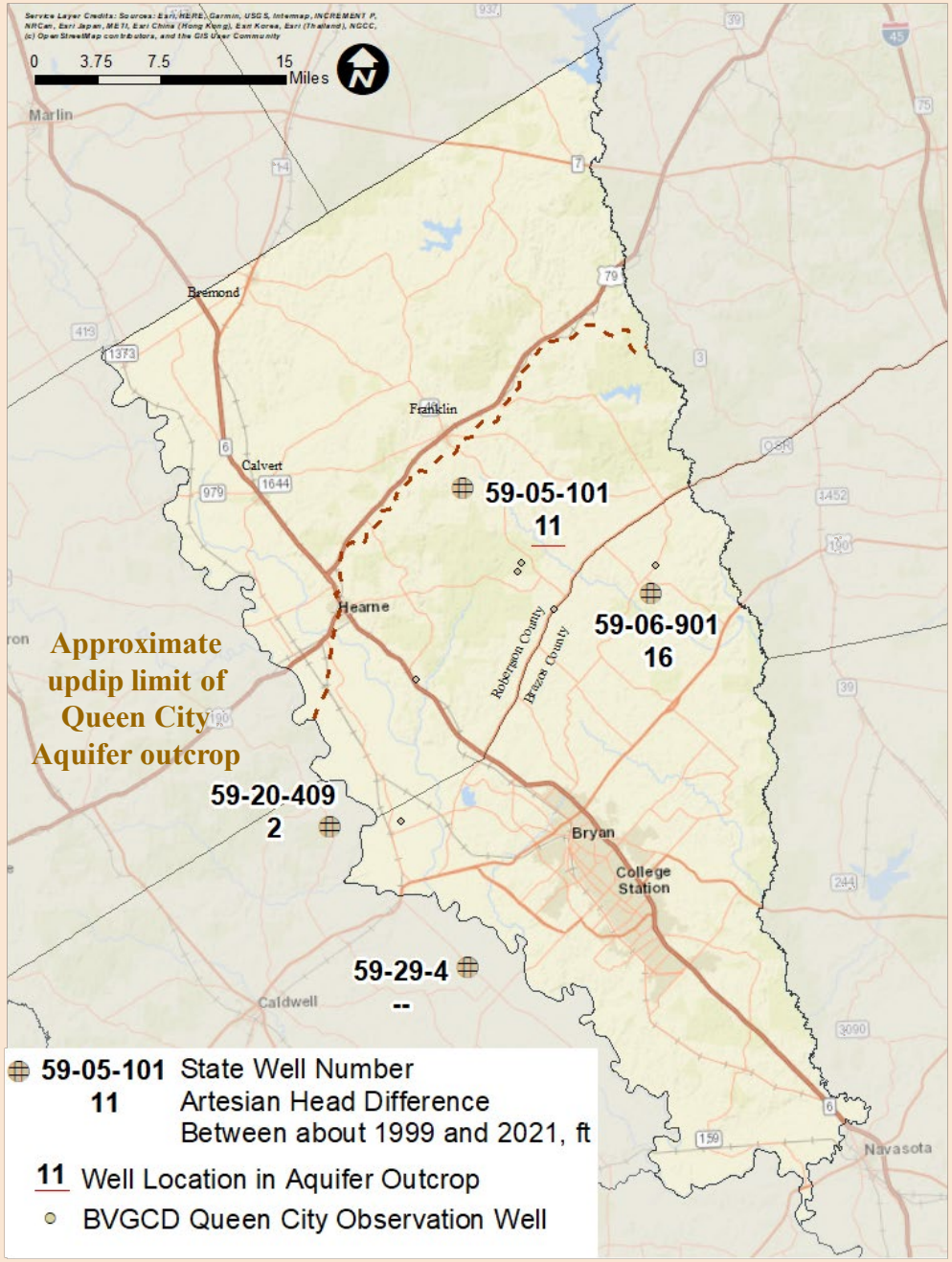
DFC by 2070:
Average Artesian Head Decline 50 feet
Previous DFC 12 feet

SPARTA AQUIFER
OBSERVATION WELLS



Queen City, Carrizo and Calvert Bluff Aquifers DFC Wells

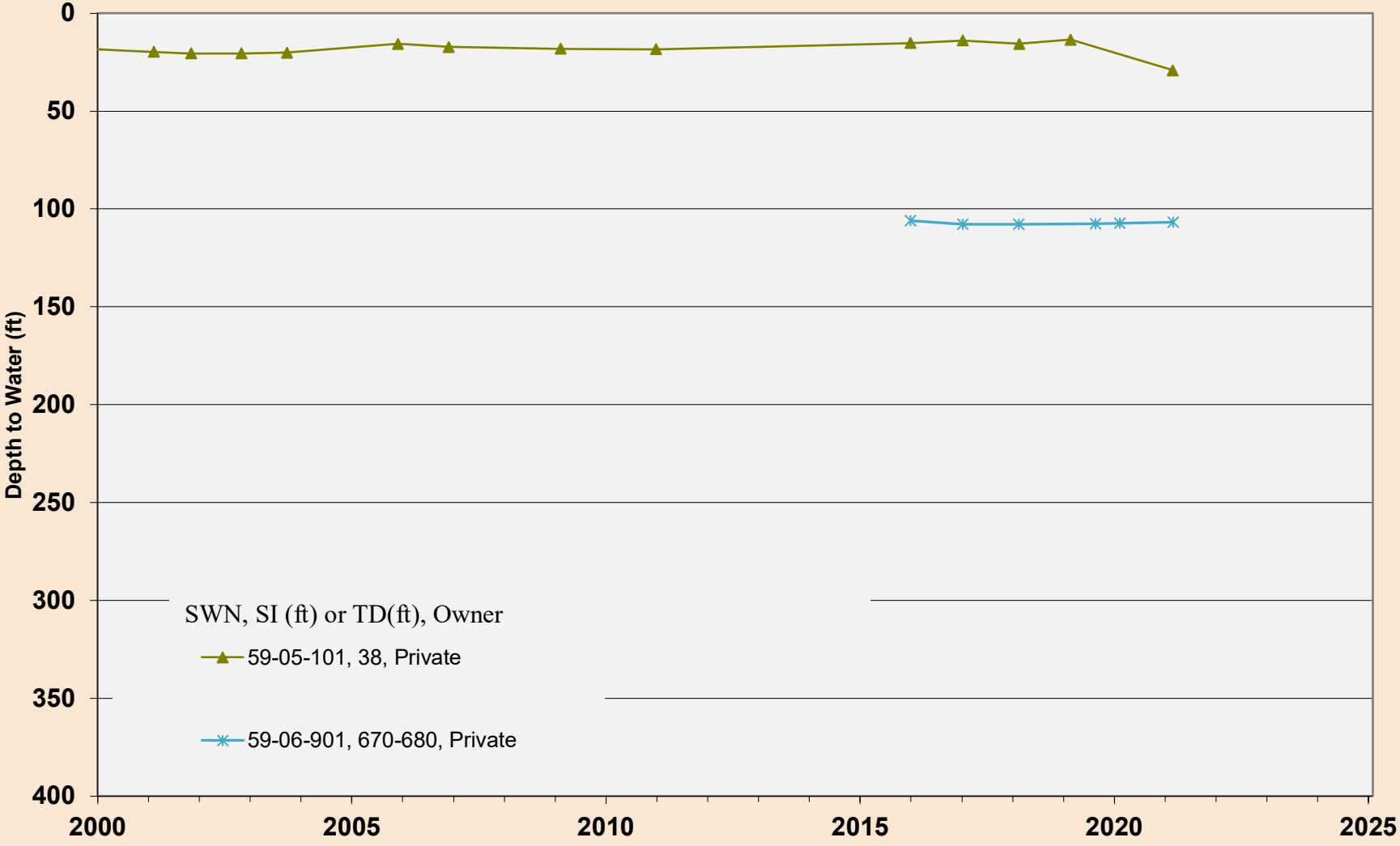
State Well Number	Well Owner
Queen City Aquifer	
59-05-101	Private
59-06-901	Private
Carrizo Aquifer	
59-04-708	Private
59-05-105	Private
59-05-301	Private
59-21-402	TAMU Well 5
59-21-416	City of College Station Carrizo #1
Calvert Bluff	
59-03-438	Private
59-03-606	Private

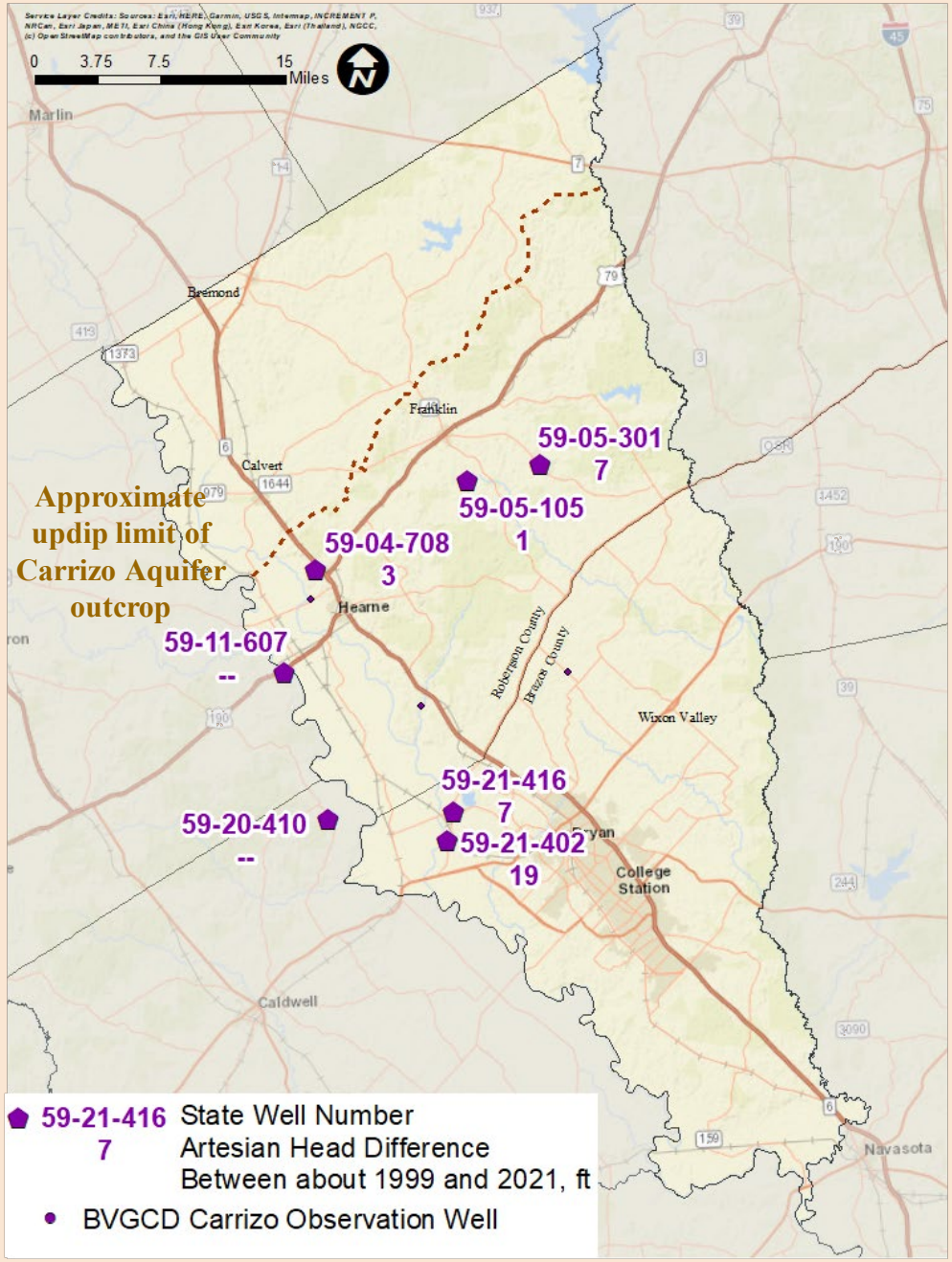


Queen City Aquifer

DFC by 2070:
Average Artesian Head Decline 45 feet
Previous DFC 12 feet

QUEEN CITY AQUIFER
OBSERVATION WELLS



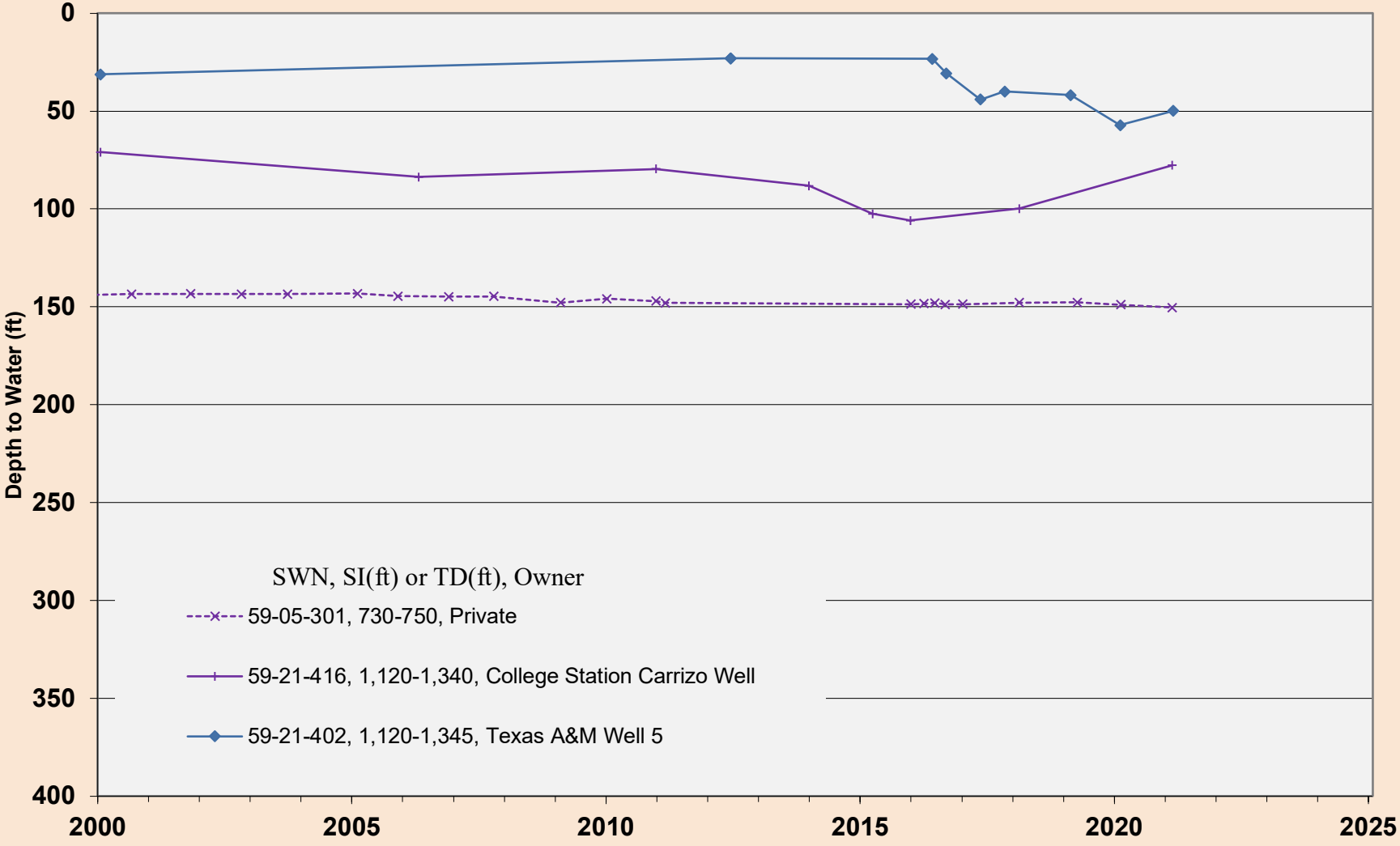


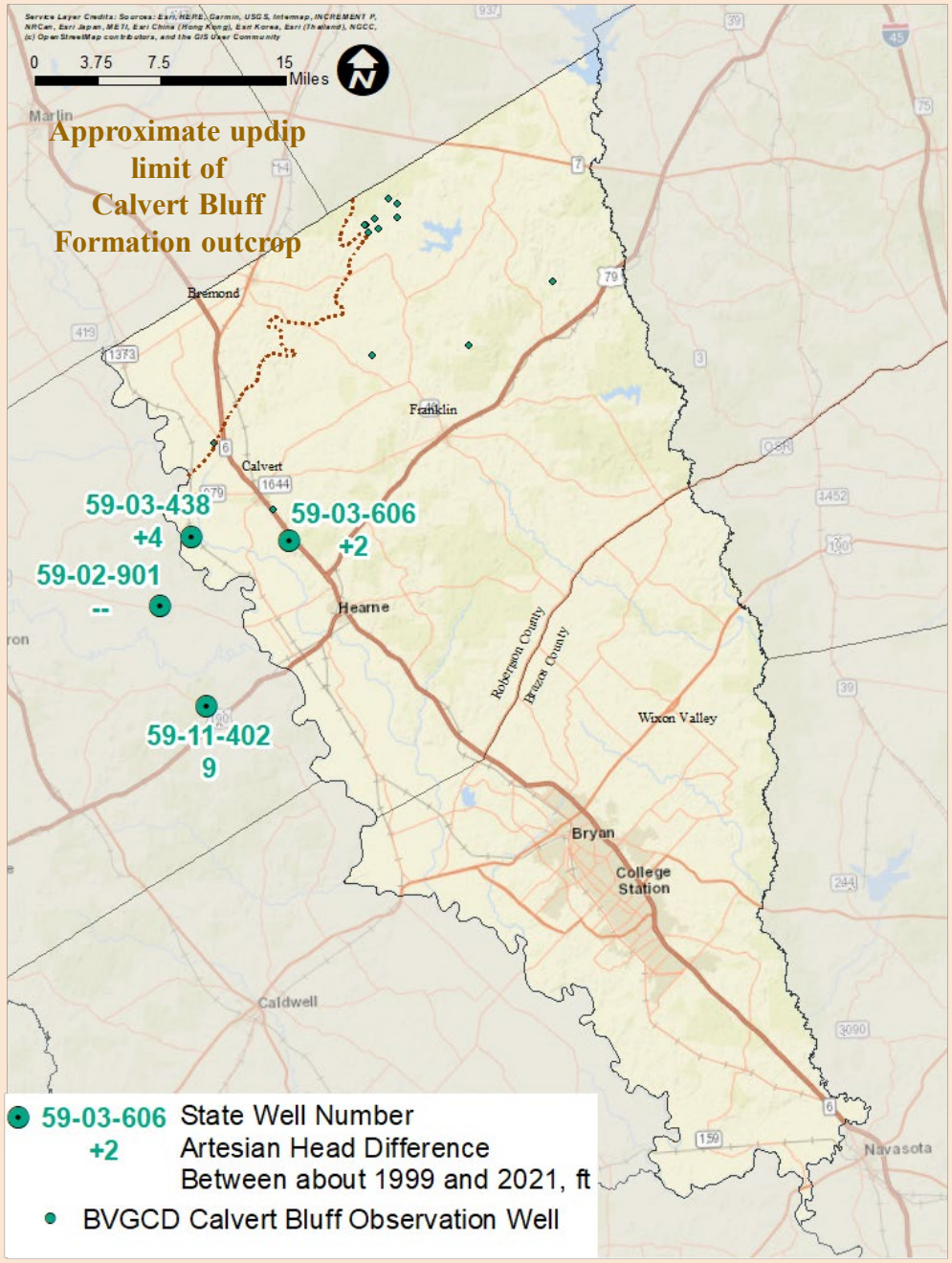
Carrizo Aquifer

Average Artesian Head Decline
1999-2020 = 7 ft

DFC by 2070:
Average Artesian Head Decline of 88 feet
Previous DFC 61 feet

CARRIZO AQUIFER
OBSERVATION WELLS

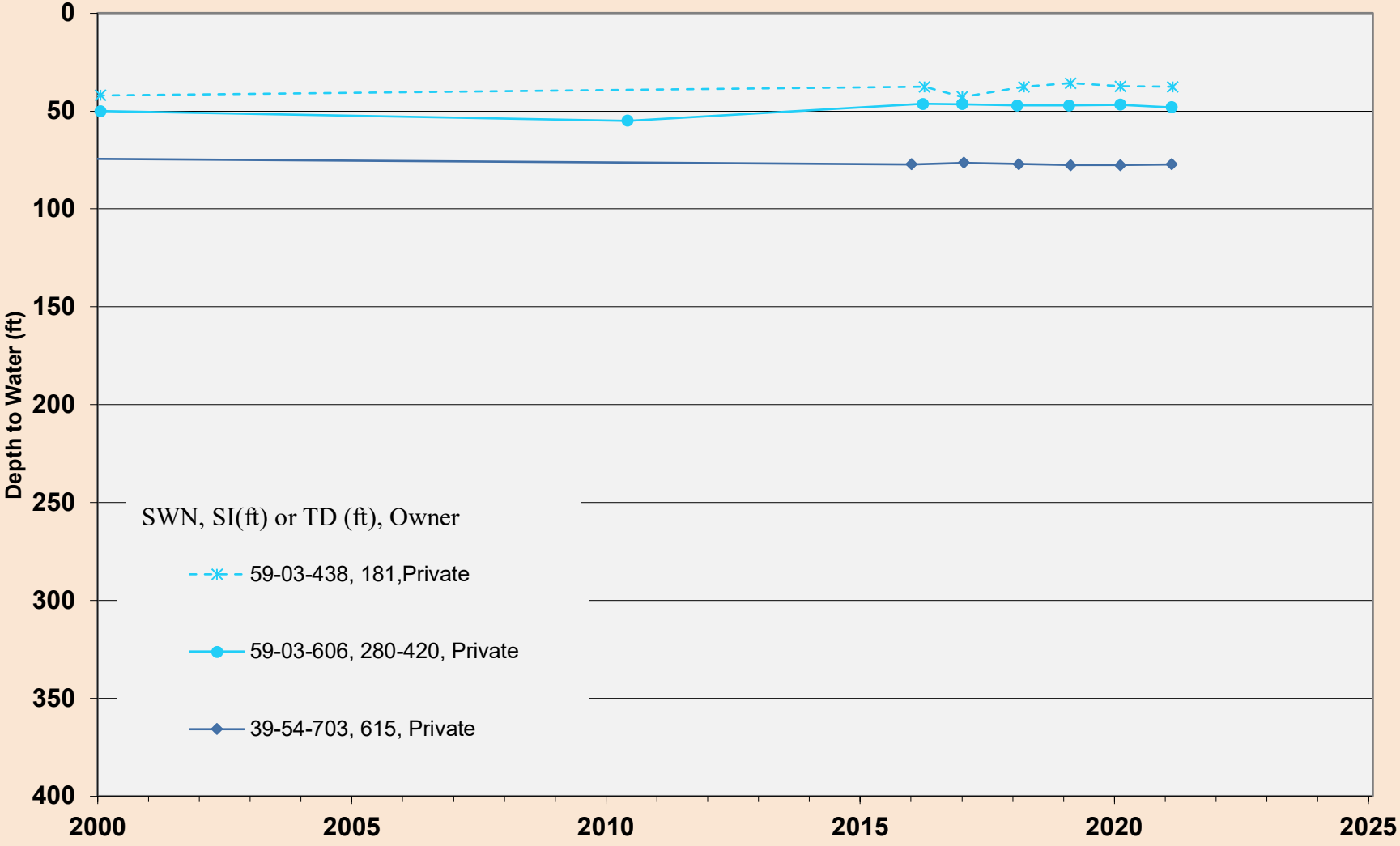




Calvert Bluff Formation

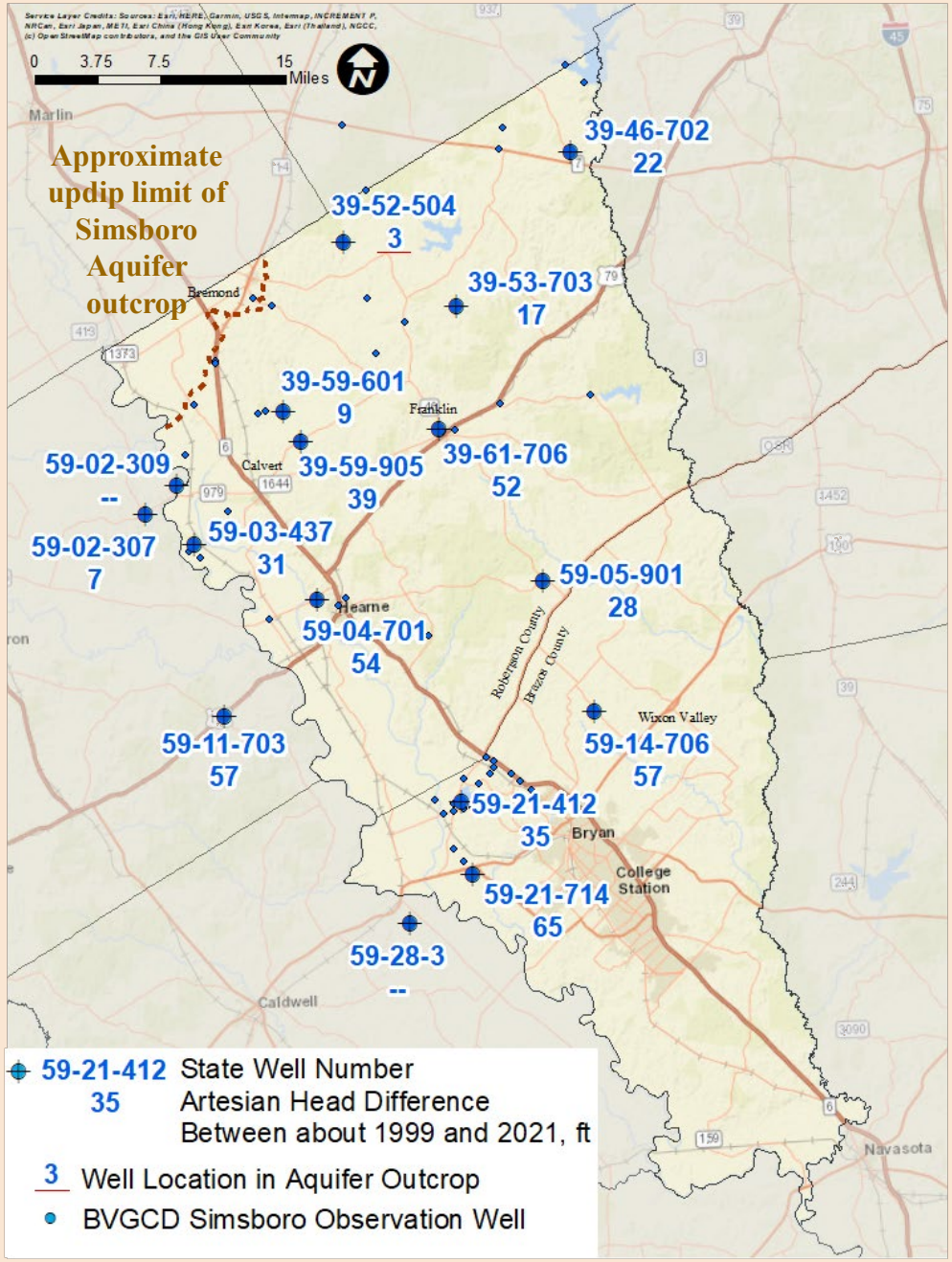
DFC by 2070:
Average Artesian Head Decline of 122 feet
Previous DFC 125 feet

CALVERT BLUFF FORMATION
OBSERVATION WELLS



Simsboro Aquifer DFC Wells

State Well Number	Well Owner
39-46-702	Private
39-52-504	Private
39-53-703	Private
39-59-601	Private
39-59-905	Private
39-61-706	City of Franklin Well 4
59-03-437	Private
59-04-701	City of Hearne Well 4
59-05-901	Wickson Creek SUD Wheelock Well
59-14-706	Wickson Creek SUD Well 1
59-21-412	City of Bryan Well 19
59-21-714	TAMU Well 8



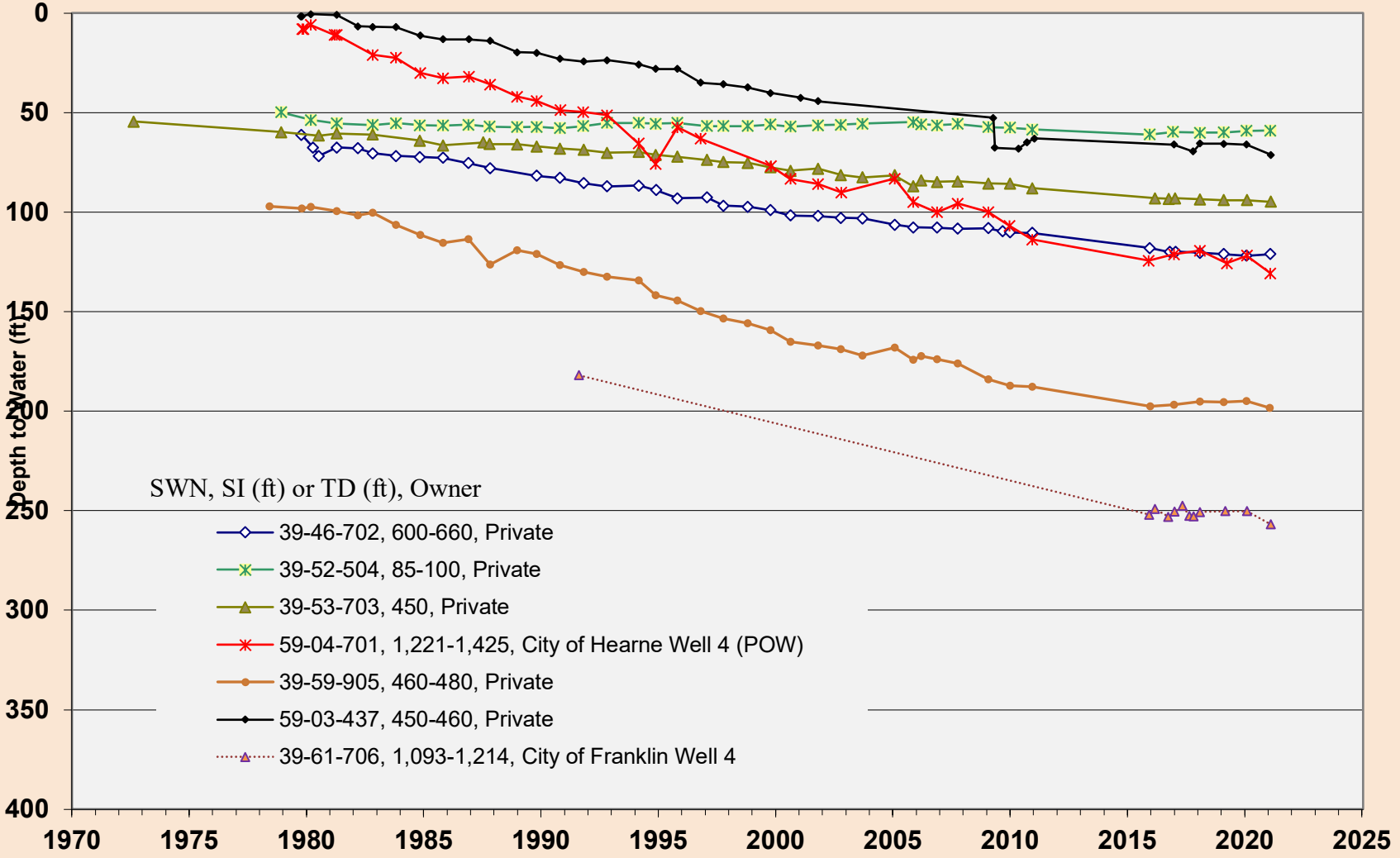
Simsboro Aquifer

Average Artesian Head Decline
1999-2020 = 34 feet

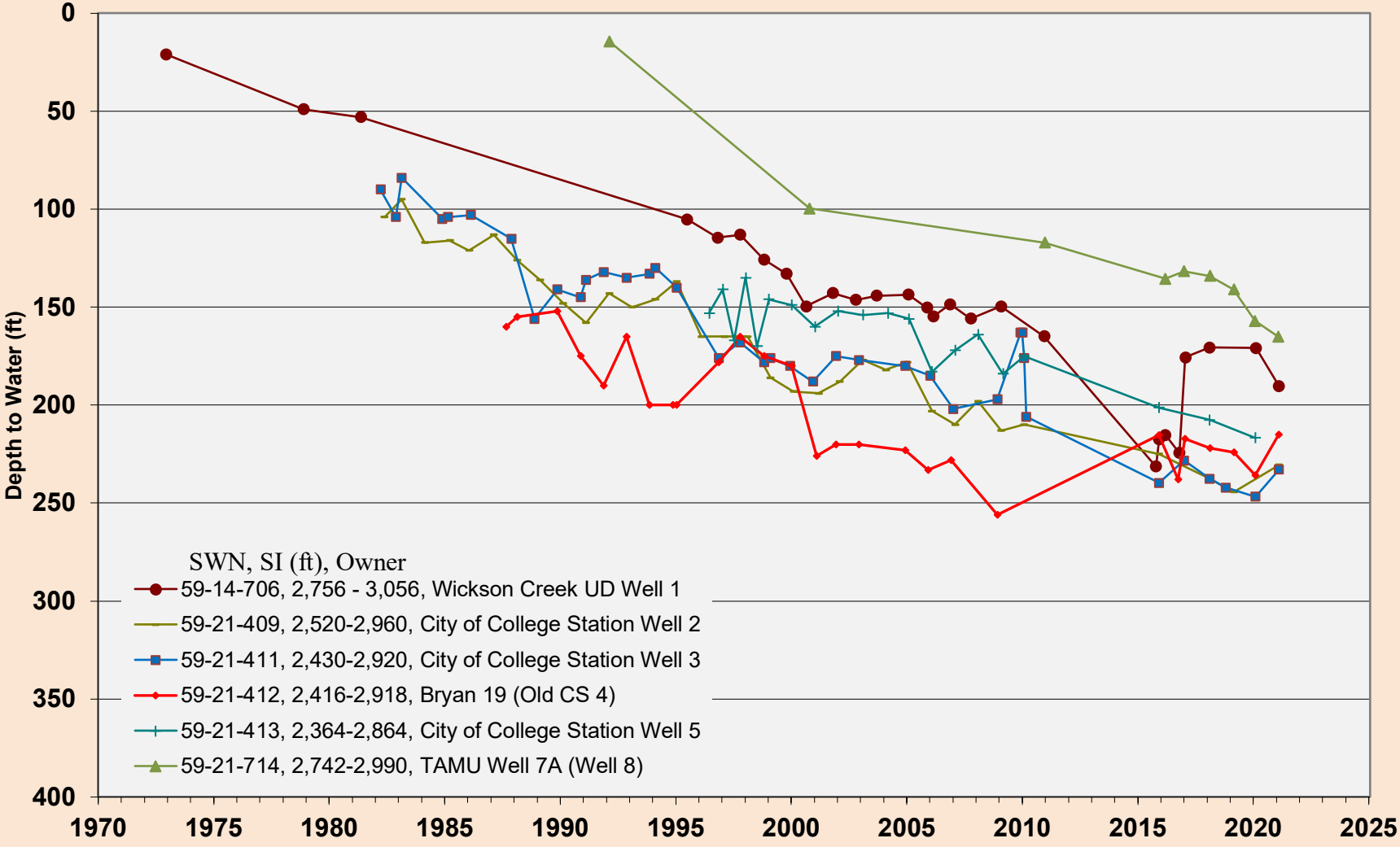
Weighted Average Artesian Head Decline
1999-2020 = 35feet

DFC by 2070:
Average Artesian Head Decline of 274 feet
Previous DFC 295 feet

SIMSBORO AQUIFER OBSERVATION WELLS
Robertson County

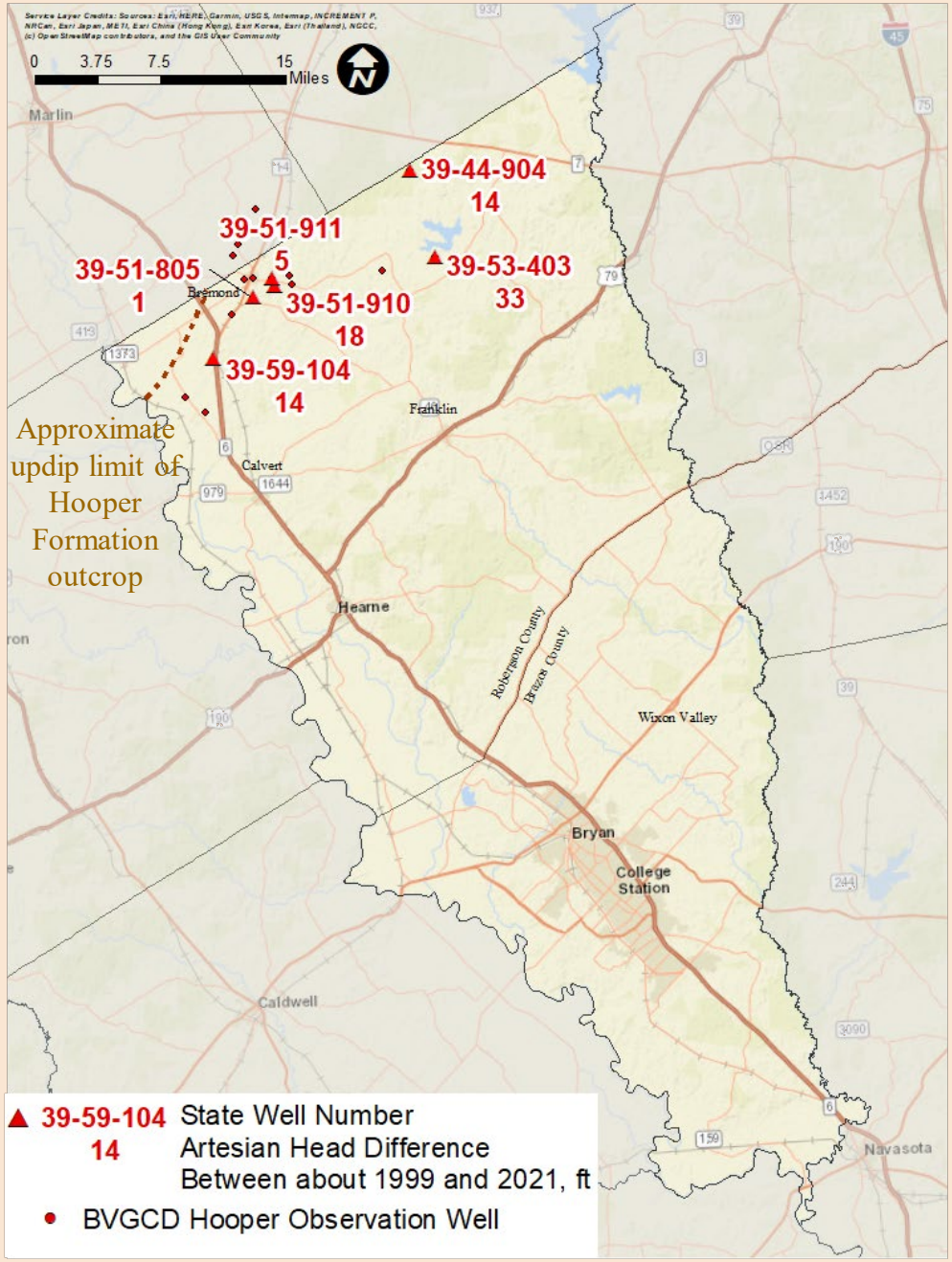


SIMSBORO AQUIFER OBSERVATION WELLS
Brazos County



Hooper Aquifer DFC Wells

State Well Number	Well Owner
Hooper Aquifer	
39-44-904	Private
39-51-805	Private
39-51-910	City of Bremond Well 4
39-51-911	City of Bremond Well 5
39-59-403	Private
39-59-104	Private
Yegua - Jackson Aquifer	
59-21-911	Private
59-22-511	Private
59-22-601	Private
59-30-207	TAMU Golf Course
59-30-308	Wellborn WSC Agnello Well 1
59-30-410	TAMU Brayton Training Field
59-31-703	Private

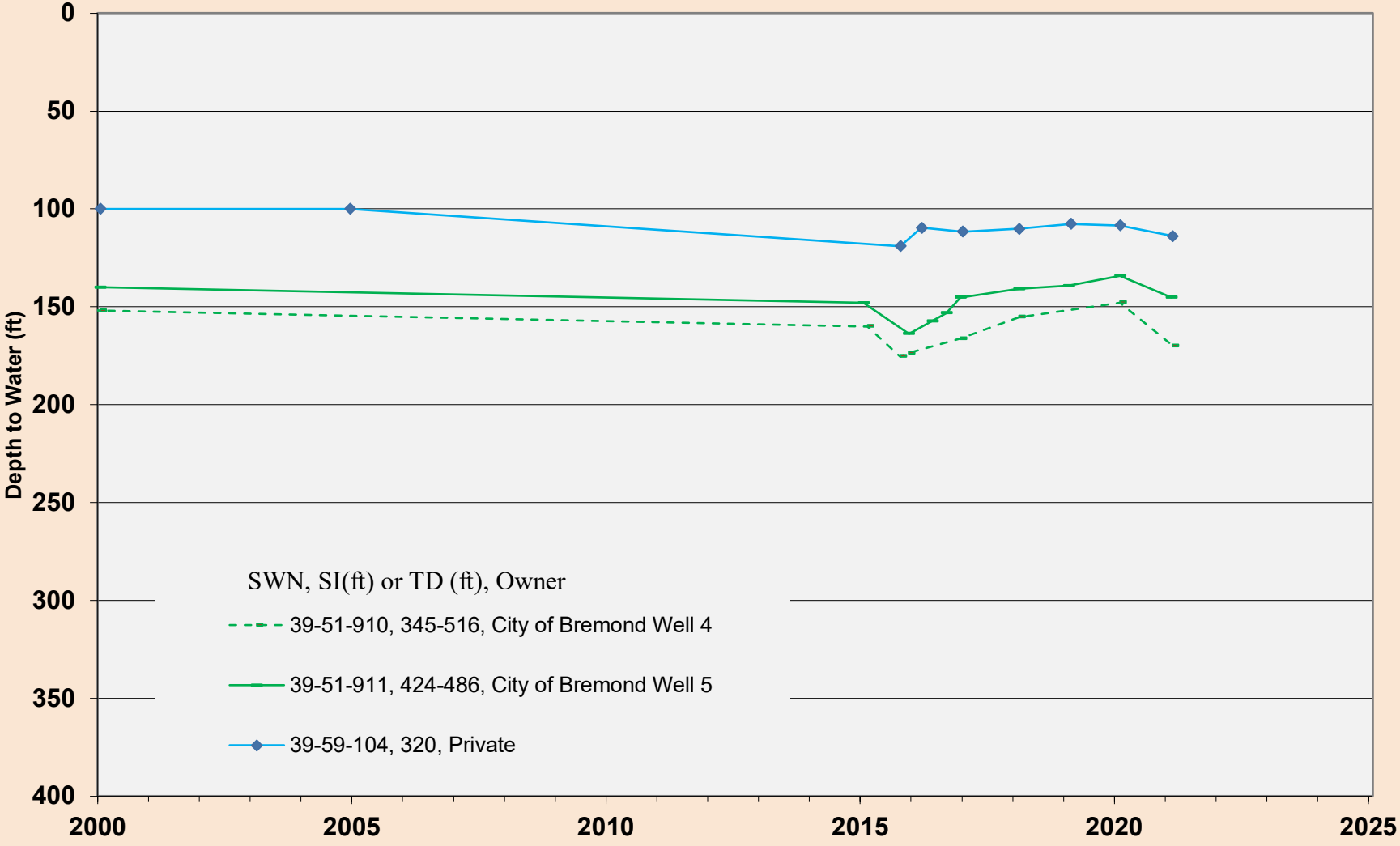


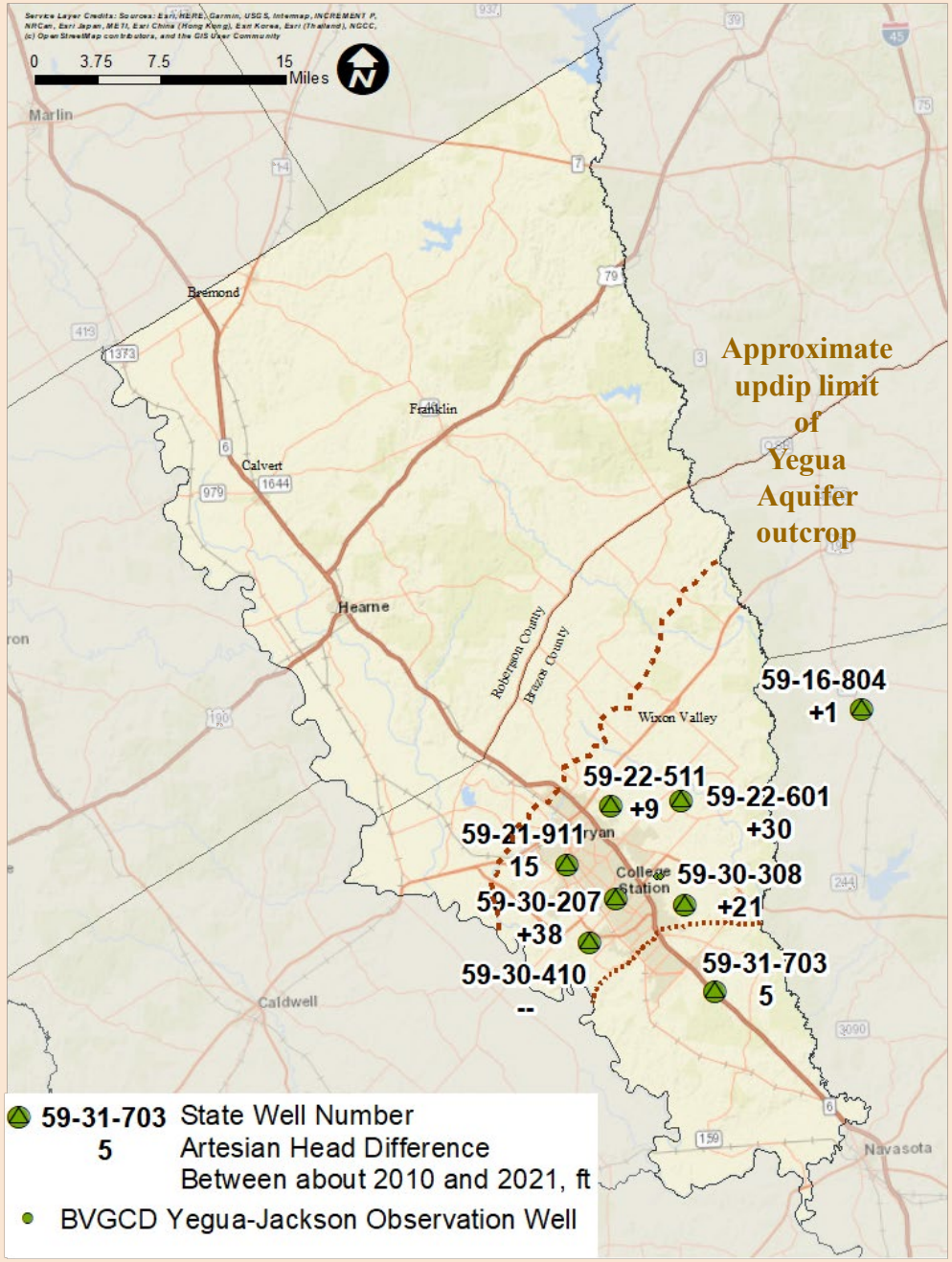
Hooper Formation

Average Artesian Head Decline
1999-2020 = 14 feet

DFC by 2070:
Average Artesian Head Decline of 187 feet
Previous DFC 207 feet

HOOPER FORMATION
OBSERVATION WELLS



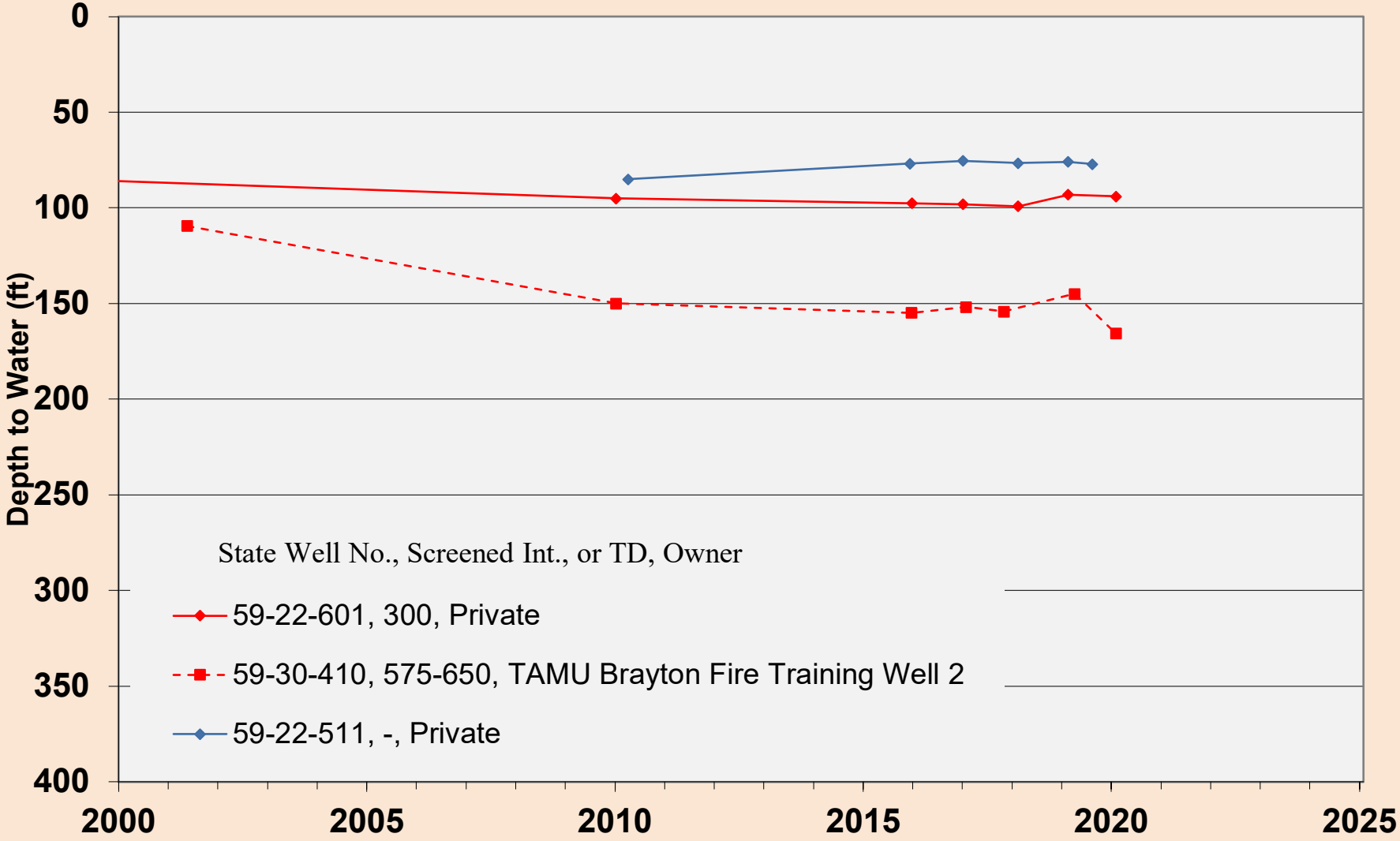


Yegua-Jackson Aquifer

Average Artesian Head Change 2010-2020 = +11feet

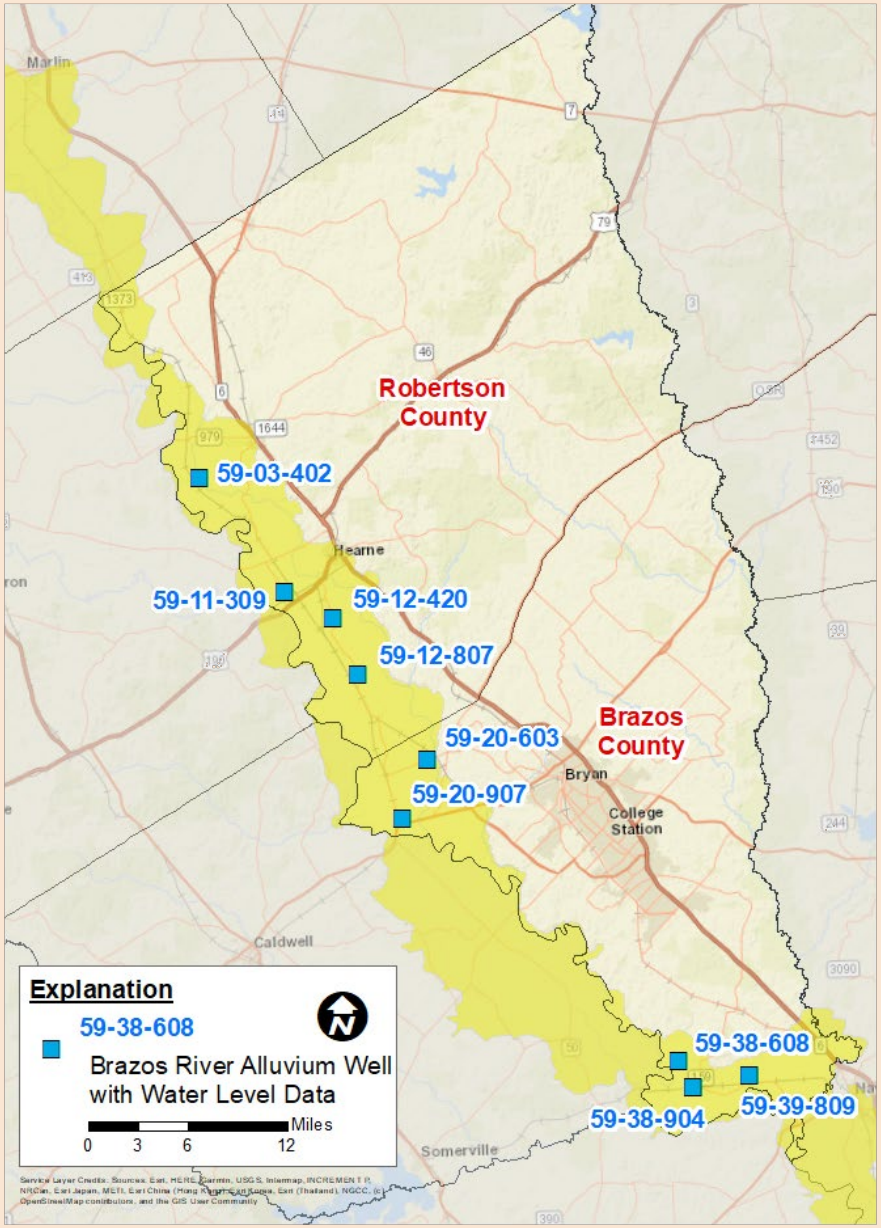
DFC by 2070:
Average Artesian Head Decline of 64 feet
Previous DFC 70/110 feet

YEGUA-JACKSON AQUIFER OBSERVATION WELLS



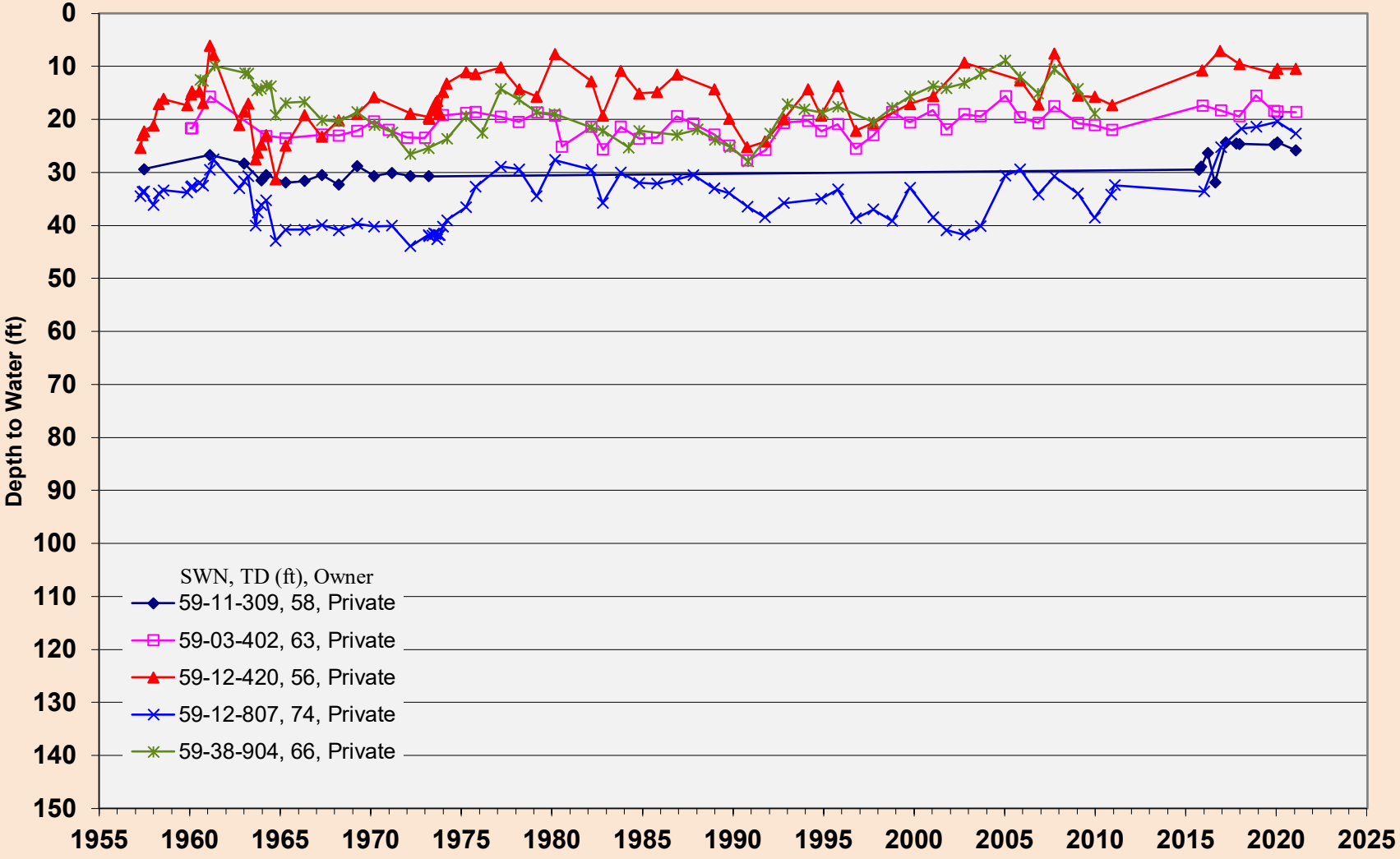
Brazos River Alluvium Aquifer DFC Wells

State Well Number	Well Owner
59-03-402	Private
59-11-309	Private
59-12-420	Private
59-12-807	Private
59-20-603	Private
59-20-907	Private
59-38-608	Private
59-38-904	Private
59-39-809	Private

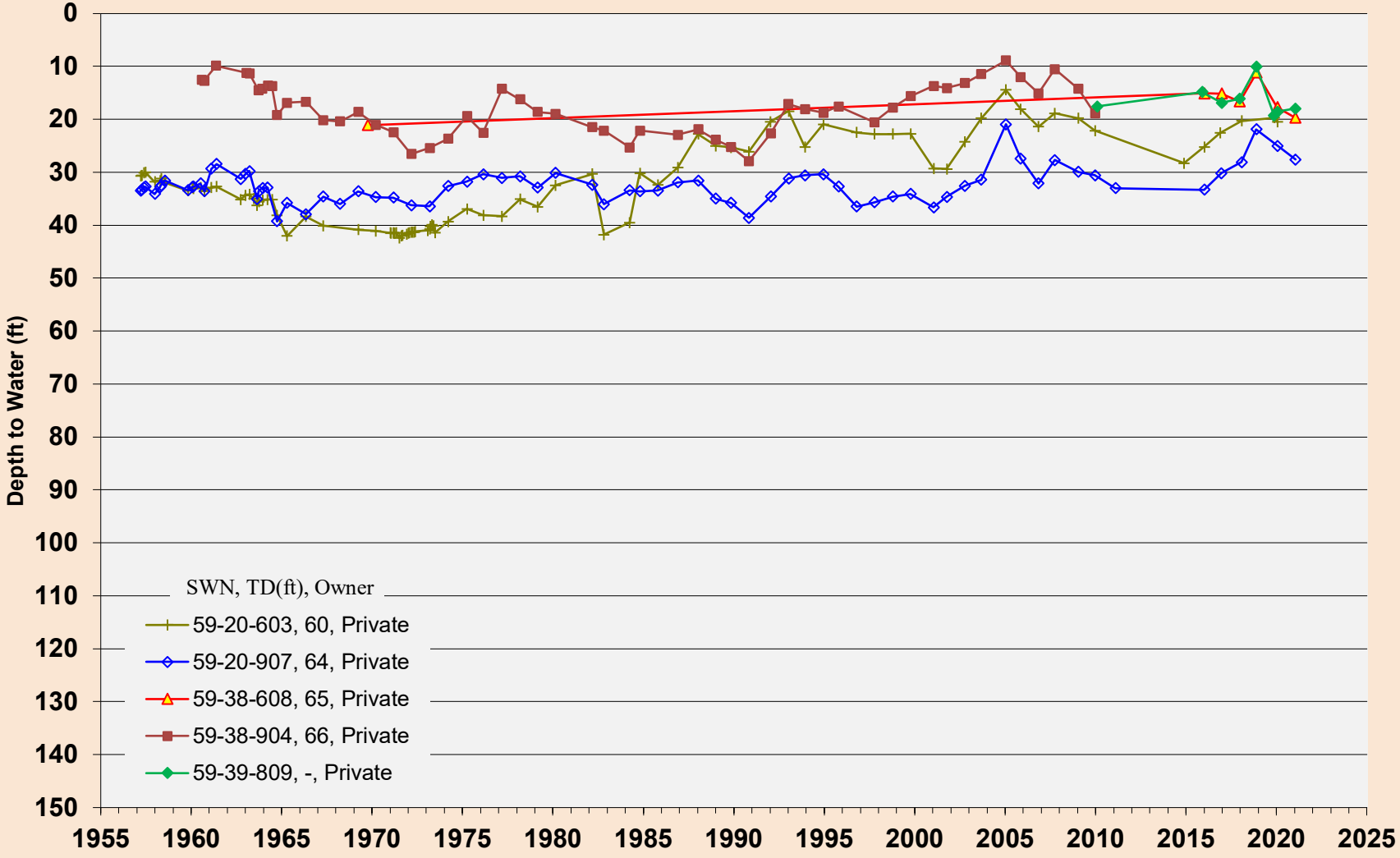


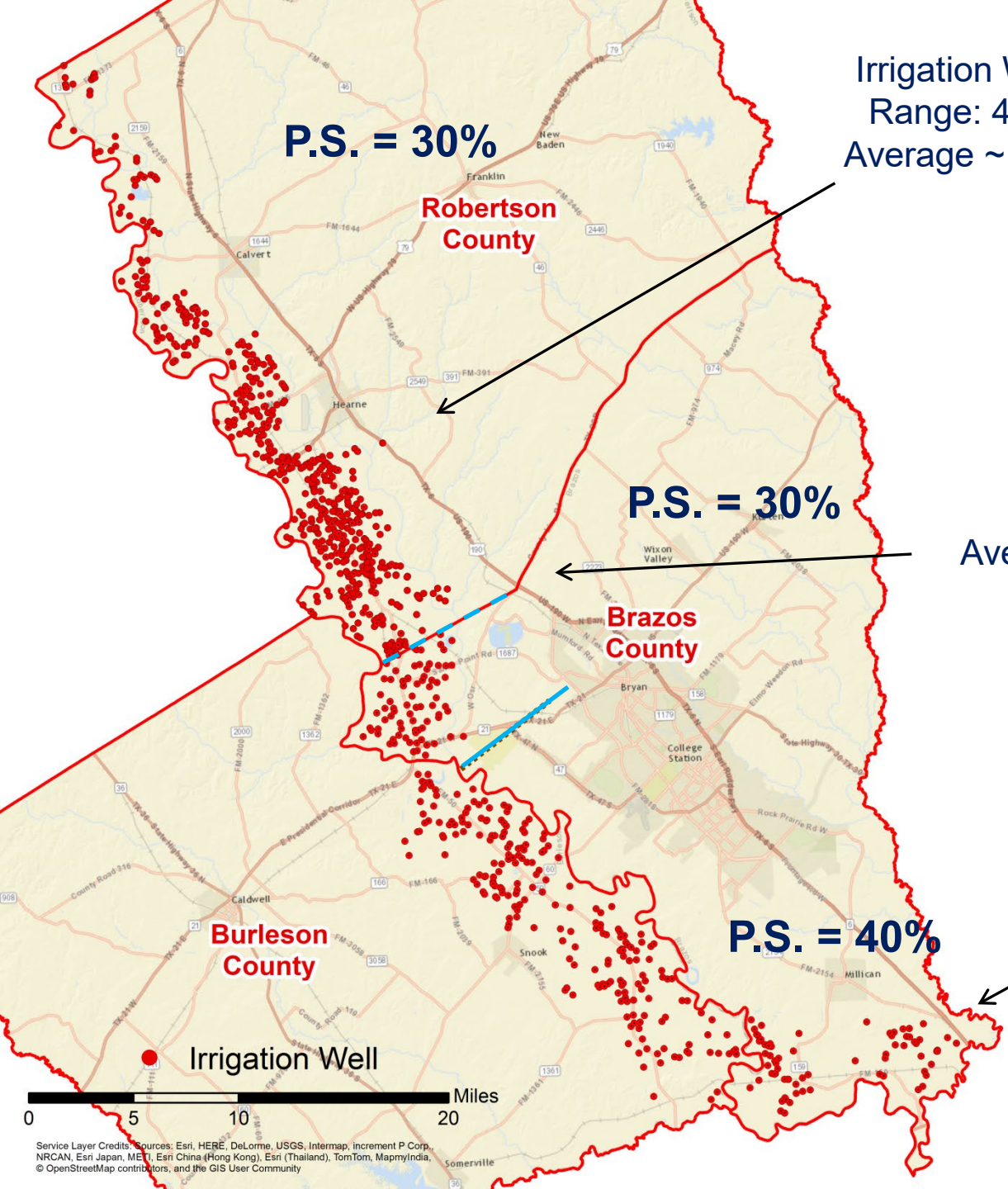
Location of Brazos River Alluvium Wells With Water Level Hydrographs

BRAZOS RIVER ALLUVIUM OBSERVATION WELLS
Robertson County



BRAZOS RIVER ALLUVIUM OBSERVATION WELLS
Brazos County





Irrigation Well Depths
Range: 45 to 72 feet
Average ~ 55 to 60 feet

Potential DFC Threshold on Allowable Percent Saturation
P.S. ≥ 30% or 40% depending on location

Average Irrigation Well Depth
60 to 65 feet

Average Irrigation Well Depth
60 to 65 feet

Brazos River Alluvium Well Data

4/8/2021

Summary

- Based on water level data, average artesian head changes through 2021are similar to through 2020 reflective of stable pumping from aquifers
- Areal coverage of observation wells improved with 23 wells added in 2020
- Addition of observation wells outside the District is assisting with evaluation of the effects of pumping from areas outside the District. Pumping effects of Vista Ridge project very limited to date
- Water levels measured in Brazos River Alluvium screened wells generally similar to those measured in 2020

Summary

(cont'd)

- Continue evaluating artesian head trends using data from DFC wells, other observation wells in the District and observation wells located outside the District
- DFCs for the aquifers changed as a result of an improved model used in 2021 cycle of GMA 12 planning and changes in estimated future pumping from the aquifers on a GMA wide basis


??Questions??
Thank you!