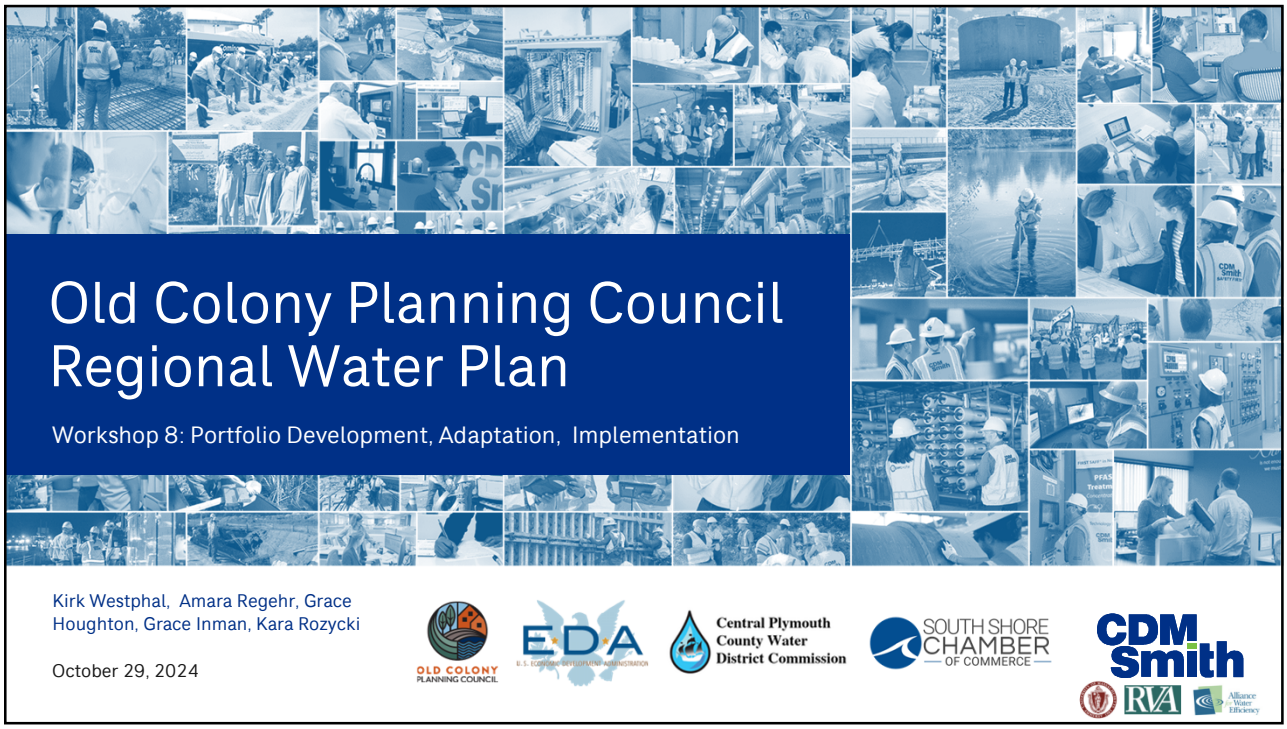


1

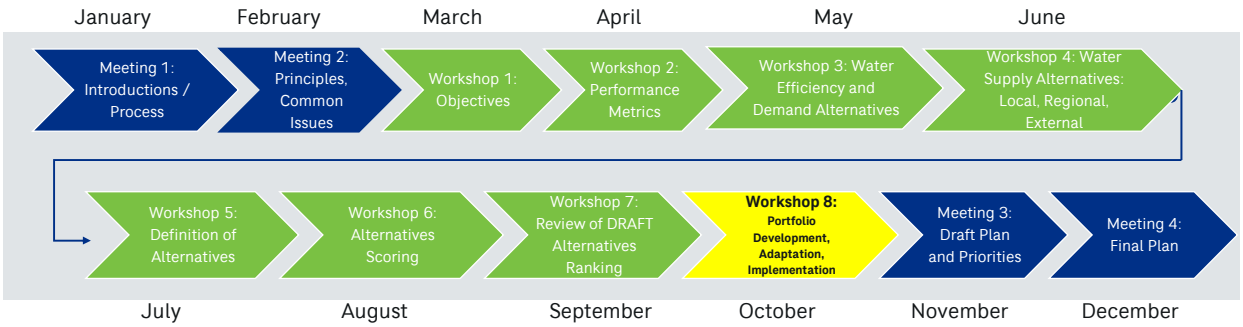
Agenda

1. Risk Considerations
2. Updated Alternatives Scoring
3. Draft Portfolio Presentation
   - Break
4. Discussion of Implementation of Best Practice Recommendations
5. Report out on Small Group Discussions

2

3

Overview of Regional Water Plan Process



OCPC Regional Water Plan 4

4

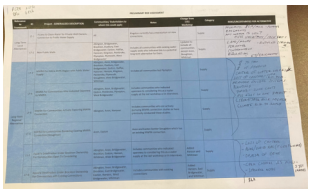
Tools to Help Guide Plan Recommendations

5

Risk Considerations

6

Risk Considerations



Small group discussion Workshop 6 — 1

CDM Smith's expertise — 2

UMassAmherst College of Engineering

Dr. Casey Brown — 3

Risk Matrix
Help understand tradeoffs with different alternatives

7

Risk Matrix

Project	Climate Uncertainty	Contamination	Environmental Risks	Funding or Funding Delays	Control over Resources and Systems	Operational Risks	Practicality (physical, political, regulatory, etc.)
Access to Clean Water for Private Well Owners - Connection to Public Water Supply			Low	High	Medium		High
New Public Wells (short and long term)	Low	High	Medium	Low			Low
MWRA Alternatives	Low		High	High	High	Medium	High
Aquaria Desalination Alternatives			High	High	Medium	Low	Medium
New Emergency Interconnections						Low	Low
Reclaimed Water for Non-Potable Uses		Medium		High		Medium	High
Conduct, Validate, and Act on Annual AWWA Water Loss Audits							Low
Rebates for Leak Detection Devices for Customer-Side Leak Detection after Meter							Low
Advanced Metering Infrastructure				Low		Low	Medium
Improve Increasing Block Rate Designs or Billing Intervals							Low

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Project - GENERALIZED DESCRIPTION	Risk and Vulnerability Matrix													
	Climate Uncertainty		Contamination		Environmental Risks		Funding or Funding Delays		Control over Resources and Systems		Operational Risks		Actual Practicality (physical, political, regulatory, etc.)	
	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score
Access to Clean Water for Private Well Owners - Connection to Public Water Supply					Higher localized drawdown near public wells	Likley to occur, but low impact because maximum withdrawal limits in place. Score = Low	Proximity and Cost (up to $2M per mile).	Score= High	homeowners lose control over their supply.	Score= medium			Uncertain amounts of public water available. Uncertainty about future legislation	Score=High
New Public Wells (short and long term	Low groundwater due to drought	Score = low	PFAS or other contaminants in new wells.	Likley, Score = High	Reduced streamflow, more local drawdown.	Score = Medium	High Cost / Limited Land (long term only). However most risks/uncertainties are known and expected	Score=low					Regulatory and EJ stasndards / easements	score=low
MWRA	Uncertain risks if MWRA begins to supply nearly all of its available water to North Shore, South Shore, and Metro West. Maybe effected by drought	Score = Low			Major pipeline construction work. Additioanl withdrawals from source, interbasin transfer	Score = high	Extremely high cost and uncertain cost models Abandonment of all prior investments in water	Score =High	Loss of control over self-supply resources	Utlimate loss of control, Score = high	Cyber Attack Vulnerability (going after large providers) Overreliance on single source Potential Blending issues if not full supply	Score =medium	Interbasin Transfer Permit would be a challenge. Limited political will Would extend existing or planned connections.	score=high
Aquaria Desalination					Brine disposal uncertainty (though already processes for current use) Spawning needs and uncertain reliability during short periods	Score = High	SRF funding with partial principal forgiveness uncertain, but pursuing. Sale price still to be negotiated.	whole ordeal has proven to be Tricky. score = High	potential Loss of control over self-supply resources	Step Below MWRA, Score=medium	Chemical changes in pipes could have adverse impacts	score=low	All months of the year?	score=medium

Project - GENERALIZED DESCRIPTION	Risk and Vulnerability Matrix													
	Climate Uncertainty		Contamination		Environmental Risks		Funding or Funding Delays		Control over Resources and Systems		Operational Risks		Actual Practicality (physical, political, regulatory, etc.)	
	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score	Narrative	Score
New Emergency Interconnections											Requires agreement on regional treatment processes Hydraulic challenges May require updated IMAs.	score=low	Emergency ok, but long-term shortages are regional (nothing to share) May not have political willpower	Score=low
Reclaimed Water for Non-Potable Uses			Possible PFAS cross-contamination with drinking water.General uncertainty about water quality standards for reclaimed water in MA. Regulations have not been developed	Score = medium			Local funding or grants - may not be a high priority	Score =High.			Requires all new SEPARATE pipelines for isolated uses.	Score= Medium	Last resort due to negative public perception. Great deal of uncertainty around permitting reclaimed recharge in MA.	score=high
Conduct, Validate, and Act on Annual AWWA Water Loss Audits													in house staffing support	score=low
Rebates for Leak Detection Devices for Customer-Side Leak Detection after Meter													Vandalism (unlikley), perception of increased government scrutiny, staffing	score=low
Advanced Metering Infrastructure							High Cost. Major effort and will not pay for itself.	Score=Low			Could backfire if people begin autopay and no longer look at bills.	score =low	Increased vulnerability to cyber attack with addition of another digital system. damage to property during installation, Staffing	score=medium
Improve Increasing Block Rate Designs or Billing Intervals													Staffing shortage. lack of support from ratepayers, lack of political will	score=low

Updated Alternatives Scoring

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Water Quality Metric Changes

Criteria	Criteria Metric	Metric Measurement
Drinking Water Quality	Volume of PFAS Impacted Supply Reduced	Quantified MGD yield (Highest = Best Score)
	Reduction in Long-Term Water Quality Risk	1-3 Score (1=Worst Score, 3=Best Score) *1 = High risk for future water quality concerns* *2 = neutral risk* *3 = low risk of future water quality concerns*

Category	Project General Description	Drinking Water Quality	
		Volume of pfas impacted supply reduced	Long-term water quality risk reduction
		MGD	Qual 1-3
Long-Term Local	Private Well Connection	0.00	2
	Long Term Wells	0.00	1
Long-Term Regional	MWRA for All - Permitted Amount	0.00	3
	MWRA for All - Target Amount	0.00	3
	MWRA for Open Communities	0.00	3
	MWRA for Actively Pursuing Communities	0.00	3
	MWRA for Bordering Communities	1.94	3
	Desal 1 - Mix	4.02	3
	Desal 2 - West	5.00	3
	Desal 3 - East	4.67	3
	Interconnections	0.00	2
	Reclaimed Non-Potable Use	0.00	2
Short Term Local	Water Loss Audit	0.00	2
	Leak Detection Rebates	0.00	2
	AMI	0.00	2
	Billing Improvements	0.00	2
	Short Term Wells	0.00	1
	Brockton Desal Use	1.00	3

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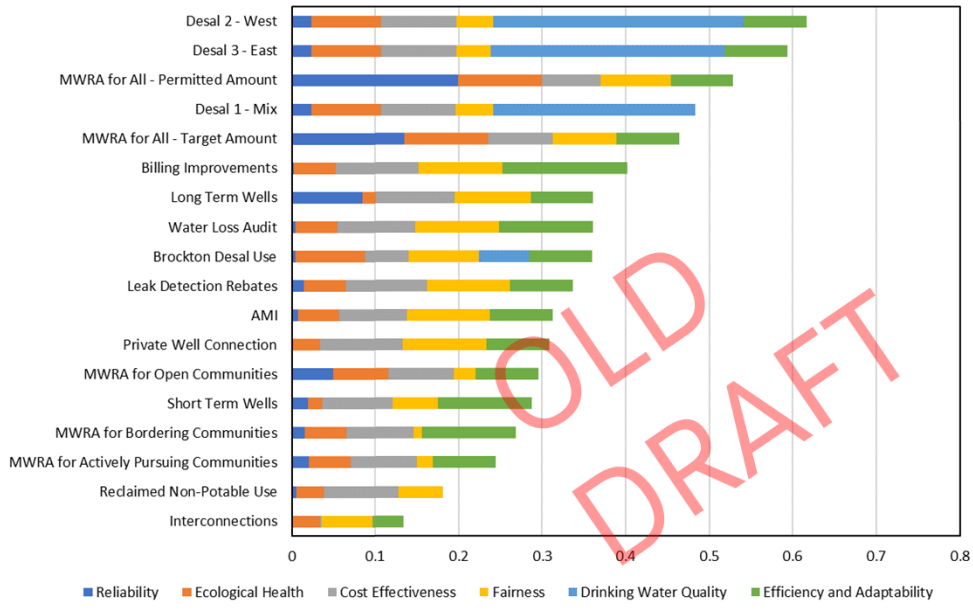
OLD Scoring Results using Average Stakeholder Weights



Draft Results

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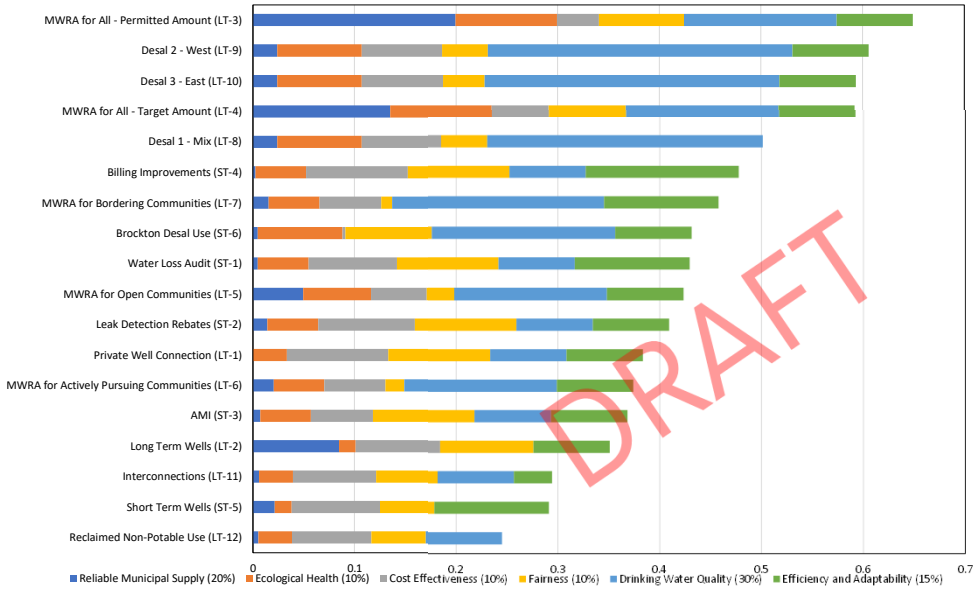
Revised Scoring Results using Average Stakeholder Weights



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Revised Scoring Results

Alternative Name	Mean	A	B	C	D	E	F	G	H	I	J	K	L	M	N
MWRA for All - Permitted Amount	0.65	0.71	0.60	0.62	0.50	0.70	0.62	0.70	0.64	0.60	0.66	0.65	0.67	0.58	0.80
Desal 2 - West	0.61	0.48	0.55	0.60	1.00	0.52	0.58	0.56	0.43	0.59	0.59	0.55	0.83	0.73	0.59
Desal 3 - East	0.59	0.47	0.54	0.59	0.97	0.51	0.57	0.55	0.42	0.59	0.58	0.53	0.82	0.71	0.58
MWRA for All - Target Amount	0.59	0.60	0.56	0.59	0.50	0.61	0.57	0.58	0.56	0.56	0.60	0.58	0.67	0.55	0.74
Desal 1 - Mix	0.50	0.36	0.43	0.50	0.90	0.44	0.48	0.51	0.33	0.49	0.49	0.42	0.75	0.65	0.53
Billing Improvements	0.48	0.45	0.50	0.59	0.25	0.39	0.49	0.26	0.47	0.49	0.50	0.49	0.41	0.40	0.48
MWRA for Bordering Communities	0.46	0.39	0.45	0.46	0.69	0.39	0.46	0.40	0.34	0.48	0.43	0.44	0.57	0.52	0.40
Brockton Desal Use	0.43	0.36	0.36	0.38	0.60	0.34	0.32	0.32	0.34	0.28	0.44	0.39	0.66	0.42	0.53
Water Loss Audit	0.43	0.39	0.44	0.52	0.25	0.36	0.43	0.25	0.41	0.42	0.45	0.43	0.39	0.37	0.45
MWRA for Open Communities	0.42	0.39	0.41	0.43	0.50	0.40	0.42	0.39	0.35	0.43	0.41	0.40	0.53	0.44	0.47
Leak Detection Rebates	0.41	0.37	0.41	0.51	0.25	0.35	0.42	0.26	0.39	0.42	0.44	0.40	0.37	0.38	0.44
Private Well Connection	0.38	0.34	0.38	0.50	0.25	0.32	0.40	0.23	0.36	0.40	0.41	0.38	0.31	0.37	0.36
MWRA for Actively Pursuing Communities	0.37	0.32	0.37	0.39	0.50	0.33	0.38	0.32	0.29	0.40	0.36	0.35	0.47	0.41	0.37
AMI	0.37	0.33	0.35	0.43	0.25	0.30	0.34	0.22	0.35	0.32	0.40	0.36	0.37	0.32	0.41
Long Term Wells	0.35	0.41	0.37	0.45	0.00	0.36	0.40	0.28	0.40	0.40	0.38	0.39	0.13	0.27	0.33
Interconnections	0.29	0.25	0.29	0.38	0.25	0.26	0.32	0.21	0.26	0.33	0.31	0.28	0.28	0.31	0.29
Short Term Wells	0.29	0.31	0.35	0.41	0.00	0.26	0.35	0.16	0.32	0.36	0.30	0.33	0.14	0.22	0.26
Reclaimed Non-Potable Use	0.25	0.18	0.23	0.32	0.25	0.22	0.27	0.20	0.20	0.28	0.26	0.22	0.26	0.29	0.26

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Coffee Break

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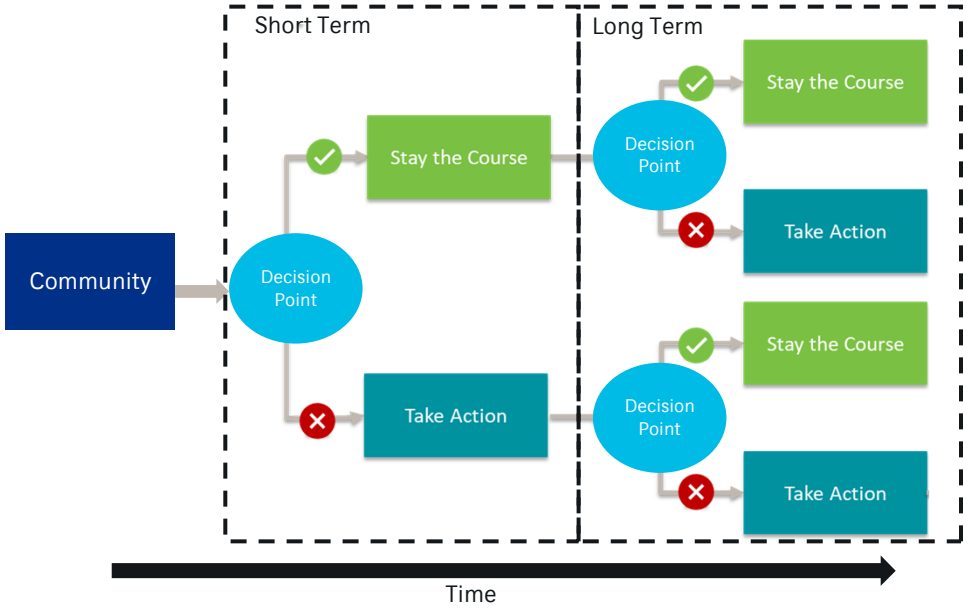
Example of an Adaptive Management Plan



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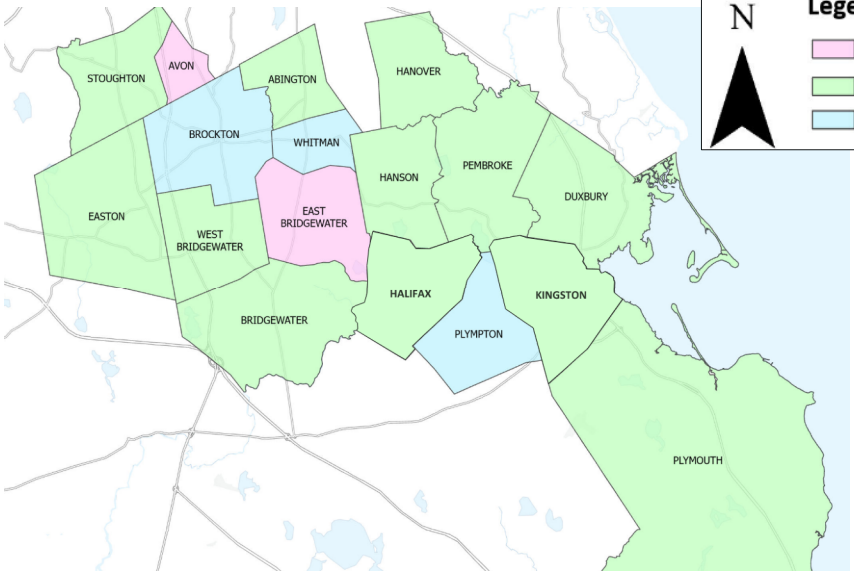
Draft Short Term Portfolio



1- PFAS treatment doesn't apply to Kingston and Plymouth

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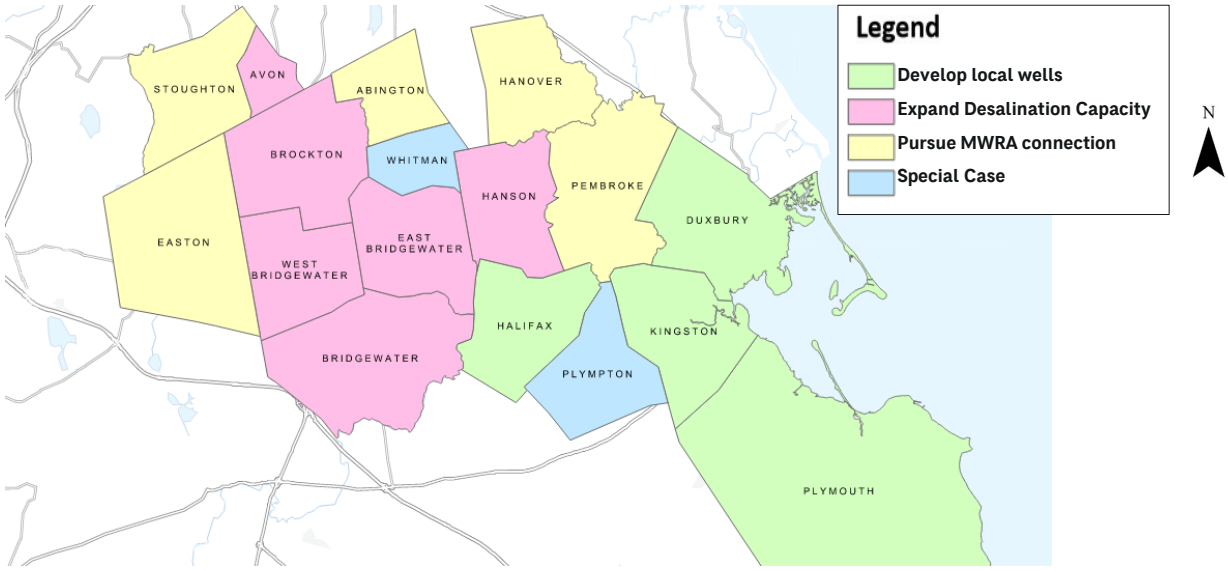
Draft Long Term Portfolio



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Summary Table of Different Paths for the Draft Portfolio

Description	Communities
Desalination in the Short Term	Avon, East Bridgewater
Develop PFAS Treatment in the short term, connect to MWRA in the long term	Abington, Hanover, Pembroke – through Weymouth Easton, Stoughton – through Stoughton
Develop PFAS Treatment in the short term, potentially expand desalination treatment capacity in the long term	Bridgewater, Hanson, West Bridgewater
Develop PFAS Treatment in the short term[1], Long Term Supply from Local Wells	Duxbury, Kingston, Plymouth, Halifax
Special cases	Brockton, Plympton, Whitman

[1] PFAS treatment doesn't apply to Kingston and Plymouth

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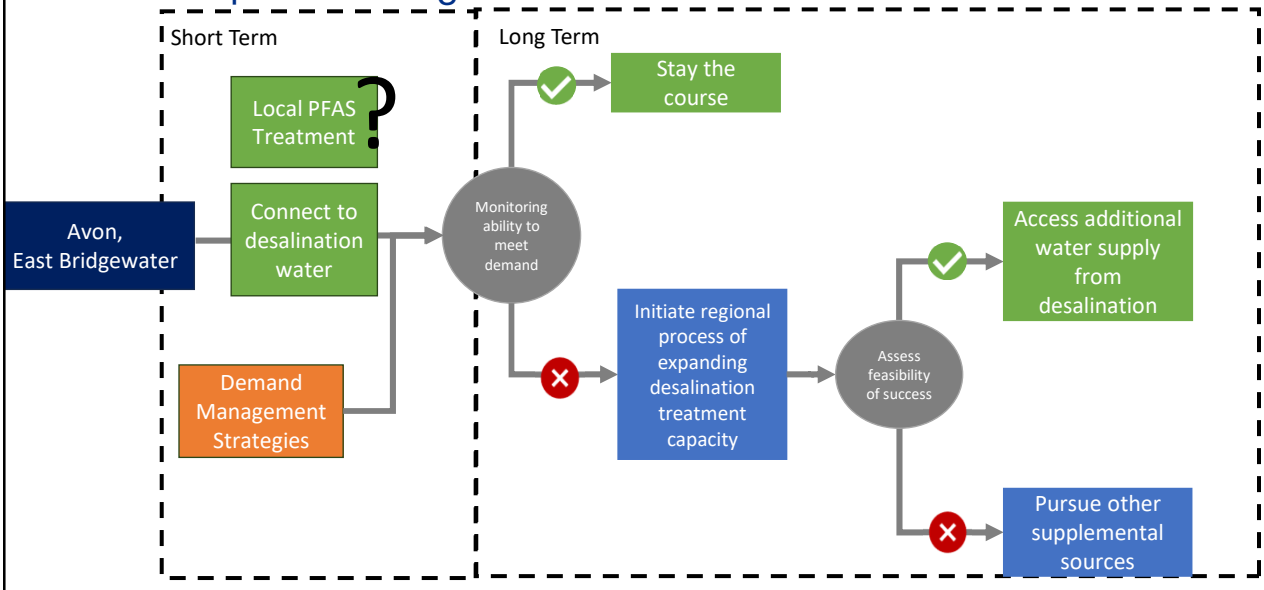
Draft Adaptive Management Plan: Desalination in the Short Term



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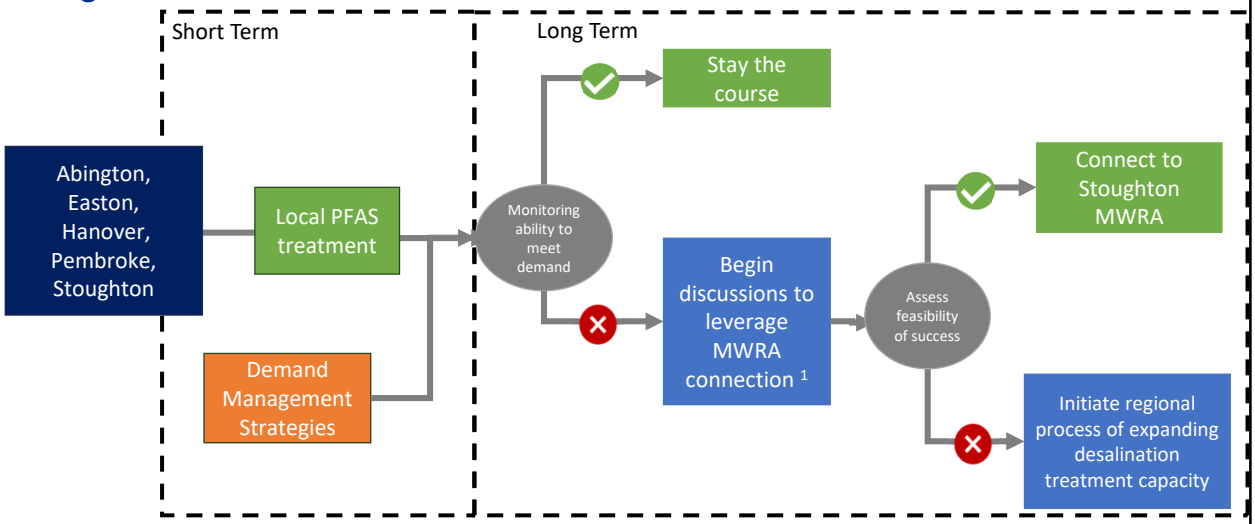
Draft Adaptive Management Plan: Short Term PFAS Treatment, Long Term Connection to MWRA



1- Abington, Hanover, Pembroke will pursue connecting to MWRA through Weymouth
Easton will pursue connecting to MWRA through Stoughton

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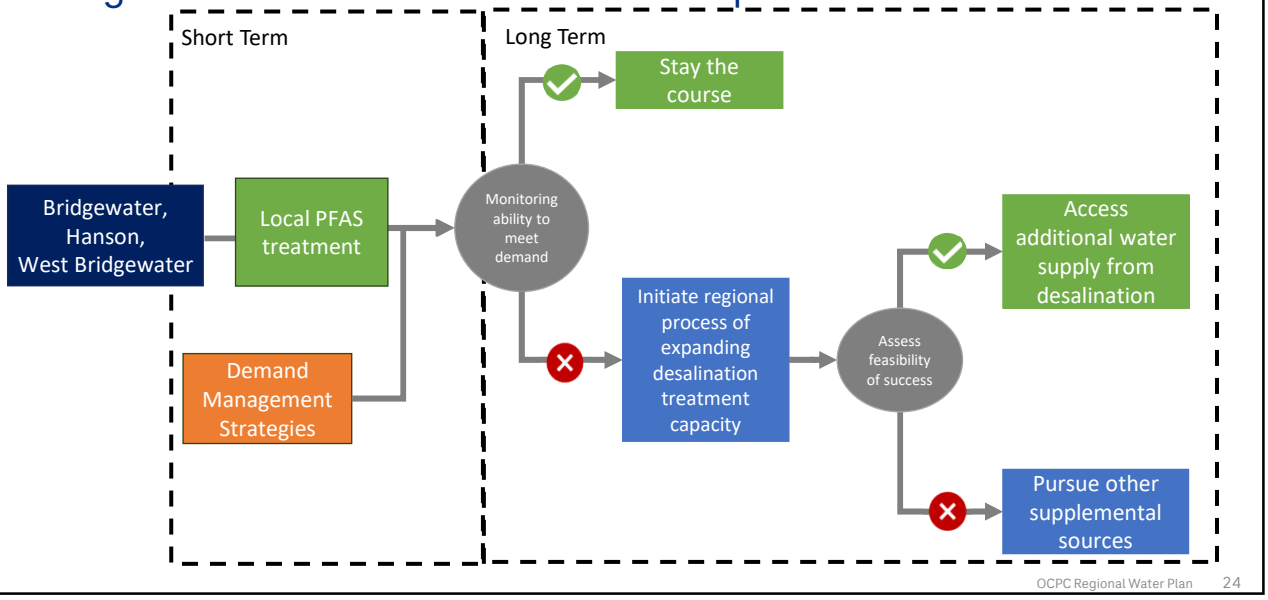
Draft Adaptive Management Plan: Short Term PFAS Treatment, Long Term Desalination Treatment Expansion



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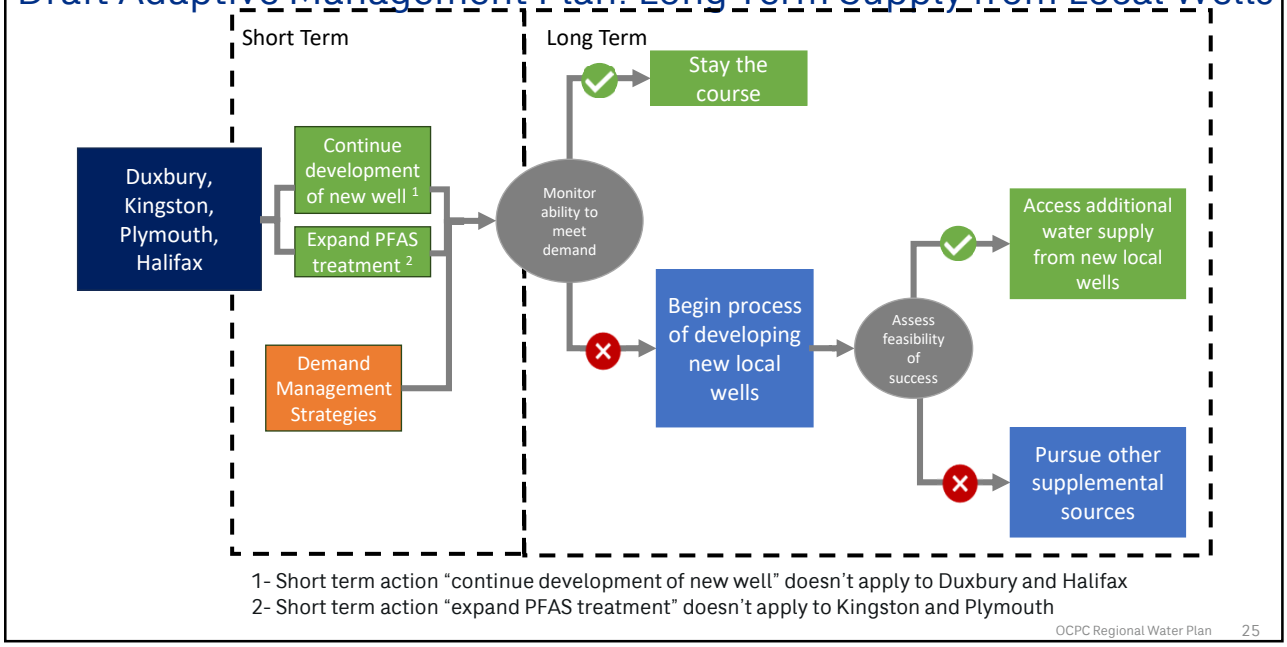
Draft Adaptive Management Plan: Long Term Supply from Local Wells



1- Short term action "continue development of new well" doesn't apply to Duxbury and Halifax
2- Short term action "expand PFAS treatment" doesn't apply to Kingston and Plymouth

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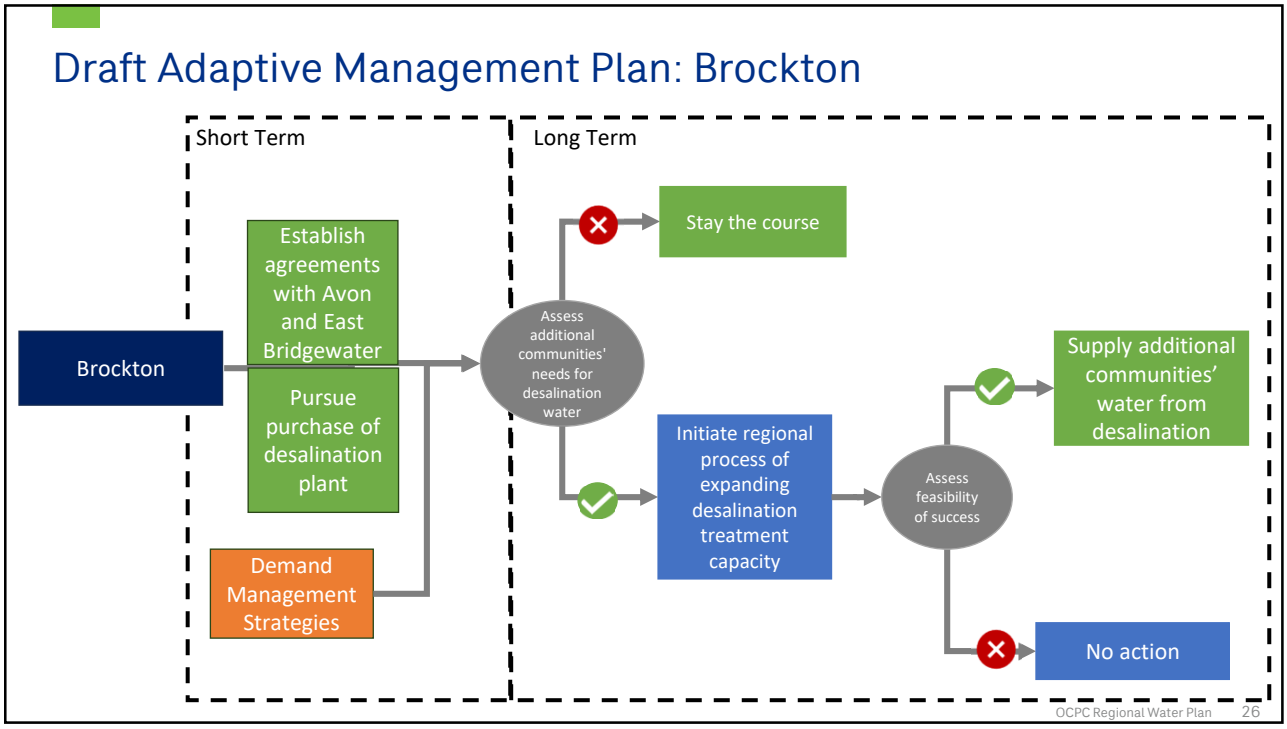
Draft Adaptive Management Plan: Brockton



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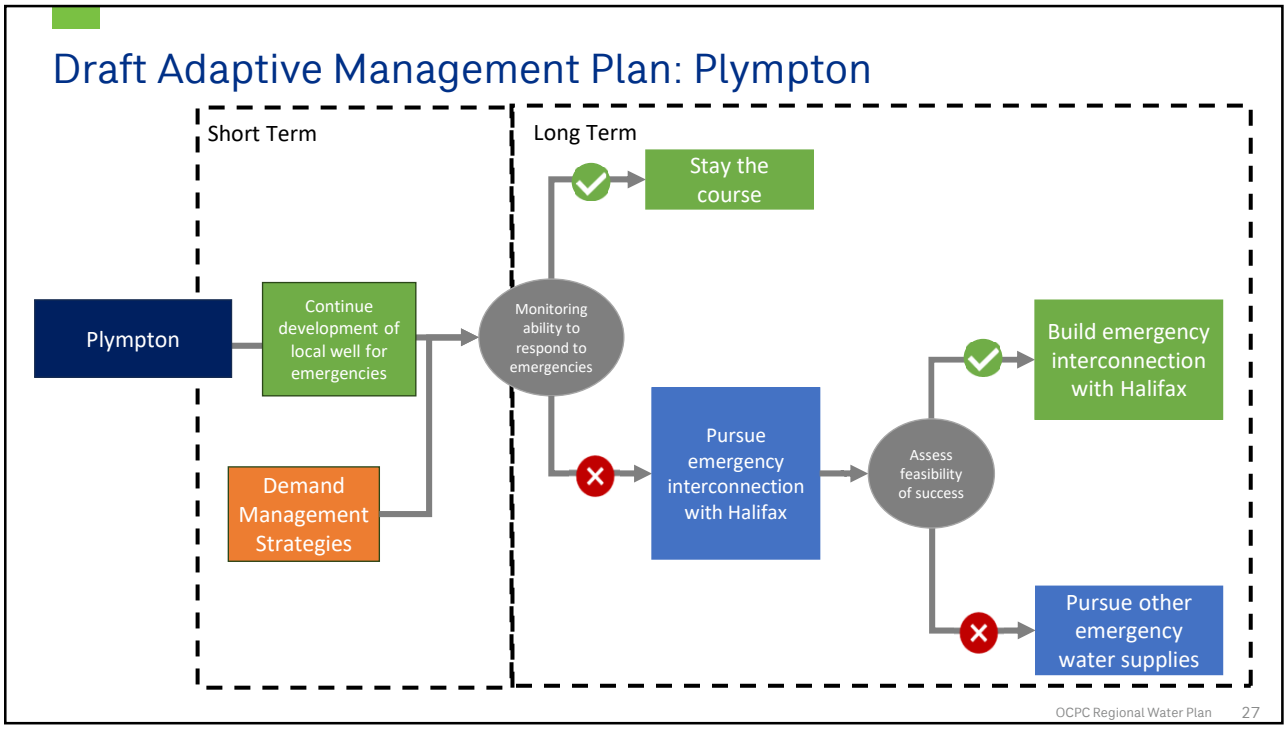
Draft Adaptive Management Plan: Plympton
Short Term
Long Term
Stay the course
Plympton
Continue development of local well for emergencies
Monitoring ability to respond to emergencies
Build emergency interconnection with Halifax
Pursue emergency interconnection with Halifax
Assess feasibility of success
Demand Management Strategies
Pursue other emergency water supplies
OCPC Regional Water Plan
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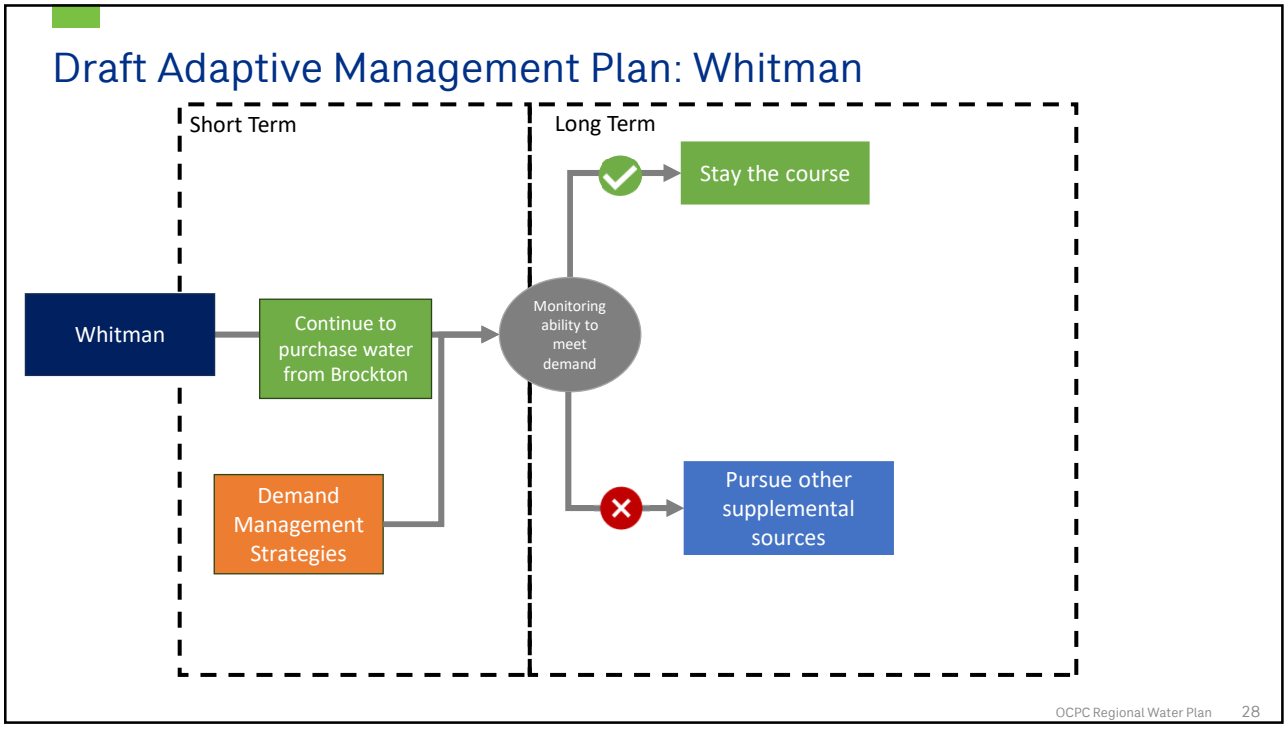
Draft Adaptive Management Plan: Whitman
Short Term
Long Term
Stay the course
Whitman
Continue to purchase water from Brockton
Monitoring ability to meet demand
Demand Management Strategies
Pursue other supplemental sources
OCPC Regional Water Plan
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Today: Individual Interviews on Draft Adaptive Management Plans

- During next activity, we will pull folks to discuss their draft adaptive management plans

29

Discussion of Implementation of Best Practice Recommendations

30

Best Practice Recommendations

- These were ideas from interviews and workshops
  - Steering committee previously agreed upon to include in the final report
  - Not evaluated through decision framework
- Many are applicable to the whole region, but will be up to each community to decide whether to pursue

Today: Discuss implementation guidelines

- By whom? How? Regional?

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Draft Best Practice Recommendations: Discuss Today

Project General Description	Communities/ Stakeholders to whom this could apply
Identification and Removal of Migratory Obstructions	Jones River Watershed Association, Taunton River Watershed Association, North and South Rivers Watershed Association
Access To Clean Water for Private Well Owners - Education and Funding Assistance	All communities
Identification of Reservoir Management Strategies	Brockton and Abington
Ecosystem Evaluation and Ecological Flow Needs	Relevant surface water and groundwater locations in the Taunton and South-Coastal Watersheds
Native Landscaping Local By-Laws	All communities
Private Well Outdoor Water Use Restrictions Local By-Laws	All communities have public wells, but this recommendation may be most beneficial for communities with significant private well use
Requiring Water Quality Tests of Private Wells By-Laws	All communities
Water Demand Offset Policies	All communities
Water Use Mitigation Program	All communities
Conduct Regular Rate Studies	All communities except Plympton
Inter-Municipal Agreements	All communities with current or future interconnections

32

Best Practice Recommendations: Still Being Drafted

Project General Description	Communities/ Stakeholders to whom this could apply
Redundant Water Supply for Agriculture	Agricultural Users
Support Agricultural Demand Side Management	Agricultural Users
Conservation, Land, And Water Use Education Program	All communities and watershed associations
Regional Conservation Committee: Coordinate Protection of Shared Resources	All communities and watershed associations
Conservation Resource Center	All communities and watershed associations
Cybersecurity Improvements	All communities
Regional Stormwater Plan	All communities and watershed associations
Regional Wastewater Plan	All communities and watershed associations
Regional Coordination for Local PFAS Treatment Implementation	All communities except Plympton

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Discussion of Best Practice Recommendations

- Small groups
- Individual review of best practice recommendations (~10 minutes)
- Small group discussion on implementation of best practice recommendations:
  - What additional pieces would be helpful to include?
  - Are there additional co-benefits?
  - Are there additional risks?
  - What stakeholders would need to collaborate for implementation?
  - Are these better recommended as local or regional?

34

Discussion of Draft Best Practice Recommendations

A
Kirk

Project General Description
Identification and Removal of Migratory Obstructions
Access To Clean Water for Private Well Owners - Education and Funding Assistance
Identification of Reservoir Management Strategies
Water Demand Offset Policies

B
Joanne and Kara
Hybrid

Project General Description
Private Well Outdoor Water Use Restrictions Local By-Laws
Water Use Mitigation Program
Inter-Municipal Agreements

C
Amara

Project General Description
Ecosystem Evaluation and Ecological Flow Needs
Native Landscaping Local By-Laws
Requiring Water Quality Tests of Private Wells By-Laws
Conduct Regular Rate Studies

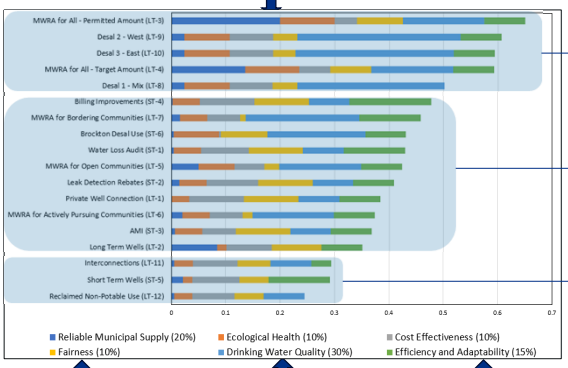
35

Reviewing the Value of the Entire Process to Date

Initial Interviews

- Subset indicated interest in Desal
- Subset indicated interest in MWRA
- Subset preferred "stay the course" with local PFAS treatment & new wells
- Little interest in interconnections as supply, but possible for emergency
- Very little interest in reclaimed water
- Demand Mgt not a major priority (generally)

Steering Committee Objectives



Highest Regional Scores

Mid-Range Regional Scores

Lowest Regional Scores

Environmental Risks & Benefits

Risk Assessment

Local Priorities

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Reviewing the Value of the Entire Process to Date

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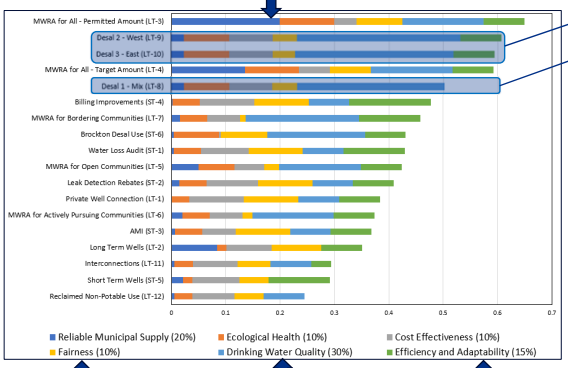

Environmental Risks & Benefits | Risk Assessment | Local Priorities

Findings

Desal ranks very high for subsets

37

Reviewing the Value of the Entire Process to Date

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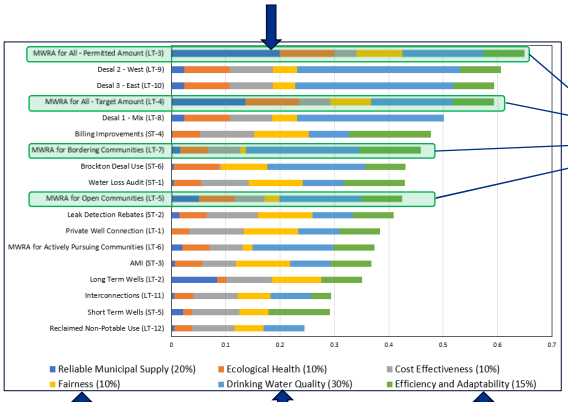

Environmental Risks & Benefits | Risk Assessment | Local Priorities

Findings

Desal ranks very high for subsets

MWRA ranks mid to high, but carries risks with larger volumes

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Reviewing the Value of the Entire Process to Date

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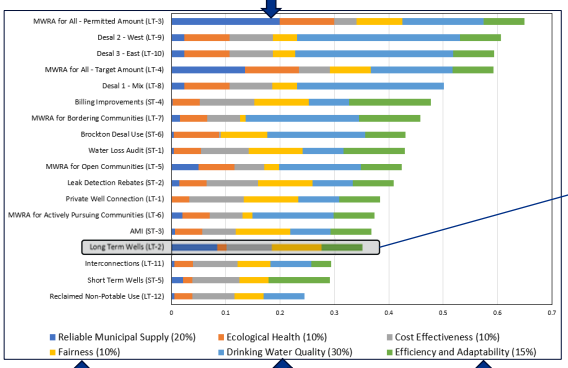
Steering Committee Objectives



Environmental Risks & Benefits | Risk Assessment | Local Priorities

Findings

- Desal ranks very high for subsets
- MWRA ranks mid to high but carries risk with larger volumes
- Long Term Well Development a mid level score – local value / **LOW RISK**

39

Reviewing the Value of the Entire Process to Date

Initial Interviews

- Subset indicated interest in Desal
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- Little interest in interconnections as supply, but possible for emergency
- Very little interest in reclaimed water
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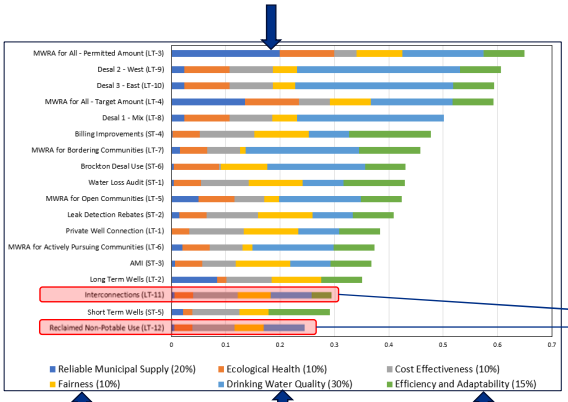
Steering Committee Objectives



Environmental Risks & Benefits | Risk Assessment | Local Priorities

Findings

- Desal ranks very high for subsets
- MWRA ranks mid to high but carries risk with larger volumes
- Long Term Well Development a mid level score – local value / **LOW RISK**
- Interconnections and Reclaimed Water as Supply: Low Value

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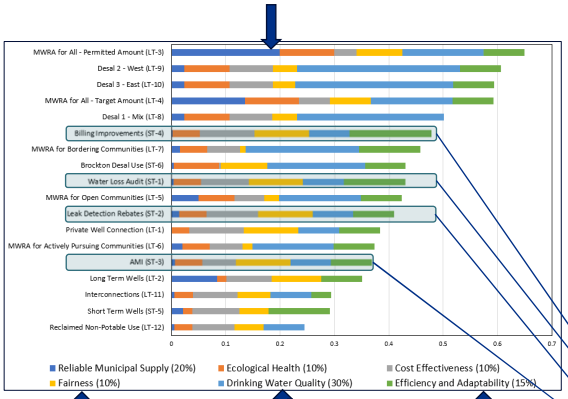
Reviewing the Value of the Entire Process to Date

Initial Interviews

- Subset indicated interest in Desal
- Subset indicated interest in MWRA
- Subset preferred "stay the course" with local PFAS treatment & new wells
- Little interest in interconnections as supply, but possible for emergency
- Very little interest in reclaimed water
- Demand Mgt not a major priority (generally)

Steering Committee Objectives



- Environmental Risks & Benefits
- Risk Assessment
- Local Priorities

Findings

- Desal ranks very high for subsets
- MWRA ranks mid to high but carries risk with larger volumes
- Long Term Well Development a mid level score – local value / **LOW RISK**
- Interconnections and Reclaimed Water as Supply: Low Value
- Demand Management Consistently strong mid-range value

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Reviewing the Value of the Entire Process to Date

Initial Interviews

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- Subset indicated interest in MWRA
- Subset preferred "stay the course" with local PFAS treatment & new wells
- Little interest in interconnections as supply, but possible for emergency
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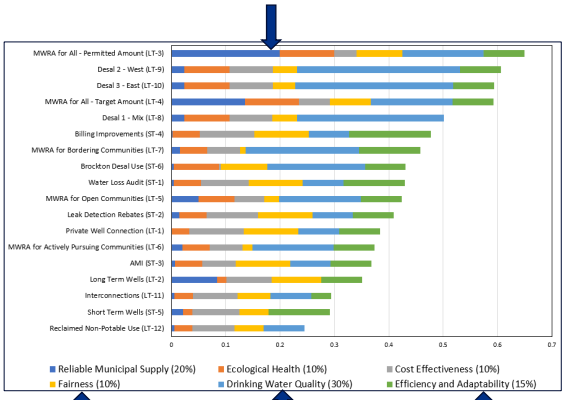

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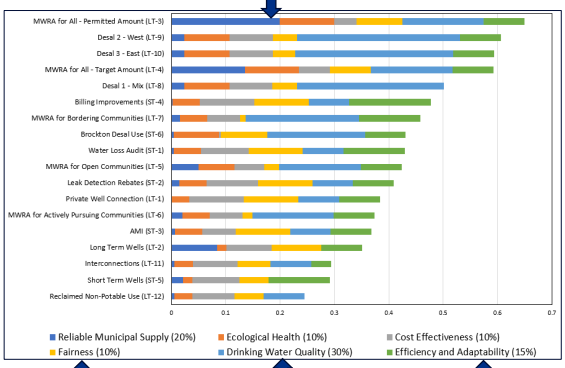

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Outcome

- **Validation** of initial strategies: Important for Influence and Funding
- **Additional focus** on demand mgt. and Best Practices for region

Regional Water Plan

Local Supply
Regional Supply
Regional Demand Mgt
Regional BMPs

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Next Steps

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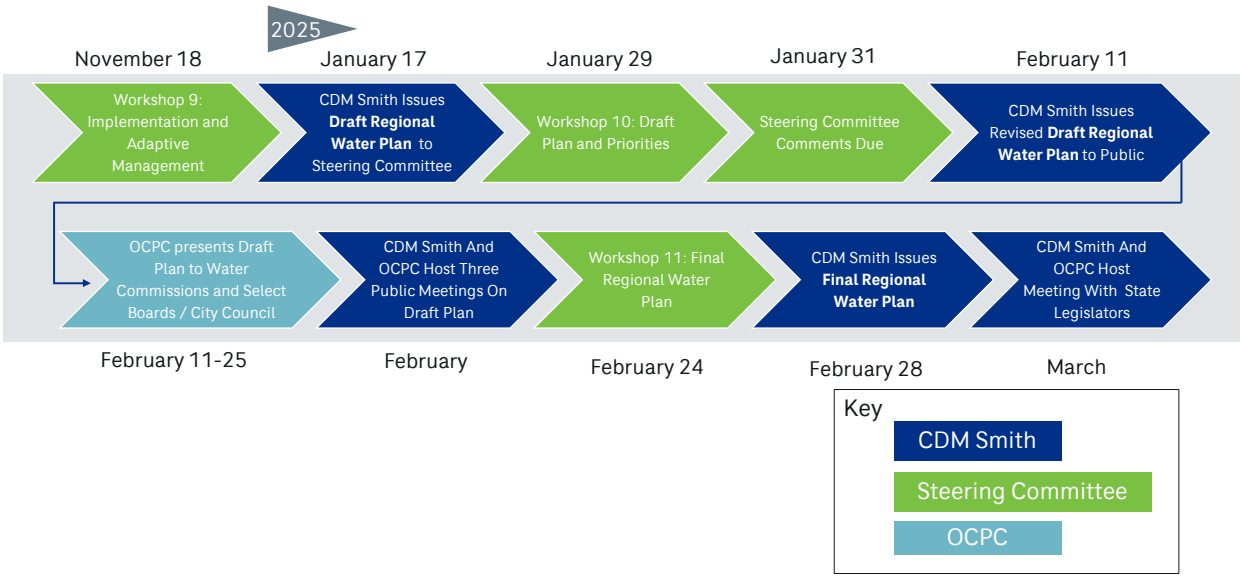
Upcoming Steps Relevant for Steering Committee



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Public Outreach

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