



Memo

To: City of Westminster – Stu Feinglas, CWCB – Kevin Reidy

From: Peter Mayer, P.E.

Date: August 1, 2011

Re: 50% Completion Report for Westminster Water Conservation Plan

Aquacraft, Inc. is working with the City of Westminster to prepare a water conservation plan for the City. Westminster applied for and received a conservation planning grant to help fund this project. One of the requirements of this grant is that the City submit 50% completion report that documents the status of the project at a point in time. According to Colorado statute, the progress report may also include:

- The success of meeting previously identified goals and objectives
- Obstacles encountered
- Preliminary findings or accomplishments
- Potential need for revisions to the scope of work and timelines

Project Tasks

As specified in the grant application, this project has the following major tasks:

Task 1.1 – Apply for CWCB Water Conservation Planning Grant (completed)

Task 1.2 – Profile City of Westminster Water System, Current Demand, Growth Estimates, Demand Projections, Conservation Program, and Proposed Facilities (completed)

Task 1.3 – Integrate Results from Water Conservation Verification Study (Project 2) (90% complete)

Task 1.4 – Develop Water Conservation Implementation Scenario (50% complete)

Task 1.5 – Model Conservation Scenarios and Develop Benefit-Cost Analysis

Task 1.6 – Revise Demand Forecasts to Incorporate Selected Water Conservation Program

Task 1.7 – Finalize Draft Conservation Plan with City Staff

Task 1.8 – Project Coordination – Project Meetings, Plan Presentation, Public Review Process, Submission of Plan to CWCB, and On-Going Technical Support (30% complete)

Success Meeting Goals

The project team has met all identified project goals and objectives to date. The conservation planning project is on schedule and on budget. It is anticipated that City staff will begin reviewing the draft water conservation plan in late August.

Obstacles Encountered

The project team has not encountered any significant obstacles to completing this project. The project schedule has been adjusted to reflect the completion schedule of the demand verification study, but that is the only element of the project that has been changed.

Preliminary Findings

Preliminary findings from the demand verification study are presented below. These and other findings have been incorporated into the Westminster water conservation plan.

Westminster Residential Demand Verification Study

The first part of the Westminster conservation planning project was to conduct a residential demand verification study to better understand the current level of water use in Westminster. This project was funded by the City and not through the CWCB grant.

The *City of Westminster Residential Water Demand Study* is complete and under final review from City staff. The purpose of the Residential Water Demand Study was to closely examine water use and water use patterns of the City of Westminster, and specifically of the single-family residential customers in the City, to help inform demand forecasting and water conservation planning efforts. This study provides data on the water use patterns of single-family households in Westminster in 2011, and compares these demands against measurements made in Westminster.

Here is a bullet list of some of the key findings from the *Residential Water Demand Verification Study*:

- **Regular outdoor irrigation** - Most households in Westminster (90.6%) irrigate their outdoor landscape regularly during the irrigation season which typically runs from late April through early October.
- **Turf grass and mulch are the most common landscape materials** - Turf grass (of any variety) was the most common landscape material (90.9%) among the homes in this study followed by non-living ground cover such as mulch (70.1%), vegetable or flower garden (64.0%), non-native trees and shrubs (48.5%), and desert/native trees and shrubs (22.6%).
- **Automatic irrigation systems are the norm** - Of those who regularly irrigate, nearly 75% are equipped with an automatic irrigation system which amounts to 67.4% of all survey respondents. This suggests that about 2/3 of homes in Westminster are equipped with an in-ground irrigation system.
- **Average of 112.5 thousand gallons (kgal) per year** - The average per household annual water use during this time period was 112.5 kgal per year and the overall trend was a decline in per household water use.
- **Indoor/Outdoor Use** - From 2000 – 2010, Westminster residential customers used an average of 60.2 kgal per year for indoor purposes and 52.3 kgal per year for outdoor purposes.

- **Conservation progress** - In Westminster, the average indoor per household use was 138 gphd. In the 1999 REUWS, the average indoor per household use was 177.0 gphd. This means that the households in Westminster are using 22.3% less water indoors than this previous national sample.
- **Per capita reductions** - Compared with the baseline 1999 REUWS, residents in Westminster are using 22.3% less water indoors per capita. Measurable demand reductions have been achieved in toilet use, clothes washer use, faucet use and in leakage. Most of the other end uses are quite similar. This indicates that Westminster homes today are equipped with more efficient fixtures and appliances than typical homes in the late 1990s.
- **Toilet flush volume** - The average per household flush volume in the City is 2.68 gallons per flush (gpf) and the median is 2.41 gallons per flush.
- **Clothes washer load volume** - The average volume per load of laundry measured in this study was 31.9 gallons per load (gpl) and the median was 35.5 gpl. In the 1999 REUWS, the average clothes washer volume was 40.9 gpl, so the typical clothes washer in Westminster appears to be 22% more efficient than this previous national sample.
- **Westminster irrigators respond to weather** - Single-family residential irrigators in Westminster appear to be well tuned in to prevailing weather conditions and to adjust their irrigation patterns accordingly when the weather becomes wetter or drier. The average irrigation application rate of the Westminster survey respondents changed dramatically in response to changes in weather.
- **Efficient irrigation patterns** - The study sample households in Westminster applied substantially less water than was theoretically required for a turf grass landscape. On average this group applied 67.7% of the theoretical requirement from 2000 – 2010. If we allow for a 5% under-estimate of the actual irrigated areas the average would be about 73%—still substantially below the annual irrigation requirement. This indicates that many single-family residential irrigators in Westminster use substantially less water than might be expected based on the weather conditions.

Key results from the *Westminster Residential Water Demand Verification Study* have been incorporated into the conservation planning effort and have resulted in significant revisions to future conservation program implementation.

Additional Preliminary Findings

Westminster is a residential community with a significant commercial and industrial sector. Water deliveries in 2010, as shown in Figure 1, go largely to the residential sector (61.9%) with the commercial and industrial sectors accounting for about 11% of deliveries. The City of Westminster has a number of large irrigated parks and non-irrigated open space area. Municipal water use accounted for 3.1% of total demand in 2010. Potable irrigation accounted for 9.9% of demand and reclaimed water (used for irrigation) accounted for 7.6% of demand.

Historic demands in Westminster from 2004 – 2010 are shown in Table 1.

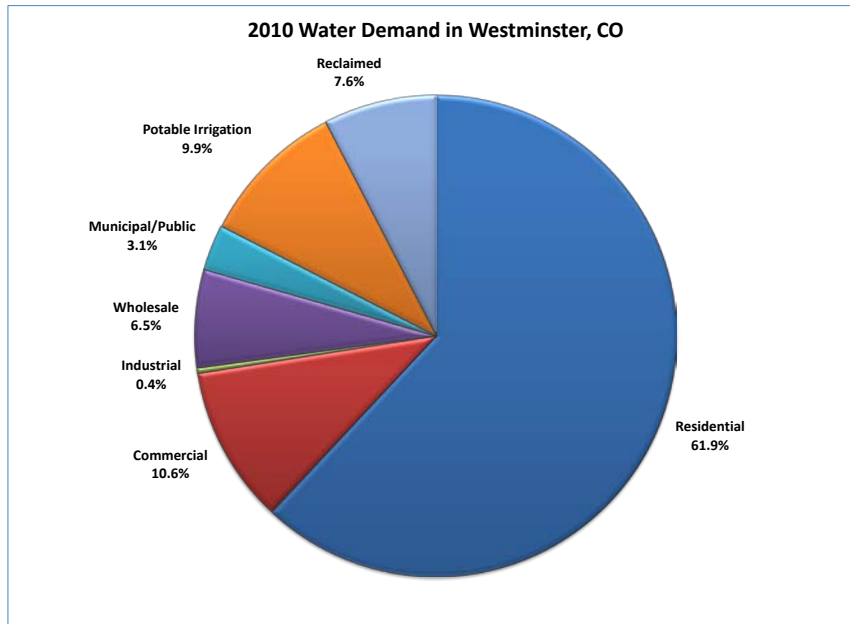


Figure 1: 2010 Westminster water deliveries by customer category

Table 1: Retail water deliveries by the City of Westminster, 2004 – 2010 (acre-feet)

	2004	2005	2006	2007	2008	2009	2010
Residential	11,592	12,544	13,522	12,705	13,060	11,343	12,056
Commercial	1,922	2,013	2,148	2,147	2,140	2,002	2,058
Industrial	80	82	105	96	69	63	73
Wholesale	1,305	1,309	1,405	1,359	1,343	1,288	1,271
Municipal/Public	892	1,063	951	906	705	461	605
Potable Irrigation	1,221	1,444	1,997	1,877	2,329	1,651	1,925
Reclaimed	679	753	1,263	1,130	1,430	1,155	1,474
Total	17,691	19,208	21,390	20,220	21,076	17,963	19,460

Potential Need for Revisions to the Scope of Work and Timelines

At this time no revisions to the scope of work or project timeline are anticipated. The City hopes to submit the new conservation plan to the CWCB for review by October 30.