GMA12 Joint Planning

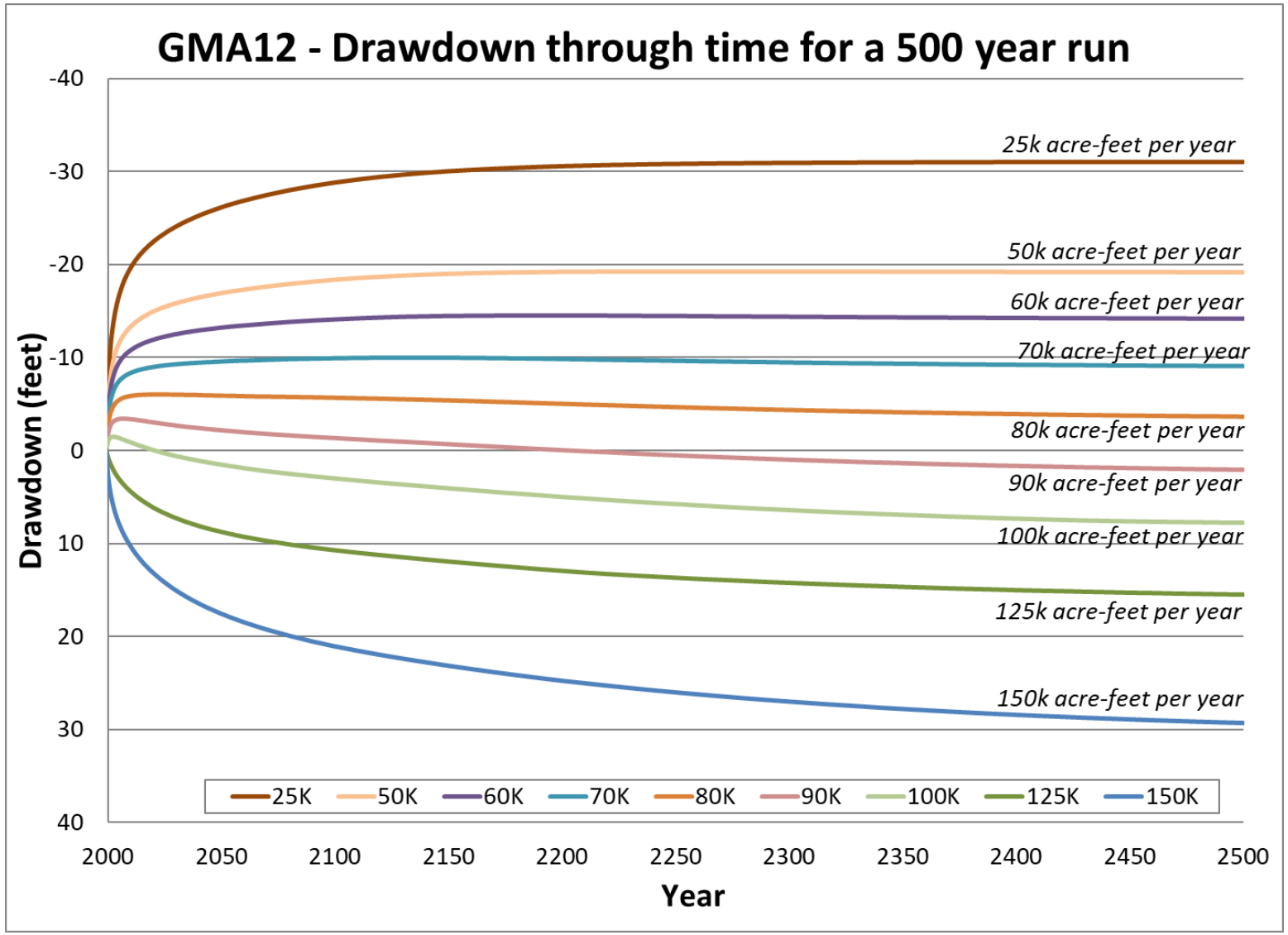
Considerations for Estimating Drawdowns for Steady-state Conditions:

First steps toward understanding sustainable pumping

4/23/2025

INTERA

Sustainable Pumping for GMA 12 (TWDB, 2012)*



Used 2004 GAM for GMA 12

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Sustainable Pumping for GMA 12 (TWDB, 2012)

County	Modeled Available Groundwater (2060)	2007 State Water Plan Groundwater Availability (2060)	2011 Regional Water Plan (2060)	Current Use (2008 Water Use Survey)	Recharge	Storage	25 percent	75 percent	Maximum Sustainable Pumping Level
BASTROP	28,498	28,000	28,000	12,395	21,783	98,429,578	24,607,394	73,822,183	5,951
BRAZOS	57,169	53,000	57,156	31,044	0	136,726,259	34,181,565	102,544,694	9,591
BURLESON	38,701	44,000	35,482	931	142	153,184,778	38,296,194	114,888,583	1,283
FALLS	895	1,000	910	15	2,390	822,161	205,540	616,621	83
FAYETTE	1,000	400	400	6	0	104,383,421	26,095,855	78,287,565	342
FREESTONE	5,259	6,653	6,653	3,475	41,502	45,870,392	11,467,598	34,402,794	2,811
LEE	27,380	45,000	27,533	1,613	7,604	129,532,459	32,383,115	97,149,344	8,326
LEON	15,196	5,558	5,558	2,889	5,933	178,933,891	44,733,473	134,200,418	4,129
LIMESTONE	11,918	20,000	12,162	3,118	21,061	11,692,040	2,923,010	8,769,030	856
MADISON	2,542	1,518	1,518	62	0	121,343,009	30,335,752	91,007,257	219
MILAM	22,319	45,000	20,090	5,429	25,691	46,350,226	11,587,556	34,762,669	4,737
NAVARRO	15	180	180	18	1,883	1,046,211	261,553	784,658	1
ROBERTSON	46,583	38,000	46,016	17,872	27,043	108,094,335	27,023,584	81,070,751	6,377
WILLIAMSON	7	0	0	32	2,146	500,081	125,020	375,061	0
Total	257,482	288,309	241,658	78,899	157,178	1,136,908,838	284,227,210	852,681,629	44,707

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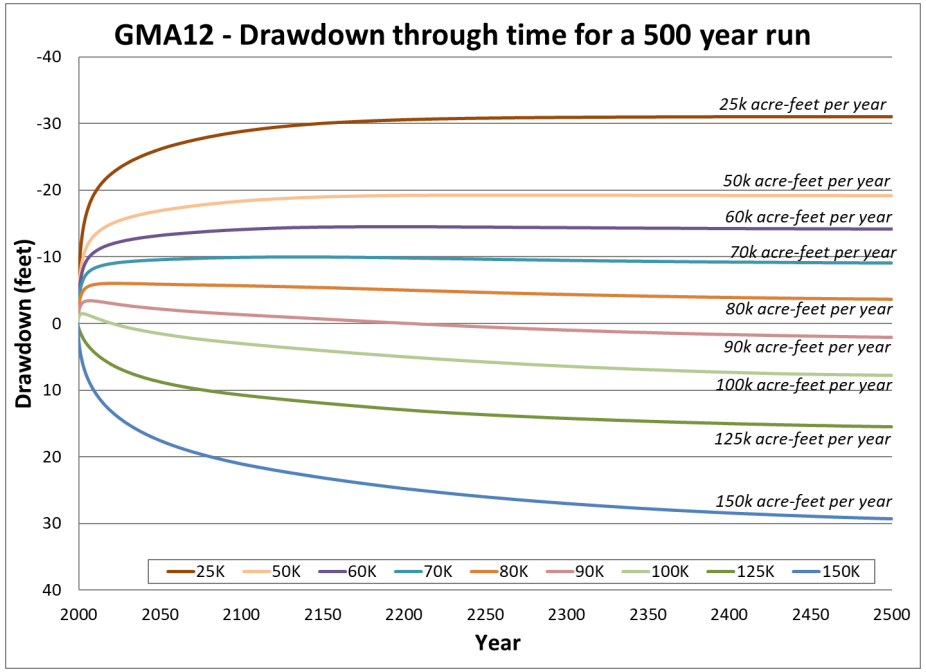
TWDB Approach

- Criteria
  - Steady-state condition
  - 500-year simulation
  - Same pumping distribution for all runs – just use a different multiplier for each pumping scenario

- Possible Concerns
  - Steady state conditions my take longer to be created than 500years
  - Moving shallowest pumping to deeper interval will allow steady-state to evolve
  - Is steady-state conditions a requirement for sustainability
  - Sensitivity to boundary conditions (SW-GW interaction)
  - Unrealistic to have sustainable pumping significantly less than recharge
  - What value is Total Estimated Recoverable Storage?



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Steady-state Conditions for PS3-19 and PS4-1

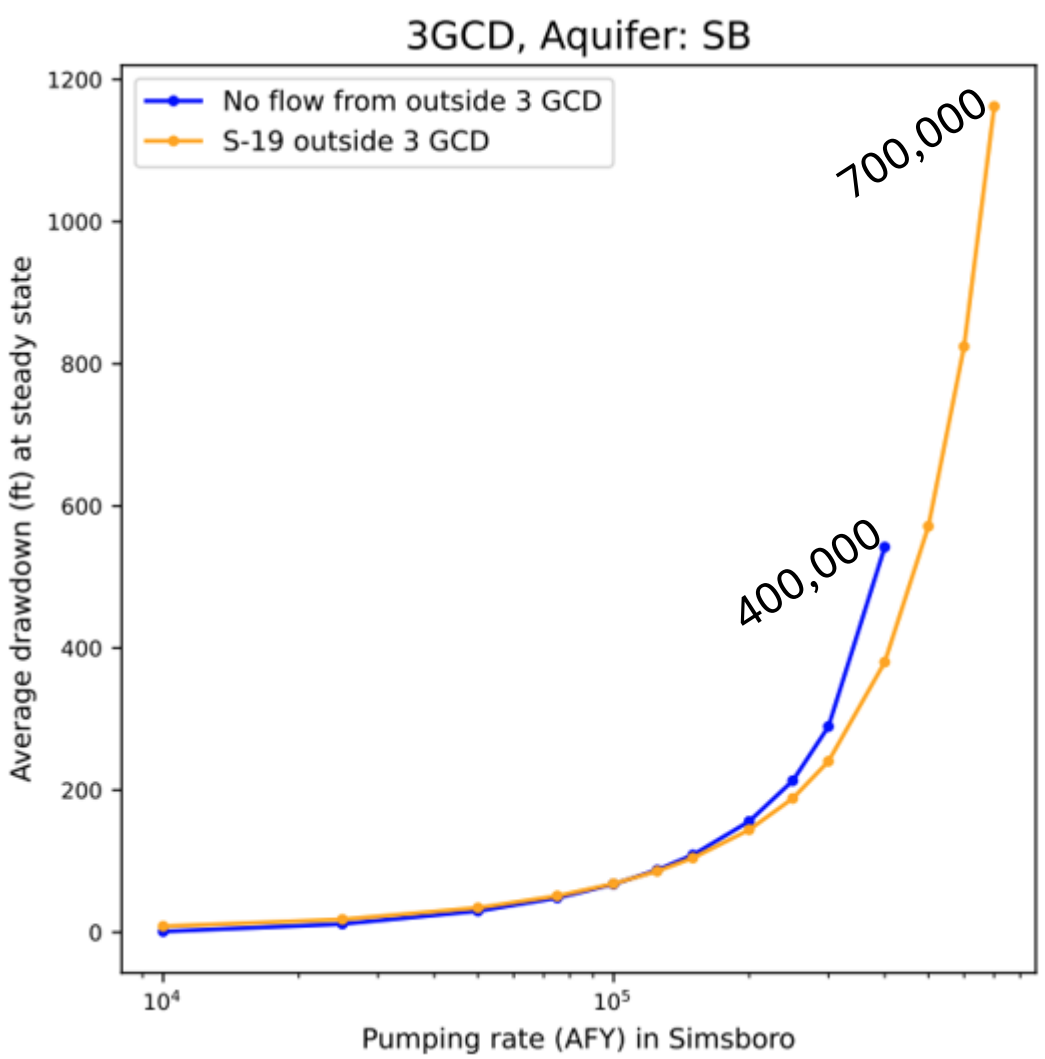
PS3-19 Results Running with 2020 GAM				
	Carrizo	Calvert Bluff	Simsboro	Hooper
	Drawdown (ft) - 2011 to 2070			
BVGCD	77	94	197	137
LPGCD	141	139	247	139
POSGCD	163	159	279	177
	Drawdown (ft) - 2011 to Steady State			
BVGCD	143	239	489	436
LPGCD	284	320	599	375
POSGCD	346	396	638	506
	Pumping (afy)			
BVGCD	5,495	1,725	147,144	2,137
LPGCD	12,937	5,465	81,620	3,496
POSGCD	18,044	4,134	75,366	2,914

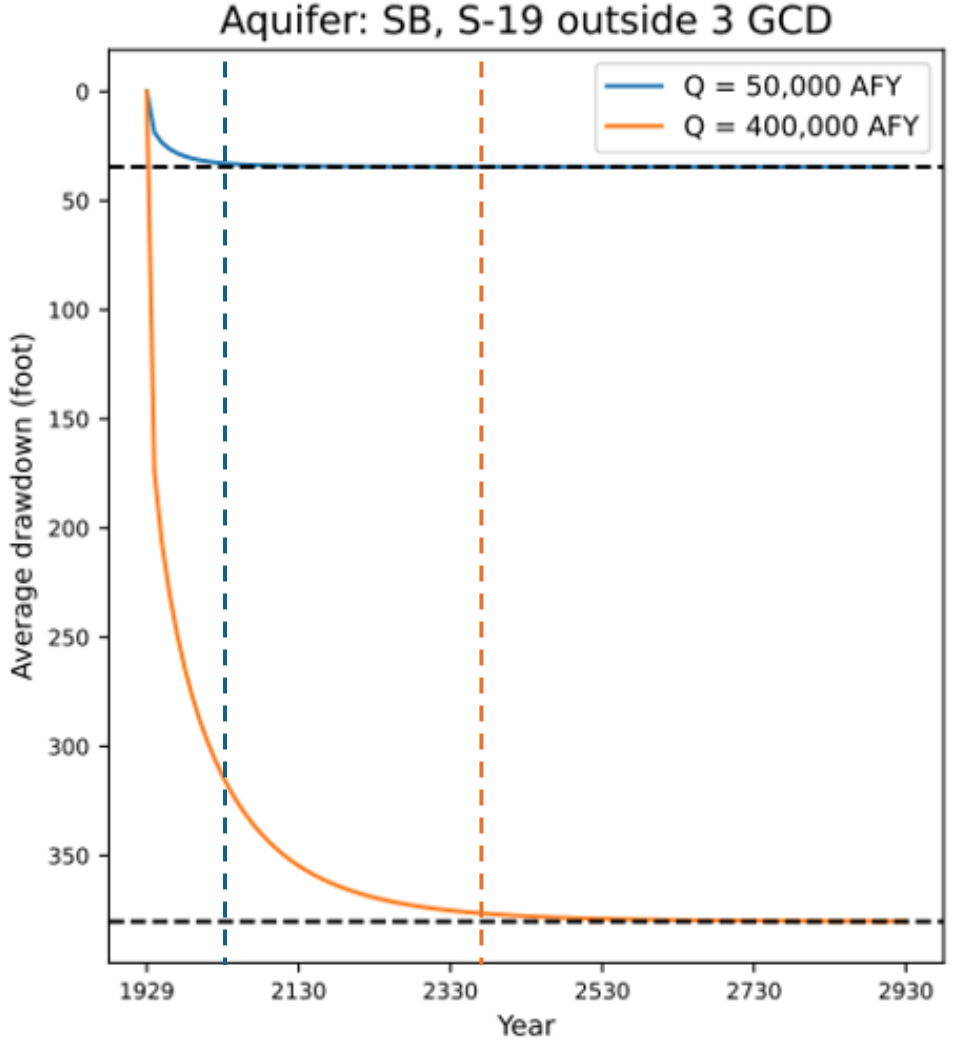
Total Input Pumping = 360,477 afy
(autoreduction of pump is active)

PS4-1 Results Running with 2020 GAM				
	Carrizo	Calvert Bluff	Simsboro	Hooper
	Drawdown (ft) - 2011 to 2070			
BVGCD	139	217	516	349
LPGCD	208	233	456	259
POSGCD	249	312	612	400
	Drawdown (ft) - 2011 to Steady State			
BVGCD	257	479	982	880
LPGCD	454	540	999	626
POSGCD	591	753	1,209	950
	Pumping (afy)			
BVGCD	10,530	1,617	335,189	1,920
LPGCD	24,109	6,544	137,434	1,952
POSGCD	18,444	6,471	114,278	2,177

Total Input Pumping = 660,665 afy
(autoreduction of pump is active)

OPMAN Sustainability Investigations: Maximum Production/Minimum Drawdown





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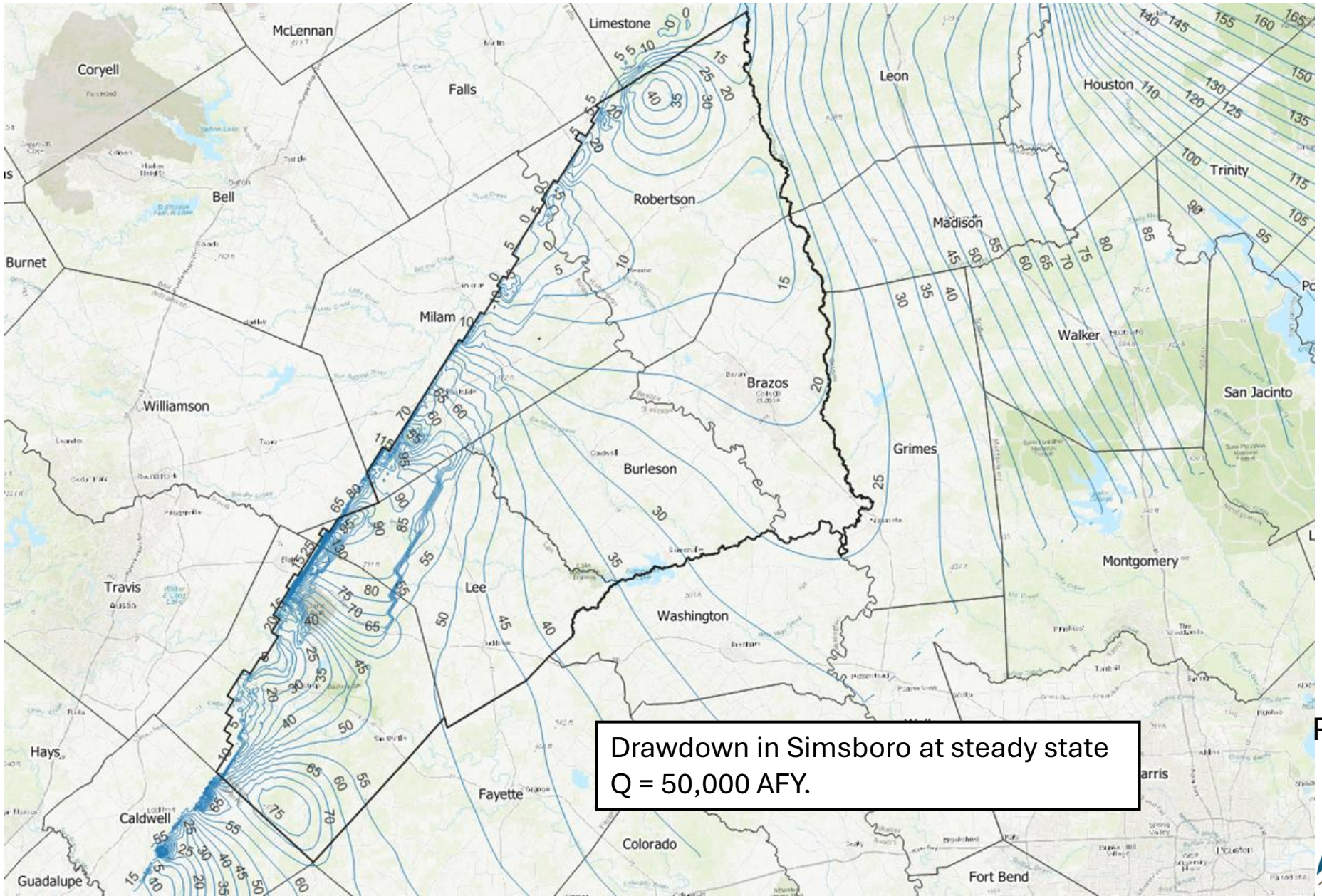
INTERA

Drawdowns at Steady-state for Pumping 50,000 (Three Districts)

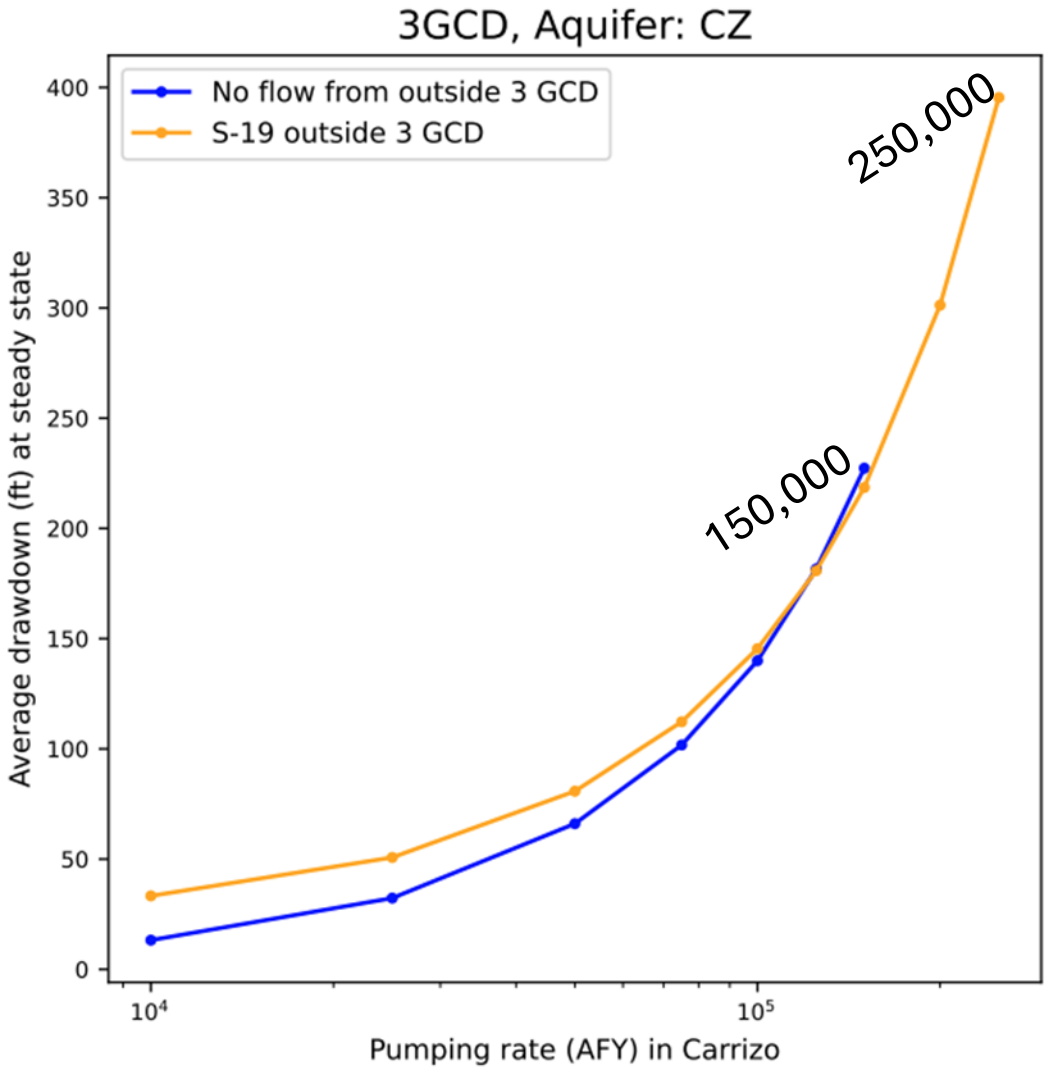


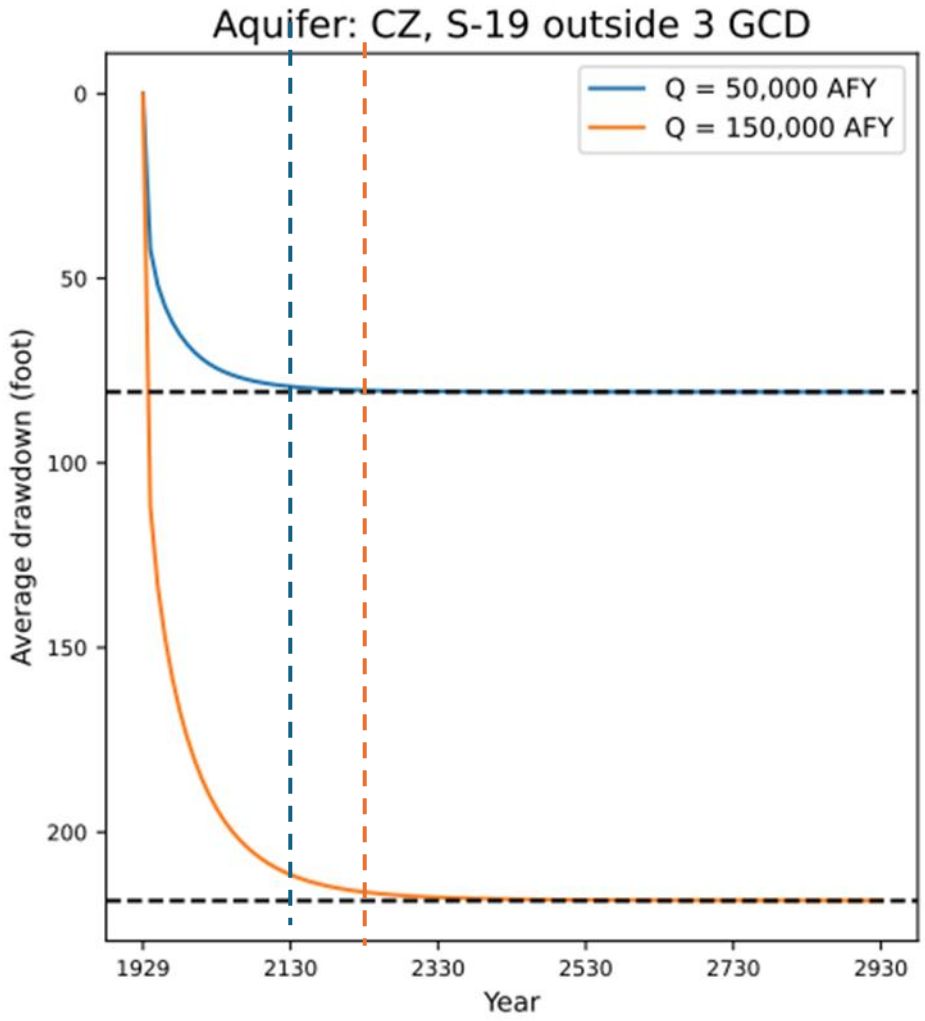
Drawdown in Simsboro at steady state
Q = 50,000 AFY.

Preliminary – Work in Progress

INTERA

OPMAN Sustainability Investigations: Maximum Production/Minimum Drawdown

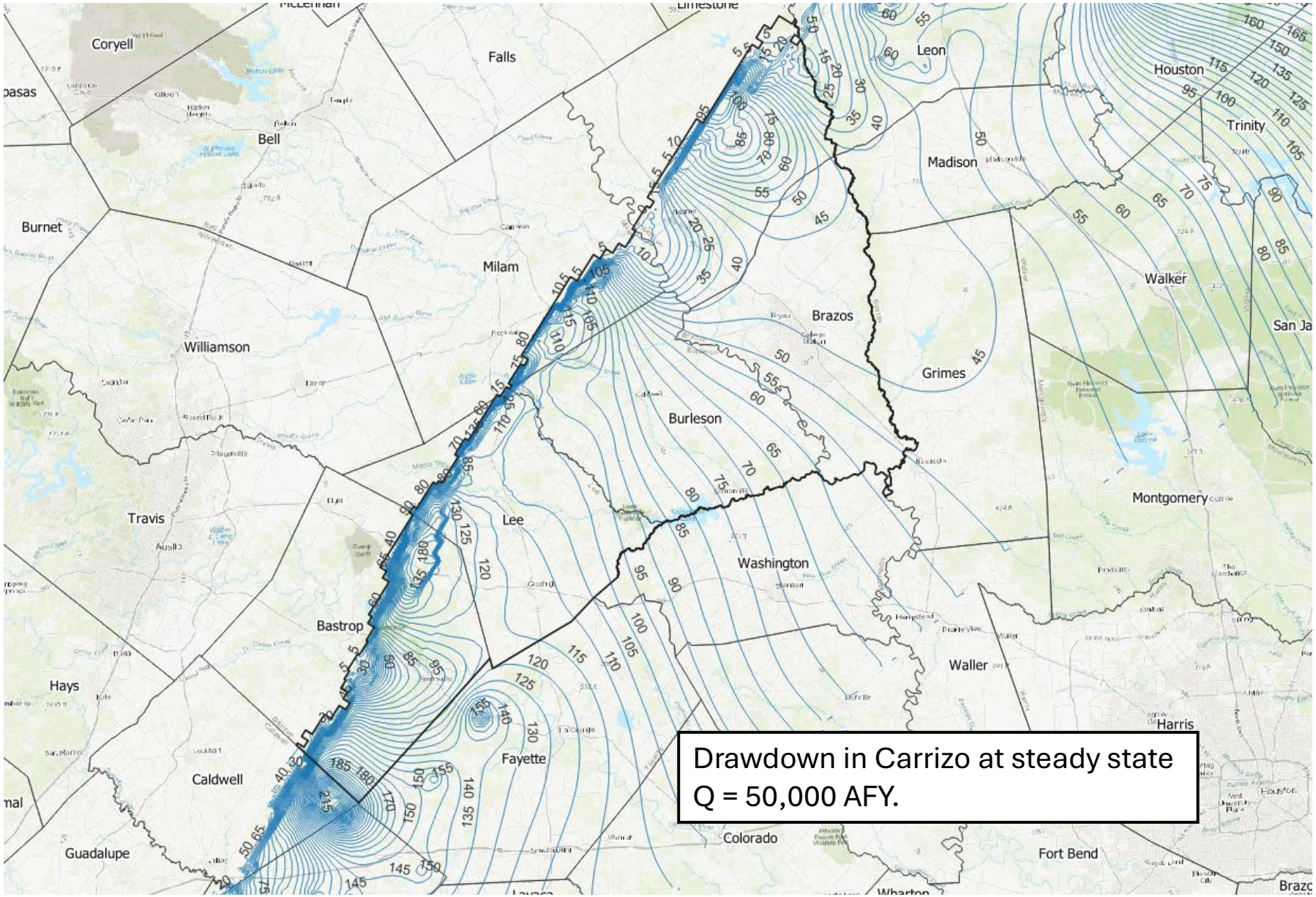




Preliminary – Work in Progress

INTERA

Drawdowns at Steady-state for Pumping 50,000 in Carrizo (Three Districts)

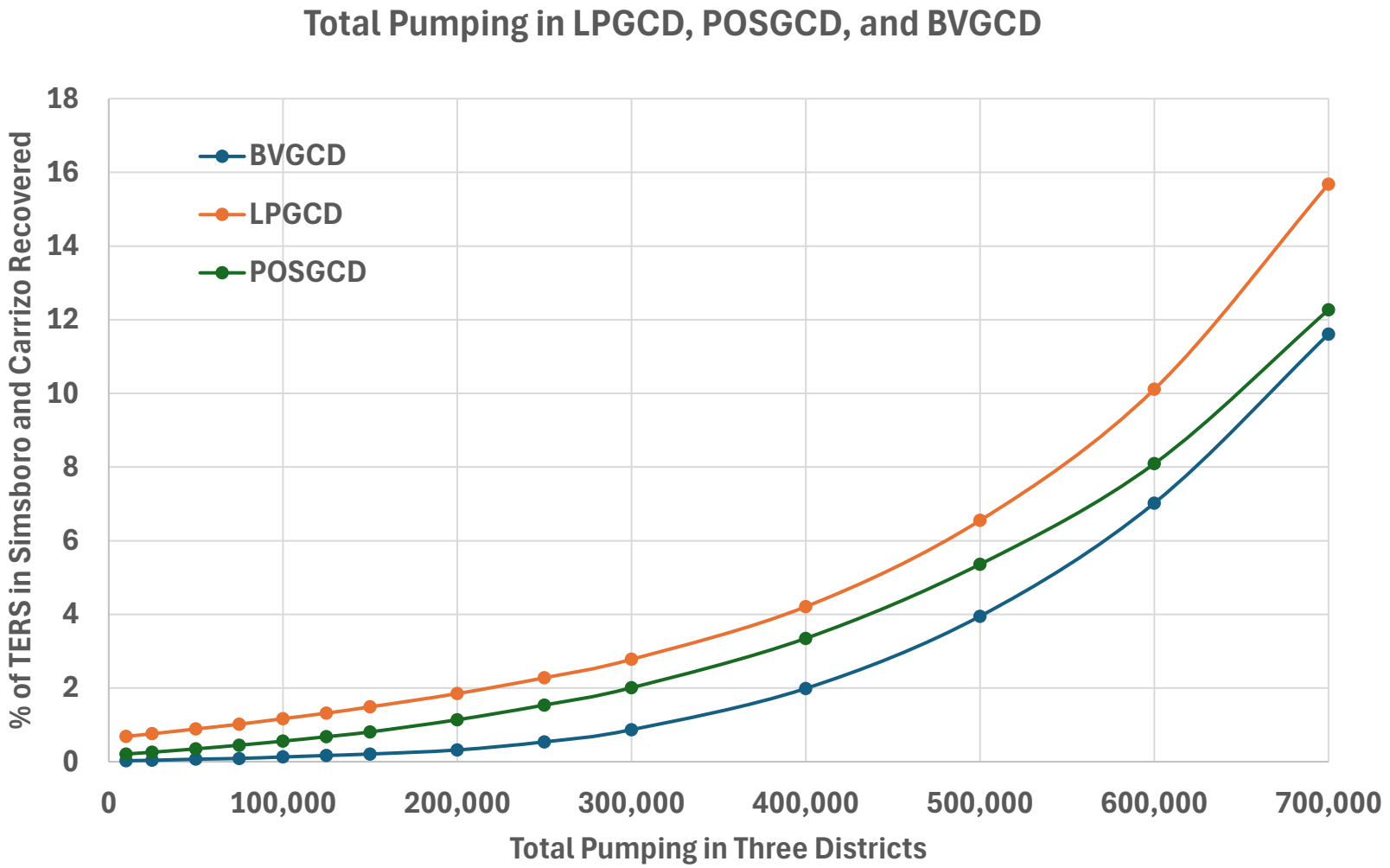


Drawdown in Carrizo at steady state
Q = 50,000 AFY.

Preliminary – Work in Progress

INTERA

Total Estimated Recoverable Storage



Preliminary – Work in Progress

INTERA

Considerations for Evaluating Sustainable Pumping

- Impacts of Water Level Declines on Existing wells
  - Lowering pumps
  - Water levels below screens

- Impacts of Water Level Declines on Groundwater Resources
  - Move aquifer confined/unconfined boundary down dip
  - Up-coning/mixing of brackish water with fresh water

- Impacts on Surface Water Resources
  - Change from gaining to losing streams
  - Increase withdrawal of base flow