Texas Municipal Water Conservation Planning Tool

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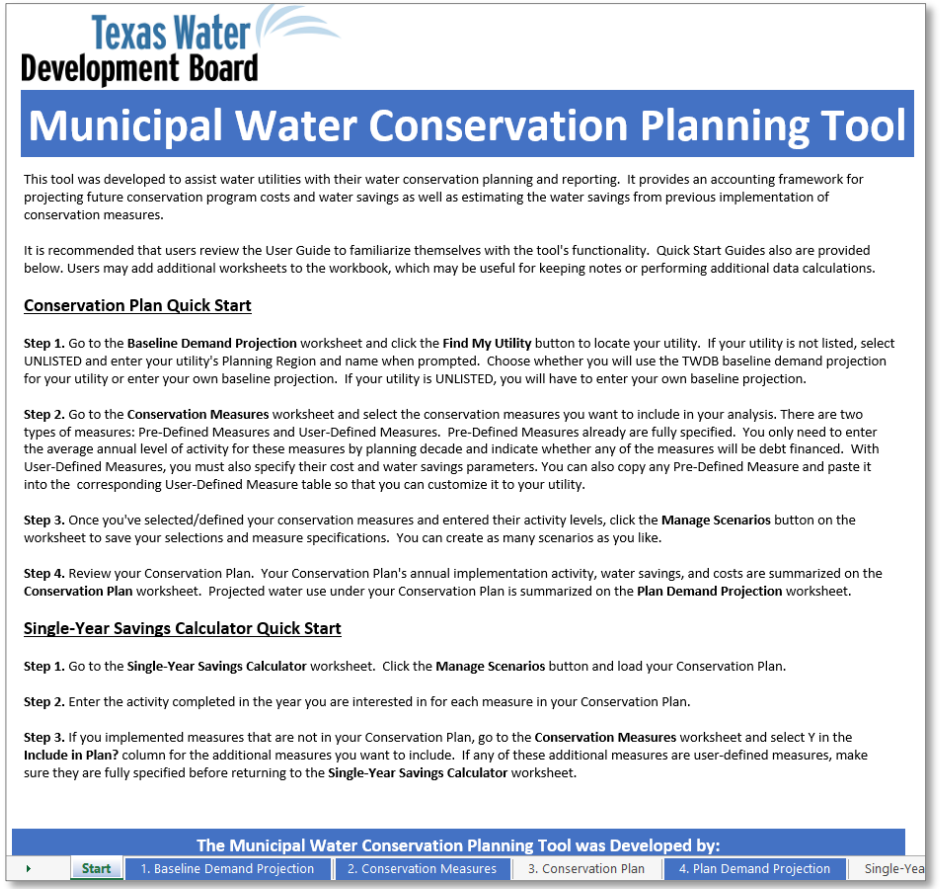
Alliance for Water Efficiency

What is the Municipal Water Conservation Planning Tool?

- An Excel-based model designed to assist water utilities with water conservation planning and reporting
- Provides a framework to account for future program costs and savings
- Includes pre-loaded baseline water demand forecasts for 462 Texas water systems using data compiled by the TWDB
- Includes a library of pre-defined water conservation measures



Texas Water Development Board

Municipal Water Conservation Planning Tool

This tool was developed to assist water utilities with their water conservation planning and reporting. It provides an accounting framework for projecting future conservation program costs and water savings as well as estimating the water savings from previous implementation of conservation measures.

It is recommended that users review the User Guide to familiarize themselves with the tool's functionality. Quick Start Guides also are provided below. Users may add additional worksheets to the workbook, which may be useful for keeping notes or performing additional data calculations.

Conservation Plan Quick Start

Step 1. Go to the **Baseline Demand Projection** worksheet and click the **Find My Utility** button to locate your utility. If your utility is not listed, select UNLISTED and enter your utility's Planning Region and name when prompted. Choose whether you will use the TWDB baseline demand projection for your utility or enter your own baseline projection. If your utility is UNLISTED, you will have to enter your own baseline projection.

Step 2. Go to the **Conservation Measures** worksheet and select the conservation measures you want to include in your analysis. There are two types of measures: Pre-Defined Measures and User-Defined Measures. Pre-Defined Measures already are fully specified. You only need to enter the average annual level of activity for these measures by planning decade and indicate whether any of the measures will be debt financed. With User-Defined Measures, you must also specify their cost and water savings parameters. You can also copy any Pre-Defined Measure and paste it into the corresponding User-Defined Measure table so that you can customize it to your utility.

Step 3. Once you've selected/defined your conservation measures and entered their activity levels, click the **Manage Scenarios** button on the worksheet to save your selections and measure specifications. You can create as many scenarios as you like.

Step 4. Review your Conservation Plan. Your Conservation Plan's annual implementation activity, water savings, and costs are summarized on the **Conservation Plan** worksheet. Projected water use under your Conservation Plan is summarized on the **Plan Demand Projection** worksheet.

Single-Year Savings Calculator Quick Start

Step 1. Go to the **Single-Year Savings Calculator** worksheet. Click the **Manage Scenarios** button and load your Conservation Plan.

Step 2. Enter the activity completed in the year you are interested in for each measure in your Conservation Plan.

Step 3. If you implemented measures that are not in your Conservation Plan, go to the **Conservation Measures** worksheet and select Y in the **Include in Plan?** column for the additional measures you want to include. If any of these additional measures are user-defined measures, make sure they are fully specified before returning to the **Single-Year Savings Calculator** worksheet.

The Municipal Water Conservation Planning Tool was Developed by:

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Yea

Water Conservation Plans

Water Conservation Plan (New Users)

Water Conservation Plan (Registered Users)

The purpose of a Water Conservation Plan is to ensure water use efficiency within your operation. The Water Conservation Plan is a strategy or combination of strategies for reducing the consumption of water, reducing the loss or waste of water, improving or maintaining the efficiency in the use of water, or increasing recycling and reuse of water. It contains best management practice measures to try to meet the targets and goals identified within the plan. The effectiveness of your water conservation plan is in the implementation of your water conservation program. Reviewing your program annually will help to evaluate program successes and needs. The water conservation plan, including targets and goals, must be revised every 5 years.

- Municipal Water Conservation Planning Tool - The MWCPT contains pre-loaded data to assist in the development of conservation plans. A guide to using the tool is available. In addition, a training workshop for the tool is also available.
- Water Conservation Plan Checklist (TWDB-1968 Form) - The WCP Checklist outlines the components that your plan should contain.
- Water Conservation Plan FAQs - The WCP FAQs are a list of common questions and answers received regarding WCPs.
- Water Conservation Plan Tutorial - The WCP Tutorial provides additional step by step guidance on how to develop a water conservation plan.
- Water Conservation Plans ~ Identifying Targets and Goals - The WCP Tutorial provides additional step by step guidance on how to identify targets and goals for your water conservation plan.
- Please note that an entity with surface water rights that is required to have a water conservation plan by the Texas Commission on Environmental Quality may have additional requirements.

Water for Texas Conference 2019

Best Management Practices

Agriculture

Literature

Resources

Education

Outreach

Municipal

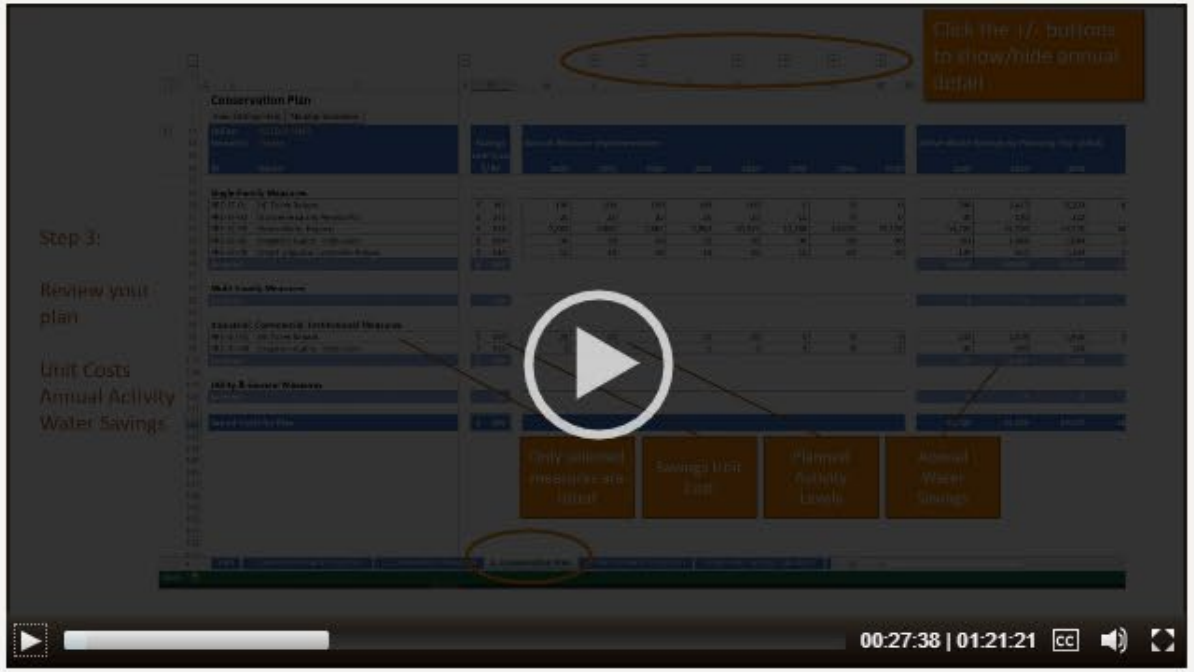
- Water Conservation Plans
- Water Conservation Plan ~ Utility Profile
- Water Conservation Plan ~ Annual Reports
- Water Loss Audit
- Water Loss Auditor Training
- Historical Water Loss Audit and Conservation Annual Report Data
- Industrial, Commercial & Institutional (ICI)

Workshops & Presentations

Conservation Staff

Municipal Water Conservation Planning Tool Training

The training offers workshop on the Municipal Water Conservation Planning Tool.



Training Video Resources

Municipal Water Conservation Planning Tool Training

Regional Water Planning Data Entry Application (RWP22) Training

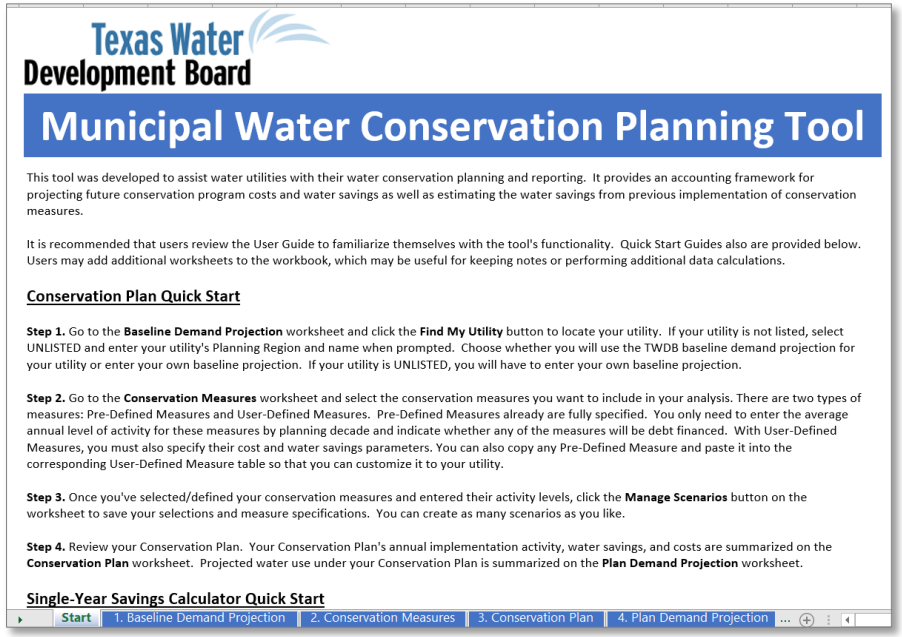
Water Use Survey (WUS) Training

Development Team

- Alliance for Water Efficiency
- M.Cubed
- Freese & Nichols, Inc.
- Texas State University
- Watearth, Inc.

Beta Testing

- Seven Municipalities Participated
- Population Ranged from 10,000 to +2 Million
- Represented 6 Regional Water Planning Groups
- Ten additional Utilities Provided Comments



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Conservation Plan Quick Start

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Single-Year Savings Calculator Quick Start

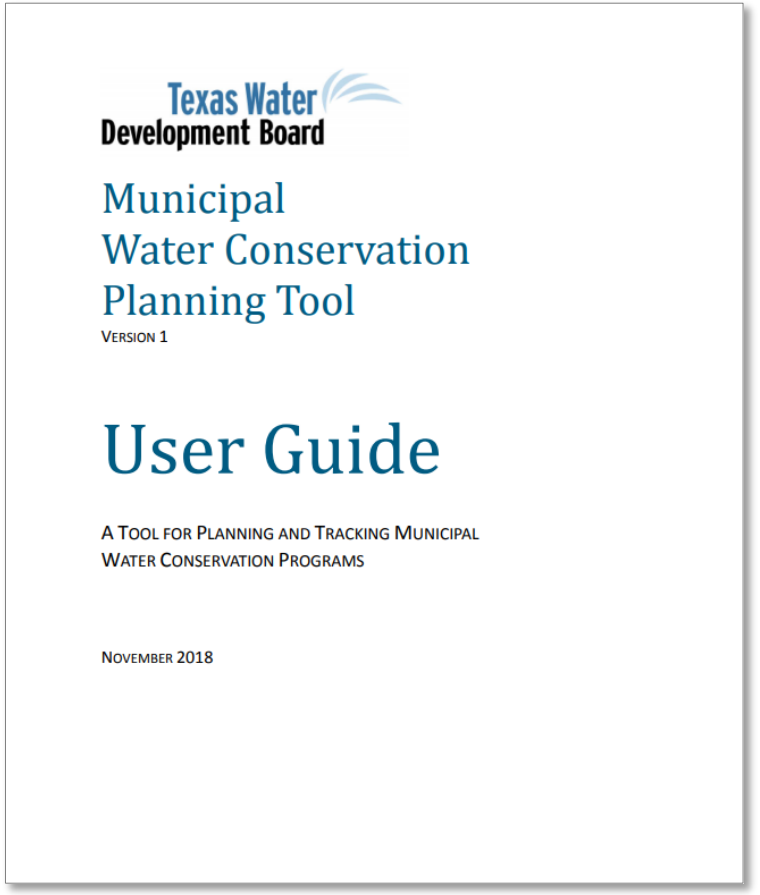
Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection

How is the MWCPT Organized?

Main Worksheets	Data Entry Required?	Special Worksheets
Start Page	NO	Pre-Defined Measures
1. Baseline Demand Projection	YES	Passive Savings
2. Conservation Measures	YES	TWDB Data
3. Conservation Plan	NO	Lists & Settings
4. Plan Demand Projection	NO	Scenarios
Single-Year Savings Calculator	YES	Plumbing Fixture Inventory

User Guide

- Searchable PDF
- Describes Sections of the Tool in Great Detail
- Includes Citations for All Pre-Defined Measures



Software

- Excel 2010 or later
- Macros MUST BE ENABLED in Excel
- Worksheets ARE protected BUT NOT password protected

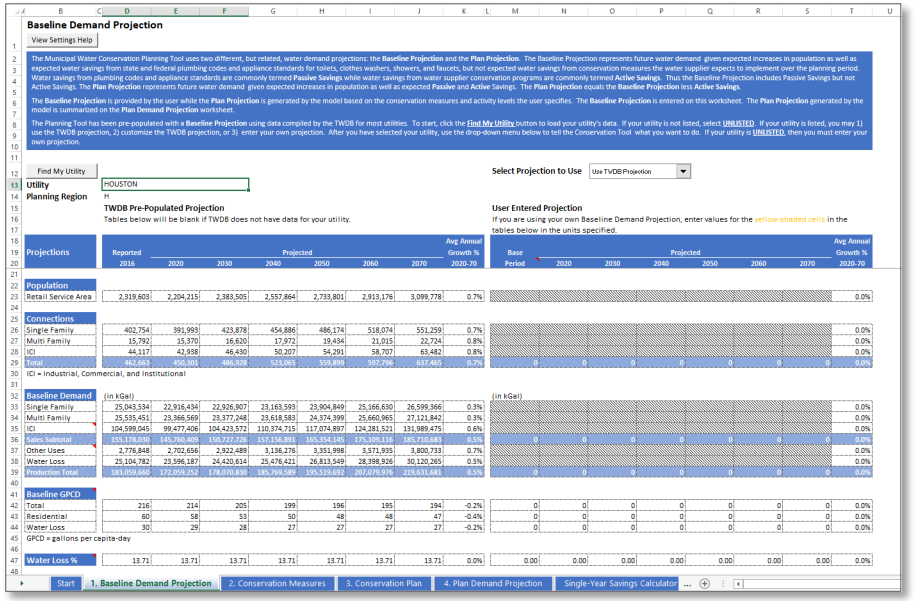
The Tool designed and tested for Windows computers

Some help screens and dialog boxes may display poorly in Mac versions of Excel

Baseline Demand Projections

Three Options:

1. Use TWDB Projection
2. Customize TWDB Projection
3. Enter your Own Projection



Baseline Demand Projection

View Settings Help

The Municipal Water Conservation Planning Tool uses two different, but related, water demand projections: the **Baseline Projection** and the **Plan Projection**. The Baseline Projection represents future water demand given expected increases in population as well as expected water savings from state and federal plumbing codes and appliance standards for toilets, clothes washers, showers, and faucets, but not expected water savings from conservation measures the water supplier expects to implement over the planning period. Water savings from plumbing codes and appliance standards are commonly termed **Passive Savings** while water savings from water supplier conservation programs are commonly termed **Active Savings**. Thus the Baseline Projection includes Passive Savings but not Active Savings. The **Plan Projection** represents future water demand given expected increases in population as well as expected **Passive** and **Active** Savings. The **Plan Projection** equals the **Baseline Projection** less **Active Savings**.

The **Baseline Projection** is provided by the user while the **Plan Projection** is generated by the model based on the conservation measures and activity levels the user specifies. The **Baseline Projection** is entered on this worksheet. The **Plan Projection** generated by the model is summarized on the **Plan Demand Projection** worksheet.

The Planning Tool has been pre-populated with a **Baseline Projection** using data compiled by the TWDB for most utilities. To start, click the **Find My Utility** button to load your utility's data. If your utility is not listed, select **UNLISTED**. If your utility is listed, you may 1) use the TWDB projection, 2) customize the TWDB projection, or 3) enter your own projection. After you have selected your utility, use the drop-down menu below to tell the Conservation Tool what you want to do. If your utility is **UNLISTED**, then you must enter your own projection.

Find My Utility

Utility

Planning Region

Select Projection to Use Use TWDB Projection

- Use TWDB Projection
- Customize TWDB Projection
- Enter My Own Projection

User Entered Projection

If you are using your own Baseline Demand Projection, enter values for the yellow-shaded cells in the tables below in the units specified.

Projections	Base Period	Projected						Avg Annual Growth %
		2020	2030	2040	2050	2060	2070	2020-70

Find Utility

Enter Search String to Filter Utility List

MUD

Select your utility from the list. If your utility is not listed, choose UNLISTED.

- ACTON MUD
- BOIS D ARC MUD
- CANEY CREEK MUD OF MATAGORDA COUNTY
- CLEAR BROOK CITY MUD
- CROSBY MUD
- FORT BEND COUNTY MUD 23
- FORT BEND COUNTY MUD 25
- FORT BEND COUNTY MUD 26
- FORT BEND COUNTY MUD 42
- FORT BEND COUNTY MUD 49
- HARRIS COUNTY MUD 148
- HARRIS COUNTY MUD 46
- HARRIS COUNTY MUD 50
- HARRIS COUNTY MUD 55
- HIDALGO COUNTY MUD 1
- HORIZON REGIONAL MUD
- LAKEWAY MUD
- LUMBERTON MUD
- MEADOWCREEK MUD
- MONTGOMERY COUNTY MUD 9
- NEW CANEY MUD
- NORTH AUSTIN MUD 1
- NORTH FOREST MUD

OK

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Year Savings Calculator

Baseline Demand Projection

View Settings Help

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Find My Utility

Utility HOUSTON

Planning Region H

Select Projection to Use Use TWDB Projection

TWDB Pre-Populated Projection

Tables below will be blank if TWDB does not have data for your utility.

User Entered Projection

If you are using your own Baseline Demand Projection, enter values for the yellow-shaded cells in the tables below in the units specified.

Projections	Reported	Projected						Avg Annual Growth %
	2016	2020	2030	2040	2050	2060	2070	2020-70
Population								
Retail Service Area	2,319,603	2,204,215	2,383,505	2,557,864	2,733,801	2,913,176	3,099,778	0.7%
Connections								
Single Family	402,754	391,993	423,878	454,886	486,174	518,074	551,259	0.7%
Multi Family	15,792	15,370	16,620	17,972	19,434	21,015	22,724	0.8%
ICI	44,117	42,938	46,430	50,207	54,291	58,707	63,482	0.8%
Total	462,663	450,301	486,928	523,065	559,899	597,796	637,465	0.7%

ICI = Industrial, Commercial, and Institutional

Projections	Base Period	Projected						Avg Annual Growth %
		2020	2030	2040	2050	2060	2070	2020-70
Population								
Retail Service Area								0.0%
Connections								
Single Family								0.0%
Multi Family								0.0%
ICI								0.0%
Total	0	0	0	0	0	0	0	0.0%

Baseline Demand	(in kGal)							
Single Family	25,043,534	22,916,434	22,926,907	23,163,593	23,904,849	25,166,630	26,599,366	0.3%
Multi Family	25,535,451	23,366,569	23,377,248	23,618,583	24,374,399	25,660,965	27,121,842	0.3%
ICI	104,599,045	99,477,406	104,423,572	110,374,715	117,074,897	124,281,521	131,989,475	0.6%
Sales Subtotal	155,178,030	145,760,409	150,727,726	157,156,891	165,354,145	175,109,116	185,710,683	0.5%
Other Uses	2,776,848	2,702,656	2,922,489	3,136,276	3,351,998	3,571,935	3,800,733	0.7%
Water Loss	25,104,782	23,596,187	24,420,614	25,476,421	26,813,549	28,398,926	30,120,265	0.5%
Production Total	183,059,660	172,059,252	178,070,830	185,769,589	195,519,692	207,079,976	219,631,681	0.5%

Baseline Demand	(in kGal)							
Single Family								0.0%
Multi Family								0.0%
ICI								0.0%
Sales Subtotal	0	0	0	0	0	0	0	0.0%
Other Uses								0.0%
Water Loss								0.0%
Production Total	0	0	0	0	0	0	0	0.0%

Baseline GPCD								
Total	216	214	205	199	196	195	194	-0.2%
Residential	60	58	53	50	48	48	47	-0.4%
Water Loss	30	29	28	27	27	27	27	-0.2%

GPCD = gallons per capita-day

Water Loss %	13.71	13.71	13.71	13.71	13.71	13.71	13.71	0.0%

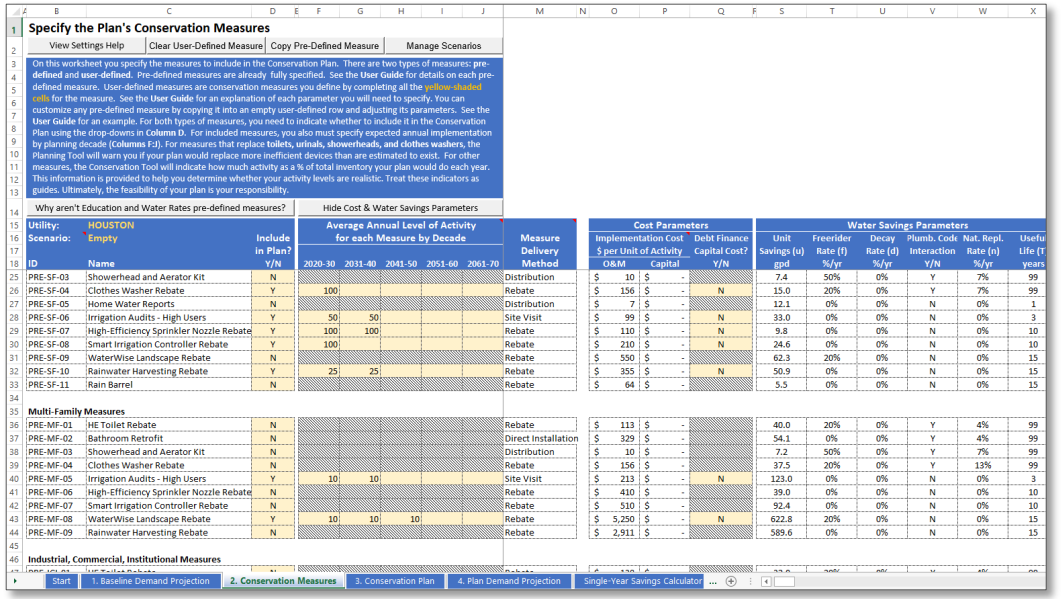
Baseline GPCD								
Total	0	0	0	0	0	0	0	0.0%
Residential	0	0	0	0	0	0	0	0.0%
Water Loss	0	0	0	0	0	0	0	0.0%

Water Loss %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%

Specify Conservation Measures

Three Options:

1. Pre-Defined Measures
2. Modify Pre-Defined Measures
3. User-Defined Measures



Specify the Plan's Conservation Measures

View Settings Help | Clear User-Defined Measure | Copy Pre-Defined Measure | Manage Scenarios

On this worksheet you specify the measures to include in the Conservation Plan. There are two types of measures: **pre-defined** and **user-defined.** Pre-defined measures are already fully specified. See the **User Guide** for details on each pre-defined measure. User-defined measures are conservation measures you define by completing all the **yellow-shaded cells** for the measure. See the **User Guide** for an explanation of each parameter you will need to specify. You can customize any pre-defined measure by copying it into an empty user-defined row and adjusting its parameters. See the **User Guide** for an example. For both types of measures, you need to indicate whether to include it in the Conservation Plan using the drop-downs in **Column D.** For included measures, you also must specify expected annual implementation by planning decade (**Columns F:J**). For measures that replace **toilets, urinals, showerheads, and clothes washers**, the Planning Tool will warn you if your plan would replace more inefficient devices than are estimated to exist. For other measures, the Conservation Tool will indicate how much activity as a % of total inventory your plan would do each year. This information is provided to help you determine whether your activity levels are realistic. Treat these indicators as guides. Ultimately, the feasibility of your plan is your responsibility.

Why aren't Education and Water Rates pre-defined measures? | Hide Cost & Water Savings Parameters

Utility: HOUSTON
Scenario: Empty

ID	Name	Include in Plan? Y/N	Average Annual Level of Activity for each Measure by Decade 2020-30	2031-40	2041-50	2051-60	2061-70	Measure Delivery Method	Cost Parameters: Implementation Cost $ per Unit of Activity O&M	Capital	Debt Finance Capital Cost? Y/N	Water Savings Parameters: Unit Savings (u) gpd	Freerider Rate (f) %/yr	Decay Rate (d) %/yr	Plumb. Code Interaction Y/N	Nat. Repl. Rate (n) %/yr	Useful Life (T) years
PRE-SF-03	Showerhead and Aerator Kit	N						Distribution	$ 10	$ -		7.4	50%	0%	Y	7%	99
PRE-SF-04	Clothes Washer Rebate	Y	100					Rebate	$ 156	$ -	N	15.0	20%	0%	Y	7%	99
PRE-SF-05	Home Water Reports	N						Distribution	$ 7	$ -		12.1	0%	0%	N	0%	1
PRE-SF-06	Irrigation Audits - High Users	Y	50	50				Site Visit	$ 99	$ -	N	33.0	0%	0%	N	0%	3
PRE-SF-07	High-Efficiency Sprinkler Nozzle Rebate	Y	100	100				Rebate	$ 110	$ -	N	9.8	0%	0%	N	0%	10
PRE-SF-08	Smart Irrigation Controller Rebate	Y	100					Rebate	$ 210	$ -	N	24.6	0%	0%	N	0%	10
PRE-SF-09	WaterWise Landscape Rebate	N						Rebate	$ 550	$ -		62.3	20%	0%	N	0%	15
PRE-SF-10	Rainwater Harvesting Rebate	Y	25	25				Rebate	$ 355	$ -	N	50.9	0%	0%	N	0%	15
PRE-SF-11	Rain Barrel	N						Rebate	$ 64	$ -		5.5	0%	0%	N	0%	15
	Multi-Family Measures																
PRE-MF-01	HE Toilet Rebate	N						Rebate	$ 113	$ -		40.0	20%	0%	Y	4%	99
PRE-MF-02	Bathroom Retrofit	N						Direct Installation	$ 329	$ -		54.1	0%	0%	Y	4%	99
PRE-MF-03	Showerhead and Aerator Kit	N						Distribution	$ 10	$ -		7.2	50%	0%	Y	7%	99
PRE-MF-04	Clothes Washer Rebate	N						Rebate	$ 156	$ -		37.5	20%	0%	Y	13%	99
PRE-MF-05	Irrigation Audits - High Users	Y	10	10				Site Visit	$ 213	$ -	N	123.0	0%	0%	N	0%	3
PRE-MF-06	High-Efficiency Sprinkler Nozzle Rebate	N						Rebate	$ 410	$ -		39.0	0%	0%	N	0%	10
PRE-MF-07	Smart Irrigation Controller Rebate	N						Rebate	$ 510	$ -		92.4	0%	0%	N	0%	10
PRE-MF-08	WaterWise Landscape Rebate	Y	10	10	10			Rebate	$ 5,250	$ -	N	622.8	20%	0%	N	0%	15
PRE-MF-09	Rainwater Harvesting Rebate	N						Rebate	$ 2,911	$ -		589.6	0%	0%	N	0%	15
	Industrial, Commercial, Institutional Measures																

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Year Savings Calculator

Conservation Measure Parameters

- Costs
- Savings
- Freeriders
- Decay
- Plumbing Code Interaction
- Useful Life
- Delivery Method

Water Savings Parameters					
Unit Savings (u) gpd	Freerider Rate (f) %/yr	Decay Rate (d) %/yr	Plumb. Code Interaction Y/N	Nat. Repl. Rate (n) %/yr	Useful Life (T) years
25.4	20%	0%	Y	4%	99
28.9	0%	0%	Y	4%	99
6.5	50%	0%	Y	7%	99
13.2	20%	0%	Y	7%	99
12.1	0%	0%	N	0%	1
33.0	0%	0%	N	0%	3
22.1	0%	0%	N	0%	10
55.7	0%	0%	N	0%	10
140.7	20%	0%	N	0%	15
22.5	0%	0%	N	0%	15
2.4	0%	0%	N	0%	15

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PRE-SF-11	Rain Barrel	N						Rebate	$ 64	$ -		5.5	0%	0%	N	0%	15
Multi-Family Measures																	
PRE-MF-01	HE Toilet Rebate	N						Rebate	$ 113	$ -		40.0	20%	0%	Y	4%	99
PRE-MF-02	Bathroom Retrofit	N						Direct Installation	$ 329	$ -		54.1	0%	0%	Y	4%	99
PRE-MF-03	Showerhead and Aerator Kit	N						Distribution	$ 10	$ -		7.2	50%	0%	Y	7%	99
PRE-MF-04	Clothes Washer Rebate	N						Rebate	$ 156	$ -		37.5	20%	0%	Y	13%	99
PRE-MF-05	Irrigation Audits - High Users	Y	10	10				Site Visit	$ 213	$ -	N	123.0	0%	0%	N	0%	3
PRE-MF-06	High-Efficiency Sprinkler Nozzle Rebate	N						Rebate	$ 410	$ -		39.0	0%	0%	N	0%	10
PRE-MF-07	Smart Irrigation Controller Rebate	N						Rebate	$ 510	$ -		92.4	0%	0%	N	0%	10
PRE-MF-08	WaterWise Landscape Rebate	Y	10	10	10			Rebate	$ 5,250	$ -	N	622.8	20%	0%	N	0%	15
PRE-MF-09	Rainwater Harvesting Rebate	N						Rebate	$ 2,911	$ -		589.6	0%	0%	N	0%	15
Industrial, Commercial, Institutional Measures																	

Specify the Plan's Conservation Measures

View Settings Help | Clear User-Defined Measure | Copy Pre-Defined Measure | Manage Scenarios

On this worksheet you specify the measures to include in the Conservation Plan. There are two types of measures: **pre-defined** and **user-defined**. Pre-defined measures are already fully specified. See the **User Guide** for details on each pre-defined measure. User-defined measures are conservation measures you define by completing all the yellow-shaded cells for the measure. See the **User Guide** for an explanation of each parameter you will need to specify. You can customize any pre-defined measure by copying it into an empty user-defined row and adjusting its parameters. See the **User Guide** for an example. For both types of measures, you need to indicate whether to include it in the Conservation Plan using the drop-downs in **Column D**. For included measures, you also must specify expected annual implementation by planning decade (**Columns F:J**). For measures that replace **toilets, urinals, showerheads, and clothes washers**, the Planning Tool will warn you if your plan would replace more inefficient devices than are estimated to exist. For other measures, the Conservation Tool will indicate how much activity as a % of total inventory your plan would do each year. This information is provided to help you determine whether your activity levels are realistic. Treat these indicators as guides. Ultimately, the feasibility of your plan is your responsibility.

Why aren't Education and Water Rates pre-defined measures? | Hide Cost & Water Savings Parameters

Utility: HOUSTON Scenario: Empty			Average Annual Level of Activity for each Measure by Decade					Measure Accounting Unit	Measure Delivery Method	Cost Parameters			Water Savings Parameters					
		Include in Plan?								Implementation Cost $ per Unit of Activity		Debt Finance Capital Cost?	Unit Savings (u)	Freerider Rate (f)	Decay Rate (d)	Plumb. Code Interaction	Nat. Repl. Rate (n)	Useful Life (T)
ID	Name	Y/N	2020-30	2031-40	2041-50	2051-60	2061-70			O&M	Capital	Y/N	gpd	%/yr	%/yr	Y/N	%/yr	years
Industrial, Commercial, Institutional Measures																		
USR-ICI-01	Cooling Tower Audits	Y	20	20	20			ICI Acct.	Site Visit	$ 1,000		Y	410.0	0%	0%	N	0%	10
USR-ICI-02	Ozone Laundry Systems	Y	25	25	25			ICI Acct.	Rebate	$ 1,000		Y	200.0	0%	0%	N	0%	10
USR-ICI-03		N																
USR-ICI-04		N																
USR-ICI-05		N																
USR-ICI-06		N																
USR-ICI-07		N																
USR-ICI-08		N																
USR-ICI-09		N																
USR-ICI-10		N																
USR-ICI-11		N																
USR-ICI-12		N																
USR-ICI-13		N																
USR-ICI-14		N																
USR-ICI-15		N																
USR-ICI-16		N																
USR-ICI-17		N																
USR-ICI-18		N																
USR-ICI-19		N																
USR-ICI-20		N																

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Year Savings Calculator ...

Warning Flags

Specify the Plan's Conservation Measures

View Settings Help | Clear User-Defined Measure | Copy Pre-Defined Measure | Manage Scenarios

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Why aren't Education and Water Rates pre-defined measures? | Hide Cost & Water Savings Parameters

Utility: Example
Scenario: Empty

ID	Name	Include in Plan? Y/N	Average Annual Level of Activity for each Measure by Decade — WARNING: Infeasible Fixture Replacement Level 2020-30	2031-40	2041-50	2051-60	2061-70	Measure Accounting Unit	Measure Delivery Method	Cost Parameters: Implementation Cost $ per Unit of Activity O&M	Capital	Debt Finance Capital Cost? Y/N
Multi-Family Measures												
PRE-MF-01	HE Toilet Rebate	N						Toilet	Rebate	$ 113	$ -	
PRE-MF-02	Bathroom Retrofit	N						Toilet	Direct Installation	$ 329	$ -	
PRE-MF-03	Showerhead and Aerator Kit	Y	100	100	100			Showerhead	Distribution	$ 10	$ -	N
PRE-MF-04	Clothes Washer Rebate	Y	1,000	1,000	1,000			Clothes Washer	Rebate	$ 156	$ -	N
PRE-MF-05	Irrigation Audits - High Users	Y	50	50	50			MF Acct.	Site Visit	$ 213	$ -	N
PRE-MF-06	High-Efficiency Sprinkler Nozzle Rebate	Y	500	500	500			MF Acct.	Rebate	$ 410	$ -	N

Conservation Plan

Conservation Plan

View Settings Help | Manage Scenarios

Your **Conservation Plan** is summarized on this worksheet. It shows the expected unit cost, annual implementation level, annual water savings, and annual O&M, capital, and debt service costs for each measure in the Plan. These quantities are subtotaled for each measure category and the Plan's Grand Totals are displayed at the bottom of the tables. Use the Manage Scenarios button to load and view different **Conservation Plan** scenarios.

Utility: HOUSTON
Scenario: Empty

ID	Name	Savings Unit Cost $/AF	Annual Measure Implementation 2020	2024	2029	2030	2040	2050	2060	2070	Active Water Savings by Planning Year (kGal) 2020	2024	2029	2030	2040	2050	2060	2070	Total Cost by Planning Year (2018 $) 2020	2024	2029	2030	2040
Single-Family Measures																							
PRE-SF-01	HE Toilet Rebate	$ 339	200	200	200	200	100	100	0	0	1,577	7,277	13,211	14,259	16,085	17,299	11,501	7,646	$ 22,600	$ 22,600	$ 22,600	$ 22,600	$ 11,300
PRE-SF-04	Clothes Washer Rebate	$ 1,190	100	100	100	100	100	100	0	0	438	1,899	3,212	3,422	4,851	5,535	2,650	1,269	$ 15,600	$ 15,600	$ 15,600	$ 15,600	$ 15,600
PRE-SF-06	Irrigation Audits - High Users	$ 924	50	50	50	50	50	0	0	0	602	1,807	1,807	1,807	1,807	0	0	0	$ 4,950	$ 4,950	$ 4,950	$ 4,950	$ 4,950
PRE-SF-07	High-Efficiency Sprinkler Nozzle Rebate	$ 1,169	100	100	100	100	100	0	0	0	356	1,781	3,563	3,563	3,563	0	0	0	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000
PRE-SF-08	Smart Irrigation Controller Rebate	$ 884	100	100	100	100	0	0	0	0	899	4,495	8,989	8,989	0	0	0	0	$ 21,000	$ 21,000	$ 21,000	$ 21,000	$ -
PRE-SF-10	Rainwater Harvesting Rebate	$ 523	25	25	25	25	25	0	0	0	464	2,321	4,642	5,106	6,963	2,321	0	0	$ 8,875	$ 8,875	$ 8,875	$ 8,875	$ 8,875
Subtotal		$ 633									4,336	19,580	35,424	37,146	33,268	25,155	14,151	8,915	$ 84,025	$ 84,025	$ 84,025	$ 84,025	$ 51,725
Multi-Family Measures																							
PRE-MF-05	Irrigation Audits - High Users	$ 533	50	50	50	50	25	0	0	0	2,245	6,734	6,734	6,734	3,367	0	0	0	$ 10,650	$ 10,650	$ 10,650	$ 10,650	$ 5,325
PRE-MF-08	WaterWise Landscape Rebate	$ 789	10	10	10	10	10	10	0	0	1,819	9,093	18,185	20,004	27,278	27,278	9,093	0	$ 52,500	$ 52,500	$ 52,500	$ 52,500	$ 52,500
Subtotal		$ 743									4,065	15,827	24,919	26,738	30,645	27,278	9,093	0	$ 63,150	$ 63,150	$ 63,150	$ 63,150	$ 57,825
Industrial, Commercial, Institutional Measures																							
USR-ICI-01	Cooling Tower Audits	$ 203	20	20	20	20	20	20	0	0	3,723	18,615	37,230	37,230	37,230	37,230	0	0	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
USR-ICI-02	Ozone Laundry Systems	$ 415	25	25	25	25	25	25	0	0	2,281	11,406	22,813	22,813	22,813	22,813	0	0	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000
Subtotal		$ 284									6,004	30,021	60,043	60,043	60,043	60,043	0	0	$ 45,000	$ 45,000	$ 45,000	$ 45,000	$ 45,000
Utility & General Measures																							
Subtotal		NA									0	0	0	0	0	0	0	0	$ -	$ -	$ -	$ -	$ -
Grand Total for Plan		$ 494									14,403	65,428	120,386	123,926	123,956	112,475	23,244	8,915	$ 192,175	$ 192,175	$ 192,175	$ 192,175	$ 154,550

Chart Area

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Year Savings Calculator ...

Conservation Plan Demand Projection

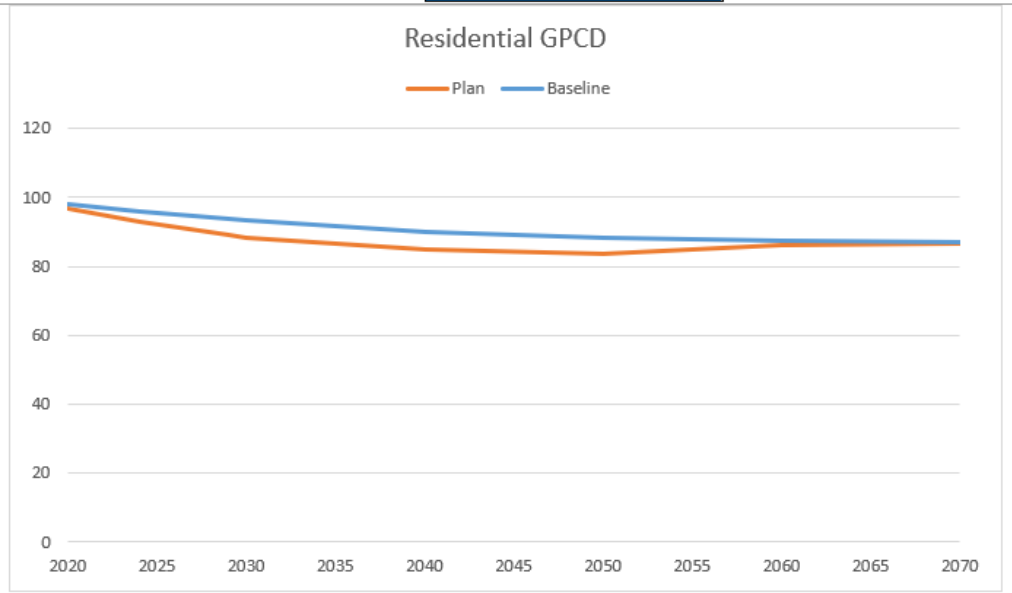
View Settings Help | Adjust Column Width | Manage Scenarios

The **Baseline** and **Plan Projections** are summarized on this worksheet. Population and connection counts are the same for both projections. The **Baseline Projection** represents expected demands given projected population growth and **Passive Savings** from plumbing codes and appliance standards. The **Plan Projection** represents expected demands given projected population growth and **Passive** and **Active Savings**. The **Active Savings** are the expected water savings from your **Conservation Plan** as estimated by the **Conservation Tool**.

Utility: Example
Scenario: Empty
Volume Units: kGal

Select Chart to View: Residential GPCD (Total Production / Total GPCD / Residential GPCD)

Projections	2020	2024	2029	2030	2040	2050	2060	2070	Avg Annual Growth % 2020-70
Population									
Retail Service Area	219,236	229,272	241,818	244,327	270,211	296,318	324,470	353,937	1.0%
Connections									
Single Family	65,792	68,804	72,569	73,322	81,090	88,925	97,373	106,216	1.0%
Multi Family	1,312	1,372	1,447	1,462	1,629	1,815	2,023	2,255	1.1%
ICI	8,348	8,730	9,208	9,304	10,369	11,555	12,877	14,351	1.1%
Total	75,452	78,906	83,224	84,088	93,088	102,295	112,273	122,822	1.0%
Baseline Demand (in kGal)									
Single Family	7,002,342	7,173,390	7,387,200	7,429,962	7,925,859	8,519,433	9,257,905	10,050,820	0.7%
Multi Family	837,701	858,164	883,743	888,858	948,183	1,019,193	1,107,538	1,202,396	0.7%
ICI	8,800,231	9,088,390	9,448,589	9,520,629	10,370,671	11,286,690	12,311,928	13,404,375	0.8%
Sales Subtotal	16,640,274	17,119,944	17,719,531	17,839,449	19,244,713	20,825,317	22,677,371	24,657,591	0.8%
Other Uses	223,875	234,124	246,935	249,497	275,929	302,588	331,336	361,427	1.0%
Water Loss	516,359	531,360	550,111	553,861	597,698	646,910	704,498	766,051	0.8%
Production Total	17,380,509	17,885,428	18,516,577	18,642,807	20,118,339	21,774,815	23,713,205	25,785,069	0.8%
Water Loss %	3%	3%	3%	3%	3%	3%	3%	3%	0.0%
Baseline GPCD									
Total	217	214	210	209	204	201	200	200	-0.2%
Residential	98	96	94	93	90	88	88	87	-0.2%
Water Loss	6	6	6	6	6	6	6	6	-0.2%



Conservation Plan Demand Projection

View Settings Help | Adjust Column Width | Manage Scenarios

The **Baseline** and **Plan Projections** are summarized on this worksheet. Population and connection counts are the same for both projections. The **Baseline Projection** represents expected demands given projected population growth and **Passive Savings** from plumbing codes and appliance standards. The **Plan Projection** represents expected demands given projected population growth and **Passive** and **Active Savings**. The **Active Savings** are the expected water savings from your **Conservation Plan** as estimated by the **Conservation Tool**.

Utility: Example
Scenario: Empty
Volume Units: kGal

Select Chart to View: Residential GPCD

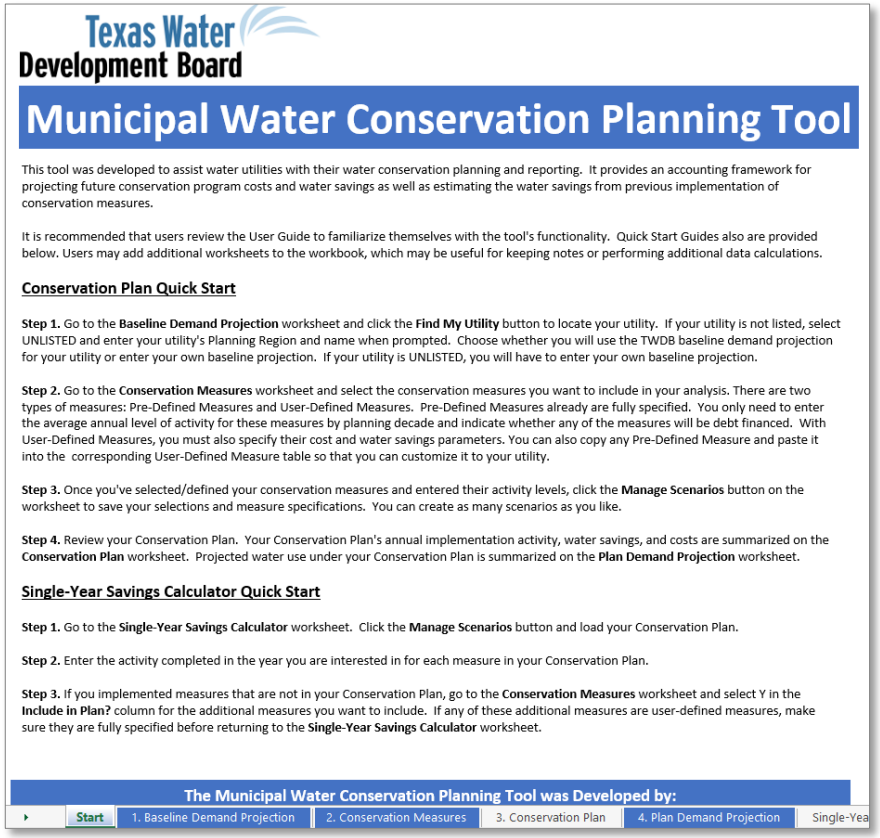
Projections	2020	2024	2029	2030	2040	2050	2060	2070	Avg Annual Growth % 2020-70
Plan Active Savings	(in kGal)								
Single Family	57,796	107,507	162,036	167,975	205,170	222,703	109,281	63,268	
Multi Family	27,231	130,652	252,801	257,189	275,157	275,645	23,015	811	
ICI	23,856	113,810	217,348	221,710	254,139	261,675	48,070	14,449	
Other	0	0	0	0	0	0	0	0	
Water Loss	0	0	0	0	0	0	0	0	
Total Plan Savings	108,883	351,969	632,185	646,874	734,465	760,022	180,366	78,527	
Plan Demand Projection	(in kGal)								
Single Family	6,944,546	7,065,883	7,225,164	7,261,987	7,720,689	8,296,730	9,148,623	9,987,552	0.7%
Multi Family	810,470	727,512	630,942	631,669	673,026	743,549	1,084,523	1,201,585	0.8%
ICI	8,776,375	8,974,580	9,231,241	9,298,919	10,116,532	11,025,015	12,263,858	13,389,927	0.8%
Sales Subtotal	16,531,391	16,767,975	17,087,346	17,192,575	18,510,248	20,065,295	22,497,004	24,579,064	0.8%
Other Uses	223,875	234,124	246,935	249,497	275,929	302,588	331,336	361,427	1.0%
Water Loss	513,025	520,583	530,754	534,054	575,209	623,639	698,975	763,647	0.8%
Production Total	17,268,292	17,522,682	17,865,035	17,976,126	19,361,386	20,991,522	23,527,316	25,704,137	0.8%
Water Loss %	3%	3%	3%	3%	3%	3%	3%	3%	0.0%
Plan GPCD									
Total	216	209	202	202	196	194	199	199	-0.2%
% Reduction from Baseline	1%	2%	4%	4%	4%	4%	1%	0%	
Residential	97	93	89	89	85	84	86	87	-0.2%
% Reduction from Baseline	1%	3%	5%	5%	5%	5%	1%	1%	
Water Loss	6	6	6	6	6	6	6	6	-0.2%
% Reduction from Baseline	1%	2%	4%	4%	4%	4%	1%	0%	

Savings % of Baseline	2020	2024	2029	2030	2040	2050	2060	2070
Single Family	0.83%	1.50%	2.19%	2.26%	2.59%	2.61%	1.18%	0.63%
Multi Family	3.25%	15.22%	28.61%	28.93%	29.02%	27.05%	2.08%	0.07%
ICI	0.27%	1.25%	2.30%	2.33%	2.45%	2.32%	0.39%	0.11%
Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Water Loss	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Plan Savings	0.63%	1.97%	3.41%	3.47%	3.65%	3.49%	0.76%	0.30%

Important Links

- Excel File and User Guide Download
  www.twdb.texas.gov/conservation/municipal/plans/index.asp

- Video Recording of Training Session
  http://www.twdb.texas.gov/video/conservation/planning-tool/index.asp



Texas Water Development Board

Municipal Water Conservation Planning Tool

This tool was developed to assist water utilities with their water conservation planning and reporting. It provides an accounting framework for projecting future conservation program costs and water savings as well as estimating the water savings from previous implementation of conservation measures.

It is recommended that users review the User Guide to familiarize themselves with the tool's functionality. Quick Start Guides also are provided below. Users may add additional worksheets to the workbook, which may be useful for keeping notes or performing additional data calculations.

Conservation Plan Quick Start

Step 1. Go to the **Baseline Demand Projection** worksheet and click the **Find My Utility** button to locate your utility. If your utility is not listed, select UNLISTED and enter your utility's Planning Region and name when prompted. Choose whether you will use the TWDB baseline demand projection for your utility or enter your own baseline projection. If your utility is UNLISTED, you will have to enter your own baseline projection.

Step 2. Go to the **Conservation Measures** worksheet and select the conservation measures you want to include in your analysis. There are two types of measures: Pre-Defined Measures and User-Defined Measures. Pre-Defined Measures already are fully specified. You only need to enter the average annual level of activity for these measures by planning decade and indicate whether any of the measures will be debt financed. With User-Defined Measures, you must also specify their cost and water savings parameters. You can also copy any Pre-Defined Measure and paste it into the corresponding User-Defined Measure table so that you can customize it to your utility.

Step 3. Once you've selected/defined your conservation measures and entered their activity levels, click the **Manage Scenarios** button on the worksheet to save your selections and measure specifications. You can create as many scenarios as you like.

Step 4. Review your Conservation Plan. Your Conservation Plan's annual implementation activity, water savings, and costs are summarized on the **Conservation Plan** worksheet. Projected water use under your Conservation Plan is summarized on the **Plan Demand Projection** worksheet.

Single-Year Savings Calculator Quick Start

Step 1. Go to the **Single-Year Savings Calculator** worksheet. Click the **Manage Scenarios** button and load your Conservation Plan.

Step 2. Enter the activity completed in the year you are interested in for each measure in your Conservation Plan.

Step 3. If you implemented measures that are not in your Conservation Plan, go to the **Conservation Measures** worksheet and select Y in the **Include in Plan?** column for the additional measures you want to include. If any of these additional measures are user-defined measures, make sure they are fully specified before returning to the **Single-Year Savings Calculator** worksheet.

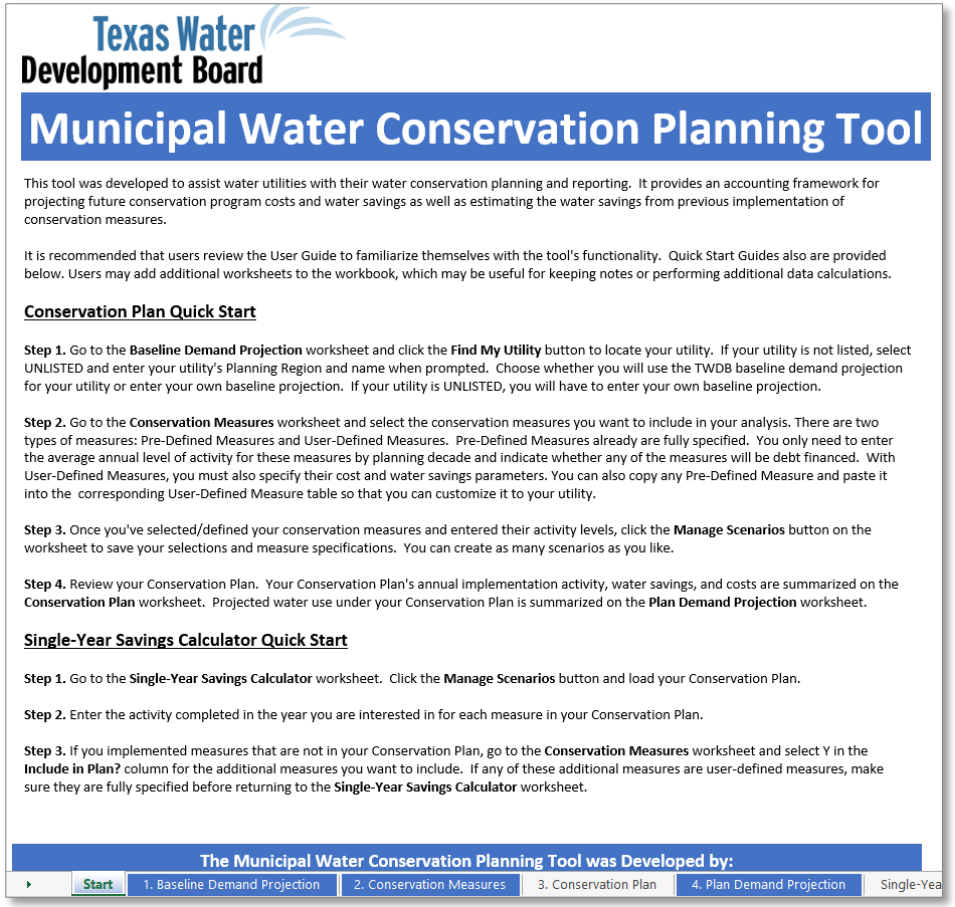
The Municipal Water Conservation Planning Tool was Developed by:

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Yea

AWE is Available to Provide Assistance

- Technical Assistance
- Help Setting up Custom Conservation Measures
- Review QA/QC

Contact: info@a4we.org



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Single-Year Savings Calculator Quick Start

Step 1. Go to the **Single-Year Savings Calculator** worksheet. Click the **Manage Scenarios** button and load your Conservation Plan.

Step 2. Enter the activity completed in the year you are interested in for each measure in your Conservation Plan.

Step 3. If you implemented measures that are not in your Conservation Plan, go to the **Conservation Measures** worksheet and select Y in the **Include in Plan?** column for the additional measures you want to include. If any of these additional measures are user-defined measures, make sure they are fully specified before returning to the **Single-Year Savings Calculator** worksheet.

The Municipal Water Conservation Planning Tool was Developed by:

Start | 1. Baseline Demand Projection | 2. Conservation Measures | 3. Conservation Plan | 4. Plan Demand Projection | Single-Yea

Questions?

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Director of Programs
Alliance for Water Efficiency
Bill@a4we.org
773-360-5100