



# Strategic Water Supply Assessment

**BOARD WORKSHOP #8**

**September 27, 2022**



# Workshop Agenda: Strategic Water Supply Assessment

- Project Update
- Alternatives Evaluation Process
- Summary of Initial Evaluation
- Next Steps
- Q&A

# Strategic Water Supply Assessment: Schedule

- **September 27 – Evaluation of Water Management Alternatives**
  - TBD – Public Workshop
  - TBD – Draft Portfolios and Strategies
  - TBD – Recommended Roadmap(s)

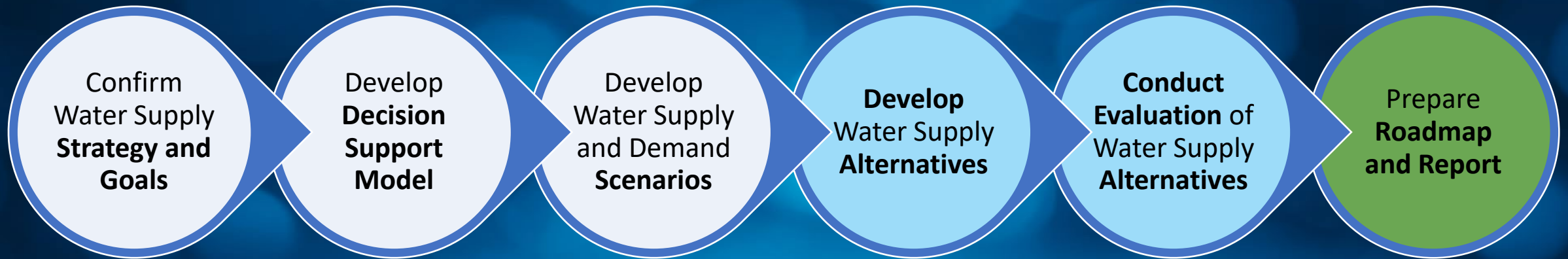
# Process for Assessment

# Key Project Scope Elements

Understanding Current Risks & Establishing Goals

Identifying & Evaluating Alternatives

Recommendations  
& Path Forward

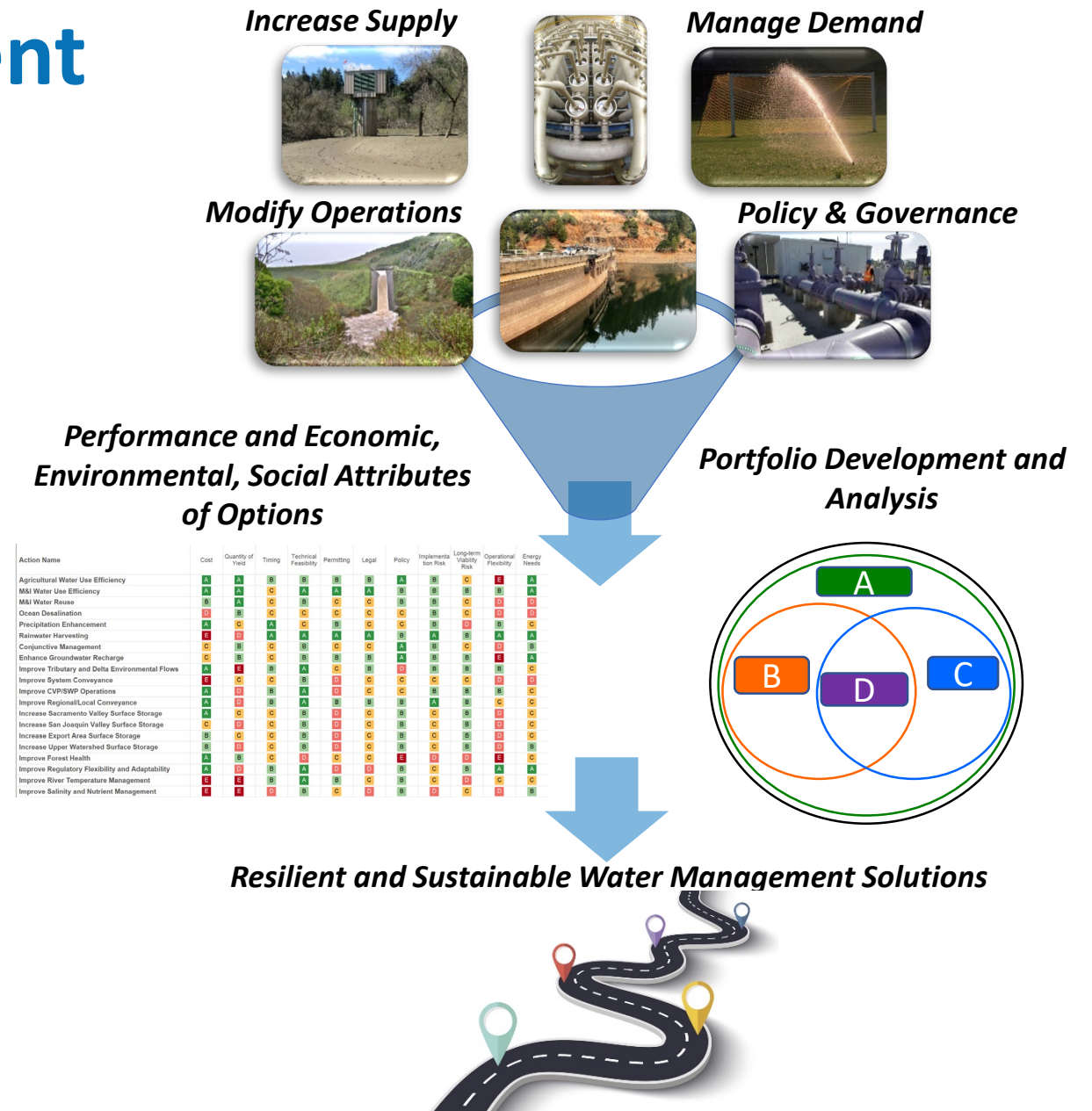


↑  
We are here



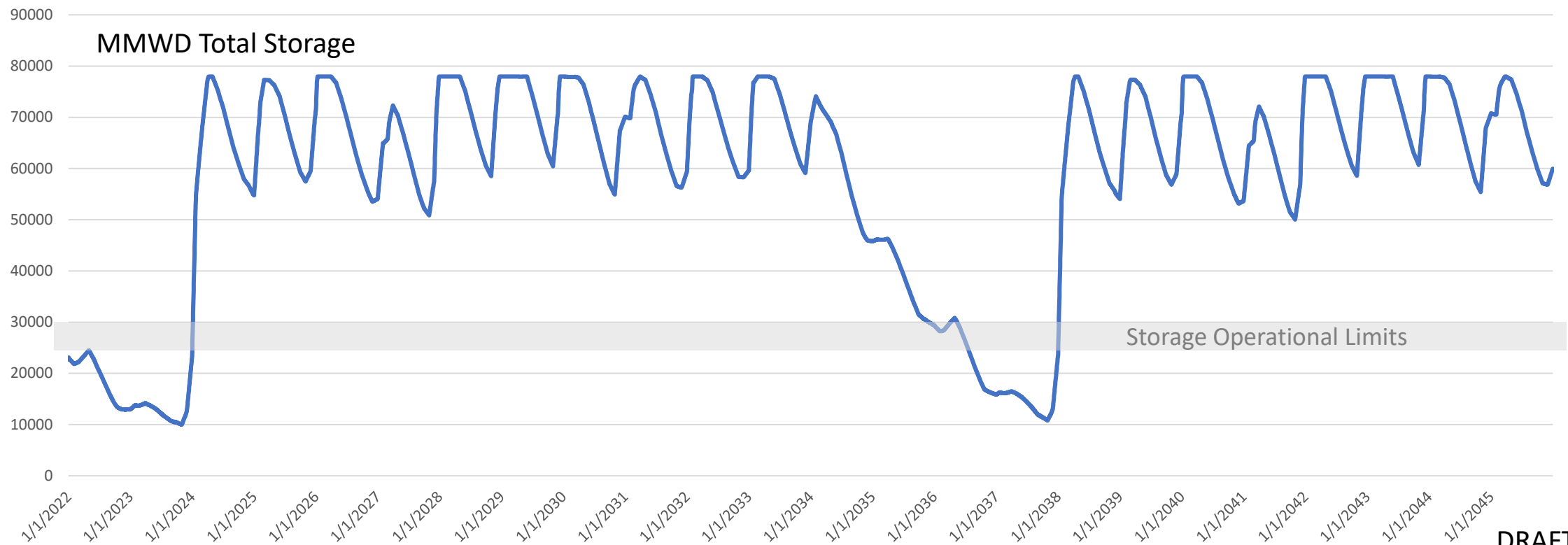
# Water Supply Assessment Process

- Consider a broad range of water management alternatives
- Identify most promising alternatives
- Evaluate alternatives for performance and other economic, environmental, and social criteria
- Explore strategic combinations of alternatives
- Develop roadmap with specific project, pathways, and triggers to achieve resilient and sustainable solutions



# Scenario 3 – Planning Level Simulations Provide Estimate of Deficit

Scenario	Max. Deficit Duration	Annual Deficit (AFY)
	4 years	



# Alternatives Evaluation Process



# Goals of Evaluation Process

- Help discern differences between alternatives
- Illustrate positive and challenging characteristics associated with alternatives
- Identify synergies and challenges of alternatives
- Support eventual strategy and portfolio development process

# Evaluation of Water Management Alternatives

- Performance Criteria
  - How well do each of the alternatives resolve system performance challenges during critical dry period?
    - Manage MMWD reservoir storage above operational reserve storage (30,000 AF)
    - Reduce potential delivery shortages
- Evaluation Criteria
  - How to compare alternatives that have similar levels of “performance”?
- Application Approach
  - How do individual alternatives perform?
  - What combination of alternatives could be considered?
  - What portfolio strategy is most strategic?

# Evaluation Criteria

Criteria	Description	Measurement
<b>Yield</b>	Estimate of new supply or reduced demand option can provide during dry years.	AF
<b>Cost</b>	Cost per acre-foot of supply or demand reduction.	\$/AFY
<b>Timing</b>	Estimate of time required before project could be implemented considering planning, design, permitting, and implementation.	Years before alternative could begin operation
<b>Reliability</b>	Reliability of supply during periods of dry year need	5-pt qualitative scale
<b>Flexibility</b>	Degree to which the option could be operated (or implemented) across a wide range of hydrologic conditions by having ability to adjust the magnitude of operation each year to meet required conditions	5-pt qualitative scale
<b>Environmental</b>	Anticipated positive or negative impacts on the natural environment.	5-pt qualitative scale
<b>Feasibility</b>	Maturity of the concept and technical ability to implement.	5-pt qualitative scale
<b>Energy</b>	Estimated change in energy required to implement and operate.	KWH/AF
<b>Permitting/Legal</b>	List of permits required and status if option has begun permitting process.	5-pt qualitative scale
<b>Social</b>	Description of positive or negative socioeconomic effects.	5-pt qualitative scale
<b>Jurisdiction</b>	Primary jurisdiction for implementation	5-pt qualitative scale
<b>Public Acceptance</b>	Anticipated public acceptance	5-pt qualitative scale

# Initial Evaluation Summary

# Water Management Alternatives Considered

- Sonoma-Marin Partnerships
- Local Surface Storage
- Water Purchases with Conveyance through Bay Interties
- Desalination
- Recycled Water
- Water Conservation

# Sonoma-Water Partnerships

Cost (\$/AF) and Yield (AFY) Information



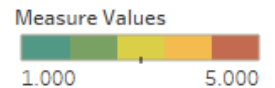
Reference Location of Alternatives



Evaluation Summary of Alternatives

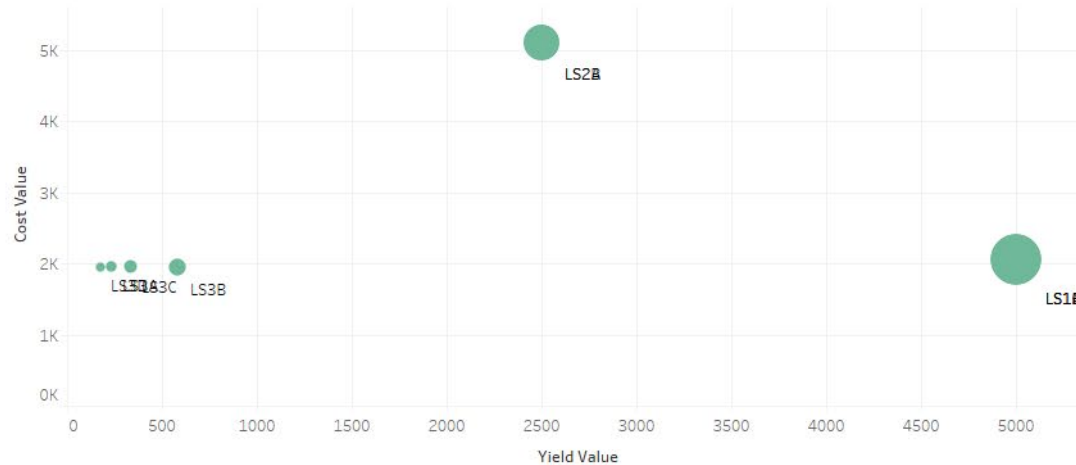
Code	Name	Yield Rating	Cost Rating	Timing Rating	Reliability Rating	Flexibility Rating	Feasibility Rating	Environmental Rating	Energy Rating	Permitting/Legal Rating	Social Rating	Jurisdiction Rating	Public Acceptance Rating
SM1	Maximize Use of Sonoma Water - Existing Facilities	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
SM2A	Maximize Use of Sonoma Water - Resolve Bottlenecks	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
SM2B	Maximize Use of Sonoma Water - Resolve Bottlenecks+South Transmission ..	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Green	Green	Green
SM3A	Maximize Use of Sonoma Water - Dedicated Conveyance Stafford to Nicasio	Red	Yellow	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green
SM3B	Maximize Use of Sonoma Water - Dedicated Conveyance Kastania to Nicasio	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
SM3C	Maximize Use of Sonoma Water - Dedicated Conveyance Cotati to Soulajule	Green	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
SM4	Regional Groundwater Bank	Green	Green	Yellow	Green	Green	Green	Green	Yellow	Green	Green	Yellow	Green

- **Maximizing use of Sonoma Water** supply provides moderate additional supply at low cost; immediate implementation; highly flexible
- **Resolving conveyance bottlenecks** will increase supply at moderate cost; reliable at lower quantities in drier years; flexible operations; and low environmental and permitting impacts
- **Dedicated conveyance to MMWD storage** can increase yield at higher cost; improves reliability; modest environmental, permitting, and jurisdiction complexities with new conveyance

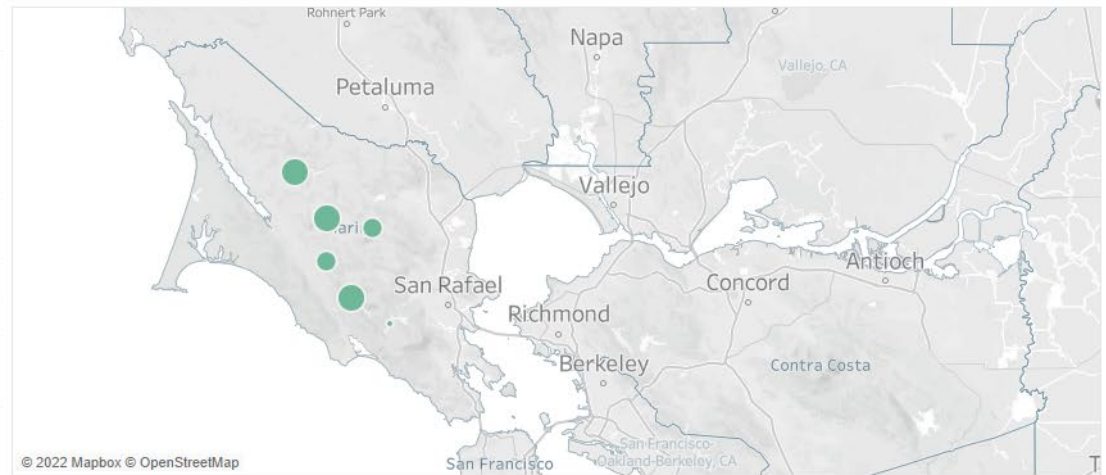


# Local Storage Augmentation

Cost (\$/AF) and Yield (AFY) Information



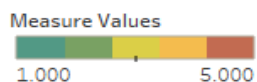
Reference Location of Alternatives



Evaluation Summary of Alternatives

Code	Name	Yield Rating	Cost Rating	Timing Rating	Reliability Rating	Flexibility Rating	Feasibility Rating	Environmental Rating	Energy Rating	Permitting/Legal Rating	Social Rating	Jurisdiction Rating	Public Acceptance Rating
LS1A	Soulajule Enlargement	Green	Yellow	Orange	Green	Orange	Yellow	Orange	Green	Orange	Red	Orange	Orange
LS1B	Nicasio Enlargement	Green	Yellow	Orange	Green	Orange	Yellow	Orange	Green	Orange	Red	Orange	Orange
LS1C	Kent Enlargement	Green	Yellow	Orange	Green	Orange	Yellow	Orange	Green	Orange	Yellow	Orange	Yellow
LS2A	Halleck Reservoir	Yellow	Red	Red	Yellow	Red	Yellow	Red	Green	Red	Red	Red	Red
LS2B	Devil's Gulch Reservoir	Yellow	Red	Red	Yellow	Red	Yellow	Red	Green	Red	Red	Red	Red
LS3A	Movable Spillway Gates - Soulajule	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
LS3B	Movable Spillway Gates - Nicasio	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
LS3C	Movable Spillway Gates - Kent	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
LS3D	Movable Spillway Gates - Alpine	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

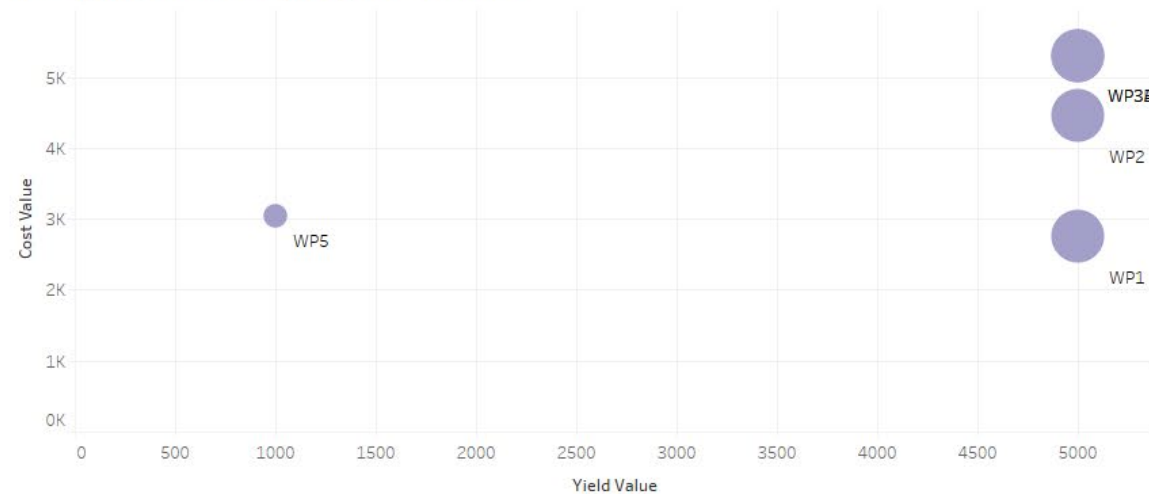
- **Storage augmentation** will produce new supply at moderate cost; reliable in most years; low energy and carbon footprint; potential for moderate to high environmental and social impacts
- **New storage** is likely to produce lower yields at higher costs; environmental impacts and permitting challenges are likely high
- **Movable spillway gates** will generate relatively low to moderate yield at low cost; early implementation; high flexibility; likely lower environmental and permitting challenges





# Water Purchases with Conveyance through Bay Interties

Cost (\$/AF) and Yield (AFY) Information



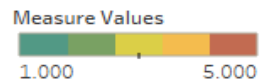
Reference Location of Alternatives



Evaluation Summary of Alternatives

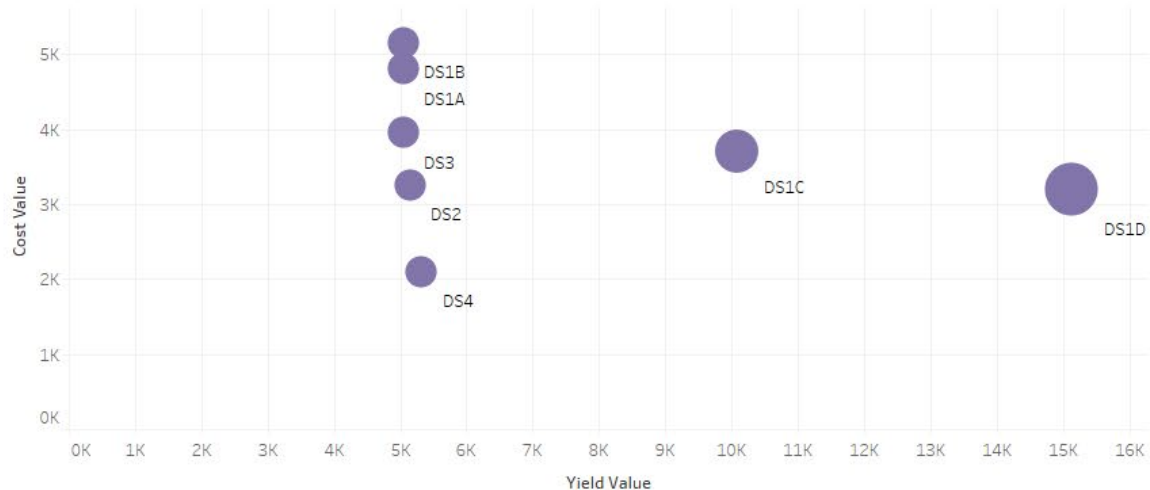
Code	Name	Yield Rating	Cost Rating	Timing Rating	Reliability Rating	Flexibility Rating	Feasibility Rating	Environmental Rating	Energy Rating	Permitting/Legal Rating	Social Rating	Jurisdiction Rating	Public Acceptance Rating
WP1	EBMUD Intertie	Green	Red	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Green
WP2	CCWD Intertie	Green	Red	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Green
WP3A	NBA Intertie - MMWD	Green	Red	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Green
WP3B	NBA Intertie - Sonoma Aqueduct	Green	Red	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Green
WP5	SFPUC Intertie	Yellow	Red	Yellow	Yellow	Yellow	Green	Yellow	Green	Yellow	Yellow	Red	Yellow

- **Water Purchases** provide moderate additional supply; high flexibility; reliability is uncertain in critical year market and Delta regulations; complex permitting involving multiple jurisdictions
- Dependence on use of third party conveyance and treatment increases uncertainty and cost
- Delivery to MMWD involves significant new conveyance with increased costs



# Desalination

Cost (\$/AF) and Yield (AFY) Information



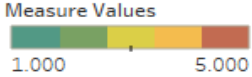
Reference Location of Alternatives



Evaluation Summary of Alternatives

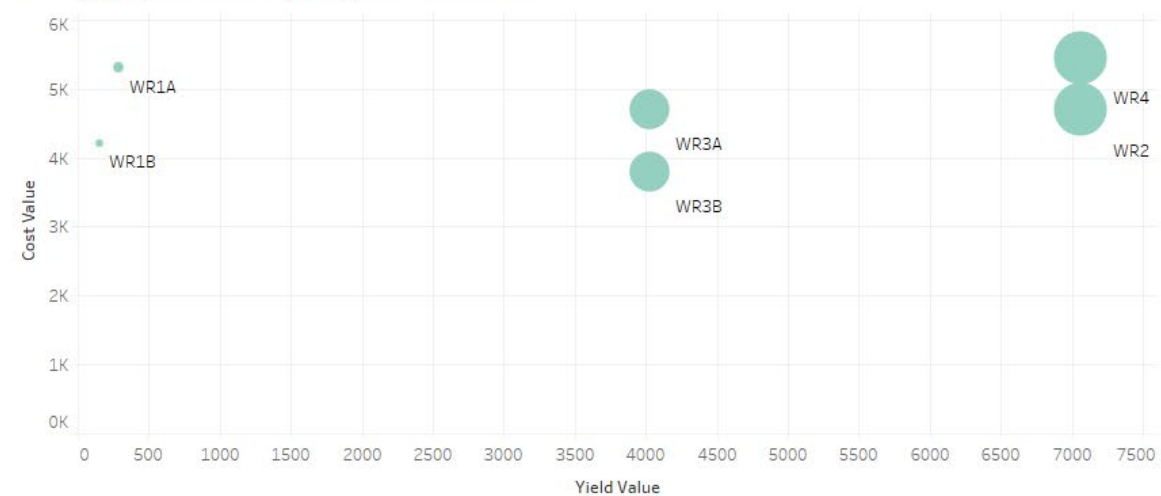
Code	Name	Yield Rating	Cost Rating	Timing Rating	Reliability Rating	Flexibility Rating	Feasibility Rating	Environmental Rating	Energy Rating	Permitting/Legal Rating	Social Rating	Jurisdiction Rating	Public Acceptance Rating
DS1A	Marin Regional Desalination Facility- 5 MGD Stand Alone	Green	Red	Yellow	Green	Yellow	Green	Yellow	Yellow	Red	Green	Green	Yellow
DS1B	Marin Regional Desalination Facility - 5 MGD Expandable	Green	Red	Yellow	Green	Yellow	Green	Yellow	Yellow	Red	Green	Green	Yellow
DS1C	Marin Regional Desalination Facility - 10 MGD Expandable	Green	Red	Yellow	Green	Yellow	Green	Yellow	Yellow	Red	Green	Green	Yellow
DS1D	Marin Regional Desalination Facility - 15 MGD	Green	Red	Yellow	Green	Yellow	Green	Yellow	Yellow	Red	Green	Green	Yellow
DS2	Containerized Desalination Facility	Green	Red	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red	Green	Green	Yellow
DS3	Bay Area Regional Desalination Facility	Green	Red	Yellow	Green	Yellow	Green	Yellow	Yellow	Red	Green	Green	Yellow
DS4	Petaluma Brackish Groundwater Desalination Facility	Green	Yellow	Yellow	Green	Yellow	Green	Yellow	Green	Yellow	Green	Yellow	Green

- Desalination alternatives** will produce high new supply at high cost; highly reliable supply; less flexible; higher energy use, environmental impact, and permitting complexity; requires vote by customers
- Petaluma Brackish Groundwater Desalination** likely to produce moderate to high supply at moderate cost; implementable more quickly; likely moderate impacts; reliability is not yet known (conceptual nature of alternative)



# Water Reuse

Cost (\$/AF) and Yield (AFY) Information



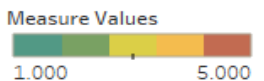
Reference Location of Alternatives



Evaluation Summary of Alternatives

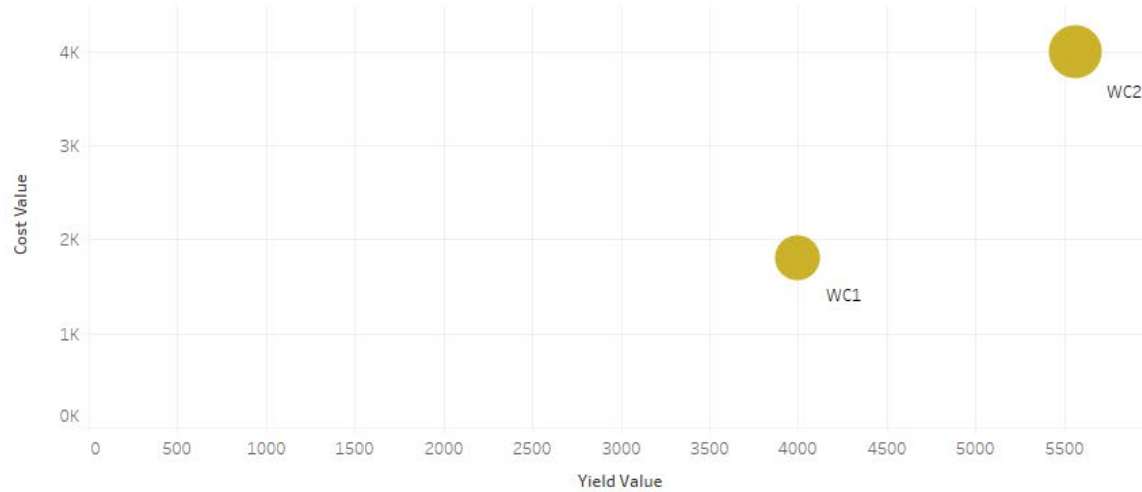
Code	Name	Yield Rating	Cost Rating	Timing Rating	Reliability Rating	Flexibility Rating	Feasibility Rating	Environmental Rating	Energy Rating	Permitting/Legal Rating	Social Rating	Jurisdiction Rating	Public Acceptance Rating
WR1A	Recycled Water Expansion - Peacock Gap	High	High	Low	High	Low	High	High	Low	High	High	High	High
WR1B	Recycled Water Expansion - San Quentin	High	High	Low	High	Low	High	High	Low	High	High	High	High
WR2	Regional Indirect Potable Reuse (IPR)	Low	High	High	High	High	Low	Low	High	Low	High	High	Low
WR3A	CMSA Direct Potable Reuse (DPR) - Raw Water Augmentation	High	High	Low	High	Low	Low	Low	High	Low	High	High	Low
WR3B	CMSA Direct Potable Reuse (DPR) - Treated Water Augmentation	High	High	Low	High	Low	Low	Low	High	Low	High	High	Low
WR4	Regional Direct Potable Reuse (DPR)	Low	High	High	High	High	Low	Low	High	Low	High	High	Low

- **Recycled Water projects** provide low yield at high costs; reliability is high; negative impacts are unlikely
- **IPR and DPR alternatives** provide high yield at high costs; reliability is high; moderate to high energy use and environmental challenges; permitting is likely complex; DPR is further challenged with yet unestablished state regulations; first of kind project



# Water Conservation

Cost (\$/AF) and Yield (AFY) Information



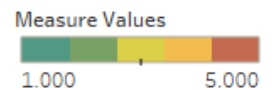
Reference Location of Alternatives



Evaluation Summary of Alternatives

Code	Name	Yield Rating	Cost Rating	Timing Rating	Reliability Rating	Flexibility Rating	Feasibility Rating	Environmental Rating	Energy Rating	Permitting/Legal Rating	Social Rating	Jurisdiction Rating	Public Acceptance Rating
WC1	Water Conservation Program	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
WC2	Regulatory Driven Program	Green	Red	Green	Green	Green	Green	Green	Green	Green	Green	Green	Yellow

- Moderate supply (demand reduction); early implementation; highly flexible; and positive environmental, energy, and permitting; jurisdiction within Marin
- **Larger program** will increase yield at higher cost, may be less reliable, could face public acceptance challenges



# Moving toward Strategies and Portfolios



# Moving Toward Strategies and Portfolios

- **Strategies** – a particular plan of action or policy designed to achieve the overall water management goals
- **Portfolios** – a combination of actions designed to implement a particular strategy
- Recognizing no singular alternative is likely to achieve all goals
  - How to balance long-term and shorter-term actions?
  - Are some alternatives synergistic? Can one set of alternatives amplify the benefit of other alternatives or preclude others?
  - Develop select strategies and associated portfolios for testing performance

# Next Steps



# Next Steps

- Integration of water management alternatives into decision support model
- Structuring strategies and portfolios and roadmap strategies
- Evaluate the performance of portfolios across range of scenarios
- Analysis of financial impact
- Upcoming schedule – dates TBD
  - Public Workshop
  - Draft Portfolios and Strategies
  - Recommended Roadmap(s)