

Draft Results, Municipal/Domestic Water Conservation

July 14, 2010

Table 1: Scenario 1- No Action

Participation Rate by Customer Category*						
Conservation Measure	First Year of Planning Period			Last Year of Planning Period		
	2011			2060		
	SF	MF	NR	SF	MF	NR
Efficient Clotheswashers	5%	5%	5%	75%	75%	75%
Bathroom Faucet Aerators - 0.5 gpm	5%	5%	5%	25%	25%	100%
Showerhead - 1.5 gpm	5%	5%	5%	25%	25%	25%
High Efficiency Toilets - 1.28 gpf	1%	1%	1%	25%	25%	25%
Urinals - 0.5 gpf	N/A	N/A	5%	N/A	N/A	10%
Kitchen Spray Valve – 1.25 gpm	N/A	N/A	5%	N/A	N/A	90%
<i>Faucets - Decrease Use</i>	5%	5%	N/A	5%	5%	N/A
<i>Showerheads - Decrease Use</i>	5%	5%	N/A	5%	5%	N/A
<i>Toilets - Leak Detection</i>	5%	5%	N/A	15%	15%	N/A
<i>Toilets - Decrease Flushes</i>	1%	1%	N/A	1%	1%	N/A
Irrigation Controllers - ET Model	0%	5%	5%	25%	25%	25%
Outdoor Irrigation Kits	5%	N/A	N/A	15%	N/A	N/A
<i>Outdoor Audit</i>	N/A	1%	1%	N/A	5%	5%
<i>Lawn Replacement</i>	5%	5%	N/A	5%	5%	N/A

*Percent of Target Customers that Participate in Water Conservation Programs

Behavior Measures are *italicized*.

Customer Categories: SF = Single Family Households; MF = Multifamily Households; NR = Non-Residential

N/A---Not Applicable

1. Participation rates for 2010 are based on qualitative information provided to the Study Team by municipal water systems in the Yakima Basin in May 2010.
2. Under Scenario 1, participation rates at 2030 will be estimated as 40% of the change in participation rates from 2010 to 2060 (20 years of the 50-year period represents 40% of the time period).
3. Future trends due to improvements in equipment technology have been assumed to be more powerful than trends that change personal behavior by consumers.

Table 2: Scenario 2 - Comprehensive Basin-Wide Conservation

Participation Rate by Customer Category*						
Conservation Measure	First Year of Planning Period			Last Year of Planning Period		
	2011			2060		
	SF	MF	NR	SF	MF	NR
Efficient Clotheswashers	5%	5%	5%	90%	90%	90%
Bathroom Faucet Aerators - 0.5 gpm	5%	5%	5%	90%	90%	100%
Showerhead - 1.5 gpm	5%	5%	5%	90%	90%	90%
High Efficiency Toilets - 1.28 gpf	1%	1%	1%	90%	90%	90%
Urinals - 0.5 gpf	N/A	N/A	5%	N/A	N/A	90%
Kitchen Spray Valve – 1.25 gpm	N/A	N/A	5%	N/A	N/A	90%
<i>Faucets - Decrease Use</i>	5%	5%	N/A	50%	50%	N/A
<i>Showerheads - Decrease Use</i>	5%	5%	N/A	50%	50%	N/A
<i>Toilets - Leak Detection</i>	5%	5%	N/A	50%	50%	N/A
<i>Toilets - Decrease Flushes</i>	1%	1%	N/A	50%	50%	N/A
Irrigation Controllers - ET Model	0%	5%	5%	90%	90%	90%
Outdoor Irrigation Kits	5%	N/A	N/A	90%	N/A	N/A
<i>Outdoor Audit</i>	N/A	1%	1%	N/A	90%	90%
<i>Lawn Replacement</i>	5%	5%	N/A	50%	50%	N/A

*Percent of Target Customers that Participate in Water Conservation Programs

Behavior Measures are *italicized*.

Customer Categories: SF = Single Family Households; MF = Multifamily Households; NR = Non-Residential
N/A---Not Applicable in this customer category

1. Participation rates for 2010 are based on qualitative information provided to the Study Team by municipal water systems in the Yakima Basin in May 2010.
2. For Scenario 2, participation rates at 2030 will be more accelerated than Scenario 1: they will be estimated as 60% of the change in participation rates from 2010 to 2060.
3. Future trends due to improvements in equipment technology have been assumed to be more powerful than trends that change personal behavior by consumers.

Table 3: Water Conservation Savings at Year 2060 – No Action Scenario

Conservation Measure	Customer Definition	Savings Generating Customers	Water Savings At Full Implementation	
			Non-Irrigation Season (gpd)	Irrigation Season (gpd)
<i>Indoor Measures</i>				
Toilets - 1.28 gpf (HET)	SF Households	47,467	545,936	545,936
Toilets - 1.28 gpf (HET)	MF Households	4,671	38,302	38,302
Toilets - 1.28 gpf (HET)	NR Accounts	1,984	99,200	99,200
Urinals - 0.5 gpf Models	NR Accounts	609	10,171	10,171
Toilets - Leak Detection	SF Households	8,310	177,014	177,014
Toilets - Leak Detection	MF Households	823	12,510	12,510
Clotheswashers	SF Households	92,327	1,449,660	1,449,660
Clotheswashers - In Unit	MF Households	4,178	46,794	46,794
Clotheswashers - Common Area	MF Households	5,013	56,146	56,146
Clotheswashers - Commercial	NR Accounts	42	56,448	56,448
Faucets - 0.5 gpm Bathrm Aerators	SF Households	34,162	355,285	355,285
Faucets - 0.5 gpm Bathrm Aerators	MF Households	3,362	16,138	16,138
Faucets - 0.5 gpm Bathrm Aerators	NR Accounts	407	13,554	13,554
Showerhead 1.5 gpm	SF Households	34,162	372,413	372,413
Showerhead 1.5 gpm	MF Households	3,362	26,224	26,224
Showerhead 1.5 gpm	NR Accounts	71	27,690	27,690
Pre-Rinse Spray Valves - 1.25 gpm	NR Accounts	343	40,543	40,543
Faucets - Decrease Use	SF Households	6,667	26,010	26,010
Faucets - Decrease Use	MF Households	658	1,184	1,184
Showerheads - Decrease Use	SF Households	6,667	16,677	16,677
Showerheads - Decrease Use	MF Households	658	1,184	1,184
Toilets - Decrease Flushes	SF Households	1,390	4,311	4,311
Toilets - Decrease Flushes	MF Households	137	301	301
<i>Outdoor Measures</i>				
Irrigation Controllers - ET Model	SF Households	14,651	0	1,046,919
Irrigation Controllers - ET Model	MF Accounts	323	0	49,088
Irrigation Controllers - ET Model	NR Accounts	518	0	89,898
Outdoor Irrigation Kits	SF Households	11,159	0	265,801
Outdoor Audit	MF Accounts	17	0	2,584
Outdoor Audit	NR Accounts	27	0	4,686
Lawn Replacement	SF Households	5,667	0	2,159,746
Lawn Replacement	MF Accounts	92	0	74,497
Seasonal Water Savings			3,393,693	7,086,912
Total Annual Water Savings ⁽¹⁾	2,025 Million Gallons (6,218 Acre-Feet)			

1. Calculated using irrigation season of 7 months (213 days), consistent with municipal use patterns obtained in this study.

Table 4: Water Conservation Savings at Year 2060 – Comprehensive Scenario

Conservation Measure	Customer Definition	Savings Generating Customers	Water Savings At Full Implementation	
			Non-Irrigation Season (gpd)	Irrigation Season (gpd)
<i>Indoor Measures</i>				
Toilets - 1.28 gpf (HET)	SF Households	170,881	1,965,366	1,965,366
Toilets - 1.28 gpf (HET)	MF Households	16,815	137,883	137,883
Toilets - 1.28 gpf (HET)	NR Accounts	7,142	357,100	357,100
Urinals - 0.5 gpf Models	NR Accounts	5,483	91,574	91,574
Toilets - Leak Detection	SF Households	27,701	590,069	590,069
Toilets - Leak Detection	MF Households	2,744	41,709	41,709
Clotheswashers	SF Households	110,793	1,739,602	1,739,602
Clotheswashers - In Unit	MF Households	5,013	56,146	56,146
Clotheswashers - Common Area	MF Households	5,013	56,146	56,146
Clotheswashers - Commercial	NR Accounts	50	67,200	67,200
Faucets - 0.5 gpm Bathrm Aerators	SF Households	122,982	1,279,013	1,279,013
Faucets - 0.5 gpm Bathrm Aerators	MF Households	12,102	58,090	58,090
Faucets - 0.5 gpm Bathrm Aerators	NR Accounts	366	12,188	12,188
Showerhead 1.5 gpm	SF Households	122,982	1,340,672	1,340,672
Showerhead 1.5 gpm	MF Households	12,102	94,396	94,396
Showerhead 1.5 gpm	NR Accounts	257	100,230	100,230
Pre-Rinse Spray Valves - 1.25 gpm	NR Accounts	343	40,543	40,543
Faucets - Decrease Use	SF Households	66,672	260,112	260,112
Faucets - Decrease Use	MF Households	6,585	11,853	11,853
Showerheads - Decrease Use	SF Households	66,672	166,771	166,771
Showerheads - Decrease Use	MF Households	6,585	11,853	11,853
Toilets - Decrease Flushes	SF Households	69,479	215,480	215,480
Toilets - Decrease Flushes	MF Households	6,862	15,096	15,096
<i>Outdoor Measures</i>				
Irrigation Controllers - ET Model	SF Households	52,743	0	3,768,867
Irrigation Controllers - ET Model	MF Accounts	1,163	0	176,748
Irrigation Controllers - ET Model	NR Accounts	1,864	0	323,493
Outdoor Irrigation Kits	SF Households	66,956	0	1,594,852
Outdoor Audit	MF Accounts	303	0	46,049
Outdoor Audit	NR Accounts	486	0	84,344
Lawn Replacement	SF Households	56,671	0	21,597,839
Lawn Replacement	MF Accounts	922	0	746,593
Seasonal Water Savings			8,709,090	37,047,876
Total Annual Water Savings ⁽¹⁾	9,215 Million Gallons (28,290 Acre-Feet)			

1. Calculated using irrigation season of 7 months (213 days), consistent with municipal use patterns obtained in this study.

Table 5: Comparison of Conservation Scenarios (MGD)

	No-Action Scenario	Comprehensive Scenario	Increased Savings from Comprehensive Scenario
Year-round	5.5	25.2	19.7
Non-Irrigation Season	3.4	8.7	5.3
Irrigation Season	7.1	37.0	29.9

MGD = million gallons per day

Note: For values in MGD, the year-round value is a weighted average of the two seasonal values (weighted by 213 days for irrigation season and 152 days non-irrigation season).

Table 6: Comparison of Conservation Scenarios (AF)

	No-Action Scenario	Comprehensive Scenario	Increased Savings from Comprehensive Scenario
Year-round	6,200	28,300	22,100
Non-Irrigation Season	1,600	4,100	2,500
Irrigation Season	4,600	24,200	19,600

AF = Acre-Feet

Note: For values in AF, the year-round value is the sum of the two seasonal values.

Table 7:

Conservation Measures Modeled	Percent Considered Consumptive
Lawn Replacement	60%
Irrigation Controllers – ET Model	30%
Outdoor Irrigation Kits	30%
Outdoor Audit	30%
All Indoor Measures	3%

Table 8: Estimate of Consumptive Use Reduction from No-Action Scenario

	gpd	gpy	afy
Total water saved from lawn replacement	2,234,000	402,120,000	1,200
Consumptive portion	1,340,000	241,200,000	700
Total water saved from other outdoor measures	1,459,000	262,620,000	800
Consumptive portion	438,000	78,840,000	200
Total water saved from all indoor measures	3,394,000	1,238,810,000	3,800
Consumptive portion	102,000	37,230,000	100
Total consumptive savings ¹	N/A	357,270,000	1,100

Note: Values in gpd are seasonal for the outdoor measures, but year-round for the indoor measures. To convert to values in gpy they are multiplied by 180 days for outdoor measures, and 365 days for indoor measures.

1. Total consumptive savings does not equal sum of values above, due to rounding.

Table 9: Estimate of Consumptive Use Reduction from Comprehensive Scenario

	gpd	gpy	afy
Total water saved from lawn replacement	22,344,000	4,021,920,000	12,300
Consumptive portion	13,406,000	2,413,080,000	7,400
Total water saved from other outdoor measures	5,994,000	1,078,920,000	3,300
Consumptive portion	1,798,000	323,640,000	1,000
Total water saved from all indoor measures	8,709,000	3,178,785,000	9,800
Consumptive portion	261,000	95,265,000	300
Total Consumptive Savings	N/A	2,831,985,000	8,700

See note on prior table.

Table 10: Estimated Consumptive Use Savings from Conservation Scenarios (AFY)

	No-Action Scenario	Comprehensive Scenario	Increased Savings from Comprehensive Scenario
Consumptive Use Reduction	1,100	8,700	7,600

Table 11: Potential Water Savings from Supply-Side Actions

Year	Forecast Production from Municipal Systems (Medium Forecast) (AFY)	No-Action Scenario Water Savings (AFY)	Comprehensive Scenario Water Savings (AFY)	Difference (Added Benefit of Comprehensive Scenario) (AFY)
2030	75,000	1,500	3,000	1,500
2060	101,000	2,000	4,000	2,000

Table 12: Potential Water Savings from Consumer Measures and Supply-Side Actions

Year	Forecast Municipal and Domestic Needs (AFY)	No-Action Scenario Combined Water Savings (AFY)	Comprehensive Scenario Combined Water Savings (AFY)	Difference (Added Benefit of Comprehensive Scenario) (AFY)
2030	121,000	4,000	20,000	16,000
2060	163,000	8,200	32,300	24,100