



Board Workshop: Delta Water Conveyance

Board of Directors
Item 5
March 26, 2019

Workshop Objectives

- Summarize alternative capacities analyzed to date
- Understand costs and benefits of alternative capacities analyzed to date
- Identify key issues and needs for moving forward

Workshop Outline

- State Water Project
 - Metropolitan's Integrated Water Resources Plan
 - Managing for the Future
- Existing Board Policy Principles
- Comparison of Single Tunnel Alternatives
 - Capacity
 - Cost Estimates
 - Benefits Analysis
- Considerations and Key Issues

State Water Project



Photo courtesy CA DWR

2015 IRP Strategy Continues Diversified Approach

**Achieve Additional
Conservation Savings
1.5 Million Acre-Feet/YR**



**Develop Additional
Local Water Supplies
2.43 Million Acre-Feet/YR**



**Maintain Colorado River
Aqueduct Supplies
900 Thousand Acre-Feet/YR**



**Stabilize
State Water Project Supplies
1.2 Million Acre-Feet/YR**



Managing the System



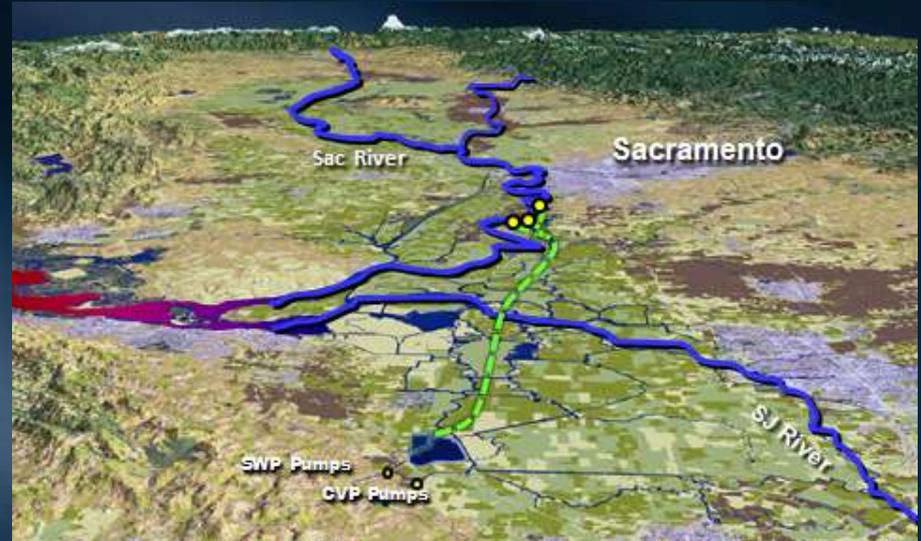
Photo courtesy CA DWR

Comparison of Processes



Existing Operations

- Coordinated Operations Agreement
- Water Quality Control Plan and Voluntary Agreement
- Long-Term Ops, ESA BiOps, & CESA



New Tunnel Conveyance

- New Operations Criteria
- No Harm Agreement
- SWRCB Change in Point of Diversion
- ESA BiOps and CESA
- Project CEQA and NEPA
- Delta Plan Consistency
- Permits

Managing Delta Risks for the Future

Climate Change/
Sea Level Rise



Seismic



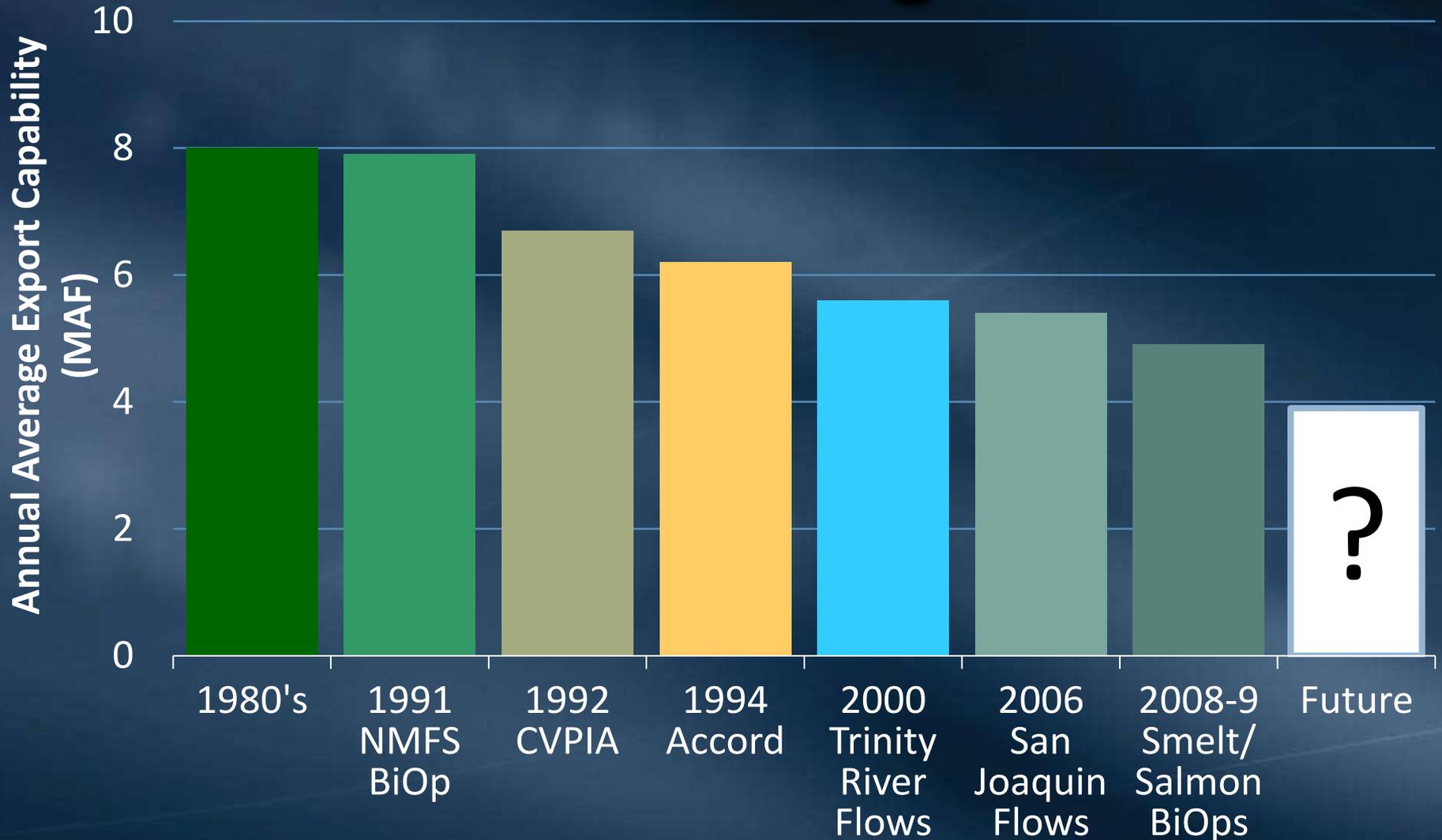
Ecosystem/
Environment



Water Quality



SWP-CVP Export Capability Has Declined Due to Regulations



Existing Board Policies



Metropolitan Board Actions Delta Action Plan Framework (Jun 2007)

- Short-Term Action Plan
 - Secure permits to operate Banks Pumping Plant
 - Implement/Fund Delta Emergency Preparedness & Response Plan
 - Approve key elements of BDCP and Delta Vision
- Mid-Term Action Plan
 - Secure long-term operating permits for SWP under BDCP
 - Develop implementation plan & environmental documentation
 - Implement ecosystem restoration projects
- Long-Term Action Plan
 - Implement long-term comprehensive solution

Metropolitan Board Actions

Delta Conveyance Criteria (Sep 2007)

Enhance Ecosystem Fishery Habitat Throughout Delta

- Provide ability to restore fishery habitat throughout the Delta
- Minimize disruption to tidal food web processes
- Provide for fluctuating salinity levels

Allow Flexible Pumping Operations in a Dynamic Fishery Environment

- Allow the greatest flexibility in meeting water demands by taking water where and when it is least harmful to migrating salmon and in-Delta fish species
- Reduce inherent conflict between fisheries & water conveyance

Provide Water Supply Reliability

- Consistent with DWR's State Water Project Reliability Report (2005)

Improve Export Water Quality

- Reduce bromide and dissolved organic carbon concentrations

Reduce Seismic Risks

- Provide significant reductions in risks to export water supplies from seismic-induced levee failure and flooding

Reduce Climate Change Risks

- Reduce long-term risks from salinity intrusion associated with rising sea levels
- Intake locations should be able to withstand an estimated 1- to 3-foot sea-level rise in the next 100 years

Summary of Planning Alternatives Evaluated to Date

Alternatives Analyzed

- Administrative Drafts and Public Draft
 - 16 BDCP alternatives
 - Capacity 3,000 to 15,000 cfs
 - No Action
 - Fully Isolated Conveyance
 - Through-Delta
 - Dual Conveyance
- Recirculated Public Draft EIR/S
 - 3 additional alternatives
- California WaterFix
 - Preferred alternative



Single Tunnel Options Considered

Single Tunnel Options Considered

- 3,000 cfs
 - One intake (3,000 cfs)
- 6,000 cfs (Staged Approach)
 - Two intakes (3,000 cfs each)

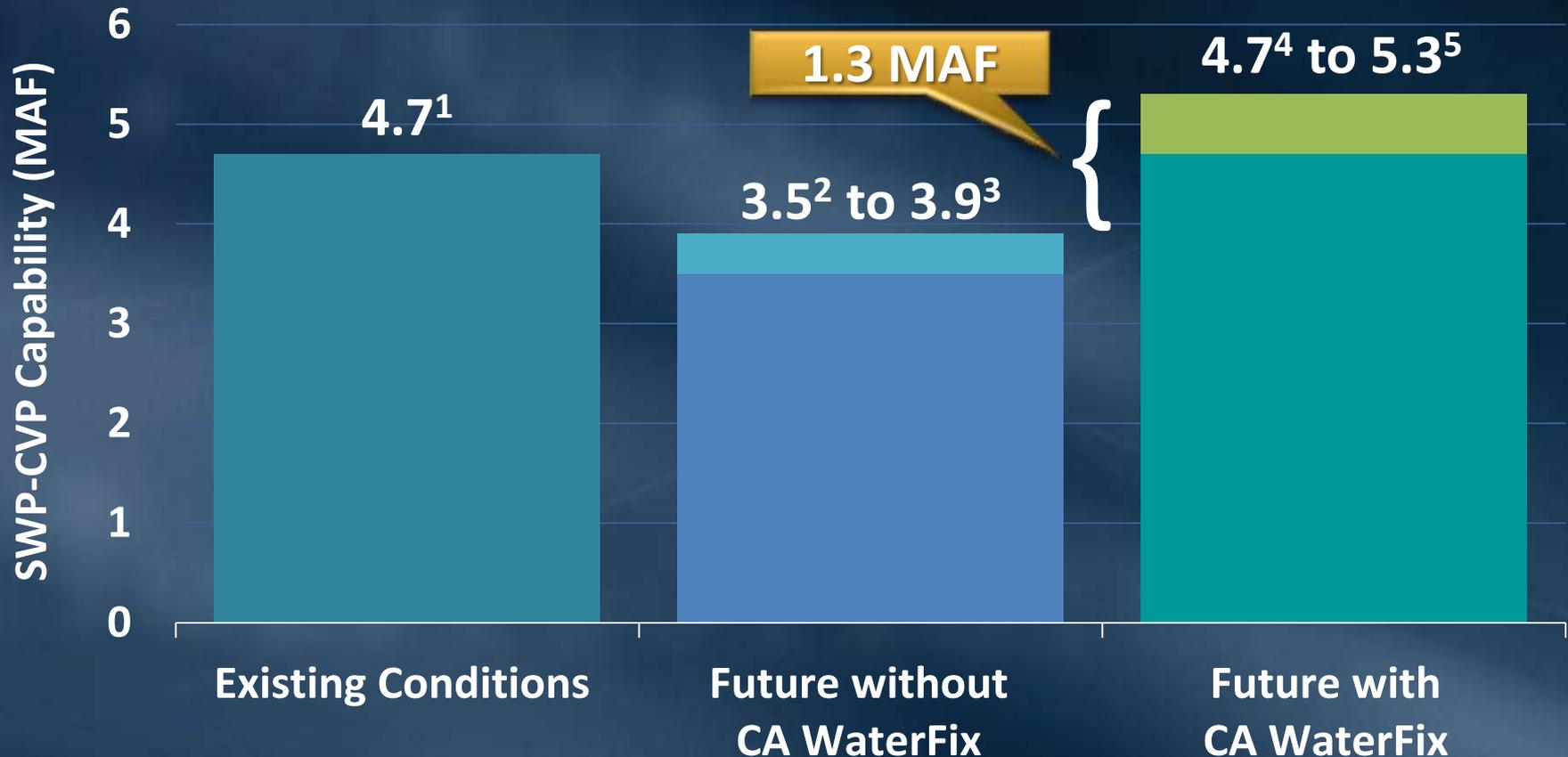
Comparison of Project Alternatives/Capacities

Assumptions

- Cost estimates in 2019 dollars
- Benefits assume SWP and CVP participation

CA WaterFix Water Supply Analysis

Average Delivery Capability With & Without 9,000 cfs Facility



1 California WaterFix EIR/EIS No Action Alternative, existing conditions with 2025 climate change impacts

2 2015 Delivery Capability Report Existing Conveyance High Outflow scenario

3 2015 Delivery Capability Report Existing Conveyance Low Outflow scenario

4 California WaterFix EIR/EIS Alternative 4A-H4, initial operating criteria lower range

5 California WaterFix EIR/EIS Alternative 4A-H3, initial operating criteria upper range

Project Alternatives Comparison

Delivery Capability Benefit



Sac River

Sacramento

North Diversion

Allows diversions during South Delta fish regulatory periods & enhances storm flow capture

South Diversion

Maintains existing SWP/CVP facilities

SWP Pumps
CVP Pumps

Project Alternatives Comparison

Delivery Capability Benefit

Intake Size	Diversion North vs. South
9,000 cfs	51% 49%
6,000 cfs	44% 56%
3,000 cfs	27% 73%

Sacramento

North Diversion

Allows diversions during South Delta fish regulatory periods & enhances storm flow capture

South Diversion

Maintains existing SWP/CVP facilities

SWP Pumps
CVP Pumps

Project Alternatives Comparison

Delivery Capability Benefit

Intake Size	SWP/CVP Incremental Improvement
9,000 cfs	1,300,000 AF
6,000 cfs	900,000 AF
3,000 cfs	500,000 AF

Sacramento

North Diversion

Allows diversions during South Delta fish regulatory periods & enhances storm flow capture

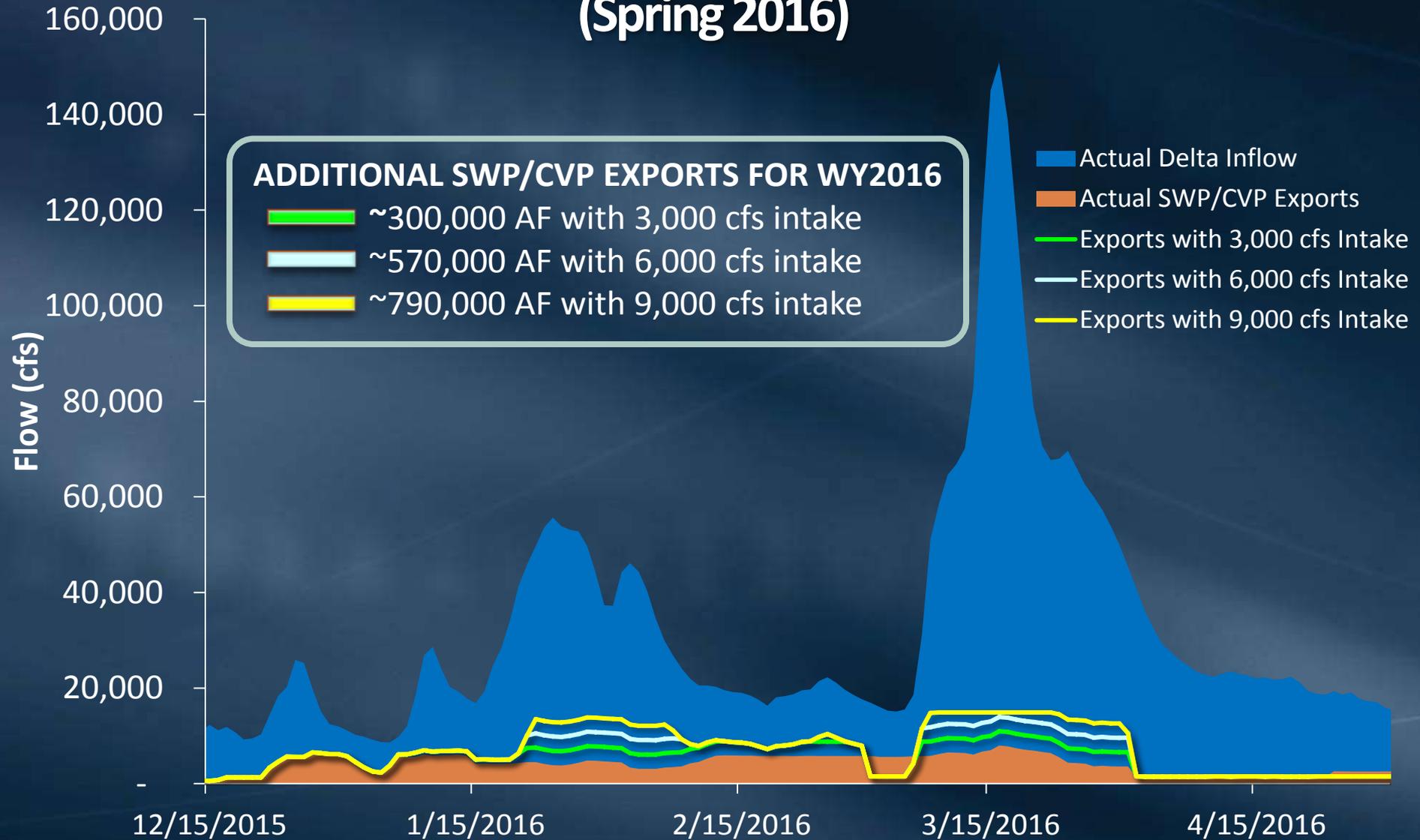
South Diversion

Maintains existing SWP/CVP facilities

SWP Pumps
CVP Pumps

California WaterFix

Export Operation Comparisons (Spring 2016)



Project Alternatives Comparison

Water Quality

Intake Size	Total Dissolved Solids Improvement	Bromide Improvement
9,000 cfs	19%	31%
6,000 cfs	15%	24%
3,000 cfs	TBD	TBD

Sacramento

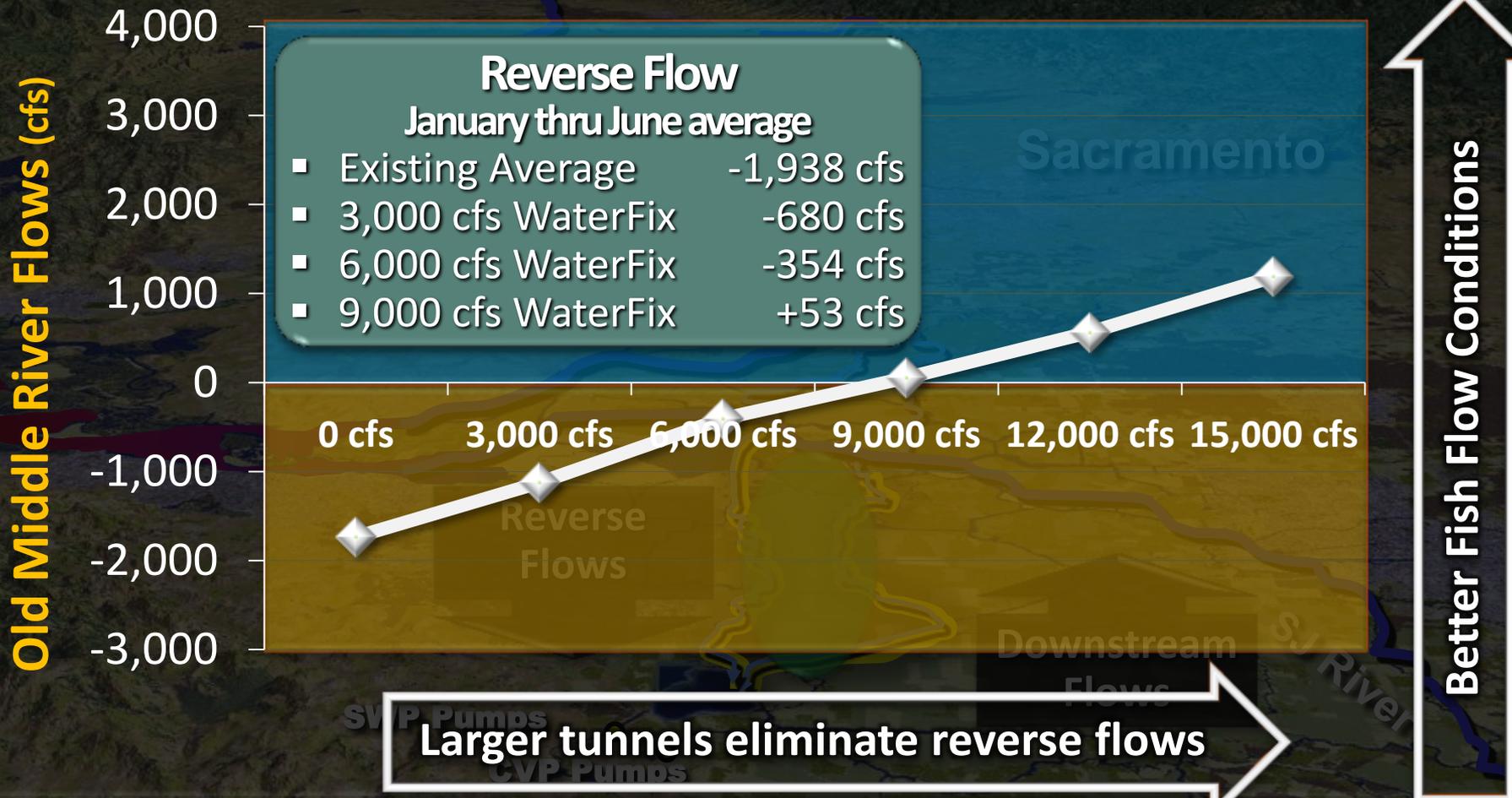
North Diversion
Low in bromide & total dissolved solids

South Diversion
Maintains ability to meet in-Delta water quality & flows

SWP Pumps
CVP Pumps

Project Alternatives Comparison

Environmental



Based on preliminary MWD staff analysis

* Average Old & Middle River flows January thru June

Project Alternatives Comparison

Resiliency to Climate Change and Seismic Events

Intake Size	Delivery Capability After Earthquake
9,000 cfs	3.8 MAF
6,000 cfs	2.9 MAF
3,000 cfs	1.6 MAF

Sacramento

North Diversion
Enhances resiliency to sea level rise and earthquakes

South Diversion
Pumping could be limited by sea level rise and earthquakes

SWP Pumps
CVP Pumps

Project Alternatives Comparison Costs

Capital Cost	MWD Approved 9,000 cfs	6,000 cfs	3,000 cfs
2017 Dollars	\$16.7 B	\$11.1 B	\$9.2 B
2019 Dollars	\$17.7 B	\$11.8 B	\$9.7 B

Initially based on 2014 cost estimates; MWD updated estimates using 3% annual increase

Project Alternatives Comparison Summary

	MWD Approved 9,000 cfs	6,000 cfs	3,000 cfs
Delivery Capability Improvement	1.3 MAF	900,000 AF	500,000 AF
Delivery Capability After Earthquake	3.8 MAF	2.9 MAF	1.6 MAF
Reverse Flow Improvement (Jan-Jun)	+53	-354	-680
Water Quality Improvements			
▪ Total Dissolved Solids	19%	15%	TBD
▪ Bromide	31%	24%	TBD
Transfer Capacity (@50% exceedance)	1.1 MAF	0.8 MAF	TBD

Based on preliminary MWD staff analysis

Observations

- Reduction in cost and capacity are not proportional

	Reduced Capacity	Reduced Cost
From 9,000 cfs to 6,000 cfs	33%	33%
From 6,000 cfs to 3,000 cfs	50%	18%

- Resiliency to respond to regulations, earthquakes, or other South Delta outages

Facility	Amount of Water from South Delta	Reverse Flow Improvement	Delivery Capability After Earthquake
9,000 cfs	49%	+53 cfs	3.8 MAF
6,000 cfs	56%	-354 cfs	2.9 MAF
3,000 cfs	73%	-680 cfs	1.6 MAF

Considerations and Key Issues



Photo courtesy CA DWR

Considerations and Key Issues

- Does the one tunnel conveyance proposal include capacity for potential federal CVP participation?
- What are the “no regrets” common work activities that are prudent to pursue for any of the alternatives?
- What contractor participation level is achievable?
- Continue with Metropolitan’s planned Cost of Service workshops, discussions, and decision process

Key Issues to be Addressed

- Facility
 - State or State/Federal
 - Proposed project
- Funding Approach
- Environmental Documentation Needs
 - CEQA
 - NEPA
- Endangered Species Act Permits
 - Federal
 - State
- SWRCB Change in Point of Diversion
- Delta Stewardship Consistency Determination

