

Water Conservation Master Plan

Santa Cruz Water Commission
February 3, 2014

Agenda

- * Update on project status
- * Review findings of water savings, costs and benefits of individual measures
- * Compare results of four potential programs
- * Solicit feedback & input to help select a program
- * Next steps

Project Goals and Objectives

- * Systematically evaluate and quantify the City's remaining long-term water conservation potential (baseline survey);
- * Determine which set of measures and implementation mechanisms represent the best approach to achieve future water savings; and
- * Create a road map to achieve maximum practical water use efficiency.



Overview of Project Scope and Schedule

- * Task A: Review current water conservation program
- * Task B: Analyze water use and organize conservation program opportunities
- * Task C: Identify and prioritize conservation measures
- * Task D: Master plan preparation

Potential Water Conservation Measures

	Measure	Customer	Type of Program
Water System			
1.	Water Loss Control Program	Water Dept/System	Operations
2.	Advanced Metering Infrastructure	Irrigation, All	Operations
3.	Water Budget-Based Billing	Irrigation, All	Pricing
4A.	General Public Information Program	All	Education
4B.	Customer Water Use (Billing) Reports & Service	SFR	Education
Residential			
5.	Leak Repair and Plumbing Emergency Assistance	SFR*, MFR*	Technical Assistance
6.	Single Family Water Surveys - Indoor / Outdoor	SFR	Technical Assistance
7.	Pressure Reduction	All	Financial Incentive
8.	High Efficiency Faucet Aerator / Showerhead Giveaway	All	Device Distribution
9A.	Residential High Efficiency Toilets (HET) Rebates	SFR, MFR	Financial Incentive
9B.	Residential Ultra High Efficiency Toilets (UHET) Rebates	SFR, MFR	Financial Incentive
10.	Install Ultra High Efficiency Toilets, Showerheads, and Faucet Aerators	SFR, MFR	Direct Install
11A.	Residential Clothes Washer Rebate	SFR, MFR	Financial Incentive
11B.	Residential Clothes Washer Rebate - Expanded*	SFR, MFR	Financial Incentive
12.	Require High Efficiency Clothes Washers in New Development	New Development	Regulation
13.	Provide a Rebate for Hot Water on Demand Pump Systems Retrofit	SFR	Financial Incentive
14.	Require Hot Water on Demand / Structured Plumbing in New Developments	New Development	Regulation
15.	Toilet Retrofit At Time of Sale	All	Regulation
Commercial			
16.	High Efficiency Washer Rebate	CII*/MFR	Financial incentive
17.	Customized Top Users Incentive Program	CII	Financial Incentive
18.	Promote Restaurant Spray Nozzles	CII	Direct Install
19.	CII Surveys Targeting Top Water Users Program	CII	Technical Assistance
20.	High Efficiency Urinal Rebates	CII	Financial Incentive
21.	Install Sensor-Activated Low Flow Faucets	CII	Direct Install
22.	School Building Retrofit	Schools	Financial Incentive

(continued)

Landscape

23. Water Efficient Landscape Ordinance	All	Regulation
24A. Landscape Conversion or Turf Removal	SFR	Financial Incentive
24B. Landscape Conversion or Turf Removal -Expanded*	SFR	Financial Incentive
25A. Landscape Conversion or Turf Removal	MFR, CII	Financial Incentive
25B. Landscape Conversion or Turf Removal -Expanded*	MFR, CII	Financial Incentive
26. Outdoor Water Audit	MFR, CII, Irr*	Technical Assistance
27. Financial Incentives for Irrigation and Landscape Upgrades	All	Financial Incentive
28. Weather Based Irrigation Controller Rebates	All	Financial Incentive
29. Rotating Sprinkler Nozzle Rebates	All	Financial Incentive
30. Residential Gray Water Retrofit	SFR	Financial Incentive
31. Shade Tree Program	All	Distribution
32. Promote Rain Sensors	All	Financial Incentive
33. Provide Rain Barrel Incentive	SFR	Financial Incentive
34. Provide Large Rain Catchment System Incentive	All	Financial Incentive

*SFR = Single Family Residential

* MFR = Multi-Family Residential

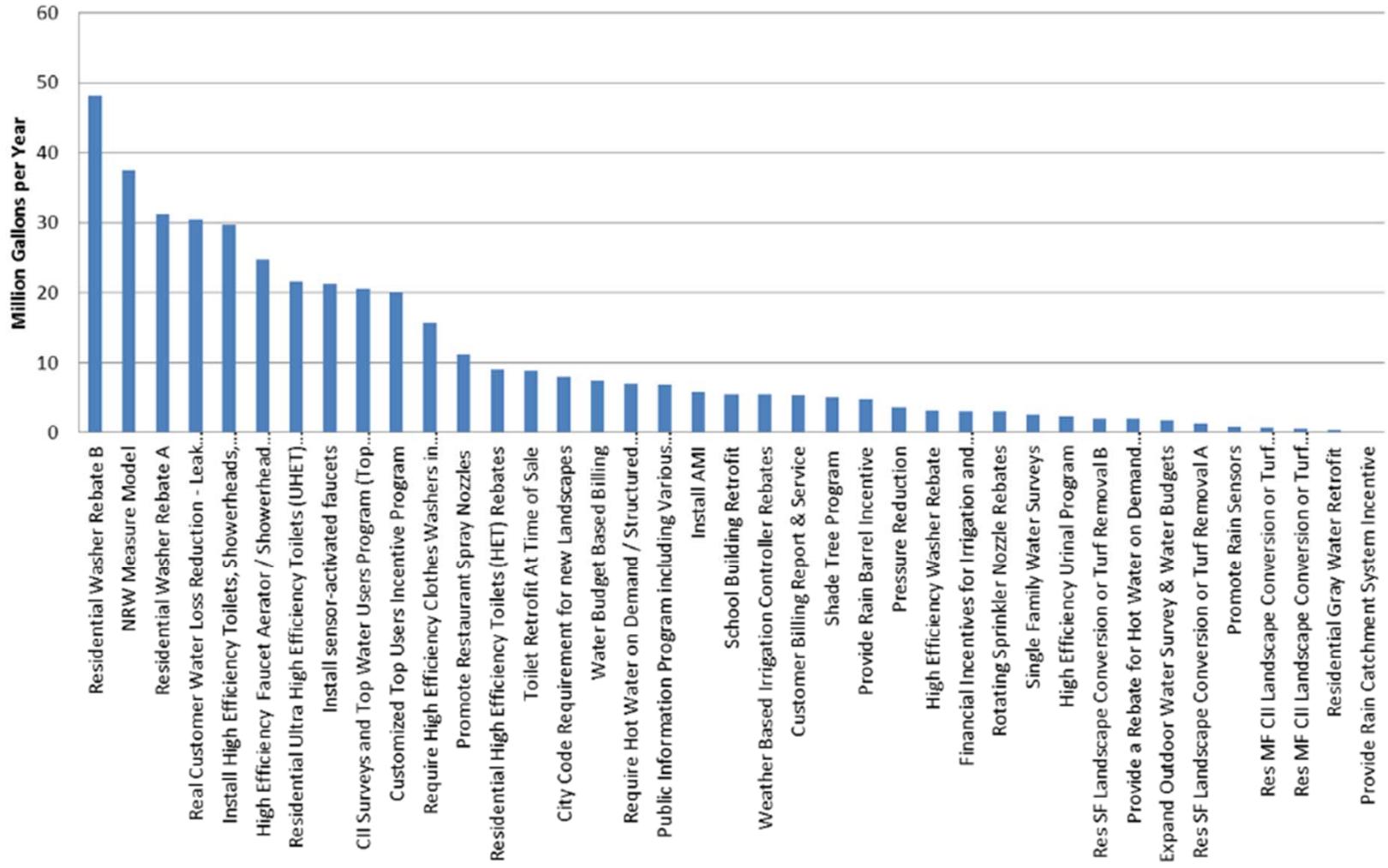
*CII = Commercial, Industrial, Institutional

*Irr = Irrigation

* Expanded programs may include fewer restrictions and/or increased incentives or other measures to increase participation levels.

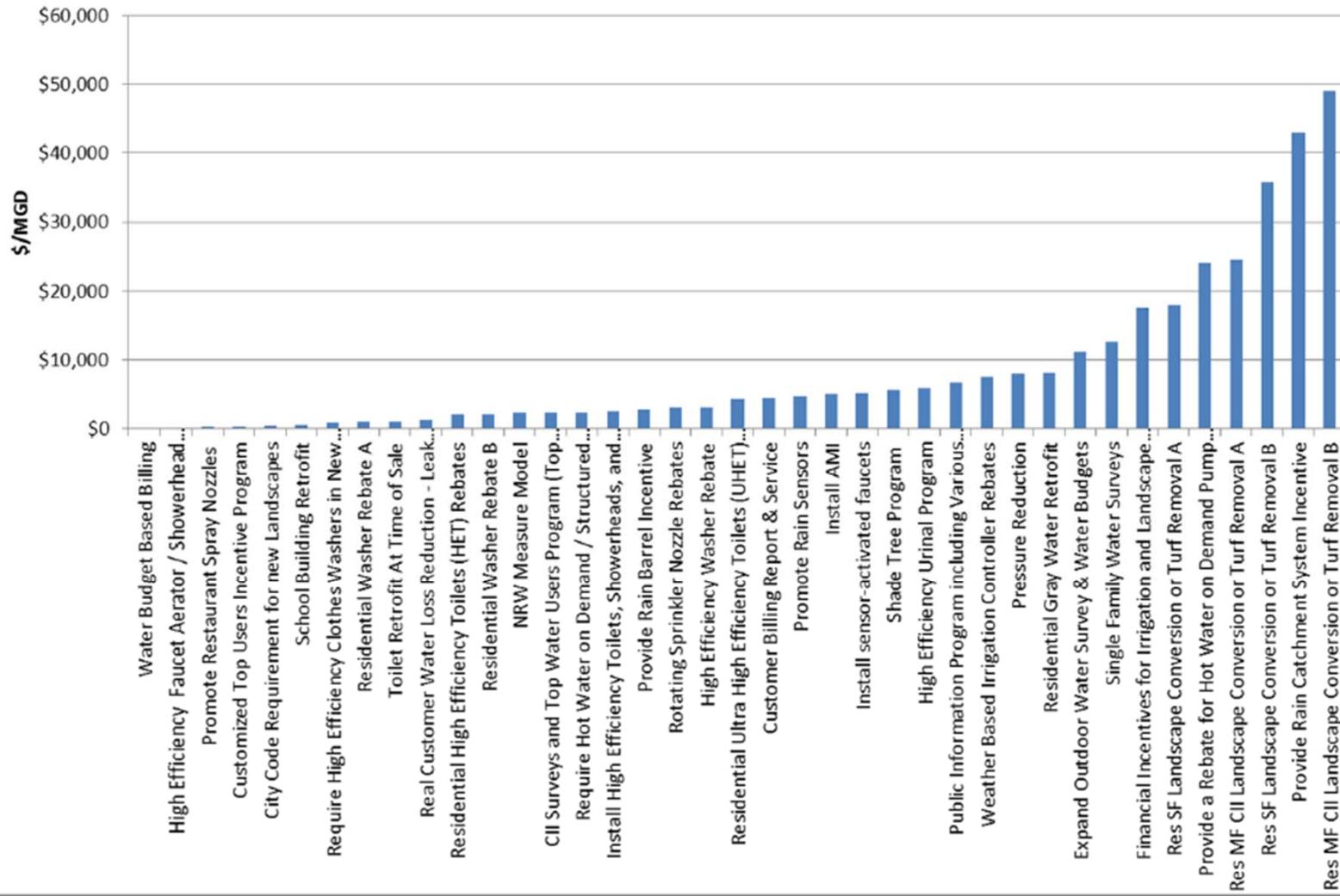
Water Savings

Figure 1. Water Savings in 2030, (Million Gallons/Year)



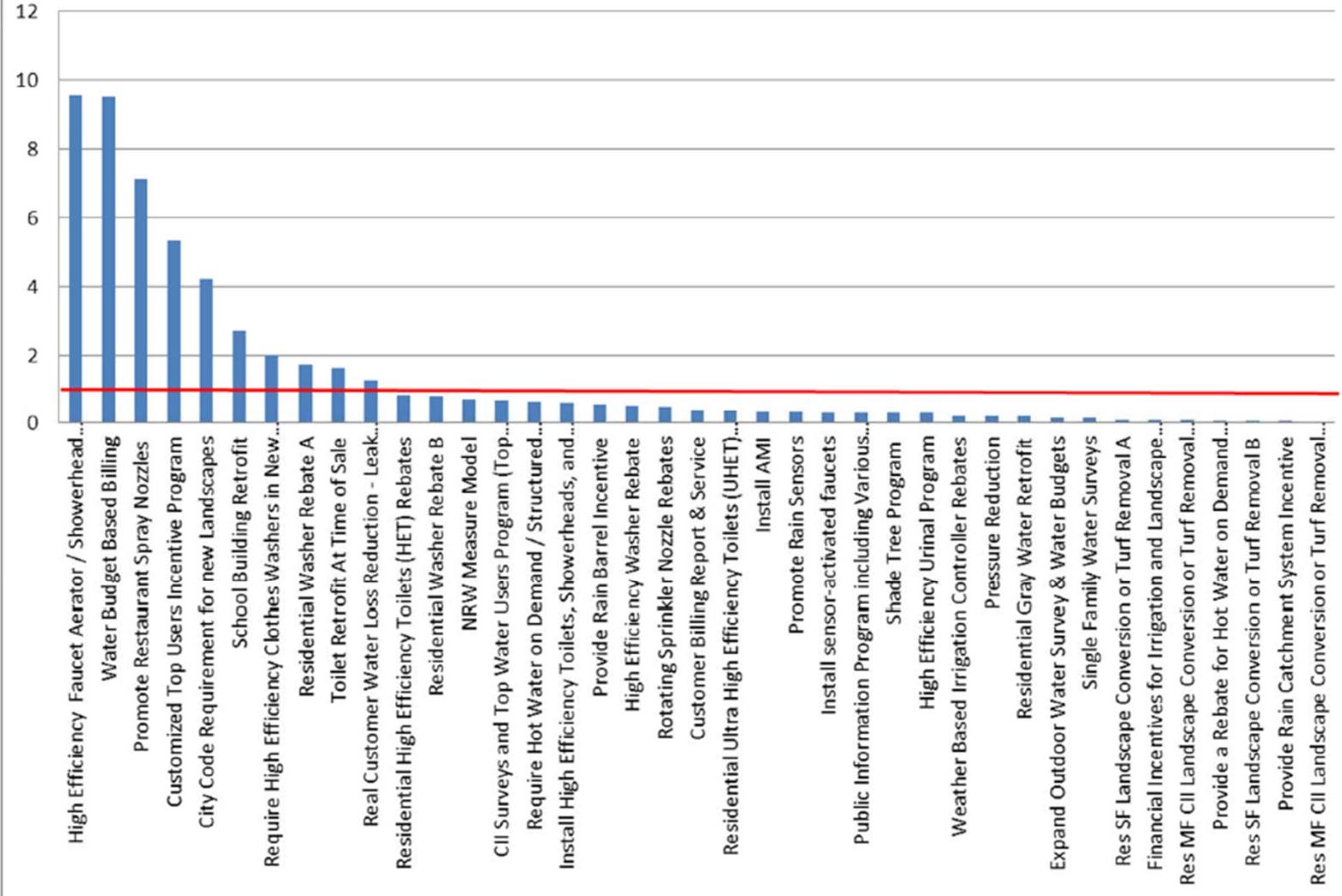
Cost of Water Saved

Figure 2. Cost of Water Saved, \$/Million Gallons



Benefit/Cost Ratio

Figure 3. Benefit/Cost Ratio



Four Program Scenarios

Program	Description
A	This program represents the group of measures that the City is currently operating.
B	This program consists of the measures that are the most cost-effective, as well as some that are included for their customer-service value.
C	This program is a combination of measures currently being operated, cost-effective measures, and selected measures for added synergy and savings.
D	This is the essentially the entire list of measures analyzed, not including the less intensive versions of the measures s designated A/B

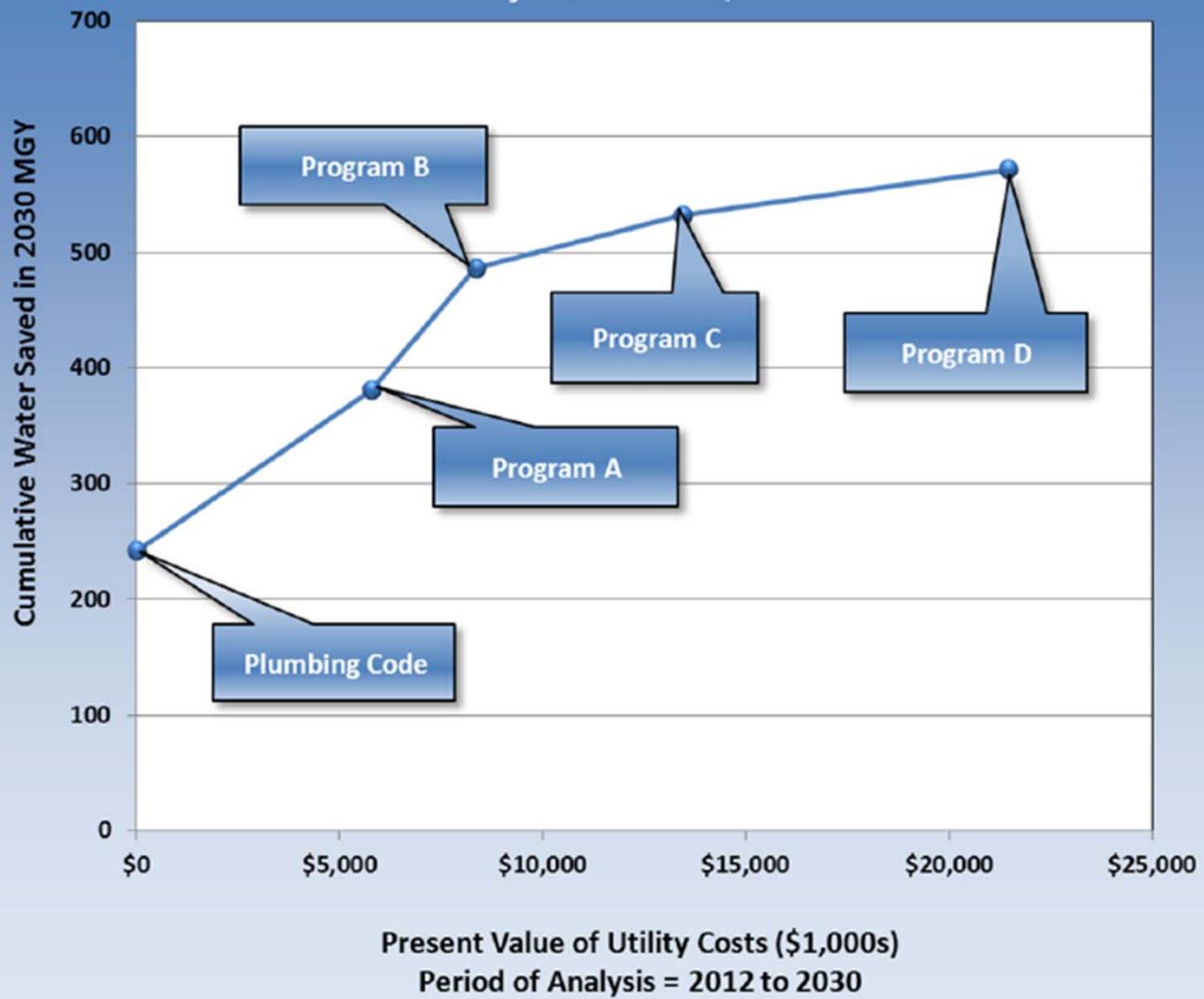
Comparison of Programs

Santa Cruz, California

Conservation Program	Present Value of Costs (\$1,000)	2030 Water Saved (MGY)
Plumbing Code	\$0	242
Program A	\$5,768	381
Program B	\$8,346	487
Program C	\$13,425	532
Program D	\$21,448	572

Present Value of Utility Costs vs. Water Saved in 2030

City of Santa Cruz, CA



Long Term Conservation Program Water Savings

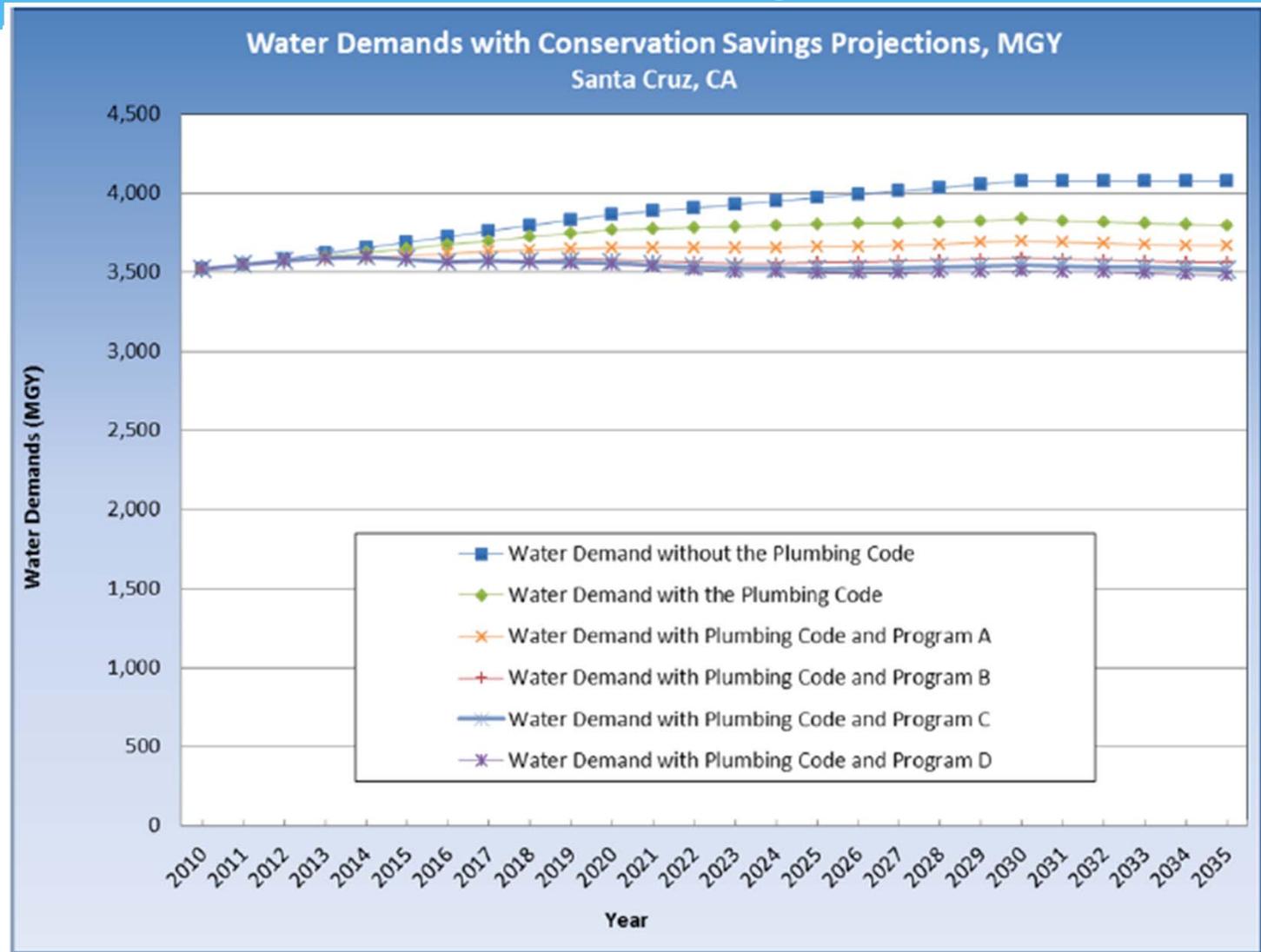
Santa Cruz, California

Water Savings (MGY)	2015	2020	2025	2030	Water Utility	Community
					Benefit to Cost Ratio	Benefit to Cost Ratio
Program A	47	110	143	139	0.93	0.91
Program B	73	186	243	245	1.11	1.02
Program C	68	206	282	291	0.79	0.52
Program D	68	220	310	330	0.55	0.45

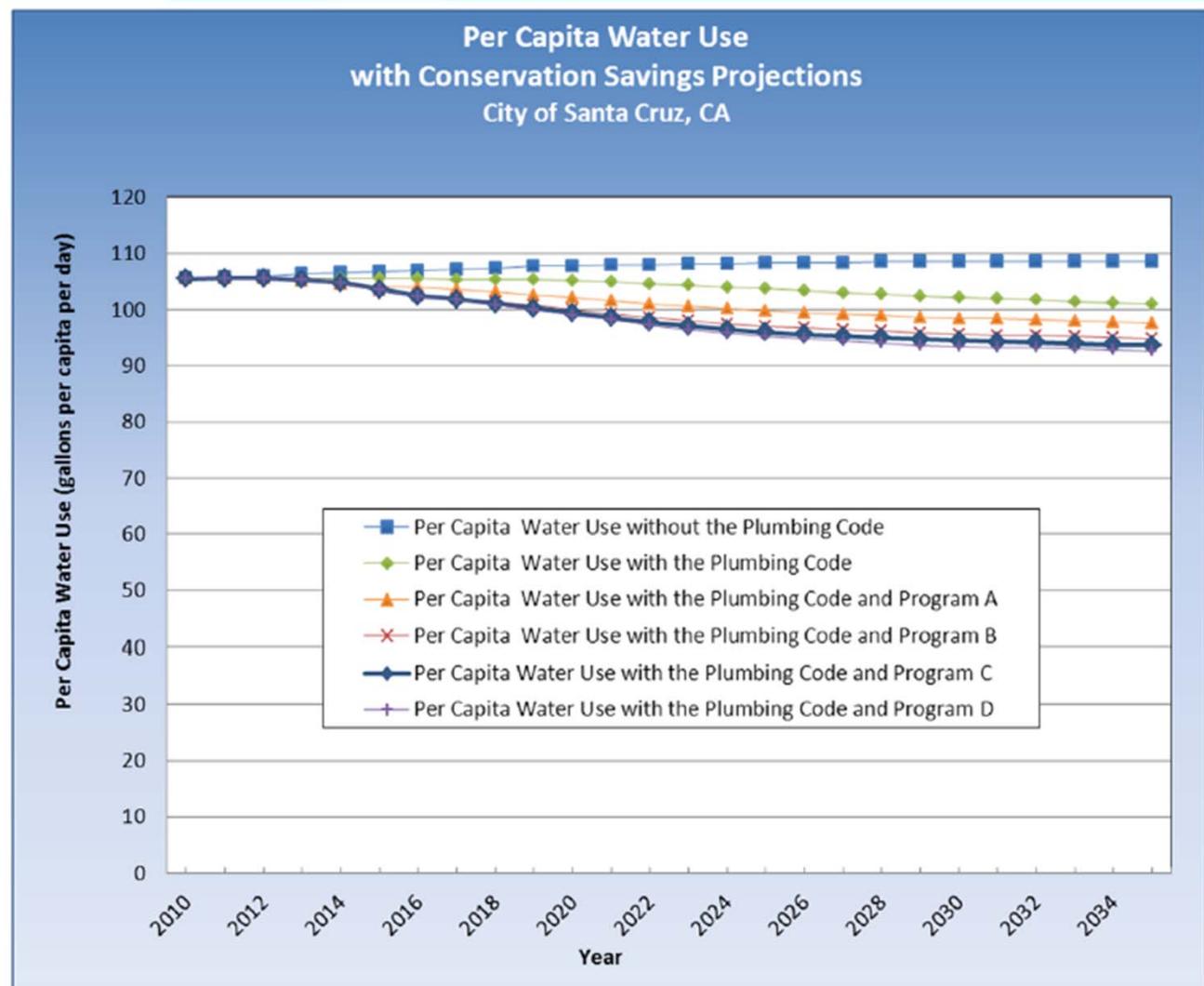
Table 4.

Marginal Cost Between Programs			
Conservation Program	Incremental Cost 30-year Present Value (\$1000)	Incremental Savings, MGY	PV/MGY, \$
Plumbing Code	\$0	Baseline	\$0
Program A	\$5,768	138.87	\$41,533
Program B	\$2,578	105.90	\$24,343
Program C	\$5,080	45.76	\$111,008
Program D	\$8,022	39.80	\$201,551

Water Demands with Conservation Savings Projections



Per Capita Water Use with Conservation Savings Projections



Next Steps

- * Asking for input tonight on kinds of information the Water Commission would like to make a choice about a preferred program at a future meeting.
- * Process going forward:
 - * Public Input
 - * Share findings with City Council
 - * Role of the Water Supply Advisory Committee
 - * Possible delay due to severe drought response

Questions?



Water savings in MGD, Percent of Total Production

Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	2030 Water Savings (MGD)	2030 Water Savings (MGY)	2030 Indoor Water Savings (MGD)	2030 Outdoor Water Savings (MGD)	Total Production in 2030	Present Value of Water Utility Costs	Annual Average Water Utility Cost in First Five Years (2013 - 2017)
Without the Plumbing Code	NA	NA	0	0	0	0	0.00%	NA	NA
With the Plumbing Code	NA	NA	0.66	242	0.66	0	5.93%	NA	NA
Plumbing Code plus Program A	0.93	0.91	1.04	381	0.97	0.07	9.55%	\$5,767,811	\$0
Plumbing Code plus Program B	1.11	1.02	1.33	487	1.23	0.10	12.32%	\$8,345,811	\$483,236
Plumbing Code plus Program C	0.79	0.52	1.46	532	1.34	0.12	13.51%	\$13,425,391	\$681,458
Plumbing Code plus Program D	0.55	0.45	1.57	572	1.42	0.15	14.55%	\$21,447,710	\$805,531