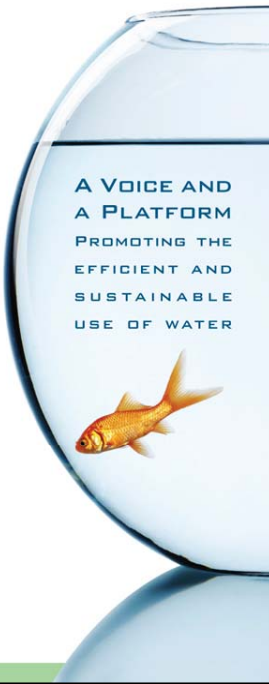


Planning Your Conservation Programs Using a Tracking Tool

Mary Ann Dickinson
David Mitchell
CPUC Workshop 1/21/2010

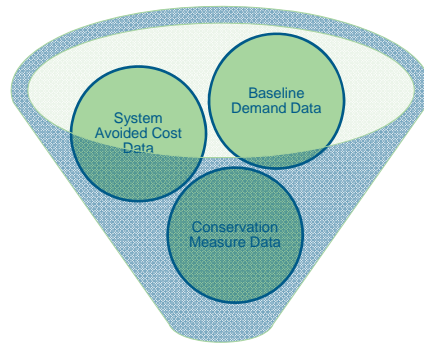


What Does It Do?

- Analyzes potential water savings, costs, and benefits of conservation measures
- Constructs water conservation portfolios and long-range plans
- Ranks conservation measures
- Tracks implementation, water savings, and costs
- Predicts revenue impact
- Tracks and graphs the benefits of actual conservation activities over time



Tracking Tool Inputs and Outputs

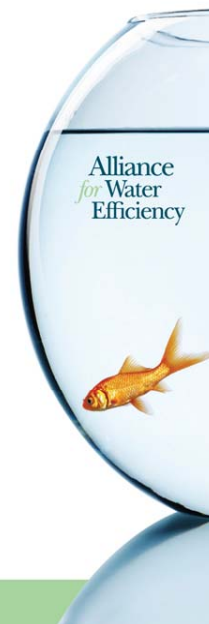


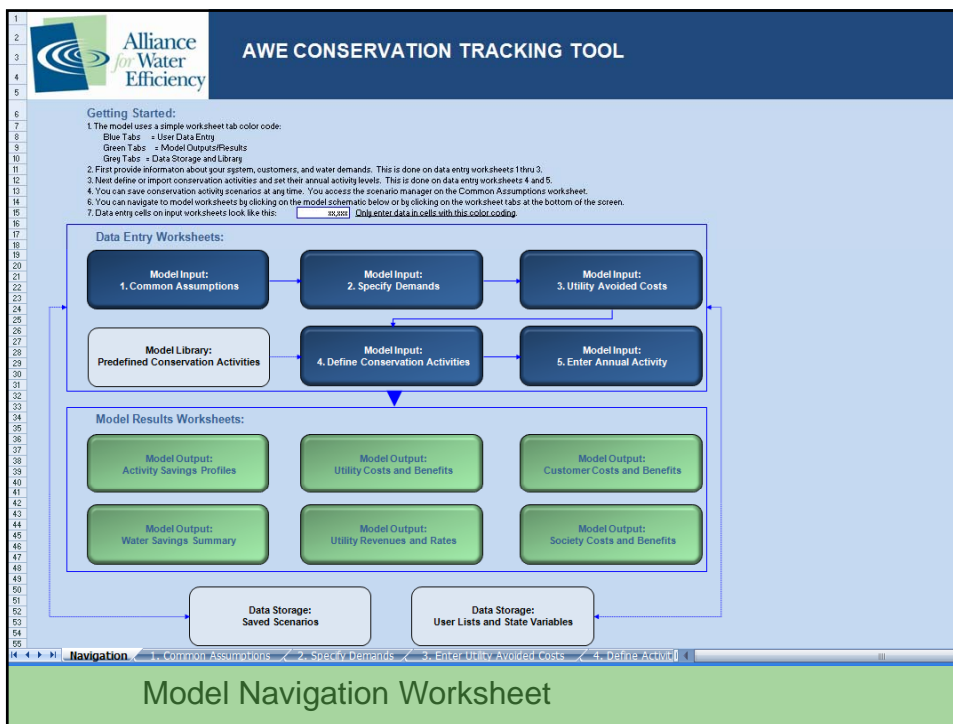
Model Outputs

Savings Analysis Benefit-Cost Analysis Revenue/Rate Impacts

Tracking Tool Features

- Runs in Excel 2002/03 or later version
- Simple User Interface
- Simple User Inputs
- 25 Pre-Defined Conservation Measures
- Demand and Avoided Cost Analysis
- Flexible Representation of Water Savings
- Dynamic Tables, Charts, and Forms
- English or Metric Units
- Scenario Management
- Detailed User Guide





Common Assumptions

AWE CONSERVATION TRACKING TOOL: COMMON ASSUMPTIONS WORKSHEET

ENTER COMMON ASSUMPTIONS:

	2005	2010	2020	2030	2040
Analysis Start Year	2005	2010	2020	2030	2040
Service Area Population	300,000	353,000	365,000	380,000	395,000
Service Area Population in 1990	300,000				
Peak-Season Start Date (month/day)	31-May				
Peak-Season End Date (month/day)	31-Oct				
Nominal Interest Rate	6.00%				
Inflation Rate	3.00%				
Persons Per Household - SF	2.25				
Persons Per Household - MF	1.50				
Full Bathrooms Per Household - SF	1.75				
Half Bathrooms Per Household - SF	0.75				
Full Bathrooms Per Household - MF	1.00				
Half Bathrooms Per Household - MF	0.25				
SF Housing Units Built Before 1992	100,000				
MF Housing Units Built Before 1992	50,000				
Reference ET (inches/yr)	57.33				
Avg. Annual Rainfall (inches/yr)	7.67				

CHOOSE VOLUME UNITS:

Water Volume Units:

- Million Gallons (MG)
- Acre Feet (AF)
- Million Cubic Feet (MCF)

MODEL UNITS:

Flow: MGD
Volume: AF

SELECT CUSTOMER CLASSES:

Select Water User Classes

ENTER UTILITY RATE INFORMATION:

Water User Classes in Model	Water Rates (\$/Thou Gall)	Sewer Rates (\$/Thou Gall)	Ext
Single Family	\$2.50	\$0.70	
Multi Family	\$2.20	\$0.70	
City	\$2.30	\$0.70	
Irrigation	\$2.30	\$0.70	

Select Customer Classes Dialog:

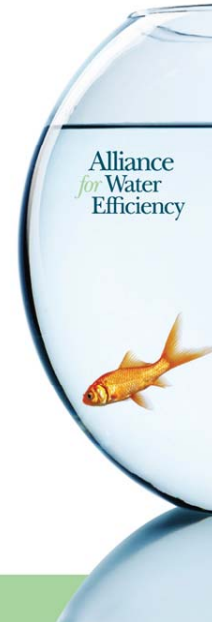
Class Names: Single Family, Multi Family, Residential CII, Commercial, Industrial, Institutional, Irrigation, All Customers, Miscellaneous, Utility/Unaccounted

Selected Classes: (Empty)

Buttons: Move Up, Move Down, Delete, Add >, OK, Cancel

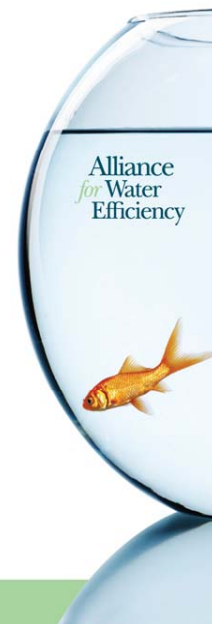
Baseline Demands

- Two Data Entry Options
 - Enter or link to an existing demand forecast
 - Use model to grow current demand by population
- Plumbing/Energy Code Adjustment
 - Model can adjust for impact of existing plumbing/energy codes as necessary
 - CA-TX edition
- Demand Disaggregation
 - Peak/Off Peak Seasonal Demands
 - Customer Class Disaggregation



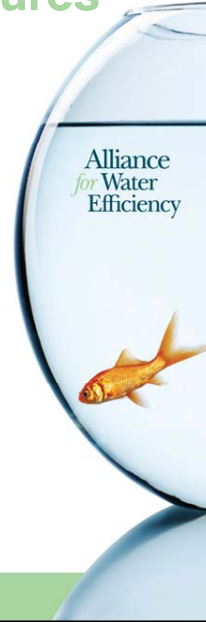
Avoided Costs

- Two Data Entry Options
 - Enter or link to an existing avoided cost forecast
 - Use model's avoided cost calculator
- Model's Avoided Cost Calculator
 - Short-run avoided O&M
 - Water Supply
 - Wastewater Treatment
 - Long-run avoided or deferred capacity
 - Calculates present value of delaying and/or downsizing peak season capacity expansion



Setting Up Conservation Measures

- Two Specification Options
 - Build from scratch
 - Import pre-defined measures from library
 - Pre-defined measures can be customized
- Library currently includes 25 measures
 - 13 residential measures
 - 8 CII measures
 - 4 large landscape measures



Defining a New Conservation Measure

1 AWE CONSERVATION TRACKING TOOL: DEFINE CONSERVATION ACTIVITIES WORKSHEET

2 Define Conservation Program Activities [Return to Navigation Sheet](#) [Report Error](#)

3 [Click to Import Library Activities or Define/Edit/Delete Custom Activities](#) [Show Table of Activities in Model](#)

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Define Conservation Activities

Activity Name: Residential Surveys, SF

Affected Customer Class: Single Family

Unit Water Savings | Utility Costs | Participant Costs | Participant Non Water Benefits | Plumbing Code

Link Water Savings (Gal/Yr): 12,373.0

Annual Rate of Savings Decay (%/Year): 20.00%

Peak Period Savings (% of Annual): 65.00% Peak days = 42% of days in a year.

Useful Life (Years): 5

Participant Freeiders (% of Participants): 0.00%

[Import an Activity from the Library](#)
[Close Form](#)
[Previous Record](#)
[Next Record](#)
[New Record](#)
[Delete Record](#)

1 of 5

4 • H1 Navigation / 1 Common Assumptions / 2 Savings Potential / 3 Enter Library Avoided Costs / 4 Define Activities / 5 Enter Annual Activity / Activity Savings Pt.

Importing a Library Measure

Define Conservation Activities

Activity Name:

Affected Customer Class:

Unit Water Savings (Gal/Yr):

Annual Rate of Savings Decr:

Peak Period Savings (% of A):

Useful Life (Years):

Participant Freeriders (% of Participants):

Import from Library

Residential Surveys, SF

Residential Surveys, MF

Residential ULF Toilets, SF

Residential ULF Toilets, MF

Residential HE Toilets, SF

Residential HE Toilets, MF

OK

Cancel

Import an Activity from the Library

Close Form

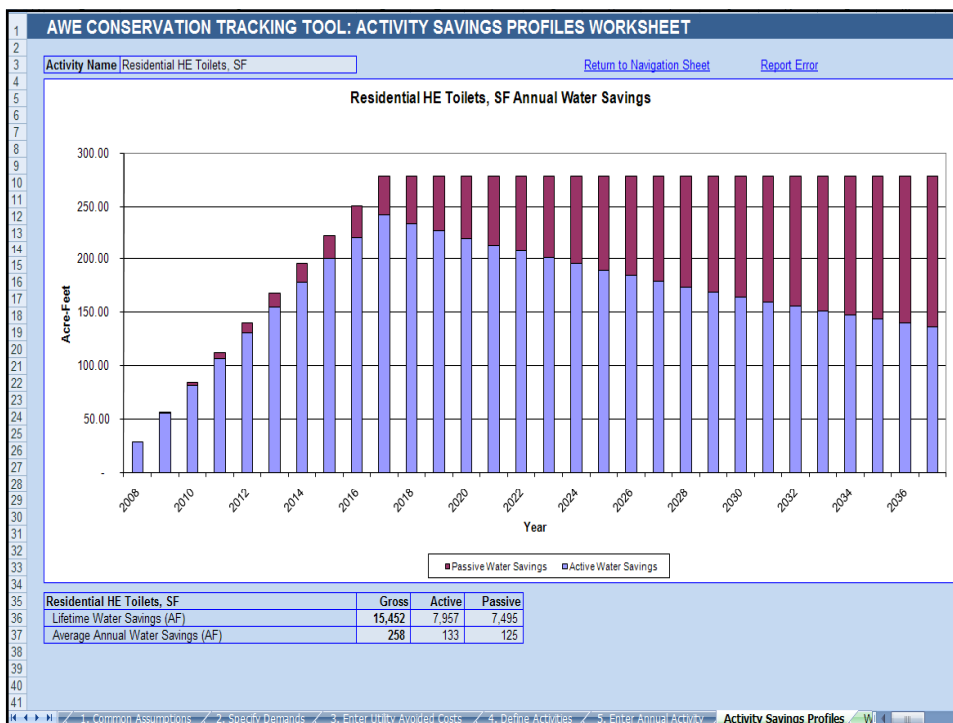
Previous Record

Next Record

New Record

Delete Record

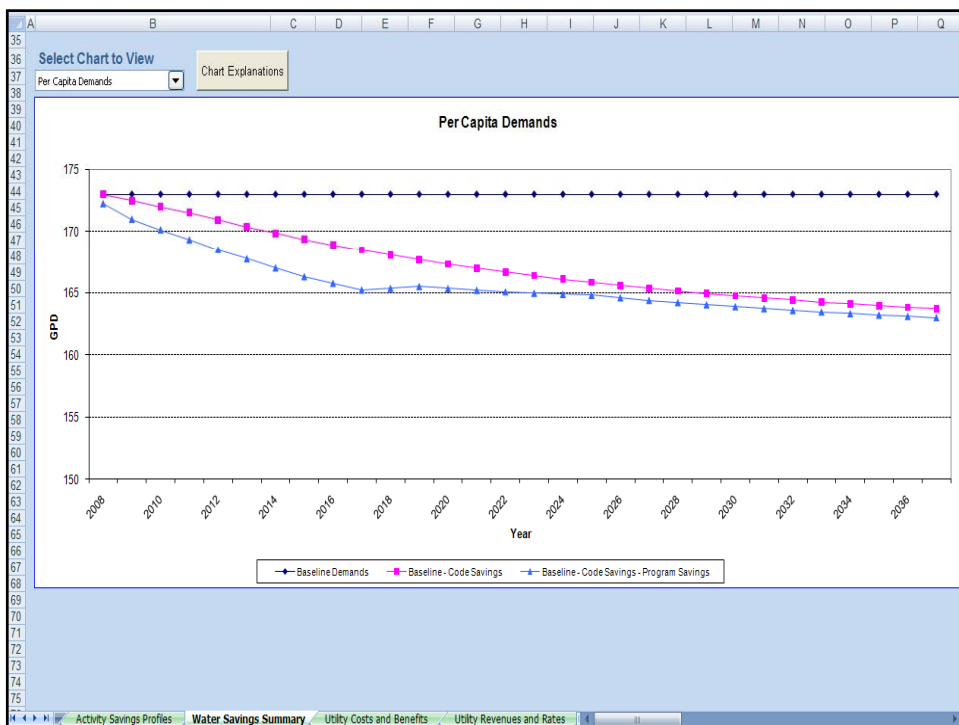
1 of 5



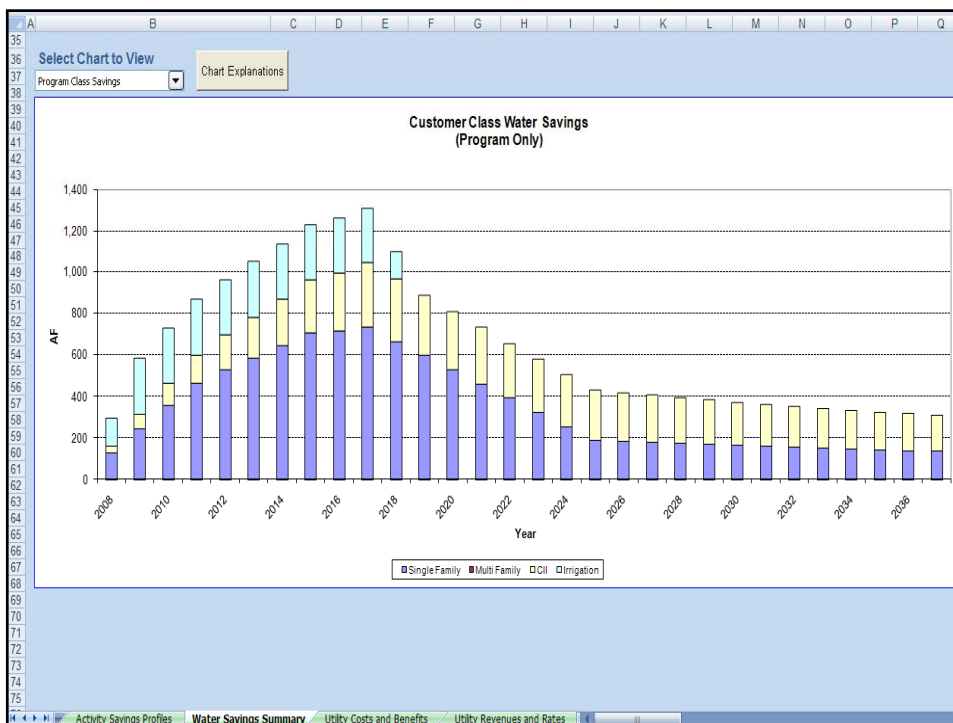
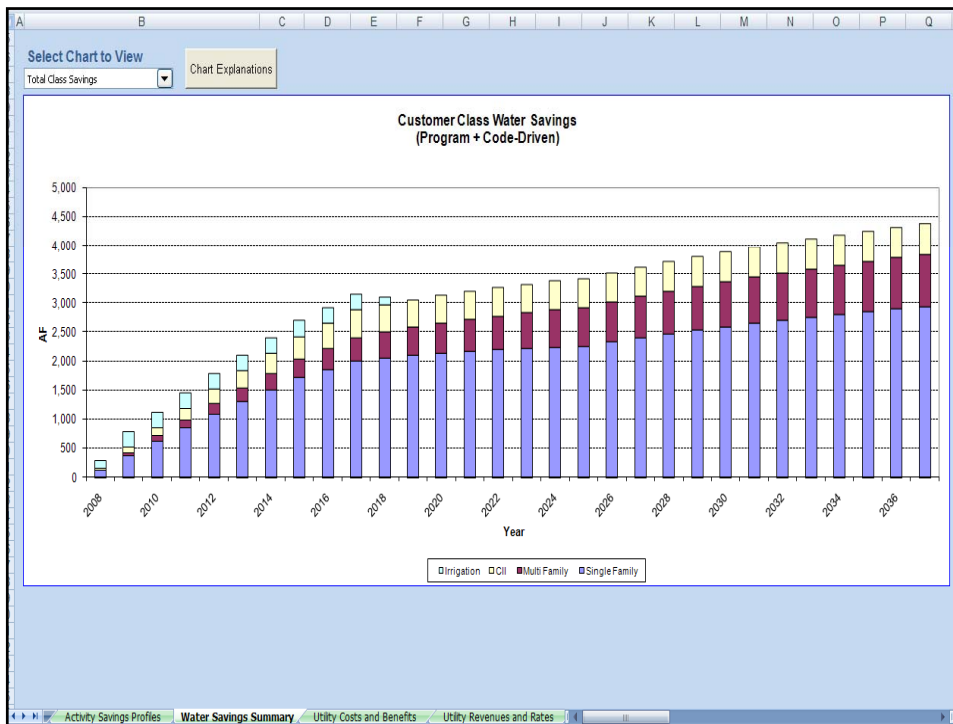
AWE CONSERVATION TRACKING TOOL: WATER SAVINGS SUMMARY WORKSHEET											
Water Demand Summary											
Return to Navigation Sheet Report Error											
Service Area Demands	Units	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Baseline Demands	AF	67,822	68,112	68,404	68,633	68,863	69,093	69,325	69,557	69,790	70,023
Baseline - Code Savings	AF	67,822	67,907	68,004	68,045	68,037	68,043	68,062	68,093	68,135	68,188
Baseline - Code Savings - Program Savings	AF	67,525	67,323	67,274	67,177	67,074	66,995	66,925	66,863	66,872	66,877
Per Capita Demands	Units	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Baseline Demands	GPD	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0	173.0
Baseline - Code Savings	GPD	173.0	172.5	172.0	171.5	170.9	170.4	169.8	169.4	168.9	168.5
Baseline - Code Savings - Program Savings	GPD	172.2	171.0	170.1	169.3	168.5	167.7	167.0	166.3	165.8	165.2
Service Area Water Savings	Units	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code Water Savings	AF	0.0	205.0	399.9	587.6	825.7	1,050.4	1,262.8	1,463.6	1,654.4	1,835.0
Program Water Savings	AF	297.0	584.3	729.5	867.9	962.7	1,047.7	1,137.1	1,229.8	1,263.3	1,310.8
Total Water Savings	AF	297.0	789.3	1,129.4	1,455.6	1,788.4	2,098.1	2,399.9	2,693.4	2,917.6	3,145.8
% of Baseline Demands	%	0.4%	1.2%	1.7%	2.1%	2.6%	3.0%	3.5%	3.9%	4.2%	4.5%
Class Water Savings	Units	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Single Family	AF	127.4	383.2	625.1	856.6	1,088.5	1,301.9	1,511.5	1,716.7	1,866.4	2,003.5
Multi Family	AF	-	47.3	92.2	135.6	187.0	235.5	281.5	325.1	366.7	406.1
CIJ	AF	35.5	90.6	143.8	195.2	244.7	292.5	338.7	383.3	426.4	468.0
Irrigation	AF	134.1	268.2	268.2	268.2	268.2	268.2	268.2	268.2	268.2	268.2
Water Losses	AF	-	-	-	-	-	-	-	-	-	-
Total	AF	297.0	789.3	1,129.4	1,455.6	1,788.4	2,098.1	2,399.9	2,693.4	2,917.6	3,145.8
Year forecasted peak season demand equals existing peak season delivery capacity		Deferred Expansion (Years)	Deferred Capacity (MGD)	Benefit of Deferred Expansion (\$)	Avoided Capacity (MGD)	Benefit of Avoided Expansion (\$)					
Baseline Demands	2020	N/A	N/A	N/A	N/A	N/A					
Baseline - Code Savings	2029	9	6.4	\$7,471,940	0.0	\$0					
Baseline - Code Savings - Program Savings	2031	11	6.4	\$8,886,090	0.0	\$0					

Select Chart to View Chart Explanations

Activity Savings Profiles Water Savings Summary Utility Costs and Benefits Utility Revenues and Rates Customer Costs and Benefits Society Costs and

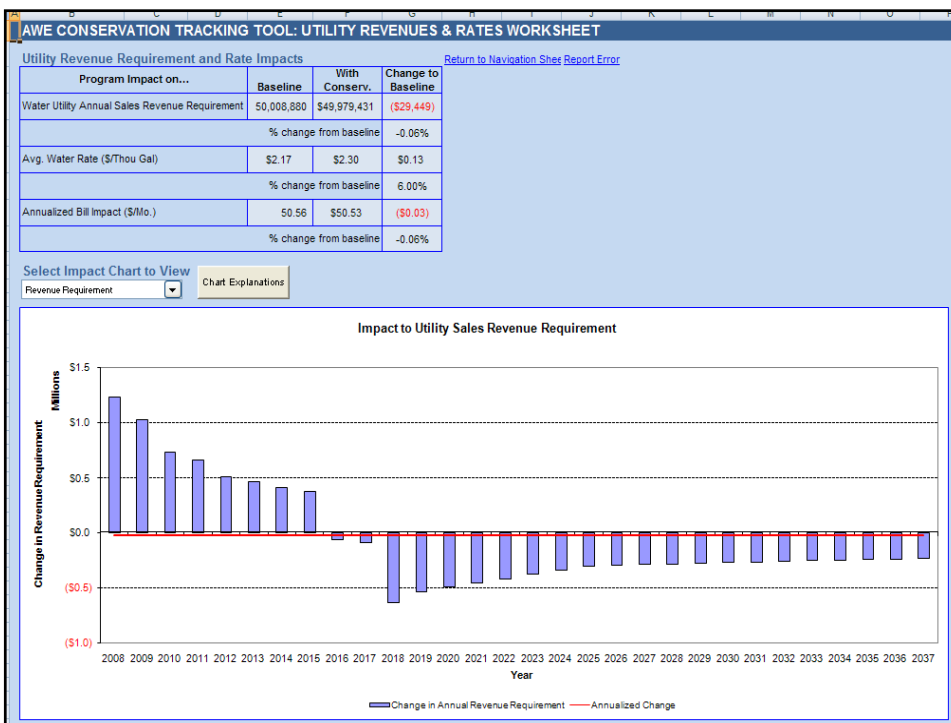


Activity Savings Profiles Water Savings Summary Utility Costs and Benefits Utility Revenues and Rates



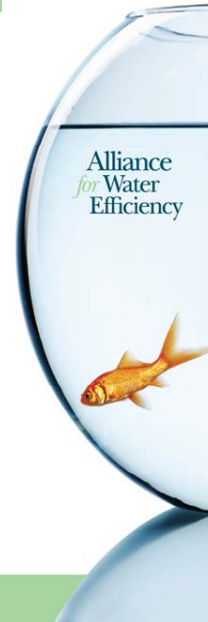
Benefit-Cost Analysis Tabular Output

AWE CONSERVATION TRACKING TOOL: UTILITY COSTS & BENEFITS WORKSHEET						
Show Budget Table		Return to Navigation Sheet Report Error				
Conservation Program Cost Analysis (2009 Dollars)				Amort. Years	20	
Class	Activity Name	Unit Cost (\$/AF)	PV Cost	Amortized Cost		
Single Family	Residential Surveys, SF	\$ 623	\$ 395,396	\$ 23,696		
Single Family	Residential HE Toilets, SF	\$ 392	\$ 1,645,145	\$ 109,658		
CI	CI HE Toilet	\$ 764	\$ 4,097,411	\$ 273,190		
Single Family	Residential Irrigation Controller, SF	\$ 762	\$ 2,997,651	\$ 199,865		
Irrigation	Large Land Irrigation Controller	\$ 189	\$ 440,840	\$ 29,393		
Subtotal Conservation Activities		\$ 587	\$ 9,566,442	\$ 637,832		
Total With Overhead & Public Information		\$ 587	\$ 9,566,442	\$ 637,832		
Conservation Benefit Analysis (2009 Dollars)						
Class	Activity Name	Unit Benefit (\$/AF)	PV Benefit	Avoided Supply	Avoided Wastewater	Capacity Benefit
Single Family	Residential Surveys, SF	\$ 600	\$ 281,013	\$ 235,370	\$ 10,347	\$ 35,297
Single Family	Residential HE Toilets, SF	\$ 685	\$ 2,860,261	\$ 2,282,200	\$ 241,010	\$ 357,051
CI	CI HE Toilet	\$ 685	\$ 3,674,135	\$ 2,911,233	\$ 307,438	\$ 455,464
Single Family	Residential Irrigation Controller, SF	\$ 575	\$ 2,264,267	\$ 1,607,607	\$ -	\$ 366,660
Irrigation	Large Land Irrigation Controller	\$ 567	\$ 1,321,437	\$ 1,121,780	\$ -	\$ 199,658
Total		\$ 639	\$ 8,448,189	\$ 658,794	\$ 1,414,160	
Utility Conservation Program NPV and B/C Ratio (2009 Dollars)				Select Chart to View		
Class	Activity Name	NPV (\$)	B/C Ratio	Unit Costs Sorted		
Single Family	Residential Surveys, SF	\$ (104,382)	0.73	Chart Explanations		
Single Family	Residential HE Toilets, SF	\$ 1,235,117	1.75			
CI	CI HE Toilet	\$ (423,277)	0.90			
Single Family	Residential Irrigation Controller, SF	\$ (733,364)	0.76			
Irrigation	Large Land Irrigation Controller	\$ 880,697	3.00			
Subtotal Conservation Activities		\$ 854,691	1.09			
Total With Overhead & Public Information		\$ 854,691	1.09			



Testing and Uses of the Model

- Four US utilities tested the model:
Seattle, San Antonio, Tampa Bay, Marin
Municipal Water District
- Savings estimates validated
- Now in use across US and Canada
- A number of California water agencies
and IOU's currently using the model
- Could be used for 20 x 2020 planning
- Possible modification for rates impact
analysis



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