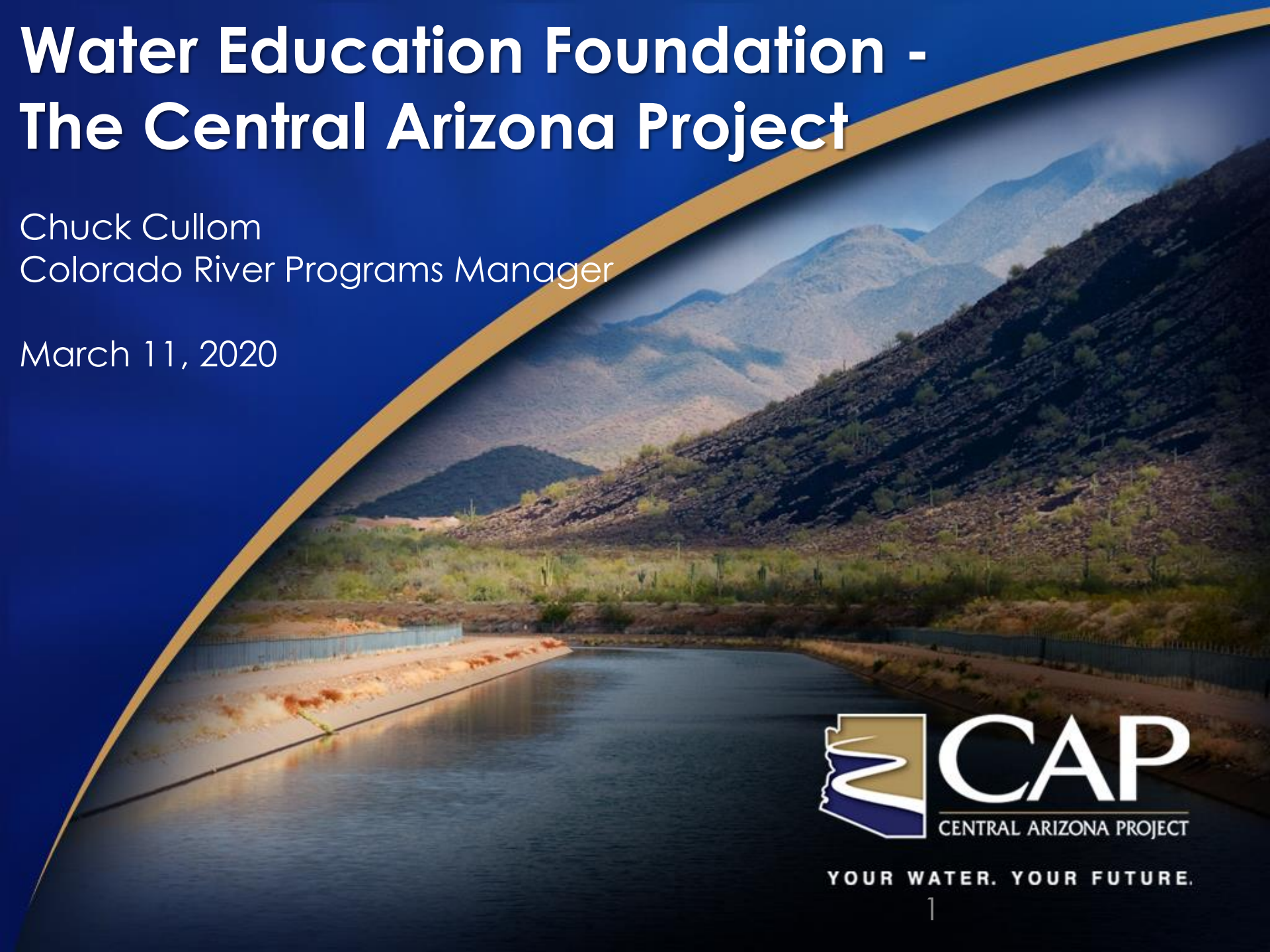
Water Education Foundation - The Central Arizona Project

Chuck Cullom
Colorado River Programs Manager

March 11, 2020



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YOUR WATER. YOUR FUTURE.

Central Arizona Project

336-mile aqueduct stretches from Lake Havasu to Tucson

14 pumping plants lift water nearly 3,000 feet

8 siphons, 3 tunnels

Lake Pleasant/New Waddell Dam

Delivery of Colorado River water began in 1985

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1916 - 1922

- Various proposals are made to bring Colorado River water into central Arizona
- In 1922, engineers survey an aqueduct route from Parker to the Salt River valley

Representative Carl Hayden

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Colorado River Compact

1922 - Colorado River Compact approved

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1944 Arizona Joins CO River Compact

Arizona reserves 2.8 MAF entitlement

Treaty with Mexico for 1.5 million acre-feet

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1952 - 1963

U.S. Supreme Court confirms Arizona's rights to Colorado River water in *Arizona*

Mark Wilmer

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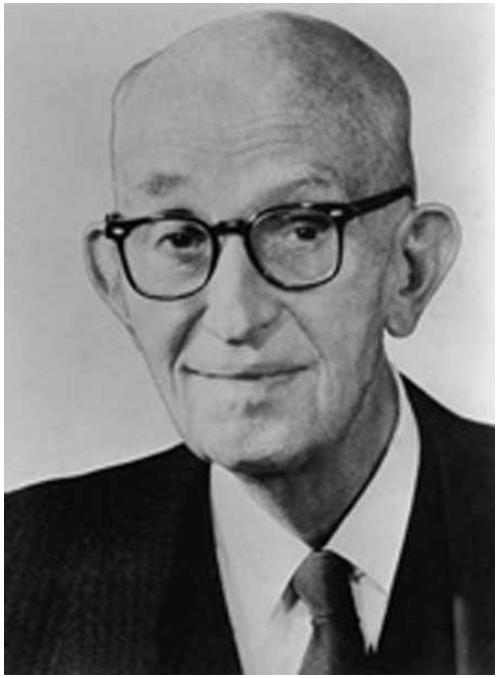
1968

CAP authorized by Congress in Colorado River Basin Project Act



Senator Carl Hayden

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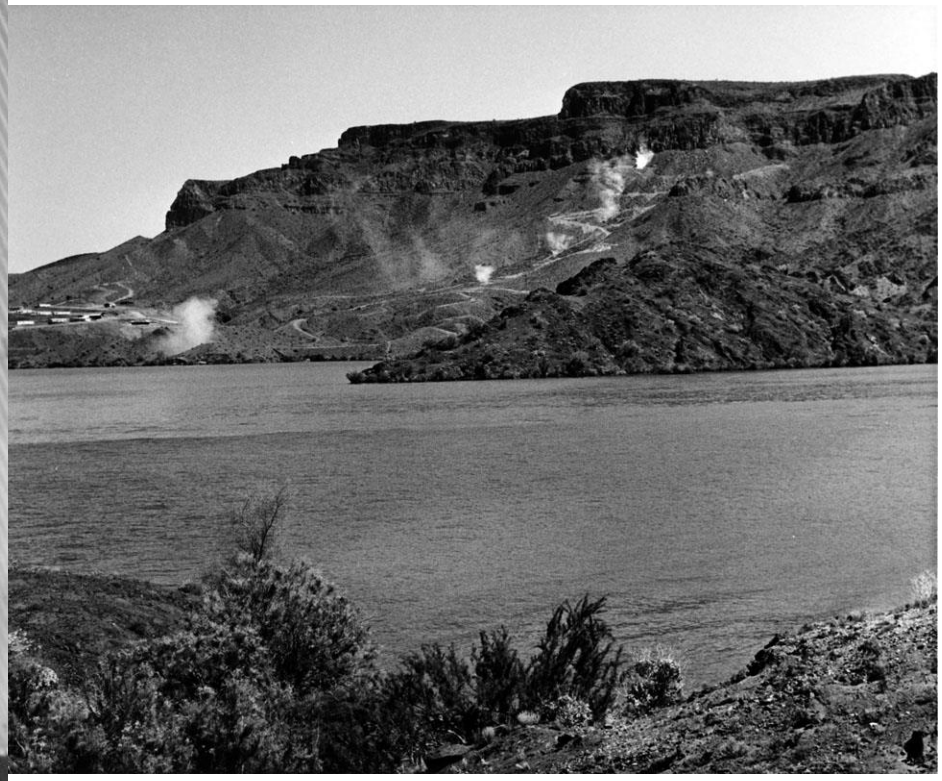
1973

Reclamation begins construction of CAP



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CAP Construction

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1985

First CAP water delivery – Harquahala Valley Irrigation District

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Mark Wilmer Pumping Plant

The system begins with an initial lift of 826’ then travels through a 7-mile tunnel to the aqueduct.

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Waddell Dam and Lake Pleasant

Waddell pumping plant is unique in the system, it generates electricity. Waddell Dam creates Lake Pleasant, the largest of the 3 reservoirs in the CAP system.

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Lake Pleasant

CAP's Largest Reservoir – Seasonal storage, ~ 800 kaf capacity

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Recharge Sites

Superstition Mountains recharge site is one of six recharge sites storing excess water in the aquifer.

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CAP Service Area

3 counties

23,790 square miles

< 8" annual rainfall

5 million people (approx. 80% of Arizona's population)

350,000 acres of irrigated agriculture

11 Native American tribes

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How Much Water Does CAP Deliver?

1.6 million acre-feet each year = 521 billion gallons

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Who Gets CAP Water?

Municipal & Industrial 33%

Agriculture 26%

Native American Communities 35%

Recharge 6%

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CAP's Water Delivery Contract

(Section 5 Contract)

- Section 5 of the 1928 Boulder Canyon Project Act authorized the Secretary of the Interior to deliver mainstem Colorado River through water delivery contracts.
- CAP's Section 5 Contract is unique. It is an unquantified contract that allows CAP to take delivery of all of Arizona's 2.8 MAF after satisfaction of other more senior priority rights.
- CAP's long-term contract obligations total 1.415 MAF but CAP has routinely delivered 1.6 MAF or more.
- The creation of the Arizona Water Banking Authority and CAGRD were facilitated by CAP's unique "sponge" contract.

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CAP Water Service Contracts

- Authorized to subcontract with non-Indian water users for delivery of each user's share of CAP water supplies.

- M&I subcontractors include the cities of Phoenix, Tucson, Scottsdale, Mesa, Peoria, Glendale, Tempe and Chandler, which collectively represent nearly 60 percent of CAP M&I water supplies.

- The Bureau of Reclamation has entered into contracts for the delivery of CAP water to Indian entities. CAWCD is not a party to Reclamation's contracts but is required to deliver CAP water pursuant to such contracts.

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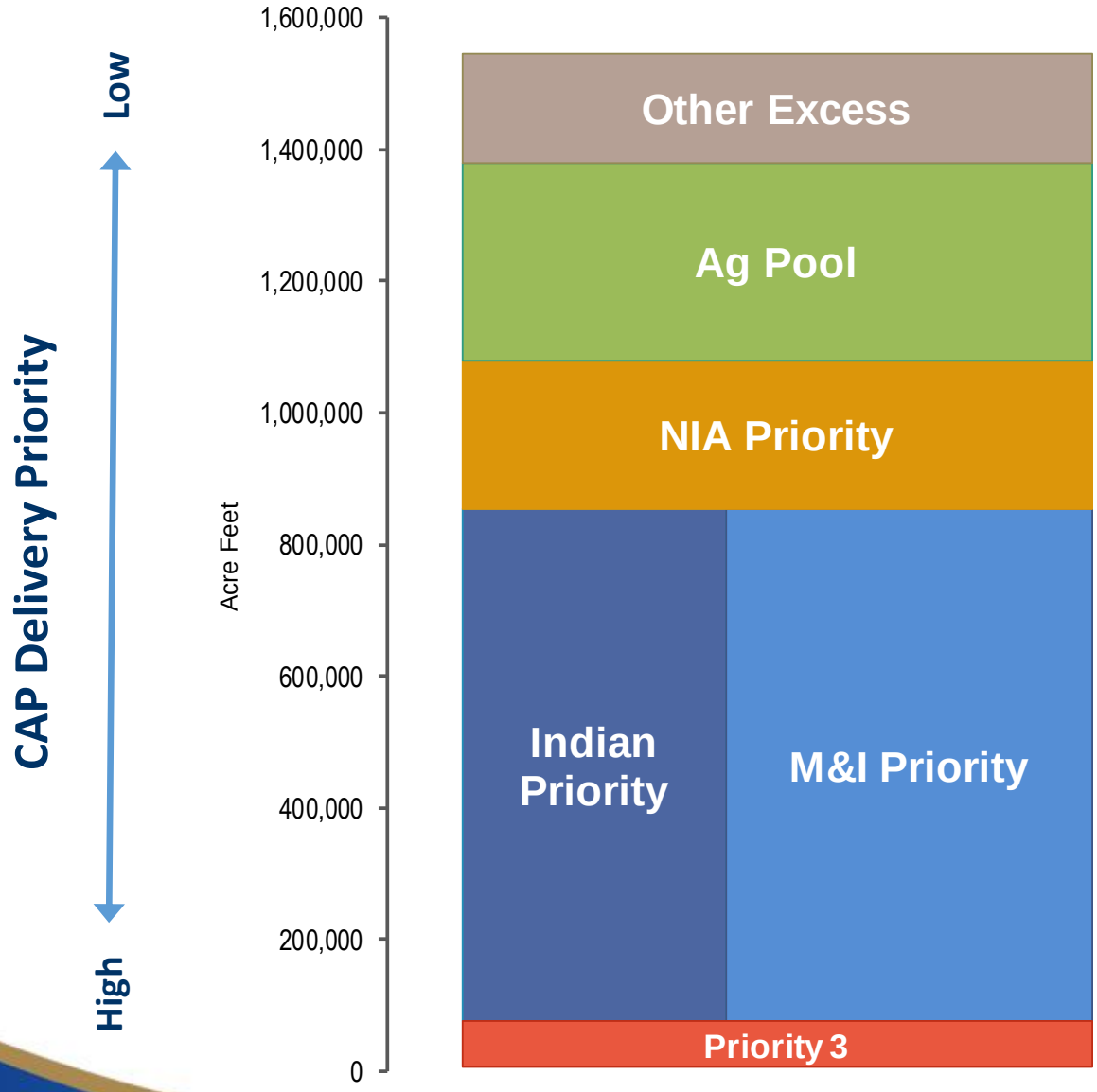
CAP Priority Pools



CAP Economic Study

- ***What is the value of CAP to the state of Arizona?***

- This question has come up over and over through the years, but was never quantified

- CAP sought to quantify the value and looked to Arizona State University researchers for help

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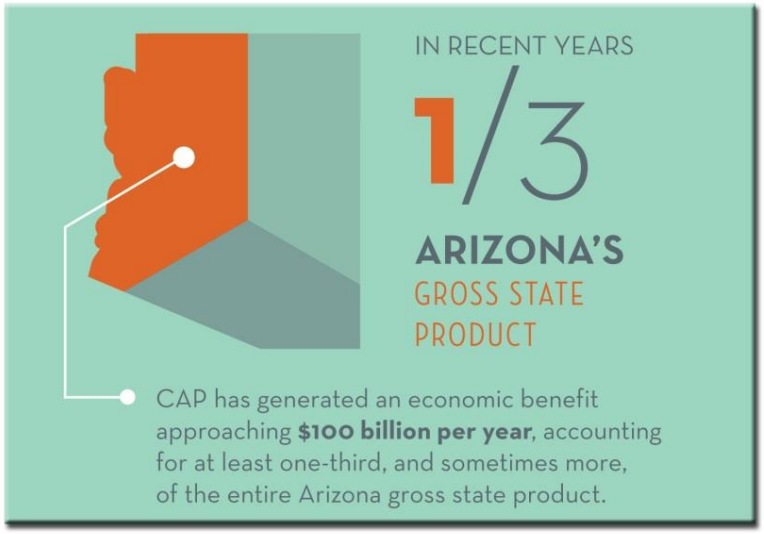
CAP Economic Study

Findings

- 2005-2010 - CAP generated an annual economic benefit averaging over $90 billion per year (35% Arizona gross state product)
- 2010 - CAP generated $128 billion (49.5%) of gross state product



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Shortages Drivers – Risk to CAP Supplies

- Climate change = hot drier future
- Structural deficit
- Lack of augmentation

1096’ = 44% capacity

- **2020 – Tier Zero**
- **2021– 80% Tier Zero**
- **2022 – 71 % Tier Zero**
- **2023 – 31% Tier One**

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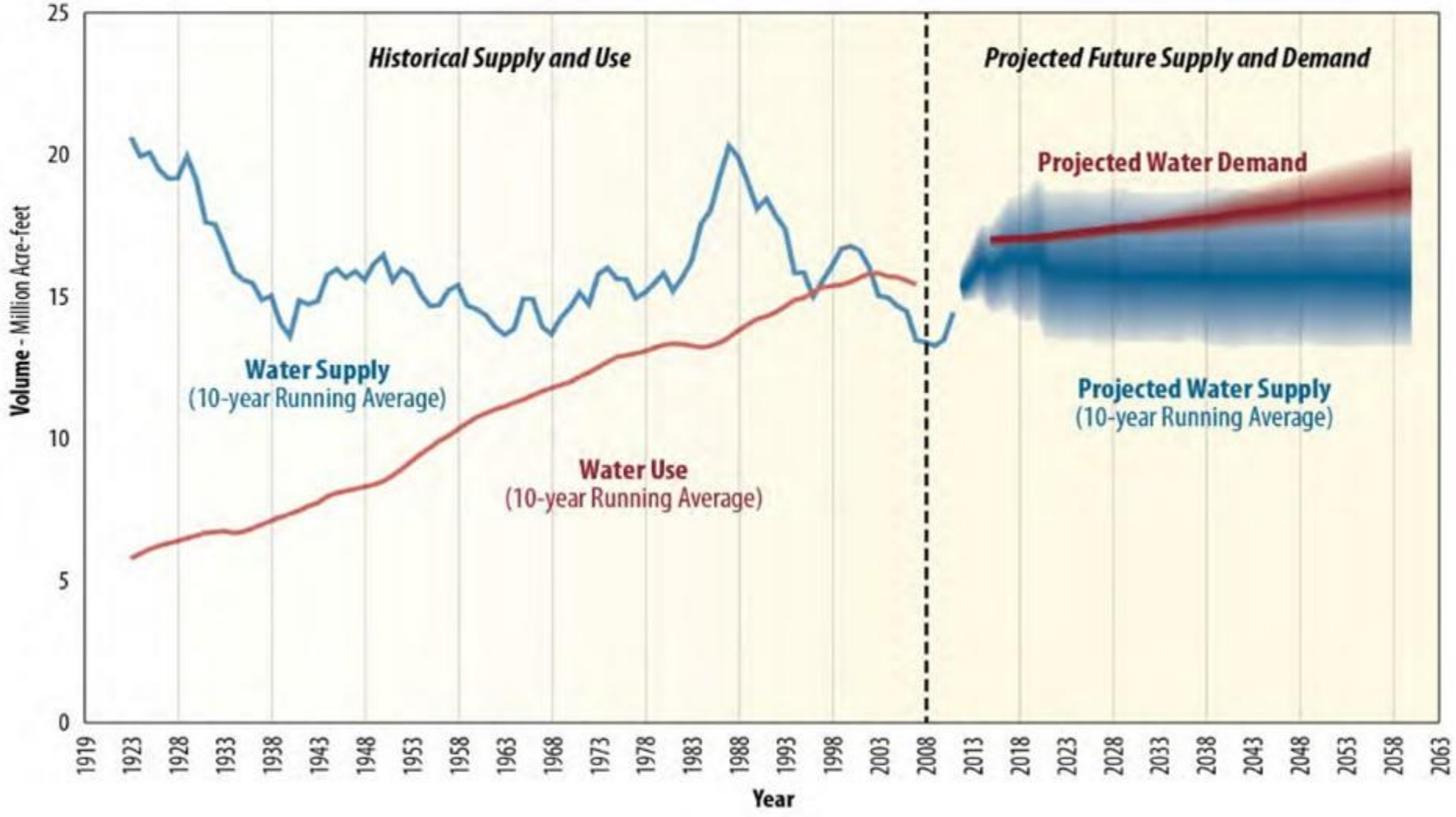
Three Colorado River Challenges – A Growing Gap

Colorado River Water Supply and Demand Study



Three Colorado River Challenges – A Long-Avoided Risk

Structural Deficit at Lake Mead

Normal Inflow (Release from Lake Powell plus smaller rivers)	9.0 MAF
Normal Outflow	9.6 MAF
Evaporation	0.6 MAF
Balance	-1.2 MAF

Approximately 12 foot decline in normal year

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CAP Prepares for Shortages

- Arizona Water Banking to firm CAP supplies (**4 MAF stored**)
- Voluntary contributions to Lake Mead (**~1.5 MAF to date**)

Contributions to Lake Mead
CAP Forbearance Volumes (ac-ft)

CAP Conservation Activities

Program Name	2014	2015	2016	2017	2018	2019	2020	Total
Yuma Mesa Irrigation and Drainage District Fallowing Program	6,827	7,180	7,509	-	-	-	-	21,516
Ag Forbearance 1 Program EC-ICS	-	80,922	82,922	-	-	-	-	163,844
Ag Forbearance 3 Program	-	-	10,627	41,763	2,323	-	-	54,713
Ag Forbearance 3 Program EC-ICS	-	-	-	-	42,340	20,671	44,968	107,979
Ag Forbearance 4 Program EC-ICS	-	-	-	-	4,673	5,475	-	10,148
Municipal Forbearance - Supply Replacement EC-ICS	-	15,000	16,000	-	-	-	3,500	34,500
CAP Excess	18,290	81,921	9,957	150,042	106,411	120,872	143,532	631,025
Note 1 Ag Forbearance 3 and 4 Program volumes in 2018 have been submitted as EC-ICS								
CAP Subtotals by Year	**25,117**	**185,023**	**127,015**	**191,805**	**155,747**	**147,018**	**192,000**	**1,023,725**

Pilot System Conservation Program (PSCP)

Program Name	2014	2015	2016	2017	2018	2019		Total
Ag Forbearance 2 Program	-	-	25,265	-	-	-	-	25,265
Ag Forbearance 5 Program	-	-	-	-	5,042	-	-	5,042
Bullhead City	-	-	-	40	542	840	400	1,822
Tohono O'odham Phase 1 & 2	-	10,080	9,817	10,080	-	-	-	29,977
Tohono O'odham Phase 3	-	-			11,050	-	-	11,050
GRIC System Conservation Phase 2	-	-	10,000	-	-	-	-	10,000
CRIT System Phase 1	-	-	1,137	7,435	-	-	-	8,572
CRIT System Phase 2	-	-	-	1,137	7,435	-	-	8,572
CRIT System Phase 3	-	-	-		1,424	9,317	-	10,741
CRIT System Phase 4	-	-	-			17,488		17,488
Fort McDowell Yavapai Nation	-	-	-			13,683	-	13,683
PSCP Program Subtotals by Year	**-**	**10,080**	**46,219**	**18,692**	**25,493**	**41,328**	**400**	**142,212**

Other System Conservation Activities

Program Name	2014	2015	2016	2017	2018	2019		Total
Fort McDowell Yavapai Nation System Conservation	-	-	13,933	-	-	-	10,000	23,933
GRIC SCIA Phase 1	-	-	-	40,000	-	-	-	40,000
GRIC SCIA Phase 2	-	-	-	40,000	-	-	-	40,000
GRIC ICS (Reclamation)	-	-	-	-	-	100,000	50,000	150,000
GRIC ICS (AWBA)	-	-	-	-	-	17,000	33,000	50,000
CRIT ICS	-	-	-	-	-	6,274	3,736	10,010
CRIT	-	-	-	-	-	-	50,000	50,000
MVIDD ICS	-	-	-	-	-	-	6,137	6,137
Other Subtotals by Year	**-**	**-**	**13,933**	**80,000**	**-**	**123,274**	**152,873**	**370,080**

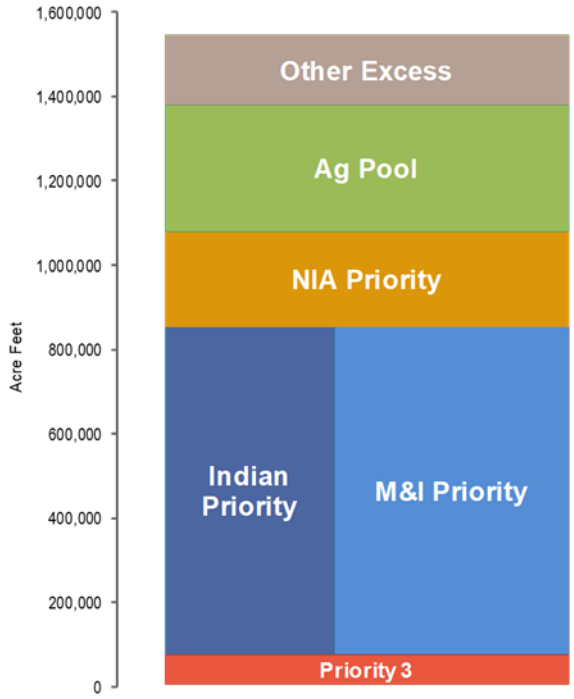
Grand Total Savings in Acre Feet	2014	2015	2016	2017	2018	2019	2020	Total
	25,117	195,103	187,167	290,497	181,240	311,620	345,273	1,536,017

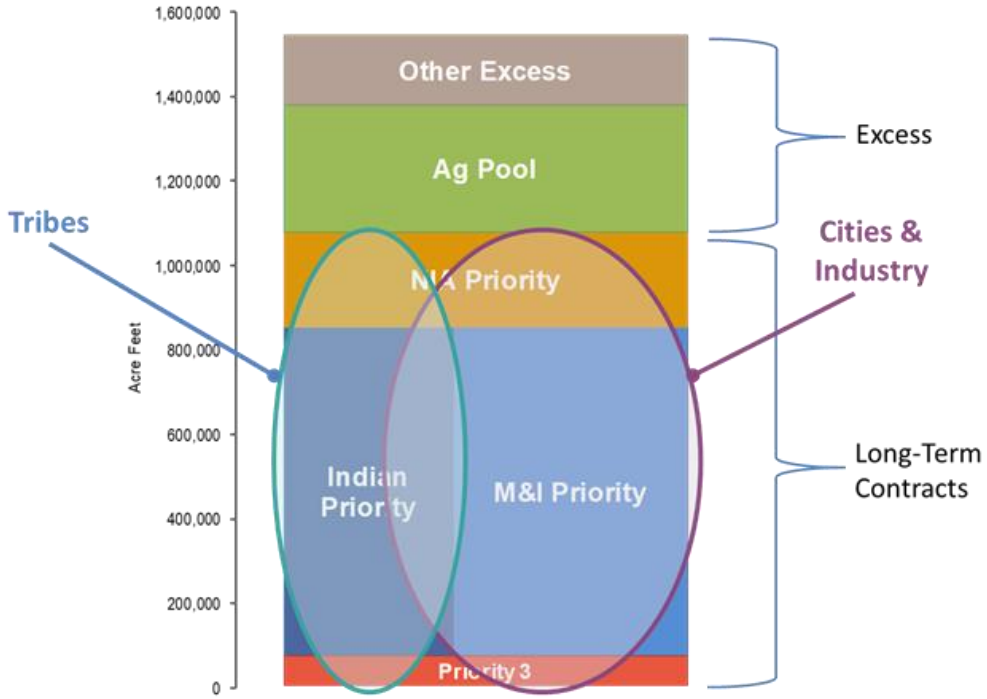
LBDCP Main Components

2007 Interim Guidelines Shortage Reductions and Incremental DCP Contributions

Lake Mead Elevation	AZ 2007	AZ DCP	AZ TOTAL	NV 2007	NV DCP	NV TOTAL	CA 2007	CA DCP	CA TOTAL	BOR DCP	MX Min 323	MX BWSCP	MX Total	TOTAL
≤1090 >1075	0	192K	192K	0	8K	8K	0	0	0	100k	0	41k	41k	341k
≤1075>1050	320K	192K	512K	13K	8K	21K	0	0	0	100k	50k	30k	80k	713k
≤1050>1045	400K	192K	592K	17K	8K	25K	0	0	0	100k	70k	34k	104k	821k
≤1045>1040	400K	240K	640K	17K	10K	27K	0	200K	200K	100k	70k	76k	146k	1,113k
≤1040>1035	400K	240K	640K	17K	10K	27K	0	250K	250K	100k	70k	84k	154k	1,171k
≤1035>1030	400K	240K	640K	17K	10K	27K	0	300K	300K	100k	70k	92k	162k	1,229k
≤1030>1025	400K	240K	640K	17K	10K	27K	0	350K	350K	100k	70k	101k	171k	1,288k
≤1025	480K	240K	720K	20K	10K	30K	0	350K	350K	100k	125k	150k	275k	1,475k

CAP Priorities and DCP Impacts





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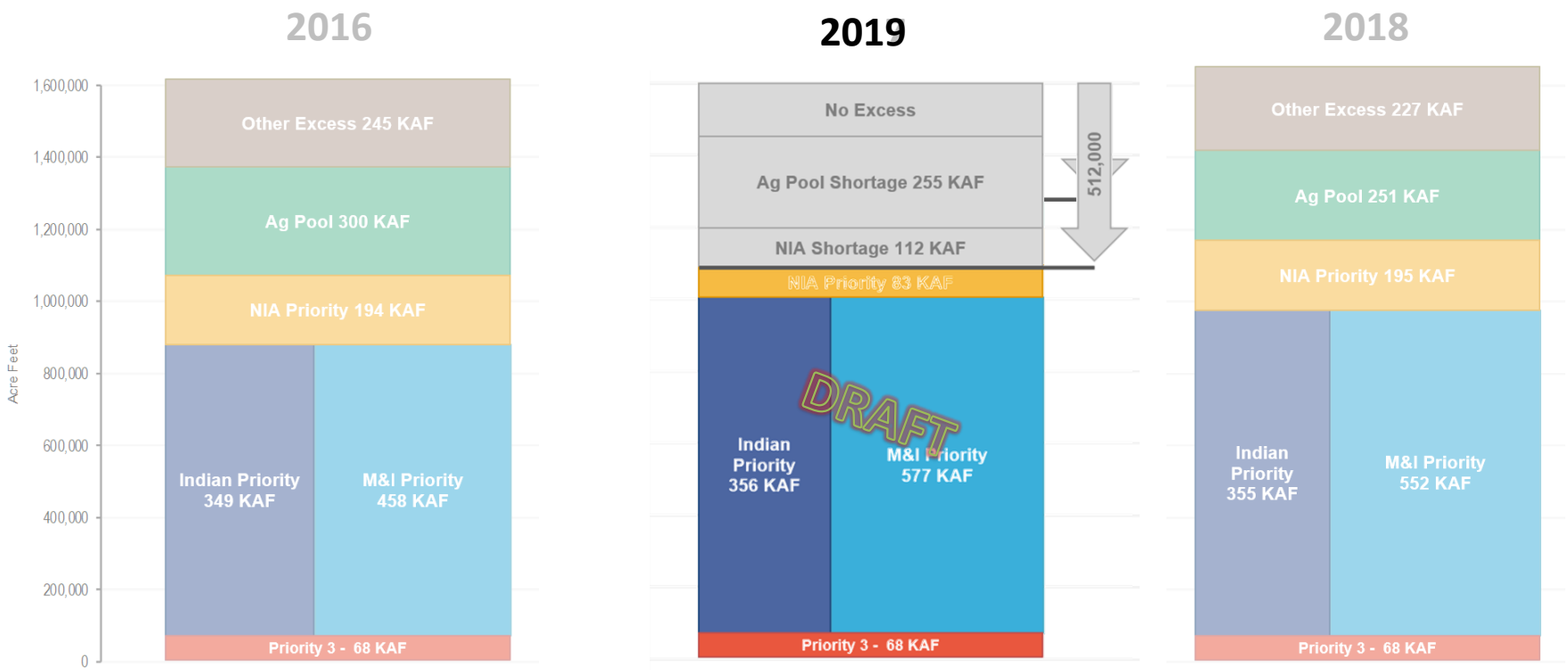
CAP Priority Pools
Impacts from '07 Guidelines vs. DCP



Based on Annual Operating Plan, prior to conservation/forbearance other than Ag F3

Arizona LBDCP Process

- ADWR & CAWCD Lead Steering Committee Process:
  - Tom Buschatzke and Ted Cooke co-chairs
  - 38 Delegates to the Steering Committee
  - Representing: CAP Tribes, On-River Tribes, CAP M&I + Ag users, On-River Ag, Developers, Arizona Legislative Leaders, Mining, NGOs
- Steering Committee process
  - Open and transparent (posted meeting materials, recorded meetings)
- Steering Committee met from July 2018 – February 2019
  - 9 SC meetings
  - Numerous small group meetings

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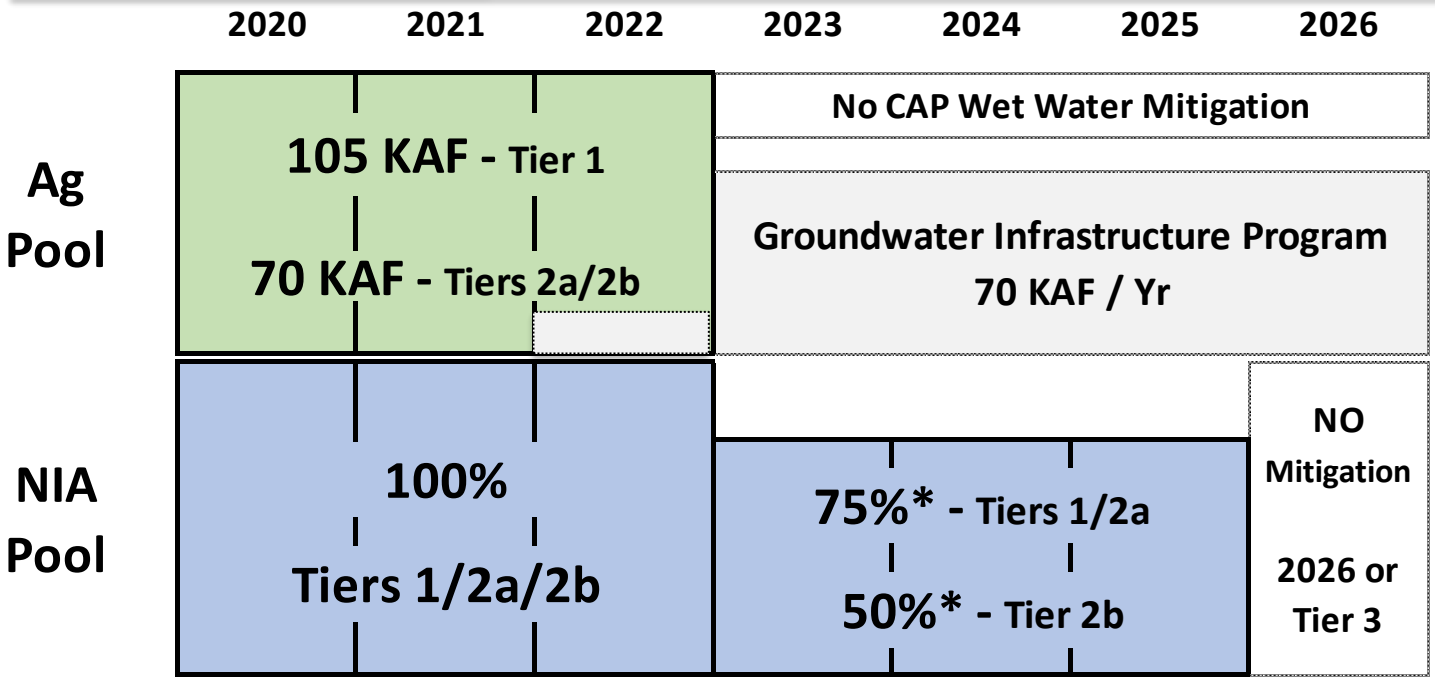
Implementation Plan – 2 Components
Mitigation Component



* Until no supplies

- DCP reductions will cause reductions to CAP deliveries
- Steering Committee agreed to mitigation for NIA and Ag water users for 2020-2025 timeframe
- NIA must be fully mitigated before Ag
- Amounts based on year and shortage tier

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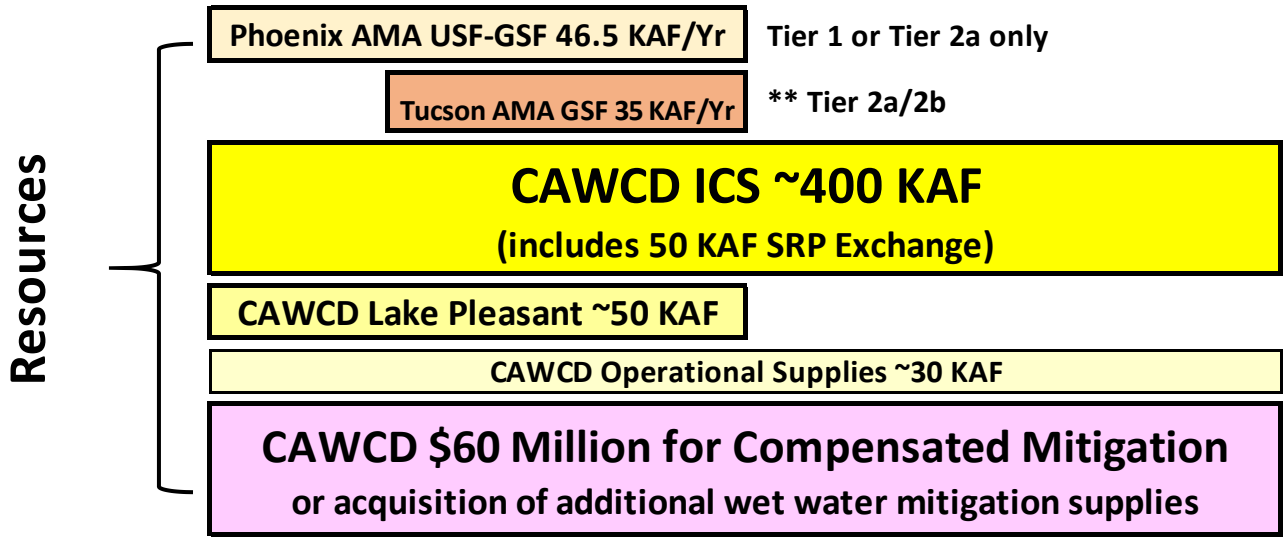
Implementation Plan – 2 Components
Water Sources for Mitigation



- Wet water CAP Deliveries
- USF to GSF transfers to irrigation districts
- Funding for new infrastructure
- Payment for reductions (compensated conservation & compensated mitigation)

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Arizona Coordination on LBDCP

- Legislative changes needed on water management policy and funding appropriation
- 24 contributors to the implementation
  - United States
  - CAWCD
  - State of Arizona
  - AWBA
  - 2 Indian Tribes
  - NGOs
  - CAP Ag Districts
  - CAP M&I Water Users
  - SRP

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Costs and Benefits of DCP to AZ

- Costs
  - $/AF of CAP water will increase
  - **DCP programs (mitigation and offset) will cost $200-$300 million**
  - ~ 800 kaf of additional contributions
- Benefits
  - Reduced risk of Lake Mead declining to critically low elevations, valued in the hundreds of billions of dollars
  - More certainty in knowing triggers for deeper reductions
  - Contributions made to Lake Mead shared by all - Basin States, the United States, and Mexico

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