Austin WATER | WATER FORWARD
INTEGRATED WATER RESOURCE PLAN

Austin Integrated Water Resource Planning Community Task Force

Packet Index

December 5, 2017

Austin Integrated Water Resource Planning Community Task Force
December 5, 2017 – 4:00 p.m.
Waller Creek Center, Room 104
625 East 10th Street
Austin, Texas 78701

For more information go to:
Austin Integrated Water Resource Planning Community Task Force

AGENDA

Voting Members:

Sharlene Leurig - Chair	Marianne Dwight	Sarah Richards
Jennifer Walker – Vice Chair	Diane Kennedy	Lauren Ross
Todd Bartee	Perry Lorenz	Robert Mace
Clint Dawson	Bill Moriarty	

Ex Officio Non-Voting Members:
Austin Water: Greg Meszaros
Austin Energy: Kathleen Garrett
Austin Resource Recovery: Sam Angoori
Neighborhood Housing and Community Development: Rebecca Giello
Office of Innovation: Kerry O'Connor
Office of Sustainability: Lucia Athens
Parks and Recreation: Sara Hensley
Watershed Protection: Mike Personett

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1. **CALL TO ORDER – December 5, 2017, 4:00 p.m.**

2. **CITIZEN COMMUNICATION**

   The first 10 speakers signed up prior to the meeting being called to order will each be allowed a three-minute allotment to address their concerns regarding items not posted on the agenda.

3. **APPROVAL OF MEETING MINUTES**
   a. Approval of the meeting minutes from the November 07, 2017 Task Force meeting (5 minutes)

4. STAFF BRIEFINGS, PRESENTATIONS, AND OR REPORTS

a. Draft Initial Portfolio Scoring - City Staff and Consultant Team (approximately 2.5 hours)
    i. Task Force Discussion and Input

5. SUBCOMMITTEE REPORTS

6. VOTING ITEMS FROM TASK FORCE

a. Discuss and consider approval of proposed meeting schedule through June 2018 (10 minutes)

7. FUTURE AGENDA ITEMS

8. ADJOURN

Note: Agenda item sequence and time durations noted above are subject to change.

The City of Austin is committed to compliance with the American with Disabilities Act. Reasonable modifications and equal access to communications will be provided upon request. Meeting locations are planned with wheelchair access. If requiring Sign Language Interpreters or alternative formats, please give notice at least 2 days (48 hours) before the meeting date. Please call Austin Integrated Water Resource Planning Community Task Force, at 512-972-0194, for additional information; TTY users route through Relay Texas at 711.

For more information on the Austin Integrated Water Resource Planning Community Task Force, please contact Marisa Flores Gonzalez at 512-972-0194.

MINUTES

The *Austin Integrated Water Resource Planning Community Task Force* convened in a Regular Meeting on November 07, 2017 at Waller Creek Center, Conference Rm 104, 625 E 10th Street, in Austin, Texas.

Members in Attendance:

Sharlene Leurig - Chair	Diane Kennedy	Lauren Ross
Jennifer Walker – Vice Chair	Robert Mace	Marianne Dwight
William Moriarty	Sarah Richards	Clint Dawson

Ex-Officio Members in Attendance:
Mike Kelly

Staff in Attendance:
Greg Meszaros, Kevin Critendon, Teresa Lutes, Marisa Flores Gonzalez, Joe Smith, Mark Jordan, Prachi Patel, Helen Gerlach, Gabriella Ybarra, Shannon Halley, Drema Gross

Additional Attendees:
Dan Rodrigo, Tina Petersen, Richard Hoffpauir, David Briggs, Craig Smith, John Burke, Stefan Schuster, Jerry Roane

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1. **CALL TO ORDER**
   Sharlene Leurig, Chair, called the meeting to order at 6:09 p.m.

2. **CITIZEN COMMUNICATION: GENERAL**
   None

3. **APPROVAL OF MEETING MINUTES**
   The meeting minutes from the September 12, 2017 Austin Integrated Water Resource Planning Community Task Force regular meeting were approved on Member Ross's motion and Member Moriarty's second on an 8-0-1-2 vote with Member Dawson abstaining and Member Bartee and Member Lorenz absent.

4. **STAFF BRIEFINGS, PRESENTATIONS, AND/OR REPORTS**
   a. Presentation on Draft Initial Portfolio Composition was provided by Marisa Flores Gonzalez, Senior Planner, Austin Water and Dan Rodrigo, CDM Smith. This presentation was followed by Task Force discussion and input, followed by questions and answers.

5. **SUBCOMMITTEE REPORTS**
   None

6. **VOTING ITEMS FROM TASK FORCE**
   None

7. **FUTURE AGENDA ITEMS**
   None

Chair Leurig adjourned the meeting at 9:00 pm.

DRAFT

PRESENTATION

Austin WATER

WATER FORWARD
INTEGRATED WATER RESOURCE PLAN

Water Forward Task Force Meeting

December 5, 2017

Agenda

- Timeline
- Presentation of Draft Initial Portfolio Scoring
  - Task Force Questions, Discussion, and Input
  - Initial Task Force input into Hybrid Portfolio development (if ready)
- Discuss and consider approval of proposed meeting schedule through plan development
- Next Steps

Timeline

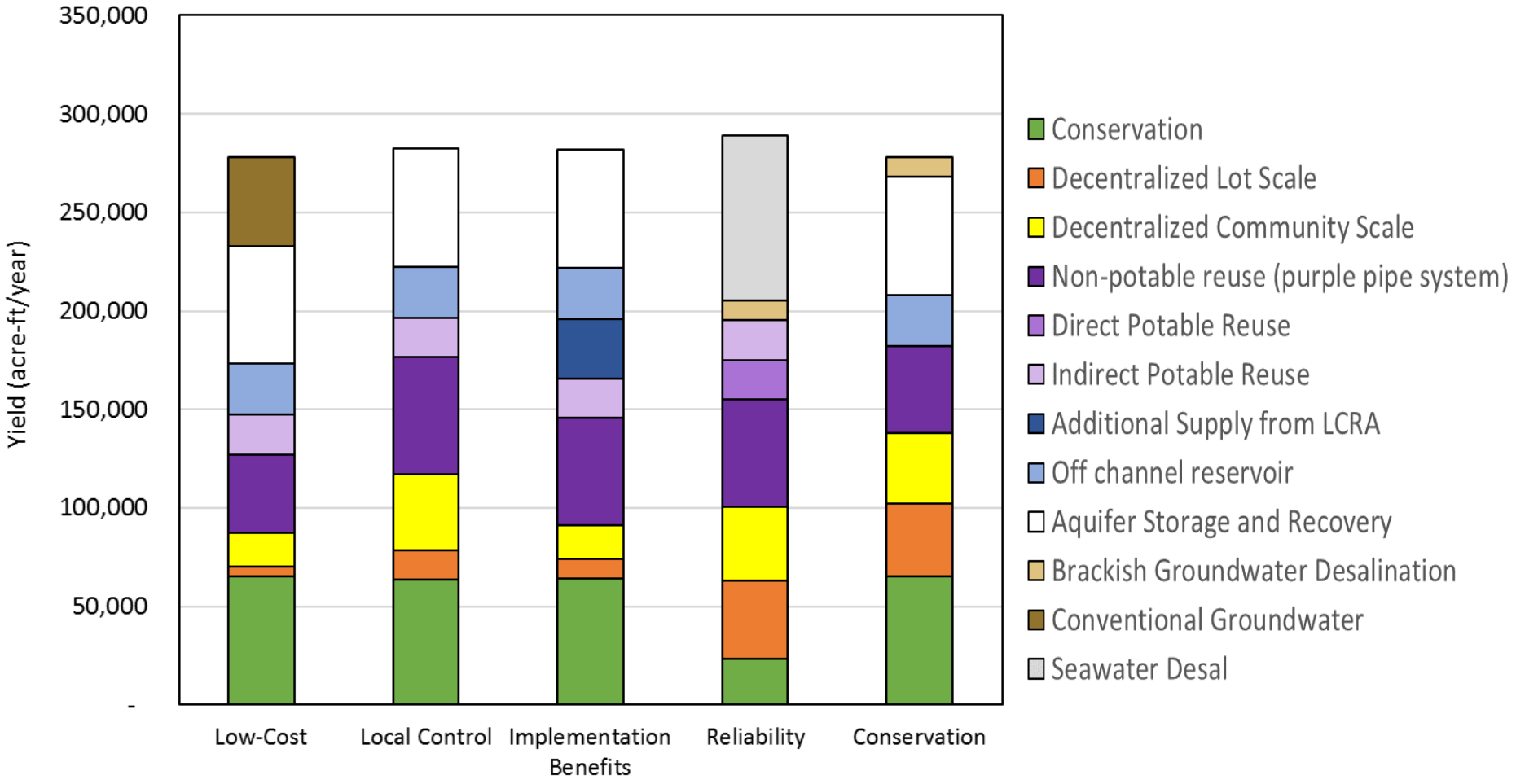
- December 5th Task Force Meeting
  - Presentation of Initial Portfolio scoring
  - Initial Task Force input into Hybrid Portfolio development (if ready)
- January 2018 Task Force Meeting
  - Additional discussion of Initial Portfolio scoring and Task Force input into Hybrid Portfolio development
- February 2018 Task Force Meeting
  - Presentation of draft Hybrid Portfolio scoring
- March 2018 Task Force Meeting
  - Presentation of draft plan recommendations

Draft Initial Portfolio Scoring

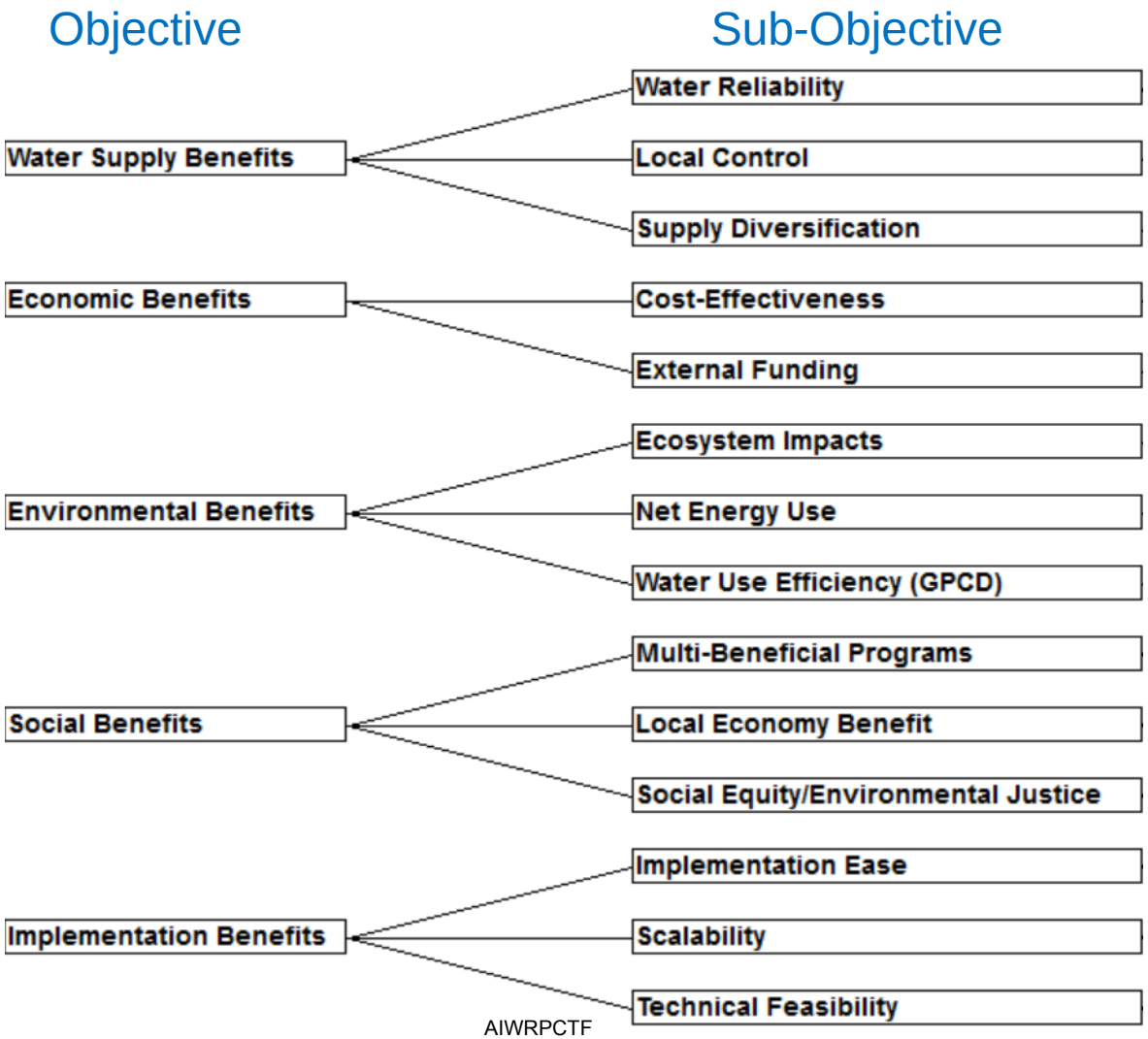
Updated Portfolio Make Up Hand Outs

- Detailed Information for Each Portfolio for All Years (one page per portfolio)
- Raw Performance Score Summary Sheet
- Changes Include:
  - Low Cost Portfolio
    - LCRA option replaced with an imported option which now incorporates conventional groundwater
  - Minimize Implementation Challenges Portfolio
    - LCRA option supply changed to 30,000 AF/yr in 2115
    - Direct Non-Potable Reuse yield increased by 5,000 AF/yr
  - Local Control Portfolio
    - Graywater harvesting yield increased by approximately 4,400 AF/yr in 2115

Portfolio Composition (2115)

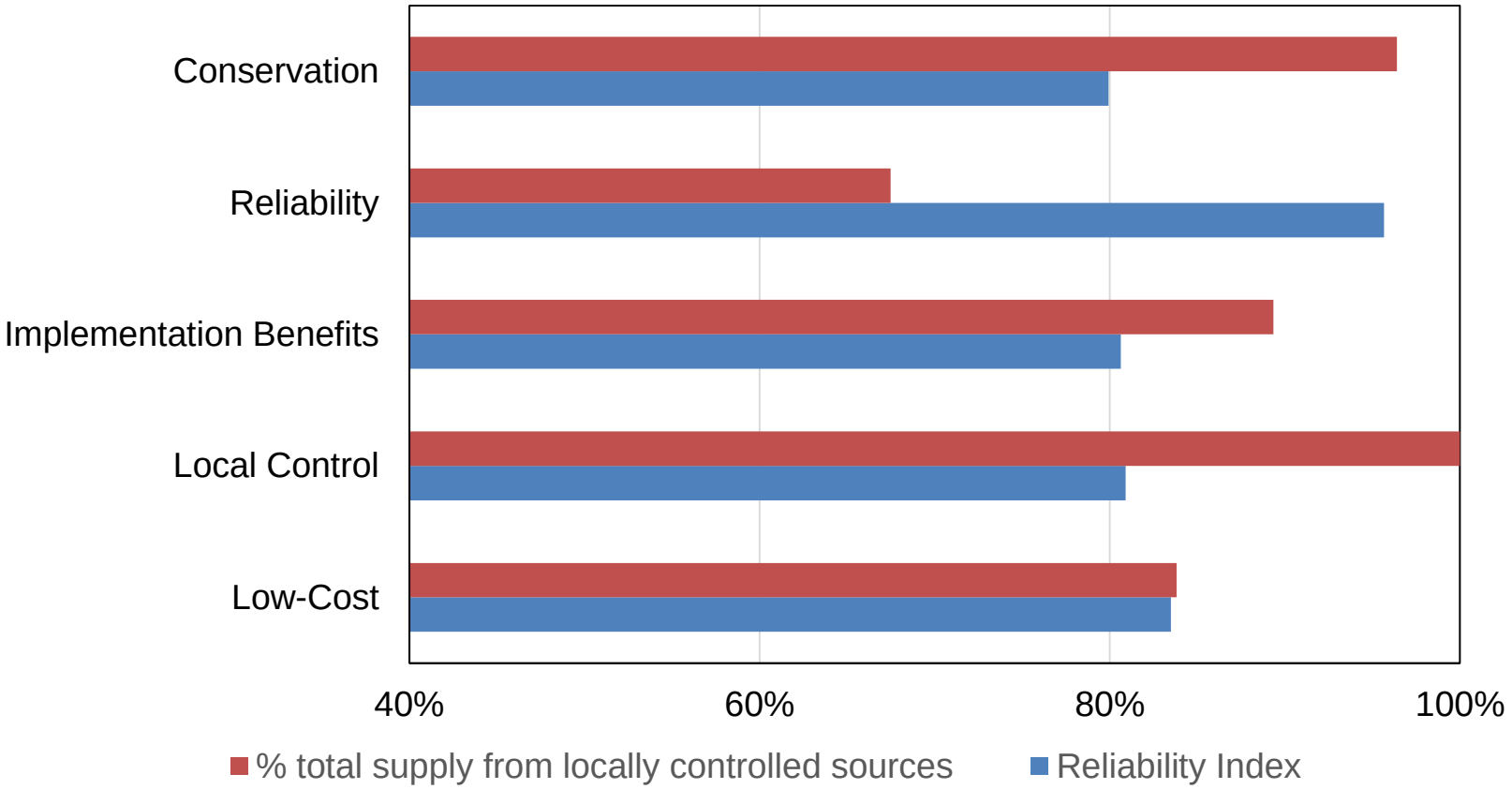


Objective / Sub-Objective Hierarchy

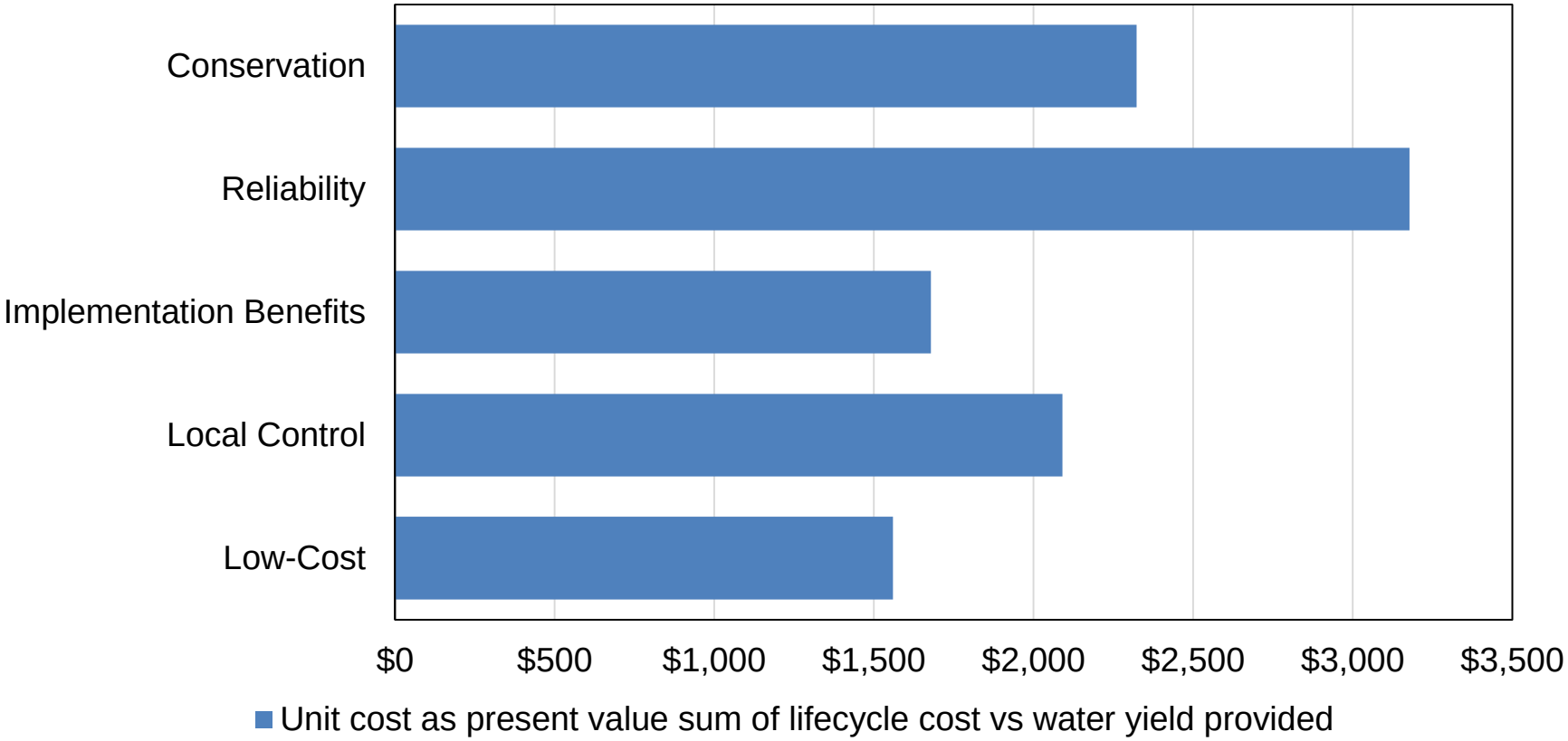


Select Raw Performance Metrics

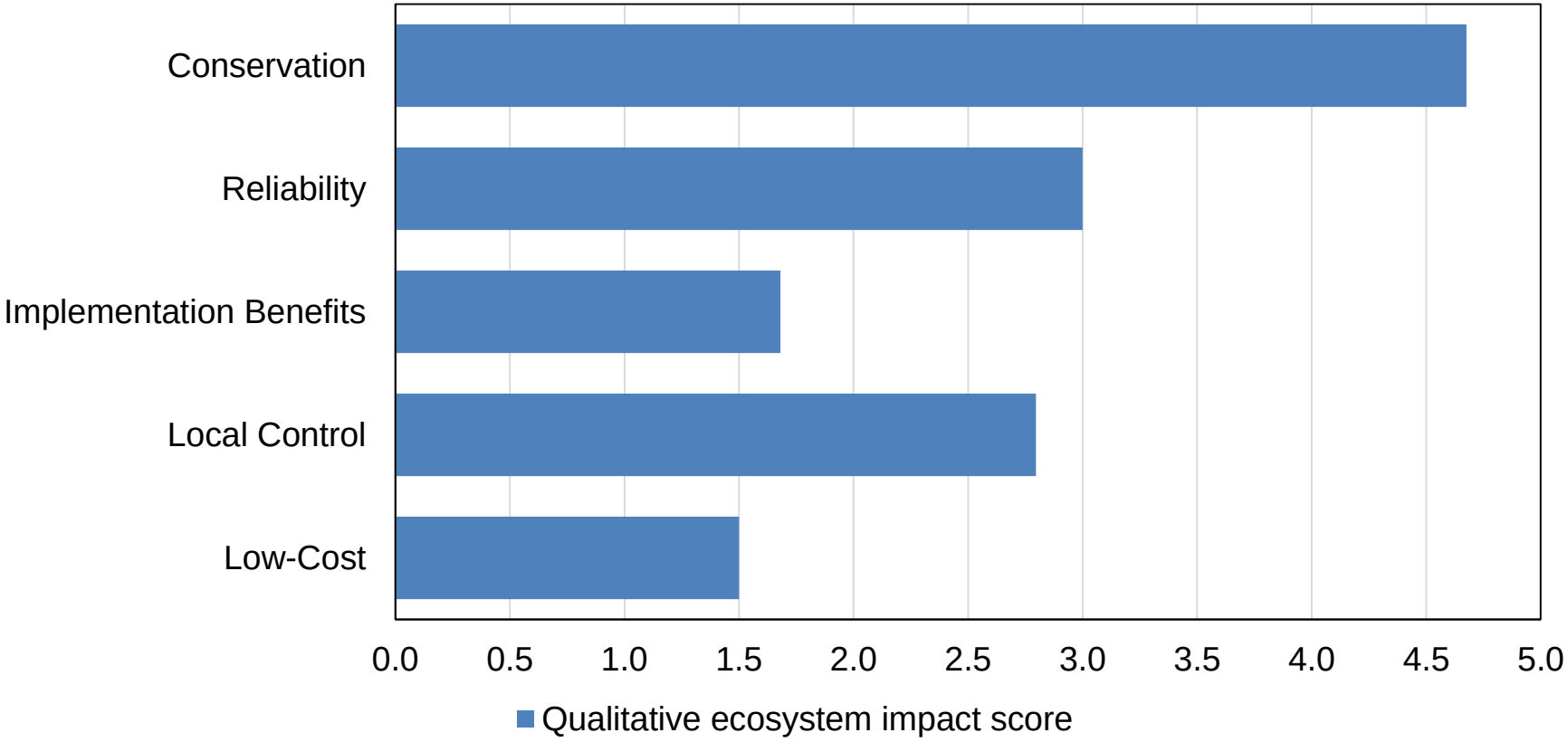
Locally Controlled Sources and Reliability



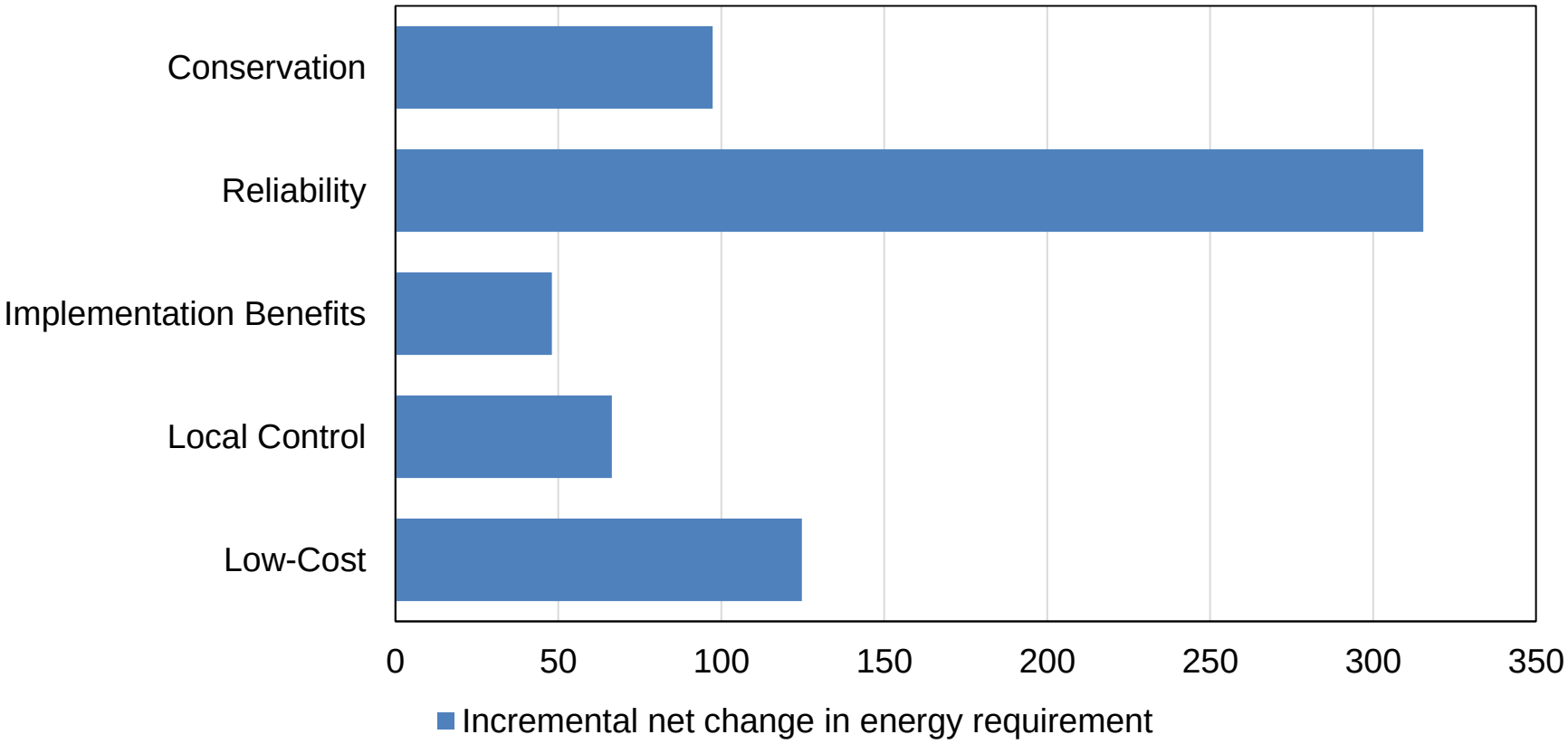
Levelized Unit Cost ($/AF)



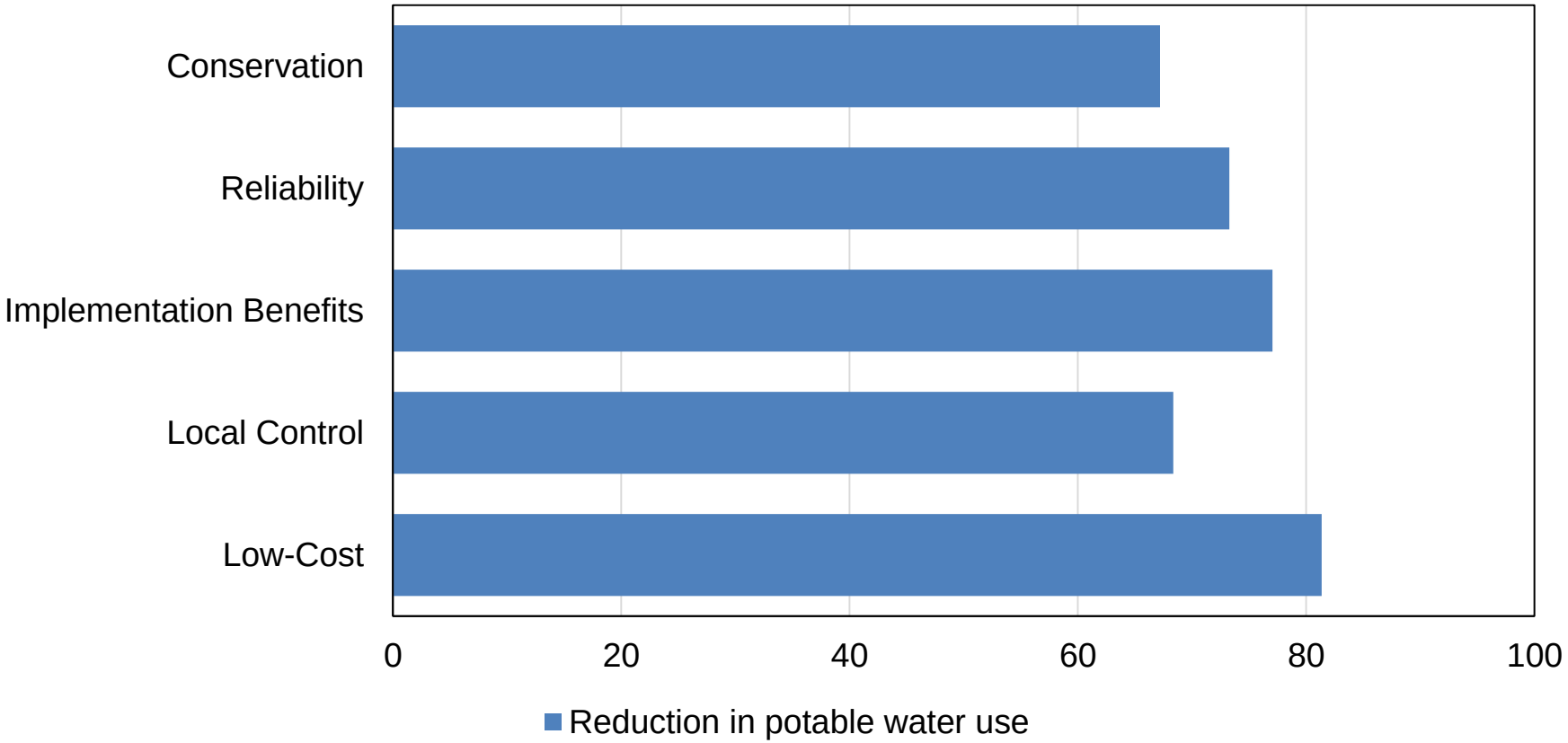
Ecosystem Benefit (1-5)
(Net river diversions and stormwater capture)



Net Energy (millions kWh/year)

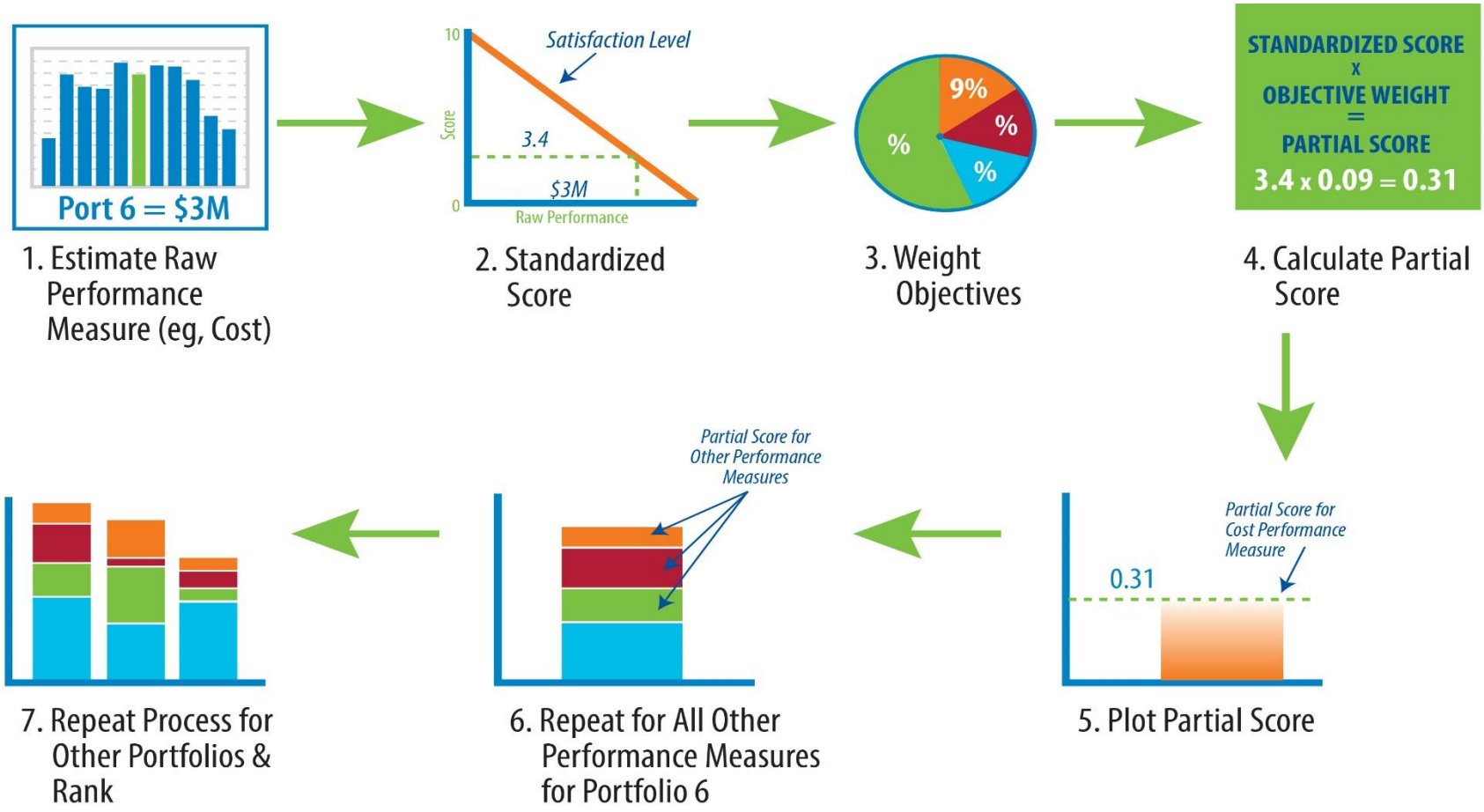


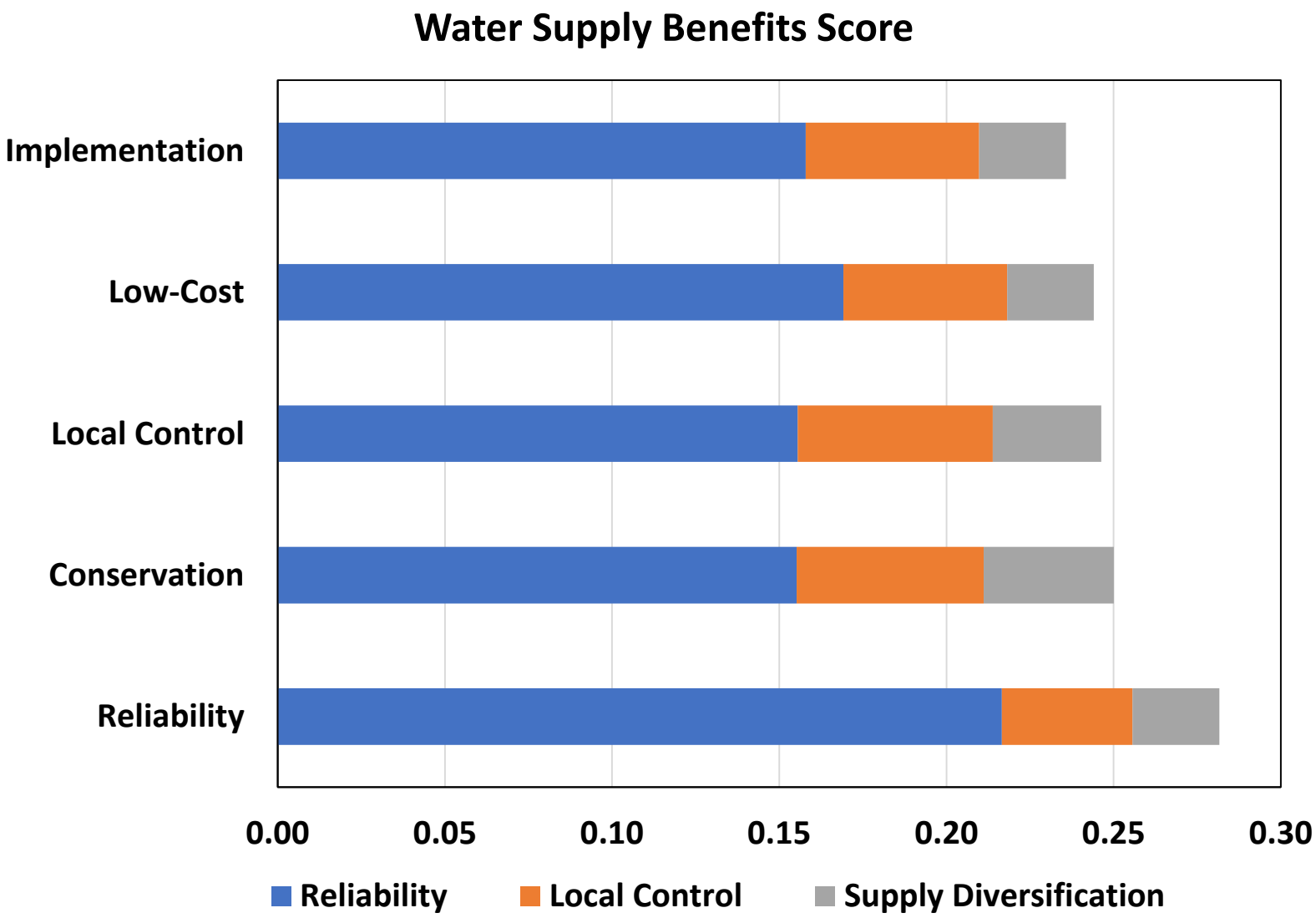
Water Use Efficiency (Potable gallons per capita day)

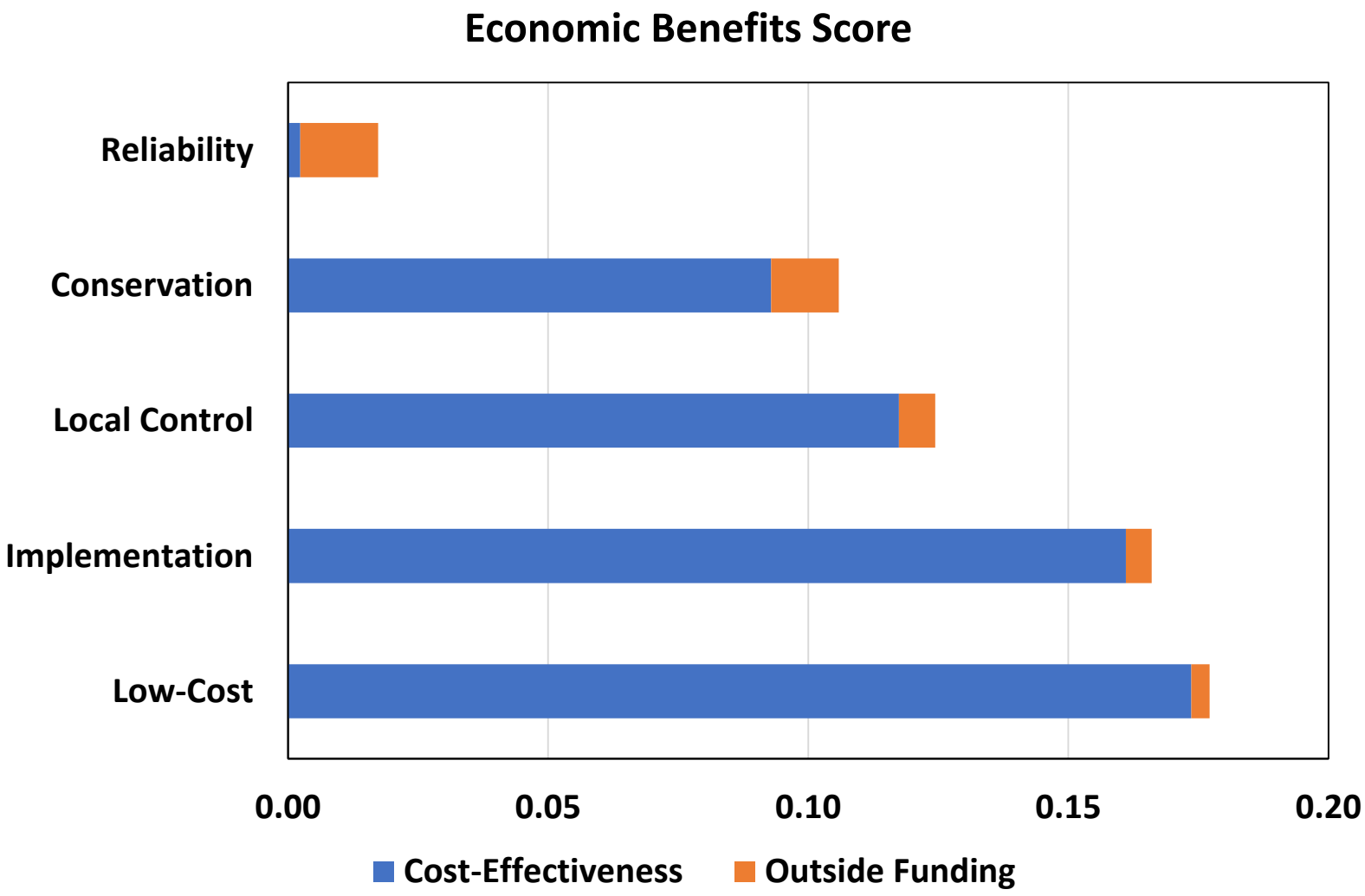


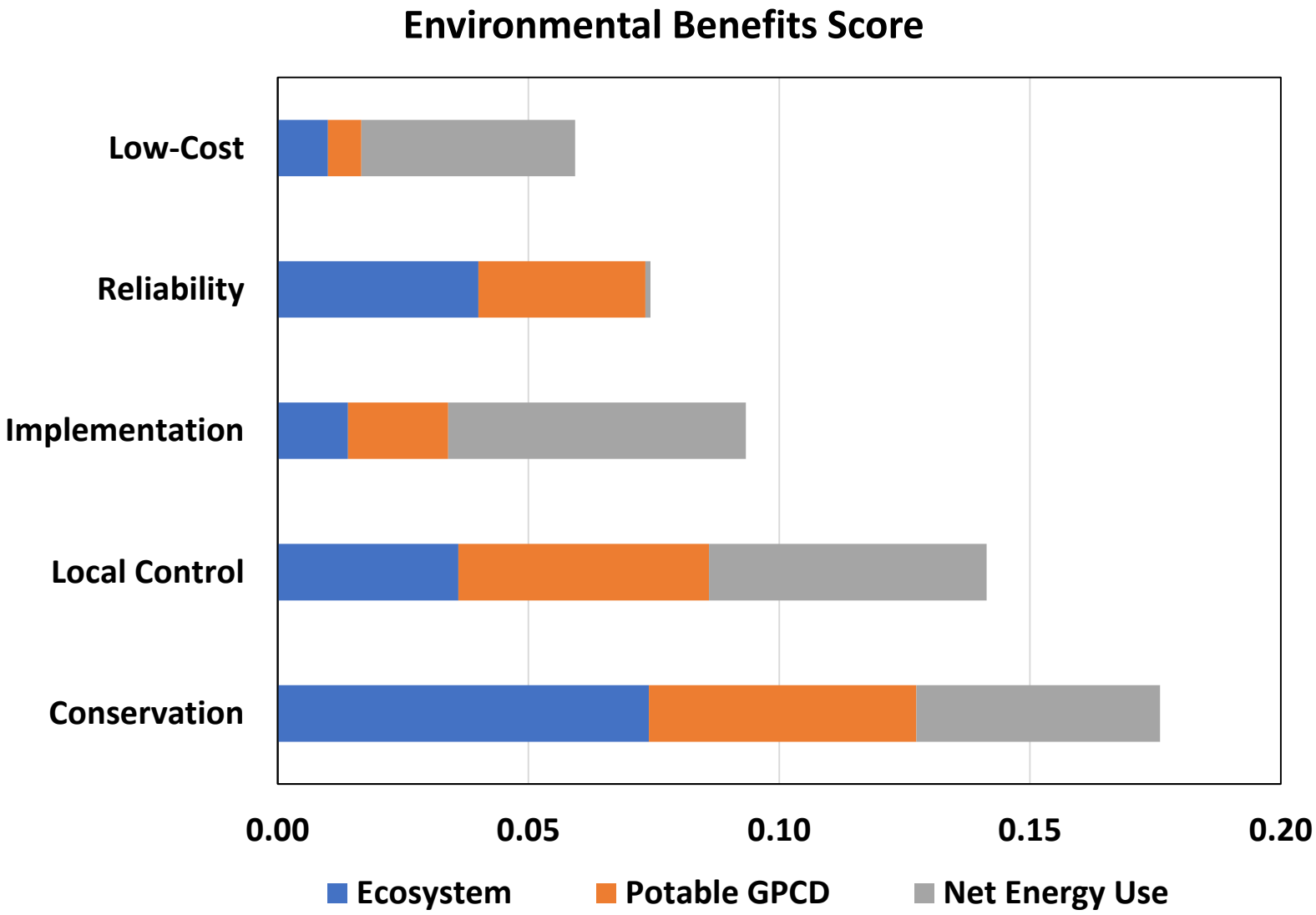
CDP Sub-Objective Scores

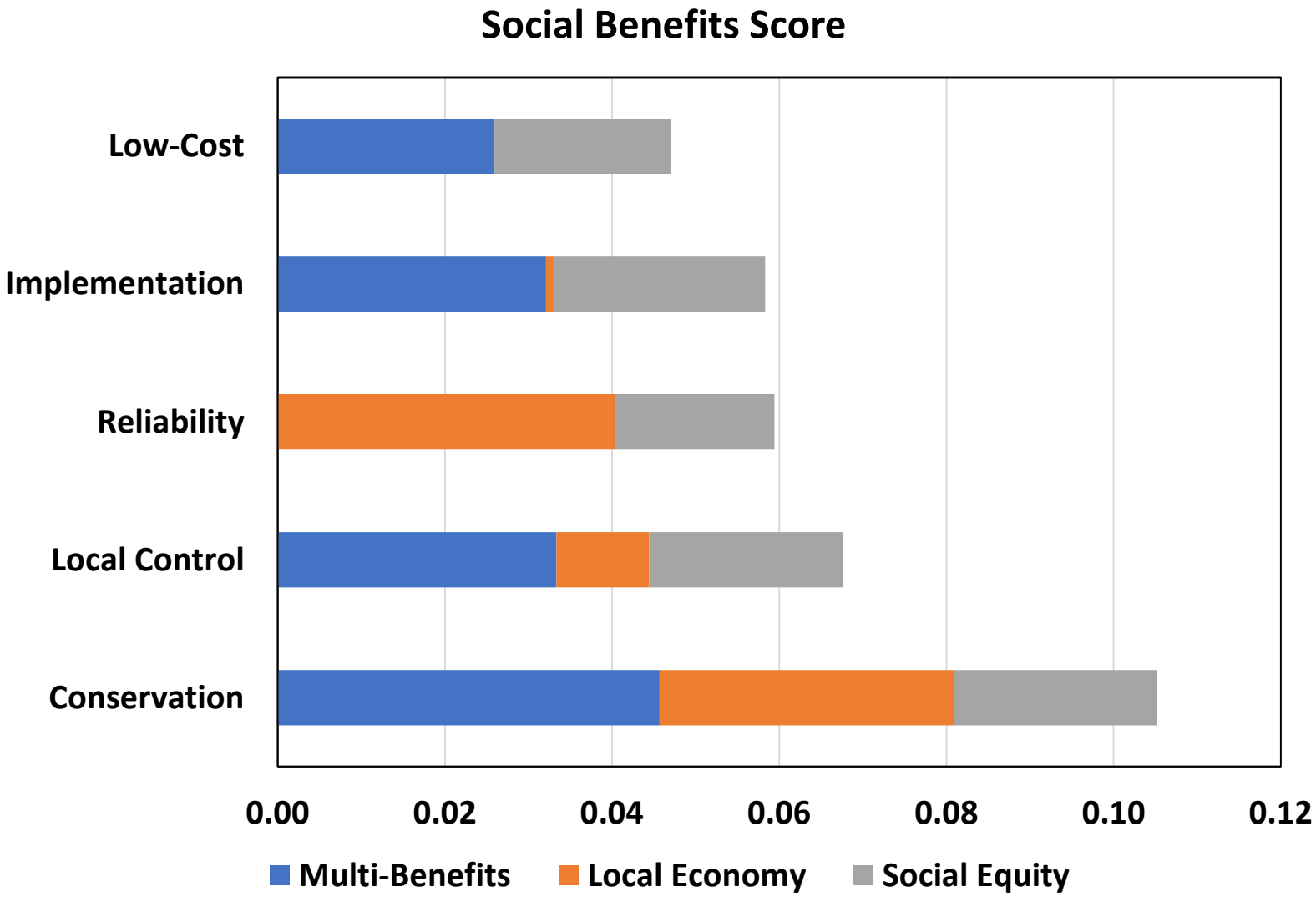
Multi-Attribute Rating Technique Used by CDP Software to Rank Portfolios

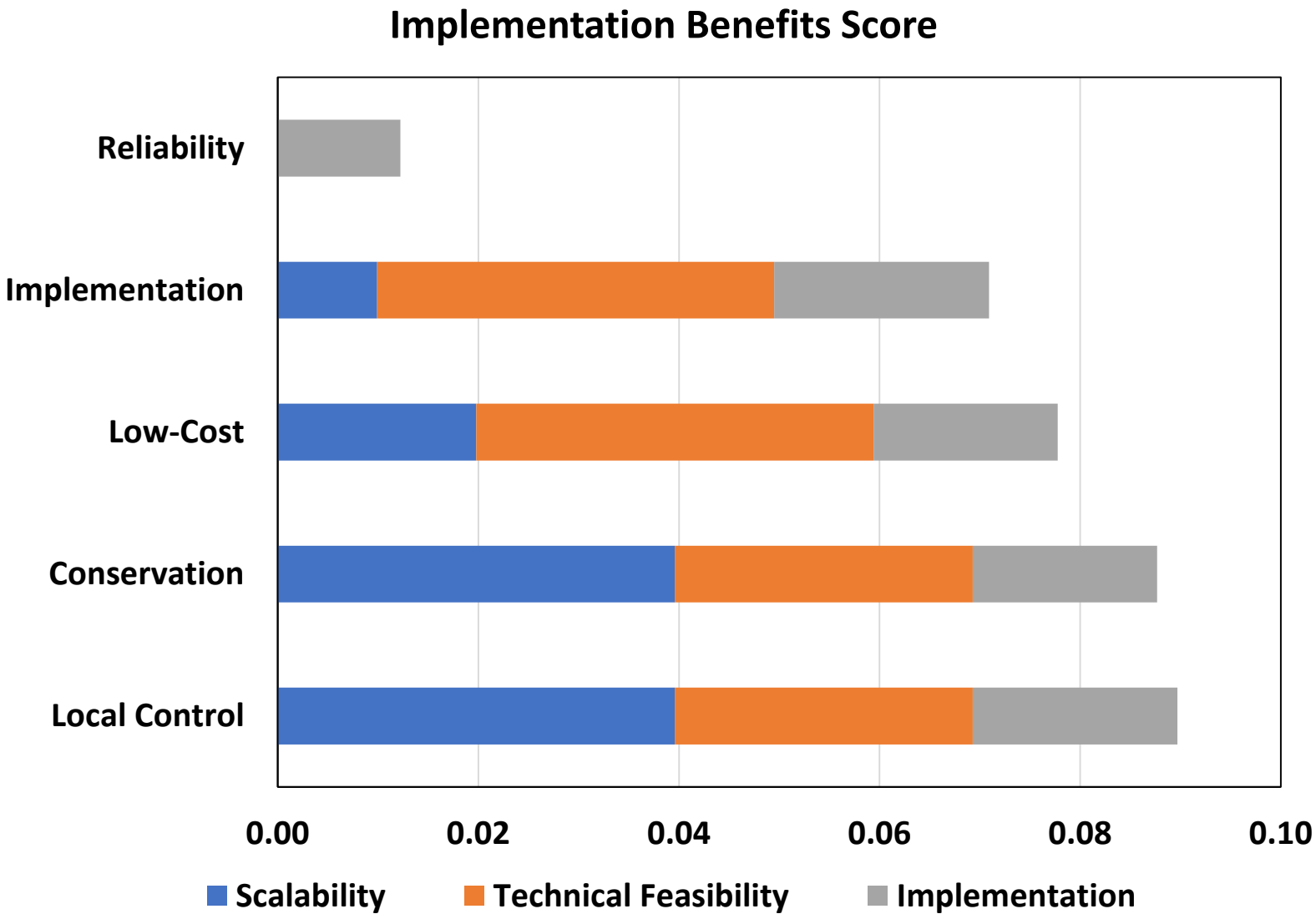



Water Supply Benefits Score
Implementation
Low-Cost
Local Control
Conservation
Reliability
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Reliability
Local Control
Supply Diversification

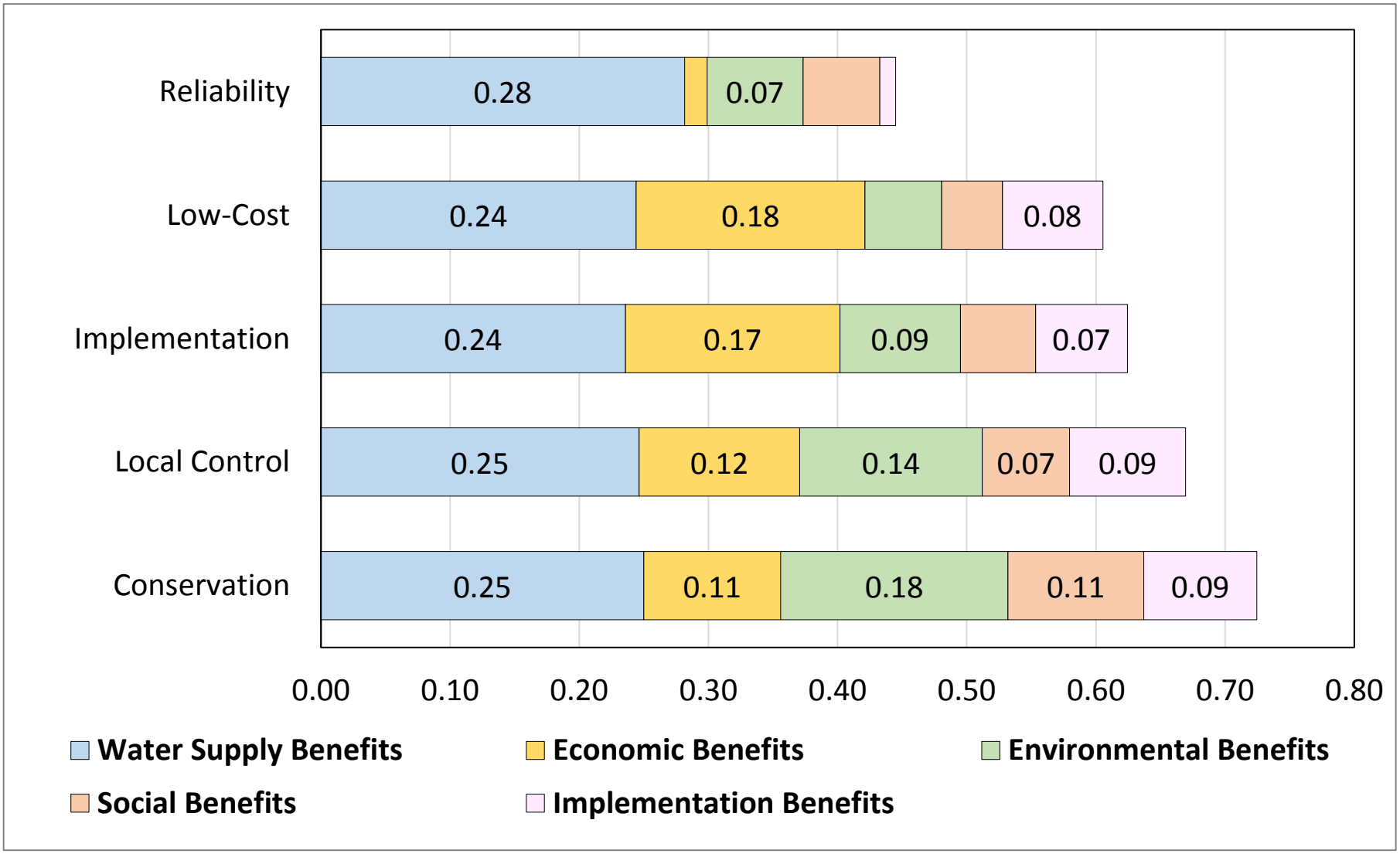

Economic Benefits Score
Reliability
Conservation
Local Control
Implementation
Low-Cost
0.00
0.05
0.10
0.15
0.20
Cost-Effectiveness
Outside Funding


Environmental Benefits Score
Low-Cost
Reliability
Implementation
Local Control
Conservation
0.00
0.05
0.10
0.15
0.20
Ecosystem
Potable GPCD
Net Energy Use


Social Benefits Score
Low-Cost
Implementation
Reliability
Local Control
Conservation
0.00
0.02
0.04
0.06
0.08
0.10
0.12
Multi-Benefits
Local Economy
Social Equity


Implementation Benefits Score
Reliability
Implementation
Low-Cost
Conservation
Local Control
0.00
0.02
0.04
0.06
0.08
0.10
Scalability
Technical Feasibility
Implementation

Initial Portfolio Ranking



Questions and Discussion

Proposed Meeting Schedule Through Plan Development

Proposed Meeting Schedule Through Plan Development

- January 16
- February 13
- March 13
- April 03
- May 01
- June 05

Questions and Discussion

Next Steps

Next Steps

- Task Force to provide feedback on initial portfolio scoring by Thursday, December 14th
  - Feedback may be provided via email, phone, or in person
- January 2018 Task Force Meeting
  - Additional discussion of Initial Portfolio scoring and Task Force input into Hybrid Portfolio development

BACKUP MATERIALS

Proposed Meeting Dates Through Plan Development

12/01/2017

Proposed Task Force Meeting Dates Through Plan Development

- January 16
- February 13
- March 13
- April 03
- May 01
- June 05

DRAFT - RAW PERFORMANCE SCORES
Subject to Change

Objective	Sub-Objective	Performance Measure	Units	Range	Low-Cost	Local Control	Implementation Benefits	Reliability	Conservation
Water Supply Benefits	Maximize Water Reliability	Reliability Index	%	0-100	83.5%	80.9%	80.6%	95.7%	79.9%
	Maximize Local Control	% total supply from locally controlled sources	%	0-100	84%	100%	89%	67%	96%
	Maximize Supply Diversification	# of supply/demand-side management sources	#	3-12	7	8	7	7	9
Economic Impacts	Maximize Cost-Effectiveness	Unit cost as present value sum of lifecycle cost vs water yield provided	$/AF in 2115	$1,000 - $4,000	$1,560	$2,091	$1,679	$3,178	$2,323
	Maximize Advantageous External Funding	Qualitative external funding score	qualitative	1-5	1.7	2.4	2.0	4.0	3.6
Environmental Impacts	Minimize Ecosystem Impacts	Qualitative ecosystem impact score	qualitative	1-5	1.5	2.8	1.7	3.0	4.7
	Minimize Net Energy Use	Incremental net change in energy requirement	Millions of kWh/yr	40M - 320M	124.7	66.4	48.0	315.4	97.3
	Maximize Water Use Efficiency	Reduction in potable water use	gpcd	65-85	81	68	77	73	67
Social Impacts	Maximize Multi-Benefit Infrastructure / Programs	Qualitative multiple benefit score	qualitative	1-5	3.1	3.7	3.6	1.0	4.7
	Maximize Net Benefits to Local Economy	Qualitative local economy score	qualitative	1-5	1.0	2.1	1.1	5.0	4.5
	Maximize Social Equity and Enivornmental Justice	Qualitative social equity and environmental justice score	qualitative	1-5	3.1	3.3	3.5	2.9	3.4
Implementation Impacts	Minimize Implementation Challenges	Qualitative implementation uncertainty score	qualitative	1-5	2.8	3.0	3.1	2.2	2.8
	Maximize Scalability	Qualitative scalability score	qualitative	1-5	3.0	5.0	2.0	1.0	5.0
	Minimize Technical Feasibility Challenges	Qualitative technical feasibility score	qualitative	1-5	5.0	4.0	5.0	1.0	4.0

Summary of Draft Initial Portfolios

12/5/2017

	#	Options	Decentralized Option Parameters							Maximize Conservation and Environmental Stewardship						
			Sub-Option / Scenario	SFR	MFR	COM	COA	End Uses	Type of New Development Option Applies To	On?	Implement. Year	Decent. Saturation Rate	2020 Yield (AF/Yr)	2040 Yield (AF/Yr)	2070 Yield (AF/Yr)	2115 Yield (AF/Yr)
Demand Management Options	D1	AMI								✓	2020		596	3,882	5,766	9,371
	D2	Water Loss Control								✓	2020		3,108	9,326	10,918	13,064
	D3	CII Ordinances								✓	2020		1,063	1,063	1,063	1,063
	D4	Benchmarking								✓	2020		-	5,953	11,670	25,228
	D5	Landscape Ordinance								✓	2020		-	3,038	7,428	15,050
	D6	Landscape Incentive								✓	2020		-	321	633	929
	D7	Irrigation Incentive								✓	2020		42	205	427	394
	D8	Lot Scale Stormwater Harvesting	Outdoor		Y			IRR	All	✓	2020	20%	-	180	496	1,391
			Outdoor			Y		IRR	All	✓	2020	20%	-	149	373	885
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D9	Lot Scale Rainwater Harvesting	Outdoor	Y				IRR	All	✓	2020	40%	-	937	2,410	5,088
			Outdoor		Y			IRR	All				-	54	151	425
			Outdoor			Y		IRR	All				-	82	209	498
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL	All	✓	2020	20%	-	195	556	1,562
			Dual pipe			Y		IRR TL HVC	All	✓	2020	20%	-	281	706	1,678
			Potable	Y				ALL	All				-	-	-	-
	D10	Gray Water Harvesting	Outdoor	Y				IRR	All	✓	2020	10%	-	244	631	1,336
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All	✓	2020	10%	-	571	1,461	2,860
			Dual pipe		Y			IRR TL CW	All	✓	2020	20%	-	991	2,702	6,832
			Dual pipe			Y		IRR TL	All	✓	2020	15%	-	321	823	1,638
	D11	Building Scale Wastewater Reuse	Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All	✓	2020	20%	-	1,323	3,672	7,875
	D12	AC Condensate Reuse								✓	2020		100	1,084	2,711	5,150
Supply Options	S1	Aquifer Storage and Recovery								✓	2040		-	30,000	30,000	60,000
	S2	Brackish Groundwater Desal								✓	2070		-	-	5,000	10,000
	S3	Direct Non-Potable Reuse								✓	2020		4,000	12,000	24,000	44,000
	S4	Direct Potable Reuse											-	-	-	-
	S5	Indirect Potable Reuse											-	-	-	-
	S6	LCRA Additional Supply											-	-	-	-
	S7	Off Channel Reservoir								✓	2070		-	-	25,827	25,827
	S8	Imported Option - Seawater Desal (Max Reliability Portfolio) or Groundwater (Min Cost)											-	-	-	-
	S9	Distributed WW Reuse	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield	✓	2040	70%	-	3,154	14,467	30,049
	S10	Sewer Mining	Outdoor				Y	IRR	NA	✓	2040	40%	-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Mainly Brownfield	✓	2040	30%	-	1,000	2,211	5,284
	S11	Community Stormwater	Outdoor				Y	IRR	NA	✓	2040	30%	-	48	48	48
			Outdoor	Y	Y	Y	Y	IRR	Green&Brownfield	✓	2040	30%	-	109	188	455
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Green&Brownfield				-	-	-	-
	S12	Community Rainwater	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield				-	-	-	-

Total Demand Side Options (AFY)	5,108	30,202	54,806	102,316
Total Supply Side Options (AFY)	4,000	46,312	101,741	175,663
Total Potable Supply Options (AFY)	-	30,000	60,827	95,827
Total of All Options (AFY)	9,108	76,514	156,547	277,979

Type 1 Needs	2,745	9,090	12,660	19,684
Type 2 Needs	4,365	10,735	59,462	88,484
Type 3 Needs	-	-	-	170,400
Total Needs	7,110	19,825	72,122	278,568

Additional Supply or Demand Options Required to meet Water Needs	-	-	-	589
Total Supplies Available to meet Type 2 Water Needs	-	30,000	60,827	95,827
Additional Supply Side Options Required to Meet Type 2 Need	4,365	-	-	-

Options Available to meet Type 1 need	200	4,534	12,000	25,692
Options Available to meet Type 2 need	-	30,000	60,827	95,827
Options Available to meet Type 3 need	8,908	41,980	83,720	156,461

Summary of Draft Initial Portfolios

12/5/2017

	#	Options	Decentralized Option Parameters							Maximize Local Control						
			Sub-Option / Scenario	SFR	MFR	COM	COA	End Uses	Type of New Development Option Applies To	On?	Implement. Year	Decent. Saturation Rate	2020 Yield (AF/Yr)	2040 Yield (AF/Yr)	2070 Yield (AF/Yr)	2115 Yield (AF/Yr)
Demand Management Options	D1	AMI								✓	2020		596	3,882	5,766	9,371
	D2	Water Loss Control								✓	2020		3,108	9,326	10,918	13,064
	D3	CII Ordinances								✓	2020		1,063	1,063	1,063	1,063
	D4	Benchmarking								✓	2020		-	5,953	11,670	25,228
	D5	Landscape Ordinance								✓	2020		-	3,038	7,428	15,050
	D6	Landscape Incentive											-	-	-	-
	D7	Irrigation Incentive											-	-	-	-
	D8	Lot Scale Stormwater Harvesting	Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D9	Lot Scale Rainwater Harvesting	Outdoor	Y				IRR	All				-	-	-	-
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All	✓	2040	20%	-	917	2,350	4,819
			Dual pipe		Y			IRR TL	All				-	-	-	-
			Dual pipe			Y		IRR TL HVC	All				-	-	-	-
			Potable	Y				ALL	All				-	-	-	-
	D10	Gray Water Harvesting	Outdoor	Y				IRR	All				-	-	-	-
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All	✓	2040	10%	-	495	1,351	3,416
			Dual pipe			Y		IRR TL	All	✓	2040	10%	-	214	549	1,092
	D11	Building Scale Wastewater Reuse	Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D12	AC Condensate Reuse								✓	2020		100	1,084	2,711	5,150
Supply Options	S1	Aquifer Storage and Recovery								✓	2040		-	30,000	30,000	60,000
	S2	Brackish Groundwater Desal											-	-	-	-
	S3	Direct Non-Potable Reuse								✓	2020		4,000	12,000	25,000	59,600
	S4	Direct Potable Reuse											-	-	-	-
	S5	Indirect Potable Reuse								✓	2070		-	-	10,000	20,000
	S6	LCRA Additional Supply											-	-	-	-
	S7	Off Channel Reservoir								✓	2070		-	-	25,827	25,827
	S8	Imported Option - Seawater Desal (Max Reliability Portfolio) or Groundwater (Min Cost)											-	-	-	-
	S9	Distributed WW Reuse	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield	✓	2040	90%	-	3,391	15,144	31,602
	S10	Sewer Mining	Outdoor				Y	IRR	NA				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Mainly Brownfield	✓	2040	50%	-	1,255	2,673	6,357
	S11	Community Stormwater	Outdoor				Y	IRR	NA	✓	2040	70%	-	73	73	73
			Outdoor	Y	Y	Y	Y	IRR	Green&Brownfield	✓	2040	80%	-	21	43	101
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Green&Brownfield	✓	2040	80%	-	174	324	700
	S12	Community Rainwater	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield	✓	2040	100%	-	16	17	24

Total Demand Side Options (AFY)	4,867	25,974	43,805	78,253
Total Supply Side Options (AFY)	4,000	46,929	109,101	204,285
Total Potable Supply Options (AFY)	0	30,000	65,827	105,827
Total of All Options (AFY)	8,867	72,903	152,906	282,537

Type 1 Needs	2,757	9,301	13,210	20,887
Type 2 Needs	4,443	12,088	62,982	89,687
Type 3 Needs	0	0	0	170,400
Total Needs	7,199	21,390	76,192	280,975

Additional Supply or Demand Options Required to meet Water Needs	-	-	-	-
Total Supplies Available to meet Type 2 Water Needs	-	30,000	65,827	105,827
Additional Supply Side Options Required to Meet Type 2 Need	4,443	-	-	-

Options Available to meet Type 1 need	100	1,084	2,711	5,150
Options Available to meet Type 2 need	-	30,000	65,827	105,827
Options Available to meet Type 3 need	8,767	41,819	84,368	171,560

Summary of Draft Initial Portfolios

12/5/2017

	#	Options	Decentralized Option Parameters							Maximize Water Supply Reliability and Climate Resiliency						
			Sub-Option / Scenario	SFR	MFR	COM	COA	End Uses	Type of New Development Option Applies To	On?	Implement. Year	Decent. Saturation Rate	2020 Yield (AF/Yr)	2040 Yield (AF/Yr)	2070 Yield (AF/Yr)	2115 Yield (AF/Yr)
Demand Management Options	D1	AMI								✓	2020		596	3,882	5,766	9,371
	D2	Water Loss Control								✓	2020		3,108	9,326	10,918	13,064
	D3	CII Ordinances								✓	2020		1,063	1,063	1,063	1,063
	D4	Benchmarking											-	-	-	-
	D5	Landscape Ordinance											-	-	-	-
	D6	Landscape Incentive											-	-	-	-
	D7	Irrigation Incentive											-	-	-	-
	D8	Lot Scale Stormwater Harvesting	Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D9	Lot Scale Rainwater Harvesting	Outdoor	Y				IRR	All				-	-	-	-
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL	All				-	-	-	-
			Dual pipe			Y		IRR TL HVC	All				-	-	-	-
			Potable	Y				ALL	All				-	-	-	-
	D10	Gray Water Harvesting	Outdoor	Y				IRR	All	✓	2040	20%	-	488	1,262	2,672
			Outdoor		Y			IRR	All	✓	2040	20%	-	334	925	2,524
			Outdoor			Y		IRR	All	✓	2040	20%	-	229	665	1,558
			Dual pipe	Y				IRR TL CW	All	✓	2040	10%	-	571	1,461	2,860
			Dual pipe		Y			IRR TL CW	All	✓	2040	20%	-	991	2,702	6,832
			Dual pipe			Y		IRR TL	All	✓	2040	20%	-	428	1,098	2,185
	D11	Building Scale Wastewater Reuse	Dual pipe		Y			IRR TL CW	All	✓	2040	10%	-	585	1,637	4,209
			Dual pipe			Y		IRR TL CW HVC	All	✓	2040	30%	-	1,985	5,509	11,812
	D12	AC Condensate Reuse								✓	2020		100	1,084	2,711	5,150
Supply Options	S1	Aquifer Storage and Recovery											-	-	-	-
	S2	Brackish Groundwater Desal								✓	2040		-	5,000	5,000	10,000
	S3	Direct Non-Potable Reuse								✓	2020		4,000	12,000	25,000	54,600
	S4	Direct Potable Reuse								✓	2040		-	20,000	20,000	20,000
	S5	Indirect Potable Reuse								✓	2040		-	10,000	10,000	20,000
	S6	LCRA Additional Supply											-	-	-	-
	S7	Off Channel Reservoir											-	-	-	-
	S8	Imported Option - Seawater Desal (Max Reliability Portfolio) or Groundwater (Min Cost)								✓	2070		-	-	40,000	84,000
	S9	Distributed WW Reuse	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield	✓	2070	70%	-	3,154	14,467	30,049
	S10	Sewer Mining	Outdoor				Y	IRR	NA				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Mainly Brownfield	✓	2040	50%	-	1,417	3,012	7,168
	S11	Community Stormwater	Outdoor				Y	IRR	NA				-	-	-	-
			Outdoor	Y	Y	Y	Y	IRR	Green&Brownfield				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Green&Brownfield				-	-	-	-
	S12	Community Rainwater	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield				-	-	-	-

Total Demand Side Options (AFY)	4,867	20,967	35,716	63,301
Total Supply Side Options (AFY)	4,000	48,417	117,478	225,817
Total Potable Supply Options (AFY)	0	35,000	75,000	134,000
Total of All Options (AFY)	8,867	69,384	153,194	289,118

Type 1 Needs	2,757	9,552	13,614	21,635
Type 2 Needs	4,443	13,691	65,571	90,435
Type 3 Needs	0	0	0	170,400
Total Needs	7,199	23,242	79,185	282,470

Additional Supply or Demand Options Required to meet Water Needs	-	-	-	-
Total Supplies Available to meet Type 2 Water Needs	-	35,000	75,000	134,000
Additional Supply Side Options Required to Meet Type 2 Need	4,443	-	-	-

Options Available to meet Type 1 need	100	6,695	17,968	39,803
Options Available to meet Type 2 need	-	35,000	75,000	134,000
Options Available to meet Type 3 need	8,767	27,689	60,226	115,314

Summary of Draft Initial Portfolios

12/5/2017

	#	Options	Decentralized Option Parameters							Minimize Cost						
			Sub-Option / Scenario	SFR	MFR	COM	COA	End Uses	Type of New Development Option Applies To	On?	Implement. Year	Decent. Saturation Rate	2020 Yield (AF/Yr)	2040 Yield (AF/Yr)	2070 Yield (AF/Yr)	2115 Yield (AF/Yr)
Demand Management Options	D1	AMI								✓	2020		596	3,882	5,766	9,371
	D2	Water Loss Control								✓	2020		3,108	9,326	10,918	13,064
	D3	CII Ordinances								✓	2020		1,063	1,063	1,063	1,063
	D4	Benchmarking								✓	2020		-	5,953	11,670	25,228
	D5	Landscape Ordinance								✓	2020		-	3,038	7,428	15,050
	D6	Landscape Incentive								✓	2020		-	321	633	929
	D7	Irrigation Incentive								✓	2040		-	205	427	394
	D8	Lot Scale Stormwater Harvesting	Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D9	Lot Scale Rainwater Harvesting	Outdoor	Y				IRR	All				-	-	-	-
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL	All				-	-	-	-
			Dual pipe			Y		IRR TL HVC	All				-	-	-	-
			Potable	Y				ALL	All				-	-	-	-
	D10	Gray Water Harvesting	Outdoor	Y				IRR	All				-	-	-	-
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL	All				-	-	-	-
	D11	Building Scale Wastewater Reuse	Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D12	AC Condensate Reuse								✓	2020		100	1,084	2,711	5,150
Supply Options	S1	Aquifer Storage and Recovery								✓	2070		-	-	30,000	60,000
	S2	Brackish Groundwater Desal											-	-	-	-
	S3	Direct Non-Potable Reuse								✓	2020		4,000	8,000	16,000	40,000
	S4	Direct Potable Reuse											-	-	-	-
	S5	Indirect Potable Reuse								✓	2040		-	10,000	10,000	20,000
	S6	LCRA Additional Supply								✓	2020		-	-	-	-
	S7	Off Channel Reservoir								✓	2040		-	25,827	25,827	25,827
	S8	Imported Option - Seawater Desal (Max Reliability Portfolio) or Groundwater (Min Cost)								✓	2040		-	10,000	20,000	45,000
	S9	Distributed WW Reuse	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield	✓	2040	20%	-	1,055	8,025	16,989
	S10	Sewer Mining	Outdoor				Y	IRR	NA				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Mainly Brownfield				-	-	-	-
	S11	Community Stormwater	Outdoor				Y	IRR	NA				-	-	-	-
			Outdoor	Y	Y	Y	Y	IRR	Green&Brownfield				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Green&Brownfield				-	-	-	-
	S12	Community Rainwater	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield				-	-	-	-

Total Demand Side Options (AFY)	4,867	24,874	40,615	70,249
Total Supply Side Options (AFY)	4,000	54,882	109,852	207,816
Total Potable Supply Options (AFY)	0	45,827	85,827	150,827
Total of All Options (AFY)	8,867	79,755	150,468	278,065

Type 1 Needs	2,757	9,356	13,369	21,288
Type 2 Needs	4,443	12,440	64,003	90,088
Type 3 Needs	0	0	0	170,400
Total Needs	7,199	21,797	77,372	281,775

Additional Supply or Demand Options Required to meet Water Needs	-	-	-	3,710
Total Supplies Available to meet Type 2 Water Needs	-	45,827	85,827	150,827
Additional Supply Side Options Required to Meet Type 2 Need	4,443	-	-	-

Options Available to meet Type 1 need	100	2,139	10,736	22,139
Options Available to meet Type 2 need	-	35,827	65,827	105,827
Options Available to meet Type 3 need	8,767	41,789	73,905	150,099

Summary of Draft Initial Portfolios

12/5/2017

	#	Options	Decentralized Option Parameters							Minimize Implementation Challenges						
			Sub-Option / Scenario	SFR	MFR	COM	COA	End Uses	Type of New Development Option Applies To	On?	Implement. Year	Decent. Saturation Rate	2020 Yield (AF/Yr)	2040 Yield (AF/Yr)	2070 Yield (AF/Yr)	2115 Yield (AF/Yr)
Demand Management Options	D1	AMI								✓	2020		596	3,882	5,766	9,371
	D2	Water Loss Control								✓	2020		3,108	9,326	10,918	13,064
	D3	CII Ordinances								✓	2020		1,063	1,063	1,063	1,063
	D4	Benchmarking								✓	2020		-	5,953	11,670	25,228
	D5	Landscape Ordinance								✓	2020		-	3,038	7,428	15,050
	D6	Landscape Incentive											-	-	-	-
	D7	Irrigation Incentive								✓	2040		-	207	434	401
	D8	Lot Scale Stormwater Harvesting	Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D9	Lot Scale Rainwater Harvesting	Outdoor	Y				IRR	All	✓	2040	20%	-	468	1,205	2,544
			Outdoor		Y			IRR	All	✓	2040	20%	-	107	302	850
			Outdoor			Y		IRR	All	✓	2040	30%	-	247	626	1,493
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL	All				-	-	-	-
			Dual pipe			Y		IRR TL HVC	All				-	-	-	-
			Potable	Y				ALL	All				-	-	-	-
	D10	Gray Water Harvesting	Outdoor	Y				IRR	All				-	-	-	-
			Outdoor		Y			IRR	All				-	-	-	-
			Outdoor			Y		IRR	All				-	-	-	-
			Dual pipe	Y				IRR TL CW	All				-	-	-	-
			Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL	All				-	-	-	-
	D11	Building Scale Wastewater Reuse	Dual pipe		Y			IRR TL CW	All				-	-	-	-
			Dual pipe			Y		IRR TL CW HVC	All				-	-	-	-
	D12	AC Condensate Reuse								✓	2020		100	1,084	2,711	5,150
Supply Options	S1	Aquifer Storage and Recovery								✓	2040		-	30,000	30,000	60,000
	S2	Brackish Groundwater Desal											-	-	-	-
	S3	Direct Non-Potable Reuse								✓	2020		4,000	12,000	25,000	54,600
	S4	Direct Potable Reuse											-	-	-	-
	S5	Indirect Potable Reuse								✓	2070		-	-	10,000	20,000
	S6	LCRA Additional Supply								✓	2115		-	-	-	30,000
	S7	Off Channel Reservoir								✓	2070		-	-	25,827	25,827
	S8	Imported Option - Seawater Desal (Max Reliability Portfolio) or Groundwater (Min Cost)											-	-	-	-
	S9	Distributed WW Reuse	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield	✓	2070	20%	-	1,055	8,025	16,989
	S10	Sewer Mining	Outdoor				Y	IRR	NA				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Mainly Brownfield				-	-	-	-
	S11	Community Stormwater	Outdoor				Y	IRR	NA				-	-	-	-
			Outdoor	Y	Y	Y	Y	IRR	Green&Brownfield				-	-	-	-
			Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Green&Brownfield				-	-	-	-
	S12	Community Rainwater	Dual pipe	Y	Y	Y	Y	IRR TL CW HVC	Greenfield				-	-	-	-

Total Demand Side Options (AFY)	4,867	25,377	42,123	74,213
Total Supply Side Options (AFY)	4,000	42,000	98,852	207,416
Total Potable Supply Options (AFY)	0	30,000	65,827	135,827
Total of All Options (AFY)	8,867	67,377	140,975	281,629

Type 1 Needs	2,757	9,331	13,294	21,089
Type 2 Needs	4,443	12,279	63,521	89,889
Type 3 Needs	0	0	0	170,400
Total Needs	7,199	21,610	76,815	281,379

Additional Supply or Demand Options Required to meet Water Needs	-	-	-	-
Total Supplies Available to meet Type 2 Water Needs	-	30,000	65,827	105,827
Additional Supply Side Options Required to Meet Type 2 Need	4,443	-	-	-

Options Available to meet Type 1 need	100	1,084	2,711	5,150
Options Available to meet Type 2 need	-	30,000	65,827	105,827
Options Available to meet Type 3 need	8,767	36,293	72,438	170,652