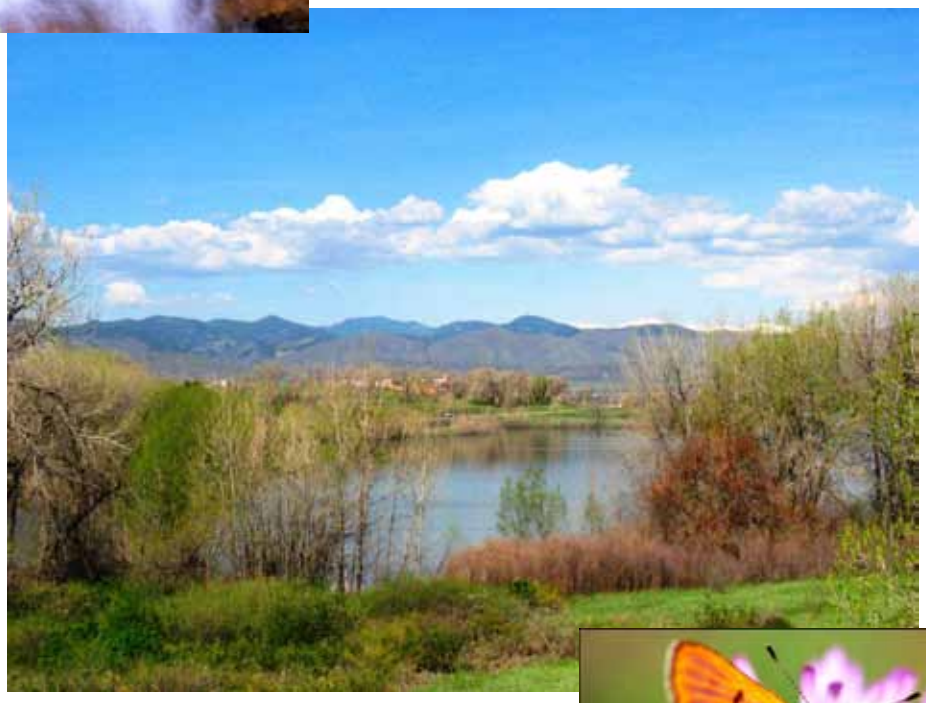
CITY OF ENGLEWOOD
Utilities Department

2013

WATER CONSERVATION PLAN



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EXECUTIVE SUMMARY

The City of Englewood, Colorado ("City" or "Englewood") is a suburban metropolitan community located south of Denver in Arapahoe County. During the past five years, the City of Englewood's population has hovered around 30,000.

Englewood has developed a Water Conservation Plan 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 Englewood for funding from the Colorado Water Conservation Board (CWCB) and the Colorado Water Resources and Power Development Authority for water supply and delivery projects.

In 2011, Englewood's water customers used approximately 5,203 acre-feet. The City, according to the Planning Department's projection, is not expected to increase its water demand through new growth. Water savings from this water conservation planning effort is estimated to save the 6,669 acre-feet over the planning period of 2013 to 2022.

For some of the selected water conservation measures and programs, estimated savings over the planning period is calculated by compounding the estimated annual water savings per the total number of annual participants. The savings from this planning effort will make a considerable contribution toward the water supplies needed to serve the 2022 demand.

This report documents Englewood's water system, past and future water use and the water conservation planning process used in accordance with CWCB's Water Conservation Plan guidelines and policies.

Water Conservation Goals

Englewood has considered water conservation in its planning for many years and has developed a number of measures to promote efficient water use. The City has instituted the following water conservation measures and programs:

- Public Information
- Meter Replacement
    - Englewood Meter Assistance Program (EMAP) - This program helps water customers install meters in homes by allocating a portion of their water bill payment towards the cost of a meter.
- Leak Detection
- Plumbing Code
- Nonpotable and Water Reuse

The City is uncertain of the reduction in water use attributable to the existing water conservation efforts. However, over the ten-year planning period (2013 to 2022), tracking efforts will be implemented to quantify water savings and costs to operate this Water Conservation Plan.

Water savings goals were established for this Water Conservation Plan by completing the following steps:

- Establishing an initial water savings goal estimate
- Selecting water conservation measures or programs to meet those goals
- Comparing the expected water savings to the original goals

In order to select water conservation measures and programs to meet the water savings goals, a universal list of measures and programs were subject to an initial screening, cost-benefit analysis and final screening. This process pared the universal list down to the final selection of measures/programs that Englewood will implement. The screening criteria used consisted of the following:

1. Staff Time
2. Financial implications
3. Political ramifications

The goal for this Water Conservation Plan is to reduce the overall water use by ten percent or 6,669 AF over a ten-year planning period. This savings will come from water use categories that were identified through the planning process for potential water savings:

- Single-Family
- Multi-Family
- Commercial
- Industrial
- Municipal
- Non-Metered Customers – Meter Replacement and EMAP
- Unaccounted-For Losses

The City's water conservation goals are shown in **Table ES-1**.

Table ES-1 – Water Conservation Goals

Water Use Categories:	Total Projected Water Use (2013 to 2022)	Adjusted Reduction Goals for Planning Horizon	
	(AF)	(%)	(AF)
Single-Family	19,642	6.5%	1,277
Multi-Family	11,602	11.0%	1,276
Commercial	10,387	5.5%	571
Industrial	4,778	7.0%	334
Municipal	225	0.5%	1
Non-Metered Customers - Meter Replacement and EMAP	14,010	18.6%	2,603
Unaccounted-for Losses (currently 9%)	5,458	8.0%	606
Total Water Production:	66,102		
Total Demand Reduction:			6,669
Total Percent Reduction:		10%	

Implementation Plan

All of the proposed water conservation measures and programs chosen will require staff and financial resources for implementation. This will require some strategy in implementing the most beneficial measures first. For illustrative purposes, a three-year schedule has been proposed and should be interpreted that Year 1 is the City's first priority of projects followed by Year 2 and then Year 3 and will not be within three years exactly. The proposed implementation of this Water Conservation Plan will occur as the necessary resources become available.

Englewood is committed to implementing the selected water conservation programs and will budget money and pursue CWCB water-efficiency grant money to accomplish this goal. **Table ES-2** shows the implementation schedule of the selected measures/programs.

Monitoring of the Plan will be completed on an annual basis and a formal update is required by CWCB within seven years. Public feedback is an integral part of this Plan and comments were solicited and incorporated into the final Plan.

Table ES-2 – Implementation Plan for Englewood's Water Conservation Plan

Measure/Program		Implementation Considerations
YEAR 1 (1ST PRIORITY)		
Utility Maintenance Programs	Englewood Meter Assistance Program (EMAP)	Staff Time & Funding
Regulatory Standards Program	General Evaluation of Policies that Encourage Water Savings	Staff Time
	Water Waste Ordinance	Staff Time & Governmental Action
Educational Programs	School Education Program (K-12 Education)	Staff Time & Funding
	Online Access to Water Bill and History	Staff Time
YEAR 2 (2ND PRIORITY)		
Regulatory Standard Programs	Drought Mitigation Plan	Funding & Staff Time
Educational Programs	Public Education - Newsletter, Bill Stuffers, Website	Staff Time, Funding & Procurement of Materials
	Distribute ET Irrigation Scheduling in Water Bill	Staff Time, Funding & Procurement of Materials
Rebate and Incentive Programs	Residential water audits	Staff Time, Funding & Procurement of Materials
YEAR 3 (3RD PRIORITY)		
Utility Maintenance Programs	Leak Detection & Repair	Funding & Staff Time
Educational Programs	Educational Kits	Staff Time, Funding & Procurement of Materials
Rebate and Incentive Programs	Commercial & Industrial water audits	Staff Time
Regulatory Standard Programs	Water Rates that Encourage Water Savings	Funding & Staff Time

CHAPTER 1 – INTRODUCTION

The City of Englewood, Colorado ("City" or "Englewood") is a suburban metropolitan community located south of Denver in Arapahoe County. Englewood's beginnings are traced to gold. In the mid-1800s, prospectors on their way to California stopped in Colorado to pan its streams. One of these prospectors was a man from Georgia named William Green Russell. He and 12 other miners found gold in the South Platte River and established a Placer Camp near the confluence of Little Dry Creek and the South Platte River in an area that would eventually become Englewood. Today's Englewood is a distinct reflection of its colorful history. There is still a focus on transportation, education, and the arts, and Englewood boasts more jobs and businesses per square mile than any other city in the Rocky Mountain region. Englewood is located west of the Denver Tech Center, north of Littleton and south of Denver, which gives it its strong employment base.

While Englewood, according to the Planning Department's projection, is not expected to increase its water demand through new growth, a number of multi-family housing projects are being planned. The City of Englewood was incorporated in 1903 with a land area of 4,410 acres. Fifty-eight percent of the land is residential, 35 percent industrial/commercial and seven percent public. The City is landlocked with no appreciable amount of land that can be annexed. During the past five years, the City of Englewood's population has hovered around 30,000.

Englewood has developed this Water Conservation Plan 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 Englewood for funding from the Colorado Water Conservation Board (CWCB) and the Colorado Water Resources and Power Development Authority for water supply and delivery projects.

Englewood is committed to optimizing its water supplies and system through practical water conservation practices. Englewood has also been able to provide water to neighboring communities in need. With added efficiency, the City may have more water to allocate for lease (sale of raw water) outside the City. The planning horizon for this plan is ten years, from 2013 to 2022.

CHAPTER 2 – PROFILE EXISTING WATER SYSTEM

Characteristics of Englewood's Water Supply System

Population and Service Area

The 2010 Census data for Englewood shows a population of 30,255 people. The following table shows Englewood's population for the last six years.

Table 2.1 – City of Englewood Historical Population

Year	Population
2007	32,191
2008	32,191
2009	32,191
2010	30,255
2011	30,255
2012	30,255
Average	**31,223**

Source: Englewood's comprehensive planning process and document, *Roadmap Englewood: Englewood Comprehensive Plan.*

Prior to 1952, the City of Englewood was provided water service by the Denver Water Board. In response to new water meter requirements and proposed higher rates for water service, the citizens of Englewood voted in September 1948 to issue bonds to develop an independent water system to serve the City.

Attorney Marcus Shivers and Charles Allen, the mayor during this period, were the guiding forces in the development of Englewood's water system. Their task was not only to build a water treatment and pump facility to distribute the treated water but also to acquire an adequate raw water supply.

Having secured water rights, the necessary facilities to deliver raw water for treatment and distribution to the City were built. An intake facility to pump raw water was constructed at Union Avenue along the side of the South Platte River. The intake facility consisted of a diversion dam, intake gate, a small reservoir and a pump station. A pipeline was then constructed from the facility to the new treatment plant located at S. Windermere Street and W. Layton Avenue. The treatment plant had a capacity of 25 million gallons per day (MGD) and began operation in April 1952. Two 3-MG reservoirs were also constructed during the fifties to supplement the distribution system supply.

Over the following years, many improvements were made to the system to meet water use demands, pressure problems, and to enhance treatment. The following figures show Englewood's service area and distribution system.

Figure 2.1 – Englewood Water Service Area

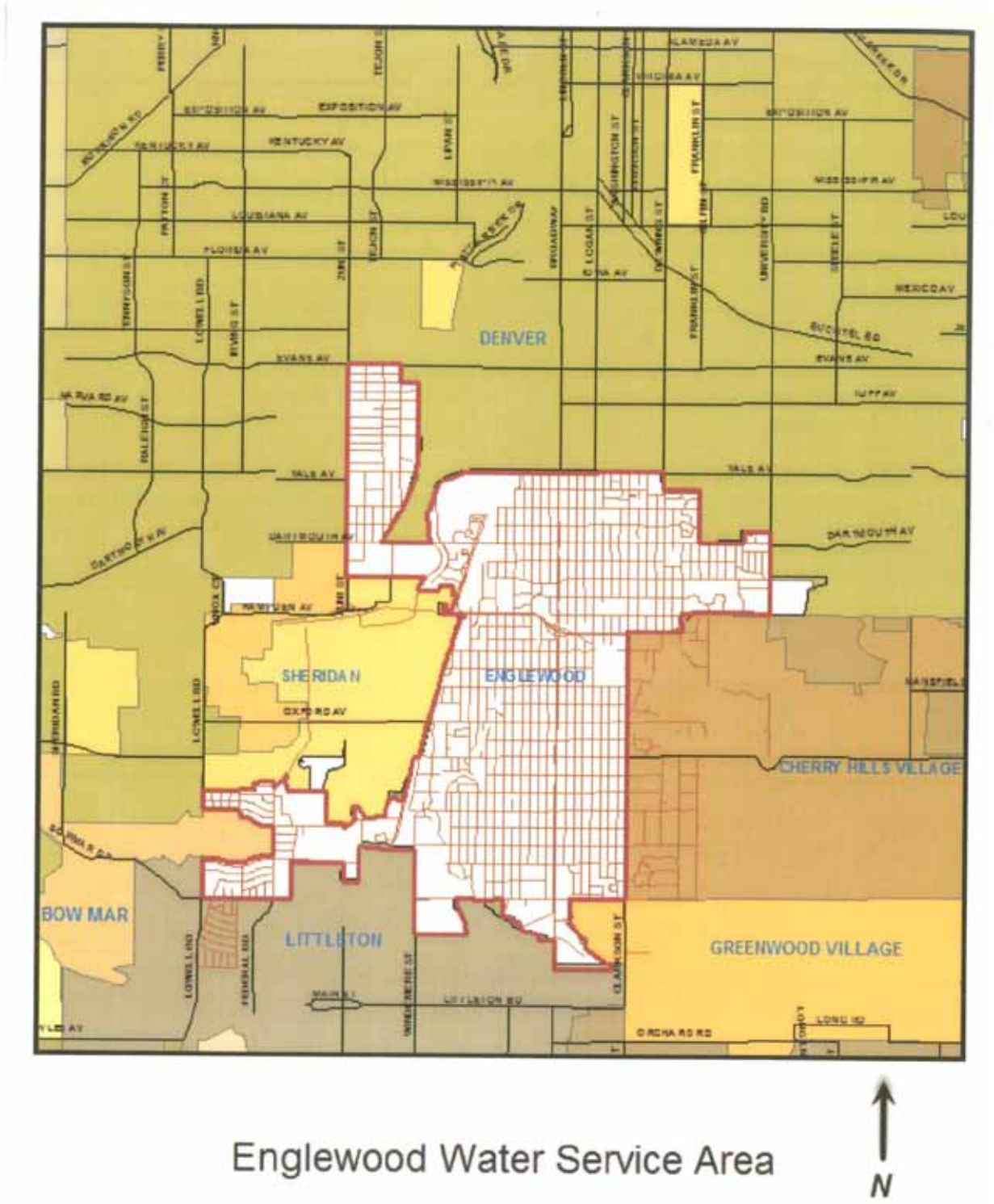
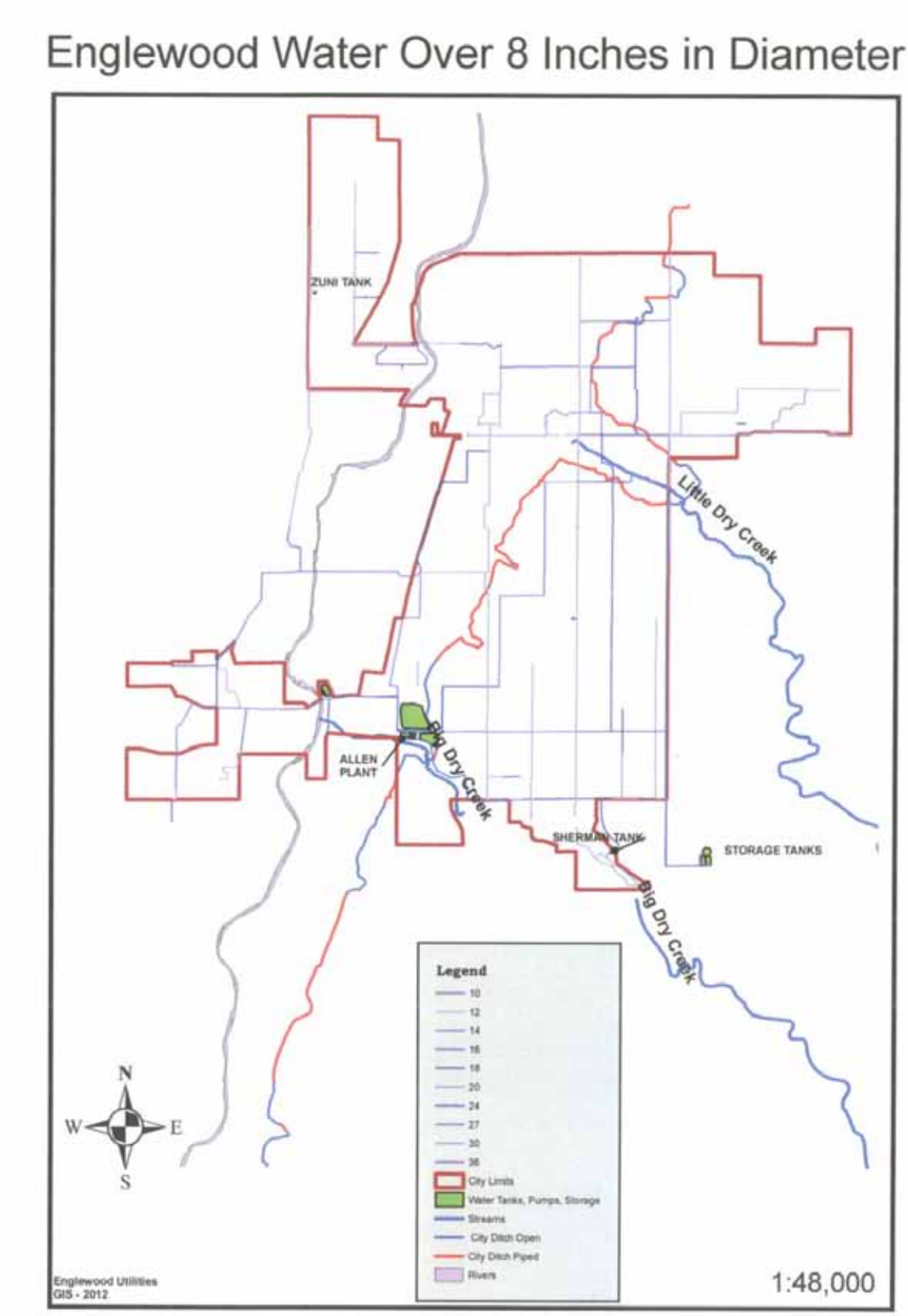


Figure 2.2 – Englewood Water Distribution System



To meet future demand, the raw water supply system was supplemented with several major supply and storage projects to increase the yield of Englewood's water resources. The City constructed McLellan Reservoir on Dad Clark Gulch located near County Line Road and S. Santa Fe. The 6,000 acre-foot reservoir was constructed to provide storage to augment the raw water supply in dry years. Other projects included the piping of the City Ditch and McBroom Ditch, the rehabilitation of the Boreas Pass Ditch, and upgrades to the Union Avenue pumping facilities and associated piping. Also, the City constructed three deep wells to augment the raw water supply.

The City was plagued with water pressure problems during the sixties and seventies as Englewood's population grew. There was insufficient water pressure at several points in the system and the quantities of available water were less than adequate. Several studies were performed during this period with the intent of solving the pressure and supply problem. Several improvements were constructed including the 500,000 gallon Zuni tank, a 6-MG reservoir, and several pump stations in the distribution system. In 1977, the City, still plagued with water pressure problems, adopted a multi-pressure zone system. The water distribution system was segmented into three separate and independent pressure zones. Several large transmission mains were installed to deliver a water supply to the separate zones. Along with the large transmission mains, a 200,000 gallon elevated tank was constructed on Sherman Street south of Belleview. This zoned system proved to finally resolve the pressure supply problem.

The quality of the South Platte River at the Union Avenue Diversion pump station was excellent when the City system was initiated in 1952. The original plant was a softening plant. That was abandoned when the City went to coagulation/filtration. Over the last few decades, several conditions on the South Platte River upstream of Union Avenue led to the degradation of the water. The treatment plant was therefore partially upgraded in 1977, and then more completely so in 1980. The upgrade increased the treatment capacity to 34 MGD; added new chemical coagulation and a multimedia filtration system. By the mid-nineties, the increased nutrients and algae in the South Platte River once again triggered improvements. To meet the challenges, the treatment plant was converted from a direct filtration process to a conventional treatment process. Using plate settlers, new flocculation and sedimentation facilities were incorporated into the existing plant site. In addition, the existing filters were retrofitted with granular activated carbon to improve taste and odor. The new plant addition was online in 2000 with a treatment capacity of 28 MGD. The treatment capacity was lowered due to reduced water demand. The reduced water demand was due to required metering of residential property at the time the property changed hands.

Water Demand

Based on the City's billing system, average water use for the last five years is:

- **Total:** 160 Gallons Per Capita Per Day (GPCD) system-wide
- **Residential:** 89 GPCD for single- and multi-family homes

In 1987, the Englewood City Council passed an ordinance requiring the installation of water meters (and switching to consumption-based rate) at properties receiving flat rates, upon transfer of ownership. An average of 220 meters have been installed annually for the past 25 years, and an associated 30 percent reduction in water use has taken place. By the end of 2011, Englewood was serving 10,670 taps including 8,596 variable rate customers (metered taps) and 2,074 fixed rate customers (non-metered taps). The tap categories include the following:

- Single-Family
- Multi-Family
  - Includes Mobile Home Parks
- Commercial
  - Includes Schools
- Industrial
- Municipal
- Non-Metered Taps

Each of the customer categories are shown in **Figure 2.3** below with the coinciding percentage of total taps (metered and non-metered).

The water use distribution for the same customer categories looks a little different than the tap distribution and is shown below in **Figure 2.4**. While Single-Family water users consist of 80 percent of the taps, they only contribute 43 percent of the water use. Conversely, while Industrial and Commercial taps only consist of ten percent of the taps, they contribute 31 percent of the water use. This is helpful to consider when selecting conservation measures to target certain categories.

Figure 2.3 – Percentage of Taps per Customer Category

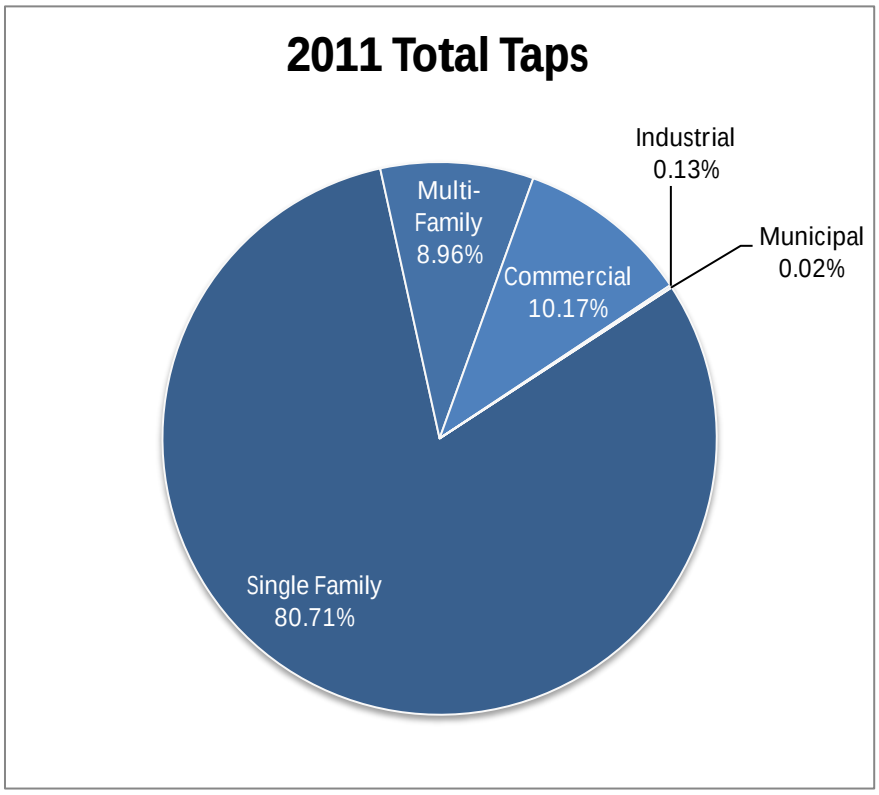
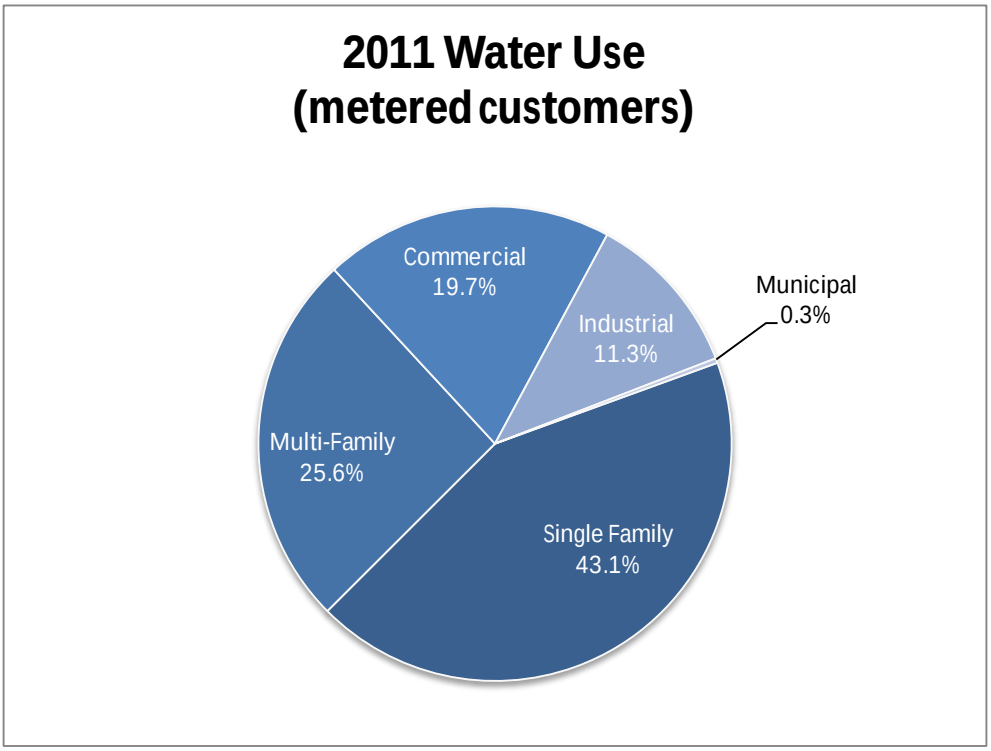


Figure 2.4 – Percentage of Water Use per Category



The following table shows Englewood's overall production for each of the past ten years.

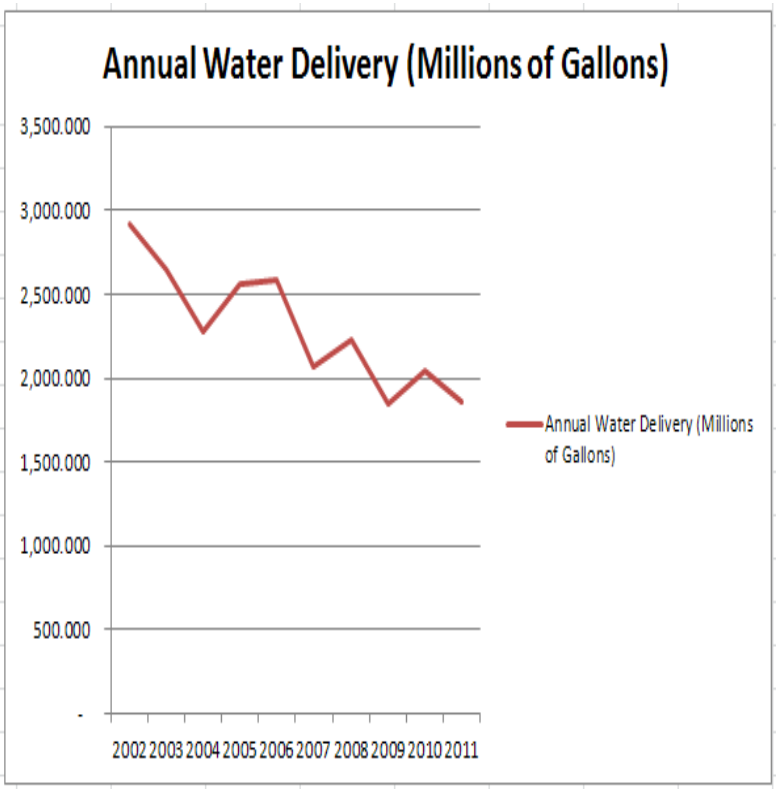
Table 2.2 - Annual Water Delivered (Overall Production) & Associated Precip.

YEAR	Annual Water Delivery (MG)	Annual Water Delivery (AF)	Precipitation (Inches)
2002	2,920.65	8,963	5.96
2003	2,647.29	8,124	13.92
2004	2,273.17	6,976	18.47
2005	2,559.70	7,855	13.54
2006	2,589.76	7,948	11.19
2007	2,070.91	6,355	16.33
2008	2,224.46	6,827	11.15
2009	1,851.71	5,683	24.7
2010	2,040.89	6,263	9.9
2011	1,863.22	5,718	13.4

Notes: MG - Million Gallons, AF - Acre-Feet. Precipitation accounts for rainfall and snowfall

Table 2.2 and **Figure 2.5** shows steady decline in overall water consumption.

Figure 2.5 - Annual Water Delivered (Overall Production)



Sources of Water Supply

The water supplies owned by the City are shown in **Table 2.3** along with their firm yield.

Table 2.3 – Firm Source Water Owned by the City of Englewood

Water Source	Decreed Amounts - acre-feet/yr	
	Consumptive Use	*Single-Use*
Nevada Ditch #4		6,078
Nevada Ditch #19		3,827
Platte Canyon Ditch #14		724
Petersburg Ditch #6		927
Nevada Ditch #4	409	856
Nevada Ditch #19	105	198
McBroom Ditch #1	227	442
Ranch Creek		928
Boreas Ditch	175	
Brown Ditch #9	41	81
Guiraud Ditch #6		85
City Ditch #1		1,363
Aurora Delivery Obligation	339	509
Total	**1,296**	**16,018**
Water Stored*		
North Res.		245
WWRes		43
McLellan		2,000
	Total	**2,288**

*Amounts show for stored water are not firm yields

During the late forties to mid-fifties, Englewood acquired senior water rights from five ditches, which were then transferred in water court to Englewood's South Platte River intake located at Union Avenue. In addition, Englewood acquired rights on two ditches located on Bear Creek and rights on the City Ditch. The City Ditch rights are the number one priority in the South Platte River Basin. The rights to two transmountain diversion projects were also acquired by the City in the fifties. The first was Boreas Ditch located on the continental divide between Como and Breckenridge, which diverts water from the Blue River drainage basin to the South Park area in the South Platte River Basin. The second transmountain diversion rights which the City acquired were the Ranch Creek/Meadow Creek rights, which were the right to collect, store, and divert Fraser River Basin water through Denver's Moffat Tunnel system.

System Limitations

Along with areas of high water use, system limitations can provide insight into how and where to set water conservation goals. Discussions here will include both current and potential system limitations. Ideally, conservation can help mitigate a portion of the limitations and improve the reliability and efficiency of the system.

Statewide Water Supply Initiative

In 2003, the Colorado General Assembly authorized CWCB to implement the Statewide Water Supply Initiative (SWSI) as a result of growing pressure on water supplies in Colorado and the 2002 drought. The study identified current and future water demands, available water supplies, and existing and planned water supply projects in eight major river basins in the State. SWSI was recently updated to SWSI 2010, which projects demands to 2050 and includes passive water conservation savings. Passive savings includes such things as future development using more efficient water fixtures in their building process.

The City of Englewood is located in the Metro Basin where SWSI 2010 identified a 57 percent gap between water needs and water supplies in the Basin by 2050. Water conservation is one method the SWSI report identified for meeting this gap.

Dry-Year Water Supply

Englewood owns several very senior water rights that divert from the South Platte River at Union Avenue. While these water rights provide the City with an ample supply of water, in dry years, such as 2002 and 2012, the low streamflow in the river, together with the demands for water from other senior rights, may result in the City's senior river rights not being able to provide the City with all of the water needed.

Unaccounted-for Water Use

There are two types of water losses that occur in water utilities, apparent losses and real losses. Apparent losses are paper losses that can be caused by customer meter inaccuracies, billing system data errors or unauthorized consumptions. Real losses are those that are physically lost within the distribution system, including the water treatment process.

Englewood staff estimates that system losses have averaged nine percent for the last few years. Even though unaccounted-for water loss ratios of less than ten percent are considered good by industry standards, the City desires to reduce those losses to eight percent.

The City does not have any notable limitation beyond the limitations listed above. Because the City was proactive in their infrastructure planning and construction,

Englewood's water treatment and storage facilities are more than adequate to accommodate their water supplies.

Water Costs and Pricing

Water Fund

The Englewood Utilities Water Fund accounts for revenues and expenses associated with providing water services to City of Englewood residents. The Water Fund is one of the City's Enterprise Funds, which account for operations that: (a) are financed and operated in a manner similar to private business enterprises where the intent of the governing body is that the costs of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges, or (b) where the City Council has decided that periodic determination of revenue earned, expenses incurred and/or net income is appropriate for capital maintenance, public policy, management controls, accountability or other purposes. The Water and Sewer Board provides guidance and oversees the Water and Sewer Enterprise Funds and related activities.

Charges for Water Service

The City of Englewood sets its water and sewer rates based upon cost-of-service principles. Englewood charges only enough to cover the cost of its operations and to maintain a reasonable contingency for emergencies.

All Englewood water and sewer customers are grouped into one of two customer classes (residential or commercial) and by whether they live inside or outside of Englewood. Cost-of-service rates recover costs from each customer class in proportion to the cost of providing the service to each class.

The rates for the Englewood water and sewer service area are approved by the Englewood Water and Sewer Board and the Englewood City Council after a review of the revenue requirements and costs underlying any rate proposal. There is a public comment period (thirty days) prior to the Council's voting on the proposed rates. New rates become effective thirty days after Council approval.

There are two components to Englewood's metered water rates: a per 1,000 gallons consumption charge, and an administrative charge to cover such things as the cost of meter reading and billing. For residences or businesses with water meters larger than 3/4" there is a minimum charge based on the size of the water meter. All customers are billed on a quarterly basis.

Table 2.4 – City of Englewood 2012 Metered Rates Inside City

Quarterly Consumption (per 1,000 gallons)	
First 400,000 gallons	$3.29
All Consumption over 400,000 gallons	$2.04

Inside City Minimum Charge				
Meter Size	Total Quarterly Charge	Admin Fee	Minimum Charge	Consumption Included in Minimum (Gallons)
5/8"	$8.51	$8.51	N/A	None
3/4"	$9.71	$9.71	N/A	None
1"	$83.10	$10.74	$72.36	22,000
1 - 1/4"	$104.25	$12.16	$92.09	28,000
1 - 1/2"	$158.82	$10.81	$148.01	45,000
2"	$249.66	$12.85	$236.81	72,000
3"	$461.66	$17.64	$444.02	135,000
4"	$764.51	$24.48	$740.03	225,000
6"	$1,457.91	$40.41	$1,417.50	450,000

Note: The minimum charge plus the administrative fee equals the Total Quarterly Charge

Table 2.5 – City of Englewood 2012 Metered Rates Outside City

Quarterly Consumption (per 1,000 gallons)	
First 400,000 gallons	$4.61
All Consumption over 400,000 gallons	$3.29

Outside City Minimum Charge				
Meter Size	Total Quarterly Charge	Admin Fee	Minimum Charge	Consumption Included in Minimum (Gallons)
5/8"	$8.58	$8.58	N/A	None
3/4"	$9.22	$9.22	N/A	None
1"	$112.80	$11.36	$101.44	22,000
1 - 1/4"	$142.26	$13.15	$129.11	28,000
1 - 1/2"	$218.12	$10.62	$207.50	45,000
2"	$344.59	$12.60	$331.99	72,000
3"	$639.62	$17.14	$622.49	135,000
4"	$1,057.04	$19.57	$1,037.48	225,000
6"	$2,049.42	$40.52	$2,008.90	450,000

Note: The minimum charge plus the administrative fee equals the Total Quarterly Charge

Englewood's water connection fees are based on the size of the tap, or a combination of multi-family residential units and commercial fixture units. The following tables detail the water system connection charges.

Table 2.6 – Single-Use Water System Connection Charges

Meter Size	Inside City Connection Fee	Outside City Connection Fee
5/8" or 3/4"	$4,360.00	$6,540.00
1"	$7,270.00	$10,905.00
1 - 1/2"	$14,500.00	$21,750.00
2"	$23,300.00	$34,950.00
3"	$46,500.00	$69,750.00
4"	$72,700.00	$109,050.00
6"	$174,400.00	$261,600.00

The multi-family residential water system connection charge is the total of the base fee plus the per-dwelling unit fee. For multi-family water connections, fees shall be the greater of 1) the sum of the multi-family connection fees or 2) the meter sized based connection fee per the Single-Use Water Connection Fee schedule above.

Table 2.7 – Multi-Family Residential Water System Connection Charges

	Inside City	Outside City
Base Fee	$2,620.00	$3,930.00
Dwelling Unit Fees (per dwelling unit)		
First 12 units	$580.00	$870.00
Next 22 units	$450.00	$675.00
Over 3 units	$275.00	$412.00

The Water System Connection Charge for Mixed Use Residential and Commercial properties is the combination of the Multi-Family Residential Connection Charge and the Commercial Mixed Use Water Connection Charge.

Table 2.8 – Commercial Mixed Use Water Connection Charges

	Inside City	Outside City
First 125 Fixture Units	$83.00	$124.50
Next 250 Fixture Units	$35.00	$52.50
Over 375 Fixture Units	$25.00	$26.00

Policies and Planning Initiatives Affecting Water Use

Municipal Code

Englewood's municipal code includes an ordinance in which water shall be used only for beneficial purposes and shall never be wasted. The ordinance specifically prohibits water from being wasted by watering public walks, driveways or streets while irrigating adjacent areas.

Current Water Conservation Activities

The City has instituted the following water conservation measures and programs:

- Public Information
- Meter Replacement
    - Englewood Meter Assistance Program (EMAP)
- Leak Detection
- Plumbing Code
- Non-potable and Water Reuse

Public Information

Currently, the City has an annual newsletter called "The Pipeline" that is sent to all its water users. This newsletter is used to inform the citizens of Englewood about various utility issues including water conservation ideas. Additionally, brochures and information regarding water conservation is readily available at City Hall.

Meter Replacement

The City of Englewood is committed in its effort to meter the entire City to provide an accurate measurement and record of water use to aid in the promotion of water conservation. Metering has been used to make customers more aware of how much water they are using and to equitably distribute the costs of the operation and maintenance of the water system. Presently the City has 80 percent of their customers metered.

The metering program is enforced through the City Code which requires the installation of meters in flat rate homes when the property ownership changes. On a weekly basis the City checks records of transactions in the City and if these transactions indicate that the ownership of a flat-rate account has changed the City immediately sends the owner a notice to install a meter. This requirement was adopted in the Code March 1987, and has been successful in converting approximately 220 flat rate to metered water per year, which has resulted in a 50 percent reduction in peak water use.

The City also has an on-going program of meter repair, replacement and recalibration. The meter reading, repair/calibration and meter purchase are approximately two percent of the budget.

Englewood Meter Assistance Program - Help with switching from flat rate to metered water

If an Englewood water customer is interested in switching from flat rate to a water meter, the Utilities Department has a program that helps manage the expense of switching called the Englewood Meter Assistance Program (EMAP).

Under the flat rate plan (non-metered customers), small families typically pay for more water than they actually use, especially during the winter months. The EMAP program takes the difference between what customers pay for the flat rate and what customers would pay for the metered rate and uses that money to help pay the cost of installing the water meter.

The cost of the meter, yoke and installation is about $500. The yoke is designed to be easy for a homeowner to install, but the Utilities Department will include the cost of a plumber to complete installation in the EMAP program. Details are included in **Figure 2.6** below.

Leak Repair & Maintenance

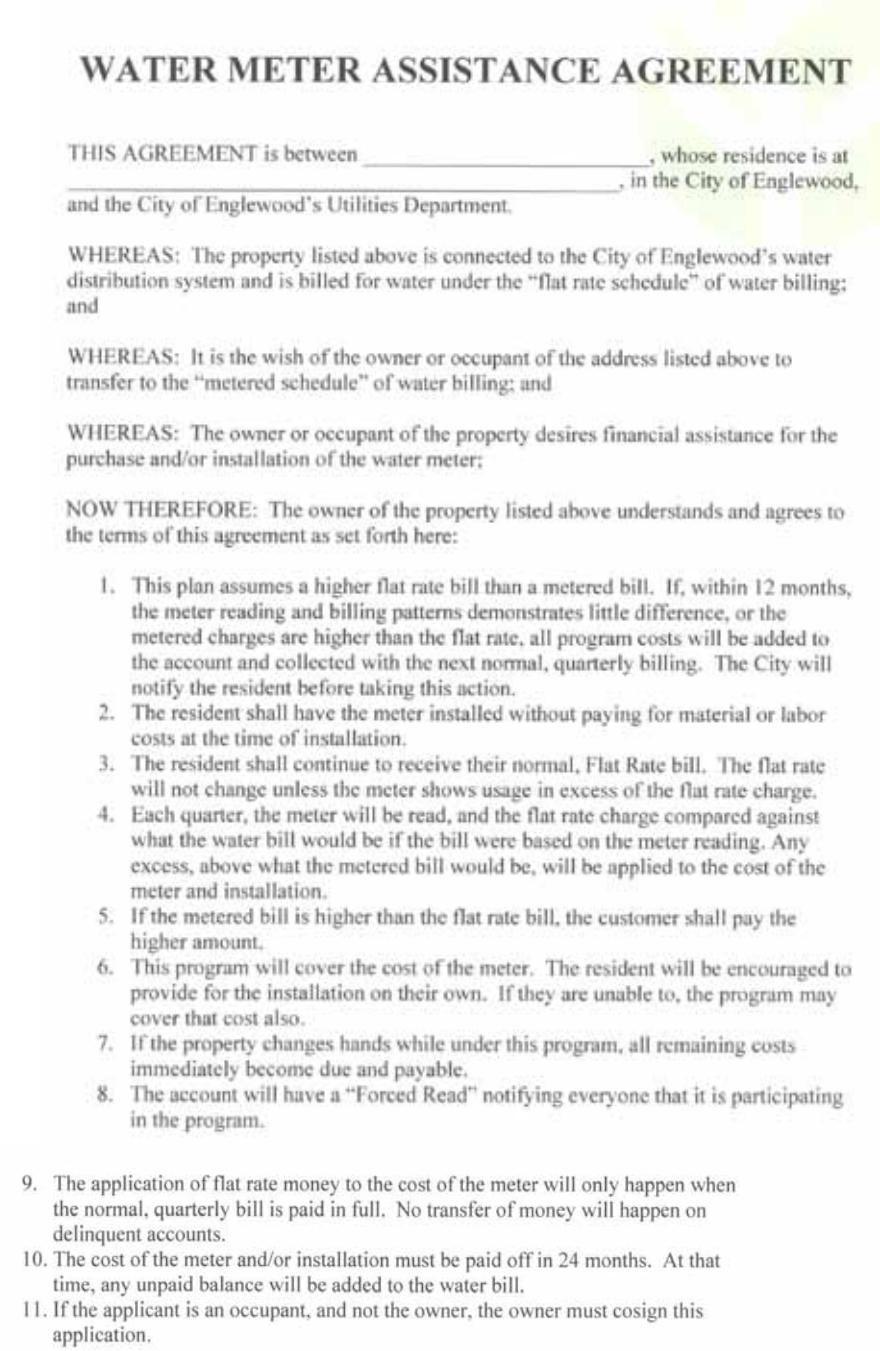
The City of Englewood is making a large effort to reduce the amount of leakage to zero. The City has funded the upgrading and replacement of older deteriorated water mains. This is possible through a capital improvement program, which during the next ten years is expected to spend $500,000 on water system upgrades.

1. The City water department performs leak surveys which include pressure drops, surface water complaints and investigation of dirty water complaints.

2. The City's maintenance crews respond as soon as possible to a report of actual or detected leaks. They assess each situation individually by making the appropriate shutoff to isolate the leak and reduce the volume of lost water.

The City has adopted a systematic repair and replacement program to upgrade its water system and avoid leaks.

Figure 2.6 – EMAP Details



WATER METER ASSISTANCE AGREEMENT

THIS AGREEMENT is between _____, whose residence is at _____, in the City of Englewood, and the City of Englewood's Utilities Department.

WHEREAS: The property listed above is connected to the City of Englewood's water distribution system and is billed for water under the "flat rate schedule" of water billing; and

WHEREAS: It is the wish of the owner or occupant of the address listed above to transfer to the "metered schedule" of water billing; and

WHEREAS: The owner or occupant of the property desires financial assistance for the purchase and/or installation of the water meter;

NOW THEREFORE: The owner of the property listed above understands and agrees to the terms of this agreement as set forth here:

1. This plan assumes a higher flat rate bill than a metered bill. If, within 12 months, the meter reading and billing patterns demonstrates little difference, or the metered charges are higher than the flat rate, all program costs will be added to the account and collected with the next normal, quarterly billing. The City will notify the resident before taking this action.
2. The resident shall have the meter installed without paying for material or labor costs at the time of installation.
3. The resident shall continue to receive their normal, Flat Rate bill. The flat rate will not change unless the meter shows usage in excess of the flat rate charge.
4. Each quarter, the meter will be read, and the flat rate charge compared against what the water bill would be if the bill were based on the meter reading. Any excess, above what the metered bill would be, will be applied to the cost of the meter and installation.
5. If the metered bill is higher than the flat rate bill, the customer shall pay the higher amount.
6. This program will cover the cost of the meter. The resident will be encouraged to provide for the installation on their own. If they are unable to, the program may cover that cost also.
7. If the property changes hands while under this program, all remaining costs immediately become due and payable.
8. The account will have a "Forced Read" notifying everyone that it is participating in the program.
9. The application of flat rate money to the cost of the meter will only happen when the normal, quarterly bill is paid in full. No transfer of money will happen on delinquent accounts.
10. The cost of the meter and/or installation must be paid off in 24 months. At that time, any unpaid balance will be added to the water bill.
11. If the applicant is an occupant, and not the owner, the owner must cosign this application.

Plumbing Code

The City of Englewood's Plumbing Code requires water-saving devices for all new construction. These water-conserving devices include maximum 1.6 gallon-per-flush toilets, 2.5 gallons-per-minute (gpm) faucets and 2.5 gpm showerheads.

Water Reuse and Non-potable Systems

At the present time, the only reusable or fully consumable water rights that Englewood owns are the consumptive use entitlements decreed for the changes of Englewood's interests in the Nevada Ditch, the McBroom Ditch and the Brown Ditch, as well as the Aurora Delivery Obligation and Boreas No. 2 Ditch. However, because Englewood's practice has been to lease these fully reusable entitlements to Centennial Water and Sanitation District, there has been little opportunity for Englewood's actual reuse of these sources. Currently, 100 percent of the backwash at the City water treatment plant is recycled back into the treatment process. The City uses the non-potable water released from the plant for irrigating the turf around the treatment plant.

The City does, however, provide water from the senior, 1860 City Ditch water right which is used to irrigate the Cherry Hills Country Club in Cherry Hills Village and several small customers along the ditch.

Use by Customer Category

In 2011, Englewood's total water production for both metered and non-metered customers was estimated to be 5,203 acre-feet. Non-metered water use was estimated based on the total water production, the known water use for metered customers and the nine percent system loss estimate provided by Englewood staff. **Table 3.1** summarizes water use per customer category from 2005 through 2011.

Table 3.1 – City of Englewood Water Use

	Metered						Non-Metered	
Year	Single Family acre-feet	Multi-Family acre-feet	Commercial acre-feet	Industrial acre-feet	Municipal acre-feet	Total Metered Water Use acre-feet	Estimated Water Use of Non-Metered Customers acre-feet	**Total Water Use** acre-feet
2005	1,832	994	1,307	420	62	4,615	2,534	**7,148**
2006	2,162	1,149	1,314	547	27	5,199	2,034	**7,232**
2007	1,921	1,178	966	545	21	4,630	1,153	**5,783**
2008	2,233	1,058	1,051	419	0	4,761	1,451	**6,212**
2009	1,703	1,419	884	434	14	4,454	717	**5,171**
2010	1,971	1,176	867	473	20	4,507	1,193	**5,700**
2011	1,928	1,147	882	505	14	4,477	726	**5,203**
Average	**1,964**	**1,160**	**1,039**	**478**	**23**	**4,663**	**1,401**	6,064

Notes:
Non-metered water use is estimated by subtracting the total metered water use from the total overall water production, less 9% for system losses

Taps and Water Use Summary

The total number of metered and non-metered taps per customer category is shown in **Table 3.2** through **Table 3.4**.

Table 3.5 shows the estimated metered water use per tap for each customer category from 2005 through 2011.

Table 3.2 – City of Englewood Metered Taps by Customer Category

Year	Single Family taps	Multi-Family taps	Commercial taps	Industrial taps	Municipal taps	**Total Variable Rate Taps**
2005	5,308	650	959	13	7	**6,937**
2006	5,989	740	1,022	12	3	**7,765**
2007	6,088	748	1,017	12	3	**7,867**
2008	6,221	759	1,013	12	3	**8,008**
2009	6,336	766	1,013	12	3	**8,129**
2010	6,572	792	1,063	13	3	**8,442**
2011	6,715	788	1,078	12	3	**8,596**

Table 3.3 – City of Englewood Non-Metered Taps by Customer Category

Year	Single Family taps	Multi-Family taps	Commercial taps	Industrial taps	Municipal taps	**Total Fixed Rate Taps**
2005	2,601	225	8	2	0	**2,836**
2006	2362	201	8	2	0	**2,573**
2007	2,249	188	8	2	0	**2,447**
2008	2,146	177	7	2	0	**2,332**
2009	2,047	175	7	2	0	**2,231**
2010	1,983	169	7	2	0	**2,161**
2011	1,897	168	7	2	0	**2,074**

Table 3.4 – City of Englewood Total Taps by Customer Category

Year	Single Family taps	Multi-Family taps	Commercial taps	Industrial taps	Municipal taps	**Total Taps**
2005	7,909	875	967	15	7	**9,773**
2006	8,351	941	1,030	14	3	**10,338**
2007	8,337	936	1,025	14	3	**10,314**
2008	8,367	936	1,020	14	3	**10,340**
2009	8,383	941	1,020	14	3	**10,360**
2010	8,555	961	1,070	15	3	**10,603**
2011	8,612	956	1,085	14	3	**10,670**

Table 3.5 – City of Englewood Water Use per Tap (metered customers)

Year	Single Family acre-feet/tap	Multi-Family acre-feet/tap	Commercial acre-feet/tap	Industrial acre-feet/tap	Municipal acre-feet/tap
2005	0.35	1.53	1.36	32.34	9.20
2006	0.36	1.55	1.29	45.59	10.63
2007	0.32	1.58	0.95	45.45	7.58
2008	0.36	1.39	1.04	34.94	0.00
2009	0.27	1.85	0.87	36.15	5.43
2010	0.30	1.49	0.82	36.40	8.05
2011	0.29	1.46	0.82	42.11	5.75
Average	**0.32**	**1.55**	**1.02**	**39.00**	**6.66**

Per Capita Water Use

Per capita water use, both system-wide and residential only, is a commonly used way to gage an entity's water use habits. System-wide per capita use can vary significantly between entities depending on the type of non-residential customers within the system.

Englewood averages 171 GPCD system-wide with an estimated 89 GPCD for residential uses from 2007 to 2011 as shown in **Table 3.6**. Due to lack of specific residential water use and population for non-metered customers, the residential GPCD may be skewed.

Table 3.6 – City of Englewood Per Capita Water Use

Year	Total Water Use (Metered and Non-Metered) acre-feet	Metered Residential Water Use (Single and Multi Family) acre-feet	Population	System Wide GPCD	Residential GPCD
2007	5,783	3,098	32,191	160	86
2008	6,212	3,291	32,191	172	91
2009	5,171	3,123	32,191	143	87
2010	5,700	3,147	30,255	168	93
2011	5,203	3,075	30,255	154	91
Average	5,614	3,147	31,417	160	89

Notes:
Non-metered residential use was not included in the residential GPCD calculation because we are unsure of use allocation between non-metered customer categories.

Indoor vs. Outdoor Use

In Colorado, a significant portion of water use typically occurs outdoors for irrigation. To determine Englewood's average outdoor use, we assumed the average residential unit would use 50 percent of their water for outdoor irrigation[1].

Demand Forecast

The majority of Englewood's land area was developed during the post World War II era, between 1945 and 1960. As is evident by the population data presented in **Table 2.1**, Englewood's population growth is limited and not expected to increase during the planning period. Therefore, average water use (See **Table 3.1**) and average water use per tap figures (See **Table 3.5**) for the period of 2005 – 2011 are used to forecast future water use.

[1] According to Denver Water data

CHAPTER 4 - WATER CONSERVATION GOALS

Goal Development Process

The development of water-savings goals for Englewood was a collaborative process involving Clear Water Solutions and City staff. Information was gathered from billing records and existing planning documents to properly characterize the system, resources and water use. Development of this data showed the City's largest water use customer categories, seasonal usage, system limitations and losses, and outlined the City's existing conservation efforts and their estimated effectiveness.

We met with staff to discuss water-savings goals and the potential methods to reach those goals. Initial reduction percentages were established and a universal list of measures and programs were compiled for consideration. The goals focused on the water use areas that could be successfully impacted considering factors such as water savings potential, costs, control, and public acceptance.

Water Conservation Goals

Establishing water conservation goals is an iterative process that begins with quantifying the future demand for water based on current water-use habits and identifying areas water use can feasibly and effectively be reduced. Englewood, according to the Planning Department's projection, is not expected to increase its water demand through new growth. However, the City would still like to reduce overall demand by ten percent in the next ten years.

Discussions with City staff focused on the desire to continue and expand Englewood's EMAP. EMAP takes the difference between what the customer pays for the non-metered rate and what the customer would pay for the metered rate and uses that money to help pay the cost of installing the water meter. Participation in EMAP is optional. If provided a grant by the CWCB, Englewood would like to expand upon their current program by providing 50 to 100 meters at no cost to the customer while the customer continues to pay the flat rate charges, as further incentive for meter replacement. If the customer converts, the money received by the City would go to providing a meter for another flat rate customer.

In addition to the EMAP expansion, City staff discussed possibly expanding educational programs that encourage residential category (Single-Family and Multi-Family water users) water conservation and may also impact the Commercial and Industrial customers as well. City staff discussed the desire to explore performing a water rate study, which would ensure that the City has a fair rate structure that could provide incentives for customers to save water.

In setting initial water savings goals for the City, we looked at the current water use per customer category and the limitations of the water supply system. **Table 4.1** shows initial goals established for each customer category.

Table 4.1 – Englewood Water Conservation Goals

Water Use Categories:	Total Projected Water Use (2013 to 2022)	Reduction Goals for Planning Horizon	
	(AF)	(%)	(AF)
Single-Family	19,642	5.0%	982
Multi-Family	11,602	5.0%	580
Commercial	10,387	2.5%	260
Industrial	4,778	2.5%	119
Municipal	225	0.5%	1.13
Non-Metered Customers - Meter Replacement and EMAP	14,010	19.0%	2,662
Unaccounted-for Losses (currently 9%)	5,458	8.0%	606
Total Water Production:	66,102		
Total Demand Reduction:			5,211
Total Percent Reduction:			8%

Notes:
Unaccounted-For Loss (UL) equals loss rate (above = 9%) times estimated projected water use. Reduction Goal for UL equals the difference between ULs at 9% and the ULs at the reduced rate goal (8.0%).
Non-Metered Customers include Residential, Commercial and Industrial water users

Single-Family and Multi-Family Conservation Goals

The per-capita water use in Englewood is comparable to the average in Colorado. Considering that there are a number of existing measures that can be improved and new measures that can be introduced, the reduction goal was set at five percent for Single-Family and Multi-Family categories.

Commercial and Industrial Conservation Goals

The Commercial category includes but is not limited to hospitality, restaurants, retail, healthcare, car washes, and schools. Because there are many types of Commercial

and Industrial customers, actual savings are difficult to predict. For now, a goal of 2.5 percent is estimated for the Commercial and Industrial categories.

Municipal Conservation Goals

Englewood tracks water use in and surrounding City-owned properties. We estimate that a 0.5 percent savings can be achieved through water conservation measures targeting this category.

Non-Metered Customer Conservation Goals

Eventually, all non-metered customers will be converted to metered customers. We estimate that with the meter replacement and EMAP programs, a 19 percent savings can be achieved through water conservation measures targeting this category.

Unaccounted-for Losses

The average loss in the system due to leaks, record keeping errors, theft, or lack of measurement (non-metered customers) is estimated at about nine percent of the water production. The goal for the City is to reduce the system losses by one percent bringing them to eight percent.

CHAPTER 5 – CONSERVATION MEASURES AND PROGRAMS

Water Conservation Measures and Programs

We developed a universal list of conservation measures and programs. The measures and programs were placed into five major categories: Utility Maintenance Programs, Regulatory Controls and Standards, Educational Programs, Rebates and Incentive Programs, and Audit Programs. The universal list is shown in **Table 5.1** with existing measures highlighted in green.

Screening Criteria

The following screening criteria were compiled based on discussions with staff. The criteria were chosen as a general screening to pare down the universal list to a list of measures and programs to evaluate further, including reviewing costs to implement, expected water savings, and loss of revenue from the water savings. Each measure and program in **Table 5.1** was screened with the following criteria.

1. Staff Time
2. Financial implications
3. Political ramifications

Screening of Conservation Measures and Programs

The purpose of the initial screening was to create a list of measures and programs that would be evaluated further in the planning process via a cost-benefit analysis. A meeting was held with City staff and Water Board to discuss each measure/program on the universal list and eliminate ones that were not feasible using the established screening criteria.

The list of measures was also evaluated to determine if the CWCB Minimum Required Water Conservation Plan Elements were addressed. The required CWCB elements include:

- Water-efficient fixtures and appliances, including toilets, showerheads, and faucets
- Low water use landscapes, drought resistant vegetation, removal of phreatophytes (a deep rooted plant that obtains water from the water table or the layer of soil just above it. Includes cottonwoods, tamarisk, etc.), and efficient irrigation
- Water-efficient industrial and commercial water use processes
- Water reuse systems
- Distribution system leak identification and repair

- Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water-saving demonstrations
- Water rate structures and billing systems designed to encourage water use efficiency in a fiscally responsible manner
- Regulatory measures designed to encourage water conservation
- Incentives to implement water conservation techniques, including rebates to customers

Turf and landscape standards and irrigation system requirements for new construction will be re-evaluated at future planning efforts due to the fact that Englewood is not seeing a large amount of new construction at this point. For water-wise landscaping and efficient irrigation educational programs, Englewood has opted to refer residents to Denver Water's educational programs. Englewood currently does not have the staff resources to build a landscaping and irrigation educational program.

The screening was completed on October 31, 2012 and November 13, 2012. The resulting decisions are noted on **Table 5.1**.

Table 5.1 – Universal List of Conservation Measures and Programs

Conservation Measure or Program		Existing	Further Evaluation	Comment
Supply side measures & programs	**Utility Maintenance Programs**			
	Water Meter Conversion Program	Yes	Yes	The City would like to continue the current program
	Englewood Meter Assistance Program	Yes	Yes	Englewood would like to expand this program
	Meter Testing and Replacement Program	Yes	No	When they have an issue with a bill, then they check and replace meter
	Sub-Meter Mobile Home Parks	No	No	
	Require sub-metering in new multi-family housing	No	No	
	Installing Meters in the Distribution System to	No	No	
	Leak Detection & Repair Program	No	Yes	Rely on a local company to complete
	Leak Detection for Master Meter Communities	No	No	
	Leak Detection in Mobile Home Parks	No	No	
	Billing Software Upgrades	Yes	Yes	Just upgraded - will upgrade every 3 to 5 years
	Water provider facility fixture upgrades (indoor and outdoor)	No	No	Already have newer efficient fixtures in City facilities
	Recycling WTP Filter Backwash	Yes	Yes	Englewood recycles 100% of the backwash water
	Water Reuse System	Yes	Yes	See Recycling WTP Filter Backwash

Conservation Measure or Program		Existing	Further Evaluation	Comment
Demand side measures & programs	**Regulatory Controls and Standards**			
	Water Waste Ordinance	Yes	Yes	The City would like to explore expanding ordinances that prohibit water waste
	Removal of Phreatophytes e.g. Cottonwoods	No	No	City does this but it is not required of the general public
	Drought Mitigation Plan	No	Yes	The City will pursue drought mitigation planning separately from this conservation planning effort.
	Turf and Landscape Restrictions/Standards for New Construction	No	No	Re-evaluate with future planning efforts.
	Irrigation System Requirements/Standards for New Construction	No	No	Re-evaluate with future planning efforts.
	Water Rate Structure Changes	No	Yes	A rate study may be conducted to determine a fair structure that will help maximize water savings.
	General Evaluation of Policies that Encourage Water Savings	No	Yes	City staff would like to evaluate further.
	Educational Programs			
	Billing Statements that Encourage Water Savings	Yes	Yes	Program to be combine with ET Scheduling in Water Bill.
	Children's Water Festival	No	No	
	Xeriscape Garden Demonstration	No	No	Refer to Denver Water's Xeriscape Programs
	Xeriscape Gardening Classes	No	No	
	Xeriscape Program for Commercial	No	No	
	Xeriscape Program for Open Space (HOAs)	No	No	
	School Education Program (K-12 Education)	No	Yes	Each year, Englewood hosts school children at the water treatment plant for water day.
	Post BMPs on Website or as Bill Stuffers	No	Yes	Combined with Public Education -Bill Stuffers & Website Measure below
	Online Access to Water Bill and History	No	Yes	Beginning in 2013, Englewood water customers will be able to access the water bill online
	Educational Kits	No	Yes	Will evaluate further
	Property Manager/HOA Education and Training	No	No	Staff limitations.
	Public Education - Bill Stuffers & Website	No	Yes	Combined with BMP Measure above.
	Send ET Irrigation Scheduling in Water Bill	No	Yes	Combined with Billing Statement Measure above.

Conservation Measure or Program		Existing	Further Evaluation	Comment
	Rebates and Incentive Programs			
	Distribute Pre-rinse Spray Heads to Restaurants & Institutions	No	No	Staff limitations
	Rebate Programs for Toilets, Clothes Washers, Dishwashers, Faucets and Showerheads	No	No	Staff limitations
	Rebates for ET (SMART) Sprinkler System Controllers	No	No	
	Zero Interest Loans for Washers	No	No	Not interested for financial reasons.
	Water Conservation Upgrades for City Facilities-Outdoor	No	No	Re-evaluate with future planning efforts.
	Water Conservation Upgrades for City Facilities-Indoor	No	No	
	Xeriscape Incentives for all customer categories	No	No	
	Irrigation System Efficiency Device Rebates	No	No	Re-evaluate with future planning efforts.
	Wind and/or Rain Sensor Rebates for Residential or Commercial	No	No	
	Low Income Retrofit Program	No	No	Re-evaluate with future planning efforts.
	Commercial Water Audits	No	Yes	City staff would like to evaluate further.
	Residential Audit Kit	No	Yes	City staff would like to evaluate further.
	Sprinkler System Audit Kit and Instructions	No	No	
	Irrigation Audit of City Parks and Properties	No	No	Re-evaluate with future planning efforts.

* Shaded cells represent existing measures.

CHAPTER 6 – EVALUATION AND SELECTION

The initial screening of the measures and programs with City staff resulted in selecting 15 measures for further evaluation. Englewood would like to evaluate many of the eliminated measures with future planning efforts. Some of the measures have been combined as noted in **Table 5.1**. The benefits and costs of the selected measures and programs are shown in **Table 6.1**. The grouping of the measures enabled us to consider like measures and avoid double counting savings. Details about the cost-benefit evaluation and information about each measure can be found in **Appendix A**.

Costs and Water Savings of Conservation Options

Prior to evaluating the potential cost effectiveness of the measures/programs, it is important to understand the magnitude of typical indoor and outdoor uses and the contribution of each to total demand. There is a wide range of use related to each indoor and outdoor measure that can affect the potential water savings and cost effectiveness accordingly. The assumptions for calculating water savings used for this analysis were on the conservative end of the ranges found in the available water conservation research to avoid overestimating savings.

Many resources were used to estimate water savings including Amy Vickers Handbook of Water Use and Conservation, studies and papers from California and Arizona, local studies available from the American Water Resources Association, the Environmental Protection Agency, Western Resource Advocates, information from other Colorado municipalities, and the CWCB website.

Table 6.1 provides a cost-benefit analysis for all of the measures and programs previously identified to be evaluated further. A planning horizon of ten years is used to quantify the full benefit of these measures and programs. The costs and water savings over the planning period are calculated assuming the measures/programs all start in Year One. This provides an equitable ranking of the measures, so they can be compared on an apples-to-apples basis. In reality, the measures and programs will be implemented according to the implementation schedule developed in **Chapters 7** and **8**.

The first four columns (Columns A-D) of **Table 6.1** identify the conservation measure or program and quantify the costs to the City. These costs include annual costs for materials, staff time, and one-time start up costs. The table then quantifies water savings annually and for the entire ten-year planning horizon. Annual water savings and projected lost revenue are based on full

implementation. This gives the City an idea of the anticipated water savings and estimated revenue impacts after full implementation.

The cost per 1,000 gallons of water saved is found by dividing the total cost by the total water savings for the entire ten-year period. The measures and programs are then ranked by cost per 1,000 gallons saved. This ranking helps to determine which measures will be more effective and to suggest a useful order of implementation.

Table 6.1 – Cost/Savings Analysis of Conservation Measures and Programs

	Conservation Measure or Program	Total Cost to Water Provider			# of Participants per Year	Estimated Annual Water Savings (MG)	Estimated Total Water Savings over Planning Period (MG)	Annual Revenue Loss Related to Water Savings	Estimated Annual Cost	Estimated Total Cost over Planning Period including Set-up	Cost per 1000 Gallons Saved	Rank
		One time Labor and Material Cost	Annual Labor	Annual Materials								
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
Supply side measures & programs	**Utility Maintenance Programs**											
	Water Meter Replacement Program	$0	$0	$0	50	5.1	278.9	$0	$0	$0	$0.00	1
	Englewood Meter Assistance Program (EMAP)	$0	$0	$50,000	100	10.1	557.8	$0	$50,000	$500,000	$0.90	4
	Billing Software Upgrades	$110,000	$0	$11,000	0	5.4	26.9	$0	$308,000	$308,000	$11.44	15
	Recycling WTP Filter Backwash	$0	$0	$0	0	21.5	215.4	$0	$0	$0	$0.00	2
	Leak Detection & Repair	$0	$109,362	$0	0	21.5	215.4	$0	$109,362	$218,724	$1.02	5
Demand side measures & programs	**Regulatory Controls and Standards**											
	General Evaluation of Policies that Encourage Water Savings	$750	$0	$0	0	0.037	0.37	$0	$0	$750	$2.05	7
	Water Waste Ordinance	$500	$0	$0	0	4.9	49.2	$16,193	$16,193	$162,430	$3.30	10
	Water Rates that Encourage Water Savings	$40,000	$0	$0	0	30.2	302.4	$99,505	$99,505	$1,035,046	$3.42	11
	Educational Programs											
	School Education Program (K-12 Education)	$0	$800	$500	0	4.1	41.5	$13,638	$14,938	$149,382	$3.60	12
	Educational Kits	$59,900	$0	$0	0	4.1	224.9	$28,573	$28,573	$345,628	$1.54	6
	Public Education - Newsletter, Bill Stuffers, Website	$0	$2,000	$7,757	10,342	13.6	135.7	$44,630	$54,387	$543,869	$4.01	13
	Online Access to Water Bill and History	$0	$0	$0	0	15.1	151.2	$49,752	$49,752	$497,523	$3.29	9
	Distribute ET Irrigation Scheduling in Water Bill	$0	$400	$7,757	10,342	6.8	67.8	$22,315	$30,472	$304,717	$4.49	14
	Rebate and Incentive Programs											
	Commercial & Industrial water audits	$0	$400	$10,500	21	1.8	96.3	$12,181	$23,081	$230,812	$2.40	8
	Residential water audits	$0	$1,000	$0	186	2.7	148.0	$1,447	$2,447	$24,468	$0.17	3

Column Explanations:

(A) Name of conservation measure or program
(B) One time labor and material costs involved in set up program or measure
(C) Labor involved each year for operation of measure or program
(D) Materials needed each year for each unit if listed or for the whole measure or program
(E) Number of participants expected to participate and resulting units or audits needed
(F) Total water savings seen in a year from the measure or program (in million gallons MG)
(G) Total water savings seen over entire ten year planning period; could be based on increasing water demand or a fixed use per account (in MG)
(H) Revenue the water provider will not be paid if the water savings occur.
(I) Total annual cost to water provider plus the annual revenue loss.
(J) Total cost to implement and operate measure or program over entire planning period, including annual operation, one time set up costs
(K) and annual revenue lost due to water savings
(L) Cost per 1000 gallons saved = total cost over planning period divided by total water saved over planning period
Ranks the measures and programs according to the price per 1000 gallons of water saved, lowest to highest

Comparison of Benefits and Costs

The resulting rank of measures by cost-benefit is shown in **Table 6.2** below. The cost per 1,000 gallons saved ranges from $0.00 to $11.44. The measures are ranked fairly evenly throughout the five categories. For the $0.00 per 1,000 gallon saved measures, we did not consider the costs to the City, as the City will continue these measures regardless of cost.

The rankings are a result of the ratio of cost, including lost revenue, to water savings. For instance, billing software upgrades help Englewood save a fair amount of water. However, the cost relative to the water savings is high, so it ranks lower than one might expect. This is only a cost per water saved ranking. There are other factors to consider, which will be accomplished in a second screening.

Table 6.2 – Cost-Benefit Ranking

Rank	Conservation Measures and Programs
1	Water Meter Replacement Program
2	Recycling WTP Filter Backwash
3	Residential water audits
4	Englewood Meter Assistance Program (EMAP)
5	Leak Detection & Repair
6	Educational Kits
7	General Evaluation of Policies that Encourage Water Savings
8	Commercial & Industrial water audits
9	Online Access to Water Bill and History
10	Water Waste Ordinance
11	Water Rates that Encourage Water Savings
12	School Education Program (K-12 Education)
13	Public Education - Newsletter, Bill Stuffers, Website
14	Distribute ET Irrigation Scheduling in Water Bill
15	Billing Software Upgrades

Evaluation Criteria

After each of the conservation measures and programs were ranked by *cost per 1,000 gallons saved*, as shown in **Table 6.2**, the next step was to select conservation measures and programs for implementation. The criteria used for selection are as follows:

1. Staff Time
2. Financial implications
3. Political ramifications

Selected Conservation Measures and Programs

The second screening was accomplished by evaluating each measure/program based on the screening criteria and Englewood's overall goal for this Water Conservation Plan. As mentioned previously, further detail on the conservation measures and programs chosen in the final selection are found in **Appendix A**.

Metering Measures and Programs

Englewood has approximately 11,000 water connections, of which 8,700 are single family homes – All non-residential accounts are metered. There remains 1,750 single family homes yet to be metered, and the City is changing those at a rate of 100-150 per year.

To help customers understand how much water they use and how much that will cost, the City will phase in a fully-metered system (described below). Residents will know how much water they use, and the equivalent usage-based cost vs. flat rate, for a period of time before the metered rate takes effect. The City of Englewood is committed to full metering as a foundational goal for effective conservation planning. The Utilities Department has designed its water metering program in an innovative way that fits its unique conditions while ensuring compliance in a more-defined timeline as follows:

PHASE I - Englewood will immediately begin a voluntary meter installation program/initiative for three years. Englewood Utilities expects 250 new meter conversions per year based on the current mandatory conversion and Englewood Meter Assistance Program (EMAP) in addition to the new metering initiative. This new initiative will start in year 2014 for approximately 100 meters and continue on a rotating-basis. This should result in Englewood becoming fully metered in seven years.

PHASE II - If Phase I doesn't achieve the anticipated/required results (fully metered in seven years), the City will implement an additional program to expedite the pace of meter conversion. We will proactively add 100 new meter conversions per year, which will also encourage the new metered customers to convert to metered rate. This should ensure a fully metered system by year 2019

Residential and Commercial Audits

Currently, City staff performs water audits for customers that notice spikes in their water consumption. A City water technician visits the residents, inspects the meter, audits indoor uses, and searches for leaks. During the irrigation season, the technician will search for irrigation system leaks, inspect the system components, and walk the irrigated areas for overwatering. The City envisions a residential audit program in which

local plumbers may also be utilized to help perform indoor and outdoor water audits for interested residential and multi-family customers.

The City envisions a commercial and industrial audit program in which indoor and outdoor commercial and industrial water audits are be performed by a third party consultant for interested water customers. Since commercial and industrial water use varies so much, City staff does not have the expertise to perform these audits. These third-party audits are an effective way to educate commercial and industrial businesses on how they can save water.

In **Chapter 4**, conservation goals were established for eight customer categories:

- Single-Family: 5% - 982 AF
- Multi-Family: 5% - 580 AF
- Commercial: 2.5% - 260 AF
- Industrial: 2.5% - 119 AF
- Municipal: 0.5% - 1.13 AF
- Non-Metered Customers: 19% - 2,662 AF
- Unaccounted-for Losses: 8% - 606 AF (of savings)

The selected conservation measures/programs 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 6.3** shows the water savings for the selected measures, sub-totaled for each category.

Table 6.3 – Combined Water Savings of Selected Conservation Measures and Programs

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (MG)	Estimated Total Water Savings over Planning Period (MG)
System Losses		
Billing Software Upgrades	5.4	26.9
Recycling WTP Filter Backwash	21.5	215.4
Leak Detection & Repair	21.5	215.4
Subtotal - MG	48.5	457.7
Acre-Feet	149	1,405

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (MG)	Estimated Total Water Savings over Planning Period (MG)
Non-Metered Customer - Meter Replacement and EMAP		
Water Meter Replacement	5.1	278.9
Englewood Meter Assistance Program (EMAP)	10.1	557.8
Water Waste Ordinance	1.1	11.4
Subtotal - MG	16.4	848.1
Acre-Feet	50	2,603
Single-Family		
Water Waste Ordinance	1.6	16.0
Water Rates that Encourage Water savings	12.8	128.0
School Education	3.2	32.0
Educational Kits	4.1	86.0
Public Education	6.4	64.0
Online Access to Water Bill and History	6.4	64.0
Distribute ET Irrigation Scheduling in Water Bill	3.2	32.0
Residential Water Audits	0.08	24.0
Subtotal - MG	37.8	446.1
Acre-Feet	116	1,369
Multi-Family		
Water Waste Ordinance	0.9	9.5
Water Rates that Encourage Water savings	7.6	75.6
School Education	0.9	9.5
Educational Kits	2.5	138.9
Public Education	3.8	37.8
Online Access to Water Bill and History	3.8	37.8
Distribute ET Irrigation Scheduling in Water Bill	1.9	18.9
Residential Water Audits	0.39	124.0
Subtotal - MG	21.8	451.9
Acre-Feet	67	1,387
Commercial		
Water Waste Ordinance	0.8	8.5
Water Rates that Encourage Water savings	6.8	67.7
Public Education	3.4	33.8
Online Access to Water Bill and History	3.4	33.8
Distribute ET Irrigation Scheduling in Water Bill	1.7	16.9
Commercial and Industrial Water Audits	0.7	36.2
Subtotal - MG	16.7	197.0
Acre-Feet	51	604
Industrial		
Water Waste Ordinance	0.4	3.9
Water Rates that Encourage Water savings	3.1	31.1
Online Access to Water Bill and History	1.6	15.6
Commercial and Industrial Water Audits	1.1	60.1
Subtotal - MG	6	111
Acre-Feet	19	340

Conservation Measures and Programs	Estimated Annual Water Savings after full Implementation (MG)	Estimated Total Water Savings over Planning Period (MG)
Municipal		
Evaluation of Policies to Encourage Water Savings	0.04	0.37
Subtotal - MG	0.04	0.37
Acre-Feet	0.11	1.13
Grand Total - (MG)	**147**	**2,512**
Acre-Feet	**452**	**7,708**
Grand Total Savings from Existing Measures (Acre-Feet)	**157**	**3,589**

These savings were compared to the original goals set in **Chapter 4**. As mentioned earlier, water conservation goal setting is an iterative process; original goals are established, conservation measures are evaluated and selected based on appropriate criteria, and the resulting water savings are compared to the original goals. In this case, the resulting water savings are close to the original goals.

Table 6.4 compares the anticipated water savings from the selected measures with the original goals and then adjusts the water-saving goals for this plan.

Table 6.4 – Water Conservation Goals Comparison

Water Use Categories:	Total Projected Water Use (2013 to 2022)	Reduction Goals for Planning Horizon		Total Water Savings from Selected Programs	Resulting Reduction	Adjusted Reduction Goals for Planning Horizon	
	(AF)	(%)	(AF)	(AF)	(%)	(%)	(AF)
Single-Family	19,642	5.0%	982	1,369	7.0%	6.5%	1,277
Multi-Family	11,602	5.0%	580	1,387	12.0%	11.0%	1,276
Commercial	10,387	2.5%	260	604	5.8%	5.5%	571
Industrial	4,778	2.5%	119	340	7.1%	7.0%	334
Municipal	225	0.5%	1	1	0.5%	0.5%	1
Non-Metered Customers - Meter Replacement and EMAP	14,010	19.0%	2,662	2,603	18.6%	18.6%	2,603
Unaccounted-for Losses (currently 9%)	5,458	8.0%	606	1,405	6.7%	8.0%	606
Total Water Production:	66,102						
Total Demand Reduction:			5,211	7,708			6,669
Total Percent Reduction:			8%		12%	10%	

Over the ten-year planning period, the selected measures/programs provide an overall estimated water savings of 7,708 acre-feet. This is higher than the initial water savings goals set in **Chapter 4**. The Non-Metered Customer category goal was adjusted down to 18.6 percent from the initial goal of 19 percent, to reflect the estimated savings from the selected Non-Metered Customer program. Goals for all other categories, with the exception of the Municipal category, were adjusted up from the original City goals. The adjusted goals reflect the goals believed to be obtainable by City staff.

After the goals were adjusted to better reflect the expected water savings, the estimated water use reduction is 6,669 acre-feet or ten percent. Therefore, Englewood will target a reduction in its water use by ten percent over the next ten years because of implementation of this plan.

CHAPTER 7 – INTEGRATE RESOURCES AND MODIFY FORECASTS

Englewood operates in a manner to make the most efficient use of its resources. Each year, a budget is carefully developed with the given funding and personnel available. While water conservation has been an effort that has been gradually incorporated, implementation of the measures and programs selected in this plan will require reevaluation of staff resources and pursuit of additional funding in the form of grants.

Implementation Schedule

Water savings resulting from implementation of this Water Conservation Plan will occur gradually as the City has the resources to implement each selected measure and program and the water users respond to that implementation. Grant availability will be crucial in the timing of implementation.

The following table proposes a schedule of implementation. For illustrative purposes, a three-year schedule has been proposed and should be interpreted that Year 1 is the City's first priority of projects followed by Year 2 and then Year 3 and will not be within three years exactly. The proposed implementation of this Water Conservation Plan will occur as the necessary resources become available.

This table does not include existing measures that are already implemented and are not scheduled for expansion and improvements. Those measures include recycling WTP filter backwash and billing software upgrades. The City will continue these programs as is. However, the City would like to expand upon EMAP, water waste ordinances and the school education program, so these measures are included in the implementation schedule.

Table 7.1 –City of Englewood Water Conservation Plan Implementation Schedule

Measure/Program		Implementation Considerations
YEAR 1 (1ST PRIORITY)		
Utility Maintenance Programs	Englewood Meter Assistance Program (EMAP)	Staff Time & Funding
Regulatory Standards Program	General Evaluation of Policies that Encourage Water Savings	Staff Time
	Water Waste Ordinance	Staff Time & Governmental Action
Educational Programs	School Education Program (K-12 Education)	Staff Time & Funding
	Online Access to Water Bill and History	Staff Time
YEAR 2 (2ND PRIORITY)		
Regulatory Standard Programs	Drought Mitigation Plan	Funding & Staff Time
Educational Programs	Public Education - Newsletter, Bill Stuffers, Website	Staff Time, Funding & Procurement of Materials
	Distribute ET Irrigation Scheduling in Water Bill	Staff Time, Funding & Procurement of Materials
Rebate and Incentive Programs	Residential water audits	Staff Time, Funding & Procurement of Materials
YEAR 3 (3RD PRIORITY)		
Utility Maintenance Programs	Leak Detection & Repair	Funding & Staff Time
Educational Programs	Educational Kits	Staff Time, Funding & Procurement of Materials
Rebate and Incentive Programs	Commercial & Industrial water audits	Staff Time
Regulatory Standard Programs	Water Rates that Encourage Water Savings	Funding & Staff Time

The total cost to implement the conservation plan is $291,625 (this figure includes the costs for the initial year of operation). The implementation schedule will be most affected by available staff time and funding. While this schedule may be optimistic, the goal is to allow time for researching and obtaining grants to develop sound programs for a higher probability of success.

It should be noted that the implementation costs include both cost to implement the water conservation measure/program and staff time associated with the implementation and is not necessarily representative of the capital outlay requirement. Please refer to **Appendix A** for the detailed breakdown of costs for each measure/program.

Modified Demand Forecast and Benefits of Conservation

As mentioned previously, the total projected annual water demand (without water conservation) for Englewood is estimated at 6,046 acre-feet. The anticipated annual savings, after full implementation is approximately 452 acre-feet, reducing the annual demand to 5,594 acre-feet annually.

Benefits of Water Conservation

Because Englewood has sufficient water supply and treatment capacity, this planning effort will not delay any future improvement projects or put off water supply acquisition. However, Englewood is still committed to conserving their water supply for the benefit of their customers and the broader region.

CHAPTER 8 – PLAN OF IMPLEMENTATION AND MONITORING

The schedule for implementation is presented in **Table 7.1** in **Chapter 7**. The process for implementing the plan and monitoring its success is outlined in this chapter.

Public Participation

One of CWCB's requirements for a State-approved Water Conservation Plan is to solicit public comments on the draft plan for not less than a 60-day period unless otherwise specified by City policy.

Through this water conservation planning process, the public was notified and given 60 days to comment. **Appendix B** includes affidavits from the local newspaper and Englewood's Citizen Newsletter that legal notice was published. The plan was available on Englewood's website and at the Utilities Department for review. Written comments and responses to those comments are included in **Appendix C**.

Monitoring and Evaluation

Monitoring the success of this Water Conservation Plan includes measuring water use as well as money spent on the selected conservation measures and programs. Customer class water use will be monitored for programs such as a water rate study. **Table 8.1** presents the information that will be tracked for each measure proposed by the City. More specific monitoring information will be developed as each measure is implemented.

Many of the costs evaluated in the cost-benefit analysis include annual costs for follow up. This will allow staff to specifically set aside time to monitor and evaluate the success of the conservation measures and programs. Expenditures for conservation will be documented by staff and reported to City Council on a regular basis. This will be valuable information in evaluating the cost-benefit ratio and to validate the success of implementing the selected conservation measures and programs. Since the programs will be implemented in phases, there will be time to evaluate and establish the appropriate method to monitor success of each program and measure.

Plan Updates and Revisions

The required schedule for updating the Water Conservation Plan is seven years. The progress towards achieving the water-savings goals will be monitored on an annual basis by Englewood. The City may choose to update this plan prior to seven years if implementation and actual water savings deviate too much from these projections. This deviation may be caused by several factors including

less than anticipated participation and the inability to implement the plan due to lack of staff availability or funding.

Plan Adoption and Approval

After the public comment period, the comments were incorporated into the plan. The Englewood City Council formally adopted the plan prior to submittal to CWCB for final approval. The resolution is attached as **Appendix D**. Implementation will begin after CWCB approval is received. It is only after final CWCB approval that Englewood will be eligible for a water-efficiency grant through CWCB for plan implementation.

Table 8.1 – Tracking Matrix for Monitoring Water Conservation Measures

Conservation Measures and Programs	Number of Rebates/ Giveaways (A)	Individual Customer Water use (B)	Customer Class Water Use (C)	Per Capita water use (D)	Unaccounted for Water (E)	Peak & Annual Treated & Total Water Demand (F)
Water Meter Replacement Program		ü	ü	ü		ü
Recycling WTP Filter Backwash					ü	ü
Residential water audits		ü	ü	ü		ü
Englewood Meter Assistance Program (EMAP)		ü		ü		ü
Leak Detection & Repair				ü	ü	ü
Educational Kits	ü			ü		ü
General Evaluation of Policies that Encourage Water Savings			ü	ü		ü
Commercial & Industrial water audits			ü	ü		ü
Online Access to Water Bill and History			ü	ü		ü
Water Waste Ordinance				ü		ü
Water Rates that Encourage Water Savings			ü	ü		ü
School Education Program (K-12 Education)				ü		ü
Public Education - Newsletter, Bill Stuffers, Website				ü		ü
Distribute ET Irrigation Scheduling in Water Bill				ü		ü
Billing Software Upgrades			ü	ü		ü

NOTES:

(A) The number of rebates and/or giveaways will be tracked for those installations that have been proven.

(B) Water use prior and post installation will be tracked to determine if a savings has occurred.

(C) These measures affect specific customer classes that can be tracked to determine savings.

(D) A reduction in the Gallons per Capita Water Use will show an overall savings

(E) These measures track uses that are not billed but are supply-side related.

(F) Reductions in peak and annual water use will show an overall savings.

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APPENDIX A

Water Conservation Measures

Englewood Meter Replacement Program - Existing Measure

The City is working to convert the flat rate customers to variable rate customers as accounts change owners.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Estimated Annual Water Savings	**5.1**	MG/yr
Estimated Savings over Planning Period	**278.9**	MG

Notes:

Englewood has saved an average 12.8 MG/year for an average of 127 taps/year from 2006-2011 (a savings rate of about 101,411 gal/tap/year).

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of participants for each given year.

Costs

Total Cost to Water Provider

Materials Costs		
Unit Cost	$0.00	/year
Number of Participants	50	/year
Annual Materials	**$0.00**	/year

For this program, material costs are the responsibility of the customer. Labor costs are not considered. The replacement rate is expected to be lower than average, at approximately 50 taps/year.

Estimated Annual Cost	**$0.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$0.00**	
Cost per 1000 Gallons Saved	**$0.00**	

Englewood Meter Assistance Program (EMAP) - Existing Measure

The EMAP program takes the difference between what the customer pays for the non-metered rate and what the customer would pay for the metered rate and uses that money to help pay the cost of installing the water meter. Englewood would like to expand upon their current program by providing 50 to 100 meters, at no cost to the customer, as further incentive for meter replacement.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Estimated Annual Water Savings	**10**	MG/yr
Estimated Savings over Planning Period	**557.8**	MG

Notes:

Englewood has saved an average 12.8 MG/year for an average of 127 taps/year from 2006-2011 (a savings rate of about 101,411 gal/tap/year). The annual savings reflect the replacement of 100 meters. Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of participants for each given year.

Costs

Total Cost to Water Provider

Materials Costs

Unit Cost	$500.00	/unit
Number of Participants	100	/year
Annual Materials	**$50,000.00**	/year

For this program, Englewood would pay the cost to replace the meter. As with the Meter Replacement Program, labor costs are not considered. This program is anticipated to increase the number of meter conversion to a total of 120-150 meters replaced/year combined with the Meter Replacement Program.

Estimated Annual Cost	**$50,000.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$500,000.00**	
Cost per 1000 Gallons Saved	**$0.90**	

Leak Detection and Repair Program

This measure would include electronic leak detection by a third party consultant every 5 years.

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Frequency	2	years

Estimated Water Savings

Annual Estimated Savings Rate	1.0%	
Annual Estimated Water Production without Savings	2,154	MG/yr
Estimated Water Production over Planning Period without Savings	21,539	MG
Estimated Annual Water Savings	**22**	MG/yr
Estimated Savings over Planning Period	**215**	MG

Notes:

Current system leakage/loss rate is estimated at 9%.

The estimated production (without savings) equals the projected water usage plus 9%.

Costs

Total Cost to Water Provider

Labor Costs		
Third Party Costs (Leak Detection Consult)	**$109,362.00**	/year

Notes:

The City may evaluate approximately 50% of their system (water mains) every 5 years. Cost estimate for an outside consultant to perform electronic leak detection is $0.25 per foot. Therefore, a 165.7 mile system of pipeline would total $109,362.00.

Estimated Annual Cost	**$109,362.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$218,724.00**	
Cost per 1000 Gallons Saved	**$1.02**	

Billing Software Upgrades - Existing Measure

Software upgrades allow water providers to quickly and easily retrieve water usage data and relay that data to their customers, helping customers to monitor their water usage and conservation. Software upgrades help staff to identify system problems, faulty meters and distinguish between customer categories. The City upgrades their billing system every three to five years.

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Length	5	years

Estimated Water Savings

Annual Estimated Savings Rate	0.25%	
Estimated Annual Water Savings	**5.4**	MG/yr
Estimated Savings over Planning Period	**26.9**	MG

Notes:

Current system leakage/loss rate is estimated at 9%. Software upgrades are estimated to reduce apparent losses that occur due to billing system errors by a quarter of percent.

The estimated production (without savings) equals the projected water usage plus 9%.

Costs

Total Cost to Water Provider

Annual Materials Costs		
Annual Materials	**$11,000.00**	/year
One Time Labor and Material Costs		
Software Upgrade	**$110,000.00**	

Annual maintenance cost is 10% of upgrade fee. 2011-2012 upgrade fee was approximately $110,000.

Estimated Annual Cost	**$308,000.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$308,000.00**	
Cost per 1000 Gallons Saved	**$11.44**	

Recycling WTP Filter Backwash - Existing Measure

Currently, 100 percent of the backwash at the City waste water treatment plant is recycled back into the treatment process.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Planning Period Savings Rate	1.0%	
Estimated Annual Water Savings	**21.5**	MG/yr
Estimated Savings over Planning Period	**215.4**	MG

Notes:

Englewood estimates that 1% of the total treated water is recycled.

Costs

Total Cost to Water Provider

Materials Costs

Unit Cost	$0.00	/unit
Number of Participants	0	/year
Annual Materials	**$0.00**	/year

Estimated Annual Cost	**$0.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$0.00**	
Cost per 1000 Gallons Saved	**$0.00**	

General Evaluation of Policies that Encourage Water Savings

The City would like to evaluate policies that would encourage Municipal water savings.

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.5%	

Customer Category	Average Water Use MG	*Estimated Annual Water Savings gallons/yr*
Municipal	7	36,674.29

Estimated Annual Water Savings	**0.037**	MG/yr
Estimated Savings over Planning Period	**0.367**	MG

Notes:

This measure affects only the Municipal category. Assume a conservative reduction of 0.25% of projected annual water use.

Costs

Total Cost to Water Provider

One Time Labor and Material Costs	
One Time Materials Cost	$0.00
One Time Staff Costs	$750.00
One Time Labor/Material Cost	**$750.00**

Estimated one time staff costs for Staff to spend approximately 15 hours at $50.00/hour to evaluate current policies within the City.

Estimated Annual Cost	**$0.00**	/year
Estimated Total Cost over Planning Period Including Set-up	**$750.00**	
Cost per 1000 Gallons Saved	**$2.05**	

Water Waste Ordinance - Existing Measure

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Length	1	years

Estimated Water Savings

Annual Estimated Savings Rate	0.25%

Customer Category	Average Annual Water Use (MG/yr)	*Estimated Annual Water Savings MG/yr*
Single-Family	640	1.6
Multi-Family	378	0.9
Commercial	338	0.8
Industrial	156	0.4
Non-Metered Customers (all categories)	457	1.1

Estimated Annual Water Savings	**5**	MG/yr
Estimated Savings over Planning Period	**49**	MG

Notes:

This measure affects all customer categories with the exception of the Municipal category.

Costs

Total Cost to Water Provider

One Time Labor and Material Costs

One Time Staff Labor Costs	$500.00
One Time Material Costs	$0.00
One Time Labor/Material Cost	**$500.00**

Estimated one time staff costs for Staff to spend approximately 10 hours at $50.00/hour to evaluate current policies within the City.

Water Rates

Rate Category	**Current Rates** (per 1000 gallons)
Base Fee for First 400,000 gallons	$3.29

Notes:

The annual revenue loss was estimated based on current in-city rates for all City customers.

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

Estimated Average Annual Revenue without Water Savings	$6,477,186.33	/year
Estimated Average Annual Revenue with Water Savings	$6,460,993.36	/year
Estimated Annual Revenue Loss Related to Water Savings	**$16,192.97**	/year

Estimated Annual Cost	**$16,192.97**	/year
Est. Cost over Planning Period not including Lost Revenue	**$500.00**	
Est. Cost over Planning Period Including Set-up and Lost Revenue	**$162,429.66**	
Cost per 1000 Gallons Saved	**$3.30**	

Water Rate Structure Changes

Based on many water conservation studies, an inclining block water rate design most effectively encourages efficient water use. A rate study may be necessary to ensure maximum water conservation savings.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	2.0%

Customer Category	Water Use MG/yr	*Estimated Annual Water Savings MG/yr*
Single-Family	640	13
Multi-Family	378	8
Commercial	338	7
Industrial	156	3

Estimated Annual Water Savings	**30**	MG/yr
Estimated Savings over Planning Period	**302**	MG

Notes:

Assume a conservative reduction of 2% of projected total billed water. Rate change studies have shown a greater savings (Southwest Florida Water Management District study - 13%).

This measure does not affect non-metered customers

Costs

Total Cost to Water Provider

One Time Labor and Material Costs

One Time City Staff Labor	$10,000.00
Rate Study performed by Consultants	$30,000.00
One Time Labor/Material Cost	**$40,000.00**

Notes:

Labor costs include estimated staff time for researching water rate options and implementing those options (~200 hours at $50/hour).

Costs also include water rate study completed by a Consultant. Before a new rate structure is adopted, a rate study would need to be completed by an outside consulting firm.

Water Rates

Rate Category	Current Rates/Fees
Base Fee for First 400,000 gallons	$3.29

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

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

Estimated Average Annual Revenue without Water Savings	$4,975,229.18	/year
Estimated Average Annual Revenue with Water Savings	$4,875,724.60	/year
Annual Revenue Loss Related to Water Savings	**$99,504.58**	/year

Estimated Annual Cost	**$99,504.58**	/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	**$1,035,045.84**	
Cost per 1000 Gallons Saved	**$3.42**	

Educational Kits

Self-guided residential educational kits can be designed to include items such as leak detection tablets, surveys, and water saving fixtures. 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.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	2.00%

	Water Use (gallons/tap)	Annual Program Participants	Estimated Annual Water Savings (gallons/yr)
Single-Family	104,272	750	1,564,085
Multi-Family	505,069	250	2,525,345

Estimated Annual Water Savings	**4.1**	MG/yr
Estimated Savings over Planning Period	**224.9**	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 following 2005-2011 average:
Single Family = 0.24 af/tap Potable Multi-Family = 1.24 af/tap

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours (Website updates, etc.)	0	/year
Hourly Cost	$50.00	/hour
Annual Staff Costs	$0.00	
Evaluation and Follow up Costs	$0.00	/year
Annual Labor	**$0.00**	/year

One Material Costs	
One Time Materials Cost (Bulk Purchase of 10000 Audit Kits)	**$59,900.00**

Notes:

Online instruction can be set up on City Website.

Residential water conservation educational kits are available at wholesalers like AM Conservation Group, Inc. for $5.99 per unit for a bulk purchase of 10000 units. Kits can be customized to include the Englewood's logo.

Water Rates

Rate Category	Current Rates/Fees
Base Fee for First 400,000 gallons	$3.29

Notes:

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

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

Estimated Average Annual Revenue without Water Savings	$1,472,836.25	/year
Estimated Average Annual Revenue with Water Savings	$1,444,263.42	/year
Annual Revenue Loss Related to Water Savings	**$28,572.82**	/year

Estimated Annual Cost	**$28,572.82**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$59,900.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$345,628.23**	
Cost per 1000 Gallons Saved	**$1.54**	

Public Education - bill stuffers and website

Water providers may periodically provide customers with water conservation tips in water bills, on their website, and at the front desk of their office.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	1.00%

Notes:

Estimated saving for bill stuffers and website education is 1%.

Customer Category	Average Annual Water Use MG	*Estimated Annual Water Savings MG/yr*
Single-Family	640	6.4
Multi-Family	378	3.8
Commercial	338	3.4

Estimated Annual Water Savings	13.6	MG/yr
Estimated Savings over Planning Period	**136**	MG

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	40	/year
Hourly Cost	$50.00	/hour
Annual Labor	**$2,000.00**	/year

Materials Costs

Unit Cost (cost of Bill Stuffers)	$0.75	/participant
Number of Participants	10,342	/year
Annual Materials	**$7,756.50**	/year

Notes:

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

Average 10,342 tap accounts

The AWWA has bill stuffers available for purchase. Average cost per bill stuffer ranged from $0.50 to $0.75 per item.

The City may also purchase bi-lingual bill stuffers and offer bi-lingual information on their website.

Water Rates

Rate Category	**Current Rates** (per 1000 gallons)
Base Fee for First 400,000 gallons	$3.29

Notes:

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

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

Estimated Average Annual Revenue without Water Savings	$4,463,035.40	/year
Estimated Average Annual Revenue with Water Savings	$4,418,405.05	/year
Estimated Annual Revenue Loss Related to Water Savings	**$44,630.35**	/year

Estimated Annual Cost	**$54,386.85**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$97,565.00**	
Revenue	**$543,868.54**	
Cost per 1000 Gallons Saved	**$4.01**	

Online Access to Water Bill & History

Beginning in 2013, Englewood will be able to allow customers to access their water bill history

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	1.0%	

Notes:

This measure was analyzed for metered customers only.

Customer Category	Average Water Use MG	*Estimated Annual Water Savings MG/yr*
Single-Family	640	6.4
Multi-Family	378	3.8
Commercial	338	3.4
Industrial	156	1.6

Estimated Annual Water Savings	**15.1**	MG/yr
Estimated Savings over Planning Period	**151**	MG

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	0	/year
Hourly Cost	$50.00	/hour
Annual Labor	**$0.00**	/year

Notes:

Materials Costs

Unit Cost	$0.00	/participant
Number of Participants	0	/year
Annual Materials	**$0.00**	/year

Water Rates

Rate Category	Current Rates/Fees
Base Fee for First 400,000 gallons	$3.29

Notes:

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

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

Estimated Average Annual Revenue without Water Savings	$4,975,229.18	/year
Estimated Average Annual Revenue with Water Savings	$4,925,476.89	/year
Estimated Annual Revenue Loss Related to Water Savings	**$49,752.29**	/year

Estimated Annual Cost	**$49,752.29**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$0.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$497,522.92**	
Cost per 1000 Gallons Saved	**$3.29**	

Post or Distribute ET Irrigation Scheduling

ET irrigation schedules using historical averages of weather data can be prepared by the City prior to the irrigation season and sent out to all customer categories to reference when programming their irrigation systems. Northern Colorado Water Conservancy District has tools on their website that can aid with this calculation. The schedule could be printed on the bill or posted on the web at the beginning or for the duration of the irrigation season.

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	1.0%	

Customer Category	Average Outdoor Water Use MG	*Estimated Annual Water Savings MG/yr*
Single-Family	320	3.2
Multi-Family	189	1.9
Commercial	169	1.7

Estimated Annual Water Savings	**6.8**	gallons/yr
Estimated Savings over Planning Period	**68**	gallons

Notes:

This measure affects projected outdoor water usage for the customer categories shown.

Estimate that approximately 50% of use is used outdoors.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	8	/year
Hourly Cost	$50.00	/hour
Annual Labor	**$400.00**	/year
Materials Costs		
Unit Cost (cost of Bill Stuffers)	$0.75	/participant
Number of Participants	10,342	/year
Annual Materials	**$7,756.50**	/year

Notes:

Staff hours include time spent preparing schedules. Send out a schedule one time per year. One time costs include schedule program set up.

Average 10,342 tap accounts

Water Rates

Rate Category	**Current Rates/Fees**
Base Fee for First 400,000 gallons	$3.29

Notes:

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

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

Estimated Average Annual Revenue without Water Savings	$2,231,517.70	/year
Estimated Average Annual Revenue with Water Savings	$2,209,202.52	/year
Estimated Annual Revenue Loss Related to Water Savings	**$22,315.18**	/year

Estimated Annual Cost	**$30,471.68**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$81,565.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$304,716.77**	
Cost per 1000 Gallons Saved	**$4.49**	

School Education Program - Existing

Each year, Englewood hosts school children at the water treatment plant for water day.

Planning Period	2013 to 2022	
Years in Planning Period	10	
Program Length	10	years

Estimated Water Savings

Annual Estimated Savings Rate	0.5%	

Customer Category	Average Water Use MG	*Estimated Annual Water Savings MG/yr*
Single-Family	640	3.2
Multi-Family	189	0.9

Estimated Annual Water Savings	**4.1**	gallons/yr
Estimated Savings over Planning Period	**41.5**	gallons

Notes:

This measure only affects Single-Family and Multi-Family metered water usage.

Assume 0.25% savings of projected water usage.

Costs

Total Cost to Water Provider

Labor Costs		
Staff Hours	16	/year
Hourly Cost	$50.00	/hour
Annual Labor	**$800.00**	/year
Materials Costs		
Annual Materials Budget	$500	/year
Annual Materials	**$500.00**	/year

Notes:

Staff hours include time preparing for and participating in water day (16 hours).

Material costs include an annual budget for education materials costs.

Water Rates

Rate Category	**Current Rates/Fees**
Base Fee for First 400,000 gallons	$3.29

Notes:

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

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

Estimated Average Annual Revenue without Water Savings	$621,873.21	/year
Estimated Average Annual Revenue with Water Savings	$608,235.05	/year
Annual Revenue Loss Related to Water Savings	**$13,638.15**	/year

Estimated Annual Cost	**$14,938.15**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$13,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$149,381.54**	
Cost per 1000 Gallons Saved	**$3.60**	

Residential Water Audits

The City envisions a residential audit program in which local plumbers may be utilized to perform water audits for customers.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Residential Water Use Per Tap without Savings

Single-Family	78,204	gallons/tap
Multi-Family	404,055	gallons/tap
Total	482,259	gallons/tap

Annual Estimated Savings Rate	3%	
Annual Program Participants	186	/year
Maximum No. of Participants over Planning Period	1860	

Annual Estimated Residential Water Use Per Tap with Savings

Single-Family	75,858	gallons/tap
Multi-Family	391,934	gallons/tap
Estimated Annual Water Savings	**2.7**	gallons/yr
Estimated Savings over Planning Period	**148**	gallons

Notes:

Estimated Water Use is based on the following 2005-2011 average:
Single Family = 0.24 af/tap Potable Multi-Family = 1.24 af/tap

Estimate that by 2022, 20% of residential accounts (total taps avg 9,294 taps) will have participated (approx. 1860 participants). Assume annual participation of 186 and 3% savings of average household use.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year.

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours (Website updates, etc.)	20	/year
Hourly Cost	$50.00	/hour
Annual Labor	**$1,000.00**	/year

Materials Costs

Unit Cost	$0.00	/participant
Number of Participants	186	/year
Annual Materials	**$0.00**	/year

Notes:

The City may help put plumbers in touch with interested customers.

Water Rates (2012)

Rate Category	Current Rates/Fees
Base Fee for First 400,000 gallons	$3.29

Notes:

The annual revenue loss was estimated based on current rates for all City customers.

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

Estimated Average Annual Revenue without Water Savings	$482,259.48	/year
Estimated Average Annual Revenue with Water Savings	$480,812.70	/year
Annual Revenue Loss Related to Water Savings	**$1,446.78**	/year

Estimated Annual Cost	**$2,446.78**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$10,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$24,467.78**	
Cost per 1000 Gallons Saved	**$0.17**	

Commercial and Industrial Water Audits

Commercial and Industrial customers are often the highest water users and have been an area of increasing focus for water conservation. Commercial and Industrial customers who participate in a water audit could identify ways to reduce their operating costs over the long term. Water audits can be performed by a third party consultant and is an effective way to educate businesses on how they can save water.

Planning Period	2013 to 2022
Years in Planning Period	10
Program Length	10

Estimated Water Savings

Annual Estimated Savings Rate	10%

Customer Category	Water Use Per Tap gallons/tap	Annual Program Participants	*Estimated Annual Water Savings gallons/yr*
Commercial	329,110	20	658,219
Industrial	10,922,526	1	1,092,253

Estimated Annual Water Savings	**1.8**	gallons/yr
Estimated Savings over Planning Period	**96**	gallons

Notes:

Estimated Water Use is based on a 1.01 AF/tap use for Commercial taps and 33.52 AF/tap Industrial taps. This is the average tap use for 2006 through 2011.

Estimated Savings over Planning Period is calculated by compounding the estimated annual water savings per the total number of audit participants for each given year. For example, in the first year of the program, there are 20 participants. In the second year of the program, there are water savings from the 20 participants from last year's program, and new participants thereby compounding the savings.

Costs

Total Cost to Water Provider

Labor Costs

Staff Hours	8	/year
Hourly Cost	$50.00	/hour
Annual Labor	**$400.00**	/year

Materials Costs

Unit Cost	$500.00	/participant
Number of Participants	21	/year
Annual Materials	**$10,500.00**	/year

Notes:

Staff hours include time for coordination with third party consultants.

Consultants may be hired to perform audits at an average cost of approximately $500.00 per audit.

Water Rates (2012)

Rate Category	Current Rates/Fees
Base Fee for First 400,000 gallons	$3.29

Notes:

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

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

Estimated Average Annual Revenue without Water Savings	$176,835.25	/year
Estimated Average Annual Revenue with Water Savings	$164,654.07	/year
Annual Revenue Loss Related to Water Savings	**$12,181.18**	/year

Estimated Annual Cost	**$23,081.18**	/year
Estimated Cost over Planning Period not including Lost Revenue	**$109,000.00**	
Estimated Total Cost over Planning Period Including Set-up and Lost Revenue	**$230,811.82**	
Cost per 1000 Gallons Saved	**$2.40**	

APPENDIX B

Public-Review Process

Legal Publication Invoice

Colorado Community Media

303-566-4100

Colorado Community Media
9137 S. Ridgeline Blvd., Ste. 210
Highlands Ranch, CO 80129
URL: www.ourcoloradonews.com

Cathy Burrage
City of Englewood Utilities Department**
1000 Englewood Pkwy.
Englewood, CO 80110

Acct. #: 00029448
Phone: #:
Post Date: 04/27/2013
Due Date: 05/27/2013

Ad #	Text	Start	Stop	Ins.	Amount	Prepaid	Due
00037986	No.: 4211: WATER	04/26/2013	04/26/2013	1	20.80	0.00	20.80

Payment Terms Net 30

Affidavits will be sent upon receipt of payment.

Total Due **20.80**

Community Media of Colorado

Phone: (303) 566-4089
Email: vortega@ourcoloradonews.com

AFFIDAVIT OF PUBLICATION

State of Colorado)ss
County of Arapahoe

This Affidavit of Publication for the Englewood Herald, a weekly newspaper, printed and published for the County of Arapahoe, State of Colorado, hereby certifies that the attached legal notice was published in said newspaper once in each week, for 1 successive week(s), the last of which publication was made the 26th day of April A.D., 2013, and that copies of each number of said paper in which said Public Notice was published were delivered by carriers or transmitted by mail to each of the subscribers of said paper, according to their accustomed mode of business in this office.

for the Englewood Herald

State of Colorado)
County of Arapahoe)ss

The above Affidavit and Certificate of Publication was subscribed and sworn to before me by the above named Gerard Healey, publisher of said newspaper, who is personally known to me to be the identical person in the above certificate on this 26th day of April A.D., 2013.

VIOLA ORTEGA NOTARY PUBLIC STATE OF COLORADO

My Commission Expires 06/11/16

Notary Public,

PUBLIC NOTICE

OF THE 2013 WATER CONSERVATION PLAN
CITY OF ENGLEWOOD, COLORADO

PUBLIC COMMENT PERIOD:
MAY 1st – JULY 1st, 2013

Notice is hereby given that the City of Englewood, CO is updating its 1997 Water Conservation Plan, pursuant to State law. The City is seeking public comment over the next 60-days.

The City's 2013 Water Conservation Plan is designed to promote the efficient consumption of all water usage by residents, businesses, and local governments to more beneficially use our water resources, and insure a future adequate water supply.

The 2013 Water Conservation Plan is available for review by the public after May 1, 2013 at the Englewood Civic Center, 1000 Englewood Parkway, Englewood, CO during regular business hours and is posted on the City's website at: www.englewoodgov.org. People wishing to comment on the plan can submit written comments to Yasser Abouaish in the Utilities Department at City Hall, or post on the City webpage no later than 5:00 p.m. on Monday, July 1, 2013.

The point of contact for the 2013 Water Conservation Plan is Yasser Abouaish, Englewood Utilities Department at 303-762-2652.

Legal Notice No.: 4211
First Publication: April 26, 2013
Last Publication: April 26, 2013
Publisher: The Englewood Herald

APPENDIX C

Public Comments and Response

2013 ENGLEWOOD WATER CONSERVATION PLAN

COMMENTS AND RESPONSES

The City of Englewood has completed its 60-day public review period for the Water Conservation Plan that began on May 1, 2013 through July 1, 2013. Official notification was posted in the Englewood Herald (copy attached). A complete copy of the Plan was available at Englewood Civic Center and on the City's website. During the public-review period, the City received eight comments on the Plan.

Complete copies of the public comments are found at the end of this Appendix. The following is a summary of the core issues conveyed in the public comments, and Englewood's response.

Xeriscape Programs and Measures

A couple of comments requested the incorporation of Xeriscape programs and incentives. The City did consider Xeriscape programs during the initial screening of potential conservation measures and programs. Based on the City's screening criteria (1. staff time, 2. financial implications and 3. political ramifications), the City does not currently have the staff resources to implement Xeriscape programs and did not feel the programs merited putting money into it. The City will re-evaluate Xeriscape measures and programs with future water conservation planning efforts. Englewood residents are encouraged to utilize Xeriscape landscape.

Turf and Landscape Restrictions/Standards for New Construction

One comment requested that Englewood limit the amount of grass for new homes and businesses and require the use of low water usage grasses. Englewood staff considered turf and landscape restrictions/standards for new construction. Based on the City's screening criteria (1. staff time, 2. financial implications and 3. political ramifications), the City decided to re-evaluate new constructions restrictions and standards with future water conservation planning efforts.

Mandatory Watering Schedule

A resident requested that Englewood go to a mandatory three-day-a-week watering schedule on a permanent basis. While this may be necessary during a water shortage or drought, the City felt that a mandatory three-day-a-week watering schedule is not necessary to reach its water conservation goals.

Water Rates

There were several comments provided regarding water rates. One comment suggested that the City should use a base rate which accounts for the cost of the system operations, plus a reasonable amount of water for household use and

landscaping; (with an allowance for trees and gardens) and then have a surcharge for excessive use, and an even higher rate for usage that is clearly wasteful or abusive. Incorporated into the Conservation Plan is a water rate study. The study will consider all of the elements of this comment and determine if any changes need to be made to Englewood's current water rate structure.

One resident was concerned that the City Code regarding the conversion of flat-rate customers to metered customers was changing to require flat-rate customers to install meters. The City Code is not changing. The Englewood Meter Replacement Program (EMAP) discussed in the Plan is voluntary. EMAP takes the difference between what the customer pays for the non-metered rate and what the customer would pay for the metered rate and uses that money to help pay the cost of installing the water meter. If provided a grant by the CWCB, Englewood would like to expand upon their current program by providing 50 to 100 meters at no cost to the customer while the customer continues to pay the flat rate charges, as further incentive for meter replacement. If the customer converts, the money received by the City would go to providing a meter for another flat rate customer.

The City would like to respond to an inaccuracy regarding Englewood's water rates as compared to Denver's water rates. The comment states that Denver rates are $2.59/1000 gallons plus $6.33 admin fee; Englewood's rate is $3.29/1000 gallons plus a $9.71 admin fee. According to the resident, if you use 10,000 gallons in a billing period you pay $4.26/1000 gallons in Englewood, vs $3.22/1000 gallons in Denver. However, the calculation did not consider that Denver Water bills monthly while Englewood bills on a quarterly basis. If we examine a scenario in which one uses 10,000 gallons per month for a three-month period, an Englewood resident would pay $3.61/1,000 gallons as compared to $3.22/1,000 gallons in Denver.

A comment was made regarding the fact that Englewood's current rate structure charges less per 1,000 gallons for water consumption over 400,000 gallons. The current rate structure is an incentive for industry and large water users and it is unlikely that residents will reach the 400,000 gallon threshold. As mentioned previously, a water rate study will evaluate the current water rates and determine if any changes need to be made to Englewood's current water rate structure.

Rainwater Harvesting and Graywater Reuse

There were a couple of comments made regarding rainwater harvesting and incorporating the practice into this Plan. Capturing rainwater is an ongoing issue in Colorado, and it is not allowed if it will injure vested water rights. For the most part, Colorado law does not allow homeowner to collect or use rainwater runoff from roof unless their only source of water is a well on the property.

In 2009, however, the Colorado State Legislature passed two laws that carve out exemptions from the general rule - The first law says that if you are not served by a domestic water system and you are located in a designated ground water basin or your collection system qualifies as exempt from 37-92-602(1)(g)(I), you are allowed to

capture rainwater for household, fire protection, stock watering and irrigation of up to one acre of lawns and gardens as long as it is applied to uses specified in the well permit that applies to your property. The second law allows the State to participate in a study of 10 new developments to determine the impact of capturing rainwater on streams, rivers and tributary groundwater.

Additionally a couple of comments were made regarding graywater reuse. The term "graywater" means discharges from bathroom and laundry room sinks, bathtubs, showers, laundry machines and other sources authorized by the Colorado Water Quality Control Commission. In May 2013, the Colorado General Assembly passed House Bill 1044, which authorized the use of graywater. The majority of Englewood's water rights do not allow for reuse, particularly if that reuse involves further consumption of the water.

Public Education

A couple of comments were provided regarding public education. Based on the City's screening criteria (1. staff time, 2. financial implications and 3. political ramifications), the City does not currently have the staff resources to devote to educational classes. However, the Plan includes educational kits, public education through newsletter, bill stuffers and the City Website, online access to water bill and history and distribution of ET irrigation scheduling in water bill. The City will re-evaluate education measures and programs with future water conservation planning efforts.

City Building Fixtures

A comment was made that every toilet that is in an Englewood controlled building should be modified or replaced with low usage toilets. Currently, as new toilets and fixtures are needed in City buildings, low water use fixtures are used as a replacement.

Comment 1: *I strongly recommend that everyone involved with the water conservation plan be required to read "Rainwater Harvesting for Drylands and Beyond Vol. 1-3" by Brad Landcaster. I would also like to see the city use more xeriscaping around city facilities. It's baffling why you have lawn around places like the WTP, city maintenance facility, Police station, etc. The only person who ever sets foot on those expanses of grass are the people who mow them, truly a waste of water and maintenance. Allow and implement the use of greywater. Give incentives for xeriscaping. Limit the amount of grass for new homes and businesses and require the use of low water usage grasses. Go to a mandatory 3 day a week watering schedule all of the time.*

Comment 2: *Water is the staff of life…..we all know that. We cannot do without it and our quality of life, particularly here in the dry Western Desert, depends upon the availability of good, clean water. I am sure that is why our civic leaders in Englewood worked so hard to obtain water rights for Englewood—to insure that our quality of life would remain high because we had enough water. In the 1970's, Englewood had a "flat rate" water billing system. We paid in advance, and the city had a stable, absolutely predictable fund to pay the cost of providing water. Our lawns and neighborhoods were green and inviting. The name "Englewood" seemed to describe our green urban forest.*

Now we have water meters and we sell our "excess" water to more affluent neighborhoods. The rationale for this was that by selling our excess water, Englewood would have plenty and our rates would stay lower than surrounding cities.

Unfortunately, this hasn't worked out. Denver rates right now are $2.59/1000 gallons plus $6.33 admin fee; Englewood's rate is $3.29/1000 gallons plus a $9.71 admin fee. If you use 10,000 gallons in a billing period you pay $4.26/1000 gallons in Englewood, vs $3.22/1000 gallons in Denver. As just a side note, if you are one of Englewood's "out of city" metered customers, you only pay an admin fee of $9.22. So much for the theory of "sell off our water and pay less for the water we use."

Over the past several decades, as Englewood's water policy has moved from a flat rate, predictable cost to a metered cost, Englewood's neighborhoods have consistently declined in appearance. Certainly a big part of that has been the fact that bluegrass lawns are water guzzlers and have become very expensive to maintain under the current water pricing system, and as you drive through the city you can see numerous homes with dead or abandoned lawns, but also fewer gardens and more neglected trees. No rational person is going to suggest that we encourage bluegrass lawns, or running water in the gutter. But our policies are not encouraging APPROPRIATE WATER USE to Keep Englewood Beautiful. As the appearance of our neighborhoods continues its decline, so does the desire to live here, raise a family, participate in civic affairs, and so forth. Our water policies have contributed to this decline even though we seem to have enough water to take a more enlightened approach, saving water appropriately, but encouraging water use that keeps Englewood an attractive, livable city. It is vexing to me that Englewood's neighborhoods can't afford the water that we are selling to other, more affluent metro neighborhoods to waste on THEIR lawns and green space, which they seem to do with reckless abandon, even to the point, in Highlands Ranch, of penalizing homeowners who do not use enough water on their lawns. Obviously, they have recognized that people want to live and do business in a city which has visually appealing trees, landscaping, and so forth. We apparently haven't figured that out, even though we already have the water resources.

Obviously, the cost of water is a much small part of a family's budget in a more affluent community than it is in less affluent Englewood. So I see nothing in the proposed Water Conservation Plan to encourage the APPROPRIATE USE of the water Englewood owns to improve the quality of the appearance and livability of the City of Englewood, taking into account that our city is not as affluent as some of our Southern neighbors. For instance, Englewood's development guidelines require trees, and our Concrete Replacement plan requires replacement trees when a tree is removed next to a sidewalk. But our water conservation plan gives no thought to the cost or effort involved in owning a tree, or the water required. Trees are an expensive addition to a homeowner's landscape. They require watering, maintenance, insurance, trimming, and probably eventual expensive removal. I guess a "conservation minded" citizen should simply do without trees. But can you imagine Englewood without trees? Certainly the "wood" part refers to our attractive urban forest. I imagine the growing number of apartment dwellers in Englewood feel that their water rate should be lower, after all they don't have trees, or grass or gardens, or flowers to tend, water and maintain.

So it seems to me that Englewood homeowners should not be disadvantaged when compared to apartment dwellers, or to homeowners in more affluent areas to whom

Englewood sells water. While a homeowner will probably use more water, much of that will to enhance the urban landscape, providing trees and landscaping which enhances all of our quality of life. There is clearly a benefit to the community provided by homeowners who invest in trees and appropriate landscaping, and a water conservation program should recognize this benefit and encourage trees through water pricing. Tree ownership should not be mandated by the City, and then immediately penalized by Englewood's water pricing policy. Similarly, some thought should be given to the social and community benefit provided by a homeowner who has a flower or vegetable garden, enhancing the beauty of the neighborhood and the livability of the urban landscape. These gardens should be encouraged, not penalized by water pricing when compared to the person who only plants a water guzzling bluegrass lawn. Again, isn't it curious that the City of Englewood is now subsidizing a community garden for people (apartment dwellers) who cannot have their own garden, but gives no break to the homeowner who owns, pays taxes on, and provides his own garden area. Additionally, it is curious that this "Conservation Plan" doesn't seem to encourage, or even to allow some innovative conservation techniques, such as grey water systems, rain barrels, low flow toilets, and so forth. Grey water systems should be encouraged when appropriately designed and installed. There is no good reason why bathing or hand washing water cannot be used again for toilet flushing before it passes back into the sanitary sewer system. This does not affect the amount of water available for re-introduction back into the river as treated effluent, but will reduce the amount needed to operate a household. Similarly, cisterns designed to catch and use rainwater for garden or lawn, or household use should be encouraged and allowed. It is curious that Englewood "claims" that runoff rain water creates a storm drainage burden that must be remediated through a tax, but will not allow a homeowner to catch and use that rainwater, thereby eliminating this storm drainage burden. Homeowners should be encouraged to use low flow toilets, low flow showerheads, drip irrigation for flowerbeds and gardens; if not through a rebate program then at least through an education program, classes, product recommendations, and so forth. Some considerable thought should be given to the problems faced by a family trying to plan a family budget and the effects of a constantly changing water bill which seems to be out of their control. A family should be able to predict its water bill with some certainty, even through periods of drought. I suggest that the city should use a base rate which completely accounts for the cost of the system operations, plus a reasonable amount of water for household use and landscaping; (with an allowance for trees and gardens, as mentioned earlier) and then have a surcharge for excessive use, and an even higher rate for usage that is clearly wasteful or abusive. Under this scenario, a family could reasonably plan and know its costs, and would be encouraged to not abuse or waste this water resource, but would be encouraged to have trees, a garden, flowers and so forth. The rate paid by apartment dwellers should take into account that someone else, i.e. homeowners and the City through its parks, is paying the cost of the landscaping amenities, trees, lawns, and so forth which we all enjoy in this SUBURBAN environment In Summary, we all know that waste is bad. Now we need to recognize that the quality of life in Englwood, in the future, will be determined by how we allow and encourage appropriate use of the water resources we own, and which we are constantly reminded that are more than adequate.

Our Conservation Plan should plan for not just water conservation, but should embrace innovative water saving technologies to "stretch" the water we can use, and should ENCOURAGE THE APPROPRIATE USE OF WATER, using our pricing mechanism to insure that we have the kind of landscaping, trees, gardens, flowers and water efficient landscaping that will "Keep Englewood Beautiful" and provide a high quality of life for our residents and businesses.

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I appreciate that this is a ***Water Conservation Plan*** *but I think it concentrates too much on reducing water use including punitive measures, and not enough on efficient use of the resource. I believe the plan should discuss collaboration with other City departments to achieve some of the goals. For instance working with Parks and Recreation for educational seminars and even gardens and alternative grasses for lawns, or Community Development to achieve a balance between landscaping requirements and water use.*

Englewood participates in the Arbor Day Foundations Tree City program promoting a healthy urban forest. Water plays an essential part in maintaining that urban forest. The only mention of trees in the entire plan is on page 25 where it talks about removing native tree species as a way of conserving water! EMC 16-6-7 details required landscaping standards for new development and again this plan doesn't really address the water use issues presented by these City requirements.

Public education is an essential element if this plan is to succeed, but aside from the Pipeline publication, while widely distributed I suspect isn't widely read, there seems to

be little else. In fact, according to Page 27 Xeriscape education is left to Denver Water. While the Water Day for school children is a laudable program, it is the parents who make most of the water use decisions I would hate to see Englewood buried in mountains of crushed rock simply because it requires less water.

Comment 6: *Every toilet that is in an Englewood controlled building should be modified or replaced with low usage ones,,,fire stations, police buildings , court houses ,,,,Englewood. Public buildings,etc ,,all !*

Comment 7: *"Water Conservation Plan" Will we keep the code below? It does not require all flat rate customers to be updated. Is that correct?*

"The Englewood Municipal Code includes a requirement for all flat-rate customers to install approved water meters when they sell or transfer their property. The Code states: "All owners of property having unmetered water service shall be required to install approved water meter within ninety (90) days after the sale or transfer of the property or change in property use from residential to commercial or industrial. Whenever a meter is to be installed, it shall be supplied by the Englewood Utilities Department at the owners cost."

Comment 8: *After reading Mr. Woullard's article in the Hub regarding water conservation, it really peaked my interest as I am one of the 10,00[0] plus homes on a water meter.*

I understand there are 2,074 single family dwellings under the flat rate system, and I am sure several of these homeowners are trying to conserve water. However, there are a percentage of these homes that are taking advantage of this system. I have a neighbor that will use one of the fountain type sprinklers. They will set it in one spot in the morning and it will still be in the same spot in the afternoon. When confronted as to why they would do such a thing there comment is "we don't care we don't pay for water." In addition I drive S. Logan to Belleview to and from work every week. There are a few houses where the water is on in the afternoons prior to 6:00 pm. I do not know whether these homes are metered or on the flat rate system, either way they should not be watering during the heat of the day.

My opinion is that all single family dwellings should have a meter installed sooner than later.

2013 ENGLEWOOD WATER CONSERVATION PLAN

COMMENTS AND RESPONSES

The City of Englewood has completed its 60-day public review period for the water conservation plan that began on May 1, 2013 through July 1, 2013. Official notification was posted in the *Englewood Herald* (copy attached). During the pre-approval period, three newspaper articles were published; an article in the *Denver Post, Your Hub* dated May 29, 2013, "Englewood creates water conservation plan, seeks input," an article in the *Coyote Gulch* dated May 1, 2013, "Englewood rolls out draft water conservation plan #CO drought," and an article in the *Englewood Herald* dated April 26, 2013, "Water plan awaits comment." A complete copy of the plan was available at Englewood Civic Center and on the City's website. During the public-review period, the City received eight comments on the plan.

The following is a list of the comments, summary of the core issues conveyed in the public comments, and Englewood's response.

COMMENTS:

Comment 1: *I strongly recommend that everyone involved with the water conservation plan be required to read "Rainwater Harvesting for Drylands and Beyond Vol. 1-3" by Brad Landcaster. I would also like to see the city use more xeriscaping around city facilities. It's baffling why you have lawn around places like the WTP, city maintenance facility, Police station, etc. The only person who ever sets foot on those expanses of grass are the people who mow them, truly a waste of water and maintenance. Allow and implement the use of greywater. Give incentives for xeriscaping. Limit the amount of grass for new homes and businesses and require the use of low water usage grasses. Go to a mandatory 3 day a week watering schedule all of the time.*

RESPONSE:

Xeriscape Programs and Measures

Several comments requested the incorporation of xeriscape programs and incentives. The City did consider xeriscape programs during the initial screening of potential conservation measures and programs. Based on the City's screening criteria (1. staff time, 2. financial implications and 3. political ramifications), the City does not currently

have the staff resources to implement xeriscape programs and did not feel the programs merited putting money into it. The City will re-evaluate xeriscape measures and programs with future water conservation planning efforts. Englewood residents are encouraged to utilize xeriscape landscape.

Comment 2: *Water is the staff of life…..we all know that. We cannot do without it and our quality of life, particularly here in the dry Western Desert, depends upon the availability of good, clean water. I am sure that is why our civic leaders in Englewood worked so hard to obtain water rights for Englewood—to insure that our quality of life would remain high because we had enough water. In the 1970's, Englewood had a "flat rate" water billing system. We paid in advance, and the city had a stable, absolutely predictable fund to pay the cost of providing water. Our lawns and neighborhoods were green and inviting. The name "Englewood" seemed to describe our green urban forest. Now we have water meters and we sell our "excess" water to more affluent neighborhoods. The rationale for this was that by selling our excess water, Englewood would have plenty and our rates would stay lower than surrounding cities.*

Unfortunately, this hasn't worked out. Denver rates right now are $2.59/1000 gallons plus $6.33 admin fee; Englewood's rate is $3.29/1000 gallons plus a $9.71 admin fee. If you use 10,000 gallons in a billing period you pay $4.26/1000 gallons in Englewood, vs $3.22/1000 gallons in Denver. As just a side note, if you are one of Englewood's "out of city" metered customers, you only pay an admin fee of $9.22. So much for the theory of "sell off our water and pay less for the water we use."

Over the past several decades, as Englewood's water policy has moved from a flat rate, predictable cost to a metered cost, Englewood's neighborhoods have consistently declined in appearance. Certainly a big part of that has been the fact that bluegrass lawns are water guzzlers and have become very expensive to maintain under the current water pricing system, and as you drive through the city you can see numerous homes with dead or abandoned lawns, but also fewer gardens and more neglected trees. No rational person is going to suggest that we encourage bluegrass lawns, or running water in the gutter. But our policies are not encouraging APPROPRIATE WATER USE to Keep Englewood Beautiful. As the appearance of our neighborhoods continues its decline, so does the desire to live here, raise a family, participate in civic affairs, and so forth. Our water policies have contributed to this decline even though we seem to have enough water to take a more enlightened approach, saving water appropriately, but encouraging water use that keeps Englewood an attractive, livable city. It is vexing to me that Englewood's neighborhoods can't afford the water that we are selling to other, more affluent metro neighborhoods to waste on THEIR lawns and green space, which they seem to do with reckless abandon, even to the point, in Highlands Ranch, of penalizing homeowners who do not use enough water on their lawns. Obviously, they have recognized that people want to live and do business in a city which has visually appealing trees, landscaping, and so forth. We apparently haven't figured that out, even though we already have the water resources.

Obviously, the cost of water is a much small part of a family's budget in a more affluent

community than it is in less affluent Englewood. So I see nothing in the proposed Water Conservation Plan to encourage the APPROPRIATE USE of the water Englewood owns to improve the quality of the appearance and livability of the City of Englewood, taking into account that our city is not as affluent as some of our Southern neighbors. For instance, Englewood's development guidelines require trees, and our Concrete Replacement plan requires replacement trees when a tree is removed next to a sidewalk. But our water conservation plan gives no thought to the cost or effort involved in owning a tree, or the water required. Trees are an expensive addition to a homeowner's landscape. They require watering, maintenance, insurance, trimming, and probably eventual expensive removal. I guess a "conservation minded" citizen should simply do without trees. But can you imagine Englewood without trees? Certainly the "wood" part refers to our attractive urban forest. I imagine the growing number of apartment dwellers in Englewood feel that their water rate should be lower, after all they don't have trees, or grass or gardens, or flowers to tend, water and maintain.

So it seems to me that Englewood homeowners should not be disadvantaged when compared to apartment dwellers, or to homeowners in more affluent areas to whom Englewood sells water. While a homeowner will probably use more water, much of that will to enhance the urban landscape, providing trees and landscaping which enhances all of our quality of life. There is clearly a benefit to the community provided by homeowners who invest in trees and appropriate landscaping, and a water conservation program should recognize this benefit and encourage trees through water pricing. Tree ownership should not be mandated by the City, and then immediately penalized by Englewood's water pricing policy. Similarly, some thought should be given to the social and community benefit provided by a homeowner who has a flower or vegetable garden, enhancing the beauty of the neighborhood and the livability of the urban landscape. These gardens should be encouraged, not penalized by water pricing when compared to the person who only plants a water guzzling bluegrass lawn. Again, isn't it curious that the City of Englewood is now subsidizing a community garden for people (apartment dwellers) who cannot have their own garden, but gives no break to the homeowner who owns, pays taxes on, and provides his own garden area. Additionally, it is curious that this "Conservation Plan" doesn't seem to encourage, or even to allow some innovative conservation techniques, such as grey water systems, rain barrels, low flow toilets, and so forth. Grey water systems should be encouraged when appropriately designed and installed. There is no good reason why bathing or hand washing water cannot be used again for toilet flushing before it passes back into the sanitary sewer system. This does not affect the amount of water available for re-introduction back into the river as treated effluent, but will reduce the amount needed to operate a household.

Similarly, cisterns designed to catch and use rainwater for garden or lawn, or household use should be encouraged and allowed. It is curious that Englewood "claims" that runoff rain water creates a storm drainage burden that must be remediated through a tax, but will not allow a homeowner to catch and use that rainwater, thereby eliminating this storm drainage burden. Homeowners should be encouraged to use low flow toilets, low flow showerheads, drip irrigation for flowerbeds and gardens; if not through a rebate program then at least through an education program, classes, product recommendations, and so forth. Some considerable thought should be given to the problems faced by a family trying to plan a family budget and the effects of a constantly

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RESPONSE:

See prior response on "Xeriscape Programs and Measures".

Water Rates

There were several comments provided regarding water rates. One comment suggested that the City should use a base rate which accounts for the cost of the system operations, plus a reasonable amount of water for household use and landscaping; (with an allowance for trees and gardens) and then have a surcharge for excessive use, and an even higher rate for usage that is clearly wasteful or abusive. Incorporated into the conservation plan is a future water rate study. The study will consider all of the elements of this comment and determine if any changes need to be made to Englewood's current water rate structure.

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A couple of comments were provided regarding public education. Based on the City's screening criteria (1. staff time, 2. financial implications and 3. political ramifications), the City does not currently have the staff or financial resources to devote to educational classes. However, the plan includes educational kits, public education through newsletter, bill stuffers and the city website, online access to water bill and history and distribution of ET irrigation scheduling in water bill. The City will re-evaluate education measures and programs with future water conservation planning efforts.

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RESPONSE:

A comment was made regarding the fact that Englewood's current rate structure charges less per 1,000 gallons for water consumption over 400,000 gallons. The current rate structure recognizes that large users, as a class, do not contribute to the peaking cost of the system as much as the smaller users. It is unlikely that residents will reach the 400,000 gallon threshold. As mentioned previously, a future water rate study will evaluate the current water rates and determine if any changes need to be made to Englewood's current water rate structure.

Comment 4: *Table 2.2. Where are the Rainfall numbers from? Englewood, Watershed from where we get our water, snowpack, does it exclude our snowfall, etc.? …. I'd like to see a reference. Figure 2.5. on the Y axis it is really easy to (mentally) put a comma where there is a period in the Y values; I would recommend using the number without decimals (e.g.1000) or with only one decimal (e.g. 1000.0) ….. or just use billion gallons with one decimal. Pretty amazing how water use has gone down (3 billion to 2 billion) …. Something was really done right to get this to happen! Figures 2.1 and 2.2 need to be readable (higher resolution?). Figure 2.2. Englewood Water (Mains/Lines?) over 8 inches in Diameter. I know what you mean but citizens might not.*

RESPONSE:

The rainfall numbers come from the National Weather Service out of Denver International Airport. Other recommended corrections are being taken into consideration.

Comment 5: *I've attached a brochure from the City of Calgary, Alberta, that encourages residents to collect rainwater for their landscape watering. I suggest that Englewood consider this practice. Ottawa, Ontario, Convention Centre collects rainwater for toilet and urinal flushing saving 359,000 gallons per year--another practical conservation approach.*

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RESPONSE:

Rainwater Harvesting and Graywater Reuse

There were a couple of comments made regarding rainwater harvesting and incorporating the practice into this plan. Capturing rainwater is an ongoing issue in Colorado, and it is not allowed if it will injure vested water rights. For the most part, Colorado law does not allow homeowner to collect or use rainwater runoff from roofs unless their only source of water is a well on the property.

In 2009, however, the Colorado State Legislature passed two laws that carve out exemptions from the general rule. The first law says that if you are not served by a domestic water system and you are located in a designated ground water basin or your collection system qualifies as exempt from 37-92-602(1)(g)(I), you are allowed to capture rainwater for household, fire protection, stock watering and irrigation of up to one acre of lawns and gardens as long as it is applied to uses specified in the well permit that applies to your property. The second law allows the State to participate in a study of 10 new developments to determine the impact of capturing rainwater on streams, rivers and tributary groundwater.

Additionally a couple of comments were made regarding graywater reuse. The term "graywater" means discharges from bathroom and laundry room sinks, bathtubs, showers, laundry machines and other sources authorized by the Colorado Water Quality Control Commission. In May 2013, the Colorado General Assembly passed House Bill 1044, which authorized the use of graywater. The majority of Englewood's

water rights do not allow for reuse, particularly if that reuse involves further consumption of the water.

See prior response, “Xeriscape Programs and Measures.”

Comment 6: *Every toilet that is in an Englewood controlled building should be modified or replaced with low usage ones fire stations, police buildings, court houses Englewood Public buildings, etc. all !*

RESPONSE:

City Building Fixtures
A comment was made that every toilet that is in an Englewood controlled building should be modified or replaced with low usage toilets. Currently, as new toilets and fixtures are needed in City buildings, low water use fixtures are used as a replacement.

Comment 7: *“Water Conservation Plan" Will we keep the code below? It does not require all flat rate customers to be updated. Is that correct?*

RESPONSE:

Metering
The Englewood Municipal Code includes a requirement for all flat-rate customers to install approved water meters when they sell or transfer their property. The Code states: All owners of property having unmetered water service shall be required to install approved water meter within ninety (90) days after the sale or transfer of the property or change in property use from residential to commercial or industrial. Whenever a meter is to be installed, it shall be supplied by the Englewood Utilities Department at the owners cost.

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I understand there are 2,074 single family dwellings under the flat rate system, and I am sure several of these homeowners are trying to conserve water. However, there are a percentage of these homes that are taking advantage of this system. I have a neighbor that will use one of the fountain type sprinklers. They will set it in one spot in the

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My opinion is that all single family dwellings should have a meter installed sooner than later.

RESPONSE:

See prior response, “Metering.”

Mandatory Watering Schedule
A resident requested that Englewood go to a mandatory three-day-a-week watering schedule on a permanent basis. While this may be necessary during a water shortage or drought, the City felt that a mandatory three-day-a-week watering schedule is not necessary to reach its water conservation goals.

Xeriscape Programs and Measures
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Turf and Landscape Restrictions/Standards for New Construction
One comment requested that Englewood limit the amount of grass for new homes and businesses and require the use of low water usage grasses. Englewood staff considered turf and landscape restrictions/standards for new construction. Based on the City's screening criteria (1. staff time, 2. financial implications and 3. political ramifications), the City decided to re-evaluate new constructions restrictions and standards with future water conservation planning efforts.

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One resident was concerned that the City Code regarding the conversion of flat-rate customers to metered customers was changing to require flat-rate customers to install meters. The City Code is not changing. The Englewood Meter Replacement Program (EMAP) discussed in the Plan is voluntary. EMAP takes the difference between what the customer pays for the non-metered rate and what the customer would pay for the metered rate and uses that money to help pay the cost of installing the water meter. If provided a grant by the CWCB, Englewood would like to expand upon their current program by providing 50 to 100 meters at no cost to the customer while the customer continues to pay the flat rate charges, as further incentive for meter replacement. If the customer converts, the money received by the City would go to providing a meter for another flat rate customer.

The City would like to respond to an inaccuracy regarding Englewood's water rates as compared to Denver's water rates. The comment states that Denver rates are $2.59/1000 gallons plus $6.33 admin fee; Englewood's rate is $3.29/1000 gallons plus a $9.71 admin fee. According to the resident, if you use 10,000 gallons in a billing period you pay $4.26/1000 gallons in Englewood, vs $3.22/1000 gallons in Denver. However, the calculation did not consider that Denver Water bills monthly while Englewood bills on a quarterly basis. If we examine a scenario in which one uses 10,000 gallons per month for a three-month period, an Englewood resident would pay $3.61/1,000 gallons as compared to $3.22/1,000 gallons in Denver.

A comment was made regarding the fact that Englewood's current rate structure charges less per 1,000 gallons for water consumption over 400,000 gallons. The current rate structure is an incentive for industry and large water users and it is unlikely that residents will reach the 400,000 gallon threshold. As mentioned previously, a water rate study will evaluate the current water rates and determine if any changes need to be made to Englewood's current water rate structure.

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In 2009, however, the Colorado State Legislature passed two laws that carve out exemptions from the general rule - The first law says that if you are not served by a domestic water system and you are located in a designated ground water basin or your collection system qualifies as exempt from 37-92-602(1)(g)(I), you are allowed to capture rainwater for household, fire protection, stock watering and irrigation of up to one acre of lawns and gardens as long as it is applied to uses specified in the well permit that applies to your property. The second law allows the State to participate in a study of 10 new developments to determine the impact of capturing rainwater on streams, rivers and tributary groundwater.

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City Building Fixtures

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Water Rate Comparison *

Englewood Vs. Denver

***Based on:**

- **Single-family residential**
- **Size ¾ inch meter**

Assumptions:

- **120,000 Gal Total Annual Consumption**
- **8,000 Gal per month for 9 months**
- **16,000 Gal per month for 3 months (Summer)**

Category (Average Month)	ENGLEWOOD	DENVER (Inside)	DENVER (Outside)
Service Charge	$ 3.24	$ 6.33	$ 6.33
Consumption Cost	$32.90	$29.14	$32.96
Total monthly Bill	$36.14	$35.47 - $0.67 diff.	$39.29 + $3.15 diff.

Assumptions:

- **150,000 Gal Total Annual Consumption**
- **10,000 Gal per month for 9 months**
- **20,000 Gal per month for 3 months (Summer)**

Category (Average Month)	ENGLEWOOD	DENVER (Inside)	DENVER (Outside)
Service Charge	$ 3.24	$ 6.33	$ 6.33
Consumption Cost	$41.12	$38.20	$43.22
Total monthly Bill	$44.36	$44.53 + $0.17 diff.	$49.55 + $5.19 diff.

APPENDIX D

Englewood City Council Adoption