ITEM NO.
5.

June 18, 2024

Santa Clarita Valley Water Agency Board Meeting

Agenda Item - 5

DELTA CONVEYANCE PROJECT

Cost Estimate and Benefit Cost Analysis

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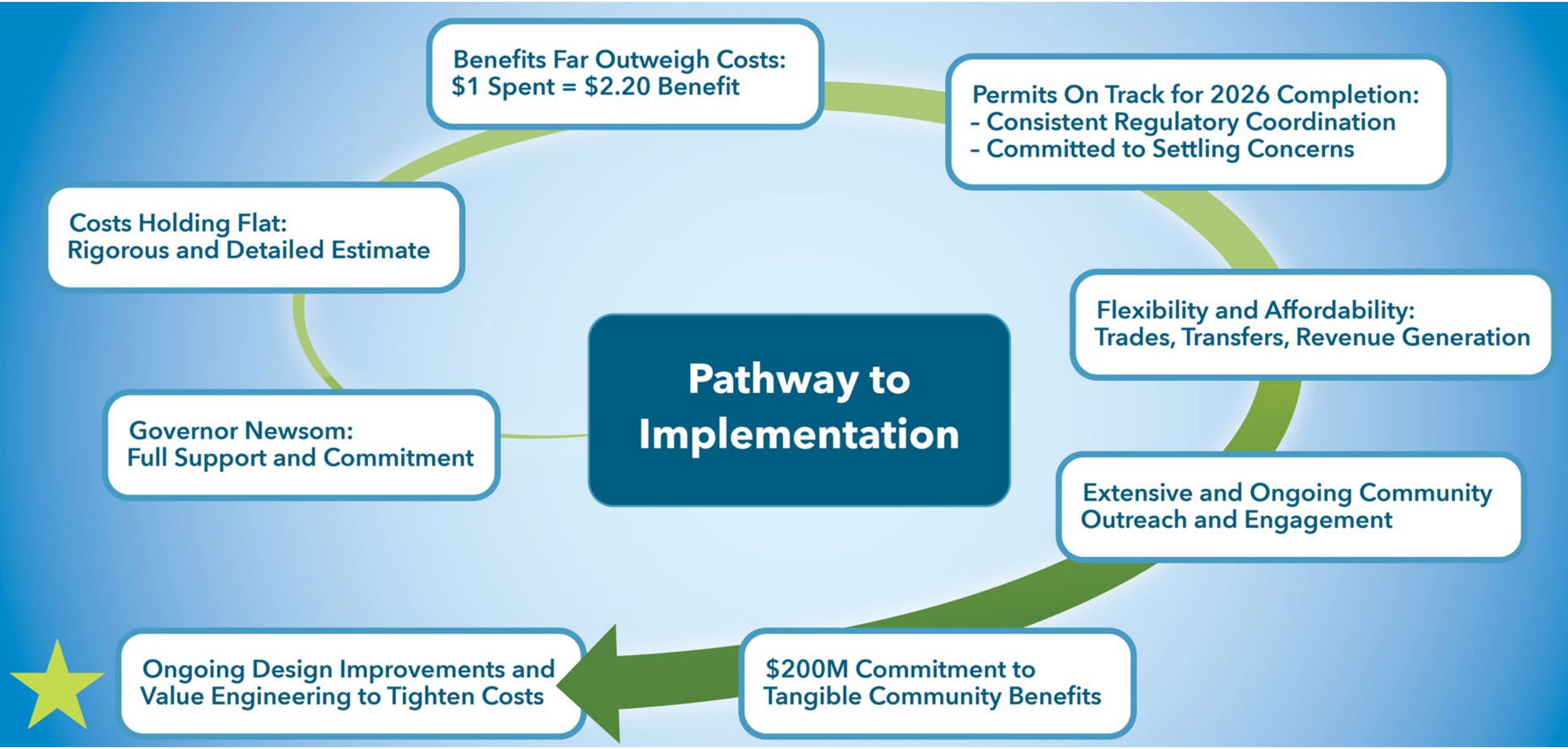
Moving Forward



Modernizing California's Water Infrastructure

January 1, 2024 – June 13, 2024

941,000 acre-feet of water = enough water to supply:

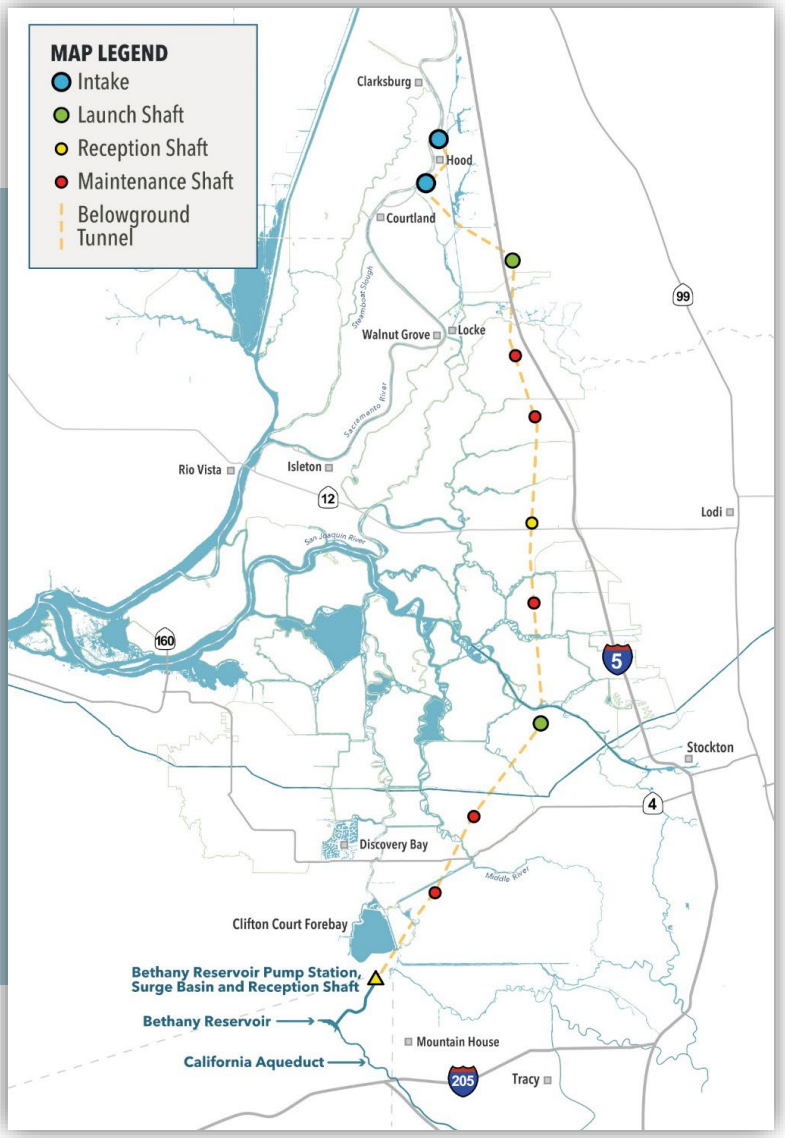
Over **9.8 million** people for one year

or

Nearly **3.3 Million** households for one year

What did we estimate?

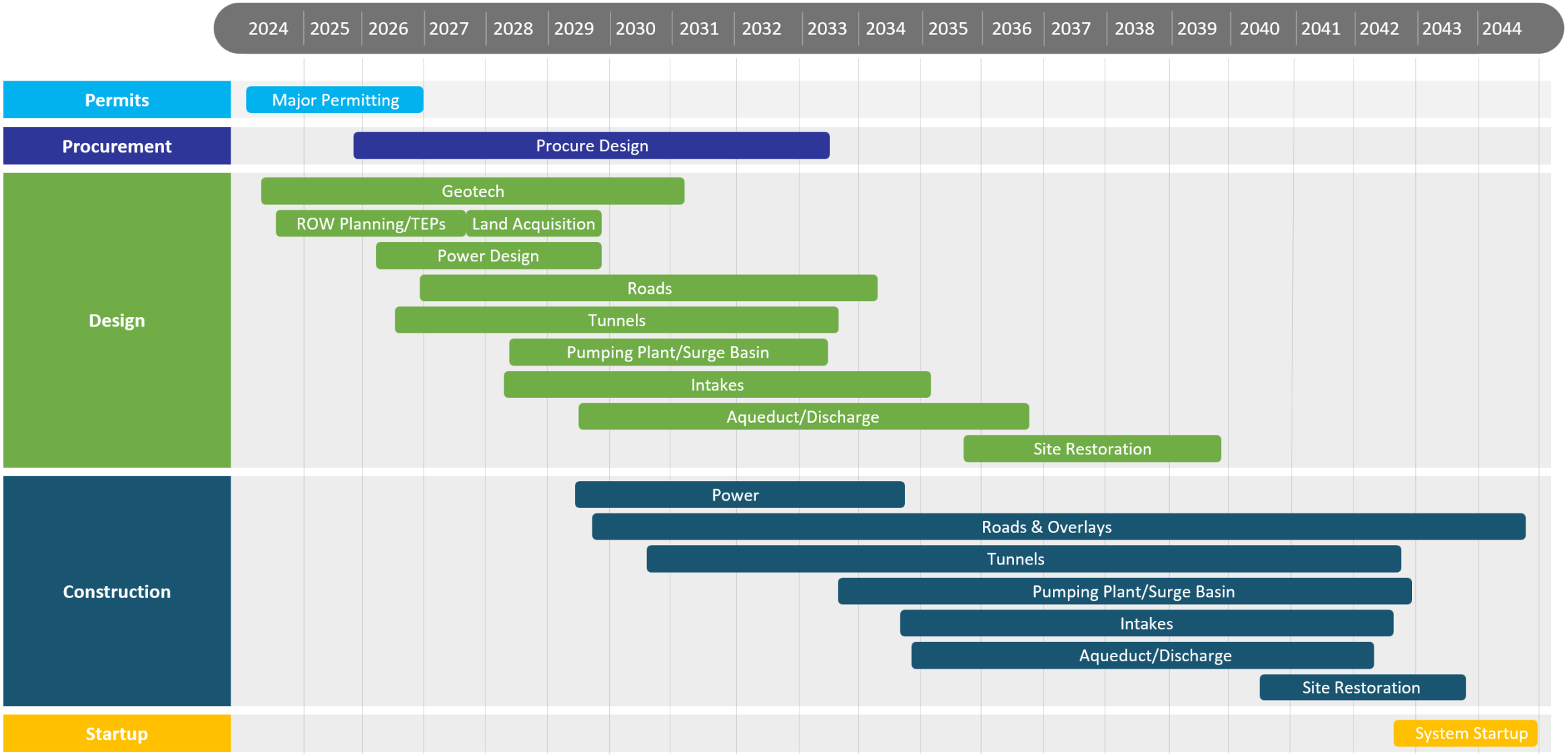
- **Bethany Reservoir Alignment – 6,000 cfs (~10% design)**
  - ➢ Two (2) new intakes in the North Delta
  - ➢ Conveyance tunnel: 45 miles of 36-ft ID single tunnel, 11 shafts
  - ➢ New pumping plant, aqueducts and discharge structure connecting directly to Bethany Reservoir
- **Land acquisition, power supply & consumption, mitigation, Community Benefits Program, CCWD settlement**
- **Accounts for uncertainty w/ contingency and risk treatment costs**



Estimate Methodology

- "Bottoms up" (deterministic, unit cost) estimating approach based on labor, equipment, materials, and schedule
- Estimate uses 2023 "real" undiscounted dollars
- Reconciliation process with independent cost estimating and resolution
- Mostly AACE Class 4 Estimate (accuracy +80% to -55%) with some Class 5 aspects
- Assumes Design-Bid-Build procurement

DCP Schedule Summary



2023 Cost Estimate Update

- **Completed reconciliations:**
  - Independent construction est. prepared by DCA Design and Program Management teams – reconciled cost Δ ~2%
  - Independent Soft Cost estimates, reconciled differences and aligned to Master Program Schedule
  - Compared to the 2020 cost assessment corrected for inflation
- **Risk management**
  - $467M risk treatment costs included in construction est.
  - Construction contingency = 30%
  - Other Program Cost contingency = 0%, 15%, or 30% depending on item

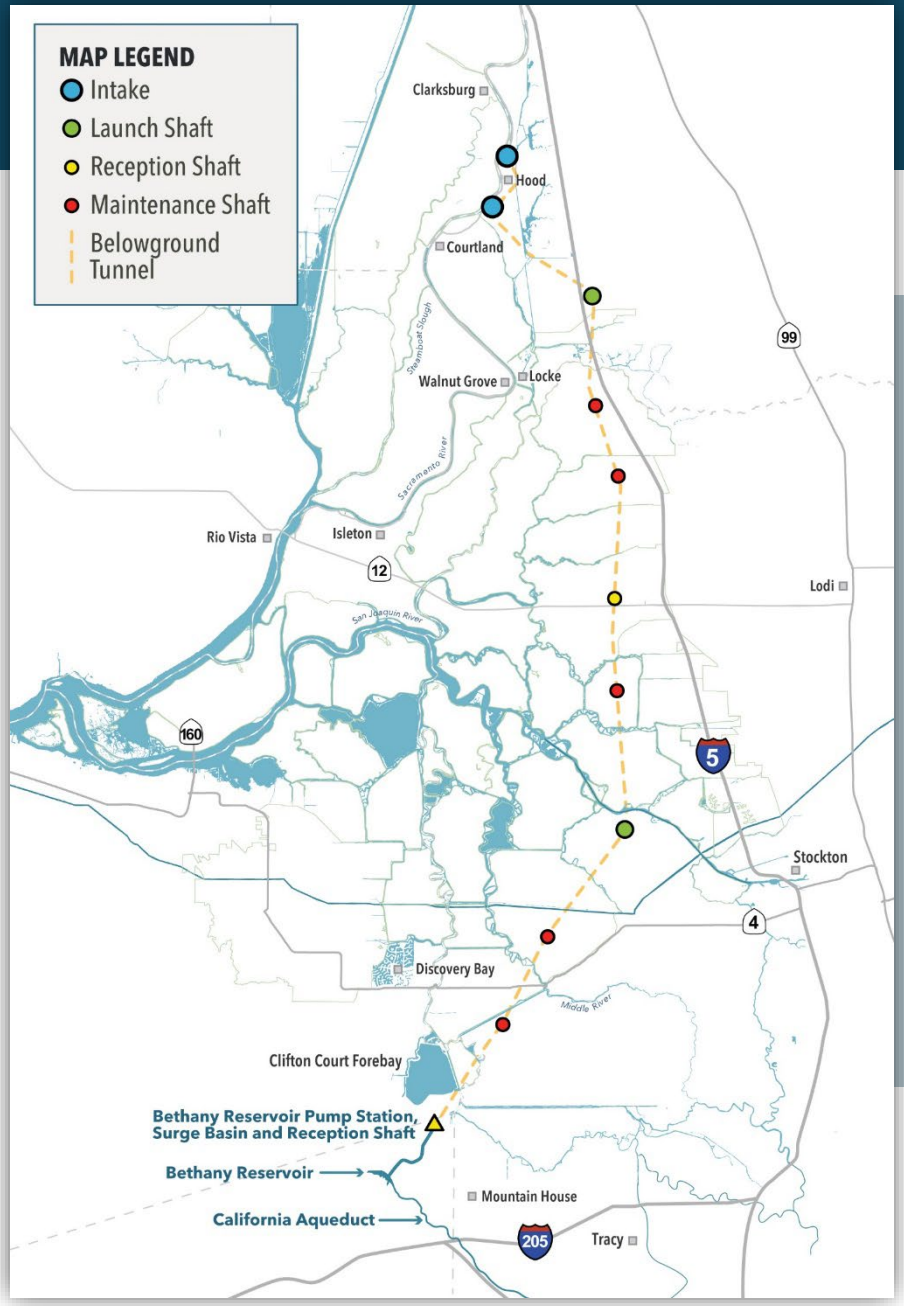
TOTAL CONSTRUCTION COSTS	BETHANY (2023) $15,012,000,000	% Construction Cost
Intakes	$1,714,000,000	--
Tunnel and Shafts	$6,353,000,000	--
Pumping Plant /Surge Basin/Aqueduct & Discharge	$3,198,000,000	--
Utilities and Logistics (power included below)	$283,000,000	--
Construction Sub-Total	**$11,548,000,000**	**--**
Contingency (30%)	**$3,464,000,000**	**--**
OTHER PROGRAM COSTS	**$5,108,000,000**	
Planning/Design/CM (Soft Costs)	**$3,328,000,000**	**22.2%**
DWR Oversite	$426,000,000	2.8%
DCA Program Management Office	$668,000,000	4.4%
DCA Engineering (Design and CM Services)	$2,167,000,000	14.4%
DCA Permits and Agency Coordination	$67,000,000	0.4%
Other Costs	**$1,780,000,000**	**--**
Land Acquisition	$158,000,000	--
Mitigation Program	$960,000,000	--
Power	$415,000,000	--
CCWD Settlement	$47,000,000	--
Community Benefits Program	$200,000,000	--
	TOTAL $20,120,000,000	

Comparison to 2020 Cost Assessment

TOTAL CONSTRUCTION COSTS	BETHANY (2023) $15,012,000,000	% Const Cost	2020 Assessment $ 12,101,000,000	% Const Cost	*2020 in $2023 $15,346,000,000
Two Intakes	$1,714,000,000	--	$ 1,448,000,000	--	$1,836,000,000
Tunnel and Shafts	$6,353,000,000	--	$ 4,473,000,000	--	$5,672,000,000
Bethany Complex / Southern Complex Facilities (Forebay)	$3,198,000,000	--	$ 2,326,000,000	--	$2,950,000,000
Utilities, Power and Logistics (Power for Bethany Below)	$283,000,000	--	$ 522,000,000	--	$662,000,000
Construction Sub-Total	**$11,548,000,000**	**--**	**$ 8,769,000,000**	**--**	**$11,120,000,000**
Contingency (30% / 38%)	**$3,464,000,000**	**--**	**$ 3,332,000,000**	**--**	**$4,226,000,000**
Other Program Costs	**$5,108,000,000**		**$3,800,000,000**		**$4,827,000,000**
Planning/Design/CM (Soft Costs)	**$3,328,000,000**	**22.2%**	**$3,080,000,000**	**25.5%**	**$3,906,000,000**
DWR Oversite	$426,000,000	2.8%	$ 180,000,000	1.5%	$228,000,000
DCA Program Management Office	$668,000,000	4.4%	$ 420,000,000	3.5%	$533,000,000
DCA Engineering (Design and CM Services)	$2,167,000,000	14.4%	$ 2,420,000,000	20.0%	$3,069,000,000
DCA Permits and Agency Coordination	$67,000,000	0.4%	$ 60,000,000	0.5%	$76,000,000
Other Costs	**$1,780,000,000**	**--**	**$720,000,000**	**--**	**$921,000,000**
Land Acquisition	$158,000,000	--	$ 320,000,000	--	$416,000,000
Mitigation Program	$960,000,000	--	$ 400,000,000	--	$ 505,000,000
Power	$415,000,000	--	included above	--	included above
CCWD Settlement	$47,000,000	--	$0	--	$0
Community Benefits Program	$200,000,000	--	$0	--	$0
TOTAL	**$20,120,000,000**		**$15,901,000,000**		**$20,173,000,000**

*** 2020 Dollars Escalated to 2023 Dollars based on USBR CCT = 26.8%**

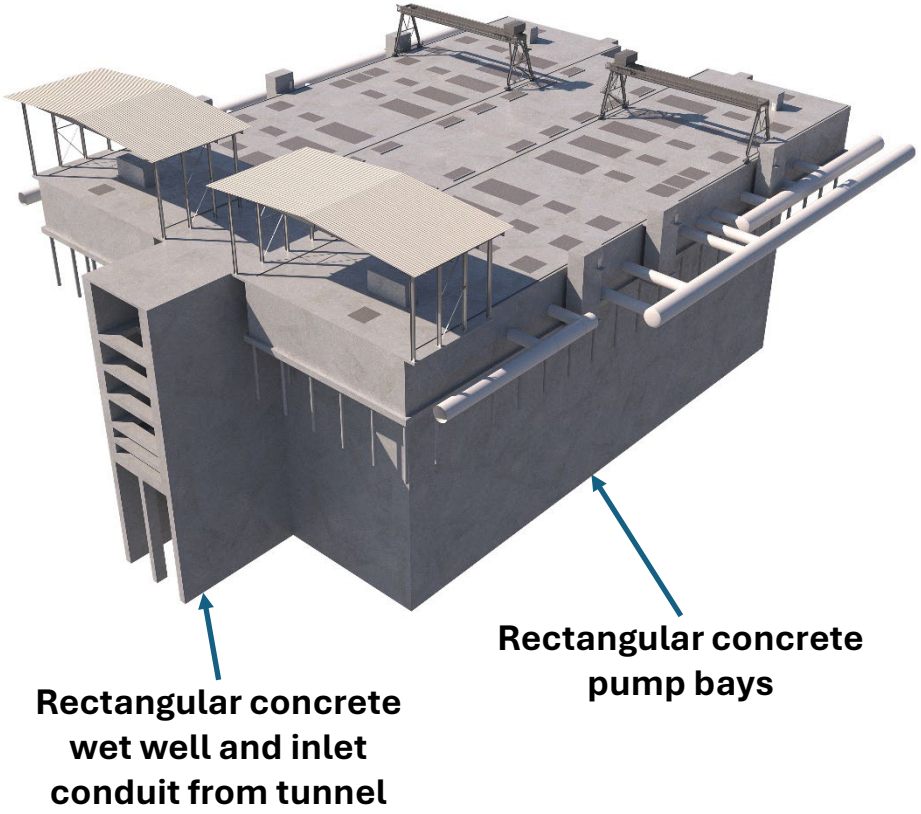
What are Innovations?



- Represent opportunities to reduce impacts, cost, schedule, and/or risk
- Indicate how the project could evolve through future value engineering
- Developed 19 innovations for secondary cost estimate - do not currently represent changes to the project description

Innovation Example – Bethany Reservoir Pumping Plant

Current EPR Design



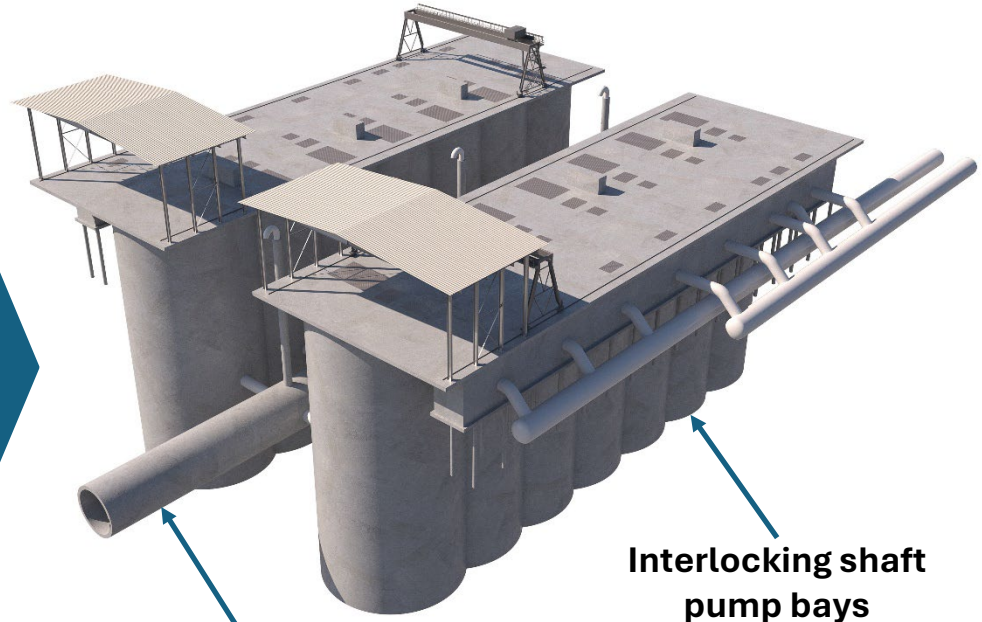
Rectangular concrete wet well and inlet conduit from tunnel

Rectangular concrete pump bays

INNOVATION ADVANTAGES

- Reduced quantities, saves:
  - 274,000 yd^3 soil excavation
  - 84,000 yd^3 concrete
  - 10,400 tons rebar
- Shortens construction schedule by 981 days
- Reduces direct construction cost by $138,720,000
- No changes to above ground configuration or features

Innovation Design



Tunnel connection to pump bays

Interlocking shaft pump bays

Comparison of Costs w/ Innovations

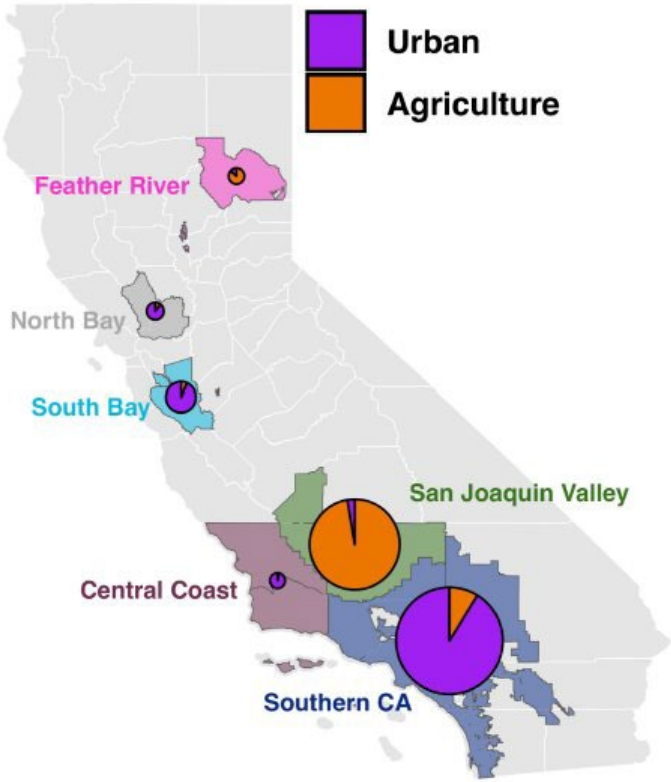
- **Estimate Total Project Cost w/ Innovations using:**
  - proportion of risk treatment costs
  - contingency %, labor %
  - direct application of “other costs”
- **Does not account for cost benefits of risk or schedule reduction**
- **Does not account for Collaborative Delivery contracting**
- **Innovations reduce total project cost by $1.23B , or 6% of total cost**

TOTAL CONSTRUCTION COSTS	Total Project Cost Estimate ($2023) $15,012,000,000	% Const Cost	Total Project Cost w/ Innovations ($2023) $ 14,008,000,000
Two Intakes	$1,714,000,000	--	$ 1,678,000,000
Tunnel and Shafts	$6,353,000,000	--	$ 6,130,000,000
Pumping Plant /Surge Basin/Aqueduct & Discharge	$3,198,000,000	--	$ 2,703,000,000
Utilities and Logistics	$283,000,000	--	$ 264,000,000
Construction Sub-Total	**$11,548,000,000**	**--**	**$ 10,775,000,000**
Contingency (30%)	**$3,464,000,000**	**--**	**$ 3,223,000,000**
Other Program Costs	**$5,108,000,000**		**$4,838,900,000**
Planning/Design/CM	**$3,328,000,00**	**22.2%**	**$3,106,000,000**
DWR Oversite	$426,000,000	2.8%	$ 398,000,000
DCA Program Management Office	$668,000,000	4.4%	$ 623,000,000
DCA Engineering (Design and CM Services)	$2,167,000,000	14.4%	$ 2,022,000,000
DCA Permits and Agency Coordination	$67,000,000	0.4%	$ 63,000,000
Other Costs	**$1,780,000,000**	**--**	**$1,780,000,000**
Land Acquisition	$158,000,000	--	$158,000,000
Mitigation Program	$960,000,000	--	$960,000,000
Power	$415,000,000	--	$415,00,000
CCWD Settlement	$47,000,000	--	$47,000,000
Community Benefits Program	$200,000,000	--	$200,000,000
TOTAL	**$20,120,000,000**		**$18,894,000,000**

Benefit/Cost Analysis Results

The State Water Project

- **Service Area:**
  - 27 million people
  - GDP $2.8 trillion, equivalent to the world's 8th largest economy
- **Current Water Supply:**
  - ~2.56 million acre-feet per year (MAF/yr) of deliveries to urban and agricultural customers
- **Future Challenges:**
  - Climate change and sea level rise expected to reduce deliveries by ~22% by 2070
  - Risk of extended disruption during seismic event

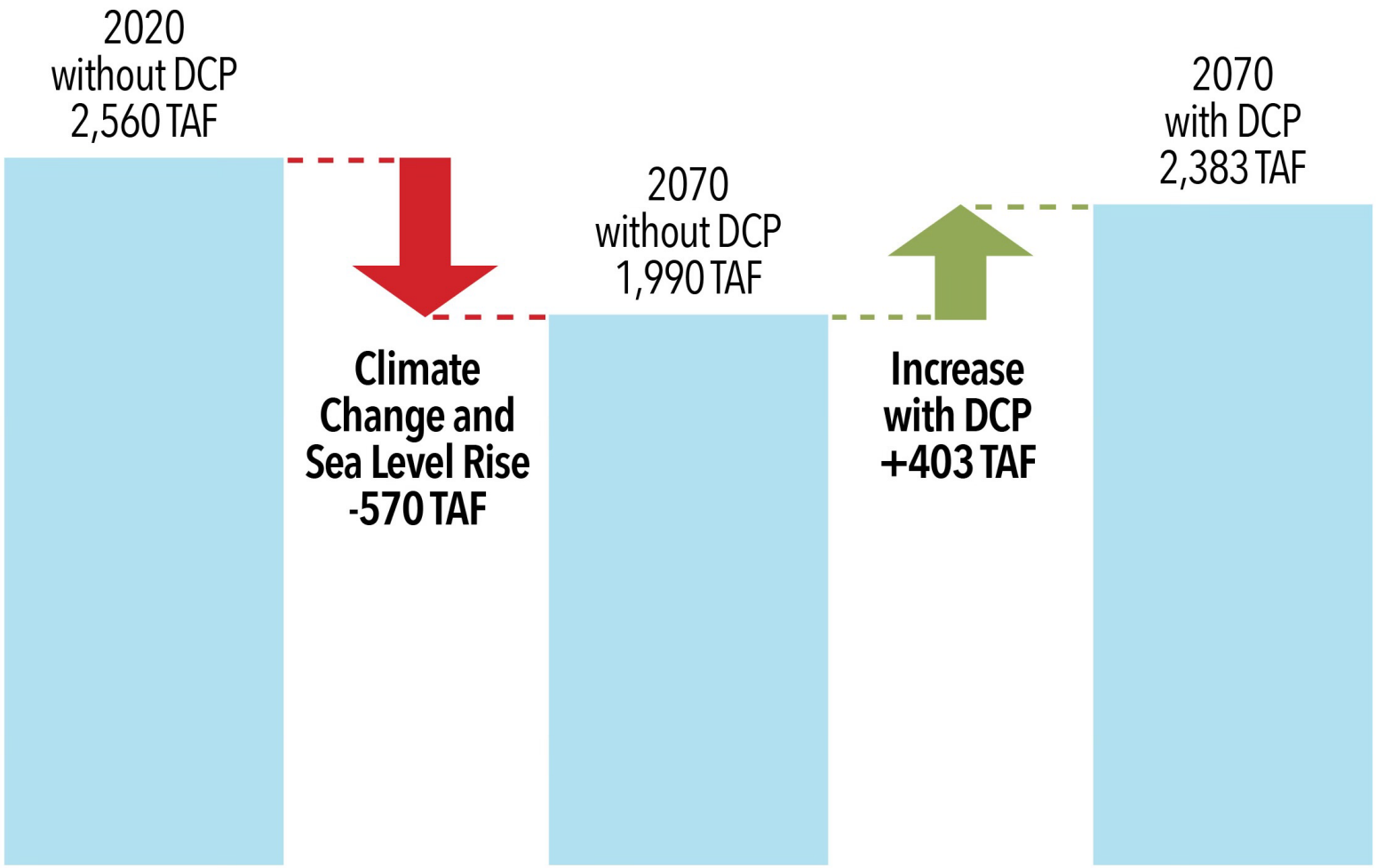


DCP Readily Passes the Benefit-Cost Test

- **Project Benefits:**
  - **Water Supply Reliability and Quality:** Offset negative impacts of climate change on water deliveries
  - **Seismic Reliability:** Maintain deliveries even after major seismic events
- **Project Costs:**
  - DCA Cost estimate (discounted)
  - + additional O&M costs and environmental impacts
- **Benefit Cost Ratio: 2.20**
  - Passes the Benefit-Cost Test
  - **Every $1 spent = $2.20 gained**

Water Supply Benefits

State Water Project Deliveries:



Water Supply Benefits

- **More SWP deliveries allow** agencies to:
  - Fill storage more frequently
  - Enter drought periods with higher reserves
  - Impose fewer periods of mandatory rationing
  - Reduce severity and frequency of shortages
- **Urban**: measured as consumers' willingness to pay to avoid shortages
  - Shortages predominantly estimated by MWD
  - Economic impact based on peer-reviewed economic models
- **Ag**: based on widely-used SWAP model and water market transaction data

Water Quality Benefits

- **Benefits** of reduced salinity for SWP contractors **outweigh costs** of 'less than significant' increase in Delta salinity

- **Salinity Impacts:**
  - **Urban:** Reduces treatment cost, improves taste, useful life of appliances, cost of water softening
  - **Ag:** More efficient water use; reduces use of irrigation water needed to flush salts from root zones

Seismic Benefits

- **Avoiding disruption** to statewide water supply during potentially significant earthquakes **saves money and protects water quality**

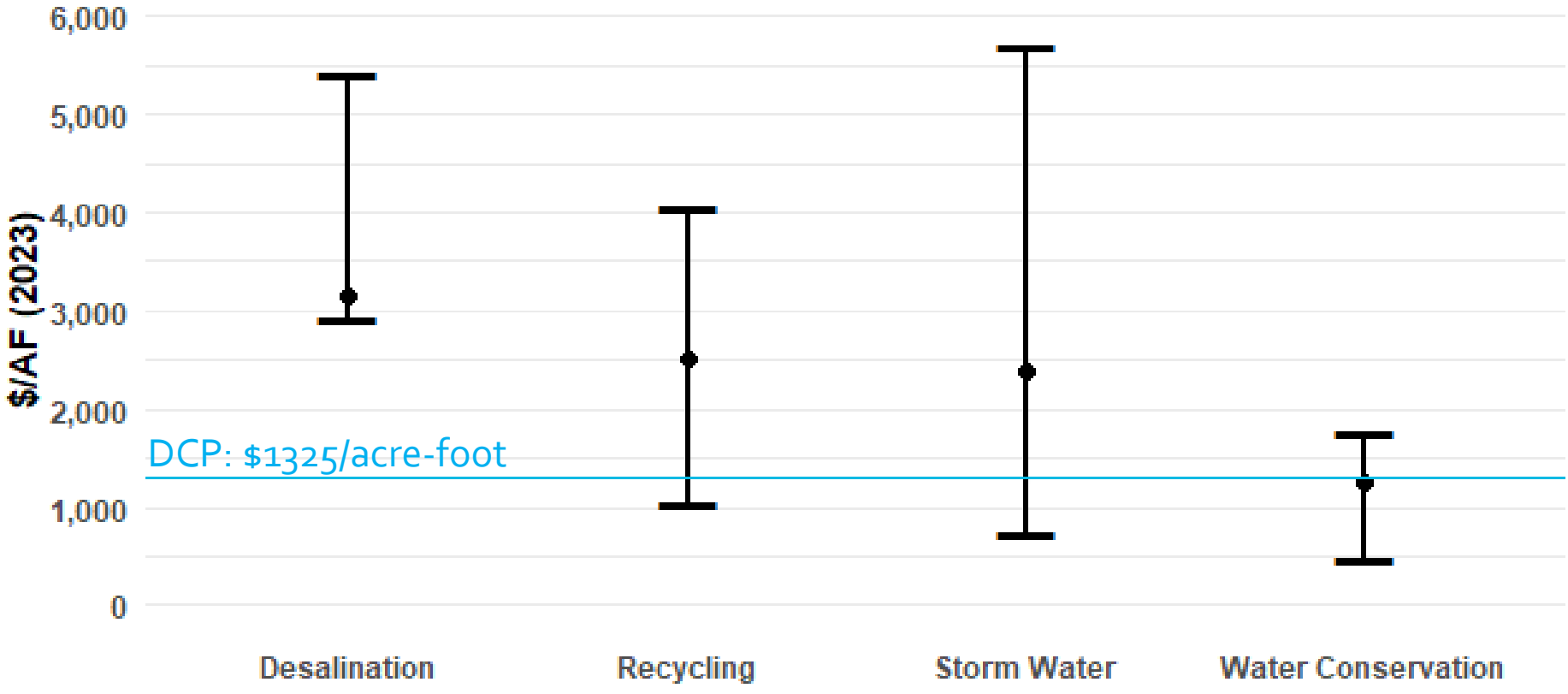
- **Scenario Analyzed: Delta Flood Emergency Management Plan (2018) Scenario 1**
  - 500-year event, 50 levee breaches & 20 islands flooded
  - Economic impacts assessed with water supply reliability and water quality models for urban and agriculture

Positive Benefit-Cost Ratio Across All Climate Scenarios

Sensitivity Analysis

	Main Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	2070 Median 1.8′ SLR	2070 Median 1.8′ SLR & mitigation	2070 Median 3.5′ SLR	2070 Median 3.5′ SLR & mitigation	2040 Median 1.8′ SLR	2040 Central Tendency 1.8′ SLR
Benefit-Cost Ratio	2.20	2.20	2.63	2.45	1.78	1.54

Comparison to Alternative Supplies



Source: Sunding, Browne, Zhu (2023) The Economy of the State Water Project
Constructed using data from previous studies by the Pacific Institute, PPIC and CPUC and updated for inflation
DCP cost does not include South-of-Delta conveyance

Cost of Doing Nothing

- **Cost of Inaction on Climate and Seismic Risk**
  - 22% reduction in deliveries by 2070 (570,000 AF/yr)
- **Direct impacts** of climate change and seismic risk:
  - **Reduced reliability** and flexibility for SWP operations
  - **Water shortages** and mandatory restrictions
  - Ongoing risk of **major seismic disruption**
  - Expensive **alternative supplies**
- **Indirect Impacts** (not evaluated):
  - **Higher rates** for local agencies
  - Impacts on **employment and economic activity** for agricultural economies in Central Valley and urban development in SoCal
  - Higher **food prices**
  - Depletion of **groundwater resources**
- **The cost of inaction** on climate and seismic risk **exceeds the $38B in project benefits**

Bethany Cost Estimate

Benefit Cost Analysis

Stay Informed

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Questions?