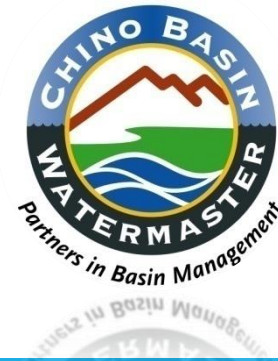




Development of 2020 Storage Management Plan

Workshop No. 2
July 18, 2019





Workshop agenda

Introductions

Recap of Workshop 1

Answers to Question 1 “What are your needs regarding storage?”

Poster Breakout

Storage Framework Investigation Recap

Discussion of Questions 2 and 3

Next Steps



Workshop 1 Recap

- Current Storage Management Plan
- Technical requirements for 2020 Storage Management Plan
- Questions for discussion



Current Storage Management Plan

Pre – Peace Agreement / OBMP Implementation Plan

Peace Agreement and Peace II Amendments

Current status of Storage Agreements:

- Non – Agricultural Pool Storage ✓
- Appropriative Pool Storage ✓
- Storage and Recovery ✓

Allocation of storage among the classes of storage (excess carry-over; local supplemental; storage and recovery) and the parties pursuant to guidance documents

Storage-related thresholds

- 500 TAF “Safe Storage Capacity” (Temporarily increased to 600 TAF as per SEIR Addendum until 2021)
- 100 TAF of “Safe Harbor” for Local Supplemental provided there is no MPI



Technical requirements for the 2020 SMP

- Watermaster requirements:
 - Reservation of Existing Spreading Basin Facilities to Satisfy Watermaster's Recharge and Replenishment Obligations
 - Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage
- Parties' input required:
 - Use of Storage Space by the Parties and Storage and Recovery Programs
 - Addressing Reduced Net Recharge and Safe Yield
 - Addressing Hydraulic Control Impacts Due to a Storage and Recovery Programs
 - Storage Management Plan Update



Questions for discussion

1. What are your needs regarding storage?
2. How should the storage space be used by parties and by Storage and Recovery Programs (S&R)?
3. Of the storage used by parties, how should it be used by them? Of the storage used by S&R Programs, how should it be used by them?
4. How should the effects of that be accounted for (for parties' use and S&R use)?
5. How often should the Storage Management Plan be updated?



Question 1: “What are your needs regarding storage?”

Total Answers received: 12

Implied needs:

Parties' Storage	S&R	Both
5	4	3



Q1 Poster Break out



Q1 Activity Summary

Are your needs reflected in the summary table?

Do you disagree with the implied needs from your answer?

Do you disagree with using storage for the Parties and S & R Programs?

Send final thoughts to Edgar Tellez Foster by COB July 22.



Background Technical Information to Support Discussion of Questions 2 & 3:

How should the storage space be used by parties and by Storage and Recovery Programs (S&R)?

Of the storage used by parties, how should it be used by them? Of the storage used by S&R Programs, how should it be used by them?

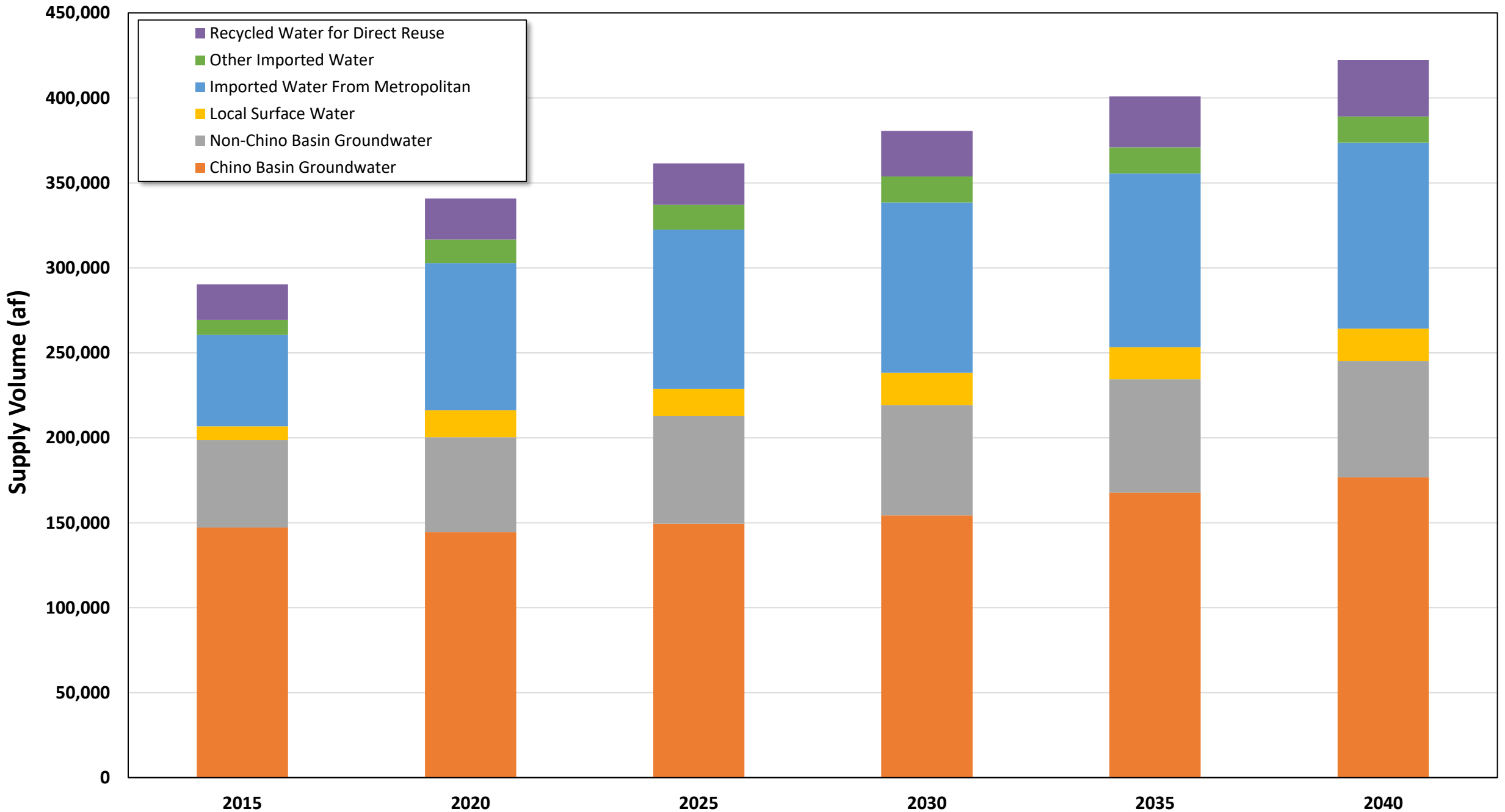
STORAGE FRAMEWORK INVESTIGATION RECAP



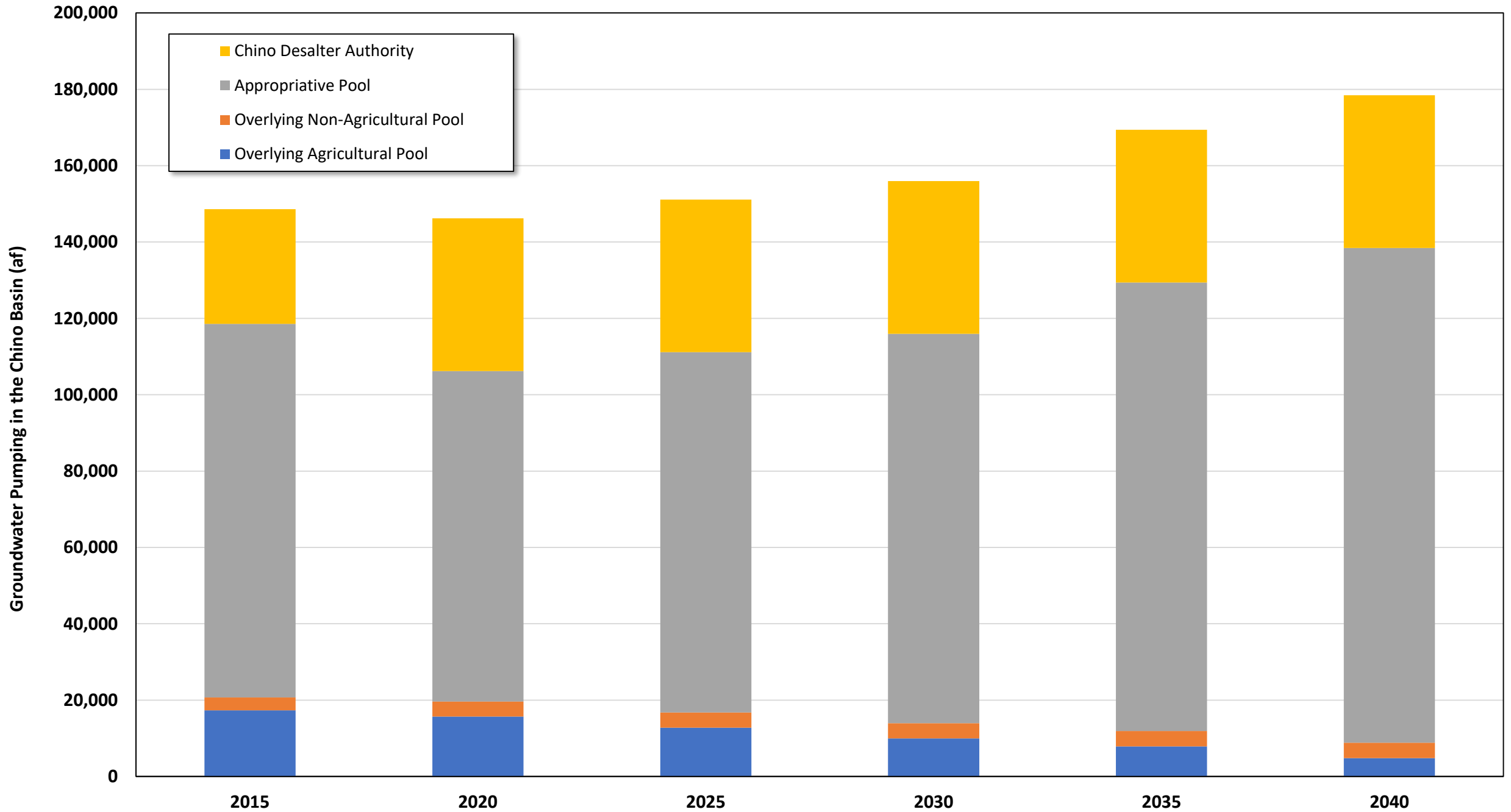
How was the 700 TAF projection of storage use by the parties estimated?



Aggregate Water Supply Plan for Chino Basin Agencies, Scenario 1A



Projected Chino Basin Groundwater Pumping by Pool and Desalters, Scenario 1A





Watermaster will request updated demand projections, water supply plans, and expected use of stored water



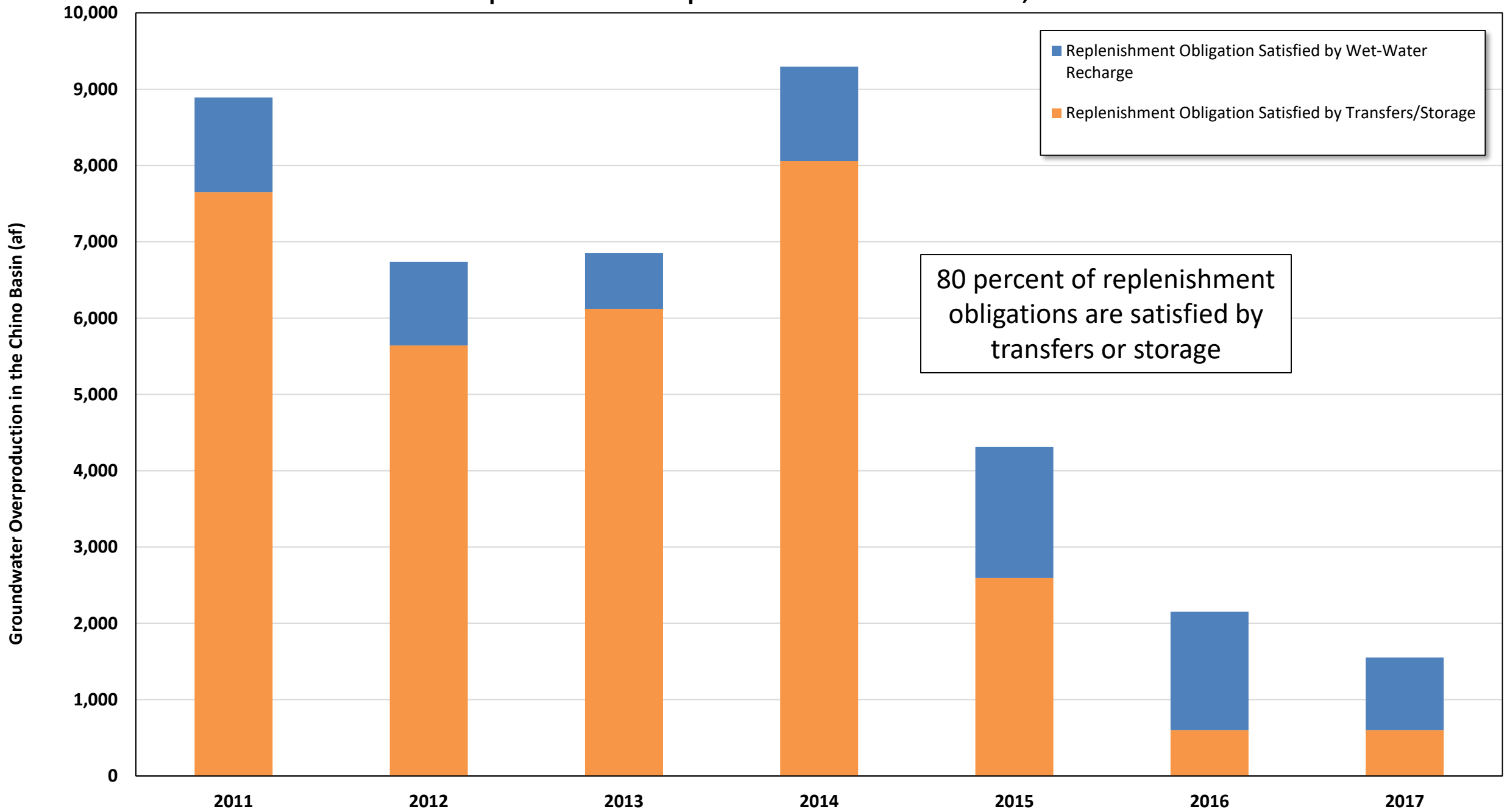
Other assumptions included in baseline scenarios

Replenishment obligations are met:

- 100 percent from transfers/storage when total pumping is less than total pumping rights
- Up to 80 percent from transfers/storage when total pumping exceeds total pumping rights



Overproduction and Replenishment in the Chino Basin, 2011-2017





Baseline scenarios

Scenario 1A: Parties' best estimates of how they will use available water supplies to meet their demands

Scenario 1B: Parties will pump all their annual pumping rights before meeting demands from other sources plus incorporating recent water conservation observed during the recent drought

Scenario 1C: Pumping same as Scenario 1A, plus incorporating recent water conservation observed during the recent drought



Projected Groundwater Production, Production Rights, Replenishment and End of Year Managed Storage – Scenario 1A

(af)

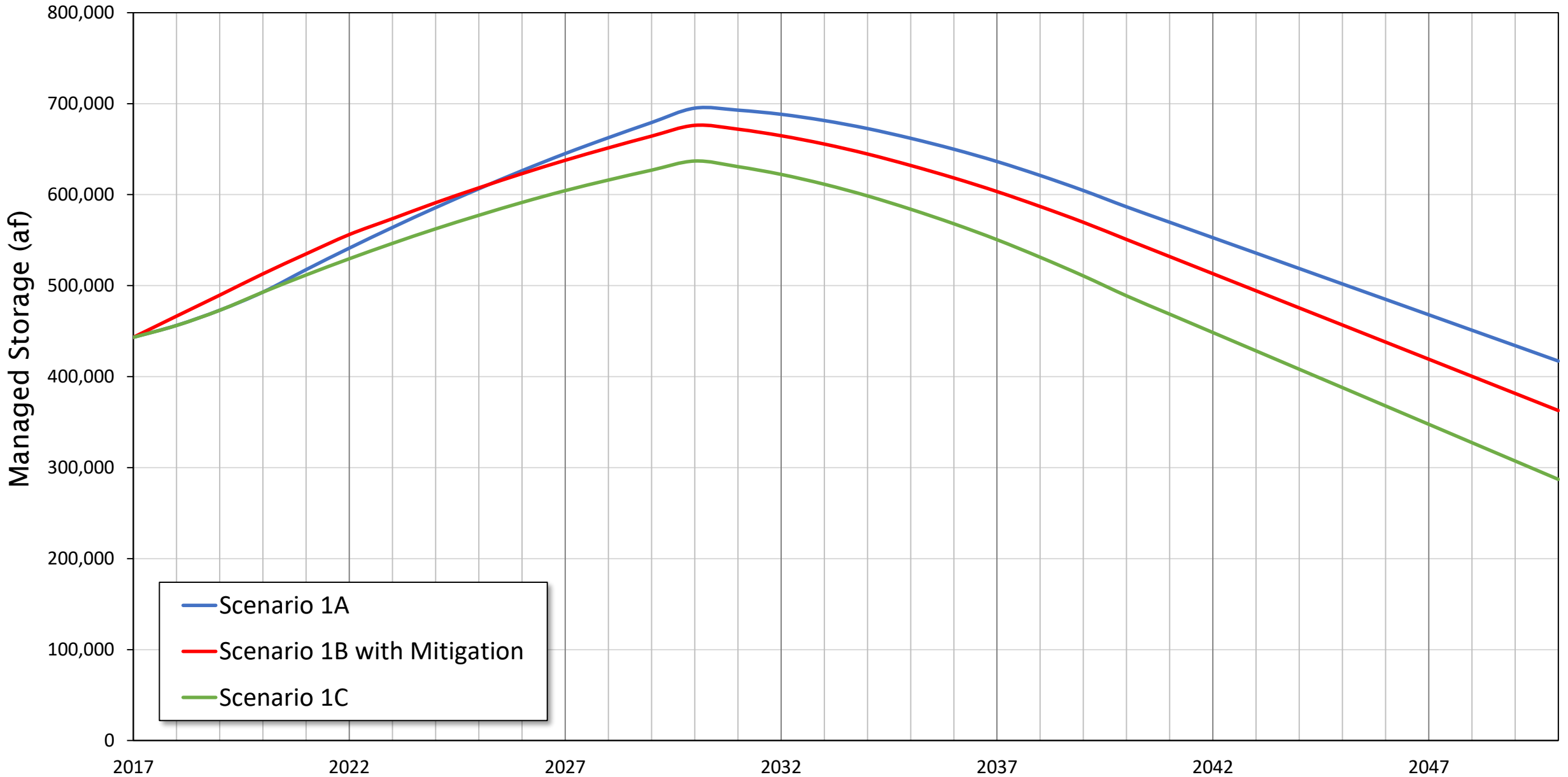
Fiscal Year	Projected Groundwater Production per 2017 Survey for Normal Year	Production Rights							Aggregate Replenishment Obligation ²	Replenishment from Storage	Wet Water Replenishment	End of Year Managed Storage
		Safe Yield ¹	Controlled Overdraft Pursuant to Judgment	Reoperation Water Offset to Desalter Production	6,500 afy Supplemental Water Recharge in MZ1 per Peace II	Recycled Water Recharge	Debit Against 6,500 afy Obligation from Recycled Water Recharged in MZ1	Total				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9) = (3)+(4)+(5)+(6)+(7)+(8)	(10) = (2)-(9)	(11)	(12)	(13) _t = [(2) _t -(9) _t] + (12) _t + (13) _{t-1}
2018	145,981	135,000	0	5,000	6,500	16,000	-3,490	159,010	-13,029	0	0	456,273
2019	147,718	135,000	0	10,000	6,500	16,420	-3,490	164,430	-16,712	0	0	472,985
2020	144,528	135,000	0	10,000	6,500	16,420	-3,490	164,430	-19,902	0	0	492,887
2021	145,488	140,717	0	10,000	6,500	16,420	-3,490	170,147	-24,659	0	0	517,546
2022	146,492	140,717	0	10,000	6,500	16,420	-3,490	170,147	-23,654	0	0	541,201
2023	147,437	140,717	0	10,000	6,500	16,420	-3,490	170,147	-22,710	0	0	563,910
2024	148,368	140,717	0	10,000	6,500	16,420	-3,490	170,147	-21,778	0	0	585,689
2025	149,468	140,717	0	10,000	6,500	16,420	-3,490	170,147	-20,679	0	0	606,367
2026	150,231	140,717	0	10,000	6,500	16,420	-3,490	170,147	-19,916	0	0	626,284
2027	151,348	140,717	0	10,000	6,500	16,420	-3,490	170,147	-18,799	0	0	645,083
2028	152,701	140,717	0	10,000	6,500	16,420	-3,490	170,147	-17,446	0	0	662,528
2029	153,490	140,717	0	10,000	6,500	16,420	-3,490	170,147	-16,657	0	0	679,185
2030	154,302	140,717	0	10,000	6,500	16,420	-3,490	170,147	-15,845	0	0	695,030
2031	157,135	137,943	0	0	0	16,420	0	154,363	2,772	2,217	554	692,813
2032	160,063	137,943	0	0	0	16,420	0	154,363	5,699	4,559	1,140	688,253
2033	162,928	137,943	0	0	0	16,420	0	154,363	8,565	6,852	1,713	681,401
2034	165,381	137,943	0	0	0	16,420	0	154,363	11,017	8,814	2,203	672,588
2035	167,723	137,943	0	0	0	16,420	0	154,363	13,360	10,688	2,672	661,900
2036	169,366	137,943	0	0	0	16,420	0	154,363	15,003	12,002	3,001	649,898
2037	171,285	137,943	0	0	0	16,420	0	154,363	16,921	13,537	3,384	636,361
2038	173,514	137,943	0	0	0	16,420	0	154,363	19,151	15,321	3,830	621,040
2039	175,943	137,943	0	0	0	16,420	0	154,363	20,679	16,512	4,167	604,497



Conclusions from the review of baseline scenarios through 2050

Feature	Scenario 1A	Scenario 1B with mitigation	Scenario 1C
Maximum storage space used	700 TAF	680 TAF	640 TAF
Pumping sustainability	Pumping sustainability challenges are projected to occur in the CDA and JCSD well fields and at some FWC wells. Scenario 1A has the least challenges and Scenario 1B with mitigation has the greatest challenges.		
New Land Subsidence	No new land subsidence projected through 2050		
Net Recharge	Net recharge increases in 2021 with implementation of the 2013 RMPU facilities. In Scenarios 1A and 1C, net recharge declines with increasing managed storage through 2030 and increases in 2040 and thereafter with decreasing managed storage and increasing pumping. In Scenario 1B with mitigation, net recharge increases generally through 2050.		
Hydraulic Control	Maintained through 2050 for all baseline scenarios		

Figure 5-1 from the Storage Framework Investigation
Model-Projected End-of-Year Volume in Managed Storage for Baseline

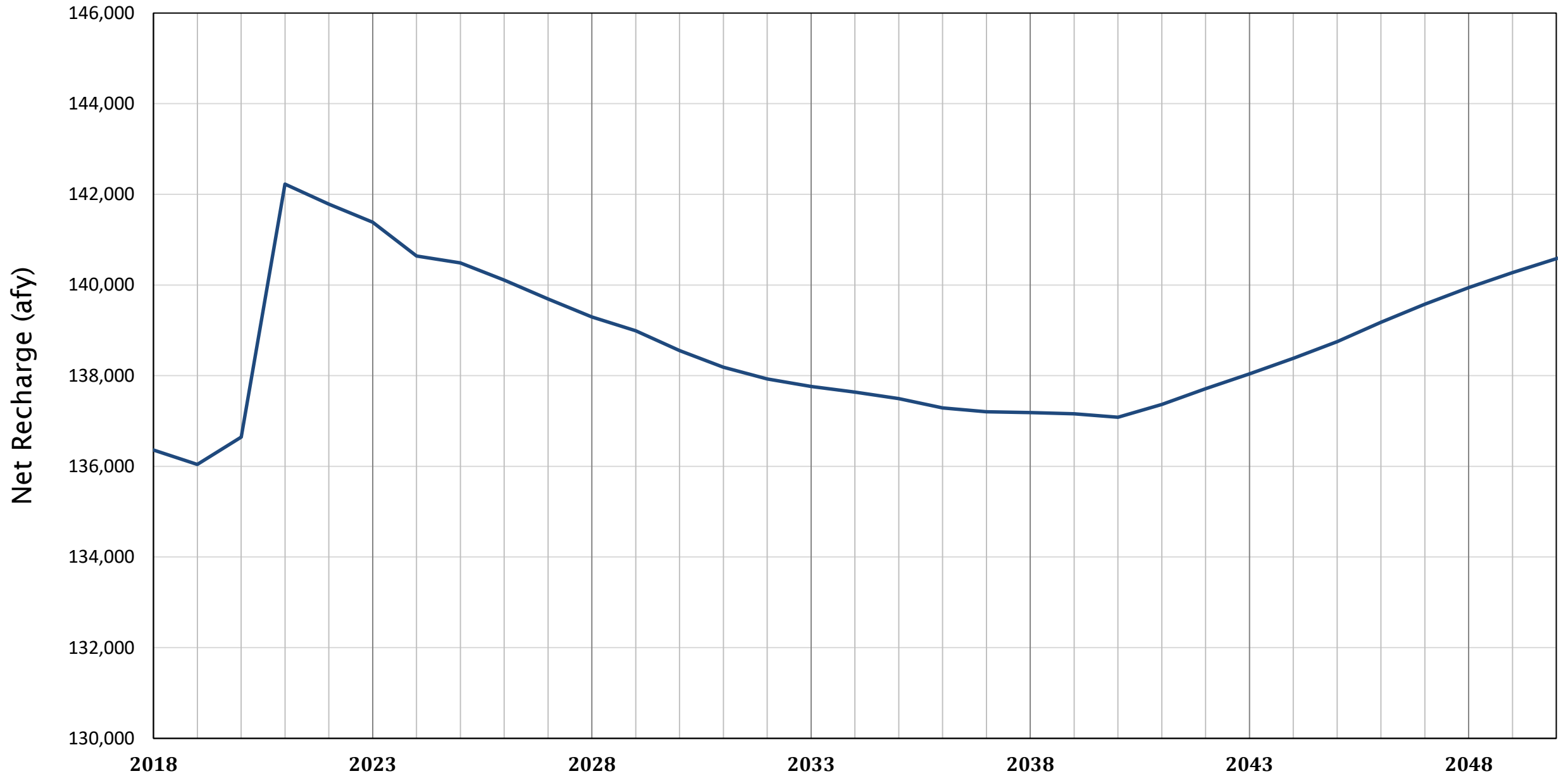




What does the 700 TAF mean?

- It is Watermaster's estimate of the maximum aggregate storage required by the Parties during the planning period to implement their water management plans.
- It represents an aggregate physical requirement based on planning projections provided by each individual party in 2017 and expected to be updated periodically.
- A higher number, provided that is supported by planning projections, can be analyzed for basin impacts and MPI.

Figure 5-7 from the Storage Framework Investigation
Projected Net Recharge for Baseline Scenario 1A





How was the 300 TAF basin impacts from storage use by storage and recovery programs evaluated?





Operating bands, scenarios, storage, and put and take capacities

Operational Bands	Scenarios	Range of Managed Storage Used (af)	Cumulative Put Capacity (afy)	Cumulative Take Capacity (afy)
1	1A	0 to 700,000	na	na
1 and 2	2C	0 to 800,000	25,000	33,333
1, 2 and 3	3A and 3B	0 to 900,000	50,000	66,667
1, 2, 3 and 4	4A and 4B	0 to 1,000,000	75,000	100,000



Description of Op Bands 2, 3 and 4 “take” features (afy)

Feature	Operating Bands				
	2C	3 (800 to 900 kaf)		4 (900 to 1,000 kaf)	
Scenario	2C	3A	3B	4A	4B
Total Cumulative Take	33,333	66,667	66,667	100,000	100,000
Ex Well Capacity	33,333	50,000	33,333	50,000	50,000
New ASR Well Capacity	0	11,667	33,333	27,000	50,000
New Conventional Well Capacity	0	5,000	0	23,000	0



Figure 6-3 from the Storage Framework Investigation
Model-Projected End-of-Year Volume in Managed Storage for Scenarios 1A and 2C and Average End-of-Year Volume for Scenarios 3A and 3B and 4A and 4B

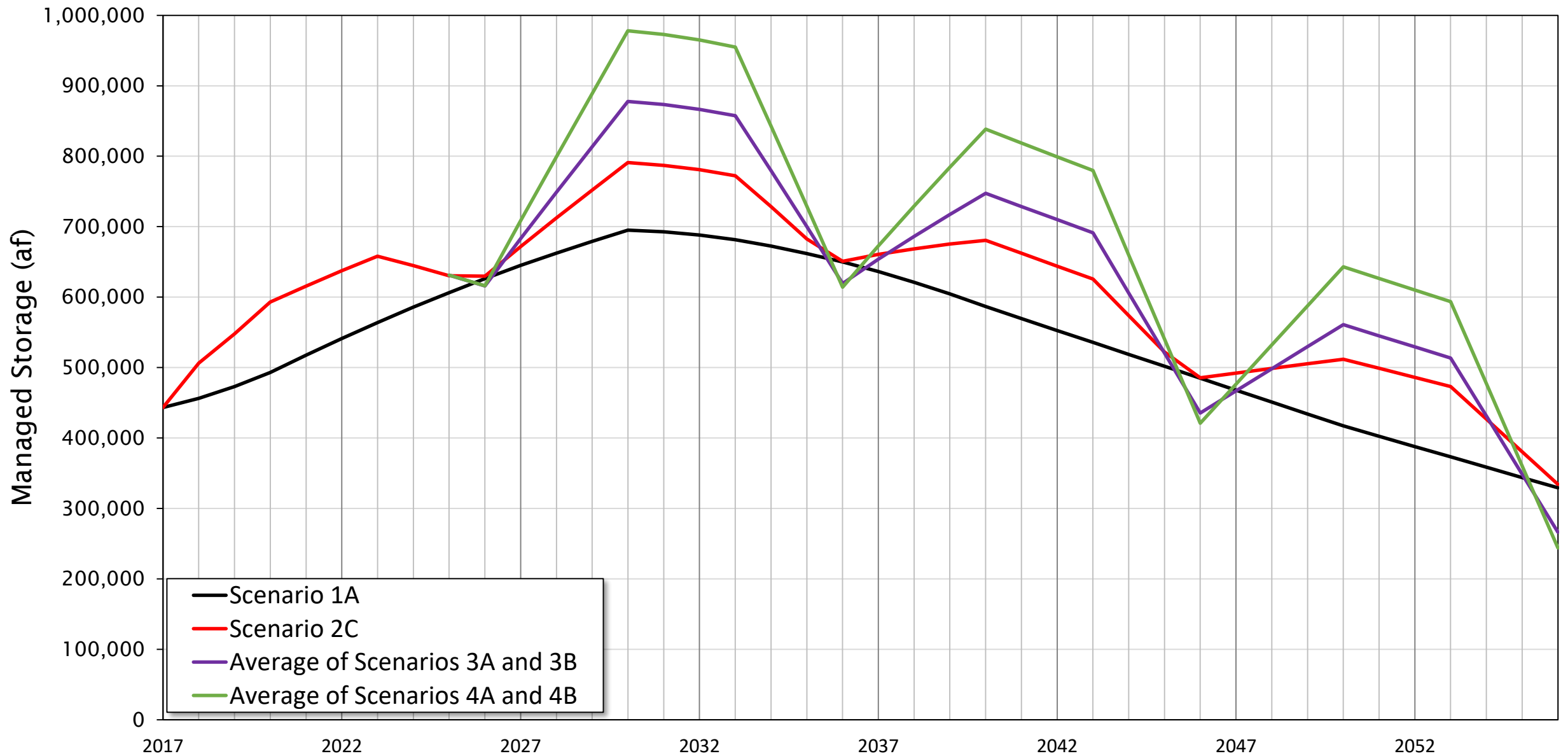
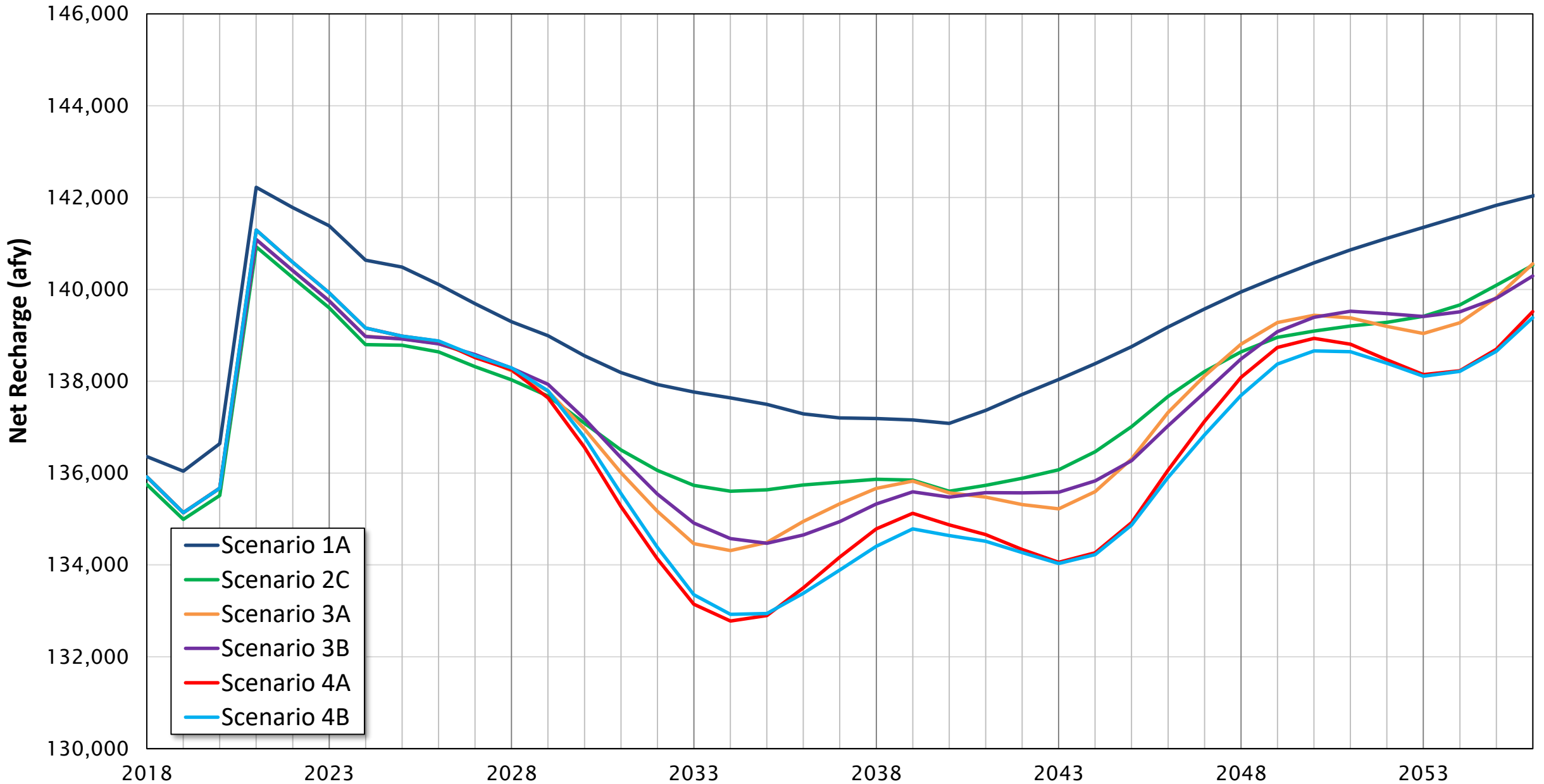


Figure 6-8 from the Storage Framework Investigation, Projected Net Recharge for Baseline and Storage and Recovery Program Scenarios





Summary of conclusions for Op bands 2, 3 and 4 through 2050

Feature	Operating Band				
	2 (700 to 800 TAF)	3 (800 to 900 TAF)		4 (900 to 1,000 TAF)	
Scenario	2C	3A	3B	4A	4B
Pumping sustainability	No MPI	No MPI through 2050. Potential MPI afterwards. Can be mitigated by optimizing recovery well field			
New land subsidence	No MPI				
Reduction in annual net recharge as a percentage of annual storage space used	2.41%	1.50%			
Hydraulic Control	Maintained	Increased groundwater discharge through the CCWF, approaching the de minimis standard. Can be mitigated by optimizing recovery well field.			
Effects on solvent plumes	Affects the speed and direction of the GE Flat Iron and GE Test Cell plumes				



Questions for discussion

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Takeaways

- Parties expressed the need of storage for local use and for S & R Programs
- Based on the parties' planning projections and use of storage, the maximum accumulation of water in storage is estimated at 700 TAF for local use (ECO, Supplemental, Recycled, etc.)
- The Storage Framework Investigation (SFI) analyzed effects of storing water at different levels on top of the 700 TAF projection for S & R Programs
- The SFI concluded that for S & R Programs beyond 800 TAF, new facilities will be required



Next Steps

- Update planning projections by COB August 2nd, 2019. WEI will send a request next week.
- Provide collective input to Watermaster on Questions 2 and 3 by August 30th, 2019:
 - How should the storage space be used by parties and by Storage and Recovery Programs (S&R)?
 - Of the storage used by parties, how should it be used by them? Of the storage used by S&R Programs, how should it be used by them?

Questions

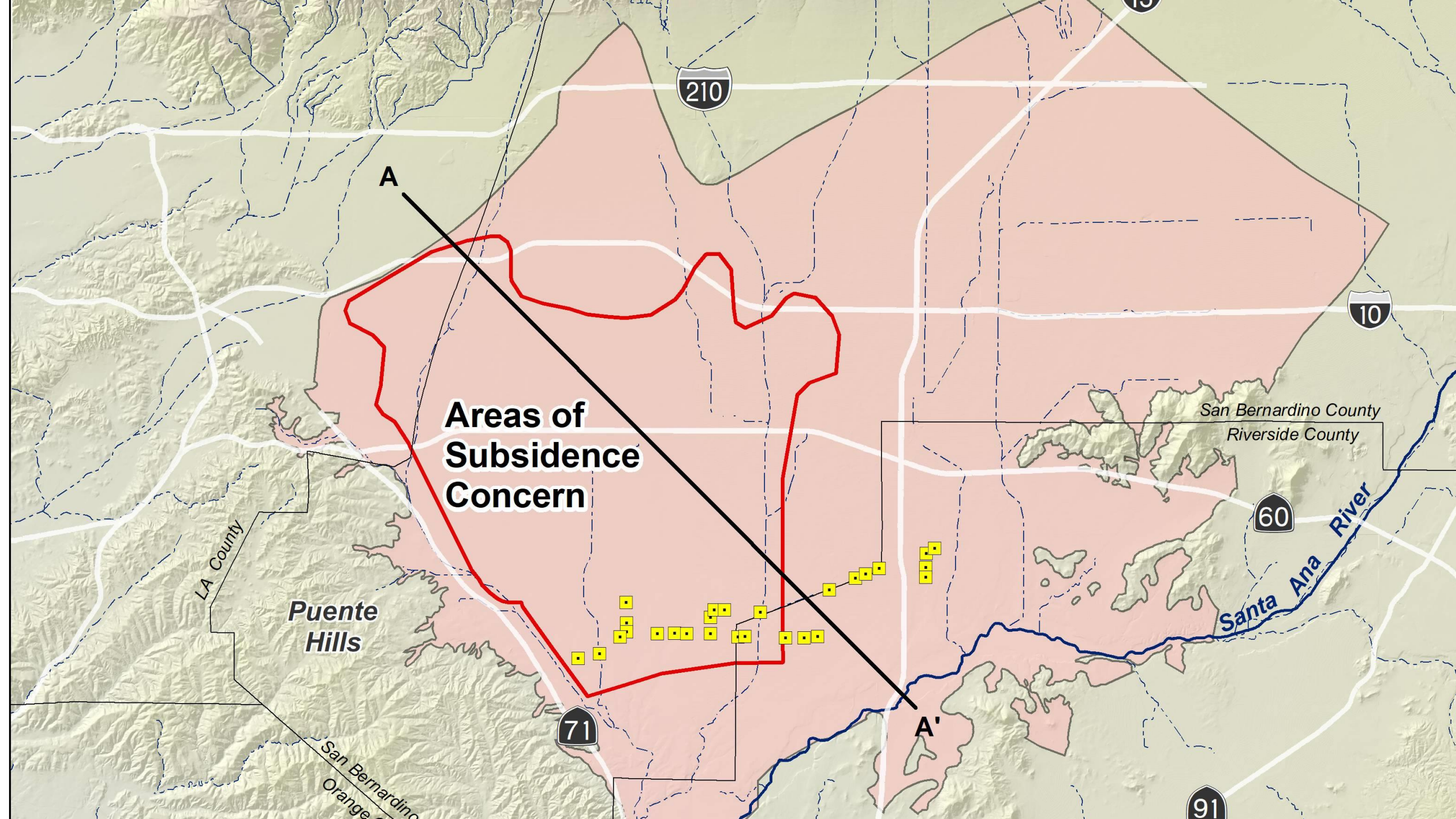
Presentation can be viewed and
downloaded from:

<http://cbwm.org/FTP/Storage/>





End



210

10

60

71

91

A

A'

Areas of Subsidence Concern

Puente Hills

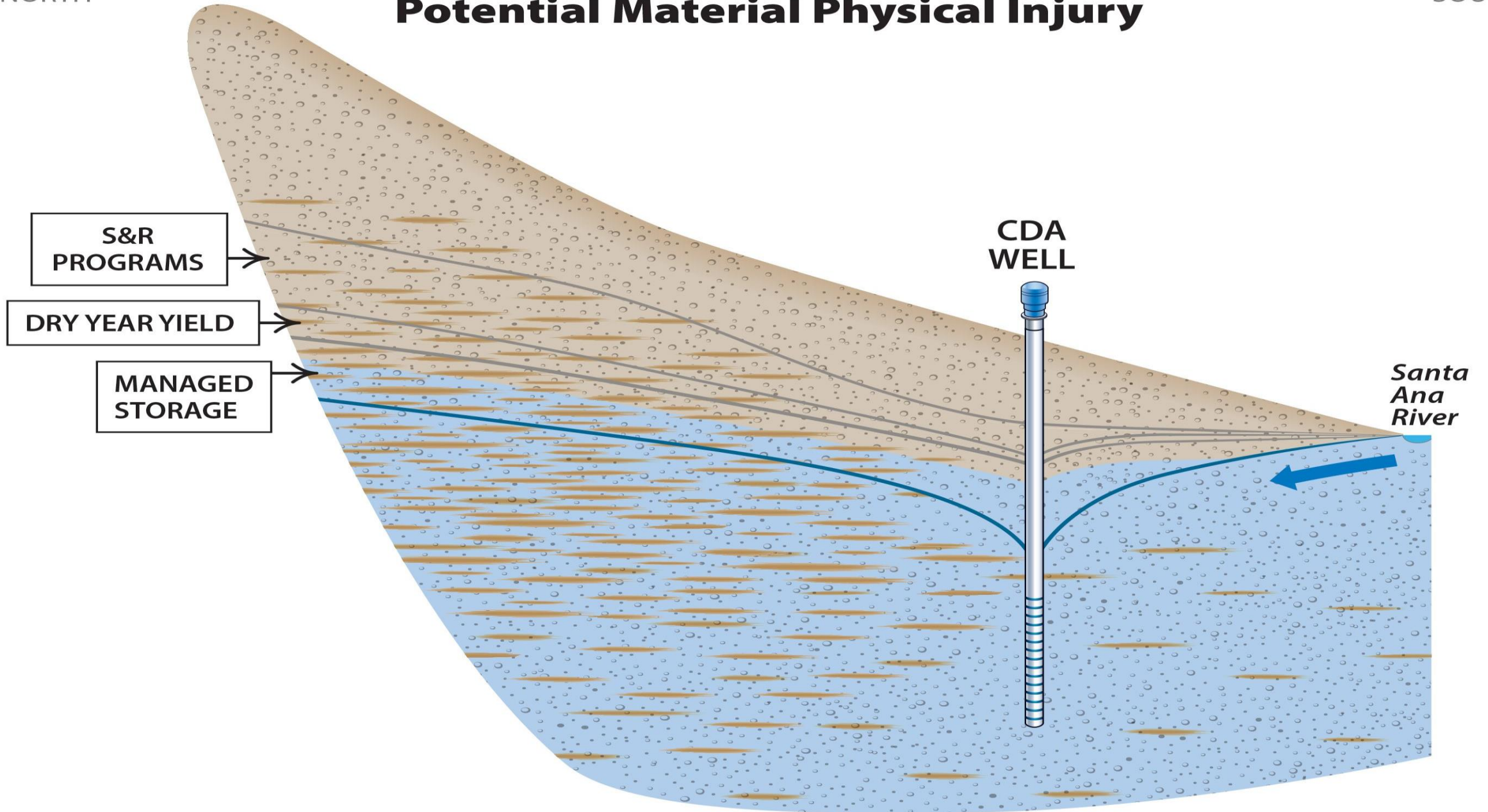
San Bernardino County
Riverside County

LA County

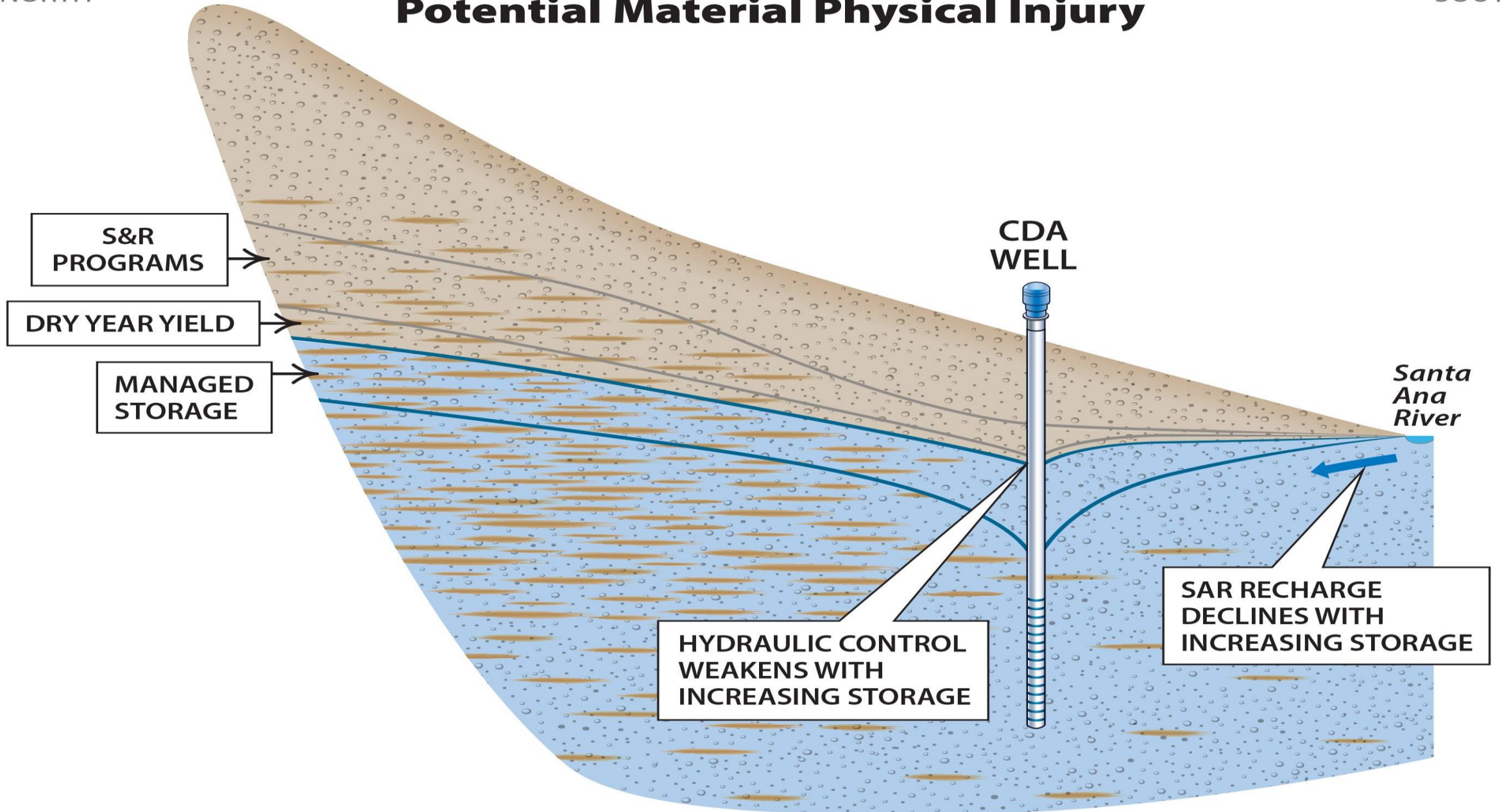
Santa Ana River

San Bernardino
Orange

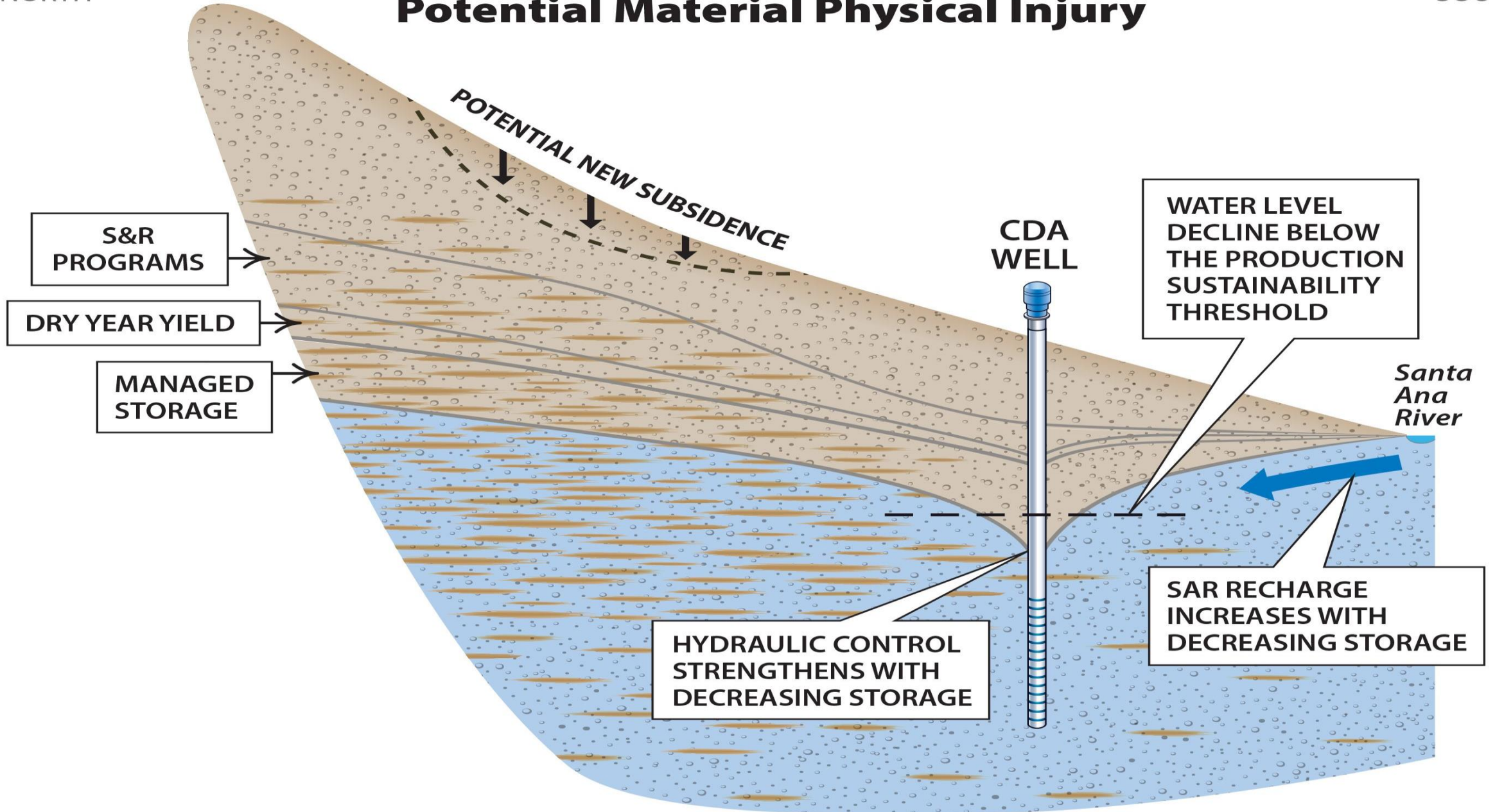
Storage Framework and Potential Material Physical Injury



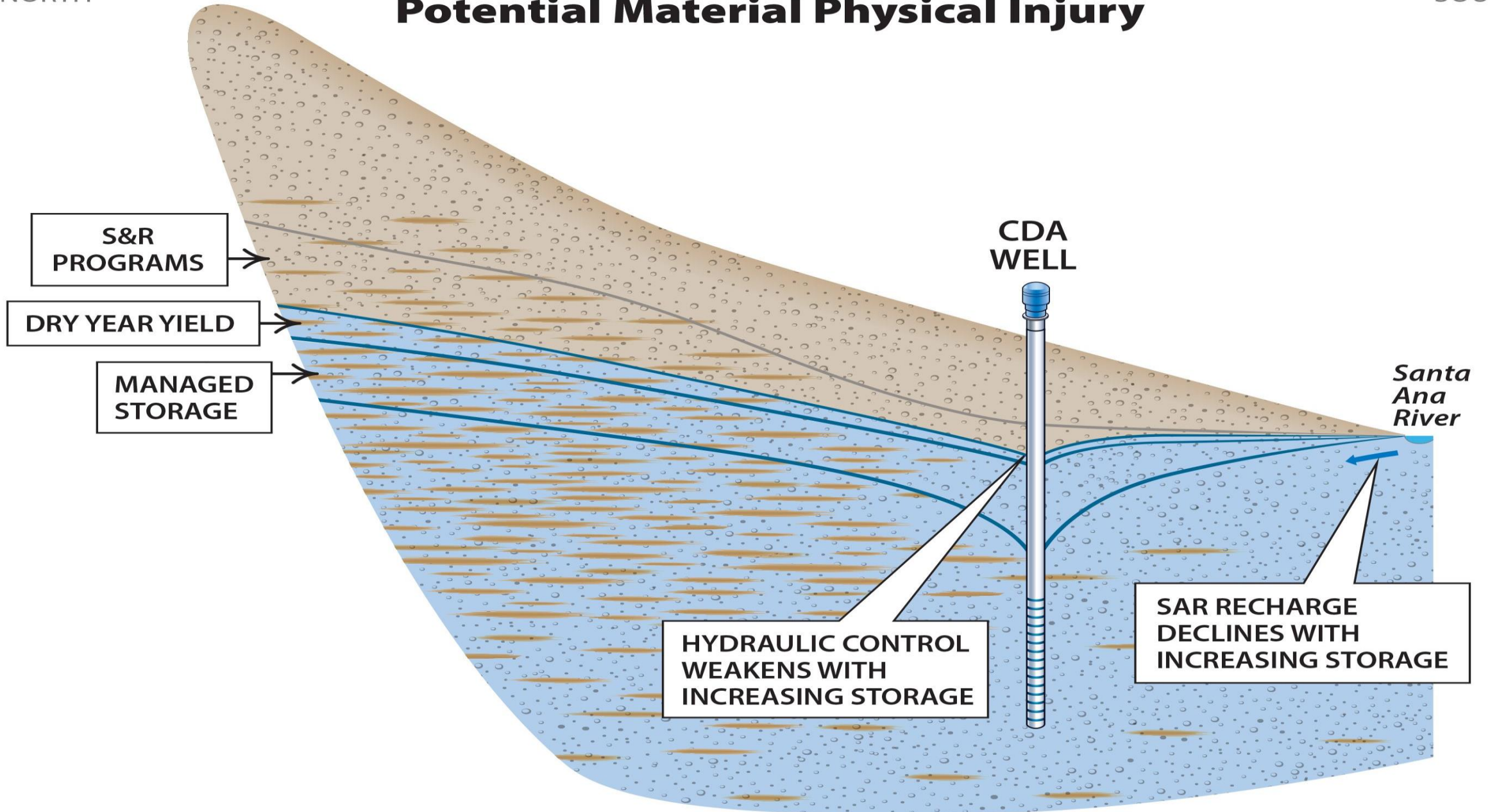
Storage Framework and Potential Material Physical Injury



Storage Framework and Potential Material Physical Injury



Storage Framework and Potential Material Physical Injury



Storage Framework and Potential Material Physical Injury

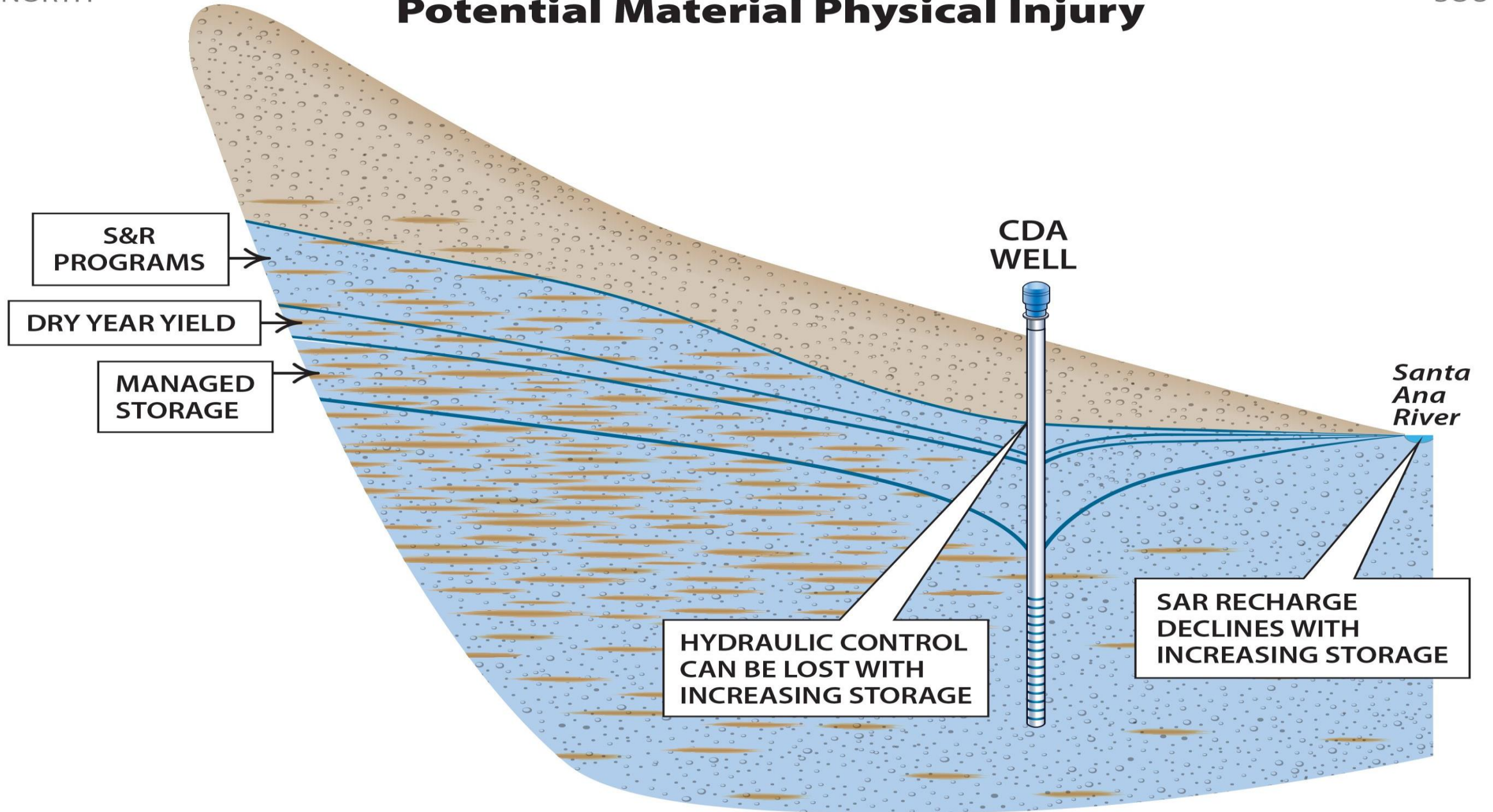


Figure 5-8 from the Storage Framework Investigation
Projected Groundwater Discharge from the Chino North Management Zone through the Chino Creek Wellfield

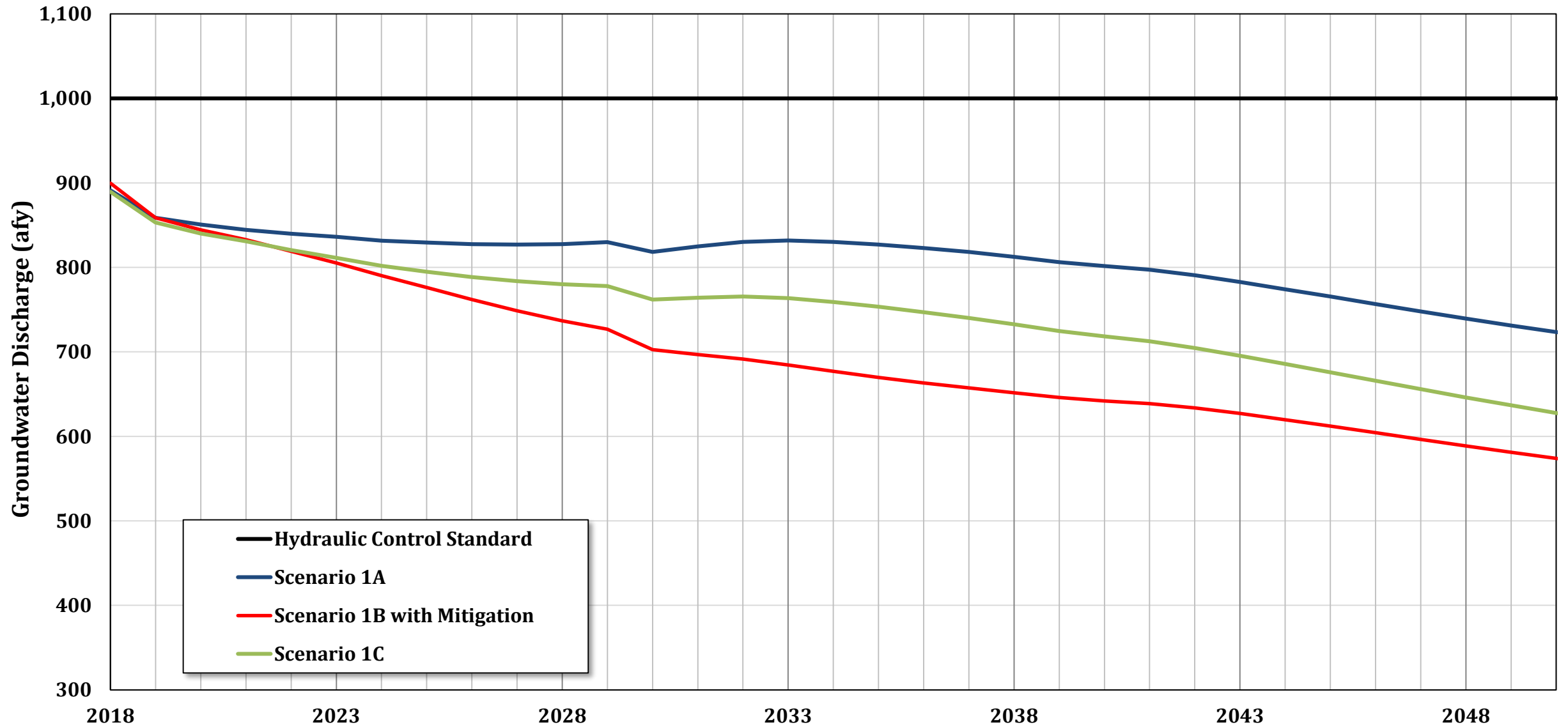
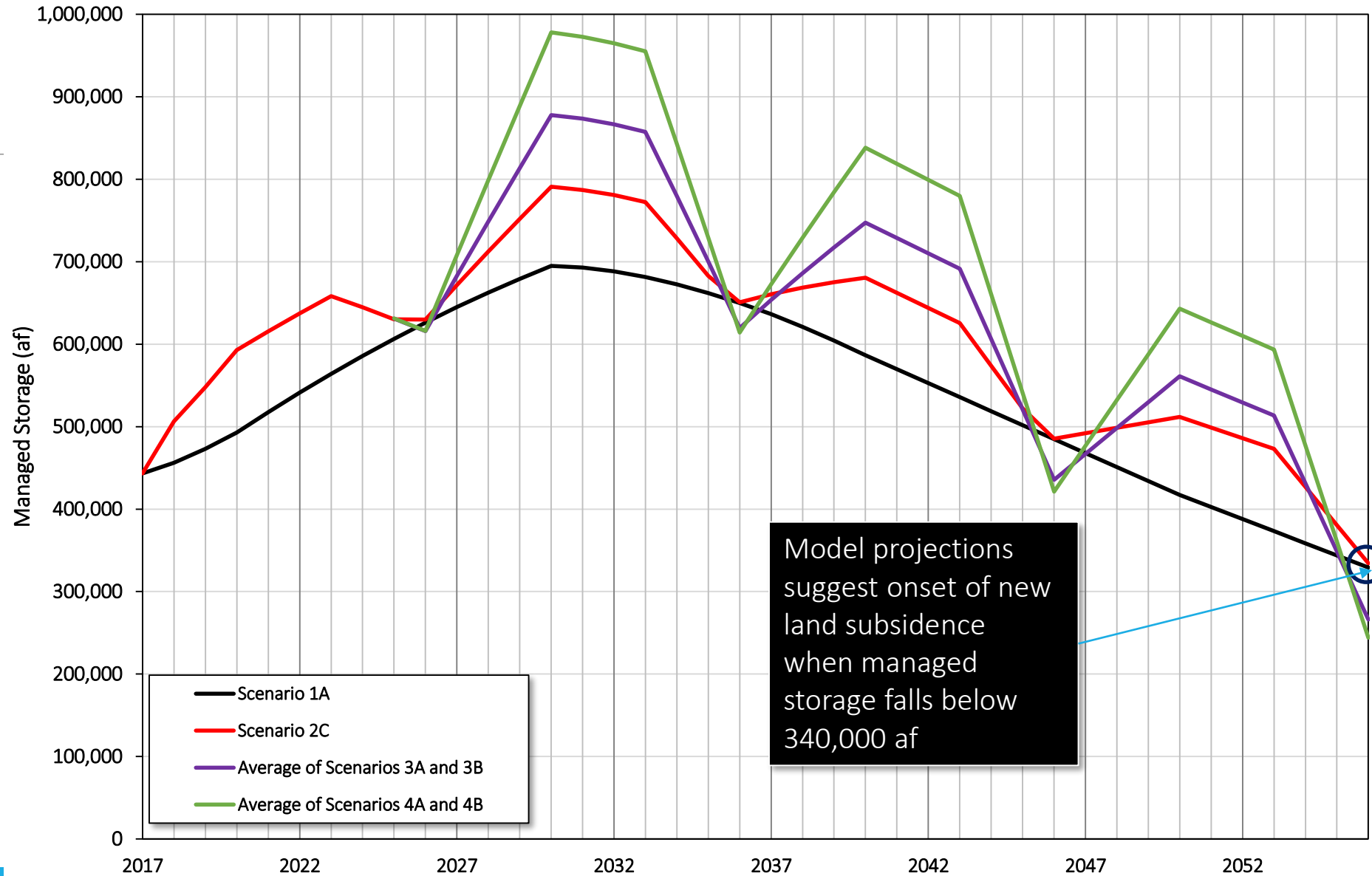




Figure 6-3 from the Storage Framework Investigation
Model-Projected End-of-Year Volume in Managed Storage for Scenarios 1A and 2C and Average
End-of-Year Volume for Scenarios 3A and 3B and 4A and 4B





Conclusions from the review of Storage Framework baseline scenarios through 2050

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