TOWN BOARD WORK SESSION MEETING
January 4, 2016 - 6:00 P.M. Town Board Chambers
301 Walnut Street, Windsor, CO 80550

The Town of Windsor will make reasonable accommodations for access to Town services, programs, and activities and will make special communication arrangements for persons with disabilities. Please call (970) 674-2400 by noon on the Thursday prior to the meeting to make arrangements.

GOAL of this Work Session is to have the Town Board receive information on topics of Town business from the Town Manager, Town Attorney and Town staff in order to exchange ideas and opinions regarding these topics.

Members of the Public in attendance are asked to be recognized by the Mayor before participating in any discussions of the Town Board.

AGENDA

1. 2016 Water Efficiency Plan Draft Report – P. Garcia
   Presentation: Nathan Alburn & Michelle Hatcher – Clear Water Solutions

2. RTA Update – S. Johnson
   Verbal update

3. Future Meetings Agenda

M E M O R A N D U M

Date: January 4, 2016
To: Mayor and Town Board
Via: Kelly Arnold, Town Manager
From: Patti Garcia, Town Clerk/Assistant to Town Manager
Re: 2015 Municipal Water Efficiency Update
Item #: Work Session - 1

Background / Discussion:

Colorado Revised Statute 37-60-126, prompted by the Water Conservation Act of 2004, declares that water providers delivering over 2,000 acre-feet of water are required to carry a State approved Water Conservation Plan on file with the Colorado Water Conservation Board (CWCB) Office of Water Conservation and Drought Planning. In response to this statute, the Town of Windsor, in conjunction with Clear Water Solutions, Inc. comprised the 2008 Water Conservation Plan that was adopted by the Town Board, accepted by CWCB and implemented by the Town of Windsor.

An updated Water Conservation Plan is required to be submitted every seven years; this update will keep Windsor compliant with the Water Conservation Act and will also allow Windsor to continue to receive grants and loans through CWCB. Windsor's updated Plan is entitled *2015 Municipal Water Efficiency Plan.* The Plan is designed to promote the efficient consumption of all water usage; the goal of the Plan is to encourage the beneficial use of our water resources which will help support a future water supply.

Staff began working with Clear Water Solutions in May 2015 on this effort which included a grant submittal to CWCB for funding to complete the Plan. The Town received a grant in the amount of $40,634 with the Town matching $10,451 in in-kind services and $3,200 cash. Representatives from Public Works, Engineering, Finance and Customer Service have contributed to the Draft Plan which will be presented to the Town Board by Clear Water Solutions.

The Draft Plan provides a large amount of data regarding Windsor's water including an overview of Windsor's water supply, historical data related to water, past and current water demands along with demand forecasts. It notes the various water efficiency activities that have already been implemented which has saved the Town an average of 12% of the projected water use since 2008. Section 4 identifies the water efficiency activities recommended in the 2015 Municipal Water Efficiency Plan (pages 34-40); some of which are already in place. The intent is to implement water savings measures at a variety of levels and give the community an opportunity to participate, as well.

The timeline for the Plan is as follows:

- January 4, 2016: Town Board review of Draft Plan
- January 6 – March 8, 2016: Public comment period (60-day comment period required by CWCB)
- March 28, 2016: Town Board adopts Plan
- March 29, 2016: Clear Water Solutions submits Plan to CWCB
- 2016: CWCB approves final Plan (up to 90 days)
- 2016 and 2017: Budget & program planning

Financial Impact:
The matching funds for the grant are included in the 2015 & 2016 Water Fund. The funding of Water Efficiency Activities included in the 2015 Plan will be addressed in future budgets. Grant funds can be pursued for conservation activities that are identified in the Plan.

Relationship to Strategic Plan:
Goal 1.E. Lead through stewardship of natural resources.

Recommendation:
For Town Board review and comment.

Attachments:
Water Efficiency Plan Update – Clear Water Solutions Presentation
Draft 2015 Municipal Water Efficiency Plan Update

Town of Windsor

2015
MUNICIPAL WATER EFFICIENCY PLAN UPDATE

January 4th, 2016

clearWATERsolutions
water rights • planning • engineering

WHY WATER EFFICIENCY PLANNING?

1. Required to update Plan every 7 years
2. Grant money from Colorado Water Conservation Board (CWCB) available for Plan
3. State approved Plan required for CWCB and CWRPDA loans
4. Implementation grant money available for Activities in approved Plans

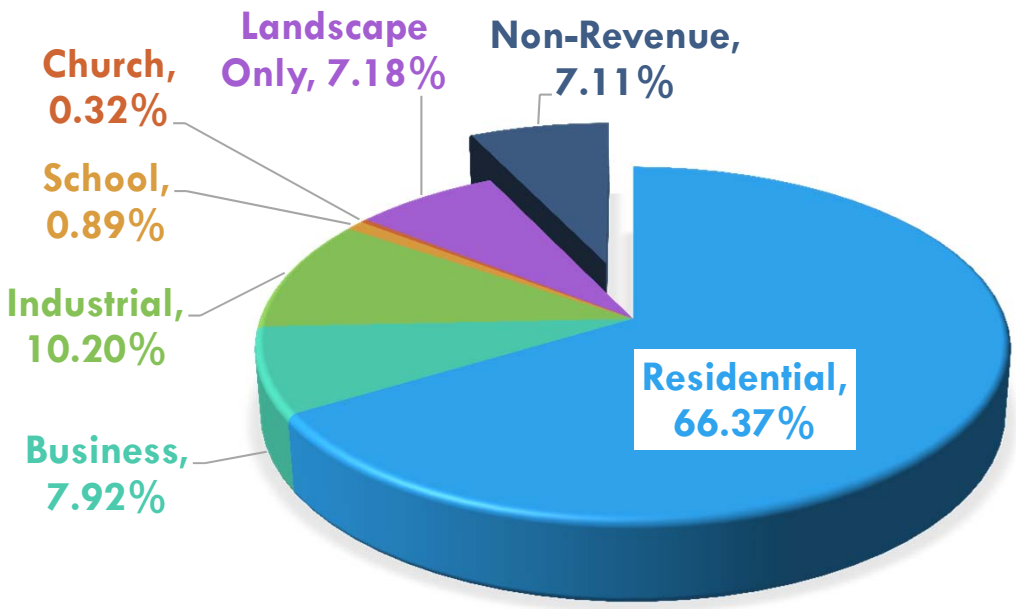
CWCB MUNICIPAL WATER EFFICIENCY PLANNING PROCESS

1. Profile existing water supply system
2. Profile water demands and historical demand management
3. Establish water efficiency goals
4. Select water efficiency activities
5. Implementation and monitoring plan

PROJECTED WATER DEMANDS

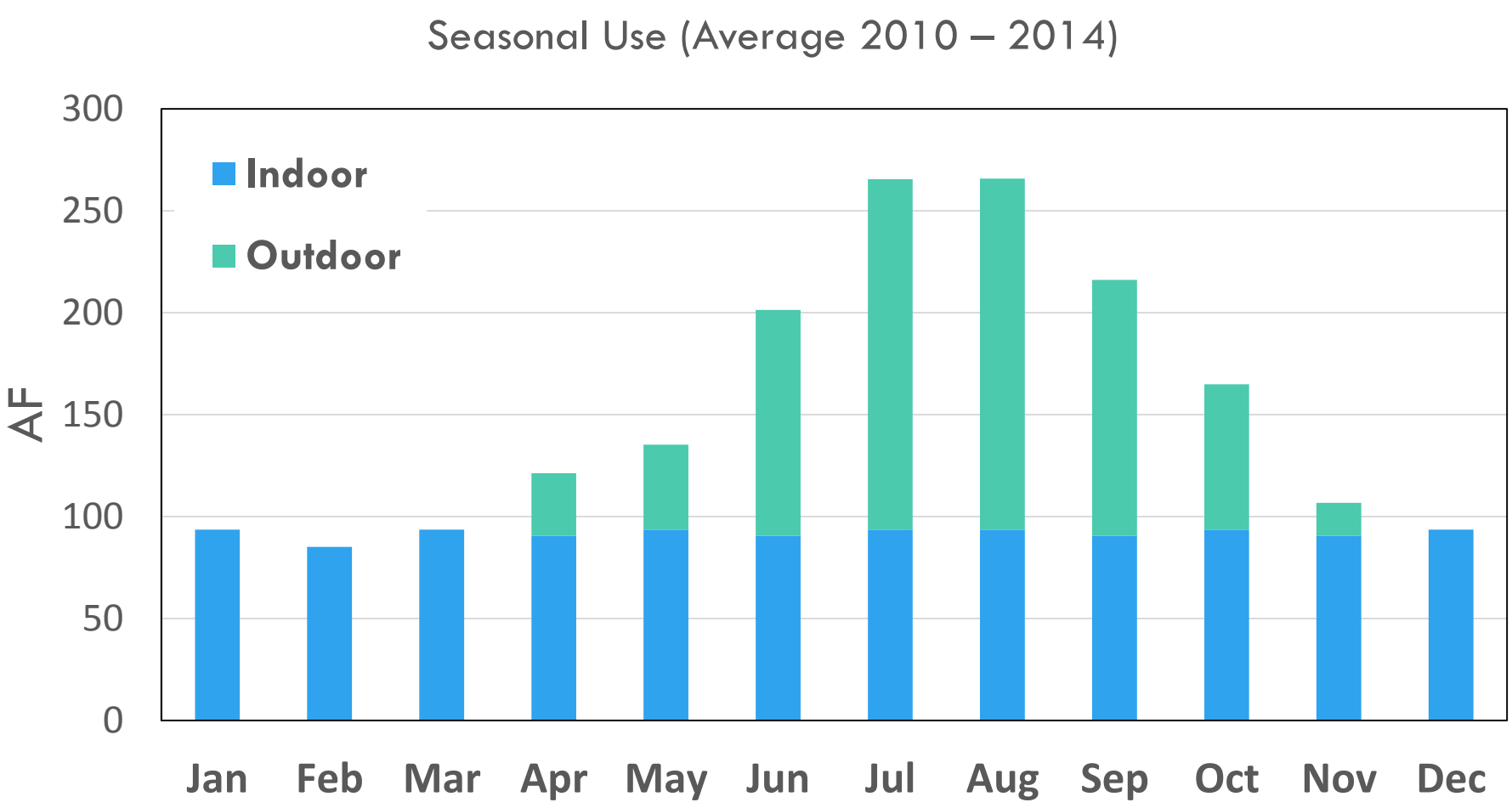
Total Estimated Treated Water Demand over the next 10 years:

24,704 acre-feet (AF)



Water Usage Categories:	Total Projected Water Use (2015 to 2024) (AF)
Total Billed	22,947
Residential	16,396
Business	1,957
Industrial	2,519
School	221
Church	80
Landscape Only	1,774
Non-Revenue	1,757
Total Treated Water Demand	24,704

SEASONAL WATER DEMANDS

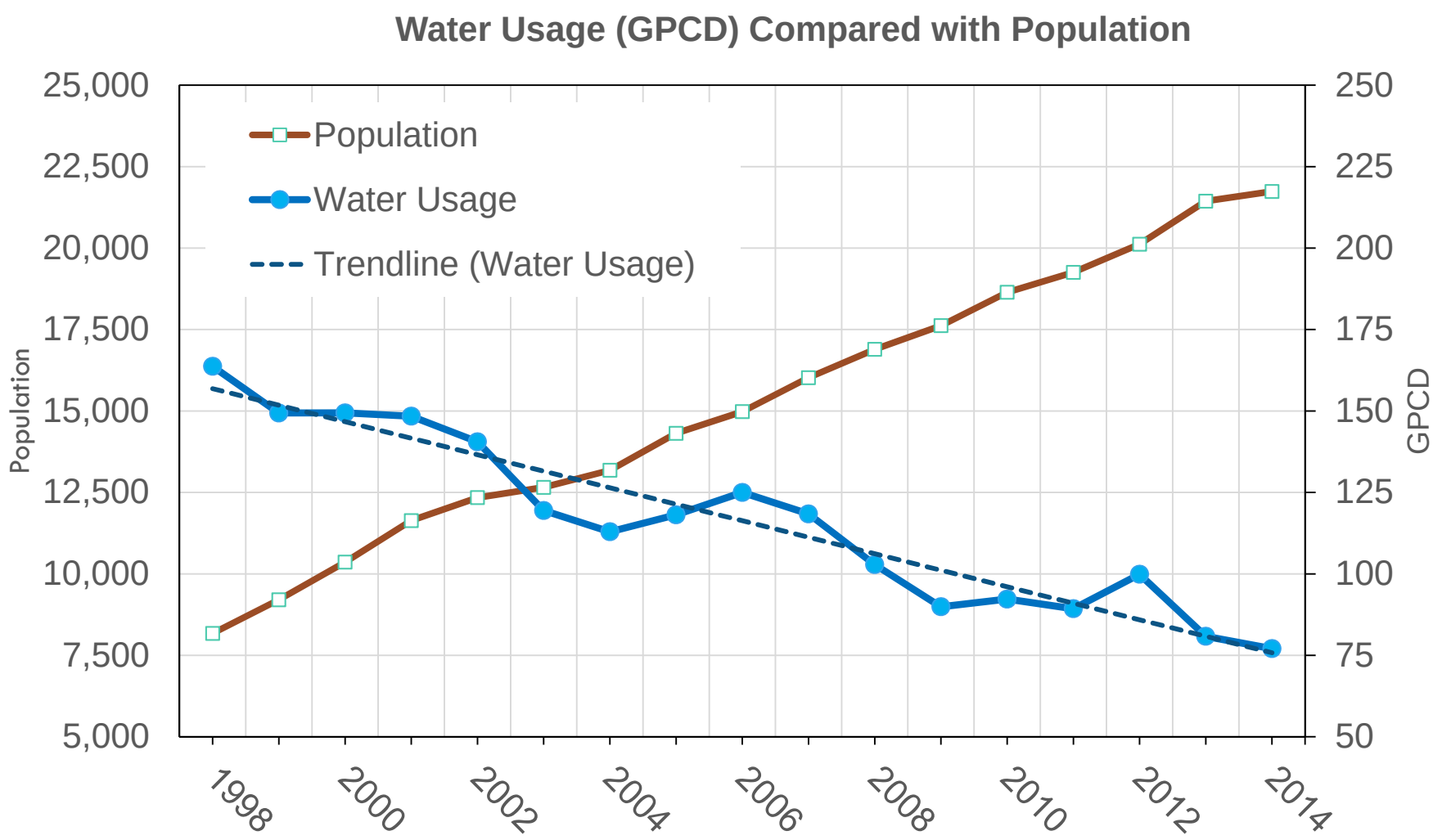


2008 WATER CONSERVATION PLAN

Activities or Programs (selected examples)

- ***Foundational***
  - Meter Testing and Replacement, Meter Upgrades, Water rate Adjustments, Leak Detection, Master Plans
- ***Targeted Technical Assistance and Incentives***
  - Xeriscape classes, Give-aways
- ***Ordinances and Regulations***
  - Water Waste Ordinance, Time of Day Watering Restriction
- ***Educational Activities***
  - Bill Stuffers, Newsletters, Website, Social Networking
  - K-12 Teacher and Classroom
  - Xeriscape Demonstration Garden

PAST PLAN EFFORTS



WATER EFFICIENCY GOALS

- **Initial goal: ~10% (2,401 acre-feet thru 2024)**

Water Use Categories:	Reduction Goals for Planning Horizon	
	(%)	(AF)
In Town Residential	**12.0%**	**1,443**
In Town Business	5.0%	87
In Town Industrial	5.0%	126
In Town School	5.0%	11
In Town Church	5.0%	4
Out of Town Residential	**12.0%**	**4**
Out of Town Business	3.0%	0.15
Out of Town Church	3.0%	0.03
Dual System Residential	**12.0%**	**521**
Dual System Business	5.0%	10
Landscape Only	10.0%	177
Non-Revenue Water	1.0%	18
Total Demand Reduction:		**2,401**
Total Percent Reduction:		**9.7%**

SELECTION OF ACTIVITIES

1. Evaluated a "Universal List" of water efficiency activities with Staff

2. Perform a cost-benefit analysis on selected activities

3. Evaluated analyzed activities with Staff and Board's input to make final selection based on established criteria

WINDSOR'S SCREENING CRITERIA:

- Applicability to the Town of Windsor
- Moderate to high potential reduction of water use
- Town Board and Town resident support and acceptance

SELECTION OF ACTIVITIES

- **HIGHLIGHTED ACTIVITIES THAT WILL CONTINUE**
  - **Water Efficient Rate Structure with Regular Updates**
  - **Leak Detection and Repair Program**
  - **Water Line Replacement Program**
  - **Give-Aways: Residential Water Audit Kits**
  - **General Educational Activities**
  - **Xeriscape Demonstration Garden**

SELECTION OF ACTIVITIES

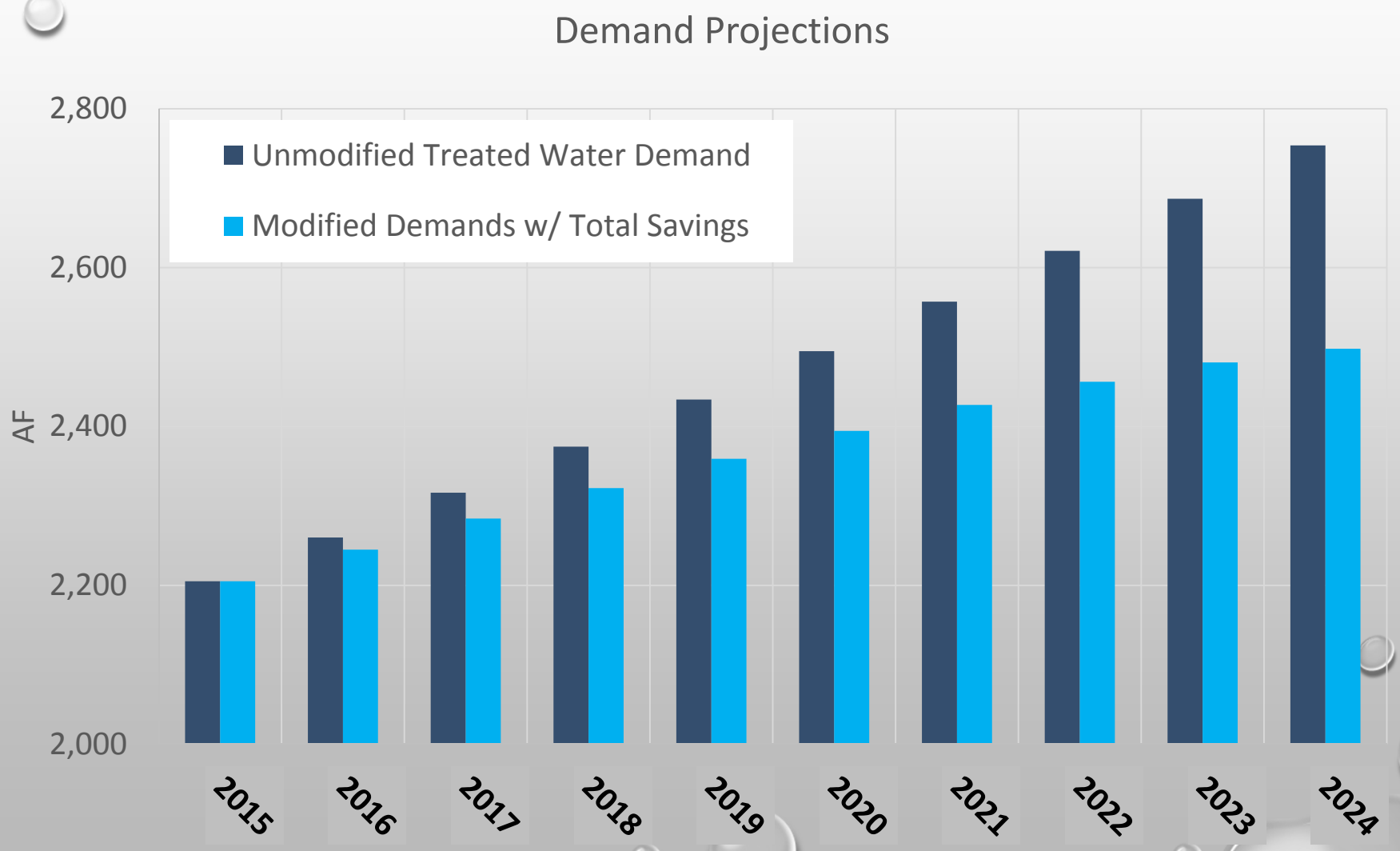
- ***NEW* OR *UPDATED* ACTIVITIES**
  - **Water Budgets**
  - **Slow the Flow Residential Irrigation Audits**
  - **Indoor Residential Water Audits**
  - **Pre-Rinse Spray Valve (PRSV) Upgrades**
  - **Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service**
  - **Rebate for ET Irrigation System Controllers**
  - **Landscape Design Ordinances and Restrictions**
  - **Garden in a Box**

OVERALL WATER REDUCTION GOALS

Water Use Categories:	Total Projected Water Use (2015 to 2024) (AF)	Original Goals (%)	Adjusted Reduction Goals for Planning Horizon	
			Total Water Savings from Activities (AF)	Resulting Reduction (%)
In Town Residential	**12,023**	**12.0%**	**1,387**	**11.5%**
In Town Business	1,743	5.0%	92	5.3%
In Town Industrial	2,519	5.0%	136	5.4%
In Town School	221	5.0%	15	7.0%
In Town Church	79	5.0%	3	4.3%
Out of Town Residential	**31**	**12.0%**	**4**	**13.1%**
Out of Town Business	5	3.0%	0.18	3.8%
Out of Town Church	1	3.0%	0.03	3.0%
Dual System Residential	**4,342**	**12.0%**	**378**	**8.7%**
Dual System Business	209	5.0%	13	6.4%
Landscape Only	1,774	10.0%	141	7.9%
Non-Revenue Water	***1,757***	***1.0%***	***126***	***6.6%***
Total Water Supply:	24,704			

GOAL to reduce total water use by 9.3% or 2,296 AF over next ten years

BENEFIT OF CONSERVATION



SCHEDULE

Event	Date
Present draft Plan at Town Board meeting (work session) and collect comments	1/4/2016
Notify public of draft Plan in paper and website	1/6/2016
Public review period (60 days)	3/8/2016
Windsor provides public input comments to CWS	3/11/2016
CWS incorporates public comments	3/17/2016
Town Board formally adopts final Plan	3/28/2016
CWS submits final Plan to CWCB	3/29/2016
CWCB approves final Plan	*up to 90 days*

QUESTIONS or COMMENTS?

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TOWN OF WINDSOR

2015 MUNICIPAL WATER EFFICIENCY PLAN UPDATE

clearWATERsolutions
water rights • planning • engineering

8010 S. County Road 5, Ste. 105 Windsor, Colorado 80528
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EXECUTIVE SUMMARY

The Town of Windsor, Colorado, (Town *or* Windsor) is a growing Northern Colorado community located a little over 50 miles north of Denver. The town limits of Windsor cover an area of approximately 25.3 square miles. The footprint of Windsor's Water Service Area, however, is a slightly different area of approximately 28.9 square miles and is shown in **Figure 1.1a, Section 1.0**. In 2014, the Town provided water to approximately 14,520 people. Future resident population for the Water Service Area is estimated to grow to 18,587 by the year 2024.

Windsor has developed a Municipal Water Efficiency Plan (Plan) update in accordance with the Water Conservation Act of 2004 and to meet the provisions of Colorado Revised Statute section 37-60-126. As part of CRS 37-60-126, a State-approved Plan will qualify Windsor for funding from the Colorado Water Conservation Board (CWCB) and the Colorado Water Resources and Power Development Authority for water supply and delivery projects.

The Town receives its treated water from three separate water providers, Fort Collins-Loveland Water District (FCLWD), North Weld County Water District (NWCWD), and the City of Greeley (Greeley). Windsor is responsible for acquiring its own raw water supplies, which it transfers to the water suppliers on an annual basis for treatment and delivery. For the water supplies that are transferred, the Town owns units of water of the Colorado-Big Thompson (C-BT) Project and shares in the North Poudre Irrigation Company. The treated water that Windsor receives at the master meters from FCLWD, NWCWD, and Greeley is then distributed to the Town's customers through over 125 miles of pipelines. Windsor also owns shares in several ditch companies which the Town uses for non-potable irrigation of several of the Town parks and open spaces. The irrigation system is separate from the treated water system.

In 2014, Windsor's customers utilized approximately 1,825 acre-feet (AF) of treated water. The Town is expected to increase its annual water demand through new growth to approximately 2,754 AF of treated water over the planning period which extends to 2024. Water savings from this water conservation planning effort is estimated to save a possible 2,296 AF over the planning period. The savings from this planning effort will make a considerable contribution toward the water supplies needed to serve the 2024 demand.

This report documents Town's water system, past and future water use, and the water efficiency planning process used in accordance with CWCB's Municipal Water Efficiency Plan Guidance Document.

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Past and Current Water Efficiency Activities

Windsor has implemented a variety of water efficiency activities since 2003, which is prior to when the Town's first Water Conservation Plan was prepared. In the 2008 Water Conservation Plan, the Town implemented additional activities. The water efficiency activities that have been historically implemented are shown in **Table ES-1**.

Table ES-1: Windsor's Existing and On-going Water Efficiency Activities

Selected Water Efficiency Activities	Approximate Date of Implementation [a]
Foundational Activities	
Meter Testing and Replacement	*2009*
Meter Upgrades [b]	*2009*
Frequency of Meter Reading [c]	*2007*
Tracking Water Use by Customer Type [c]	*2007*
Volumetric Billing [c]	*2007*
Water Rate Adjustments [c]	*2007*
Frequency of Billing [c]	*2007*
Inclining/Tiered Rates [d]	*2003*
System Wide Water Audits	*2008*
Leak Detection and Repair [d]	*2003*
Water Line Replacement Program	*Unknown*
Integrated Water Resources Plans [c]	*2007*
Master Plans/Water Supply Plans	*2008*
Capital Improvement Plans	*2007*
Parks and Open Space Meters	*2008*
Targeted Technical Assistance and Incentives	
Indoor Audits [e]	*Unknown*
Xeriscape [d]	*2003*
Parks and Open Space Rain and ET Sensors	*2009*
Give-aways	*2013*
Ordinances and Regulations	
Water Waste Ordinance [d]	*2003*
Time of Day Watering Restriction	*2007*
Education Activities	
Combined Educational Activities (Bill Stuffers, Newsletters, Newspaper Articles, Mass Mailings, Website, Social Networking) [d]	*2003*
K-12 Teacher and Classroom Education Programs [d]	*2003*
Interactive Websites	*2013*
Citizen Advisory Boards	*1978*
Xeriscape Demonstration Garden [d]	*2003*

[a] Implemented activities have continued through the present day unless otherwise noted.
[b] No additional upgrades since upgrading to Orion.
[c] These activities were mentioned in the 2008 WCP as already existing, so they were likely started prior to 2007 when the planning process began.
[d] Implemented as a result of the 2002 Drought
[e] Audits are currently conducted for Town facilities only.

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Despite the resources available to estimate water savings, the savings of some activities, such as those that are highly dependent on human behavior (e.g. public education programs) are much more difficult to quantify and, in many cases, cannot be estimated with reasonable accuracy. Additionally, data was not collected for many activities. For the activities that we were unable to quantify, demand data was used to estimate savings. The water savings from the Town's efforts since the 2008 WCP are presented in **Table ES-2**. This table shows a savings over the projected overall water use as well as savings evident on a per tap basis. The Town has saved an average of over 12 percent from their projected water use and has saved an average of 11 percent on a per tap basis.

Table ES-2: Water Savings Estimates

Year	Estimated Total Number of Taps (2008 WCP)	Actual Number of Taps	Estimated Use (2008 WCP) (AF)	Actual Water Use (AF)	% Savings Water Use	AF/Tap (from 2008 WCP)	Actual AF/Tap	% Savings per Tap
2008	4,629	4,740	1,839	1,749	4.9%	0.40	0.37	7.1%
2009	4,768	4,937	1,886	1,609	14.7%	0.40	0.33	17.6%
2010	5,006	4,952	1,967	1,817	7.6%	0.39	0.37	6.6%
2011	5,256	5,064	2,052	1,773	13.6%	0.39	0.35	10.3%
2012	5,519	5,239	2,142	2,033	5.1%	0.39	0.39	0.0%
2013	5,795	5,634	2,236	1,772	20.7%	0.39	0.31	18.5%
2014	6,085	5,741	2,335	1,825	21.8%	0.38	0.32	17.1%
Average					12.6%			11.0%

Related to the activities listed previously in **Table ES-1** and the savings evident in **Table ES-2**, **Figure ES-1** further illustrates an overall water efficiency trend. The population of Windsor has had a steady and high increase over the past 16 years of over six percent. Although the gallons per capita per day (GPCD) water usage has varied considerably year to year, the per capita usage has had a downward trend. Much of the variability in the water usage can easily be linked to the yearly fluctuations in temperature and precipitation. The downward trend in usage, however, is a clear indication of the water savings that has likely occurred because of the various water efficiency activities incorporated by the Town. The total usage of water has experienced a much smaller increase (less than three percent) versus the overall six percent in population increase.

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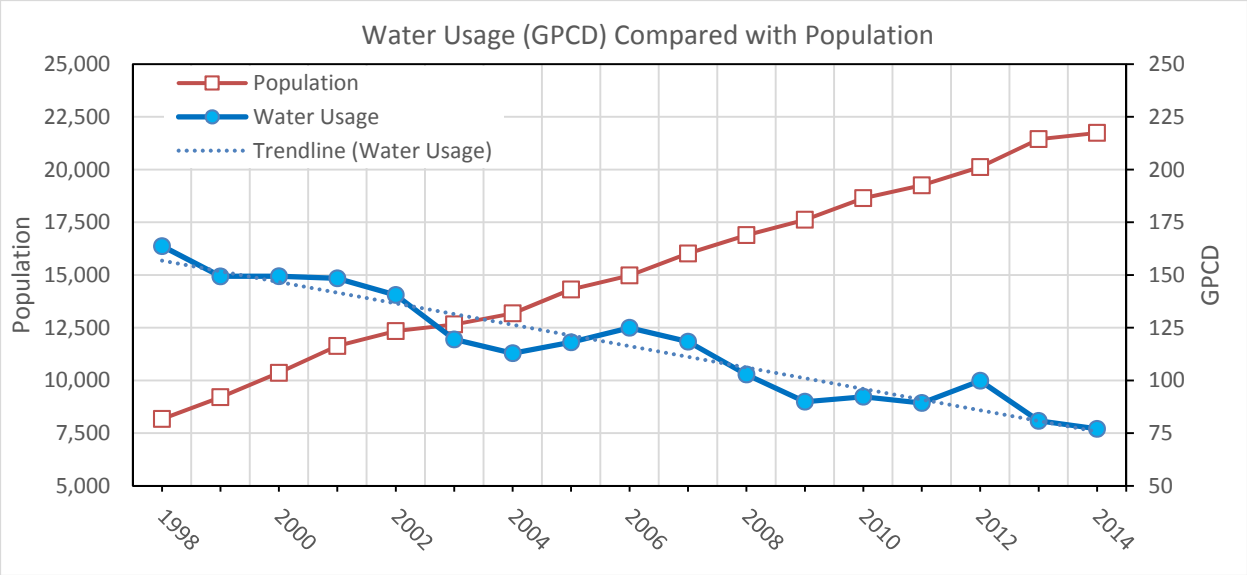

Figure ES-1: Per Capita Water Usage (GPCD) Compared with Population

A preliminary set of goals have been developed prior to the selection of the water efficiency activities to provide a means to screen and evaluate the selected activities. Goals from the Town's 2008 WCP were assessed and incorporated into the new goal development process.

A meeting was initially held with Town Staff to discuss water efficiency goals appropriate for Windsor. The following preliminary goals were established by Staff:

- In keeping with the savings goal established in Windsor's 2008 WCP, the targeted water savings goal for this Plan will be to lower the total per capita water use by 10% over the ten-year planning period.
- The targeted ten-year water reduction goals for the following customer categories were as follows:
    - In Town
        - Residential: 12.0%
        - Business: 5.0%
        - Industrial: 5.0%
        - School: 5.0%
        - Church: 5.0%
    - Out of Town
        - Residential: 12.0%
        - Business: 3.0%
        - Church: 3.0%
    - Dual System
        - Residential: 12.0%
        - Business: 5.0%
    - Landscape Only: 10.0%
    - Non-Revenue Water: 1.0%

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- To develop a water efficiency program that can be implemented within Town staffing constraints and with Staff approval.
- To implement water efficiency activities that are compatible with the community and their Town Board representatives.

The success of the stated goals will be measured through monitoring of billing data, screening and evaluating activities that are acceptable to Town Staff, and soliciting Town Board and community feedback on water efficiency activities.

Windsor used a four-phase process for selecting and fully evaluating water efficiency activities. The four phases included: 1) assessment; 2) identification; 3) qualitative screening; and 4) evaluation and selection.

The initial screening of the water efficiency activities with Town Staff resulted in selecting 25 candidate activities for further evaluation. Eliminated activities may be reevaluated with future planning efforts. Some of the activities were combined within their SWSI Levels Framework to assist in evaluation and avoid double counting savings. The second screening was accomplished by evaluating each activity based on the following criteria: Applicability to the Town of Windsor, Moderate to high potential reduction of water use, and Town Board and Town resident support and acceptance. Of the 25 original activities evaluated, 22 of those activities were chosen for implementation. The Water Budgets activity was combined into a hybrid with Water Efficient Rate Structure with Regular Updates, and the following measures were eliminated in the second screening process:

- High Efficiency Clothes Washer Rebate
- Turf Replacement Incentives

The final 22 activities chosen are as follows:

- Meter Testing and Replacement Program
- System Wide Water Audits
- Control of Apparent Losses (with Metering)
- Automatic Water Meter Reading Installation and Operations
- Water Efficient Rate Structure/Water Budgets with Regular Updates
- Leak Detection and Repair Program
- Water Line Replacement Program
- Master Plans/Water Supply Plans
- Slow the Flow Residential Irrigation Audits
- Indoor Residential Water Audits
- Pre-Rinse Spray Valve (PRSV) Upgrades
- Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program
- Rebate for Evapotranspiration (ET) Irrigation System Controllers
- Give-Aways: Residential Water Audit Kits

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- Water Waste Ordinance
- Time of Day Watering Restrictions
- Landscape Design Ordinances and Restrictions
- Town Facility Requirements
- General Educational Activities (Bill Stuffers, Newsletters, Newspaper Articles, Mass Mailings, Website (*water efficiency, interactive links, and other information*), Water Fairs, K-12 Teacher and Classroom Education Programs, Social Networking (*e.g., Facebook and Twitter*), Citizen Advisory Boards)
- Xeriscape Demonstration Garden
- Landscape Design (Xeriscape) and Maintenance Classes
- Garden in a Box

Table ES-3 compares the anticipated water savings from the selected activities with the original goals and then adjusts the water savings goals for this Plan update. Over the ten-year planning period, the selected activities could potentially provide an overall water savings of 2,296 AF. The adjusted goals reflect what is believed to be obtainable by the Town's Staff. After the goals were adjusted to reflect the expected water savings, the estimated water use reduction is 9.3%. Therefore, Windsor will target an overall reduction from their forecasted water use by 9.3% over the planning period because of implementation of this Plan.

Table ES-3: Water Efficiency Goals Comparison

Water Use Categories:	Total Projected Water Use (2015 to 2024) (AF)	Reduction Goals for Planning Horizon (%)	Reduction Goals for Planning Horizon (AF)	Adjusted Reduction Goals for Planning Horizon: Total Water Savings from Activities (AF)	Adjusted Reduction Goals for Planning Horizon: Resulting Reduction (%)
In Town Residential	12,023	12.0%	1,443	1,387	11.5%
In Town Business	1,743	5.0%	87	92	5.3%
In Town Industrial	2,519	5.0%	126	136	5.4%
In Town School	221	5.0%	11	15	7.0%
In Town Church	79	5.0%	4	3	4.3%
Out of Town Residential	31	12.0%	4	4	13.1%
Out of Town Business	5	3.0%	0.15	0.18	3.8%
Out of Town Church	1	3.0%	0.03	0.03	3.0%
Dual System Residential	4,342	12.0%	521	378	8.7%
Dual System Business	209	5.0%	10	13	6.4%
Landscape Only	1,774	10.0%	177	141	7.9%
Non-Revenue Water	1,757	1.0%	18	126	6.6%
Total Water Supply:	24,704				
Total Demand Reduction:			2,401	2,296	
Total Percent Reduction:			9.7%		9.3%

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Implementation and Monitoring Plan

The implementation plan defines the process necessary to carry out the selected water efficiency activities. Monitoring types of demand data can be beneficial in tracking the savings generated from implementing a water efficiency plan. Windsor monitors total treated water produced on a daily basis. Other categories of raw and treated water and customer accounts are monitored on a monthly and annual basis.

The demand data which will be collected during the monitoring period of the Plan is presented in **Table ES-4**. Patti Garcia (Town Clerk and Assistant to the Town Manager) will be chiefly responsible for coordinating and delegating to implement this Plan. The Town also realizes that the most successful Plan is one that involves a team effort from many staff, other key personnel, and sometimes assistance outside of Town employees.

Table ES-4: Selection of Demand Data for Efficiency Plan Monitoring

Monitoring Data	HB 10-1051 Reporting Requirement					Selection			
	Annual	Monthly	Bi-Monthly	Daily		Annual	Monthly	Weekly	Daily
Total Water Use									
Total treated water supplied (metered at wholesale suppliers master meters)						X	X	X	X
Total treated water delivered (sum of customer meters)	√					X	X		
Raw non-potable deliveries (Parks and Open Space)						X	X		
Reclaimed water produced									
Reclaimed water delivered									
Per capita water use						X			
Indoor and outdoor treated water deliveries						X			
Treated water peak day produced									
Reclaimed water peak day produced									
Raw water peak day produced/delivered									
Non-revenue water	√					X			
Water Use by Customer Type									
Treated water delivered		√				X	X		
Raw non-potable deliveries (Parks and Open Space)						X	X		
Reclaimed water delivered									
Residential per capita water use						X			
Unit water use (e.g. AF/account or AF/irrigated acre)						X			
Indoor and outdoor treated water deliveries						X			
Large users						X	X		
Other Accounting for Substitute Water Supply Plans						X	X	X	

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Monitoring Data *(cont.)*	HB 10-1051 Reporting Requirement					Selection			
	Annual	Monthly	Bi-Monthly	Daily		Annual	Monthly	Weekly	Daily
Other Demand Related Data									
Irrigated landscape (e.g. AF/acre or number of irrigated acres)						X			
Precipitation						X	X		
Temperature						X	X		
Evapotranspiration						X	X		
Drought index information						X			
Economic conditions						X			
Population						X	X		
New taps						X	X		

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INTRODUCTION

The Town of Windsor is a growing Northern Colorado community located a little over 50 miles north of Denver. The Town is surrounded by the much larger communities of Fort Collins to the west, Loveland to the southwest, and Greeley to the southeast. Windsor was founded in 1882 and incorporated in 1890; the Town just celebrated its 125th Anniversary in 2015. Windsor's roots are in agriculture, but in the 1950s its economy began to expand into manufacturing and other sectors as well. With the high growth along the northern Front Range, Windsor has grown in its economic diversity as well as providing a stable community for people working within Town limits and in the surrounding municipalities.

Windsor has an active community and Town Board that is highly vested in providing an exciting, healthy, and family-oriented lifestyle. Windsor Vision 2025 emphasizes land and growth management that enhances residential, commercial, and recreational diversity and ensures that the growth is sustainable.

The town limits of Windsor cover an area of approximately 25.3 square miles. The footprint of Windsor's Water Service Area, however, is a slightly different area of approximately 28.9 square miles and is shown in **Figure 1.1a**, Section 1.0. The Town of Windsor receives its treated water from three separate water providers, Fort Collins-Loveland Water District (FCLWD), North Weld County Water District (NWCWD), and the City of Greeley. Windsor is responsible for acquiring its own raw water supplies, which it transfers to the water suppliers on an annual basis for treatment and delivery.

A portion of Windsor's residents within the Town's current boundary and future growth area is not served by the Town of Windsor Water Division. Residents in Larimer County are served by FCLWD, and residents in portions of the northern Town boundary and future growth area are served by NWCWD.

Windsor is committed to optimizing its water supplies and system through practical water conservation practices. The benefits may include delaying the purchase of costly water supplies and infrastructure upgrades and reducing wastewater flows and treatment. The purpose of this Water Efficiency Plan is to guide Windsor in the process of water efficiency planning and implementation. The planning horizon for this plan is ten years, from 2015 to 2024.

Windsor has made a number of efforts in the last 15 years to improve their water use efficiency and have implemented a number of steps and programs throughout that time. A Water Conservation Plan (2008 WCP) was completed in May 2009. The 2008 WCP outlined several water efficiency activities that were

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implemented as early as 2003 (several years prior to the 2008 WCP) and have continued ever since.

In efforts to be as proactive as possible, Windsor has also completed other water related plans including a Water Rate Study in 2011 (2011 WRS), a Non-Potable Water Master Plan in 2010 (2010 NPWMP), and a Potable Water Master Plan in 2009 (2009 PWMP). Each of these plans, in conjunction with each other and the current Plan, have helped and will continue to assist the Town to supply its residents and businesses with water at a reasonable value.

In this Plan update, the Town of Windsor will perform the five steps of municipal water efficiency planning as outlined in the Municipal Water Efficiency Plan Guidance Document (Guidance Document); 1) profile of existing water supply system, 2) profile of water demands and historical demand management, 3) integrated planning and water efficiency benefits and goals, 4) selection of water efficiency activities, and 5) implementation and monitoring plan. The Town has made many proactive conservation efforts to date and will continue this commitment into the future.

Several documents were reviewed and utilized to develop this Municipal Water Efficiency Plan (MWEP or Plan) update. The Colorado Water Conservation Board (CWCB) *Municipal Water Efficiency Plan Guidance Document* was used as a guide to develop this plan. The 2008 WCP, 2009 PWMP, 2010 NPWMP, 2011 WRS, and the 2015 Town of Windsor Comprehensive Plan (currently in progress) were used for comparisons to previous goals, past and current implementations, and future projections. Windsor's website and Facebook pages were also used for additional information to help in this planning effort. There are many acronyms, terms, and terminology that are commonly used in water efficiency and water planning, and some additional terms are common in this geographical area; a list of terms and their meanings is included in **Appendix A**.

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SECTION 1.0 – PROFILE OF EXISTING WATER SUPPLY SYSTEM

1.1 Overview of Existing Water Supply System

Service Area

The Town of Windsor is approximately 50 miles north of the Denver Metropolitan area and is centrally located between the cities of Fort Collins, Loveland, and Greeley. Although the Town's western boundaries extend into Larimer County, Windsor's potable Water Service Area is located entirely within Weld County as shown in **Figure 1.1a**. The northernmost boundary of the service area is Weld CR 74; the westernmost boundary is the Larimer-Weld County Line Road (also known as Colorado Boulevard or WCR 13); the southernmost boundary is Highway 34; and the easternmost boundary is approximately half way between County Roads 23 and 25. The service area covers approximately 28.9 square miles.

The population that is served by the Town's water supply is estimated to be smaller than the Town's population. The water service population is estimated at 14,955 for 2015; the Town's overall population is estimated at 22,391 for the same year. The Town grew at a rapid rate in the 1990s, almost doubling its population. The growth has tapered off since 2002 with a similar slowdown in growth along the Front Range; Windsor's growth, however, remains higher than surrounding areas. The average growth rate over the last ten years is five percent. The Town considers building permits issued when estimating population. These can be higher than U.S. Census Bureau numbers. Both methods provide a good description of population trends for the Town, and the number of building permits issued gives an indication of the near future growth. The historical population from 2010 – 2015 of the Town and its Water Service Area are presented in **Table 1.1a**.

Table 1.1a: Town and Water Service Population (2010 – 2015)

Year	Population	Change in Population	Population Growth	Water Service Area Population
2010	18,644	1,025	6%	12,502
2011	19,255	611	3%	12,776
2012	20,119	864	4%	13,229
2013	21,441	1,322	7%	14,266
2014	21,739	298	1%	14,520
2015 [1]	22,391	652	3%	14,955

[1] Estimates at the time of Plan research

Some of the Town residents in the northern reaches receive their water supply directly from NWCWD. All residents west of the Larimer-Weld County Line (WCR 13) receive their supply directly from FCLWD. It is estimated that

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approximately 30 to 35 percent of the population of Windsor receives their water supply directly from one of these other water providers. These residents are not included in any past or future water use presented in this report. The Town hopes to partner with NWCWD and FCLWD for potential water efficiency activities even though these partnerships would not directly affect Windsor's water savings.

Water Supply

Windsor currently does not operate a water treatment plant and is a wholesale purchaser of potable water. As mentioned previously, the Town's supply for potable water comes from three sources: FCLWD, NWCWD, and the City of Greeley. Long-term contracts with these water providers establish the terms of service including amount, duration, and payment. Windsor owns its water rights for raw water and turns needed water over to the providers each year for treatment and delivery. A surcharge of water is required in addition to the projected use for each year to cover losses from treatment and delivery to Windsor. **Table 1.1b** shows the contracted flow from each water supplier.

Currently Windsor does not supply reclaimed water. The dual systems within the Town obtain the non-potable water from a different provider. Some additional detail will be included about non-potable water later in the report.

Table 1.1b: Contracted Flow from Suppliers

Name of Supplier	Annual Contracted Flow (Million Gallons per Year)
FCLWD	110
NWCWD (existing)	120 - 368
NWCWD (future)	120 - 1,800
Greeley	130 - 197

Key Existing Facilities

Windsor has two treated-water storage tanks with a total capacity of five million gallons (MG) and a booster pump station that delivers water to elevations above that which can be delivered by gravity. The existing water storage tanks provide water for fire protection, daily operating levels, and emergency water storage. In early 2007, construction of the water booster pump station was completed. The station is located immediately adjacent to Windsor's existing water storage tanks. The pump station is necessary to supply water to future development above elevations of 4,940 feet. The treated water flows by gravity or pump stations from the master meter connections or storage tanks through over 125 miles of pipelines ranging in diameter from two inch to 30 inches. The breakdown of pipe diameters and mileage are shown in **Table 1.1c**.

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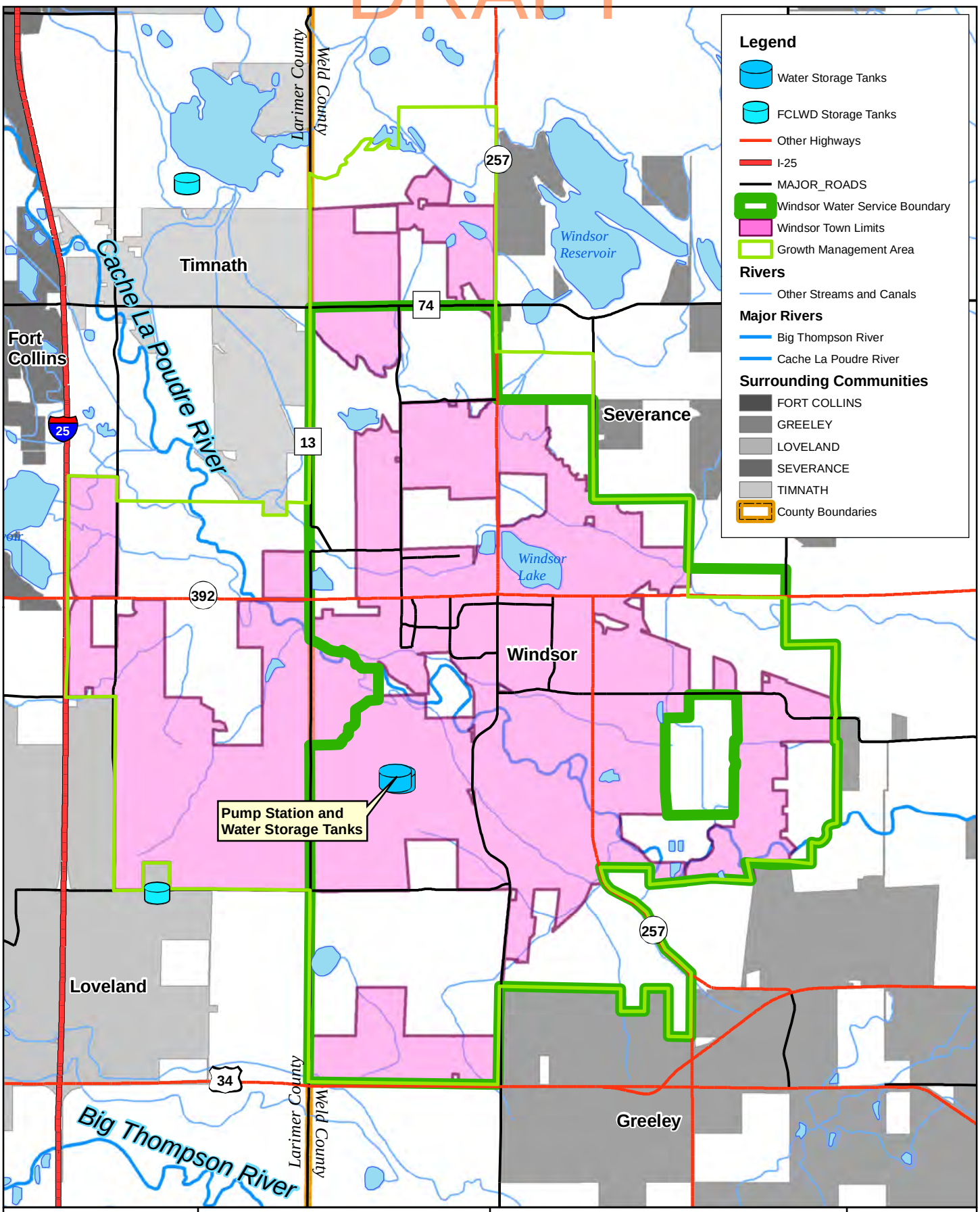

clearWATER solutions
water rights • planning • engineering
8010 S. County Road 5, Ste. 105 - Windsor, CO - 80528 - 970.223.3706

Figure 1.1a
TOWN OF WINDSOR
Municipal Water Efficiency Plan

0 0.5 1 2 Miles

N

Date:	08/20/2015
Drawn By:	NEA
Scale:	As Shown
Job No:	15-110

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Table 1.1c: Miles of Windsor Distribution System Pipeline

Diameter	Miles
18" to 30"	4.7
10" to 16"	42.4
8"	55.2
6" and below	23.5
Total	125.7

1.2 Water Supply Reliability

Water supply reliability is the ability of the Town's water supplies to meet the needs of its customers during times of stress. The Town of Windsor is located in the South Platte River Basin where the Statewide Water Supply Initiative (SWSI) 2010 identified a 58 percent gap between water needs and water supplies in the Basin by 2050. Water efficiency is one method the SWSI report identified for meeting this gap.

Colorado-Big Thompson Project

The Northern Colorado Water Conservancy District (Northern Water) manages the Colorado-Big Thompson (C-BT) Project which imports an average of 213,000 acre-feet (AF) of water from the Western Slope to the Eastern Slope of the Colorado portion of the Continental Divide. This water provides a supplementary source each year to several public and private water users along the northern Front Range and northeastern Colorado for agricultural, municipal, and industrial uses. Northern Water partitions the water it provides into 310,000 units. The C-BT system has approximately 740,000 AF of gross storage. There is approximately 2.3 times the storage than would be needed to deliver a 100 percent quota. This gives the C-BT system some drought reliability.

In over 50 years of C-BT project operation, the average yield has been 0.73 AF per unit and the commonly used average quota is 70 percent. The yield has never been less than 0.50 AF per unit (50 percent quota) or more than 1.0 AF per unit (100 percent quota). The historical annual quota established by the Northern Water Board is shown on the following **Figure 1.2a**. **Table 1.2a** shows Windsor has a firm C-BT yield of 1,953.5 AF (not including North Poudre Irrigation Company (NPIC) shares).

Northern Water defines a C-BT annual carryover program (ACP) to C-BT Allottees, which allows C-BT owners to carry over unused C-BT units from the previous year to the following year. Per Northern Water Annual Carryover Program Procedures:

> *"As with past carryover programs, the District Board, staff, and counsel will review the advantages and consequences of the ACP on a continuing basis. And while the Board recognizes the Program's benefit to many C-BT allottees, it may modify or discontinue the ACP at any time." –NorthernWater.org, accessed February 2015*

Considering this procedure, a 50 percent quota is what most water providers use as the firm yield for C-BT units.

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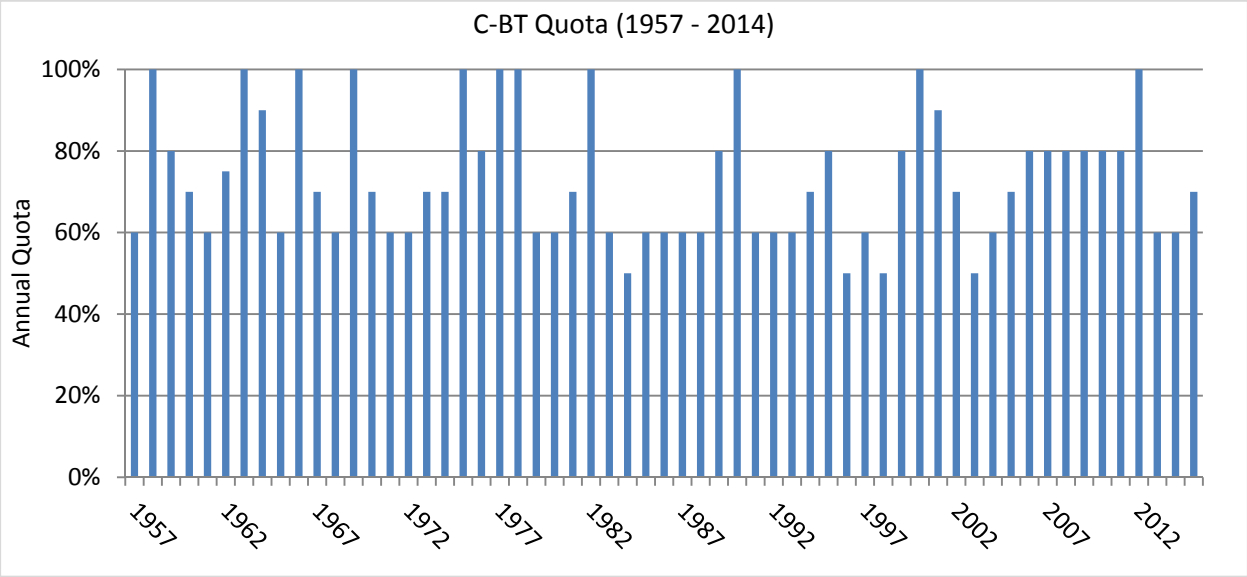

Figure 1.2a: Historical C-BT Quota

Table 1.2a: Windsor's Current Water Supply Firm Yield

Water Source	Shares or Units	Average Yield per Share (AF)	Firm Yield per Share (AF)	Total Average Supply (AF)	Total Firm Supply (AF)	Notes
Potable Sources						
Colorado-Big Thompson Project - Fixed Quota	2,101.0	0.7	0.5	1,470.7	1,050.5	
Colorado-Big Thompson Project - Variable Quota	1,568.0	0.7	0.6	1,097.6	940.8	
North Poudre Irrigation Company (NPIC)	383.5	2.4	2.0	920.4	767.0	
Non-Potable Sources						
B.H. Eaton Ditch Company	2.0	26		52.0		
Whitney Ditch Company	2.0	33		66.0		
Alluvial Wells				190.0		According to permitted pumping rate
Agricultural component of NPIC	350.5	1.0		350.5		Not available for use; rented to shareholders
Kern Reservoir & Ditch Company	100.0			450.0		

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Water Source *(cont.)*	Shares or Units	Average Yield per Share (AF)	Firm Yield per Share (AF)	Total Average Supply (AF)	Total Firm Supply (AF)	Notes
Non-Potable Sources (cont.)						
Louden Irrigating Canal & Reservoir Company [1]	3.0	9.96		29.9		
New Cache La Poudre Irrigating Company [1]	3.25	6.64		21.6		
Cache La Poudre Reservoir Company [1]	3.5	1.29		4.5		
Totals						
Total Available for Treated Use				3,488.7	2,758.3	
Total Available for Non-Potable Use				1,428.5		

[1] Values for "Average Yield per Share" and "Total Average Supply" are estimates only based on Historical Consumptive Use and do not necessarily represent decreed amounts.

Non-Potable Supply

Native Water Supplies - The Town owns agricultural water rights that divert water from the Cache la Poudre River. These include shares in the following ditch companies: NPIC, B.H. Eaton Ditch Company, Whitney Ditch Company, and Louden Ditch Company. These water rights are decreed for agricultural uses only and are used to irrigate the Town's parks and open spaces. If there is any excess above the Town's non-potable water demands, the water rights may be rented for agricultural use. The NPIC native portion cannot be physically delivered to Windsor and is therefore always rented back to shareholders within that system.

North Poudre Irrigation Company - NPIC owns 40,000 C-BT units, so its shares include a C-BT portion and a native agricultural portion. The C-BT water is delivered equally among the 10,000 shares within the NPIC system for agricultural, municipal, and industrial use. Delivery of the C-BT portion can be taken anywhere that C-BT units can be delivered, so an entity outside of the NPIC service area can actually own NPIC shares and lease the native portion back to shareholders in the service area. As shown in **Table 1.2a**, Windsor owns 370.5 shares of NPIC that equate to 741.0 AF able to be utilized for potable uses.

Reservoir Storage - Kern Reservoir (also known as Windsor Lake) is located within the municipal limits of the Town of Windsor. As Windsor has grown in recent decades, they acquired all 100 shares in the Kern Reservoir & Ditch Company (KRDC). The Town has completed the change of use court process for all 100 shares to include well augmentation and other municipal uses.

Windsor plans to continue to use KRDC to augment depletions associated with their irrigation wells and to provide augmentation water needed to fulfill a long-term lease

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agreement with Front Range Energy. In addition, Windsor will continue to use KRDC water directly for irrigation at additional public facilities and for municipal and recreation uses.

Other Factors that Potentially Impact Water Supply

The C-BT supplies are stored in Lake Granby on the Western Slope of Colorado. Should a fire ever occur in that area, water quality would be a major issue for Windsor and other C-BT Allottees. There is a tremendous amount of beetle kill to trees surrounding Lake Granby, Grand Lake, and other C-BT Reservoirs. This beetle kill poses a potential increase risk of fire. Windsor would be vulnerable to FCLWD's, NWCWD's, and Greeley's abilities to treat large quantities of water degraded from ash and soot runoff. This has been an ongoing issue for other water treatment facilities when fire has been present in a basin used for raw water supply. In addition, East Slope C-BT storage, once segregated from the system to avoid contamination, is not enough storage to meet demands, particularly in a drought.

Windsor's water supplies would also be vulnerable in an extended drought. The Town currently maximizes its carryover each year through Northern Water, but a multi-year drought would likely decrease or eliminate Windsor's carryover account. Over a decade ago, Colorado experienced one its severest water shortages on record during the Drought of 2002. Windsor's implemented a drought contingency plan during 2002, and they were able continue to provide adequate water for its residents. More recently, Colorado experienced another drought that stretched from 2012 through August of 2013; fortunately no drought contingency plan was needed during this second recent shortage, and again, Windsor was able to deliver sufficient water for its residents.

1.3 Supply-Side Limitations and Future Needs

Town System Limitations

The pipelines in the system consist of cast iron in the older part of the system and PVC in the newer areas. The cast-iron mains are slowly being replaced with PVC as their lifespan reaches the end. As mentioned earlier, Windsor maintains over 125 miles of pipeline within their system.

Floods bring particular challenges to water providers like Windsor. In September 2013, the Front Range experienced some the largest rainfall amounts recorded for this area in the last 100 years. The Town witnessed several areas of considerable flooding as can be seen in the collage of photos in **Figure 1.3a**; fortunately they did not sustain any major damage to the potable water supply infrastructure during the recent flood. The southern portions of the Town, however, sit right along the Poudre River which can easily flood again causing potential infrastructure damage in the future.

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Figure 1.3a: Various Images of 2013 Flood

Future Water Supply

Increasing pressure on water from population growth along the Front Range has driven the price of water up significantly in the last twenty years. The primary water sources that Windsor is considering for future supply are additional C-BT units, native Poudre River water, and an ongoing Northern Water project called the Northern Integrated Supply Project (NISP).

C-BT Units - In 1963, C-BT water could be purchased for $35 per unit from farmers that felt they had more water than they could use. Since C-BT water is so versatile, the market value of its shares has increased and is a good indication of the price for municipal water. The market price at the beginning of 2015 was approximately $26,000 per unit or $52,000 per AF assuming a 50 percent firm yield. **Figure 1.3b** shows how the price of C-BT units has varied from 1957 to 2015.

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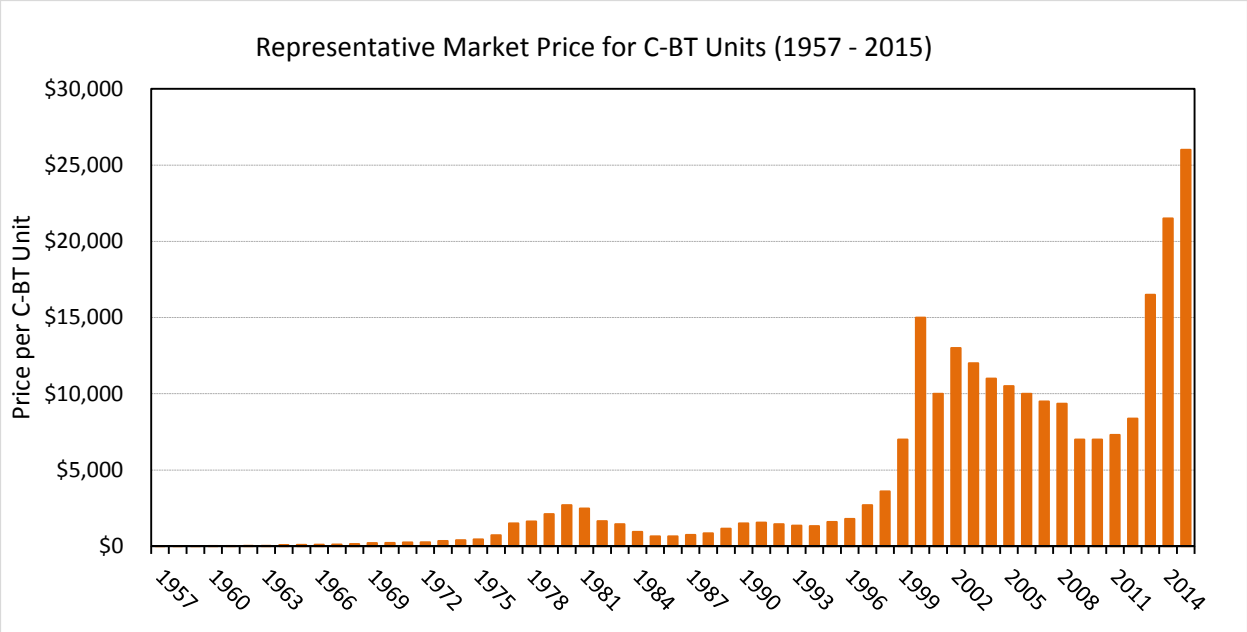

Figure 1.3b: Price of C-BT Units

A key limitation with C-BT water is the fact that it is in great demand and is converting from agricultural (AG) use to municipal and industrial (M&I) use rapidly. The transition is illustrated in **Figure 1.3c**. At this current rate of acquisition, it is projected that few (if any) C-BT units will be available by the year 2040. In the past several years, the oil and gas industry has acquired a significant amount of C-BT water when it goes to the open market. The high demand and limited availability of C-BT water has driven up the price significantly.

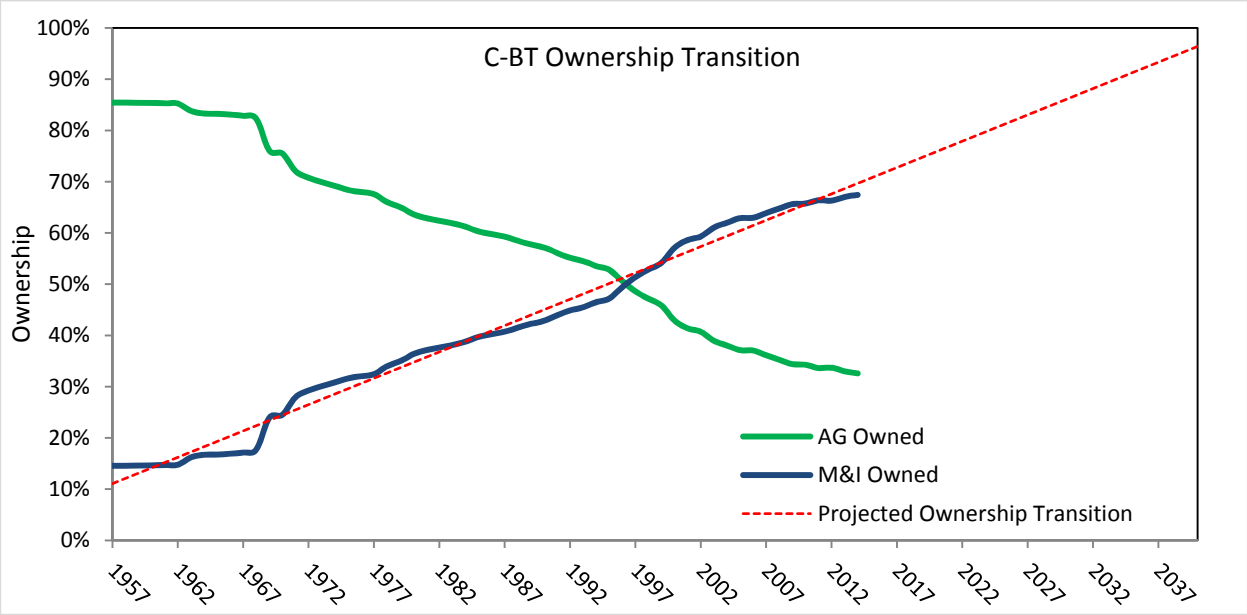

Figure 1.3c: C-BT Ownership Transfer

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Potable Water Master Plan - Windsor completed a PWMP in November of 2009. The PWMP focuses on Windsor broadening its water portfolio. Some of these steps include water rights acquisition, clarifying and updating existing agreements, and changing allocation processes in order to meet the needs of the current population as well as plan for future growth. It should be noted that the PWMP does, however, highlight that water conservation is also key to meeting the future needs of Windsor's growing community; the PWMP specifically encourages that funds be budgeted for water efficiency activities.

It is Windsor's policy for new developments in certain areas to build dual systems using the agricultural water that was historically used on that same land. This works if developers buy farms that have water rights still included. However, many times the native shares of water have been sold off long before the land is developed. The market for these native supplies has also increased.

Non-Potable Water Master Plan - Windsor also completed a NPWMP in March of 2011. The NPWMP focuses on parks and open space irrigation. Much of the NPWMP focuses on wells and consumptive use of the many parks and open space areas of Windsor. The NPWMP does, however, encourage installing more efficient irrigation systems, a measure that will save water in the long run.

Northern Integrated Supply Project - NISP is a regional project that is being financed and will be owned by fifteen municipalities and water districts in northern Colorado. It includes two reservoirs, water rights on the Poudre River, and an exchange with two local ditch companies. NISP is a good example of the kind of projects identified to fill the water need gap described in the SWSI Report. NISP is currently in the National Environmental Policy Act (NEPA) permitting process. Construction of this project will occur only if permits are obtained from the federal government and all NEPA requirements are satisfied. In June 2015, the Army Corps of Engineers released a Supplemental Draft Environmental Impact Statement for NISP. Northern Water is hoping for a final permit decision to be completed by 2017. Windsor is currently participating in NISP, and if the project makes it through the permitting process, the Town will be obligated to pay for its share of the design and construction costs; these are currently estimated at approximately $12,500 per AF. This will involve a large capital outlay from participating entities in the short term, but will provide water supply well past 2025 for Windsor.

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SECTION 2.0 – PROFILE OF WATER DEMANDS AND HISTORICAL WATER EFFICIENCY ACTIVIES

2.1 Demographics and Key Characteristics of the Service Area

Windsor provides potable and fire protection water to a service area that encompasses approximately 28.9 square miles. The Town provides service to approximately 5,670 taps for various end users. Over the past 20 years, the Town has seen a rapid growth rate that has averaged over 6 percent and has been as high as 12 percent. On the outer boundaries of Windsor, there continues to be the steady shift from a rural setting to a more urban-style development.

The Town breaks its billing system into four larger categories: *In Town, Out of Town, Dual System*, and *Landscape Only*. Within each of those larger categories, the Town has further divided customers into subcategories. **Table 2.1a** lists the categories and subcategories. Each of the categories will be discussed in more detail in Section 2.2.

Table 2.1a: Windsor's Customer Categories

Customer Categories
In Town
Residential
Business
Industrial
School
Church
Out of Town
Residential
Business
Church
Dual System
Residential
Business
Landscape Only

2.2 Historical Water Demands

Annual Treated Water

As mentioned previously, Windsor receives its potable water from three sources, FCLWD, NWCWD, and Greeley. **Figure 2.2a** graphically illustrates how the portions of water have been supplied for the Town since 1998. Prior to 1992, supplies were not broken out into the separate providers. For the last ten years of the potable water provided, NWCWD has supplied an average of

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approximately 53 percent, FCLWD has supplied 17 percent, and Greeley has supplied 30 percent.

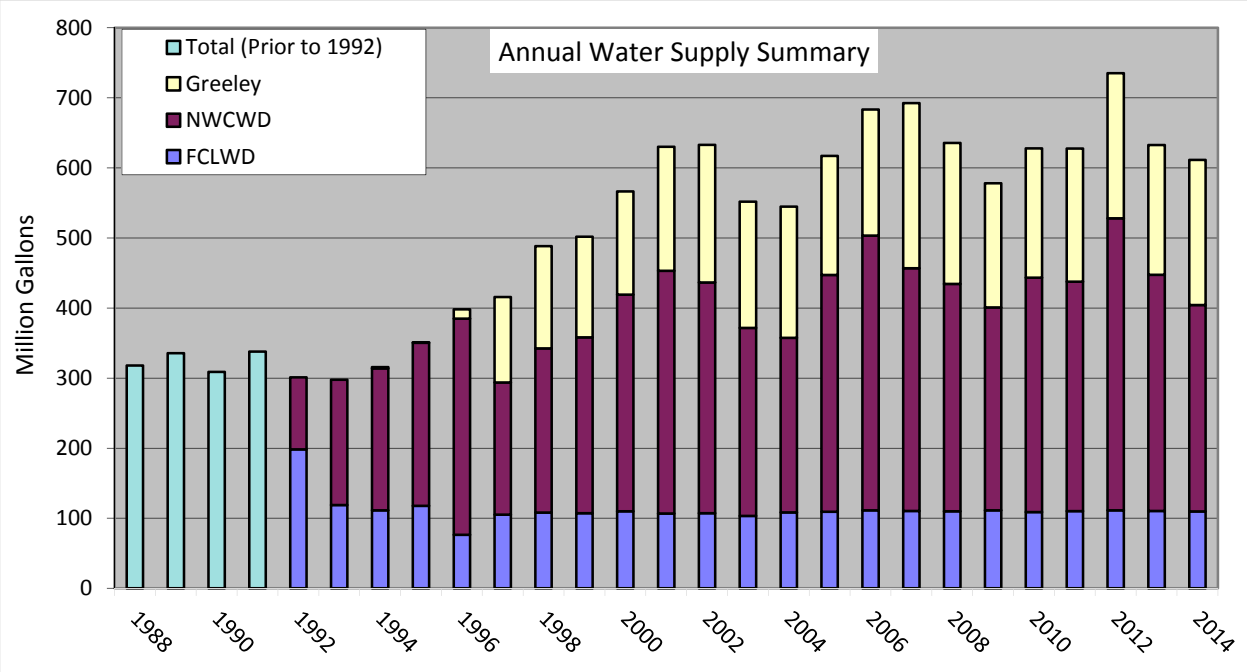

Figure 2.2a: Potable Water Supply Source Breakdown.

After receiving the water at the master meters from the three suppliers, Windsor then delivers the water to its end users through the system taps. **Table 2.2a** shows the annual treated water delivers made by Windsor for the years 2010 – 2014.

Table 2.2a: Windsor Annual Treated Water Delivery

Year	Annual Treated Water Deliveries (AF)
2010	1,817
2011	1,773
2012	2,033
2013	1,772
2014	1,825
Average	***1,844***

Table 2.2b summarizes the various water uses per customer category. Values were calculated as an average over the years 2010 - 2014. The basic breakdown by percentage for the same years is further illustrated in **Figure 2.2b**. Figure 2.2b combines the subcategories within the larger categories to give a better sense of the overall percentages of customers. Also included is Non-Revenue Water (losses) that will be discussed later. Each of the customer categories is also described in more detail following the table and chart.

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Table 2.2b: Five-Year Average Potable Supply and Water Use by Category

Customer Category	Average (AF)	Percent of Total Provided by Suppliers
In Town		
Residential	966	48.7%
Business	140	7.1%
Industrial	202	10.2%
School	18	0.9%
Church	6.3	0.3%
In Town Total	**1,333**	**67.1%**
Out of Town		
Residential	2.5	0.126%
Business	0.4	0.020%
Church	0.1	0.005%
Out of Town Total	**3.0**	**0.2%**
Dual System		
Residential	349	17.6%
Business	17	0.8%
Dual System Total	**366**	**18.4%**
Landscape		
Landscape Only	143	7.2%
Total Delivered to End Users	**1,844**	**92.9%**
Non-Revenue	**141**	**7.1%**
Total Provided by Suppliers	**1,986**	**100.0%**

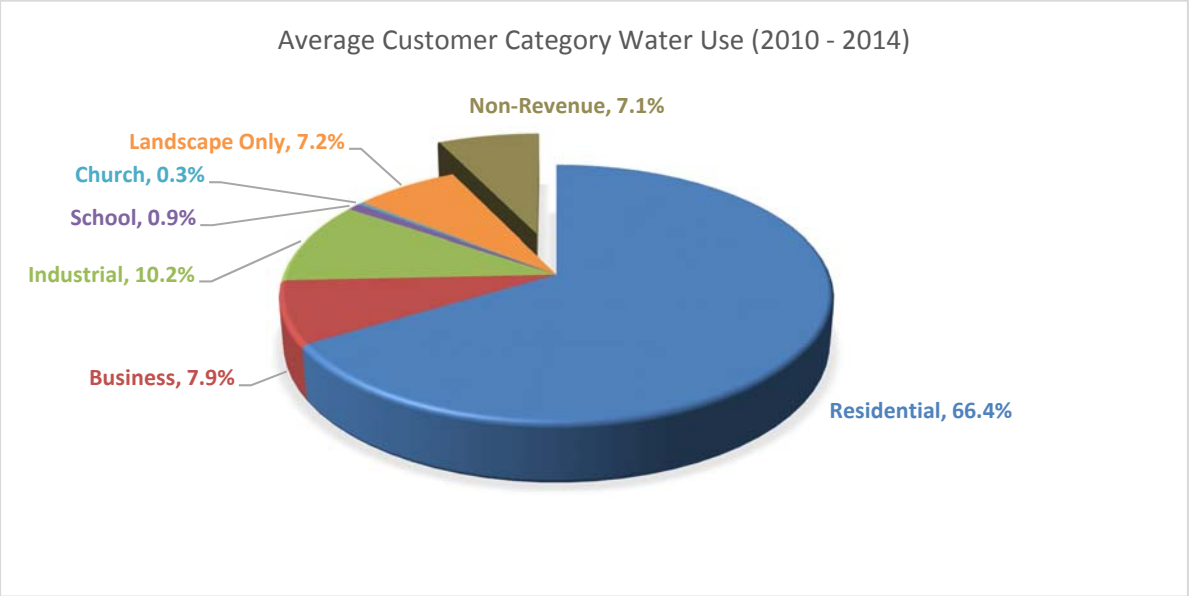

Figure 2.2b: Water Usage Categories

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In Town

In Town end users are broken into five subcategories: Residential, Business, Industrial, School, and Church. These end users are those that lie within the Town Limits and also within the Water Service Boundary. Please see **Figure 1.1a** for a map of the boundaries. All In Town users combined consumed an annual average of 1,333 AF of water from 2010 through 2014. This amount equates to 67.1% of all potable water supplied. Each category within In Town is detailed following this paragraph.

Residential: Residential water use includes both indoor and outdoor use. This customer category includes both single-family homes, townhomes, apartments, and condominiums. The Residential category constitutes the largest water use in the Town, at 48.7% of all potable water supplied. Residential water use in the Town is currently 966 AF per year.

Business: Business water users in the Town include office buildings, retail stores, grocery stores, restaurants, and car washes. In Town Businesses averaged 140 AF per year (2010 – 2014) in the Town which represents 7.1% of the potable water supplied.

Industrial: Industrial water users in the Town include multiple manufacturing and industrial facilities of various sizes. Industrial customers were the largest non-residential category. Industrial water use averaged 202 AF per year (2010 – 2014) which represents 10.2% of the potable water supplied.

School: Windsor has around ten public and private schools that are included within this category. School water use averaged 18 AF per year (2010 – 2014). This use equates to only 0.9% of the total potable water supplied.

Church: Windsor has around twenty churches that are supplied water through the Town's potable system. Even with this large number of churches for the size of the town, churches only used an average 6.3 AF per year (2010 – 2014). This amount equates to 0.3% of the total potable water supplied.

Out of Town

Out of Town end users are broken into three subcategories: Residential, Business, and Church. These customers are within the Windsor Water Service Boundary, but their actual location is outside of the Town Limits. The Out of Town category constitutes a relatively small amount of the overall water use with an annual average of only 3.0 AF from 2010 through 2014. This equates to only 0.2% of the total potable water supplied. The three subcategories represent the same type of customers with the same name that were explained with the In Town subcategories. The average percentages and AF per year (2010 – 2014) for each of these subcategories can be seen in **Table 2.2b**.

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Dual System

Dual System end users are broken into two subcategories: Residential and Business. These customers have a dual system that supplies potable water suitable for human use and consumption and non-potable water mostly used for irrigation. The Dual System category utilizes a total of 18.4% of the annual potable water supplied or 366 AF per year (2010 – 2014). Currently the non-potable component of the dual use customers is tracked by a homeowners association or other type of private group, and the Town does not have any jurisdiction or reporting requirements.

Residential: Dual System Residential customers are very similar to the In Town Residential customers except they have a dual system. This category was the second largest water consumer overall. Residential Dual System customers consumed an average of 349 AF per year (2010 – 2014). This equates to 17.6% of the total potable water supplied.

Business: Similar to the Residential Dual System customers, Business Dual System customers are those businesses that have a dual system. This category was a relatively small water consumer. Business Dual System customers consumed an average of 17 AF per year (2010 – 2014). This equates to 0.8% of the total potable water supplied during that historical period.

Landscape

The Landscape Only category includes water used to irrigate areas surrounding parking lots, medians, and landscaped areas typically associated with commercial properties. Water use associated with the Landscape category averaged 143 AF per year (2010 – 2014). This equates to 7.2% of the total potable water supplied.

Annual Treated Water Use by Customer Category

The Town's average annual water demand for 2010 - 2014 for each customer category is shown on **Table 2.2c**. Windsor has added several categories of billing data over the past several years to help identify specific use categories. The total annual potable water usage from 2010 – 2014 has ranged from 1,772 to 2,033 AF and averaged 1,844 AF. Also shown in **Table 2.2c** is the residential and total per capita water use expressed as gallons per capita per day (GPCD). Residential GPCD is calculated as the residential water use divided by the Water Service Area population, and Total GPCD is calculated as the total water use (all categories) divided by the Water Service Area population.

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Table 2.2c: Annual Treated Water Use by Customer Category

Customer Category	2010	2011	2012	2013	2014	Average
	Values in AF unless otherwise specified					
In Town						
Residential	1,005	952	1,087	886	901	966
Business	125	127	152	143	154	140
Industrial	204	194	211	204	200	202
School	18	18	17	17	19	18
Church	6.8	6.7	7.3	5.3	5.5	6.3
Out of Town						
Residential	1.9	2.1	2.5	2.7	3.4	2.5
Business	0.7	0.4	0.3	0.3	0.3	0.4
Church	0.1	0.1	0.1	0.1	0.1	0.1
Dual System						
Residential Dual System	306	318	365	369	387	349
Business Dual System	13	14	16	20	21	17
Landscape						
Landscape Only	137	142	175	124	134	143
Total (all categories)	**1,817**	**1,773**	**2,033**	**1,772**	**1,825**	**1,844**
Water Service Area Estimated Population	12,502	12,776	13,229	14,266	14,520	13,458
Residential GPCD	86.0	80.7	88.1	71.7	72.6	79.8
Total GPCD	119.1	112.5	123.1	101.0	102.6	111.6

Indoor and Outdoor Demands

The indoor and outdoor use was estimated using the total usage per month for five years (2010 – 2014) of data. The total monthly water use during the months from December through March was assumed to be only associated with indoor use. The basis for this assumption was determined from analyzing monthly use patterns over the previous five years as well as years prior to the period. A daily average for indoor use was calculated by dividing the total winter water use (December through March) by the number of days during the same four month period. The indoor use for the other months of the year (April through November) was calculated as the average indoor use per day multiplied by the days per month. The outdoor monthly use was assumed to be the difference between the total monthly use and the indoor monthly use. **Figure 2.2c** is a chart breaking-out the estimated average monthly indoor and outdoor water use. During the course of an average year (2010 – 2014), outdoor use constituted an estimated 40 percent of the total billed usage.

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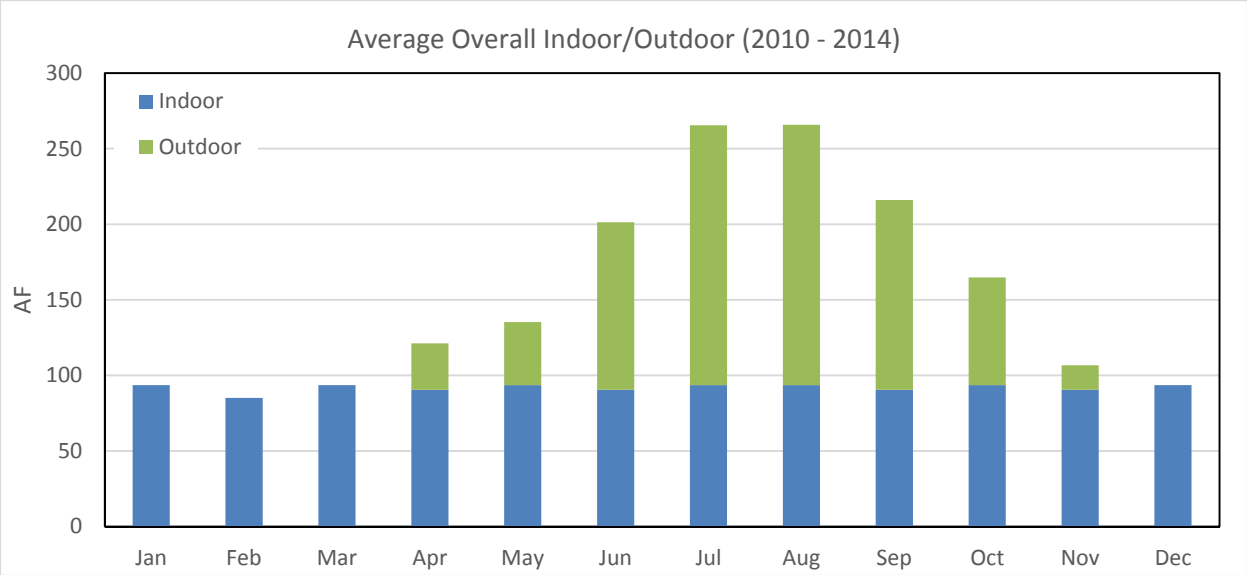

Figure 2.2c: Average Monthly Indoor & Outdoor Water Use

Parks and Open Space Irrigation

Currently the Town irrigates the majority its Parks and Open Space areas with a separate system of meters, wells, reservoirs, and pipelines. This system currently consists of over 21 meters, and since the 2008 WCP, the Town has made continuous efforts to improve the tracking of the water used to irrigate these areas. Some of the water data tracking has been due to the required augmentation mentioned in Section 1.2. The other data has been tracked to better monitor use and more efficiently utilize the water resources available. **Table 2.2d** shows the amount of non-potable and potable water that has been historically recorded since the 2008 WCP. Any potable water recorded here has not been recorded for any other customer categories previously mentioned.

On average, over the last five years (2010 – 2014), potable use has made up approximately 29 percent of the overall supply for irrigating Windsor's Parks and Open Space. **Figure 2.2d** further illustrates how the percentage of non-potable versus potable use for Parks and Open Space has varied over the years since the 2008 WCP. It should be noted that earlier years in this data do not necessarily represent the entire amount of water utilized for irrigation due to meters coming online and other data recording complications. One of Windsor's goals is to continue to refine the data gathering and recording processes. Another goal for the Parks and Open Space is to implement further water efficiency efforts without compromising the water rights associated with the ditch shares. Some of these efforts may include additional evapotranspiration (ET) sensors and other system controls.

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Table 2.2d: Parks and Open Space Water Use

Year	Non-Potable (AF)	Potable (AF)	Total (AF)
2008	178.0	87.7	265.7
2009	134.7	66.1	200.8
2010	157.7	0.1	157.7
2011	161.5	103.0	264.6
2012	245.7	125.0	370.7
2013	250.0	100.0	350.0
2014	264.1	114.6	378.7

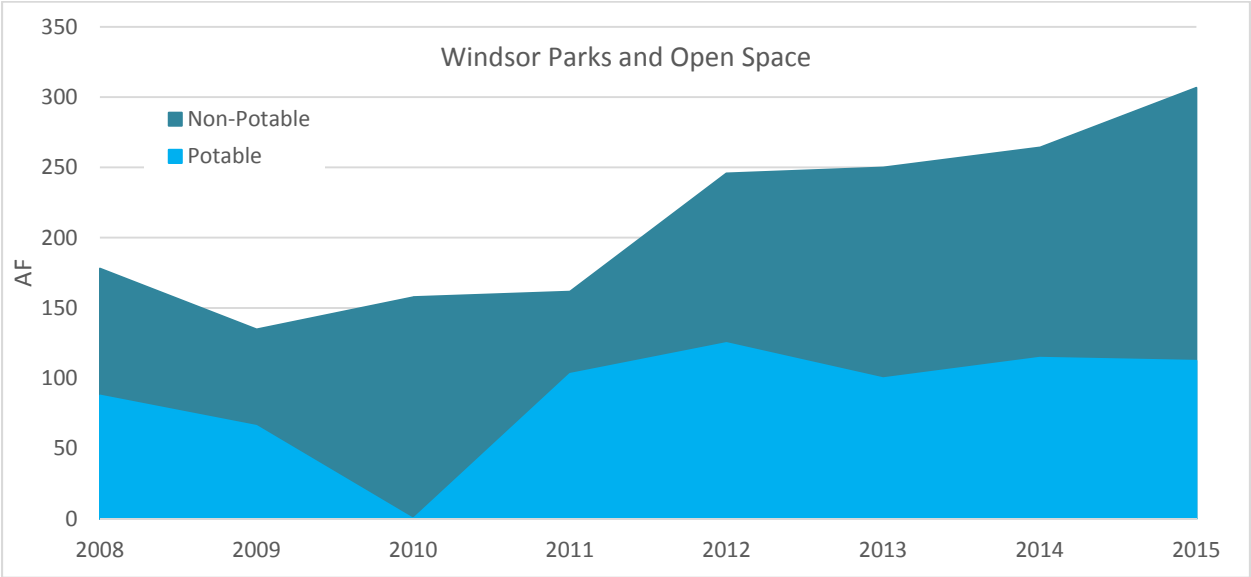

Figure 2.2d: Parks and Open Space Annual Water Use

As can be expected, a majority of the water for Windsor's Parks and Open Space is utilized during the summer months. Similar to the outdoor use in the other categories, the highest use is seen during the months of July, August, and September. If the water used for Parks and Open Space is combined with the other outdoor use, then the overall outdoor consumption is approximately 49 percent of all metered water (both potable and non-potable). **Figure 2.2e** illustrates the seasonal use of the Parks and Open Space water.

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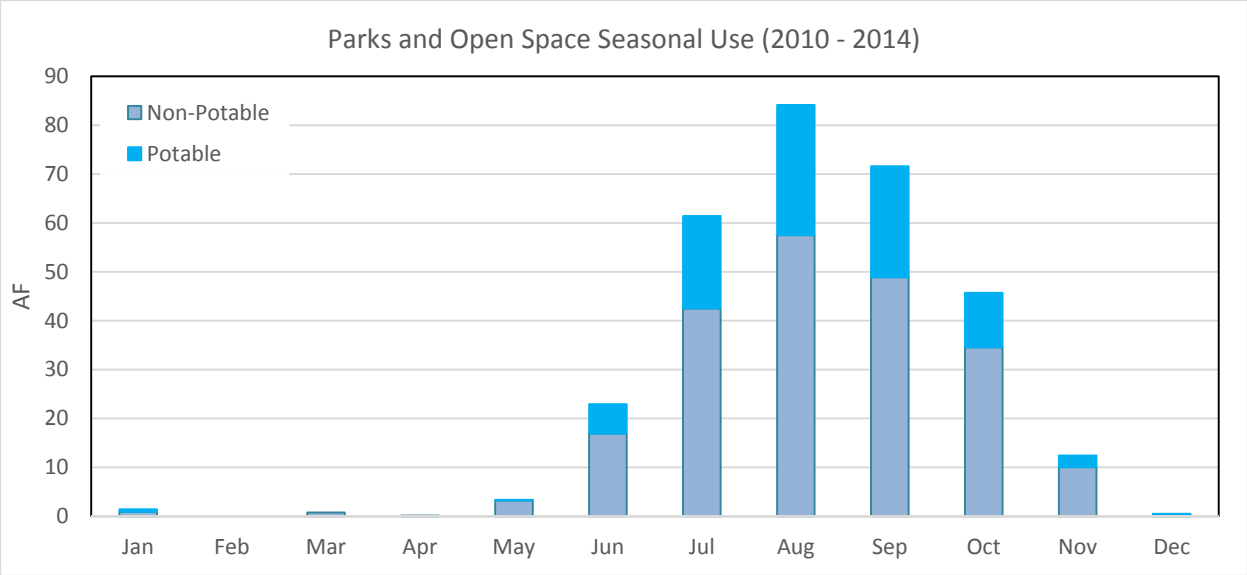

Figure 2.2e: Windsor Parks and Open Season Water Use

2.3 Past and Current Water Efficient Activities and Impact to Demands

Current Water Efficiency Measures

Table 2.3a shows the existing and on-going water efficiency activities for the Town. As can be seen from the Water Efficiency Activities list, the Town is continuously making efforts to improve its own foundational activities such as its Tracking Water Use by Customer Type and Tiered Rate Structure activities. Windsor strives to encourage its customers to be water conscious through educational activities like the Treasure Island Xeriscape Demonstration Garden. Windsor has continued to expand the demonstration garden to further illustrate to its customers ways they can beautify their landscape while saving water at the same time (see **Figure 2.3a**).

Table 2.3a: Windsor's Previous and On-going Water Efficiency Activities

Selected Water Efficiency Activities	Approximate Date of Implementation [a]
Foundational Activities	
Meter Testing and Replacement	*2009*
Meter Upgrades [b]	*2009*
Frequency of Meter Reading [c]	*2007*
Tracking Water Use by Customer Type [c]	*2007*
Volumetric Billing [c]	*2007*
Water Rate Adjustments [c]	*2007*
Frequency of Billing [c]	*2007*
Inclining/Tiered Rates [d]	*2003*
System Wide Water Audits	*2008*

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Selected Water Efficiency Activities *(cont.)*	Approximate Date of Implementation [a]
Foundational Activities *(cont.)*	
Leak Detection and Repair [d]	*2003*
Water Line Replacement Program	*Unknown*
Integrated Water Resources Plans [c]	*2007*
Master Plans/Water Supply Plans	*2008*
Capital Improvement Plans	*2007*
Parks and Open Space Meters	*2008*
Targeted Technical Assistance and Incentives	
Indoor Audits [e]	*Unknown*
Xeriscape [d]	*2003*
Parks and Open Space Rain and ET Sensors	*2009*
Give-aways	*2013*
Ordinances and Regulations	
Water Waste Ordinance [d]	*2003*
Time of Day Watering Restriction	*2007*
Education Activities	
Combined Educational Activities (Bill Stuffers, Newsletters, Newspaper Articles, Mass Mailings, Website, Social Networking) [d]	*2003*
K-12 Teacher and Classroom Education Programs [d]	*2003*
Interactive Websites	*2013*
Citizen Advisory Boards	*1978*
Xeriscape Demonstration Garden [d]	*2003*

[a] Implemented activities have continued through the present day unless otherwise noted.
[b] No additional upgrades since upgrading to Orion.
[c] These activities were mentioned in the 2008 WCP as already existing, so they were likely started prior to 2007 when the planning process began.
[d] Implemented as a result of the 2002 Drought
[e] Audits are currently conducted for Town facilities only.

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Figure 2.3a: Windsor's Treasure Island Demonstration Garden

Water conservation occurs from both passive savings and active programs. Passive savings are those correlated with changes made by customers without any utility incentive; examples of these could be replacing old inefficient fixtures with newer more efficient models. Active programs, on the other hand, are like the ones listed in **Table 2.3a** that have been initiated by the utility, in this case Windsor. Overall between passive and active savings, Windsor continues to see a general downward trend of per capita usage. This trend will be discussed in more detail later in this section.

Numerous factors can contribute to overall water usage, so it is difficult to pinpoint what is the greatest contributor to increases and decreases in usage. Drought and drought restrictions (i.e. the Drought of 2002) may reduce water use considerably. On the other hand, until restrictions are in place, water usage may increase while customers are trying to compensate for lack of natural moisture. An improving economy like that of the Windsor area after the recent recession will often include additional construction and overall increase in total water use. Some other factors may include tourism, floods (September 2013), and other significant events.

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Water Savings Estimates Using Demand Data

Despite the resources available to estimate water savings, the savings of some activities, such as those that are highly dependent on human behavior (e.g. public education programs) are much more difficult to quantify and, in many cases, cannot be estimated with reasonable accuracy. Additionally, data was not collected for many activities. For the activities that we were unable to quantify, demand data was used to estimate savings.

The water savings from the Town's efforts since the 2008 WCP are presented in **Table 2.3b**. This table shows a savings over the projected overall water use as well as savings evident on a per tap basis. The Town has saved an average of over 12 percent from their projected water use and has saved an average of 11 percent on a per tap basis.

Table 2.3b: Water Savings Estimates

Year	Estimated Total Number of Taps (2008 WCP)	Actual Number of Taps	Estimated Use (2008 WCP) (AF)	Actual Water Use (AF)	% Savings Water Use	AF/Tap (from 2008 WCP)	Actual AF/Tap	% Savings per Tap
2008	4,629	4,740	1,839	1,749	4.9%	0.40	0.37	7.1%
2009	4,768	4,937	1,886	1,609	14.7%	0.40	0.33	17.6%
2010	5,006	4,952	1,967	1,817	7.6%	0.39	0.37	6.6%
2011	5,256	5,064	2,052	1,773	13.6%	0.39	0.35	10.3%
2012	5,519	5,239	2,142	2,033	5.1%	0.39	0.39	0.0%
2013	5,795	5,634	2,236	1,772	20.7%	0.39	0.31	18.5%
2014	6,085	5,741	2,335	1,825	21.8%	0.38	0.32	17.1%
Average					12.6%			11.0%

Related to the activities listed previously in **Table 2.3a** and the savings evident in **Table 2.3b**, **Figure 2.3b** further illustrates an overall water efficiency trend. The population of Windsor has had a steady and high increase over the past 16 years of over six percent. Although the GPCD water usage has varied considerably year to year, the per capita usage has had a downward trend. Much of the variability in the water usage can easily be linked to the yearly fluctuations in the climate. As a comparison, both the average yearly temperature and total annual precipitation is shown for the same years in **Figure 2.3c**. The downward trend in usage, however, is a clear indication of the water savings that has likely occurred because of the various water efficiency activities incorporated by the Town. Although somewhat similar to **Figure 2.3b, Figure 2.3d** shows the total usage of water has experienced a much smaller increase (less than three percent) even though the population has had a much higher increase as indicated previously.

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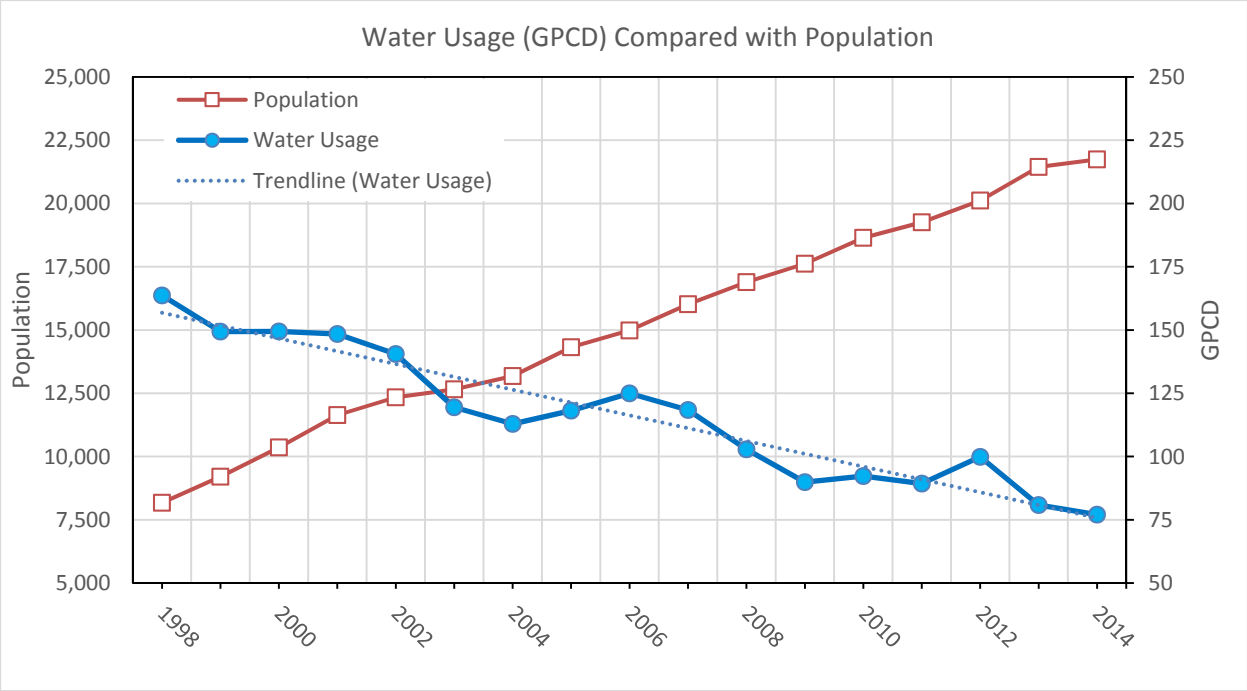

Figure 2.3b: Per Capita Water Usage (GPCD) Compared with Population

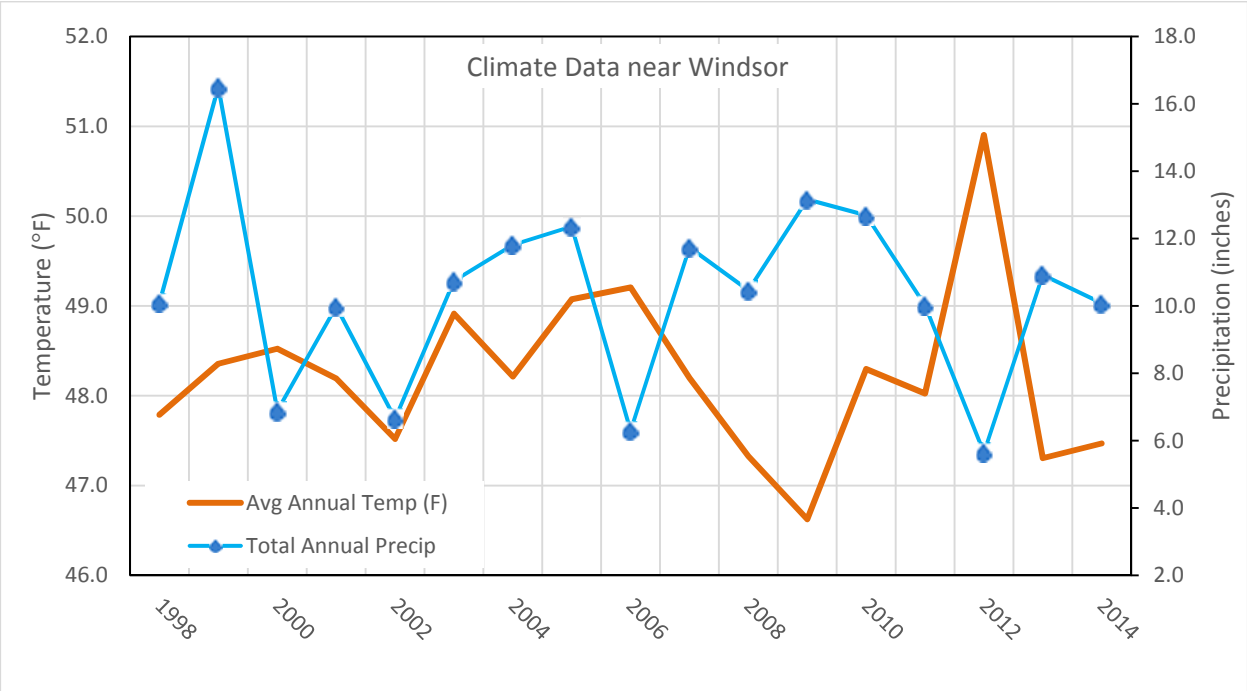

Figure 2.3c: Climate Data to Compare with Water Usage

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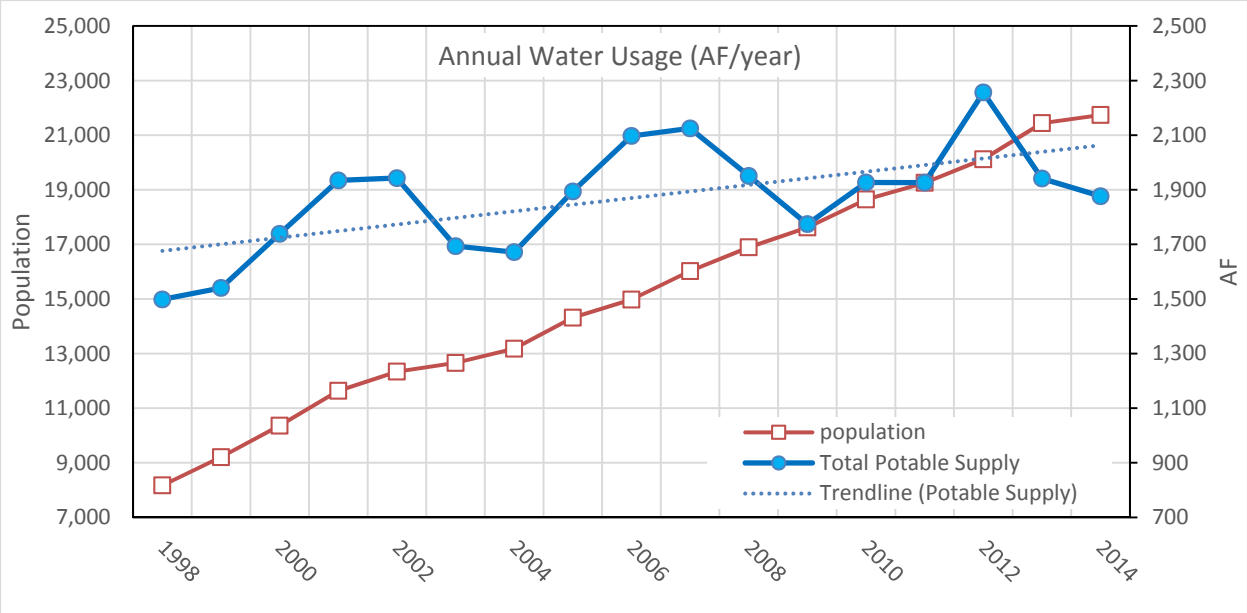

Figure 2.3d: Population Compared with Total Water Usage

2.4 Demand Forecasts

As part of the preparation of the water efficiency plan, we prepared an "unmodified" baseline demand forecast that does not include any impacts from water efficiency. This forecast shows demand starting in 2015 and going through the planning horizon of 2024 (10 years). The baseline forecast is based on a combination of anticipated demographics and land use in Windsor. In the baseline forecast, demands increase proportionally with the population at the current rate of usage. Population estimates shown in five year increments for the previous 25 years and projected population for the next 10 years are presented in **Table 2.4a** and illustrated in **Figure 2.4a.** A conservative future estimate was developed by the Town Staff (Staff) based on the general growth trend of the Town following the recent recession and economic recovery.

Table 2.4a: Windsor Population Growth in Five Year Increments

Year	Population	Average Yearly Growth Rate
1990	5,245	-
1995	6,379	4.0%
2000	10,360	10.2%
2005	14,316	6.7%
2010	18,644	5.4%
2015	22,391	3.7%
2020	25,333	2.5%
2025	28,662	2.5%

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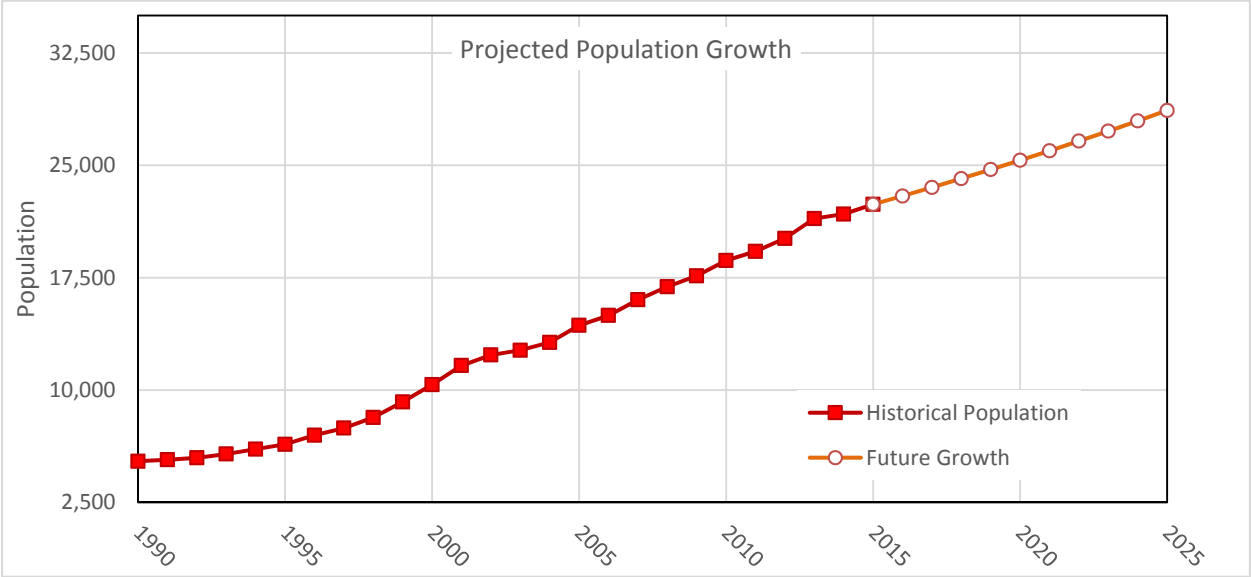

Figure 2.4a: Windsor Population Growth

Table 2.4b shows the population growth (both Total Town Population and Water Service Area Population) for the planning period. This table also shows the Total Taps anticipated and the Total Treated Water Demand over the planning period. As is shown in **Table 2.4c** and **2.4d**, the majority of the treated water is anticipated to continue to be used by the residential categories. Steady growth and therefore demand is anticipated in all categories with similar percentages representing each customer category. Build-out is not anticipated during the next 10 years, and therefore the steady increase in demand is not predicted to taper off.

Table 2.4b: Demand Projections

Year	Total Town Population	Water Service Area Population	Total Taps	Total Treated Water Demand (AF)
2015	22,391	14,883	5,884	2,205
2016	22,951	15,255	6,031	2,260
2017	23,525	15,636	6,182	2,317
2018	24,113	16,027	6,337	2,375
2019	24,715	16,428	6,495	2,434
2020	25,333	16,839	6,657	2,495
2021	25,967	17,260	6,824	2,557
2022	26,616	17,691	6,994	2,621
2023	27,281	18,133	7,169	2,687
2024	27,963	18,587	7,348	2,754

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Table 2.4c: Demand Projections for Customer Categories

Year	Total Treated Water Demand (AF)	Total Billed (AF)	In Town				
			Residential (AF)	Business (AF)	Industrial (AF)	School (AF)	Church (AF)
2015	2,205	2,048	1,073	156	225	20	7.0
2016	2,260	2,099	1,100	159	230	20	7.2
2017	2,317	2,152	1,127	163	236	21	7.4
2018	2,375	2,206	1,156	168	242	21	7.6
2019	2,434	2,261	1,185	172	248	22	7.8
2020	2,495	2,317	1,214	176	254	22	8.0
2021	2,557	2,375	1,245	180	261	23	8.2
2022	2,621	2,435	1,276	185	267	23	8.4
2023	2,687	2,496	1,308	190	274	24	8.6
2024	2,754	2,558	1,340	194	281	25	8.8

Table 2.4d: Demand Projections for Customer Categories

Year	Out of Town			Dual System		Landscape	Non-Revenue (AF)
	Residential (AF)	Business (AF)	Church (AF)	Residential (AF)	Business (AF)	Landscape Only (AF)	
2015	2.8	0.4	0.1	388	19	158	157
2016	2.9	0.4	0.1	397	19	162	161
2017	2.9	0.5	0.1	407	20	166	165
2018	3.0	0.5	0.1	417	20	171	169
2019	3.1	0.5	0.1	428	21	175	173
2020	3.2	0.5	0.1	438	21	179	177
2021	3.2	0.5	0.1	449	22	184	182
2022	3.3	0.5	0.1	461	22	188	186
2023	3.4	0.5	0.1	472	23	193	191
2024	3.5	0.5	0.1	484	23	198	196

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3.1 Water Efficiency and Water Supply Planning

Forecasted Modified Water Demands

A modified demand forecast that includes the impacts of the proposed water efficiency activities is illustrated in **Figure 3.1a** and summarized in **Table 3.1a**. Under the revised forecast, it is estimated that total demands for Windsor in 2025 will be about 549 AF greater than they are in 2015. By the end of the planning period, it is estimated that the Town will see a savings of 256 AF annually. This represents 256 AF of savings over not continuing current activities or implementing any new activities. The Town plans to accomplish this level of water efficiency by continuing successful programs already implemented (e.g., *Master Plans/Water Supply Plans* and *Strong Educational Activities*), repeat and improve important programs (e.g., *Water Efficient Rate Structure/Water Budgets with Regular Updates*), and implement new programs (e.g., offering *Slow the Flow Irrigation Audits* and other incentives like rebates). Projected water savings is expected to be seen by a steady reduction of per capita use. Overall raw water demand, however, will continue to increase.

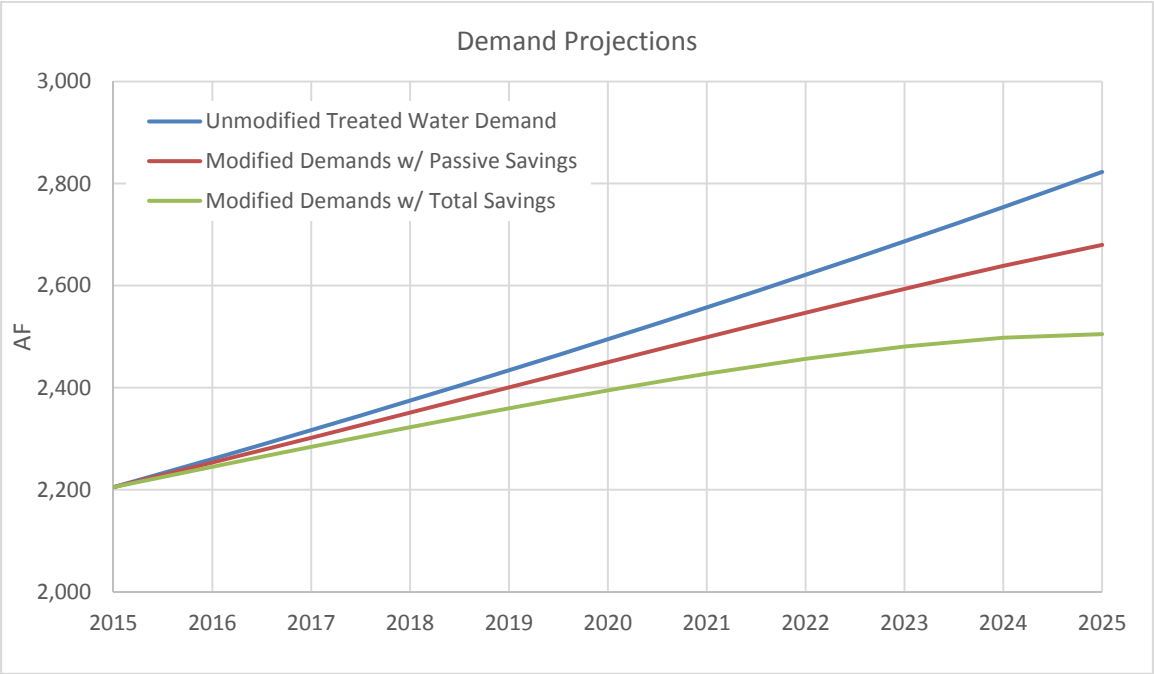

Figure 3.1a: Demand Projections with Modified Demands

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Table 3.1a: Demand Projections – Unmodified and Modified

Year	Unmodified Treated Water Demand (AF)	Modified Treated Water Demand with Passive Savings (AF)	Modified Treated Water Demands with Combination Savings (AF)
2015	2,205	2,205	2,205
2016	2,260	2,253	2,245
2017	2,317	2,302	2,284
2018	2,375	2,351	2,322
2019	2,434	2,400	2,359
2020	2,495	2,450	2,394
2021	2,557	2,499	2,427
2022	2,621	2,547	2,456
2023	2,687	2,594	2,481
2024	2,754	2,639	2,498
Savings		4.2%	9.3%
Increase Use from 2015	549	434	293
Difference from Unmodified		115	256

Impacts to Future Water Facilities and Supply Acquisitions

Water efficiency planning is very important to Windsor. The benefits of this water efficiency planning effort may include:

- Freeing up water supplies for increased growth and development
- Additional water to cover shortages in droughts or other emergency situations
- Delaying the purchase of additional water supplies

3.2 Water Efficiency Goals

Water efficiency goals are intended to lay out a set of targeted objectives that if accomplished will result in the identified benefits. A preliminary set of goals have been developed prior to the selection of the water efficiency activities to provide a means to screen and evaluate the selected activities. Goals from the Town's 2008 WCP were assessed and incorporated into the new goal development process.

A meeting was initially held with Town Staff to discuss water efficiency goals appropriate for Windsor. The following preliminary goals were established by Staff:

- In keeping with the savings goal established in Windsor's 2008 WCP, the targeted water savings goal for this Plan will be to lower the total per capita water use by 10 percent over the ten-year planning period.
- The targeted ten-year water reduction goals for the following customer categories were as follows:

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  - In Town
    - Residential: 12.0%
    - Business: 5.0%
    - Industrial: 5.0%
    - School: 5.0%
    - Church: 5.0%
  - Out of Town
    - Residential: 12.0%
    - Business: 3.0%
    - Church: 3.0%
  - Dual System
    - Residential: 12.0%
    - Business: 5.0%
  - Landscape Only: 10.0%
  - Non-Revenue Water: 1.0%
- To develop a water efficiency program that can be implemented within Town staffing constraints and with Town Board approval.
- To implement water efficiency activities that are compatible with the community and their Town Board representatives.

The success of the stated goals will be measured through monitoring of billing data, screening and evaluating activities that are acceptable to Town Staff, and soliciting Town Board and community feedback on water efficiency activities.

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SECTION 4.0 – SELECTION OF WATER EFFICIENCY ACTIVITIES

4.1 Summary of Selection Process

Windsor used a four-phase process for selecting and fully evaluating water efficiency activities. The four phases include: 1) assessment; 2) identification; 3) qualitative screening; and 4) evaluation and selection.

Assessment, Identification, and Qualitative Screening

Using the analysis performed and presented in Section 2.3, the Town identified areas where water efficiency could be enhanced. With the apparent water saving success of the Water Efficient Rate Structure Updates and the popularity of Windsor's Education Program, the Town would like to continue these activities as well as a number of others. In addition to these activities, the Town generally wants to focus on activities that assist with meeting their water efficiency goals.

We utilized Worksheets D-G from the *MWEP Guidance Document* to identify a list of water efficiency activities that are generally compatible with the Town's needs. A copy of Worksheets D-G can be found in **Appendix B** of this report.

The list of activities evaluated are organized according to the SWSI Levels Framework. The SWSI Levels Framework was developed as a component of the 2010 SWSI update to organize water efficiency activities into a model that assists municipalities in prioritizing and selecting activities. The framework may be represented as a cylinder consisting of the following four categories in **Figure 4.1a**.

SWSI Levels Framework includes the following levels of water efficiency activities:

- **Foundational Activities** – These activities focus on system operations and water efficiencies that are under Windsor's direct control and can improve the effectiveness of the planning efforts by ensuring sufficient metering and data tracking.
- **Targeted Technical Assistance and Incentives** – These measures cover activities that Windsor and its customers can do to improve existing water efficiency.
- **Ordinances and Regulations** – These measures include regulatory activities designed to encourage water efficiency.
- **Education Activities** – These efforts educate the public on the benefits of water efficiency, inform customers on how they can reduce their water usage, and publicize water efficiency activities that Windsor is implementing.

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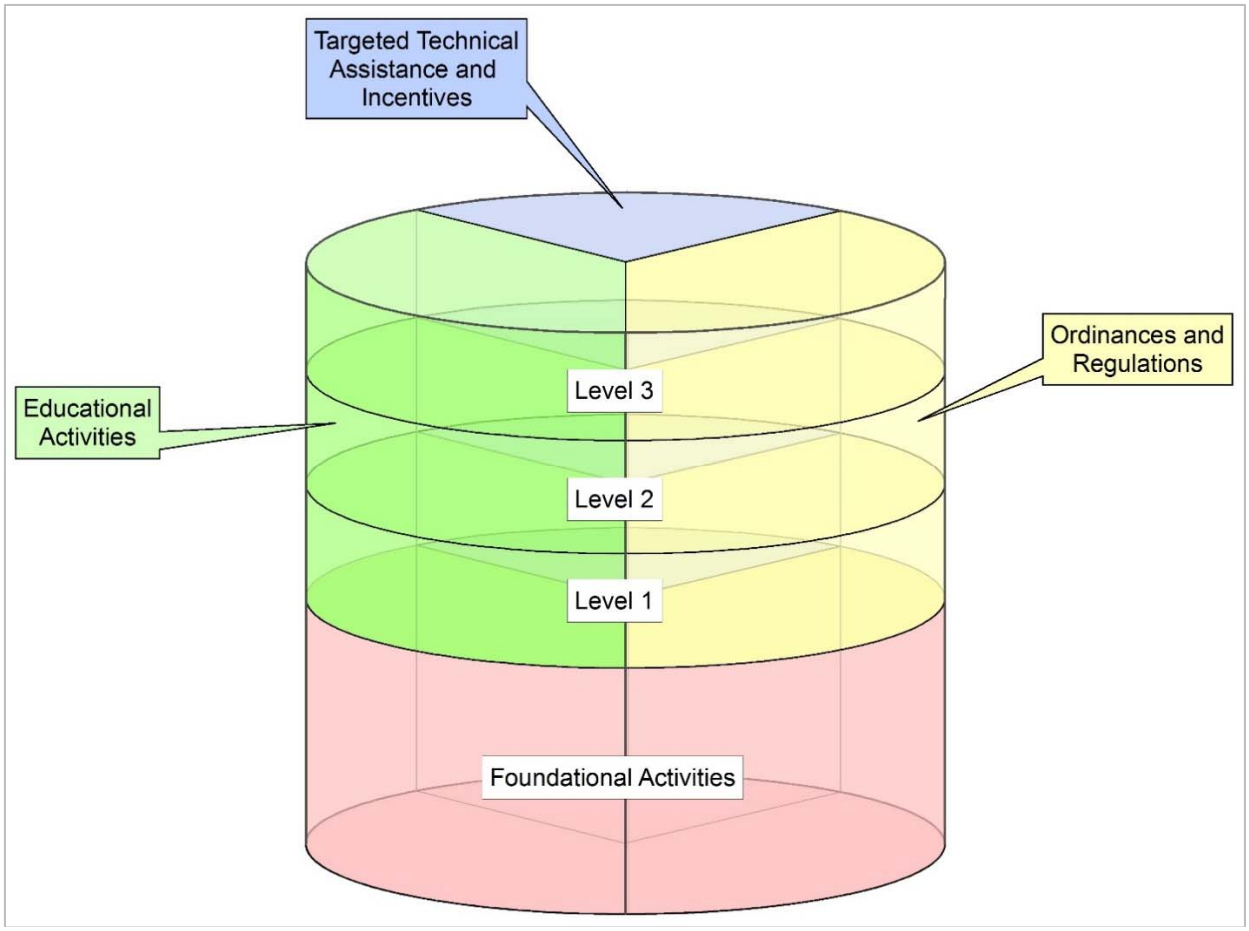

Figure 4.1a: SWSI Levels Framework

Further discussion regarding the SWSI Levels Framework are provided in subsequent sections.

Town Staff developed qualitative screening criteria used to evaluate the preliminary list of activities. The screening criteria include: 1) Financially feasibility; 2) Staff availability; 3) Staff and Board Approval. Activities not meeting the screening criteria were eliminated. The specific reason for elimination of activities can be found in Worksheets D-G, located in **Appendix B**.

Evaluation and Selection

The evaluation and selection phase of the selection process involved development of evaluation criteria, evaluation of the activities, and selection of the final activities for implementation. Some of the general evaluation criteria included:

- Applicability to the Town of Windsor
- Moderate to high potential reduction of water use
- Town Board and Town resident support and acceptance

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4.2 Water Efficiency Activities

The initial screening of the water efficiency activities with Town Staff resulted in selecting 25 candidate activities for further evaluation. Eliminated activities may be evaluated with future planning efforts. Some of the activities were combined within their SWSI Levels Framework to assist in evaluation and avoid double counting savings. The preliminary analysis of costs and benefits of the selected measures and programs are shown in **Table C1, Appendix C**. Details about the cost/benefit evaluation and information about each measure can be found in the following section with further detail is available in **Appendix D.**

4.3 Selection of Activities for Implementation

The second screening was accomplished by evaluating each activity based on the criteria discussed in Section 4.1 (Applicability to Town of Windsor, moderate to high potential reduction of water use, and Town Board and Town resident support and acceptance). Of the 25 original activities evaluated, 22 of those activities were chosen for implementation. Details about the final 22 activities chosen can be found in the following descriptions.

<u>Foundational Activities</u>

- **Meter Testing and Replacement Program**
  The Town has a program in place where large meters are sent in for testing and calibration every seven years, and small meters are replaced every ten years. Faulty meters account for apparent losses (i.e. losses due to meter inaccuracies) and real losses (also known as physical losses), and the Town wants to minimize these losses.
- **System Wide Water Audits**
  By utilizing System Wide Water Audits and pairing it with other measures (e.g., *Meter Testing and Replacement* and *Leak Detection*), Windsor identifies unmetered and unbilled treated water uses in order to assess where losses are occurring and how losses can be addressed. These losses are considered non-revenue water.
- **Control of Apparent Losses (with Metering)**
  This measure entails utilizing existing meters as well as adding additional meters to determine where system losses are occurring. This measure is often coupled with System Wide Water Audits since they have similar benefits, and metering helps the auditing process.
- **Automatic Water Meter Reading Installation and Operations**
  All of Windsor customer meters have been upgraded to Orion AMR meters. The Town is not currently planning on further upgrades to an AMI system during the Planning Period. AMR meters allow for data to be processed quicker with less sources of error.
- **Water Efficient Rate Structure/Water Budgets with Regular Updates**
  Based on many studies, water rates (e.g., inclining and/or tiered) are one of the most effective ways to encourage efficient water use. A rate study is necessary to ensure maximum water conservation savings. Windsor's last rate study was

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conducted in 2011. The Town's last rate adjustment occurred for 2016 (approved on December 14, 2015). Because they are very interrelated, this measure also includes *Volumetric Billing* within it. Windsor's current rate structure is included in **Table 4.3a**. The complete water fees schedule and other water related fees are included in **Appendix E**. Please note that water rates on Page 1 of 9 of Appendix E have been updated with the most recent adjustments on Page 6 of 9 of Appendix E.

Table 4.3a: Windsor's Current Tiered Rate Structure

Meter Size	1st Tier Usage Charge	1st Tier Threshold	2nd Tier Usage Charge	2nd Tier Threshold	3rd Tier Usage Charge	3rd Tier Threshold
	per 1,000 gal	gal / month	per 1,000 gal	gal / month	per 1,000 gal	gal / month
¾" Single family residential	$3.73	16,000	$5.56	22,500	$8.29	> 22,500
¾" residential with dual system	$3.73	9,700	$5.56	> 9,700	N/A	N/A
1" residential with dual system	$3.73	9,700	$5.56	> 9,700	N/A	N/A
1.5" residential with dual system	$3.73	9,700	$5.56	> 9,700	N/A	N/A
¾" multi-family residential	$3.73	157,000	$5.56	> 157,000	N/A	N/A
¾" commercial, industrial, school	$3.73	157,000	$5.56	> 157,000	N/A	N/A
1" commercial, industrial, school	$3.73	157,000	$5.56	> 157,000	N/A	N/A
1.5" commercial, industrial, school	$3.73	157,000	$5.56	> 157,000	N/A	N/A
2" commercial	$3.73	493,000	$5.56	> 493,000	N/A	N/A
2" industrial	$3.73	783,000	$5.56	> 783,000	N/A	N/A
2" school	$3.73	157,000	$5.56	> 157,000	N/A	N/A
3" school	$3.73	306,700	$5.56	> 306,700	N/A	N/A
4" industrial	$3.73	2,461,000	$5.56	> 2,461,000	N/A	N/A

Windsor is also investigating a Water Budget type of Rate Structure. Every water customer has unique water needs. For this activity, Windsor proposes to bill customers using a personalized water budget. Water budgets are typically based on some type of predetermined allotment and represents the amount of water a customer is expected to need for a specific month and/or year. Water budgets may vary monthly due to seasonal watering demands and climate fluctuations. The goal of a water budget structure is to encourage customers to use water more efficiently by rewarding efficient water use and reducing water waste. Those customers who are efficient, use the lowest-cost water and

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therefore pay the lowest rates. Customers who are inefficient pay higher rates for the water that exceeds the budgeted amount. No matter what, customers are only billed for the water they use.

- **Leak Detection and Repair Program**
  Currently Windsor combines customer water use observations by Staff and pairs it with help from outside consultants ("American Leak Detection" (ALD) and "National Meter and Automation Inc.") to evaluate their system for leaks. Repairs to the system are made as needed. Windsor's 2015 Leak Report from American Leak Detection is included in **Appendix E**. ALD tested 57,437 feet of pipeline. No leaks were discovered in 2015. According to ALD, "The system appeared to (be) very well maintained with ready access to valves and curb stops for testing."
- **Water Line Replacement Program**
  Windsor has budgeted 1.2 million dollars for 2016 to replace older and higher use pipeline.
- **Master Plans/Water Supply Plans**
  The Town has seen many benefits in developing, updating, and evaluating Master Plans, Water Supply Plans, Capital Improvement Plans, and Water Efficiency Plans. These plans have increased the Towns awareness of activities and programs they can incorporate to help play their part in this region's overall need for water efficiency. Windsor plans to continue committing resources for such plans that will improve its overall water efficiency and help plan for future use.

Targeted Technical Assistance and Incentives

Windsor is planning on partnering with the Center for ReSource Conservation (CReSC) for several of its *Targeted Technical Assistance and Incentive Programs*. CReSC offers multiple programs including "Garden in a Box", "Slow the Flow", "Toilet Upgrades", and more. CReSC is a non-profit organization that offers many programs that can assist communities with conservation efforts. The benefit for a provider like Windsor who is relatively small in size is that CReSC helps to greatly reduce the planning efforts, startup costs, and labor that can be associated with getting efficiency activities up and running. CReSC has the programs already set up and in place, so Windsor will know exactly what the upfront costs will be. Additionally, CReSC hires and trains local technicians to provide the various services they offer, another value added component of CReSC programs.

- **Slow the Flow Residential Irrigation Audits**
  CReSC offers "Slow the Flow" Residential Irrigation Audits for communities like Windsor. "The service usually takes 90 minutes and involves a visual inspection, data collection, and in-depth evaluation. The consultant will deliver a clear and actionable list of suggestions to reduce water use and runoff at each property, while keeping landscapes and lawns healthy" –*CReSC*. This program will also help educate the Town's participants on how to water more effectively and efficiently.

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- **Indoor Residential Water Audits**
  CReSC also offers indoor water audits. "'Slow the Flow' offers consultations on residential water use and suggests simple measures to increase water use efficiency in the home. During the session the consultant will measure outputs from faucets, toilets, and shower-heads, and perform a cost/benefit analysis on fixture replacement options. He/She may also install low-flow shower-heads and faucet aerators at no cost. The consultation will leave the home owner with a customized list of recommendations for increasing efficient water use" –*CReSC*.
- **Pre-Rinse Spray Valve (PRSV) Upgrades**
  CReSC also offers this program typically targeted for restaurants or other businesses that have a commercial type dishwasher. "Save water in commercial kitchens with a quick, easy, and effective pre-rinse spray valve (PRSV) upgrade. This 15-minute swapping service is offered at no cost to businesses and creates instant, measurable water and energy savings" –*CReSC*. CReSC estimates a savings of 20,000 per PRSV swap. Pre-rinse nozzles for dishwashers are installed by CReSC technicians.
- **Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program**
  Windsor hopes to participate in the Ultra High-Efficiency Toilet Upgrade Service offered by CReSC where participants can "Save thousands of gallons of water per year with the breakthrough technology of the Niagara Stealth Toilet." –*CReSC*. If Windsor does not participate in the CReSC program, then the Town will offer rebates instead for high efficiency toilet replacements.
- **Rebate for ET Irrigation System Controllers**
  The Town plans to offer rebates (likely in the form of a bill credit) for customers who install "Smart Controllers" for Irrigation. Smart controllers sense either the soil moisture or climate conditions (e.g., rainfall, ET, and temperature) and adjust the irrigation scheduling accordingly.
- **Give-Aways: Residential Water Audit Kits**
  The Town customized Water Audit Kits with many useful, education, and yet fun water saving components. Some of the items include hose nozzles, showerheads, aerators, and outdoor moisture meters to name a few. The complete contents list with descriptions can be found in **Appendix E**.

  The Town distributed 341 Water Audit Kits beginning April 1, 2013; of the kits distributed, 274 customers participated for the entire project period of May 2012 to April 2014 which is 8.5% of the In Town Residential customers. Participation included having the water tracked after implementing some of the components. A comparison of consumption per household was created based on usage from May 2012 to April 2013 and compared to usage from May 2013 to April 2014. Consumption savings by the 274 participating customers was 5,377,169 gallons which is an average of 19,624.70 gallons per account over a 12 month period.

  Windsor hopes to promote and distribute additional Water Audit Kits during the spring and summer of 2016 at the Water Conservation booth at various Town events. The Town will request to track data from participants.

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Ordinances and Regulations

- **Water Waste Ordinance**
  Windsor currently has an ordinance in place that specifies the responsibility the property owner has to keep the water lines on their property in good condition in order to prevent the waste of water.
- **Time of Day Watering Restrictions**
  Windsor has a Water Restriction Ordinance in place that states, "From May 1 through September 30 of each year, no lawn watering shall be permitted between the hours of 10:00 a.m. and 6:00 p.m." This restriction is also highlighted on the Water Conservation webpage.
- **Landscape Design Ordinances and Restrictions**
  Windsor is investigating the following landscape design ordinances: Rules and Regulations for Landscape Design/Installation, Soil Amendment Requirements, Turf Restrictions, and Irrigation Equipment Requirements. The Town Staff would like to word ordinances and restrictions in such a way to encourage proactive efforts on the part of developers.
- **Town Facility Requirements**
  Many of the Town facilities already have modern, low water use fixtures. Windsor hopes to update the remaining Town facilities with water saving fixtures.

Educational Activities

- **General Educational Activities**
  The Town has in the past and plans to continue to make strong efforts to educate its citizens with many educational activities. These activities include Bill Stuffers, Newsletters, Newspaper Articles, Mass Mailings, a Water Efficiency Page and links on Windsor's Website, and Social Networking (e.g., Facebook and Twitter). Windsor is also very active in the community with other outreach efforts like Water Fairs and K-12 Teacher and Classroom Education. The Town has an interactive, educational 32-foot trailer it uses to travel to schools as well as community and civic events. The trailer, named the “Water Wagon”, helps to raise the awareness of water and its conservation by demonstrating the sources, importance, function, and uses of the water that so many take for granted. A snapshot of the inside of the Water Wagon and its many displays is pictured in **Figure 4.3a**. The Water Wagon is often paired with additional outside activities to enhance the students’ experiences.

  Windsor also has Citizen Advisory Boards to further encourage residents’ involvement in conservation efforts. For ease of evaluating and avoiding overlap of the costs and benefits, these activities were combined into the one category.

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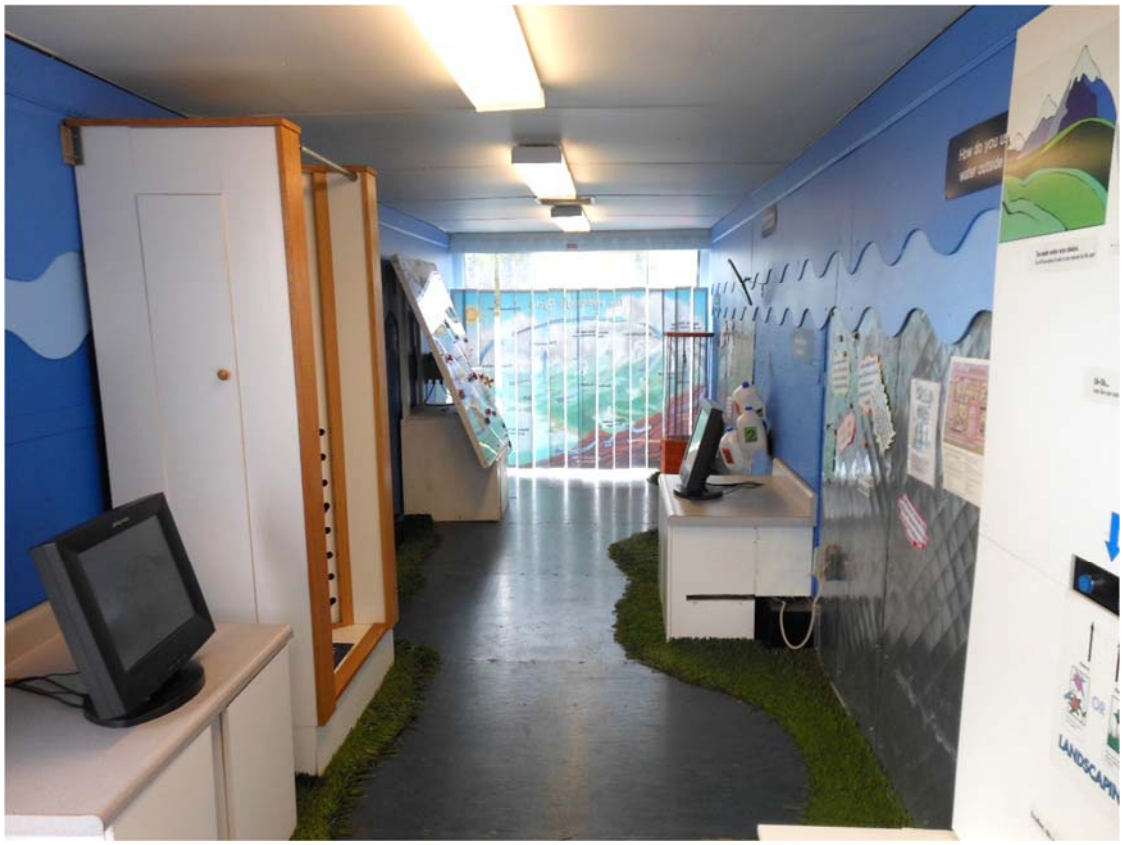

Figure 4.3a: Windsor's Water Wagon

- **Xeriscape Demonstration Garden**
  Maintaining a xeriscape demonstration garden is an excellent way to educate the public to the water savings and beauty available from xeriscaping. Windsor, in partnership with the Demonstration Gardening Group (DiGGers), has designed and maintained the Treasure Island Demonstration Garden located along the Poudre River Trail Corridor multiuse trail since 2008. The DiGGers are part of the Weld County Colorado Master Gardeners, a group of volunteers who help encourage and educate home and community gardeners. Treasure Island continues to expand each year and remains a beautiful example for Windsor residents to admire low-watering landscape options and get ideas for their own landscaping and gardening adventures.

  Treasure Island also serves other purposes. The DiGGers have often offered xeriscape and gardening classes during the summer months. During its growing seasons, the garden has provided thousands of pounds of fresh vegetables to the Windsor Food Pantry. Listed in **Table 4.3b** are just a few of the inspiring numbers associated with Treasure Island. The estimated visitors and observers are likely very conservative.

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Table 4.3b: Treasure Island Xeriscape Demonstration Garden Numbers

Year	Total Vegetable Distribution of the Windsor Food Pantry (lbs.)	Visitors (estimated)	Cyclist and pedestrians observers from Poudre Trail (estimated)	Volunteer Efforts (Hours)
2013	1,980 [1]	500	1,250	1,173
2014	2,843	600	1,100	1,416
2015	4,500 [2]			

[1] 2013 Flood caused pounds of vegetables produced to be lowered by approximately 300 pounds from previous years.
[2] Total pounds of vegetables as of October 2015. More pounds were anticipated to be added. Other values were not yet available.

- **Landscape Design (Xeriscape) and Maintenance Classes**
  Classes have been traditionally conducted at the Treasure Island Xeriscape Demonstration Garden. The classes provide a number of venues in which participants can learn more about xeriscaping as well as other home gardening tricks and techniques.
- **Garden in a Box**
  Windsor hopes to partner with CReSC for another of the programs available. Each year CReSC offers an "array of do it yourself Xeric garden kits, created by professional landscape designers for sun, shade, and everything in between." These plant by number gardens can have a significant conservation impact and are perfect for anyone who wants to beautify their yard while using less water than standard turf. Garden is a Box is also a great complimentary activity to other programs like the demonstration garden at Treasure Island and the Landscape Classes.

Comparison of Costs and Benefits

As shown in **Table C1**, the cost for the evaluated activities varied from $0.22 per 1,000 gallons for the *Water Efficient Rate Structure/Water Budgets with Regular Updates* to $1,498.16 per 1,000 gallons for the *Water Line Replacement Program*. The 22 selected water efficiency activities and associated water savings were arranged within the targeted customer categories to more easily compare the anticipated savings to the original goals. Some of the measures contribute savings to more than one category. **Table 4.3c** shows the water savings for the selected activities, sub-totaled for each category.

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Table 4.3c: Combined Water Savings of Selected Water Efficiency Activities

Conservation Measures and Programs	Estimated Annual Water Savings (MG)	Estimated Total Water Savings over Planning Period (MG)
Non-Revenue Water		
Meter Testing and Replacement Program	0.72	7.2
System Wide Water Audits	0.57	5.7
Control of Apparent Losses (with Metering)	0.43	4.3
Automatic Water Meter Reading Installation and Operations	0.14	1.4
Leak Detection and Repair Program	1.15	11.5
Water Line Replacement Program	0.80	8.0
Master Plans/Water Supply Plans	0.29	2.9
Subtotal - MG	**4.1**	**41**
Acre-Feet	**12.6**	**126**
Residential (InT-Res)		
Automatic Water Meter Reading Installation and Operations	0.98	9.8
Water Efficient Rate Structure/Water Budgets with Regular Updates	31.34	313.4
Master Plans/Water Supply Plans	1.96	19.6
Slow the Flow Residential Irrigation Audits	0.09	4.9
Indoor Residential Water Audits	0.03	1.9
Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program	0.10	5.6
Rebate for ET Irrigation System Controllers	0.01	0.8
Give-Aways: Residential Water Audit Kits	0.06	3.2
Water Waste Ordinance	0.39	3.9
Time of Day Watering Restrictions	0.28	2.8
Landscape Design Ordinances and Restrictions	0.46	4.6
Education Activities (Combined areas)	7.84	78.4
Xeriscape Demonstration Garden	0.04	2.3
Landscape Design (Xeriscape) and Maintenance Classes	0.004	0.2
Garden in a Box	0.01	0.5
Subtotal - MG	**43.6**	**452**
Acre-Feet	**133.8**	**1,387**

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Conservation Measures and Programs *(cont.)*	Estimated Annual Water Savings (MG)	Estimated Total Water Savings over Planning Period (MG)
Business (InT-Bus)		
Automatic Water Meter Reading Installation and Operations	0.09	0.9
Water Efficient Rate Structure/Water Budgets with Regular Updates	1.70	17.0
Master Plans/Water Supply Plans	0.28	2.8
Pre-Rinse Spray Valve (PRSV) Upgrades	0.01	0.5
Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program	0.06	3.2
Rebate for ET Irrigation System Controllers	0.002	0.1
Water Waste Ordinance	0.06	0.6
Time of Day Watering Restrictions	0.02	0.2
Landscape Design Ordinances and Restrictions	0.03	0.3
Town Facility Requirements	0.15	1.5
Education Activities (Combined areas)	0.28	2.8
Xeriscape Demonstration Garden	0.003	0.2
Landscape Design (Xeriscape) and Maintenance Classes	0.0002	0.01
Garden in a Box	0.001	0.04
Subtotal - MG	**2.7**	**30**
Acre-Feet	**8.2**	**92**
Industrial (InT-Ind)		
Automatic Water Meter Reading Installation and Operations	0.08	0.8
Water Efficient Rate Structure/Water Budgets with Regular Updates	1.23	12.3
Master Plans/Water Supply Plans	0.41	4.1
Pre-Rinse Spray Valve (PRSV) Upgrades	0.32	17.7
Rebate for ET Irrigation System Controllers	0.03	1.5
Water Waste Ordinance	0.08	0.8
Time of Day Watering Restrictions	0.04	0.4
Landscape Design Ordinances and Restrictions	0.06	0.6
Education Activities (Combined areas)	0.41	4.1
Xeriscape Demonstration Garden	0.03	1.5
Landscape Design (Xeriscape) and Maintenance Classes	0.003	0.2
Garden in a Box	0.001	0.04
Subtotal - MG	**2.7**	**44**
Acre-Feet	**8.3**	**136**

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Conservation Measures and Programs *(cont.)*	Estimated Annual Water Savings (MG)	Estimated Total Water Savings over Planning Period (MG)
School (InT-Sch)		
Automatic Water Meter Reading Installation and Operations	0.01	0.1
Water Efficient Rate Structure/Water Budgets with Regular Updates	0.14	1.4
Master Plans/Water Supply Plans	0.04	0.4
Pre-Rinse Spray Valve (PRSV) Upgrades	0.04	2.0
Water Waste Ordinance	0.01	0.1
Education Activities (Combined areas)	0.11	1.1
Subtotal - MG	**0.3**	**5**
Acre-Feet	**1.0**	**15**
Church (InT-Chu)		
Automatic Water Meter Reading Installation and Operations	0.004	0.04
Water Efficient Rate Structure/Water Budgets with Regular Updates	0.051	0.51
Master Plans/Water Supply Plans	0.013	0.13
Water Waste Ordinance	0.003	0.03
Time of Day Watering Restrictions	0.003	0.03
Landscape Design Ordinances and Restrictions	0.005	0.05
Education Activities (Combined areas)	0.026	0.26
Xeriscape Demonstration Garden	0.001	0.03
Landscape Design (Xeriscape) and Maintenance Classes	0.0003	0.02
Garden in a Box	0.0004	0.02
Subtotal - MG	**0.1**	**1**
Acre-Feet	**0.3**	**3**
Residential (OutT-Res)		
Automatic Water Meter Reading Installation and Operations	0.003	0.03
Water Efficient Rate Structure/Water Budgets with Regular Updates	0.076	0.76
Master Plans/Water Supply Plans	0.005	0.05
Slow the Flow Residential Irrigation Audits	0.002	0.11
Indoor Residential Water Audits	0.003	0.17
Water Waste Ordinance	0.001	0.01
Education Activities (Combined areas)	0.020	0.20
Subtotal - MG	**0.1**	**1**
Acre-Feet	**0.3**	**4**

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Conservation Measures and Programs *(cont.)*	Estimated Annual Water Savings (MG)	Estimated Total Water Savings over Planning Period (MG)
Business (OutT-Bus)		
Automatic Water Meter Reading Installation and Operations	0.0002	0.002
Water Efficient Rate Structure/Water Budgets with Regular Updates	0.0039	0.039
Master Plans/Water Supply Plans	0.0008	0.008
Water Waste Ordinance	0.0002	0.002
Education Activities (Combined areas)	0.0008	0.008
Subtotal - MG	**0.01**	**0.1**
Acre-Feet	**0.02**	**0.2**
Church (OutT-Chu)		
Automatic Water Meter Reading Installation and Operations	0.0001	0.0005
Water Efficient Rate Structure/Water Budgets with Regular Updates	0.0005	0.0045
Master Plans/Water Supply Plans	0.0002	0.0018
Water Waste Ordinance	0.00004	0.0004
Education Activities (Combined areas)	0.0004	0.0036
Subtotal - MG	**0.001**	**0.01**
Acre-Feet	**0.003**	**0.03**
Residential Dual System (Dual-Res)		
Automatic Water Meter Reading Installation and Operations	0.35	3.5
Water Efficient Rate Structure/Water Budgets with Regular Updates	8.49	84.9
Master Plans/Water Supply Plans	0.71	7.1
Slow the Flow Residential Irrigation Audits	0.001	0.04
Indoor Residential Water Audits	0.02	0.9
Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program	0.04	2.1
Give-Aways: Residential Water Audit Kits	0.02	1.2
Water Waste Ordinance	0.14	1.4
Time of Day Watering Restrictions	0.03	0.3
Landscape Design Ordinances and Restrictions	0.04	0.4
Education Activities (Combined areas)	2.12	21.2
Xeriscape Demonstration Garden	0.001	0.1
Landscape Design (Xeriscape) and Maintenance Classes	0.0001	0.01
Garden in a Box	0.002	0.1
Subtotal - MG	**12.0**	**123**
Acre-Feet	**36.7**	**378**

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Conservation Measures and Programs *(cont.)*	Estimated Annual Water Savings (MG)	Estimated Total Water Savings over Planning Period (MG)
Business Dual System (Dual-Bus)		
Automatic Water Meter Reading Installation and Operations	0.01	0.1
Water Efficient Rate Structure/Water Budgets with Regular Updates	0.10	1.0
Master Plans/Water Supply Plans	0.03	0.3
Pre-Rinse Spray Valve (PRSV) Upgrades	0.02	1.2
Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program	0.03	1.6
Water Waste Ordinance	0.01	0.1
Education Activities (Combined areas)	0.01	0.1
Subtotal - MG	**0.2**	**4**
Acre-Feet	**0.6**	**13**
Landscape Only (Land)		
Automatic Water Meter Reading Installation and Operations	0.12	1.2
Water Efficient Rate Structure/Water Budgets with Regular Updates	2.89	28.9
Master Plans/Water Supply Plans	0.29	2.9
Rebate for ET Irrigation System Controllers	0.07	4.1
Water Waste Ordinance	0.06	0.6
Time of Day Watering Restrictions	0.09	0.9
Landscape Design Ordinances and Restrictions	0.14	1.4
Education Activities (Combined areas)	0.12	1.2
Xeriscape Demonstration Garden	0.07	4.1
Landscape Design (Xeriscape) and Maintenance Classes	0.01	0.6
Garden in a Box	0.002	0.1
Subtotal - MG	**3.9**	**46**
Acre-Feet	**11.9**	**141**
Grand Total - (MG)	**70**	**748**
Acre-Feet	**214**	**2,296**

These savings were compared to the original goals set in Section 3. **Table 4.3d** compares the anticipated water savings from the selected activities with the original goals and then adjusts the water saving goals for this Plan.

Over the ten-year planning period, the selected activities provide an overall estimated water savings of 2,296 acre-feet if all activities could be implemented for the entire period. Most of the preliminary goals were fairly close (less than two percent difference) to the final calculations. Only Dual System Residential and Landscape Only had to be

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reduced more than two percent. On the positive side, Non-Revenue water percentage was increased. The adjusted goals reflect the goals believed to be obtainable by Town Staff.

After the goals were adjusted to reflect the expected water savings, the estimated water use reduction is 9.3%. Therefore, Windsor will target an overall reduction in its projected water use by 9.3% over the planning period because of implementation of this Plan.

Table 4.3d: Water Efficiency Goals Comparison

Water Use Categories:	Total Projected Water Use (2015 to 2024) (AF)	Reduction Goals for Planning Horizon (%)	Reduction Goals for Planning Horizon (AF)	Adjusted Reduction Goals for Planning Horizon: Total Water Savings from Activities (AF)	Adjusted Reduction Goals for Planning Horizon: Resulting Reduction (%)
In Town Residential	12,023	12.0%	1,443	1,387	11.5%
In Town Business	1,743	5.0%	87	92	5.3%
In Town Industrial	2,519	5.0%	126	136	5.4%
In Town School	221	5.0%	11	15	7.0%
In Town Church	79	5.0%	4	3	4.3%
Out of Town Residential	31	12.0%	4	4	13.1%
Out of Town Business	5	3.0%	0.15	0.18	3.8%
Out of Town Church	1	3.0%	0.03	0.03	3.0%
Dual System Residential	4,342	12.0%	521	378	8.7%
Dual System Business	209	5.0%	10	13	6.4%
Landscape Only	1,774	10.0%	177	141	7.9%
Non-Revenue Water	1,757	1.0%	18	126	6.6%
Total Water Supply:	24,704				
Total Demand Reduction:			2,401	2,296	
Total Percent Reduction:			9.7%		9.3%

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SECTION 5.0 – IMPLEMENTATION AND MONITORING PLAN

5.1 Implementation Plan

The implementation plan defines the process necessary to carry out the selected water efficiency activities. Patti Garcia (Town Clerk and Assistant to the Town Manager) will be chiefly responsible for coordinating and delegating to implement this Plan. Some of the details Windsor will use to implement the water efficiency plan are presented in Worksheet J, **Appendix B**. Windsor will continue to work to budget money and pursue CWCB water efficiency implementation grants to meet its water efficiency goals.

5.2 Monitoring Plan

Monitoring types of demand data can be beneficial in tracking the savings generated from implementing a water efficiency plan. Windsor monitors total treated water produced on a daily basis. Other categories of raw and treated water and customer accounts are monitored on a monthly and annual basis. The demand data which will be collected during the monitoring period of the plan is presented in Worksheets K and L, **Appendix B**. An abbreviated table of Worksheet K is presented in the following, **Table 5.2a.**

Table 5.2a: Selection of Demand Data for Efficiency Plan Monitoring

Monitoring Data	HB 10-1051 Reporting Requirement					Selection			
	Annual	Monthly	Bi-Monthly	Daily		Annual	Monthly	Weekly	Daily
Total Water Use									
Total treated water supplied (metered at wholesale suppliers master meters)						X	X	X	X
Total treated water delivered (sum of customer meters)	√					X	X		
Raw non-potable deliveries (Parks and Open Space)						X	X		
Reclaimed water produced									
Reclaimed water delivered									
Per capita water use						X			
Indoor and outdoor treated water deliveries						X			
Treated water peak day produced									
Reclaimed water peak day produced									
Raw water peak day produced/delivered									
Non-revenue water	√					X			

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Monitoring Data *(cont.)*	HB 10-1051 Reporting Requirement					Selection			
	Annual	Monthly	Bi-Monthly	Daily		Annual	Monthly	Weekly	Daily
Water Use by Customer Type									
Treated water delivered		√				X	X		
Raw non-potable deliveries (Parks and Open Space)						X	X		
Reclaimed water delivered									
Residential per capita water use						X			
Unit water use (e.g. AF/account or AF/irrigated acre)						X			
Indoor and outdoor treated water deliveries						X			
Large users						X	X		
Other Accounting for Substitute Water Supply Plans						X	X	X	
Other Demand Related Data									
Irrigated landscape (e.g. AF/acre or number of irrigated acres)						X			
Precipitation						X	X		
Temperature						X	X		
Evapotranspiration						X	X		
Drought index information						X			
Economic conditions						X			
Population						X	X		
New taps						X	X		

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SECTION 6.0 – ADOPTION OF NEW POLICY, PUBLIC REVIEW, AND FORMAL APPROVAL

6.1 Public Review Process

A public review process is required for all State approved plans. Since Windsor has had a municipal water efficiency or conservation program in place since 2002, the public has become familiar with the efficiency concept and the associated activities. The Town's public education program has contributed to this level of awareness. For this water efficiency planning process, the public was notified of the 60-day comment period from January 12, 2016 to March 14, 2016 and how to submit comments. The Plan was available for download on Windsor's website on the Water Conservation webpage and at the Town Hall for review. XX sets of public comments were received during the 60 day comment period. To the extent possible, comments were addressed in the revised water efficiency plan update. Copies of public notice announcements, all public comments, and the official Plan adoption resolution are provided in **Appendix F**.

6.2 Local Adoption and State Approval Process

After the public comment period, the comments were incorporated into the planning document as well as any additional revisions. The Windsor Board adopted the Plan at the Board meeting on March 28, 2016, and the Plan was submitted to CWCB following the Board Meeting.

CWCB provided written notification of approval, conditional approval, or disapproval within 90 days of submittal. Conditions for conditional approval or disapproval will be addressed if necessary. The soonest possible approval of the Municipal Water Efficiency Plan will be in the summer of 2016. Research and set up of programs can begin upon approval and implementation of the selected measures will begin in the fall of 2016. The cover letter prepared for CWCB, CWCB's Approval Checklist, and CWCB's formal approval letter are included in **Appendix G**.

6.3 Periodic Review and Update

The Town plans to review and update this efficiency plan every seven years. The next update is scheduled to be completed in 2022.

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APPENDIX A

Definition of Terms

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DEFINITION OF TERMS & TERMINOLOGY

This section provides an overview of some of the common terminology used in this document. Please note that this is not a comprehensive list of all terms and definitions. Other important terminology is reserved for discussion in the document.

AF:	Acre-foot: The amount of water it would take to cover one acre of land to a depth of one foot; approximately 325,851 gallons.
Average Day Demand:	Average daily treatment plant production divided by the total tap equivalents served
BMP:	Best Management Practice
Build-out:	Theoretical maximum development of city, town, district, or service area
C-BT Quota:	The percentage set by the NCWCD Board of Directors each water year which determines the amount of ac-ft per unit of CBT, i.e. 70% quota equals 0.7 ac-ft per CBT unit.
C-BT:	Colorado Big Thompson
Central Weld (CWCWD):	Central Weld County Water District
CRC:	Community Recreation Center (in Windsor)
CReSC:	Center for Resource Conservation
CWCB:	Colorado Water Conservation Board
Demand management:	The implementation of water efficiency activities to reduce water deliveries (demands) and or improve efficiencies within the distribution system. For purposes of this document, demand management refers to both system and customer water demands. Demand management is used interchangeably with water efficiency.

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Demand-side:	The distribution and consumption of treated water supplies for domestic purposes or the delivery and use of reclaimed water or untreated raw (i.e. ditch water, groundwater) for non-potable purposes such as irrigation or industrial processes.
Dual water supply systems:	Water supply systems that use a combination of treated water to meet potable water needs and reclaimed water and/or non-treated water (i.e. untreated ditch water and groundwater) to meet non-potable water needs.
ELCO:	East Larimer County Water District
ET Controllers:	Evapo-transpiration controllers adjust the amount of water applied from sprinkler systems based on soil moisture and weather conditions.
ET:	Evapo-transpiration: The rate at which water is removed from the soil by evaporation and from plant surfaces by transpiration.
FCLWD:	Fort Collins-Loveland Water District
GMA:	Growth Management Area
GPCD:	Gallons per capita per day: A measure of efficiency to determine the approximate amount of water that each resident within an area utilizes each day.
Maximum Day:	The largest amount of water used in a single day.
MG:	Million gallons
MGD:	Million gallons per day
MWEP:	Municipal Water Efficiency Plan
NCWCD:	Northern Colorado Water Conservancy District. More often referred to as Northern Water (see Northern Water)
NEPA:	National Environmental Policy Act
NISP:	Northern Integrated Supply Project
Non-Potable Use:	Water that is not treated and used for irrigation or other uses than potable. The District currently does not have a non-potable water supply.

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Non-revenue water:	Annual non-revenue water (previously referred to as unaccounted for water) consists of unbilled authorized uses (i.e. hydrant flushing), apparent losses, and real losses. Real losses consist of leaks in the water distribution system that does not reach the end user. Apparent losses consist of unauthorized consumption, customer metering inaccuracies, and data handling errors.
NPIC:	North Poudre Irrigation Company
NWCWD:	North Weld County Water District
Peak Hour:	The largest amount of water used in a single hour – typically occurs on the Maximum Day.
Phreatophytes:	Species of plants and trees that consume groundwater through their root zones below the water table such as Cottonwood and Russian Olive trees.
PIF:	Plant Investment Fee, fee charged to developers for on-going maintenance cost of infrastructure replacement and repair.
Potable Use:	Water that is treated to drinking water standards for municipal use, including residential and commercial use. The District's CBT water is used for potable use.
SCFP:	Soldier Canyon Filter Plant
SFE:	Single Family Equivalent, unit of measure used in planning to adjust water use for multi-family dwellings, such as townhomes or condominiums, to a single residential equivalent.
Supply-side:	Water supply operations and facilities that include the diversion, extraction, storage, and transmission of untreated water.
SWSI:	State Wide Supply Initiative
System water demand:	Volume of water necessary to meet customer water needs within a certain period of time. System water demand is typically measured at the point of discharge from the water treatment plant and includes non-revenue water. In dual water supply systems, system water demand may also include the distribution and delivery of non-potable water (i.e.: reclaimed water and untreated ditch and groundwater) to meet irrigation needs.
TE:	Tap Equivalent, unit of measure often used by providers to adjust water use for larger taps such as multi-family or commercial, to a single residential tap equivalent of 5/8".

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Water efficiency:	Water efficiency includes the practices, techniques, and technologies that extend water supplies either directly through water savings or through substituting alternative supplies such as reuse. For purposes of this document, water efficiency is inclusive of water conservation and is used instead of "water conservation." The term water efficiency captures the essential objective of a local plan which is to improve the efficiency of a municipal demand and water supply system. Water efficiency includes both system demands and customer water demands. *Note: CWCB's former 2005 Water Conservation Plan Development Guidance Document and other literature on conservation and water use efficiency distinguish supply-side and demand-side water use efficiency. These resources generally characterize demand-side as technical efficiencies (e.g. water efficient toilets) and behaviors (e.g. taking shorter showers) that save water at the end use/water user level. Supply-side refers to water efficiency at the system level such as the repair of pipeline leaks and water reuse. For purposes of this Plan, the distinction between these water efficiency encompasses both supply and demand side efficiencies.*
Water efficiency activities:	Traditionally water efficiency activities have been referred to as water conservation measures and or water conservation programs. For purposes of this document, measures and programs are replaced with water efficiency activities. Water efficiency activities encompass all efforts to either save water or improve efficiencies within a water supply system.
WCP:	Water Conservation Plan. CWCB's previous designation for (Municipal) Water Efficiency Plans
Wind and Rain Sensor:	A device that is connected to the irrigation system controller that will temporarily shut off irrigation when a pre-determined amount of rain or wind is detected.
WSSC:	Water Supply and Storage Company
WTP:	Water treatment plant
WWTP:	Wastewater treatment plant

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APPENDIX B

Municipal Water Efficiency Plan Guidance Document Worksheets

WORKSHEET A - WATER SUPPLY LIMITATIONS AND FUTURE NEEDS

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Limitation and/or Future Need [1]	[2] Yes	[2] No	Comments on Limitation or Future Need [3]	How is Limitation or Future Need Being Addressed [4]
System is in a designated critical water supply shortage area	X		SWSI	Water Efficiency Planning
System experiences frequent water supply shortages and/or emergencies		X		
System has substantial non-revenue water		X	7% last 5 years	
Experiencing high rates of population and demand growth		X	Appear to be leveling off. Higher than surrounding communities.	Town continues to add to their water right and storage portfolio for future development.
Planning substantial improvements or additions		X	Have recently added a 3 MG storage tank and are planning on adding a new water line from NWCWD	
Increases to wastewater system capacity anticipated		X		
Need additional drought reserves		X		
Drinking water quality issues		X	None	
Aging infrastructure in need of repair		X	Town is consistently upgrading their older infrastructure	
Issues with water pressure in portions of distribution system		X	No Issues	

Instructions:
[1] This column provides a list of limitations/future needs related to planning and operating the water supply system.
[2] Enter an "X" to show whether or not the system exhibits the limitations/future needs.
[3] Include any comments regarding the limitations/future needs that may be useful to consider in the planning process.
[4] If applicable, include how the limitation/future need is being addressed.

WORKSHEET D - IDENTIFICATION AND SCREENING OF FOUNDATIONAL ACTIVITIES

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Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification: Existing/ Potential Activity [3]	Identification: Targeted Customer Category [4]	Carry to Evaluation [5]	Reason for Elimination [6]
Metering (BP1)					
Automatic Meter Reading Installation and Operations	V, VII	**E**	All Categories	**X**	
Submetering for Large Users (Indoor and Outdoor)	V	**P**	All Categories [a]		Will re-evaluate with future planning efforts
Meter Testing and Replacement	V	**E**	Non-Revenue	**X**	
Meter Upgrades	V	**P**	All Categories		Have upgraded to Orion
Identify Unmetered/Unbilled Treated Water Uses	V	**E**	Non-Revenue	**X**	Evaluation will be combined with system wide water audits
Data Collection - Monitoring and Verification (BP2)					
Frequency of Meter Reading	VII	**E**	All Categories		Activities not evaluated in cost/benefit analysis because it is difficult to quantify savings
Tracking Water Use by Customer Type	VII	**E**	All Categories		
Upgrade Billing System to Track Use by Sufficient Customer Types	VII	**E**	All Categories		
Tracking Water Use for Large Customers	VII	**E**	All Categories		
Area of Irrigated Lands in Service Area (e.g. acres)	VII	**P**	All Categories		Will re-evaluate with future planning efforts
Water Use Efficiency Oriented Rates and Tap Fees (BP1)					
Volumetric Billing	VII, VIII	**E**	All Categories [a]	**X**	Included in Water Rate Adjustments
Water Rate Adjustments	VII, VIII	**E**	All Categories [a]	**X**	
Frequency of Billing	VII	**E**	All Categories [a]		Activities not evaluated in cost/benefit analysis because it is difficult to quantify savings
Inclining/Tiered Rates	VII, VIII	**E**	All Categories [a]	**X**	Included in Water Rate Adjustments
Water Budgets	VII, VIII	**P**	All Categories [a]	**X**	Evaluation combined with a water efficient rate structure evaluation
Tap Fees with Water Use Efficiency Incentives	VII	**P**			Will re-evaluate with future planning efforts
System Water Loss Management and Control (BP3)					
System Wide Water Audits	V	**E**		**X**	
Control of Apparent Losses (with Metering)	V	**E**	Non-Revenue	**X**	
Leak Detection and Repair	V	**E**	Non-Revenue	**X**	
Water Line Replacement Program	V	**E**	Non-Revenue	**X**	
Planning (BP2)					
Integrated Water Resources Plans		**E**	All Categories		Will re-evaluate with future planning efforts
Master Plans/Water Supply Plans		**E**	All Categories	**X**	
Capital Improvement Plans		**E**	All Categories		Activities not evaluated in cost/benefit analysis because it is difficult to quantify savings

Instructions:
[1] This column provides a list of possible activities & identifies the Best Practice activity as defined in the Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is "Existing" or a "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[5] Based on the screening process, indicate which activities will be carried onto the evaluation phase with an "X".
[6] If eliminated via screening, comment on why.

[a] All categories except Non-Revenue
[b] Outdoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Sch, OutT-Res, OutT-Bus, OutT-Chu, and Dual-Bus excluded in calculations due to small percentages of customers in these categories.
[c] Indoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Chu, OutT-Res, OutT-Bus, OutT-Chu, and Land excluded in calculations due to small percentages of customers in these categories.

WORKSHEET E - IDENTIFICATION AND SCREENING OF TARGETED TECHNICAL ASSISTANCE INCENTIVES

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Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification: Existing/ Potential Activity [3]	Identification: SWSI Framework Levels [4]: Level 1 Municipal Uses	Identification: SWSI Framework Levels [4]: Level 2 Customers with the Largest Water Use	Identification: SWSI Framework Levels [4]: Level 3 Customer Type(s) in Service Area	Identification: Targeted Customer Category [5]	Carry to Evaluation [6]	Reason for Elimination [7]
Installation of Water Efficient Fixtures and Appliances								
Indoor Audits	I	**P**	X	X	X	InT-Res, OutT-Res, Dual-Res	**X**	
Toilet Retrofits	I	**P**	X	X	X	InT-Res, InT-Bus, Dual-Res, Dual-Bus		The Town will evaluate these activities with future planning efforts
Urinal Retrofits	I	**P**	X	X	X			
Showerhead Retrofits	I	**E**	X		X		**X**	Included in Give-away kits (residential audit kit)
Faucet Retrofits (e.g. aerator installation)	I	**E**	X	X	X		**X**	
Water Efficient Washing Machines	I	**P**	X		X	InT-Res, OutT-Res, Dual-Res		Limited resources and/or need for these activities
Water Efficient Dishwashers	I	**P**	X	X	X			
Efficient Swamp Cooler and Air Conditioning Use	I	**P**	X	X	X			
Low Water Use Landscapes								
Drought Resistant Vegetation	II	**P**	X	X	X	InT-Res, InT-Bus, Dual-Res, Dual-Bus		Will re-evaluate with future planning efforts
Removal of Phreatophytes	II	**P**	X	X	X	All Categories [a]		Negative public response
Irrigation Efficiency Evaluations/Outdoor Water Audits	II	**P**	X	X	X	InT-Res, OutT-Res, Dual-Res	**X**	
Outdoor Irrigation Controllers	II	**P**	X	X	X	InT-Res, InT-Bus, Dual-Res, Dual-Bus		The Town will evaluate these activities with future planning efforts
Irrigation Scheduling/Timing	II	**P**	X	X	X			
Rain Sensors	II	**P**	X	X	X			
Residential Outdoor Meter Installations	II	**P**	X	X	X			
Xeriscape	II	**E**	X	X	X			Encouraged in standards
Other Low Water Use Landscapes	II	**P**	X	X	X			Will re-evaluate with future planning efforts
Irrigation Equipment Retrofits	II	**P**	X	X	X			Not interested in evaluation of this activity at this time
Water- Efficient Industrial and Commercial Water-Using Processes								
Specialized Nonresidential Surveys, Audits and Equipment Efficiency Improvements	III	**P**	X	X	X	InT-Bus, InT-Ind, InT-Sch, Dual-Bus		Will re-evaluate with future planning efforts
Commercial Indoor Fixture and Appliance Rebates/Retrofits	III	**P**	X	X	X		**X**	PRSV replacement
Cooling Equipment Efficiency	III	**P**	X	X	X			Will re-evaluate with future planning efforts
Restaurant equipment	III	**P**	X	X	X			See Commercial Indoor Fixture and Appliance Rebates/Retrofits

WORKSHEET E - IDENTIFICATION AND SCREENING OF TARGETED TECHNICAL ASSISTANCE INCENTIVES

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Incentives								
Toilet Rebates	X	**P**	X	X	X		**X**	Either rebates or retrofits/replacements
Urinal Rebates	X	**P**	X	X	X	InT-Res, InT-Bus, Dual-Res, Dual-Bus		Will re-evaluate with future planning efforts
Showerhead Rebates	X	**P**			X			Little need anticipated with Water Conservation Kits
Water Efficient Faucet or Aerator Rebates	X	**P**	X	X	X			
Water Efficient Washing Machine Rebates	X	**P**			X			Will re-evaluate with future planning efforts
Water Efficient Dishwasher Rebates	X	**P**			X			Not interested in evaluation of this activity at this time
Efficient Irrigation Equipment Rebates	II, X	**P**	X	X	X	InT-Res, OutT-Res, Dual-Res	**X**	
Landscape Water Budgets Information and Customer Feedback	II, X	**P**	X	X	X	InT-Res, InT-Bus,		Limited resources for this program
Turf Replacement Programs/Xeriscape Incentives	II, X	**P**	X	X	X	Dual-Res, Dual-	**X**	
Give-aways	X	**E**	X	X	X	InT-Res, Dual-Res	**X**	

Instructions:

[1] This column provides a list of activities & if applicable, identifies the Best Practice activity as defined under *Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado*. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] Specify which level the historical/potential activities fall under by entering an "X" in the appropriate column.
[5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[6] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".
[7] If eliminated via screening, comment on why.

[a] All categories except Non-Revenue
[b] Outdoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Sch, OutT-Res, OutT-Bus, OutT-Chu, and Dual-Bus excluded in calculations due to small percentages of customers in these categories.
[c] Indoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Chu, OutT-Res, OutT-Bus, OutT-Chu, and Land excluded in calculations due to small percentages of customers in these categories.

WORKSHEET F - IDENTIFICATION AND SCREENING OF ORDINANCES AND REGULATIONS

DRAFT

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification: Existing/ Potential Activity [3]	SWSI Framework Levels [4]: Level 1 Customer Type(s) within the Existing Service Area	Level 2 New Development	Level 3 Point of Sales on Existing Building Stock	Targeted Customer Category [5]	Carry to Evaluation [6]	Reason for Elimination [7]
General Water Use Regulations								
Water Waste Ordinance (BP 5)	IX	**E**	X			All Categories	**X**	
Time of Day Watering Restriction	IX	**E**	X			All Categories [b]	**X**	
Day of Week Watering Restriction	IX	**P**	X			All Categories [b]		Will re-evaluate with future planning efforts
Water Overspray Limitations	IX	**P**	X			All Categories		May be incorporated into Water Waste Ordinance at a later date
Landscape Design/Installation Rules and Regulations								
Rules and Regulations for Landscape Design/Installation (BP 9)	IX	**P**	X	X		All Categories [b]	**X**	May be incorporated into the wording for the Rules and Regulations for Landscape Design/Installation Will re-evaluate with future planning efforts
Landscaper Training and Certification (BP 8)	IX	**P**	X	X				
Irrigation System Installer Training and Certification (BP 8)	IX	**P**	X	X				
Soil Amendment Requirements (BP 9)	IX	**P**	X	X				
Turf Restrictions (BP 9)	IX	**P**	X	X				
Irrigation Equipment Requirements	IX	**P**	X	X				
Outdoor Water Audits/Irrigation Efficiency Regulations (BP 10)	IX	**P**	X	X				
Outdoor Green Building Construction (BP 8,9)	IX	**P**	X	X				
Indoor and Commercial Regulations								
High Efficiency Fixture and Appliance Replacement (BP 12)	IX	**P**	X	X	X	All Categories [c]		Will re-evaluate with future planning efforts
Commercial Cooling and Process Water Requirements (BP 14)	IX	**P**	X	X		InT-Bus, InT-Ind, InT-Sch, Dual-Bus		
Green Building Construction (BP 12)	IX	**P**	X	X		All Categories [a]		
Indoor Plumbing Requirements (BP 12)	IX	**P**	X	X				
City Facility Requirements (BP 12)	IX	**P**	X			InT-Bus	**X**	
Required Indoor Residential Audits (BP 13)	IX	**P**	X	X	X	InT-Res, OutT-Res, Dual-Res		Public response is anticipated to be negative
Required Indoor Commercial Audits (BP 14)	IX	**P**	X	X	X	InT-Bus, InT-Ind, InT-Sch, Dual-Bus		
Commercial Water Wise Use Regulations (Car Washes, Restaurants, etc.)	IX	**P**	X	X	X			

Instructions:
[1] This column provides a list of possible activities & if applicable identifies the Best Practice activity as defined under Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] For current/historical activities, specify which level the activities fall under by entering an "X" in the appropriate column.
[5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[6] Based on the screening process, indicate which activities will be carried on the evaluation phase with an "X".
[7] If eliminated via screening, comment on why.

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[b] Outdoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Sch, OutT-Res, OutT-Bus, OutT-Chu, and Dual-Bus excluded in calculations due to small percentages of customers in these categories.
[c] Indoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Chu, OutT-Res, OutT-Bus, OutT-Chu, and Land excluded in calculations due to small percentages of customers in these categories.

WORKSHEET G - IDENTIFICATION AND SCREENING OF EDUCATION ACTIVITIES

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Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification					Carry to Evaluation [6]	Reason for Elimination [7]
		Existing/ Potential Activity [3]	SWSI Framework Levels [4]			Targeted Customer Category [5]		
			Level 1 One-Way	Level 2 One-Way with Feedback	Level 3 Two-way communication			
Customer Education (BP6)								
Bill Stuffers	VI	**E**	X			All Categories [a]	**X**	
Newsletter	VI	**E**	X				**X**	
Newspaper Articles	VI	**E**	X				**X**	
Mass Mailings	VI	**E**	X				**X**	
Web Pages	VI	**E**	X	X			**X**	
Water Fairs	VI	**E**	X			InT-Res, OutT-Res, Dual-Res	**X**	
K-12 Teacher and Classroom Education Programs	VI	**E**		X	X		**X**	
Message Development/Campaign	VI	**P**	X			All Categories [a]		Not interested at this time
Interactive Websites	VI	**E**	X	X	X		**X**	
Social Networking (e.g Facebook)	VI	**E**	X	X	X		**X**	
Customer Surveys	VI	**P**		X				Will re-evaluate with future planning efforts
Focus Groups	VI	**P**			X			
Citizen Advisory Boards	VI	**E**			X		**X**	
Technical Assistance								
Customer Water Use Workshops	VI			X		All Categories [b]		Not interested at this time
Landscape Design and Maintenance Workshops	VI			X			**X**	
Xeriscape Demonstration Garden	VI		X	X			**X**	
Garden in a Box	VI						**X**	
Water Conservation Expert Available	VI				X	All Categories [a]		Limited resources for this program

Instructions:
[1] This column provides a list of possible activities & if applicable identifies the Best Practice activity as defined under Colorado WaterWise Guidebook of Best Practices (BP) for Municipal Water Conservation in Colorado. List additional activities identified through the planning process.
[2] This column identifies, by roman numeral, the elements that correspond with the best practices and that shall be fully considered in the planning process per Colorado State Statute 37-60-126.
[3] Specify whether the activity is an "Existing" or "Potential" activity to carry through screening by entering an "E" or "P", respectively.
[4] For current/historical activities, specify which level the activities fall under by entering an "X" in the appropriate column.
[5] As applicable, specify which customer category (residential, commercial, etc.) is/would be impacted by the activity.
[6] Based on the screening process, indicate which activities will be carried on the the evaluation phase with an "X".
[7] If eliminated via screening, comment on why.

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[b] Outdoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Sch, OutT-Res, OutT-Bus, OutT-Chu, and Dual-Bus excluded in calculations due to small percentages of customers in these categories.
[c] Indoor Efficiency Activity: All categories except Non-Revenue potentially benefitted; InT-Chu, OutT-Res, OutT-Bus, OutT-Chu, and Land excluded in calculations due to small percentages of customers in these categories.

WORKSHEET J - IMPLEMENTATION PLAN

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Selected Water Efficiency Activities [1]	Historical Period of Implementation [2]	Estimated Period of Implementation [2]	Implementation Actions [3]	Entity/Staff Responsible for Implementation [6]	Coordination and Public Involvement [7]	Additional Comments [8]
Foundational Activities						
Meter Testing and Replacement Program/Meter Upgrades	2009 - present	ongoing		Engineering; Public Works		
System Wide Water Audits	2008 - present	ongoing		Engineering; Public Works		
Control of Apparent Losses (with Metering)		ongoing		Engineering; Public Works		
Automatic Water Meter Reading Installation and Operations	2008 - present	ongoing		Public Works		
Water Efficient Rate Structure/Water Budgets with Regular Updates	2003 - present	ongoing		Engineering		
Leak Detection and Repair Program	2003 - present	ongoing		Engineering; Public Works		
Water Line Replacement Program	Unknown - present	ongoing		Engineering; Public Works		
Master Plans/Water Supply Plans	2008 - present	ongoing		Various Town Staff		
Parks and Open Space Meters	2008 - present	ongoing		Wade Willis, Parks and Open Space		
Targeted Technical Assistance and Incentives						
Slow the Flow Residential Irrigation Audits		2017 - ongoing	Contact and coordinate with CReSC	Town Clerk; Customer Service	CReSC	
Indoor Residential Water Audits		2017 - ongoing	Contact and coordinate with CReSC	Town Clerk; Customer Service	CReSC	
Pre-Rinse Spray Valve (PRSV) Upgrades		2017 - ongoing	Contact and coordinate with CReSC	Town Clerk; Customer Service	CReSC	
Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program		2018 - ongoing	Contact and coordinate with CReSC	Town Clerk; Customer Service	CReSC	
Rebate for ET Irrigation System Controllers		2016 - ongoing	Set up rebate program	Town Clerk; Customer Service		
Give-Aways: Residential Water Audit Kits	2013 - present	ongoing - with additional efforts	Additional marketing of availability	Town Clerk; Customer Service		
Parks and Open Space Rain and ET Sensors	2009 - present	ongoing - with additional sensors	Determine which parks are most advantageous	Wade Willis, Parks and Open Space		
Ordinances and Regulations						
Water Waste Ordinance	2003 - present	ongoing		Public Works		
Time of Day Watering Restrictions	2007 - present	ongoing		Public Works		
Landscape Design Ordinances and Restrictions		2017 - ongoing		Public Works		
Town Facility Requirements		2016 - ongoing	Inventory the number of fixtures that need to be replaced	Engineering; Public Works		Most facilities are already updated. Fixtures will be replaced as needed with more modern fixtures.

WORKSHEET J - IMPLEMENTATION PLAN

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Education Activities						
Education Activities: Bill Stuffers, Newsletters, Newspaper Articles, Mass Mailings, Website	2003 - present	ongoing		Town Clerk; Customer Service		
Xeriscape Demonstration Garden	2003 - present	ongoing		Bill Pratt; Town Clerk; Customer Service	Bill Pratt and DiGGers	
Landscape Design (Xeriscape) and Maintenance Classes	2012 - present	ongoing - with additional marketing	Coordinate with Bill Pratt and DiGGers	Bill Pratt; Town Clerk; Customer Service	Bill Pratt and DiGGers	
Garden in a Box		2017 - ongoing	Contact and coordinate with CReSC	Town Clerk; Customer Service	CReSC	

Instructions:
[1] Provide the list of water efficiency activities selected for implementation during Step 4.
[2] Provide period in which activity is going to be implemented.
[3] Include information on specific actions necessary to implement the activities (e.g. advertise rebates to public).
[4] Indicate timing of when the action are scheduled to be implemented (e.g. when leaks will be repaired, when rebate program will start, etc.).
[5] Insert anticipated annual costs.
[6] Specify which entity/staff responsible for implementing the activities.
[7] If applicable, comment on necessary coordination among staff/other entities and how the public will be involved. This includes educational campaigns, feedback, direct participation in certain actions, etc.
[8] Add any additional comments.

WORKSHEET K - SELECTION OF MONITORING DEMAND DATA FOR MONITORING PLAN

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Monitoring Data [1]	HB 10-1051 Reporting Requirement [2]				Selection [3]				Entity/Staff Responsible for Data Collection and Evaluation [4]	Schedule/Timing of Monitoring [5]	Comments [6]
	Annual	Monthly	Bi-Monthly	Daily	Annual	Monthly	Weekly	Daily			
Total Water Use											
Total treated water supplied (metered at wholesale suppliers master meters)					X	X	X	X	Engineering, Public Works		
Total treated water delivered (sum of customer meters)	√				X	X			Engineering, Public Works		
Raw non-potable deliveries (Parks and Open Space)					X	X			Wade Willis (Parks and Open Space Division)		
Reclaimed water produced (metered at WWTP discharge)									N/A		
Reclaimed water delivered (sum of customer meters)									N/A		
Per capita water use					X				Engineering, Public Works		Per capita use based on residential population
Indoor and outdoor treated water deliveries					X				Engineering, Public Works		Estimated from daily average use during Dec - Mar
Treated water peak day produced									N/A		
Reclaimed water peak day produced									N/A		
Raw water peak day produced/delivered									N/A		
Non-revenue water	√				X				Engineering, Public Works		
Water Use by Customer Type											
Treated water delivered		√			X	X			Engineering, Public Works		
Raw non-potable deliveries (Parks and Open Space)					X	X			Wade Willis (Parks and Open Space Division)		
Reclaimed water delivered									N/A		
Residential per capita water use					X				Engineering, Public Works		Per capita use based on residential population
Unit water use (e.g. AF/account or AF/irrigated acre)					X				Engineering, Public Works		Based on taps
Indoor and outdoor treated water deliveries					X				Engineering, Public Works		Estimated from daily average use during Dec - Mar
Large users					X	X			Customer Service		No specific format. Mostly observational.
Other Accounting for Substitute Water Supply Plans					X	X	X		Wade Willis, Clear Water Solutions		
Other Demand Related Data											
Irrigated landscape (e.g. AF/acre or number of irrigated acres)					X				Engineering, Public Works		Town owned irrigated lands. Water Budgets may include additional analysis
Precipitation					X	X			Engineering, Public Works, Parks and Open Space		
Temperature					X	X			Engineering, Public Works, Parks and Open Space		
Evapotranspiration					X	X			Engineering, Public Works, Parks and Open Space		
Drought index information					X				Engineering, Public Works, Parks and Open Space		
Economic conditions					X				Finance, Engineering, Other Town Staff		
Population					X	X			Planning and Zoning		
New taps					X	X			Customer Service		

Instructions:
[1] This worksheets provides a list of possible demand data. Add additional demand data provider would like to monitor.
[2] Specifies annual reporting requirements per HB 10-1051.
[3] Select demand data provider plans to use to monitor effectiveness of water efficiency activities by inserting an "X" in appropriate boxes.
[4] Specify staff/entity responsible for data collection and evaluation.
[5] Specify the timing and/or set schedule in which data will be collected and evaluated.
[6] Add any additional comments.

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APPENDIX C

Additional Tables

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Table C1: Water Effciency Activity Evaluation

Water Efficiency Activities for Evaluation	Existing/ Potential Activity	Targeted Customer Category	Evaluation					
			Projected Water Savings					Projected Implementation Costs over Planning Period Including Lost Revenue
			Total Water Savings over the Planning Period (MG)	Total Water Savings over the Planning Period (AF)	Average Annual Water Savings (MG/yr)	Average Annual Water Savings (AF/yr)	Cost per 1,000 gal saved	
Foundational Activities								
Meter Testing and Replacement Program	E	Non-Revenue	**7.2**	**21.97**	**0.72**	**2.20**	**$14.70**	**$105,183**
System Wide Water Audits	E	Non-Revenue	**5.7**	**17.57**	**0.57**	**1.76**	**$5.24**	**$30,000**
Control of Apparent Losses (with Metering)	E	Non-Revenue	**4.3**	**13.18**	**0.43**	**1.32**	**$54.72**	**$235,000**
Automatic Water Meter Reading Installation and Operations	E	All Categories	**17.9**	**54.84**	**1.79**	**5.48**	**$4.87**	**$87,014**
Water Efficient Rate Structure with Regular Updates	E/P	All Categories [a]	**460.3**	**1,412.75**	**46.03**	**141.28**	**$0.21**	**$96,400**
Water Budgets	P	All Categories [a]	**552.6**	**1,696.00**	**55.26**	**169.60**	**$0.29**	**$160,000**
Leak Detection and Repair Program	E	Non-Revenue	**11.5**	**35.14**	**1.15**	**3.51**	**$11.18**	**$128,000**
Water Line Replacement Program	E	Non-Revenue	**8.0**	**24.70**	**0.80**	**2.47**	**$1,498.16**	**$12,060,000**
Master Plans/Water Supply Plans	E	All Categories	**40.2**	**123.52**	**4.02**	**12.35**	**$8.22**	**$330,921**
Targeted Technical Assistance and Incentives								
Slow the Flow Residential Irrigation Audits	P	InT-Res, OutT-Res, Dual-Res	**5.0**	**15.38**	**0.09**	**0.28**	**$16.38**	**$82,099**
Indoor Residential Water Audits	P	InT-Res, OutT-Res, Dual-Res	**3.0**	**9.12**	**0.05**	**0.17**	**$12.83**	**$38,121**
Pre-Rinse Spray Valve (PRSV) Upgrades	P	InT-Bus, InT-Ind, InT-Sch, Dual-Bus	**21.4**	**65.54**	**0.39**	**1.19**	**$5.38**	**$114,852**
Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service	P	InT-Res, InT-Bus, Dual-Res, Dual-Bus	**12.4**	**38.11**	**0.23**	**0.69**	**$9.31**	**$115,611**
Rebate for ET Irrigation System Controllers	P	InT-Res, In-Bus, InT-Ind, Land	**6.5**	**20.04**	**0.12**	**0.36**	**$6.13**	**$40,005**
High Efficiency Clothes Washer Rebate	P	InT-Res, Dual-Res	**0.0**	**0.00**	**3.25**	**9.97**	**$0.00**	**$21**
Give-Aways: Residential Water Audit Kits	E	InT-Res, Dual-Res	**4.4**	**13.58**	**0.08**	**0.25**	**$18.24**	**$80,687**
Turf Replacement Incentives	P	InT-Res, In-Bus, InT-Ind, Dual-Res, Land	**1.2**	**3.80**	**0.02**	**0.07**	**$104.67**	**$129,528**
Ordinances and Regulations								
Water Waste Ordinance	E	All Categories	**7.5**	**22.95**	**0.75**	**2.29**	**$3.66**	**$27,384**
Time of Day Watering Restrictions	E	All Categories [b]	**4.5**	**13.72**	**0.45**	**1.37**	**$3.66**	**$16,346**
Landscape Design Ordinances and Restrictions	P	All Categories [b]	**7.4**	**22.86**	**0.74**	**2.29**	**$10.10**	**$75,243**
Town Facility Requirements	P	InT-Bus	**1.5**	**4.70**	**0.15**	**0.47**	**$26.84**	**$41,150**
Education Activities								
Bill Stuffers	E	All Categories [a]	**109.3**	**335.42**	**10.93**	**33.54**	**$5.01**	**$547,478**
Newsletters	E							
Newspaper Articles	E							
Mass Mailings	E							
Website	E							
Water Fairs	E							
K-12 Teacher and Classroom Education Programs	E							
Interactive Websites	E							
Social Networking (e.g Facebook)	E							
Citizen Advisory Boards	E							
Xeriscape Demonstration Garden	E	All Categories [b]	**8.2**	**25.28**	**0.15**	**0.46**	**$8.53**	**$70,225**
Landscape Design (Xeriscape) and Maintenance Classes	P/E	All Categories [b]	**1.0**	**3.15**	**0.02**	**0.06**	**$18.30**	**$18,752**
Garden in a Box	P	All Categories [b]	**0.8**	**2.53**	**0.01**	**0.05**	**$64.41**	**$53,003**

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APPENDIX D

Activity Cost and Benefit Analysis

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Meter Testing and Replacement Program

Large meters are sent in for testing and calibration every 7 years; small meters are replaced every 10 years. Faulty meters account for apparent losses (i.e. losses due to meter inaccuracies) and real losses (also known as physical losses).

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	1.25%	

Category	Avg. Annual Water Use over Planning Period (MG)	*Estimated Annual Water Savings (gal/yr)*
Non Revenue Water	57.26	715,747
Estimated Annual Water Savings	**0.72**	MG/yr
Estimated Savings over Planning Period	**7.2**	MG

Notes:

2010 - 2014 average system non-revenue leakage/loss rate was 7.1%. Natural Resources Defense Council estimate 10% of homes have leaks that waste 90 gals or more per day. These leaks are often go unaccounted due to faulty meters.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	90	
Hourly Cost	$60.00	
Annual Staff Costs	$5,400	
Third Party Costs	$0.00	
Evaluation and Follow-up Costs	$0.00	
Annual Labor	**$5,400.00**	
Materials Costs		
Unit Cost	$170.61	/participant
Number of Meters/Year	30	/year
Annual Materials	**$5,118.35**	/year

Notes:

The $170.61 weighted average unit cost includes meter testing and replacement

Residential = $150/meter, Business and other Non-Residential categories = $200/meter

Estimated Annual Cost	**$10,518**	/year
Estimated Total Cost over Planning Period	**$105,183**	
Cost per 1000 Gallons Saved	**$14.70**	

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System Wide Water Audits

By utilizing System Wide Water Audits and paired with other measures (e.g., Meter Testing and Replacement and Leak Detection), Windsor identifies unmetered and unbilled treated water uses in order to assess where losses are occurring and how losses can be addressed. These losses are considered non-revenue water.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	1.00%	

Category	Avg. Annual Water Use over Planning Period (MG)	*Estimated Annual Water Savings (gal/yr)*
Non Revenue Water	57.26	572,597

Estimated Annual Water Savings	**0.57**	MG/yr
Estimated Savings over Planning Period	**5.7**	MG

Notes:

By specifically identifying these losses, additional actions can be taken to reduce the water lost. This measure has the potential to improve all categories. A conservative reduction of 1% of projected annual water use was assumed.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	50	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$3,000.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs	$0.00	/year
Annual Labor	**$3,000.00**	/year

Notes:

Estimated staff costs for Staff to spend approximately 50 hours per year at $60.00/hour to continue to develop within Windsor.

Although some revenue may be lost on the demand side, more revenue will likely be realized on the supply side.

Estimated Annual Cost	**$3,000**	/year
Estimated Total Cost over Planning Period	**$30,000**	
Cost per 1000 Gallons Saved	**$5.24**	

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Control of Apparent Losses (with Metering)

This measure entails utilizing existing meters as well as adding additional meters to determine where system losses are occurring. This measure is often coupled with System Wide Water Audits since they have similar benefits, and metering helps the auditing process.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.75%	

Category	Avg. Annual Water Use over Planning Period (MG)	*Estimated Annual Water Savings (gal/yr)*
Non Revenue Water	57.26	429,448

Notes:

2010 - 2014 average system non-revenue leakage/loss rate was 7.1%. One of the first steps in reducing losses is to identify where the losses are occuring. Metering and System Wide Water Audits help in this process.

Estimated Annual Water Savings	**0.43**	MG/yr
Estimated Savings over Planning Period	**4.3**	MG

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	100.0	
Hourly Cost	$60.00	
Annual Staff Costs	$6,000	
Third Party Costs		
Evaluation and Follow-up Costs		
Annual Labor	**$6,000.00**	

Estimated staff costs for Staff to spend approximately 100 hours per year at $60.00/hour to continue to develop within Windsor.

Materials Costs		
Unit Cost	$3,500.00	/meter
Number of New Meters	5	/year
Annual Materials	**$17,500.00**	/year

Meters range in price depending on size and type. Prices range from $2000/unit to over $5,000 per unit. Unit cost represents an approximate average.

Estimated Annual Cost	**$23,500.00**	/year
Estimated Total Cost over Planning Period	**$235,000.00**	
Cost per 1000 Gallons Saved	**$54.72**	

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Automatic Water Meter Reading Installation and Operations

All of Windsor customer meters have been upgraded to Orion AMR meters. The Town is not currently planning on further upgrades to an AMI system during the Planning Period. AMR meters allow for data to be processed quicker with less sources of error.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Customer Category	**Avg. Annual Water Use over Planning Period** (MG)	**Estimated Annual Savings Rate**	***Estimated Annual Water Savings*** *(gal/yr)*
Non-Revenue	57.26	0.25%	143,149
In Town Residential	391.76	0.25%	979,412
In Town Business	56.80	0.15%	85,199
In Town Industrial	82.08	0.10%	82,083
In Town School	7.19	0.15%	10,791
In Town Church	2.57	0.15%	3,854
Out of Town Residential	1.02	0.25%	2,544
Out of Town Business	0.16	0.15%	237
Out of Town Church	0.04	0.15%	54
Residential Dual System	141.49	0.25%	353,717
Business Dual System	6.80	0.15%	10,200
Landscape Only	57.82	0.20%	115,642

Estimated Annual Water Savings	**1.79**	MG/yr
Estimated Savings over Planning Period	**17.9**	MG

Notes:

Because there is not customer interaction with an online webpage, savings is estimated to be relatively small. AMR meters are still an improvement over the older manual read meters because data can be processed quicker, and there are less sources for error.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	45	/year
Hourly Cost	$60.00	/hour
Annual Labor	**$2,700.00**	/year

Notes:

Annual Staff Costs for this savings measure include data processing. Other costs, such as fuel and vehicle maintenance are not included since some costs would be associated with reading the meters no matter what the scenario.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
Non-Revenue	N/A
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town School	$3.62
In Town Church	$3.62
Out of Town Residential	$5.47
Out of Town Business	$5.43
Out of Town Church	$5.43
Residential Dual System	$3.62
Business Dual System	$3.62
Landscape Only	$3.63

Notes:

Water rates are based on a weighted average for each customer category and incorporate seasonal usage.

The revenue calculations do not include the base fee since the base fee does not cover any usage volume.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$2,737,682	/year
Estimated Average Annual Revenue with Water Savings	$2,731,681	/year
Estimated Annual Revenue Loss Related to Water Savings	$6,001	/year

Estimated Annual Cost	**$8,701**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$27,000**	
Estimated Total Cost over Planning Period Including Lost Revenue	**$87,014**	
Cost per 1000 Gallons Saved	**$4.87**	

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Water Efficient Rate Structure/Water Budgets with Regular Updates

Based on many studies, water rates (e.g., inclining and/or tiered) are one of the most effective ways to encourage efficient water use. A rate study is necessary to ensure maximum water conservation savings. Windsor's last rate study was conducted in 2011. Because they are very interrelated, this measure also includes Inclining/Tiered rates and Volumetric Billing within it.

Windsor is also investigating a Water Budget type of Rate Structure. Every water customer has unique water needs. For this activity, Windsor proposes to bill customers using a personalized water budget (typically based on some type of predetermined allotment) that will reflect their specific water needs. The goal of a water budget structure is to encourage customers to use water more efficiently by rewarding efficient water use and reducing water waste. Those customers who are efficient, use the lowest-cost water and therefore pay the lowest rates. Customers who are inefficient pay more for the increasing cost of the water they consume.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Customer Category	**Avg. Annual Water Use over Planning Period** (MG)	**Annual Estimated Savings Rate**	***Estimated Annual Water Savings*** *(gal/yr)*
Non-Revenue	57.26	0.00%	0
In Town Residential	391.76	8.00%	31,341,190
In Town Business	56.80	3.00%	1,703,974
In Town Industrial	82.08	1.50%	1,231,248
In Town School	7.19	2.00%	143,880
In Town Church	2.57	2.00%	51,383
Out of Town Residential	1.02	7.50%	76,325
Out of Town Business	0.16	2.50%	3,943
Out of Town Church	0.04	1.25%	454
Residential Dual System	141.49	6.00%	8,489,207
Business Dual System	6.80	1.50%	101,999
Landscape Only	57.82	5.00%	2,891,048

Notes:

Assumed a conservative reduction of per customer category of projected total billed water. Rate change studies have often shown an even greater savings (e.g., Southwest Florida Water Management District study indicated a 13% savings). Conservative savings rates were applied to each category. Providers using Water Budget rate structures have often indicated an even greater savings than just a straight tiered rate type of structure.

Estimated Annual Water Savings	**46.03**	MG/yr
Estimated Savings over Planning Period	**460.3**	MG

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Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	44	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$2,640.00	
Third Party Costs (Rate study)	$7,000.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)		/year
Annual Labor	**$9,640.00**	/year

Notes:

Annual staff costs include coordination with consultants.

Annual Revenue Lost due to water savings is not incorporated into the Total Cost to Water Provider because these costs are absorbed and included in the rate adjustments to the customers.

Total Cost to Water Provider

Estimated Annual Cost	**$9,640**	/year
Estimated Total Cost over Planning Period	**$96,400**	
Cost per 1000 Gallons Saved	**$0.21**	

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Leak Detection and Repair Program

Currently Windsor combines customer service staff's analysis of billed water use, maintenance personnel's water line observations, along with help from outside consultants ("American Leak Detection" and "National Meter and Automation Inc." to evaluate their system for leaks. Repairs to the system are made as needed.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	2.00%	
Annual Estimated Non-Revenue Water without Savings	57.26	MG/yr
Estimated Annual Water Savings	**1.15**	MG/yr
Estimated Savings over Planning Period	**11.5**	MG

Notes:

2010 - 2014 average system unaccounted leakage/loss rate was 7.1%.

Savings equals the current projected water usage of non-revenue water multiplied by the estimated savings rate.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	80	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$4,800.00	
Third Party Costs (Leak Detection Consult)	$8,000.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)		/year
Annual Labor	**$12,800.00**	/year

Notes:

Third Party Costs include leak survey performed annually by a consultant.

Annual staff costs include coordination with consultants.

Estimated Annual Cost	**$12,800**	/year
Estimated Total Cost over Planning Period	**$128,000**	
Cost per 1000 Gallons Saved	**$11.18**	

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Water Line Replacement Program

This measure involves a continuing process of replacing old pipes within Windsor

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	2.0%	of area replaced
Estimated Percentage of Usage of Area Affected	5.0%	
Annual Estimated Water Usage for Area Affected	40.25	MG/yr
Estimated Water Production over Planning Period without Savings	402.49	MG
Estimated Annual Water Savings	**0.80**	MG/yr
Estimated Savings over Planning Period	**8.0**	MG

Notes:

The line replacement is estimated to affect approximately 5% of the service area each year.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	100	/year
Hourly Cost	$60	/hour
Annual Labor	**$6,000**	/year

Notes:

Staff Hours include coordinating with outside contractors

Labor and Materials Costs		
Annual Materials Budget	$1,200,000	/year
Annual Materials	**$1,200,000**	/year

Notes:

Costs provided by Windsor. $1.2 million budgeted for 2016

Estimated Annual Cost	**$1,206,000**	/year
Estimated Total Cost over Planning Period	**$12,060,000**	
Cost per 1000 Gallons Saved	**$1,498.16**	

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Master Plans/Water Supply Plans

Windsor plans to continue developing, updating, and evaluating plans (i.e. Master Plans, Water Supply Plans, Capital Improvement Plans, and Water Efficiency Plans) that will improve its overall water efficiency and help plan for future use.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.50%	

Notes:

This measure has the potential to improve all categories. A conservative reduction of 0.5% of projected annual water use was assumed.

Category	**Avg. Annual Water Use over Planning Period** (MG)	***Estimated Annual Water Savings*** *(gal/yr)*
Non-Revenue	57.26	286,299
In Town Residential	391.76	1,958,824
In Town Business	56.80	283,996
In Town Industrial	82.08	410,416
In Town School	7.19	35,970
In Town Church	2.57	12,846
Out of Town Residential	1.02	5,088
Out of Town Business	0.16	789
Out of Town Church	0.04	182
Residential Dual System	141.49	707,434
Business Dual System	6.80	34,000
Landscape Only	57.82	289,105

Estimated Annual Water Savings	**4.02**	MG/yr
Estimated Savings over Planning Period	**40.2**	MG

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	90	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$5,400.00	
Third Party Costs	$14,000.00	/year
Evaluation and Follow-up Costs		/year
Annual Labor	**$19,400.00**	/year

Notes:

Estimated staff costs for Staff to spend an average of 90 hours per year at $60.00/hour to help develop the various Plans for the Town.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
Weighted average of customer rates	$3.66

Notes:

The annual revenue loss was estimated based on a weighted average of current rates for all Windsor customers.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$2,738,427	/year
Estimated Average Annual Revenue with Water Savings	$2,724,735	/year
Estimated Annual Revenue Loss Related to Water Savings	**$13,692**	/year

Estimated Annual Cost	**$33,092**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$194,000**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$330,921**	
Cost per 1000 Gallons Saved	**$8.22**	

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Slow the Flow Residential Irrigation Audits

CReSC offers multiple programs including Slow the Flow sprinkler consultations for Windsor's residential customers. "The service usually takes 90 minutes and involves a visual inspection, data collection, and in-depth evaluation. The consultant will deliver a clear and actionable list of suggestions to reduce water use and runoff at each property, while keeping landscapes and lawns healthy." -CReSC

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	5%

Customer Category	Avg. Annual Outdoor Water Use Over the Planning Period (gal/tap)	*Estimated Annual Water Savings (gal/tap/yr)*	*Annual Program Participants (taps)*
In Town Residential	47,729.0	2,386	37
Out of Town Residential	41,722.5	2,086	1
Residential Dual System	7,628.7	381	2

Estimated Annual Water Savings	**0.091**	MG/yr
Estimated Savings over Planning Period	**5.0**	MG

Notes:

The outdoor use estimates are based on the following approximations for each customer category: In Town Residential = 47%, Out of Town Residential = 40%, Residential Dual System = 12%.

Assumed a conservative estimate of 5% savings of projected outdoor water usage . Customers have to put Auditor's advice and suggestions into practice.

Program Participants based on other water providers' participation rates for similar numbers of people. Dual System customers are assumed to be much less likely to participate in audits.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	30	/year
Hourly Cost	$60	/hour
Annual Labor	**$1,800**	/year
Third Party Costs		
Audit Cost	$114	
Number of Participants	40	/year
Annual Cost	**$4,560**	/year

Notes:

Costs include staff time for implementing (approximately 45 min. per participant). Program is largely organized by CReSC .

Third Party Costs include CReSC 's time. Residential audits = $114/audit

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	3.65
Out of Town Residential	5.47
Residential Dual System	*3.62*

Note:

The annual revenue loss was estimated based on current rates for the listed Town customer categories.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$36,999	/year
Estimated Average Annual Revenue with Water Savings	$35,149	/year
Annual Revenue Loss Related to Water Savings	**$1,850**	/year

Estimated Annual Cost	**$8,210**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$63,600**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$82,099**	
Cost per 1000 Gallons Saved	**$16.38**	

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Indoor Residential Water Audits

Center for ReSource Conservation (CReSC) also offers indoor water audits (w/ low-flow shower-heads and faucet aerators) "Slow the Flow offers consultations on residential water use and suggests simple measures to increase water use efficiency in the home. During the session the consultant will measure outputs from faucets, toilets, and shower-heads, and perform a cost/benefit analysis on fixture replacement options. He/She may also install low-flow shower-heads and faucet aerators at no cost. The consultation will leave the home owner with a customized list of recommendations for increasing efficient water use." -CReSC

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	5%

Customer Category	**Avg. Annual Indoor Water Use Over the Planning Period** (gal/tap)	***Estimated Annual Water Savings*** *(gal/tap/yr)*	***Annual Program Participants*** *(taps)*
In Town Residential	53,380.1	2,669	13
Out of Town Residential	60,836.0	3,042	1
Residential Dual System	54,285.9	2,714	6

Estimated Annual Water Savings	**0.054**	MG/yr
Estimated Savings over Planning Period	**2.97**	MG

Notes:

The indoor use estimates are based on the following approximations for each customer category: In Town Residential = 52%, Out of Town Residential = 59%, Residential Dual System = 87%.

Assumed a conservative estimate of 5% savings of projected indoor water usage . Customers have to put Auditor's advice and suggestions into practice. Shower heads and aerators will be installed by CReSC.

Program Participants based on other water providers' participation rates for similar numbers of people. Indoor audits tend to be less popular than outdoor audits.

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Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	15	/year
Hourly Cost	$60	/hour
Annual Staff Costs	$900	
Third Party Costs		/year
Evaluation and Follow-up Costs		/year
Annual Labor	**$900**	/year
Third Party Costs		
Audit Costs	$90	
Number of Participants	20	/year
Annual Third Party Cost	**$1,800**	/year

Notes:

Costs include staff time for implementing (approximately 45 min. per participant). Program is largely organized by CReSC

Third Party Costs include CReSC 's time.

Residential audits = $90/audit

Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	*3.65*
Out of Town Residential	*5.47*
Residential Dual System	*3.62*

Note:

The annual revenue loss was estimated based on current rates for the listed Town customer categories.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$22,241	/year
Estimated Average Annual Revenue with Water Savings	$21,129	/year
Annual Revenue Loss Related to Water Savings	**$1,112**	/year

Estimated Annual Cost	**$3,812**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$27,000**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$38,121**	
Cost per 1000 Gallons Saved	**$12.83**	

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Pre-Rinse Spray Valve (PRSV) Upgrades

Center for ReSource Conservation (CReSC) offers this program. "Save water in commercial kitchens with a quick, easy, and effective pre-rinse spray valve (PRSV) upgrade. This 15-minute swapping service is offered at no cost to businesses and creates instant, measurable water and energy savings" -CReSC

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	2.4%

Customer Category	Avg. Annual Indoor Water Use Over the Planning Period (gal/tap)	*Estimated Annual Water Savings (gal/tap/yr)*	*Annual Program Participants (taps)*
In Town Business	192,260	4,500	2
In Town Industrial	1,214,173	29,300	11
In Town School	376,299	9,000	4
Business Dual System	286,706	7,000	3

Estimated Annual Water Savings	**0.39**	MG/yr
Estimated Savings over Planning Period	**21.4**	MG

Notes:

CReSC estimates a savings of 20,000 per PRSV swap. Pre-rinse nozzles for dishwashers are installed by CReSC. Number of participants and savings rates are also based upon per tap water usage and percentage of water usage.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	15	/year
Hourly Cost	$60	/hour
Annual Staff Costs	$900	
Third Party Costs	$2,500	/year
Evaluation and Follow-up Costs	$0	/year
Annual Labor	**$3,400**	/year

Notes:

Costs include staff time (approximately 45 min./participant) for implementing and evaluation.

Third Party Costs include CReSC time. Minimum cost = $2,500 for 20 installs

Material cost is incorporated into Third Party Costs and includes the cost of the fixture.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Business	$3.62
In Town Industrial	*$3.83*
In Town School	*$3.62*
Business Dual System	*$3.62*

Estimated Average Annual Revenue without Water Savings	$335,981	/year
Estimated Average Annual Revenue with Water Savings	$327,896	/year
Annual Revenue Loss Related to Water Savings	**$8,085**	/year

Notes:

The annual revenue loss was estimated based on current rates for the indicated customer category.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Annual Cost	**$11,485**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$34,000**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$114,852.12**	
Cost per 1000 Gallons Saved	**$5.38**	

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Residential and Commercial Ultra High-Efficiency Toilet Upgrade Service or High-Efficiency Toilet Rebate Program

Windsor hopes to participate in the Ultra High-Efficiency Toilet Upgrade Service offered by CReSC where participants can "Save thousands of gallons of water per year with the breakthrough technology of the Niagara Stealth Toilet." -CReSC. If Windsor does not participate in the CReSC program, then the Town will offer rebates instead for high efficiency toilet replacements. Number of participants is estimated to be approximately the same.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Percent Savings **10%**

Annual Estimated Water Use Per Tap without Savings

Customer Category	**Avg. Annual Indoor Water Use Over the Planning Period** (gal/tap)	***Estimated Annual Water Savings*** *(gal/tap/yr)*	***Annual Program Participants*** *(taps)*
In Town Residential	53,380	5,338	19
In Town Business	192,260	19,226	3
Residential Dual System	54,286	5,429	7
Business Dual System	286,706	28,671	1

Estimated Annual Water Savings	**0.23**	MG/yr
Estimated Savings over Planning Period	**12.42**	MG

Notes:

Estimated Water Use is based on indoor use for the listed Customer Categories. Other categories (e.g., In Town Church) may utilize the program, but the percentage of water use within the other categories is very small and therefore incorporated into the listed categories.

Upgrade service available through CReSC.

Savings based on Toilet Rebate program data provided by other water providers. Number of participants were adjusted to fit the population. CReSC has a minimum number of 30 toilets. After the data was filtered, calculated savings came to 10% for the Cost/Benefit analysis.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of participants for each given year. As more participants utilize the replacements or rebates, more savings is realized.

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Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	**22.5**	/year
Hourly Cost	$60.00	/hour
Annual Labor	$1,350.00	/year

Rebates

Rebate Cost	$190.00	
Number of Participants	30	/year
Annual Rebate Cost	**$5,700.00**	

Notes:

Annual staff time is estimated at approximately 45 min. per participant. This time includes water savings tracking.

Minimum participation is 30 toilets at $5,700. Additional toilets are $190 a piece. Costs for a rebate program may be lower, but savings is also likely to be lower.

Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
Residential Dual System	$3.62
Business Dual System	$3.62

Notes:

The annual revenue loss was estimated based on current rates for the listed Town customer categories.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$45,111	/year
Estimated Average Annual Revenue with Water Savings	$40,600	/year
Annual Revenue Loss Related to Water Savings	**$4,511**	/year

Estimated Annual Cost	**$11,561**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$70,500**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$115,611**	
Cost per 1000 Gallons Saved	**$9.31**	

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Rebate for ET Irrigation System Controllers

Windsor will offer rebates to customers for installing Smart Controllers for irrigation. Smart controllers sense either the soil moisture or climate conditions and adjust the irrigation scheduling accordingly.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	5.0%	

Customer Category	**Avg. Annual Outdoor Water Use Over the Planning Period** (gal/tap)	***Estimated Annual Water Savings*** *(gal/tap/yr)*	***Annual Program Participants*** *(taps)*
In Town Residential	47,729	2,386	6
In Town Business	41,863	2,093	1
In Town Industrial	553,452	27,673	1
Landscape Only	746,624	37,331	2

Estimated Annual Water Savings	**0.12**	MG/yr
Estimated Savings over Planning Period	**6.5**	MG

Notes:

This measure affects projected outdoor water usage for the listed Customer Categories. Other customer categories may also benefit, but participation would be considerably less given the demographics or the very small percentage of customers within those categories.

Estimate that approximately 40% of total customer use is outdoor use.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	10	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$600.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$600.00**	/year
Rebates		
Rebates	$100.00	
Number of Participants	10	/year
Annual Rebate Cost	**$1,000.00**	/year

Notes:

The main cost associated with issuing of rebates is verification of correct ET sensor and installation and the processing of the rebate.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current rates for listed Town customers and assumes rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$48,011	/year
Estimated Average Annual Revenue with Water Savings	$45,610	/year
Annual Revenue Loss Related to Water Savings	**$2,401**	/year

Estimated Annual Cost	**$4,000.55**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$16,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$40,005.48**	
Cost per 1000 Gallons Saved	**$6.13**	

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Give-Aways: Residential Water Audit Kits

Self-guided residential water audit kits are designed with the following items: a water saving hose nozzle, a water efficient shower head, two faucet aerators, a dish squeegee, a Toilet Tummy, leak detection tablets, and an outdoor moisture meter. Instructions for conducting the audit and evaluating the results can give residential customers insight and direction on how they can save water and money. The guidance offered in the instructions could lead the customer to take part in other conservation programs offered, including rebates, Garden in a Box, or Outdoor Water Audits.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	1.00%

	Avg. Annual Indoor Water Use Over the Planning Period (gal/tap)	***Estimated Annual Water Savings*** *(gal/tap/yr)*	***Annual Program Participants*** *(taps)*
In Town Residential	53,380	534	110
Residential Dual System	54,286	543	40

Estimated Annual Water Savings	**0.08**	MG/yr
Estimated Savings over Planning Period	**4.42**	MG

Notes:

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of participants for each given year. Estimated Water Use is based on the forecasted annual indoor water use since most of the audit kit contents are related to indoor savings efforts.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours (Website updates, etc.)	50	/year
Hourly Cost	$60.00	/hour
Annual Labor	**$3,000.00**	/year

Give Aways per Year		
Give Away Kits per Year	**200**	/year
Materials Cost	**$3,458.00**	/year

Notes:

Staff Hours are estimated at 15 minutes per kit or participant. Residential water conservation kits are available at wholesalers like AM Conservation Group, Inc. (www.amconservationgroup.com) for $17.29 per unit for a bulk purchase of kits. Kits are customized to include the Windsor's logo. Windsor currently has a backstock of existing kits, so initial distribution will be less expensive.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
Residential Dual System	$3.62

Notes:

The annual revenue loss was estimated based on current rates for listed Town customers.

Estimated revenue assumes that the current rates will not change over the planning period.

Estimated Average Annual Revenue without Water Savings	$161,068	/year
Estimated Average Annual Revenue with Water Savings	$159,458	/year
Annual Revenue Loss Related to Water Savings	**$1,611**	/year

Estimated Annual Cost	**$8,069**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$64,580**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$80,687**	
Cost per 1000 Gallons Saved	**$18.24**	

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Water Waste Ordinance

Windsor currently has an ordinance in place that specifies the responsibility of the property owners to keep the water lines on their property in good condition in order to prevent the waste of water.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.10%	

Notes:

This measure potentially affects all customer categories. A very conservative estimate of 0.10% savings is used for calculations.

Customer Category	Avg. Annual Water Use over Planning Period (MG)	*Estimated Annual Water Savings (gal/yr)*
Total Metered Water Use	747.73	747,730

Estimated Annual Water Savings	**0.75**	MG/yr
Estimated Savings over Planning Period	**7.5**	MG

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	0	/year
Hourly Cost	$60.00	/hour
Annual Labor	**$0.00**	/year

Notes:

Since there is already a policy in place, no additional time is estimated for Staff Hours.

Water Rates

Rate Category	Current Rates (per 1,000 gals)
Weighted average of customer rates	$3.66

Notes:

The annual revenue loss was estimated based on a weighted average rate for all Town customer categories.

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$2,738,427	/year
Estimated Average Annual Revenue with Water Savings	$2,735,688	/year
Estimated Annual Revenue Loss Related to Water Savings	**$2,738**	/year

Estimated Annual Cost	**$2,738**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$0**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$27,384.27**	
Cost per 1000 Gallons Saved	**$3.66**	

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Time of Day Watering Restrictions

Windsor has a Water Restriction Ordinance in place that states, "From May 1 through September 30 of each year, no lawn watering shall be permitted between the hours of 10:00 a.m. and 6:00 p.m."

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate: 0.15%

Customer Category	Avg. Annual Outdoor Water Use Over the Planning Period (MG)	*Estimated Annual Water Savings (gal/yr)*
In Town Residential	184.93	277,401
In Town Business	10.16	15,234
In Town Industrial	25.70	38,551
In Town Church	1.95	2,926
Residential Dual System	17.43	26,150
Landscape Only	57.82	86,731

Notes:

Outdoor use is estimated at a weighted average of approximately 37% for the listed categories. Outdoor use of the categories not included represented less than 0.5% of the total water consumed.

A conservative estimate of 0.15% savings of projected outdoor water usage was assumed.

Estimated Annual Water Savings	**0.4**	MG/yr
Estimated Savings over Planning Period	**4**	MG

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	0	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$0.00	
Annual Labor	**$0.00**	/year

Notes:

Since ordinance is in place, no Staff Hours are estimated for this existing measure.

Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town Church	$3.62
Residential Dual System	$3.62
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current weighted rates for listed customer categories

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

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Estimated Average Annual Revenue without Water Savings	$1,089,736	/year
Estimated Average Annual Revenue with Water Savings	$1,088,102	/year
Annual Revenue Loss Related to Water Savings	**$1,635**	/year

Estimated Annual Cost	**$1,635**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$0**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$16,346**	
Cost per 1000 Gallons Saved	**$3.66**	

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Landscape Design Ordinances and Restrictions

Windsor is investigating the following landscape design ordinances: Rules and Regulations for Landscape Design/Installation, Soil Amendment Requirements, Turf Restrictions, and Irrigation Equipment Requirements

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate: 0.25%

Customer Category	Avg. Annual Outdoor Water Use Over the Planning Period (MG)	*Estimated Annual Water Savings (gal/yr)*
In Town Residential	184.93	462,336
In Town Business	10.16	25,390
In Town Industrial	25.70	64,252
In Town Church	1.95	4,876
Residential Dual System	17.43	43,583
Landscape Only	57.82	144,552

Notes:

Outdoor use is estimated at a weighted average of approximately 37% for the listed categories. Outdoor use of the categories not included represented less than 0.5% of the total water consumed.

A conservative estimate of 0.25% savings of projected outdoor water usage was assumed. Most of these ordinances and restrictions would only be applied to new construction.

Estimated Annual Water Savings	**0.7**	MG/yr
Estimated Savings over Planning Period	**7**	MG

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	80	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$4,800.00	
Third Party Costs	$0.00	/year
Evaluation and Follow-up Costs	$0.00	/year
Annual Labor	**$4,800.00**	/year

Notes:

Costs include staff time for setting up rules and ordinances and for enforcing rules and restrictions for measure.

Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town Church	$3.62
Residential Dual System	$3.62
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current weighted rates for listed customer categories

Estimated Revenue assumes that the current rates will not change significantly over the planning period.

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Estimated Average Annual Revenue without Water Savings	$1,089,736	/year
Estimated Average Annual Revenue with Water Savings	$1,087,012	/year
Annual Revenue Loss Related to Water Savings	**$2,724**	/year

Estimated Annual Cost	**$7,524**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$48,000**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$75,243**	
Cost per 1000 Gallons Saved	**$10.10**	

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Town Facility Requirements

Windsor hopes to update their Town facility fixtures with water saving fixtures

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Percent Savings	**10%**

Annual Estimated Water Use Per Tap without Savings

Customer Category	**Avg. Annual Indoor Water Use Over the Planning Period** (gal/tap)	***Estimated Annual Water Savings***
In Town Business	192,260	See Below

Number of Town Buildings and Facilities	10	
Number of employees	164	
Toilets and urinals per building	10	
Total Toilets and Urinals	100	
Estimated flushes	492	/day
Gallons Saved per flush per day	0.4	gallons
Total gallons saved per year	71,832	gallons/yr
Faucets per building	15	
Total Faucets	150	
Estimated minutes	4	/person/day
Total number of minutes	239,440	/yr
Amount saved	0.3	gpm
Total gallons saved per year	81,410	gallons/yr
Estimated Annual Water Savings	**0.153**	MG/yr
Estimated Savings over Planning Period	**1.53**	MG

Notes:

Original savings based on 10 Town Buildings and Facilities with approximately 10 toilets and urinals per building. It is also estimated that approximately 1.5 faucets per toilet/urinal will be in each area. These would include sink areas outside of restrooms. As Windsor looks into the facilities more thoroughly, this number may change.

It is also estimated that there are approximately 164 employees total utilizing Town facilities.

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Costs

Total Cost to Water Provider

Installation (One Time) Labor Costs		
Staff Hours	**275**	1st year
Hourly Cost	$60.00	/hour
Labor	$16,500.00	1st year
Yearly Labor Costs		
Staff Hours	**4**	/year
Hourly Cost	$60.00	/hour
Annual Labor	$240.00	/year
Equipment		
High Efficiency Toilet Cost	$200.00	each
Fixture/Faucets	$15	each
Total Equipment Costs	**$22,250.00**	one time fee

Notes:

Annual staff time is estimated at approximately 2 hrs. per toilet and 30 min. per fixture/faucet replacement).

This time includes water savings tracking.

Toilet equipment cost is estimated at $200 each and fixture/faucet replacement at $15 each

One Time Cost	**$38,750**	
Estimated Annual Cost	**$4,115**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$41,150**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$41,150**	
Cost per 1000 Gallons Saved	**$26.85**	

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Educational Activities

Analysis of costs and benefits for educational activities are combined as shown below. Activities include Bill Stuffers, Newsletter, Newspaper Articles, Mass Mailings, and Water Efficiency Page on Windsor's Website. Windsor is also very active in the community with outreach efforts like Water Fairs, K-12 Teacher and Classroom Education, and Citizen Advisory Boards.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Customer Category	**Avg. Annual Water Use over Planning Period** (MG)	**Estimated Annual Savings Rate**	***Estimated Annual Water Savings*** *(gal/yr)*
In Town Residential	391.76	2.0%	7,835,297
In Town Business	56.80	0.5%	283,996
In Town Industrial	82.08	0.5%	410,416
In Town School	7.19	1.5%	107,910
In Town Church	2.57	1.0%	25,691
Out of Town Residential	1.02	2.0%	20,353
Out of Town Business	0.16	0.5%	789
Out of Town Church	0.04	1.0%	363
Residential Dual System	141.49	1.5%	2,122,302
Business Dual System	6.80	0.1%	6,800
Landscape Only	57.82	0.2%	115,642

Estimated Annual Water Savings	10.9	MG/yr
Estimated Savings over Planning Period	**109**	MG

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	220	/year
Hourly Cost	$60.00	/hour
Annual Labor	**$13,184.00**	/year
Materials Costs		
Unit Cost (cost of Bill Stuffers)	$0.25	/participant
Avg. Number of Participants (receiving bill stuffers) over Planning Period	6,592	/year
Annual Materials	**$1,648.00**	/year

Notes:

Staff hours include time spent preparing newsletter, updating website, and preparing bill stuffers.

In 2014 there were 5740 active tap accounts. The average affected number of taps during the planning period is projected to be 6592.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town School	$3.62
In Town Church	$3.62
Out of Town Residential	$5.47
Out of Town Business	$5.43
Out of Town Church	$5.43
Residential Dual System	$3.62
Business Dual System	$3.62
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current rates for all Town customers and assumes rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$2,737,682	/year
Estimated Average Annual Revenue with Water Savings	$2,697,766	/year
Estimated Annual Revenue Loss Related to Water Savings	**$39,916**	/year

Estimated Annual Cost	**$54,748**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$148,320**	
Estimated Total Cost over Planning Period Including Lost Revenue	**$547,478.35**	
Cost per 1000 Gallons Saved	**$5.01**	

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Xeriscape Demonstration Garden

Maintaining a xeriscape demonstration garden is an excellent way to educate the public to the water savings and beauty available from xeriscaping. Windsor has designed, maintained, and continued to expand a xeriscape demonstration garden along the Poudre River Trail Corridor multiuse trail since 2008.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.25%

Customer Category	Avg. Annual Outdoor Water Use Over the Planning Period (gal/tap)	*Estimated Annual Water Savings (gal/tap/yr)*	*Annual Program Participants (taps)*
In Town Residential	47,729.0	119	358
In Town Business	41,863.4	105	30
In Town Industrial	553,451.7	1,384	20
In Town Church	122,318.4	306	2
Residential Dual System	7,628.7	19	50
Landscape Only	746,624.3	1,867	40

Estimated Annual Water Savings	**0.15**	MG/yr
Estimated Savings over Planning Period	**8.2**	MG

Notes:

This measure affects projected outdoor water usage for the listed Customer Categories. Other customer categories may also benefit, but participation would be considerably less given the demographics or the very small percentage of customers within those categories.

It is estimated that approximately 40% of total customer use is outdoor use.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	42	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$2,500.00	
Third Party Costs	$1,000.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$3,500.00**	/year
Materials Costs		
Annual Materials Budget	$500	/year
Annual Materials	**$500.00**	/year

Notes:

Relatively little Staff time is estimated per participant. Cost is for garden, installation, plants, planting materials, and on-going maintenance. Much of the garden is run through volunteer efforts and donations.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town Church	$3.62
Residential Dual System	$3.62
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current rates for all Town customers and assumes rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$1,208,981	/year
Estimated Average Annual Revenue with Water Savings	$1,205,959	/year
Annual Revenue Loss Related to Water Savings	**$3,022**	/year

Estimated Annual Cost	**$7,022.45**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$40,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$70,224.53**	
Cost per 1000 Gallons Saved	**$8.53**	

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Landscape Design (Xeriscape) and Maintenance Classes

Classes have been traditionally conducted at the Treasure Island Xeriscape Demonstration Garden. The classes provide a number of venues in which participants can learn more about xeriscaping as well as other gardening techniques.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.25%

Customer Category	Avg. Annual Outdoor Water Use Over the Planning Period (gal/tap)	*Estimated Annual Water Savings (gal/tap/yr)*	*Annual Program Participants (taps)*
In Town Residential	47,729.0	119	34
In Town Business	41,863.4	105	2
In Town Industrial	553,451.7	1,384	2
In Town Church	122,318.4	306	1
Residential Dual System	7,628.7	19	5
Landscape Only	746,624.3	1,867	6

Estimated Annual Water Savings	**0.02**	MG/yr
Estimated Savings over Planning Period	**1.0**	MG

Notes:

Similar to the Demonstration Garden itself, this measure affects projected outdoor water usage for the listed Customer Categories. Other customer categories may also benefit, but participation would be considerably less given the demographics or the very small percentage of customers within those categories.
It is estimated that approximately 40% of total customer use is outdoor use.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	12.5	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$750.00	
Third Party Costs	$500.00	/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$1,250.00**	/year
Materials Costs		
Annual Materials Budget	$250	/year
Annual Materials	**$250.00**	/year

Notes:

Staff time is estimated at approximately 1/4 hour per participant for scheduling and coordination. Much of the garden is run through volunteer efforts including the classes.

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Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town Church	$3.62
Residential Dual System	$3.62
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current rates for all Town customers and assumes rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$150,067	/year
Estimated Average Annual Revenue with Water Savings	$149,691	/year
Annual Revenue Loss Related to Water Savings	**$375**	/year

Estimated Annual Cost	**$1,875**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$15,000**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$18,752**	
Cost per 1000 Gallons Saved	**$18.30**	

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Garden in a Box

Each year CReSC offers an array of do it yourself Xeric garden kits, created by professional landscape designers for sun, shade and everything in between. These plant by number gardens can have a significant conservation impact and are perfect for anyone who wants to beautify their yard while using less water than standard turf.

Planning Period	2015 to 2024	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate: 25% [1]

Customer Category	**Avg. Annual Outdoor Water Use Over the Planning Period** (gal/tap)	***Estimated Annual Water Savings*** *(gal/tap/yr)*	***Annual Program Participants*** *(taps)*
In Town Residential	47,729.0	374	25
In Town Business	41,863.4	374	2
In Town Industrial	553,451.7	374	2
In Town Church	122,318.4	374	1
Residential Dual System	7,628.7	374	5
Landscape Only	746,624.3	374	5

Estimated Annual Water Savings	**0.01**	MG/yr
Estimated Savings over Planning Period	**0.8**	MG

Notes:

[1] The "Annual Estimated Saving Rate" represents a 25% savings of water for the turf area replaced with the Garden in the Box plants and not a 25% savings overall.

Similar to the Demonstration Gardens themselves, this measure affects projected outdoor water usage for the listed Customer Categories. Other customer categories may also benefit, but participation would be considerably less given the demographics or the very small percentage of customers within those categories.

It is estimated that approximately 40% of total customer use is outdoor use. Each garden is estimated to use up to 60% less water than the same area of turf, but irrigation systems need to be adjusted for benefit to be realized. A garden typically covers 100 sq ft. Assumption was made that same area of turf will be replaced with same area of xeriscaping. Irrigation requirements = approximately two AF/acre for turf = 748 gal/garden saving. This estimate was cut in half due to other potential problems.

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Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	40	/year
Hourly Cost	$60.00	/hour
Annual Staff Costs	$2,400.00	
Third Party Costs		/year
Evaluation and Follow-up Costs (Labor/Consultant)	$0.00	/year
Annual Labor	**$2,400.00**	/year

Notes:

Staff cost include approximately 1/4 hour per participant. CReSC offers end consumers a discount through the water provider.

Materials Costs

Associated Costs	$65.00	/garden
Number of Participants	40	/year
Annual Materials	**$2,600.00**	/year

CReSC's price is $4,370 for 80 gardens. An assumed 20% mark-up was made for smaller quantity.

Water Rates

Rate Category	Current Rates (per 1,000 gals)
In Town Residential	$3.65
In Town Business	$3.62
In Town Industrial	$3.83
In Town Church	$3.62
Residential Dual System	$3.62
Landscape Only	$3.63

Notes:

The annual revenue loss was estimated based on current rates for all Town customers and assumes rates will not change significantly over the planning period.

Estimated Average Annual Revenue without Water Savings	$126,557	/year
Estimated Average Annual Revenue with Water Savings	$126,257	/year
Annual Revenue Loss Related to Water Savings	**$300**	/year

Estimated Annual Cost	**$5,300**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$50,000**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$53,003**	
Cost per 1000 Gallons Saved	**$64.41**	

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APPENDIX E

Town of Windsor Supplementary Documents

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WATER FEES AND CHARGES			
CODE SECTION	**DESCRIPTION**		**RES/ORD NUMBER**
	WATER PLANT INVESTMENT FEE		
13-2-70	**Water Meter Size**	**Fee**	Res 2014-37
	3/4"	$8,063.00	
	1"	$13,062.00	
	1 1/2"	$30,801.00	
	2"	$50,716.00	
	3"	$111,753.00	
	4"	$192,464.00	
	Taps over 4” will be considered individually	-	
	MONTHLY WATER CHARGES		
13-2-90			Res 2014-80

Meter Size	Monthly Base Fee	1st Tier Usage Charge	1st Tier Threshold	2nd Tier Usage Charge	2nd Tier Threshold	3rd Tier Usage Charge	3rd Tier Threshold
		per 1,000 gal	gal / month	per 1,000 gal	gal / month	per 1,000 gal	gal / month
¾” Single family residential	$14.81	$3.62	16,000	$5.40	22,500	$8.05	> 22,500
¾” residential with dual system	$14.81	$3.62	9,700	$5.40	> 9,700	N/A	N/A
1” residential with dual system	$23.93	$3.62	9,700	$5.40	> 9,700	N/A	N/A
1.5” residential with dual system	$49.00	$3.62	9,700	$5.40	> 9,700	N/A	N/A
¾” multi-family residential	$9.57	$3.62	157,000	$5.40	> 157,000	N/A	N/A
¾” commercial, industrial, school	$14.81	$3.62	157,000	$5.40	> 157,000	N/A	N/A
1” commercial, industrial, school	$23.93	$3.62	157,000	$5.40	> 157,000	N/A	N/A
1.5” commercial, industrial, school	$49.00	$3.62	157,000	$5.40	> 157,000	N/A	N/A
2” commercial	$77.49	$3.62	493,000	$5.40	> 493,000	N/A	N/A
2” industrial	$77.49	$3.62	783,000	$5.40	> 783,000	N/A	N/A
2’ school	$77.49	$3.62	157,000	$5.40	> 157,000	N/A	N/A
3” school	$148.87	$3.62	306,700	$5.40	> 306,700	N/A	N/A
4” industrial	$243.25	$3.62	2,461,000	$5.40	> 2,461,000	N/A	N/A

	RAW WATER FEES		
	Consult Engineering Department for fees – varies by subdivision		
	MISCELLANEOUS WATER CHARGES		
13-2-90	Out of Town customers	1.5 times in-town rate	Res 2000-13
13-2-150	Reconnect following termination due to non-payment – regular hours	$30.00	Res 1992-18
13-2-150	Reconnect following termination due to non-payment – after regular hours	$60.00	Res 1992-18
13-2-150	Turning water on – routine circumstances	$10.00	Res 1992-18
13-2-150	Fee for multiple trips	$15.00	Res 1992-18
1992-839	Utility bill delinquent charge	$20.00	Res 1992-60
	Tank (bulk) water	$3.50 / 1,000 gallons	Res 2000-13
	Hydrant Meter	$2,100.00 refundable deposit + $12.00 / day rental fee + $7.40 / 1,000 gallons used	Ord 2012-1432

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SEWER FEES AND CHARGES						
CODE SECTION	**DESCRIPTION**		**FEE**			**RES/ORD NUMBER**
	MONTHLY SEWER CHARGES					
	Single-family dwelling units		$20.00			Res 2001-39
	Commercial/Industrial without separate meter for outdoor usage (irrigation)					Res 2000-49
	Water Meter Size	**Winter Usage** in gallons	**Base Fee**	**PLUS Commodity Charge**	**= TOTAL Monthly Charge**	
	¾”	3,750	$19.00	$6.10	$25.10	
	¾”	5,625	$19.00	$9.15	$28.15	
	¾”	7,500	$19.00	$12.20	$31.20	
	¾”	11,250	$19.00	$18.30	$37.30	
	¾”	21,000	$19.00	$34.61	$53.61	
	¾”	50,100	$19.00	$81.50	$100.50	
	1.0”	2,250	$31.00	$3.66	$34.66	
	1.0”	4,500	$31.00	$7.32	$38.32	
	1.0”	19,500	$31.00	$31.72	$62.72	
	1.0”	28,500	$31.00	$46.36	$77.36	
	1.0”	40,500	$31.00	$65.88	$96.88	
	1.5”	25,500	$61.00	$41.48	$102.48	
	1.5”	45,000	$61.00	$73.20	$134.20	
	1.5”	112,500	$61.00	$183.00	$244.00	
	1.5”	63,000	$61.00	$102.48	$163.48	
	2.0”	502,500	$97.00	$817.40	$914.40	
	4.0”	1,657,500	$301.00	$2,696.20	$2997.20	
	Commercial/Industrial with separate meter for outdoor usage (irrigation)					
	Water Meter Size		**Base Fee**	**PLUS Commodity Charge** per 1,000 gallons		
	¾”		$19.00	$1.63		
	1"		$31.00	$1.63		
	1.5"		$61.00	$1.63		
	2"		$97.00	$1.63		
	3"		$181.00	$1.63		
	4"		$301.00	$1.63		
	Kodak site			$1.63		Res 1997-32
	SEWER PLANT INVESTMENT FEE					
13-1-10	**Water Meter Size**		**Ratio with ¾”**	**Sewer Plant Investment Fee**		Res 2014-37
	3/4"		1.00	$4,400.00		
	1"		1.62	$7,128.00		
	1 1/2"		3.82	$16,808.00		
	2"		6.29	$27,676.00		
	3"		13.86	$60,984.00		
	4"		23.87	$105,028.00		
	Taps over 4” will be considered individually			-		

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STORM DRAINAGE FEES			
CODE SECTION	**DESCRIPTION**		**RES/ORD NUMBER**
	NEW GROWTH BASIN IMPACT FEE		
13-3-50	Collected when there is to be construction of more than 350 square feet of impervious surface on any property New Growth Basin Impact Fee = (Impervious Rate Factor) X (New Growth Basin Impact Fee Factor) X (Area) where Impervious Rate Factor is based on the following table of values		Ord 2003-1148
	Category of Development	Impervious Rate Factor	
	very low density Single-Family residential 1.5 acres	0.10	
	very low density Single-Family residential 2.5 acres	0.10	
	Single-Family residential high density	0.40	
	Single-Family residential medium density	0.40	
	Light Industrial	0.80	
	Heavy Industrial	0.90	
	Commercial	0.95	
	Multi-Family residential	0.70	
	Residential Mixed Use	0.50	
	New Growth Basin Impact Fee Factor = $0.1838 / square foot Area = net area in square feet of the property		
	MONTHLY BASIN USER FEE		
13-3-50	Monthly Basin User Fee = [(Operations and Maintenance Rate) X (Impervious Rate Factor) X (Area) + $2.20] + [(Monthly Basin Improvement Rate) X (Area) X (Impervious Rate Factor)] where Impervious Rate Factor is based on the above table of values Operations and Maintenance Rate = $0.00009 / square foot Monthly Basin Improvement Rate = $0.00046 / square foot Area = net area in square feet of the property		Ord 2007-1292

EXCAVATION, BUILDING MOVING AND DRIVEWAY FEES			
CODE SECTION	**DESCRIPTION**	**FEE**	**RES/ORD NUMBER**
Chapter 11			
Article II	**Excavation Permit**		Res 1992-18
	Type I	$10.00	
	Type II	$50.00	
Article IV	**Building Moving Permit**	$25.00	Res 1992-18
Article VI	**Driveway Permit**	$5.00	Res 1992-18

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TOWN OF WINDSOR

RESOLUTION NO. 2015-88

A RESOLUTION ESTABLISHING RATES FOR TOWN OF WINDSOR WATER SERVICE CUSTOMERS, AND AUTHORIZING THE IMPLEMENTATION OF SUCH RATES

WHEREAS, the Town of Windsor is a Colorado Home Rule Municipality, with all powers of self-government as provided by Colorado law; and

WHEREAS, in keeping with the commands of Windsor Municipal Code Section 13-2-90, the Town Board has annually undertaken to fix rates for users of the Town's municipal treated water system; and

WHEREAS, on December 14, 2015, the Town Board was presented a proposed water rate structure developed by Town staff; and

WHEREAS, the aforementioned water rate structure states that:

- sixty three percent (63%) of the Town's water customers are in the category of "*¾ inch Single Family Residential without a Dual Water System*"; and

- this customer category accounts for fifty three percent (53%) of the Town's annual water usage;

and

WHEREAS, the aforementioned water rate structure contains a recommendation that the Town consider an additional third-tier usage threshold and rate for the customer category of '*¾ inch Single Family Residential without a Dual Water System*"; and

WHEREAS, the Water and Sewer Board has recommended that the Town Board approve the within-described rates to offset supplier price increases and otherwise assure the prudent management of the Town's water utility enterprise; and

WHEREAS, the Town Board has considered the recommendations of the 2015 Water Rate Study, the needs of the community and the financial realities of the Town's treated water supply sources; and

WHEREAS, in addition to the authority found within *Windsor Municipal Code* Section 13-2-90, Section 12.2 of the Windsor Home Rule Charter authorizes the Town Board to establish rates for the use of municipal water.

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NOW, THEREFORE, BE IT RESOLVED BY THE TOWN BOARD OF THE TOWN OF WINDSOR, COLORADO, AS FOLLOWS:

1. Commencing with the monthly billing period beginning January 15, 2016, only Town water users in customer category of "*¾ inch Single Family Residential without a Dual Water System*" shall be subject to a third tier of water usage and corresponding fees, as is set forth in the attached schedule. All other users shall be subject to the first-tier and second-tier rates set forth in the attached schedule.

2. Commencing with the monthly billing period beginning January 15, 2016, Town water users shall be assessed an increased usage charge per 1,000 gallons of water used. As is set forth in the following schedule, usage under the applicable first-tier threshold for each customer category shall be charged at $3.73/1,000 gallons per month. Usage over the applicable second-tier threshold, but under the applicable third-tier threshold, shall be charged at $5.56/1,000 gallons per month. Usage over the applicable third-tier threshold shall be charged $8.29/1,000 gallons per month.

3. In order to maintain the system and plan for additional system improvements, the monthly base fee for each category of water user shall be collected at the levels set forth in the attached table.

4. The table attached hereto shall be incorporated herein by this reference as if set forth fully.

5. The within Resolution shall supersede all prior rate-setting Resolutions for treated water customers served by the Town's water utility enterprise.

Upon motion duly made, seconded and carried, the foregoing Resolution was adopted this 14th day of December, 2015.

TOWN OF WINDSOR, COLORADO

John S. Vazquez, Mayor

ATTEST:

Patti Garcia, Town Clerk

Town of Windsor Colorado WINDSOR 1890 COLO SEAL

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Customer Category	Monthly Base Fee	1st Tier Usage Charge (per 1,000 gallons)	2nd Tier Usage Charge (per 1,000 gallons)	3rd Tier Usage Charge (per 1,000 gallons)	1st Tier Threshold (gallons per month)	2nd Tier Threshold (gallons per month)	3rd Tier Threshold (gallons per month)
	2016 Water Rates						
¾" Single Family Residential w/o Dual Water System	$14.81	$3.73	$5.56	$8.29	16,000	16,001-22,500	>22,500
¾" Residential with Operative Dual System	$14.81	$3.73	$5.56	-	9,700	-	-
1" Residential with Operative Dual System	$23.93	$3.73	$5.56	-	9,700	-	-
1.5" Residential with Operative Dual System	$49.00	$3.73	$5.56	-	9,700	-	-
¾" Multi-family Residential	$9.57	$3.73	$5.56	-	157,000	-	-
¾" Commercial-Industrial-School	$14.81	$3.73	$5.56	-	157,000	-	-
1" Commercial-Industrial-School	$23.93	$3.73	$5.56	-	157,000	-	-
1.5" Commercial-Industrial-School	$49.00	$3.73	$5.56	-	157,000	-	-
2" Commercial	$77.49	$3.73	$5.56	-	493,000	-	-
2" Industrial	$77.49	$3.73	$5.56	-	783,000	-	-
2" School	$77.49	$3.73	$5.56	-	157,000	-	-
3" School	$145.87	$3.73	$5.56	-	306,700	-	-
4" Industrial	$243.25	$3.73	$5.56	-	2,461,000	-	-

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AMERICAN LEAK DETECTION
THE ORIGINAL LEAK SPECIALISTS
800.525.6595

November 17 2015
Town of Windsor
Charwon Walter
301 Walnut
Windsor, Colorado 80550

On this date American Leak Detection completed an electronic leak survey of several miles of water main and associated hydrants/services. All testing was performed in accordance with AWWA M.36 (Code of Leak Detection and Water Audits).

No leakage was indicated in the areas tested. The system appeared to very well maintained with ready access to valves and curb stops for testing.

Warm regards,

Mike Parish, Area Engineer
American Leak Detection of Northern Colorado

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Leak Survey 2015

STREET	INTERSECTION TO INTERSECTION	DISTANCE IN FEET	PIPE TYPE	NUMBER OF SERVICES
Parking Lot	11 th - Church	745	Ductile	14
West side of Church	Main St. - Walnut St.	550	Ductile	1
11th Street	South through Cypress Court	935	Ductile	3
10th Street	Main st. - Locust St.	1360	PVC	31
Walnut Street	10th - 11th	2151	Ductile	27
Century Three Parking Lot	All	800	Ductile	13
Cottonwood Drive	All	2220	Ductile	41
Cottonwood Court	All	270	Ductile	10
10th Street	Locust Street - 11th	2312	PVC	42
Pine Drive	10th - Walnut Street	1050	PVC	12
Spruce Court	All	190	Ductile	7
Sycamore Drive	All	741	PVC	14
Aspen Lane	All	520	PVC	12
9th Street	Main St. - Walnut St.	500	Ductile	4
7th Street	Main St. - Walnut St.	520	Ductile	3
Main Street	9th St. - 7th Street	990	Ductile	17
Walnut Street	10th St. - 7th Street	1325	Ductile	29
Elm Street	9th St. - 7th Street	920	PVC	27
9th Street	Walnut St. - Locust St.	880	Ductile	11
Locust Street	10th St. - 7th Street	1320	Ductile	4
Locust Street Bulb Out (2)	All	280	Ductile	9
10th Street Bulb Out	All	125	Ductile	4
Palisade Mountain Drive	All	750	Ductile	16
Horsetooth Court	All	275	Ductile	9
Spruce Mountain Court	All	160	Ductile	7
Pine Mountain Court	All	210	Ductile	9
Milner Mountain Court	All	175	Ductile	7
Buckhorn Mountain Court	All	370	Ductile	10
Oak Street	7th St. - Parkview Mountain Drive	1285	Ductile	14
Blue Mountain Court	All	240	Ductile	9
Shipman Mountain Court	All	275	Ductile	10
Parkview Mountain Drive	All	1160	Ductile	20
Oak Street	Parkview Mtn. Dr. - Stone Mtn. Dr.	717	Ductile	0
Storm Mountain Court	All	170	Ductile	7
Iron Mountain court	All	210	Ductile	9
Table Mountain Court	All	375	Ductile	10
Pine Drive	10th St. - Stone Mtn. Drive	880	Ductile	7
Medicine Man Court	All	730	Ductile	21
Indian Trail Drive	All	1765	Ductile	32
Kiva Circle	All	315	Ductile	5
Tipi Ring Court	All	165	Ductile	2
Pine Drive	Stone Mtn Dr. - Indian Trail Dr.	620	Ductile	9
Raindance Circle	All	180	Ductile	4
Stone Mtn. Drive	Indian Trail Dr. - Indian Trail Dr.	750	Ductile	0
Ivy Court	All	324	Ductile	8
Rose Court	All	950	Ductile	17
Tulip Court	All	720	Ductile	28
Dasiy Court	All	620	Ductile	14
Rochester Court	All	260	Ductile	5
Blue Bell Court	All	140	Ductile	4
Orchid Court	All	525	Ductile	15
Nantucket Court	All	270	Ductile	8
Nantucket Street	All	1550	Ductile	30
Rochester Drive	1st Street to Columbine Drive	1120	Ductile	15
Columbine Drive	Lilac Drive to Garden Drive	710	PVC	13
Columbine Drive	Rochester Drive to Garden Drive	1130	Ductile	28
Hemlock Drive	Stone Mtn . Drive to 7th Street	1310	Ductile	31
Hemlock Court	All	225	Ductile	6
Larch Drive	all	1310	Ductile	22
Juniper Drive	All	975	Ductile	20
Pinyon Drive	All	1312	Ductile	27
Pinyon Court	All	170	Ductile	4
2nd Street	Chestnut Street to Garden Drive	1190	PVC	41
Apple Way	All	500	PVC	15
Apple Court	All	640	PVC	31
Crabapple Drive	All	525	PVC	24
Lilac Drive	All	925	PVC	18
Lodgepole Drive	All	590	PVC	16
Ponderosa Drive	All	1220	PVC	27
Chestnut Street	Lilac Drive to Ponderosa Drive	640	PVC	8
Sorrel Drive	All	590	PVC	17
Bluegrass Way	All	1090	PVC	19
Bluegrass Court	All	320	PVC	12
Durum Street	All	1235	PVC	40
Durum Court	All	450	PVC	19
Buffalo Drive	All	670	PVC	11
Conifer Court	All	750	Ductile	24

Total Feet 57,437 **Total Services** 1169

Total Miles 10.88

Survey was completed by American Leak Detection of Northern Colorado

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Free Residential Water Audit Kit Contents

Item	Picture	Description
Water Saving Hose Nozzle		This heavy-duty Deluxe Seven Spray Hose Nozzle features a heavy-duty, durable metal body with a cushioned dial ring and grip for long life. Seven water saving spray settings that range from full force to a water saving mist enabling more water efficiency, with less water waste. Pressure compensated for consistent water savings regardless of water pressure.
Chrome Showerhead		• Multi-mode, adjustable spray selections offer regular, massage and combo settings. • Pressure compensator provides consistent spray velocity over a wide range of water pressures for consistent performance and customer satisfaction. • Energy efficient non-aerating spray reduces heat loss and increases comfort. • 2.0 GPM MAX
1 Standard Bath Faucet Aerator & 1 Kitchen Faucet Aerator		• Standard Faucet Aerators are water saving, increase spray velocity, reduce splash. They are great for any application including both the kitchen and bathroom sinks • Deluxe Dual Swivel Spray combines all the features one could want in a water saving faucet aerator; new 1.5 gpm ultra efficient flow rate, volume control for reduced flow with the flip of a finger, dual spray pull down for wide full force, energy efficient multiple stream spray and up for a splash-free bubble stream and 360 degree swivel for optimum convenience. Makes any kitchen faucet more water and energy efficient.
Dish Squeegee		The Dish Squeegee™ makes doing dishes simple, faster and more eco friendly. According to the US EPA, pre-rinsing dishes prior to dishwasher use wastes water. Experts estimate pre-rinsing dishes prior to putting them in the dishwasher can waste up to 6500 gallons of water a year! Not rinsing pots, bowls and plates prior to putting them in the dishwasher can also waste water when dishes emerge unclean. Simply squeegee away the mess without pre-rinsing to save water, the energy used to heat hot water, time, and money. The Dish Squeegee™ is made of soft and pliable silicone that won't scratch fine cookware or Teflon surfaces. No dishwasher, no problem! Squeegee away the mess for efficient dish doing prior to washing. The Dish Squeegee™ is dishwasher safe and won't absorb germs or bacteria like a household sponge. Take the Dish Squeegee™ challenge and keep the faucet off to break the habit of wasteful water use and squeegee off dishes prior to putting them in the dishwasher to save water, energy, time, and money.
Toilet Tummy		The Toilet Tummy™ is a globally recognized water saving product that's effective, low in cost, maintenance free and user friendly. Invented 20 years ago, millions have been sold and remain in successful operation saving water every day. Just fill with water and hang on the inside of the toilet tank wall then forget about it. Saves an approximate 80 to 160 oz. of water per flush. The Toilet Tummy™ is lightweight, and never needs maintenance. With the average person flushing a minimum of six times a day the Toilet Tummys™ water savings add up .
Leak Detection Tablets		Leak Detection Dye Tablets are used to identify leaks in your toilet tank that can waste thousands of gallons of water annually. Worn, old and poorly made toilet flappers can leak undetected allowing water to continuously flow down the drain. Leak Detection Dye Tablets, when placed in the toilet tank, dissolve, turning the water blue. If blue water appears in the bowl, you have a leaky flapper that needs to be replaced.
Outdoor Moisture Meters		The Moisture Meter promotes healthier lawns, gardens, shrubs and helps save water by eliminating improper watering, a major cause of water waste. It accurately measures the moisture in the soil at the root level where it counts.

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APPENDIX F

Public Comments and Response

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APPENDIX G

Colorado Water Conservation Board Cover Letter and Approval

FUTURE TOWN BOARD MEETINGS

Work Sessions & Regular Meetings will be held in the Board Chambers unless otherwise noted.

January 11, 2016 5:30 p.m./1st floor conference room	Board/Manager/Attorney Monthly Meeting Broadband discussion
January 11, 2016 7:00 p.m.	Town Board Meeting Kern Board Meeting
January 18, 2016 6:00 p.m. Aspen Room/ CRC	Town Board Work Session Joint work session with Planning Commission to review draft Comprehensive Plan
January 25, 2016 6:00 p.m.	Town Board Work Session Parks & Recreation Fee Schedule discussion
January 25, 2016 7:00 p.m.	Town Board Meeting
February 1, 2016 6:00 p.m. Aspen Room/CRC	Town Board Work Session Work Session with Fort Collins to review Development Standards
February 8, 2016 5:30 p.m./1st floor conference room	Board/Manager/Attorney Monthly Meeting Downtown Development Authority IGA discussion - Tentative
February 8, 2016 7:00 p.m.	Town Board Meeting
February 15, 2016	Town Board Work Session President's Day – Town Hall closed
February 22, 2016 6:00 p.m.	Town Board Work Session
February 22, 2016 7:00 p.m.	Town Board Meeting
February 29, 2016	Fifth Monday
March 7, 2016 6:00 p.m.	Town Board Work Session
March 14, 2016 5:30 p.m./1st floor conference room	Board/Manager/Attorney Monthly Meeting
March 14, 2016	Town Board Meeting

7:00 p.m.	Kern Board Meeting
March 21, 2016 6:00 p.m.	Town Board Work Session
March 28, 2016 6:00 p.m.	Town Board Work Session
March 28, 2016 7:00 p.m.	Town Board Meeting
April 4, 2016 6:00 p.m.	Town Board Work Session
April 11, 2016 5:30 p.m./1st floor conference room	Board/Manager/Attorney Monthly Meeting
April 11, 2016 7:00 p.m.	Town Board Meeting Kern Board Meeting
April 18, 2016 7:00 p.m.	Town Board Special Meeting Swearing in of Mayor and Town Board Members for Districts 1, 3 & 5
April 25, 2016 6:00 p.m.	Town Board Work Session
April 25, 2016 7:00 p.m.	Town Board Meeting

Additional Events

January 11, 2016; 4 – 6 pm Loveland	Northern Colorado's Building a Better Colorado Summit; attending - Melendez
January 13, 2016; 10 am -1 pm	Aims Public Safety Institute - Ribbon Cutting & Open House; attending – Vazquez, Morgan

Future Work Session Topics

Joint work session with Parks, Recreation & Culture Advisory Board – Parks Master Plan discussion
Water Rights Dedication Policy