

STAFF REPORT



ITEM NO. 13 CITY OF OCEANSIDE

DATE: May 18, 2011
TO: Honorable Mayor and City Councilmembers
FROM: Water Utilities Department
SUBJECT: **APPROVAL OF THE CITY OF OCEANSIDE WATER CONSERVATION MASTER PLAN**

SYNOPSIS

Staff and the Utilities Commission recommend that the City Council approve the City of Oceanside Water Conservation Master Plan (Exhibit A) and direct staff to implement the elements of the Plan beginning in fiscal year 2011-12.

BACKGROUND

In June of 2008, the City Council directed staff to prepare a Water Conservation Master Plan in response to the existing drought and court-ordered mandatory water restrictions. On December 10, 2008, the City Council approved a professional services agreement with Maddaus Water Management to prepare the Water Conservation Master Plan (Plan). Staff worked with the consultants to develop a comprehensive conservation program for the City however, the reduction of 20 percent per capita water use by the year 2020 was passed by legislation in November 2009 (SB x 7_7), necessitating incorporation of the gallons-per-capita-per-day (gpcd) calculation into the proposed plan. The legislative change also required that the department specify additional conservation measures that would need to be implemented to meet the mandated reduction goal.

On February 14, 2011, the additional measures were presented to the Utilities Commission at a public workshop. The Commissioners and members of the public reviewed the programs and chose to recommend a set of conservation measures that will achieve the goals set by the state. Presently, the City of Oceanside's gpcd is 167; the target reduction for the year 2020 is 142 gpcd, a reduction of 25 gpcd. The city's gross gallons-per-capita-per-day (gpcd) baseline, water use target for 2020 and interim water use target for 2015 will be incorporated into the Urban Water Management Plan as required by State Law. The Final Draft Water Conservation Master Plan is completed and is being presented to City Council for the first time. The Urban Water Management Plan will be brought forward for Council consideration in June of 2011.

ANALYSIS

The purpose of the Water Conservation Master Plan is to evaluate water conservation demand management alternatives and to evaluate them in terms of their water savings,

costs, and cost-effectiveness from various perspectives including their acceptability and their ability to be implemented. The successful implementation of the water conservation master plan and meeting the state mandate reduction of 20x2020 will help in meeting the City Council's goal of 50 percent water independence by 2030.

The process used a model which evaluated measures directed at existing accounts as well as new development measures to make new residential and business customers more water-efficient. Several programs were developed to evaluate the net effect of running multiple measures together over time.

The February 14, 2011, workshop was facilitated by Tamayo and Associates with the goal to provide participants with an overview of the conservation options, to provide discussion and input on the various options that would be recommended and to reach consensus on the best way to move forward. The Utilities Commissioners, staff, several members of the public and Maddaus Water Management participated in the workshop. The themes presented by participants were:

- To implement the program that is comprised of aggressive water conservation, smart meters (AMI) and further implementation of the Recycled Water Master Plan (Phase II), and
- Phase in additional elements up to the level of activity and measures of the other program as appropriate or needed over time, and
- Partner, engage and build relationships with high water users to get their full participation, and
- Use tools including new development offsets to compel participation where possible.

The work group went on to highlight the major benefits of this approach:

- It complies with State SBx7-7 law (and per capita use targets), and
- It is cost-effective and less expensive than buying additional purchased water from SDCWA and MWD, and
- The approach gives the City control over its future water supply availability.

A follow-up recommendation was made to form a 20 x 2020 working group to monitor progress and consider modifications to the plan over time to meet the 2015 and 2020 per capita use targets cost-effectively.

The recommended measures are in the table below. Detailed descriptions of each measure and costs are included in the recommended program and in Exhibit A. There are also measure-by-measure implementation suggestions included in the Plan.

General Measures	Residential Measures (Indoor)	Commercial Measures (Indoor)	Irrigation Measures (Outdoor)
Public Education	High Efficiency Toilet Rebates	High Efficiency Toilet Rebates	Financial Incentives for Irrigation Upgrades

School Retrofit by 2035	Clothes Washer Rebates	High Efficiency Urinal Rebates	Landscape Requirements New Accounts except SF
Automated Meter Infrastructure (AMI)	Water Use Efficiency Surveys (Audits)	Clothes Washer Rebates	Large Landscape Water Budgets + Audits
Recycled Water (Phase 1 & 2)	Hot Water Systems	Water Efficiency Surveys (Audits)	Weather Adjusting Controller Requirement New Dev start in 2020
Senate Bill 407 Fixture Replacement	Zero Footprint for New Development	Kitchen Pre Rinse Spray Nozzles	Landscape Classes for Residential customers
Require WaterSense on all new homes (EPA)		Inefficient Equipment Replacement Rebates	

Successful implementation of the Plan will require a significant increase in level of effort on the part of the City. Many new conservation measures will be employed and high participation rates are needed to achieve Plan goals. Recommendations to assist with implementation include the following next steps:

- Prioritize measures for implementation with those that contribute the most to meeting the per capita use targets;
- Consider working with the largest 100 water-using customers to try to reduce water use as described in section 3;
- Develop an annual work plan for the first plan year as soon as the budget is adopted (or in concert with the budget planning process);
- Form partnerships and apply for grants where appropriate;
- Outsource if needed to gain enough staff support to administer the new program;
- Set up a 20 x 2020 Working Group to guide the implementation;
- Develop analytical tools to track water use by customer class and overall per capita water use, adjusted for the weather and external factors;
- Set up a database to store and manage measure participation, cost and other data to gauge successes and failures;
- Use the tools annually to help decide on priorities for the next plan year;
- Use the Model to annually update the plan including actual measure participation, projected water savings and expected per capita water use reductions to ensure plan is on track to meet 2020 targets;
- Use the input from the 20 x 2020 Working Group and annual work planning process as the forum to amend the plan, budgets, staffing, outsourcing, schedule, etc., to stay on track.

FISCAL IMPACT

The total estimated cost of the program until 2020 is \$11,764,326 which has an estimated annual cost of \$1,176,433. The cost increase for FY12 is \$370,000, the bulk of which includes increased residential public education, washer rebates, replacement of inefficient equipment at commercial/industrial facilities and residential and commercial high-efficiency toilet rebates. The rate increases taking effect in February 2011 and July 2011 already account for the FY12 increased Department costs associated with this program.

The largest cost component over the next nine years is funding a portion of the Phase I & II recycled water projects. The conservation portion of the Phases is \$4.1M and is planned to commence during FY13. Phase I includes replacement of the pilot treatment facility at San Luis Rey as well as retrofit and use of recycled water at San Luis Rey for plant processes. Phase II includes optimizing use of recycled water from Fallbrook Public Utilities District in the Morro Hills area. It is anticipated that the remainder of the project will be paid for from Developer Fees and Fixed Asset Replacement Funds.

The other larger cost component is for Automated Meter Infrastructure (AMI) at an added cost of \$300,000/year, starting in FY15. For future years, the costs to implement the Plan will be paid for by a combination of operating and capital funds. The implementation of the Water Conservation Master Plan is an unfunded state mandate.

COMMISSION OR COMMITTEE REPORT

The Utilities Commission was unable to review staff's recommendation at its meeting on April 19, 2011, due to the lack of a quorum. The Commission will review staff's recommendation at their regular May 17, 2011, meeting.

CITY ATTORNEY'S ANALYSIS

The referenced documents have been reviewed by the City Attorney and approved as to form.

RECOMMENDATIONS

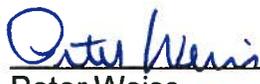
Staff and the Utilities Commission recommend that the City Council approve the City of Oceanside Water Conservation Master Plan (Exhibit A) and direct staff to implement the elements of the Plan beginning in fiscal year 2011-12.

PREPARED BY:



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Administration Manager

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City Manager

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Michelle Skaggs Lawrence, Deputy City Manager

Cari Dale, Water Utilities Director

Teri Ferro, Financial Services Director



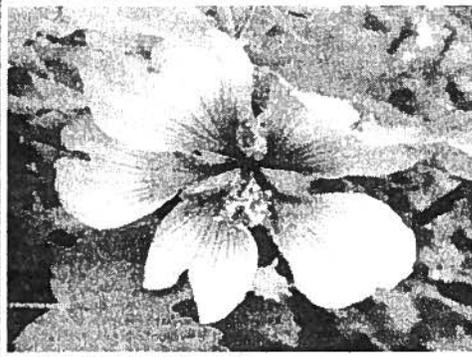




Exhibit A: Draft City of Oceanside Water Conservation Master Plan



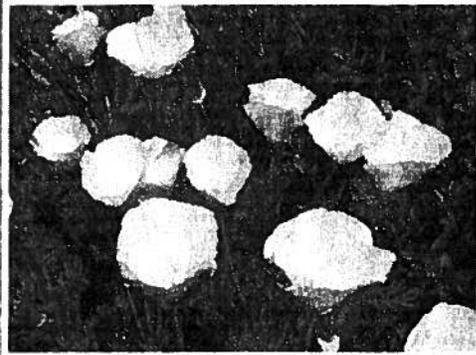
City of Oceanside



FINAL DRAFT

Water Conservation Master Plan

April 12, 2011



**MADDAUS
WATER
MANAGEMENT**



MADDAUS WATER MANAGEMENT

9 Via Cerrada, Alamo, California 94507 (925) 820-1784

April 12, 2011

Cari Dale
Water Utilities Director
300 N. Coast Highway
Oceanside, CA 92054

Subject: FINAL DRAFT Water Conservation Master Plan

Dear Mrs. Dale,

Enclosed for your review is the FINAL DRAFT Water Conservation Master Plan for the City of Oceanside. We have incorporated all your requested conservation measures and a list of additional items planned to be added in the future including AMI, recycled water, and Cal Green.

Thank you for your time and dedication to this project. We have enjoyed working with you.

Sincerely,

Michelle Maddaus, Project Manager

Bill Maddaus, Principal

Maddaus Water Management

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1. EXECUTIVE SUMMARY

The purpose of the Executive Summary is to briefly describe the City of Oceanside Water Conservation Master Plan (Master Plan). The evaluation process and assumptions used to develop this Master Plan and recommendations for future implementation are included in the full report.

The City of Oceanside (City) has a current water conservation program. This report illustrates that expanding existing efforts in a cost-effective way will help meet future water needs and meet State mandated per capita reduction targets according to the 2009 Water Conservation Act (SBx7-7 law).

The process used to develop the plan included analyzing conservation measures and programs using the Least Cost Planning Water Demand Management Decision Support System Model (DSS Model). The evaluation includes measures directed at existing accounts as well as new development measures to make new residential and business customers more water efficient. Seven programs were developed to evaluate the net effect of running multiple measures together over time. From this analysis a Recommended Plan was selected in concert with the City's Water Commission's goals in February 2011.

The City selected a plan comprised of aggressive water conservation, smart meters (AMI) and further implementation of the Recycled Water Master Plan (Phase II). The elements of the plan are highlighted in Table 1-1.

Table 1-1: Elements of Conservation Program C+AMI+Recycled Water (The Recommended Plan)

Elements of Conservation Program C+AMI+Recycled Water (The Recommended Plan) City of Oceanside			
General Measures	Residential Measures (Indoor)	Commercial Measures (Indoor)	Irrigation Measures (Outdoor)
Public Education	High Efficiency Toilets Rebates	High Efficiency Toilets Rebates	Financial Incentives for Irrigation Upgrades
School Retrofit by 2035	High Efficiency Urinal Rebates	High Efficiency Urinal Rebates	Landscape Requirements New Accounts except SF
Automated Meter Infrastructure (AMI)	Clothes Washer Rebates	Clothes Washer Rebates	Large Landscape Water Budgets + Audits
Recycled Water (Phase 1 & 2)	Water Use Efficiency Surveys	Water Efficiency Surveys	Artificial Turf Rebate (Single Family)
Senate Bill 407 Fixture Replacement	Hot Water Systems	Kitchen Pre Rinse Spray Nozzles	Weather Adjusting Controller Requirement New Dev start in 2011
Require WaterSense on all new homes (EPA)	Zero Footprint for New Development	Inefficient Equipment Replacement Rebates	Landscape Classes for Residential customers
	Sub-metering for MultiFamily in 2015		Graywater Retrofit Rebate for Single Family

The benefits of the Master Plan are as follows:

- Aims to meet State mandated per capita use reduction target of 25 gallons/capita/day (gpcd) by 2020.
- Is cost-effective and less expensive than continuing to buy water from San Diego County Water Authority.
- Helps the City become more self-sufficient with its water supply.
- Is environmentally beneficial and helps make the City more sustainable.

Successful implementation of the Master Plan will require a significant increase in level of effort on the part of the City. Many new conservation measures will be employed and high participation rates are needed to achieve selected Master Plan goals. Recommendations to assist with implementation include the following next steps:

- Prioritize measures for implementation with those that contribute the most to meeting the per capita use targets given highest priority for implementation.
- Consider working with the largest 100 water using customers to try to reduce water use as described in section 3.
- Develop annual work plan for each plan year as soon as budget is adopted (or in concert with budget planning process)
- Form partnerships and apply for grants where appropriate
- Outsource if needed to gain enough staff support to administer the new program.
- Set up a 20 x 2020 Working Group to guide the implementation
- Develop analytical tools to track water use by customer class and overall per capita water use, adjusted for the weather and external factors.
- Set up a database to store and manage measure participation, cost and other data to gauge successes and failures
- Use the tools annually to help decide on priorities for the next plan year
- Use the DSS Model to annually update the plan including actual measure participation, projected water savings and expected per capita water use reductions to ensure plan is on track to meet 2020 targets.
- Use the input from the 2020 Working Group and annual work planning process as the forum to amend the plan, budgets, staffing, outsourcing, schedule etc. to stay on track.

2. INTRODUCTION

This section provides an overview of the issues facing the City of Oceanside water system, describes the purpose and scope of the Master Plan, and provides a project history of the steps used to complete the plan.

2.1 Overview of Oceanside Water System

The City of Oceanside Water Utilities operates and maintains the City's water treatment, distribution and metering systems. Approximately 87 percent of the City's water is purchased from the San Diego County Water Authority (SDCWA). The City purchases raw water and treats it at the Robert A. Weese Filtration Plant. The remaining 13 percent of the City's water comes from the Mission Basin. This brackish groundwater is extracted and becomes potable water through a desalting process at the Mission Basin Groundwater Purification Facility. The department also reclaims wastewater at the San Luis Rey Wastewater Treatment Plant and uses it to irrigate the Oceanside Municipal Golf Course. The Water Division operates and maintains over 500 miles of waterlines that distribute water throughout the City, and 12 reservoirs with a capacity of 50.5 million gallons.¹

As a result of the decreasing reliability and increasing cost of these imported supplies, the City and other water suppliers in the region are examining the development of alternative supplies such as ocean water desalination and increased recycled water use.

On the demand side, the City has completed a demand assessment and Water Conservation Master Plan that will be instrumental in meeting SBx7-7 regulations that require the reporting of baseline demand and conservation targets. As part of the 2010 UWMP update, the City must determine how to balance potable demand reduction while maintaining a high quality, reliable and cost-effective supply for its customers.

Significant changes in the cost and availability of water supplies within the region as well as increasing conservation requirements have occurred in the City in the last few years.

2.2 Purpose and Scope of Plan

The purpose of this project is to evaluate water conservation demand management alternatives, general and type of customer (single family, multifamily, commercial, etc.) specific conservation programs, and other water efficiency measures suggested by the City of Oceanside, and Maddaus Water Management (MWM). These were evaluated in terms of their water savings, costs, and cost-effectiveness from various perspectives, their acceptability, and their ability to be implemented. Working with the City staff, the best measures have been incorporated into a Master Plan designed to cover the period 2011 to 2020.

¹ Information obtained from City of Oceanside website on March 1, 2011.

Objective of Plan

Oceanside's stated objective is to develop a Water Conservation Master Plan to attain the water efficiency goals in a cost-effective manner that is feasible to implement by City staff. Key components of the plan include:

- Updating and further examining the 10% savings already committed to by Oceanside to identify the best method of achieving those savings and the timing of achieving those savings; and
- A long-term plan for complying with SBx7-7 and meeting per capita use targets by 2020.

Conservation Savings Goals

The City is committed to implementing a water demand reduction through conservation savings as soon as possible. The future goal (see Section 9) is to reduce per capita water consumption by 25 gpcd by 2020.

Structure and Basis of Existing Oceanside Conservation Program

The City has been a member of the California Urban Water Conservation Program (CUWCC) since 1997. Currently, Oceanside partners with the San Diego County Water Authority (SDCWA) and the Metropolitan Water District of Southern California (MWD) for most of its current offering of programs, such as landscape site surveys. The City has sponsored a landscape water management class for homeowners in 2008 and 2009. An emphasis on residential outdoor water use is important because as much as 60 percent of residential water use goes to irrigating landscapes. Over 25 separate rebate programs have been historically offered to the City's customers through MWD and SDCWA. They range from toilet and washing machine rebates to residential and business customers to "Smart" irrigation controller rebates. The City is fortunate that their water wholesalers offer aggressive programs. Not many utilities in the United States have such a wealth of resources available to its customers. However, just having these programs available does not mean that the City can expect large water savings with minimal effort. The actual uptake of these programs by City customers determines how much water is being saved by the current program. This will require that the City be proactive in marketing and educating customers as to the benefits of installing water efficient devices and changing water use habits. It is anticipated that many of these programs will no longer be sponsored or run by the water wholesalers and it appears that the City will need to step up and directly administer and fund these programs.

2.3 Plan Development

The Oceanside Conservation Master Plan Project was conducted over a two and one-half year period. Significant external events shaped the course of the process used to arrive at the most appropriate plan for the City, as highlighted below in the following project timeline:

Project Timeline:

September 2008

- Maddaus Water Management (MWM) selected to prepare Conservation Master Plan through a competitive process.

December 2008

- Contract Approved.

January 2009

- Kickoff Meeting.

April 2009

- MWM released Technical Memorandum 1 – “Overview of Water Use Patterns and Screening of Demand Management Measures”.
- Measure Screening Workshop held at the City of Oceanside office, facilitated by MWM on April 24.

May 2009

- MWM releases Technical Memorandum 2 – “Results of Screening of Demand Management Measures”. A total of seventy nine measures were screened. Forty two measures were selected for further analysis.
- MWM released Technical Memorandum 3 – “Data Required for Modeling of Demand Management Measures”.

June 2009

- Project placed on hold at City’s request so City could focus on new drought rates in the spring and again in October 2009.
- Rebate funding was suspended by MWD and SDCWA for the City of Oceanside. Project placed on hold for 1 month at City’s request to see future of funding as it is a key part of the Oceanside conservation program.

Late July – October 2009

- Demand and conservation analysis completed. Meeting on July 30th 2009 with City of Oceanside to present results. City was to review results and decide on preferred conservation programs of the three alternatives provided so a recommended program could be included in the Conservation Master Plan (Program A-C).

November 2009

- New California State Law (Senate Bill SBx7-7) signed by Governor Schwarzenegger– sets 20 percent per capita reduction targets for the entire state. This was a fundamental change to the water saving goals for the City of Oceanside Conservation Master Plan. MWM requested to prepare a Master Plan that meets the targets. It is apparent that the current measures and programs considered fall short of the new targets.

December 2009

- Lonnie Thibodeaux retired from City of Oceanside Water Utilities Director. Lauren Wasserman took over as interim Director
- City requests project be put on hold until new Director is identified and then hired.

January – March 2010

- New Program D and E created (to increase water savings) to try to reach per capita reduction targets as outlined in the 2009 California State Law.

March 2010

- MWM presents results from Programs A – E and Technical Memorandums 1, 2 and 3 to City of Oceanside staff and interim Director Lauren Wasserman.

May 2010

- MWM meets with new Water Utilities Director, Cari Dale, at the City of Oceanside office.

July 2010

- New request from the City of Oceanside to add automatic meters (AMI) and recycled water to conservation programs to measure evaluation.

October 2010

- MWM released Technical Memorandum 4 – “Conservation Analysis Results”.
- Amendment to contract approved which covered additional measure analysis and strategic plan participation.

November 2010

- Additional measures analyzed, new Program F evaluated.

December 2010

- Draft Guidelines, from the Department of Water Resources for the 2011 Urban Water Management Plan, are released.

January 2011

- Addendum to Tech Memorandum 4 issued with results of new measure analysis and Program F.
- City requests MWM begin using new population and employment projections (SANDAG 2050).
- MWM revises and finalizes City Water Demand projections to 2035.

February 2011

- City holds workshop with Water Commission to select recommended Master Plan elements.
- Hybrid plan selected which has a mix of conservation, new smart meters, and recycled water, called Plan C++.

In summary, the Water Conservation Master Plan was a thorough process that adapted to the City’s request based on the change in Director, state laws, drought rates, rebate funding available from MWD and SDCWA, and to allow the plan to be well coordinated with the 2011 Urban Water Management Plan.

3. ANALYSIS OF HISTORICAL WATER DEMAND

The City's water use patterns were analyzed based on water production and consumption data from City staff, and their water loss was examined. Seven years of monthly water use data was analyzed (years 2002 to 2008) to derive average per account per day water use. Data from each customer category was analyzed separately. Based on the City's water billing system, residential water use was broken down into single-family and multi-family categories. Historical data was segregated into inside the indoor and outdoor water use by customer type using the monthly billing data.

From the billing data, residential per capita water use values were calculated for water use inside the home and outside the home. These values were compared with other sources of municipal water use data applicable to the area. Other nonresidential categories of use were analyzed separately. Average daily commercial/industrial and public water use was expressed on a gallons per account or gallons per employee basis.

3.1 Production versus Consumption

Water production data for the City was analyzed on a monthly basis for the period January 2002 to December 2008. Shown in Figure 3-1 is the total production versus total consumption for the City. Water production data was measured at their respective sources. Water consumption data was measured at the customer meters. As can be seen from the figure, the City does not experience significant losses of water in its system between the sources and the customer.

The difference between the amount of water produced and the amount of water billed is termed the non-revenue water. It is also quantified by what is called the "metered sales ratio" or the ratio of the volume of water consumption to volume of water production. The City reports that the metered sales ratio has typically been in the range of 90 to 94 percent (with an average of 91.5 percent over that past 7 years). The CUWCC BMP 3 goal is to have the metered sales ratio above 90 percent (or total water losses less than 10 percent).

3.2 Consumption by User Category

The City has several different types of water users. The various user categories in the City may be generally classified as single family residential, multifamily residential, commercial, industrial, governmental, irrigation, agricultural and reclaimed. The City is a mostly residential community, with some agriculture, and light commercial and industry. Therefore, the largest category of users of water in the City is the single family residential users that consume almost half of the water sold. Shown in Figure 3-2 is the annual consumption of the various user categories, based on the calendar year 2006 water use data from the City². Total average consumption was 28.9 mgd in 2006.

² 2006 based on rainfall data and billing data was considered the best representation of recent City Water Use. The 2008 year was not selected due to the water restrictions starting on January 1, 2008. The 2007 year was not selected due to abnormally low rainfall. 2006 had below average rainfall, but was considered the best data for recent consumption records.

Figure 3-1: Water Production and Consumption

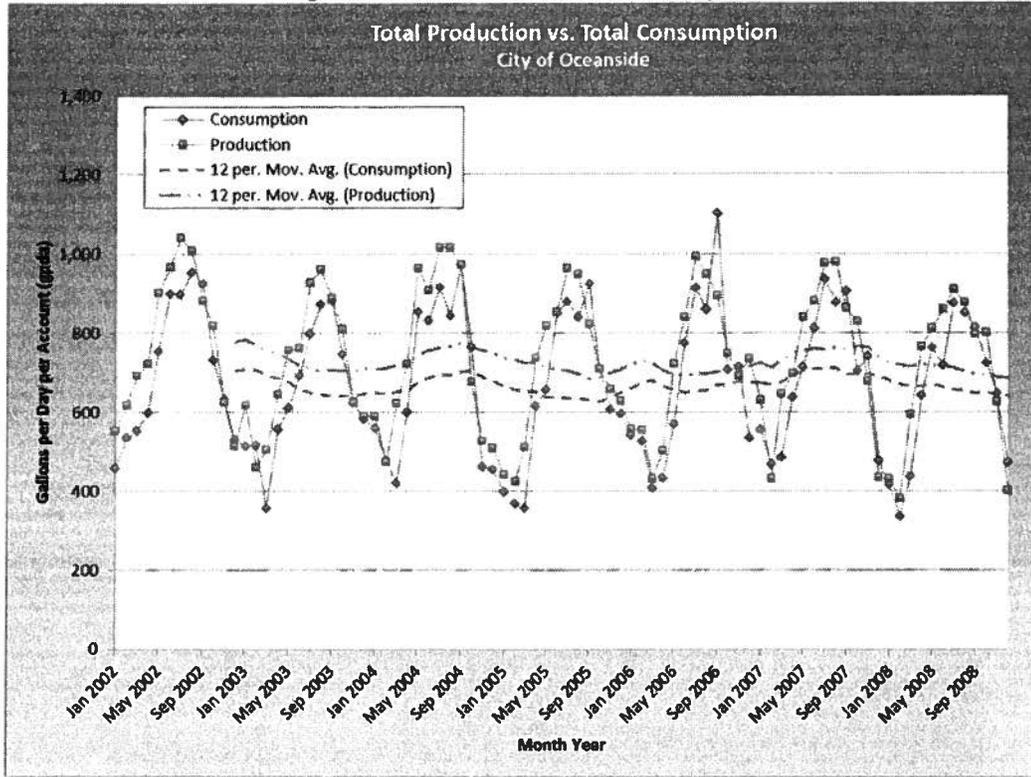
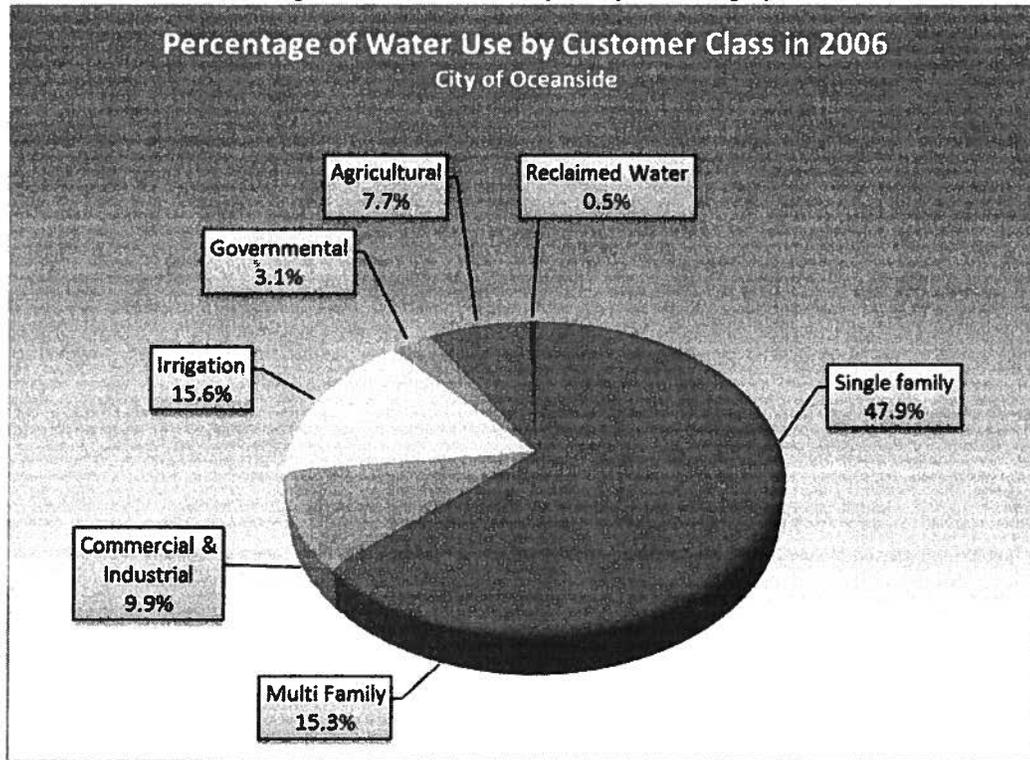


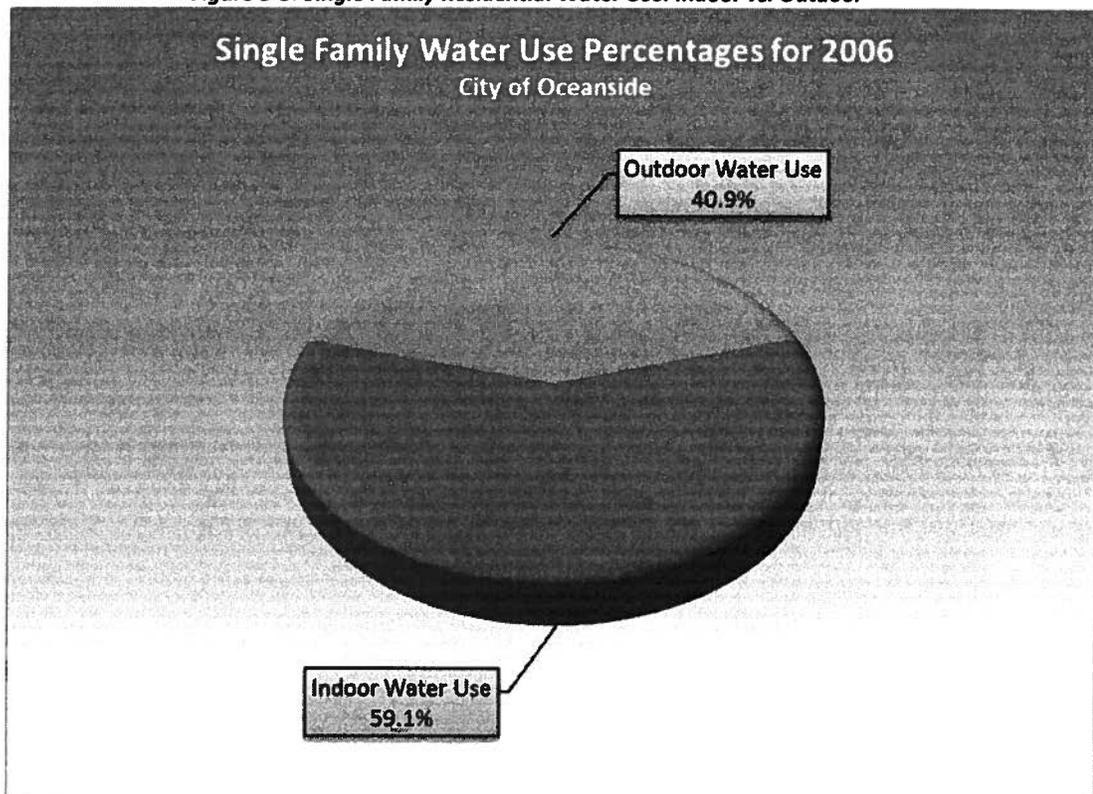
Figure 3-2: Annual Consumption by User Category



Residential use is 63 percent of the total, typical of a city without significant commercial industrial uses. Since single family residential uses formed the major portion of the City's water use (48%), it was analyzed further. Shown in Figure 3-3 is the breakdown of single family residential use as indoor and outdoor based on the assumption that indoor use is approximately equal to the minimum use in the winter. The averages of the years 2005, 2006 and 2007 was selected for this profile as it was evident that there was little if any winter watering of landscape in these years. Recent rainfall has been below average, so an average of the years 2005, 2006 and 2007 was used. The goal of the analysis by customer sector, shown in Figures 3-2, and the breakdown of indoor and outdoor water use, shown in Figure 3-3, was provided to help the water conservation planning staff to design conservation programs and marketing messages to obtain the highest water savings.

As seen in Figure 3-3, 59 percent of the average single family water use is indoors.

Figure 3-3: Single Family Residential Water Use: Indoor vs. Outdoor



The seven charts that follow show the average monthly usage per account per day for the seven types of customers including reclaimed water. All categories exhibit a strong seasonal pattern where water use is higher in the summer.

Growth in accounts from 2002-2008 are as follows:

- Single Family ~0.9 percent/year
- Multi-family ~0.4 percent/year
- Commercial ~1.5 percent/year

- Governmental ~5.9 percent/year
- Irrigation - Potable ~2.0 percent/year
- Agricultural ~negative 0.2 percent/year
- Reclaimed Water ~7.8 percent/year

Several observations can be made when looking at Figures 3-4 through 3-10 as follows:

- Drought restrictions began on January 1, 2008. Therefore, some of the decrease in water use is not actually a true long term reduction in water use, but only a reflection of the drought restrictions.
- The residential growth that did occur has mainly been in the single family category. Single family accounts have only grown 0.9 percent/year over the last seven years. Commercial accounts are also growing very slowly at 1.5 percent per year. Single family per account water use had a stable average daily water use per account. This indicates that new homes have a similar water use pattern to existing homes (per account) over the past 7 year period. Growth in recent years has slowed due to the current economic conditions.
- Multi-family water uses has a slight downward trend that suggests that newer accounts have been of the smaller size units or have separate irrigation meters and/or conservation programs are driving lower per account use.
- Commercial water use has a very slight downward trend suggesting smaller new accounts are being added.
- Irrigation account water use exhibits an upward trend suggesting new accounts have been larger.
- Reclaimed water use per account has been significantly decreasing in recent years. (I would not include this sentence because the annual use for the one reclaimed water customer is very sporadic.)

Figure 3-4: Single Family Consumption per Account per Day

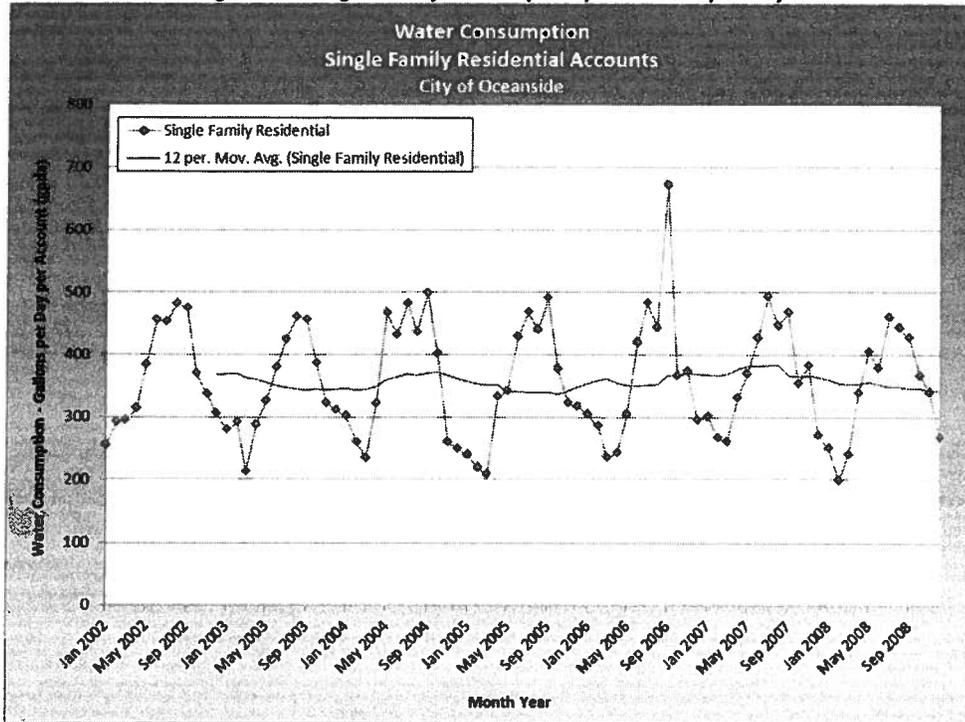


Figure 3-5: Multifamily (2 or more units) Consumption per Account per Day

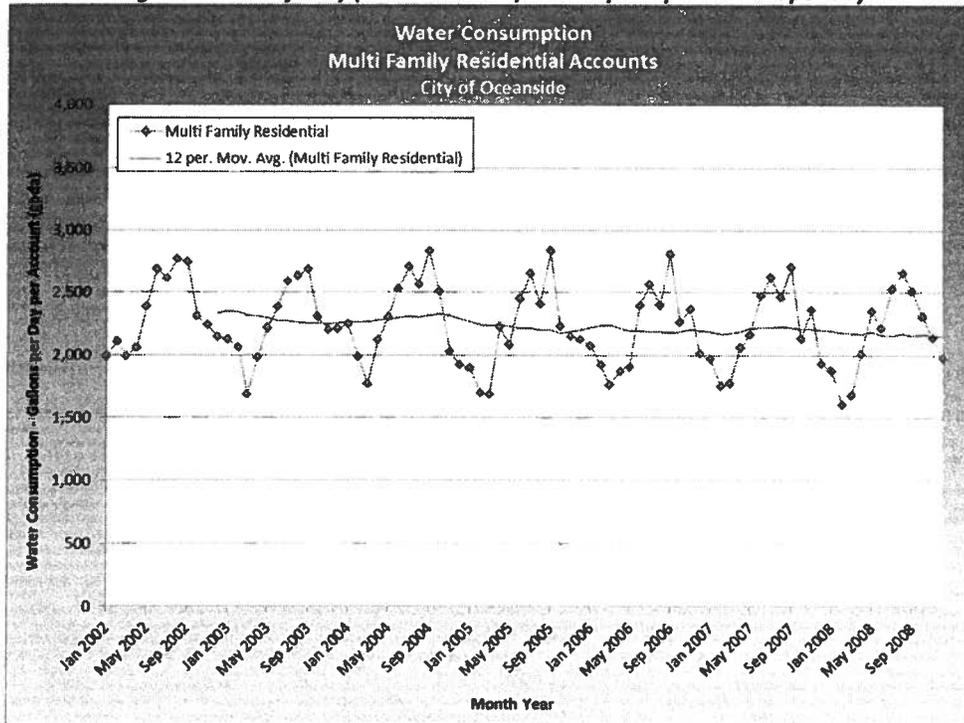


Figure 3-6: Commercial Consumption per Account per Day

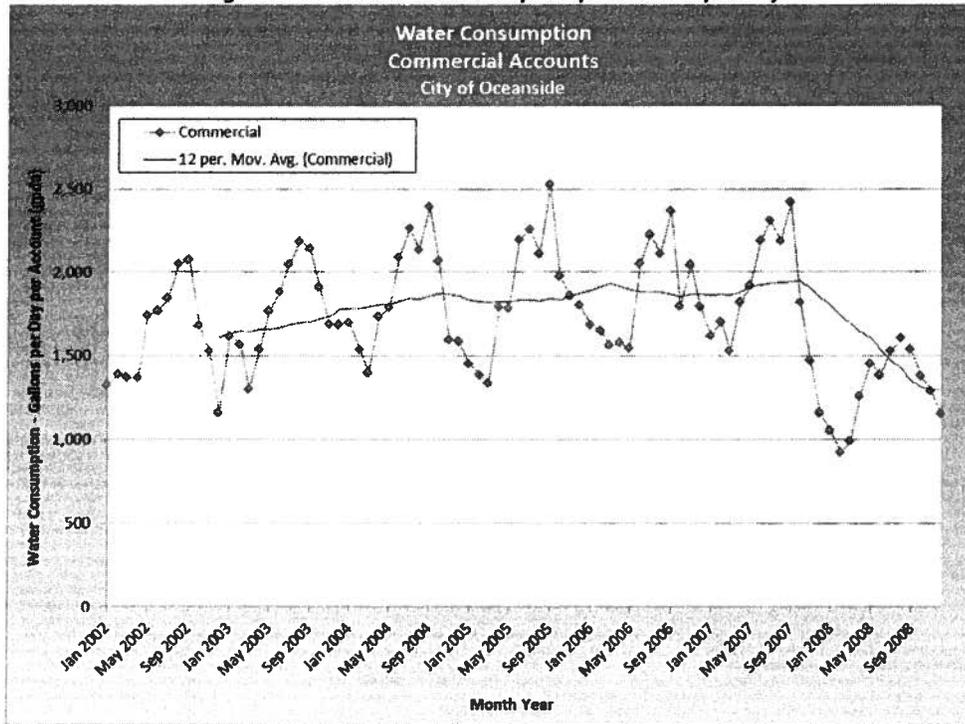


Figure 3-7: Governmental Consumption per Account per Day

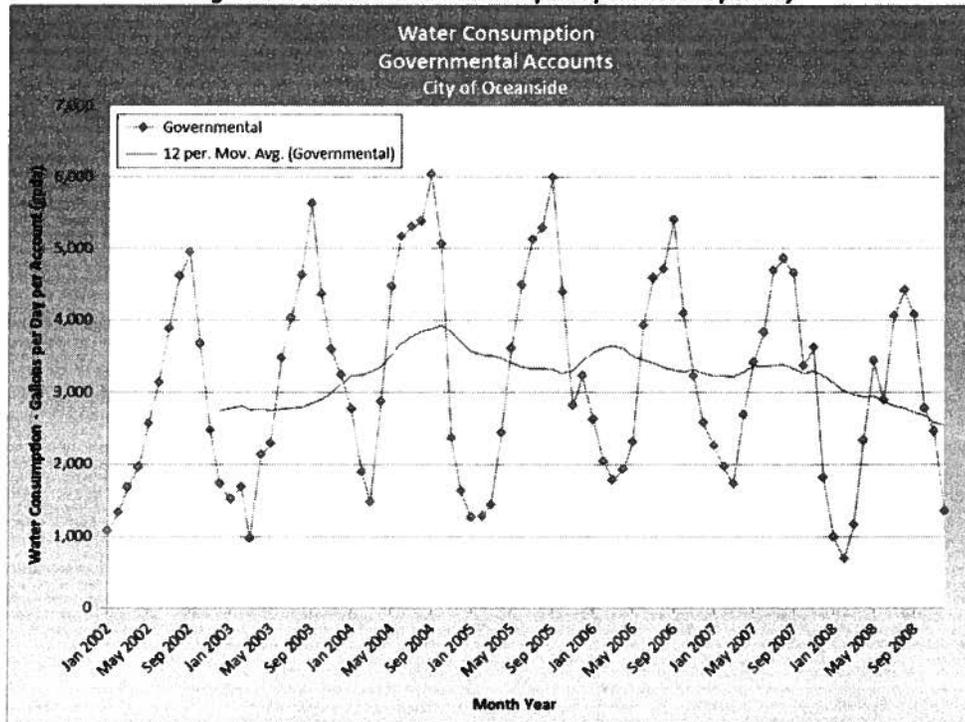


Figure 3-8: Irrigation Consumption per Account per Day

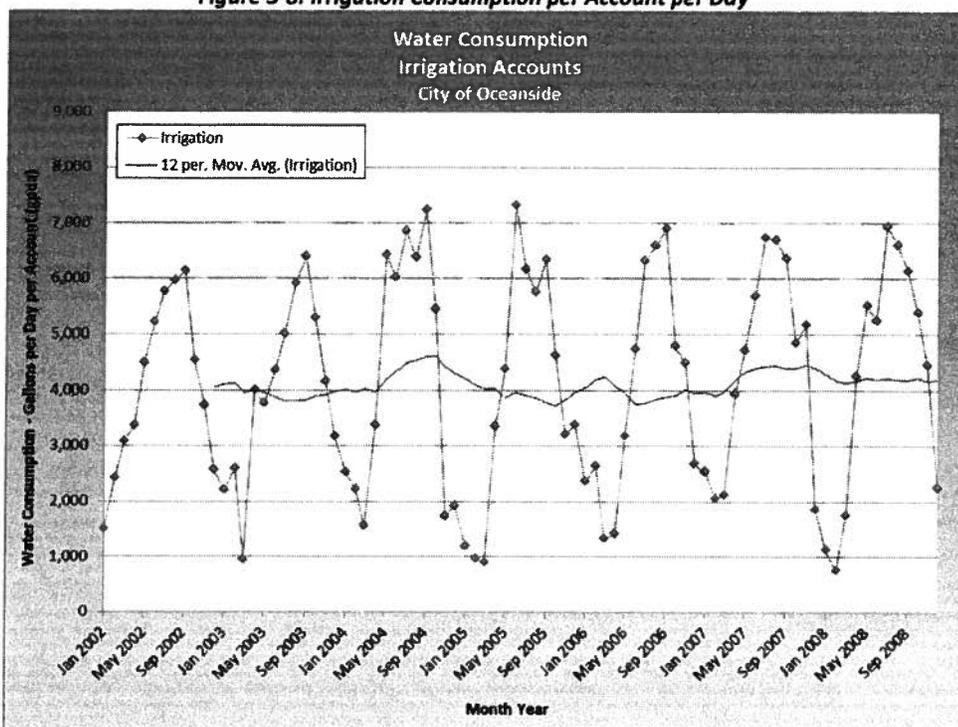


Figure 3-9: Agricultural Consumption per Account per Day

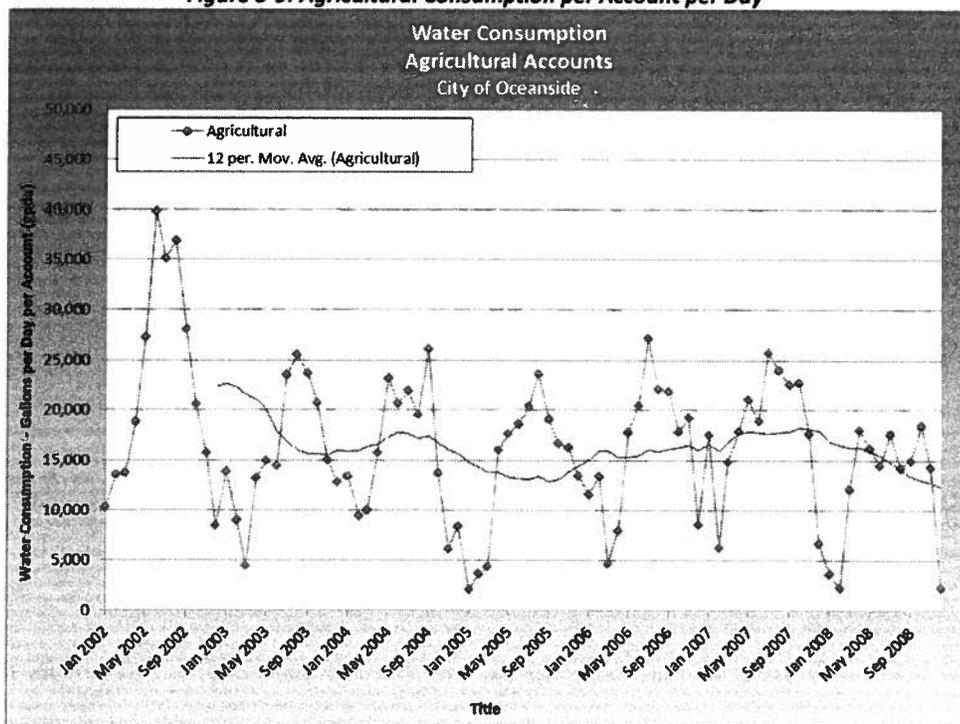
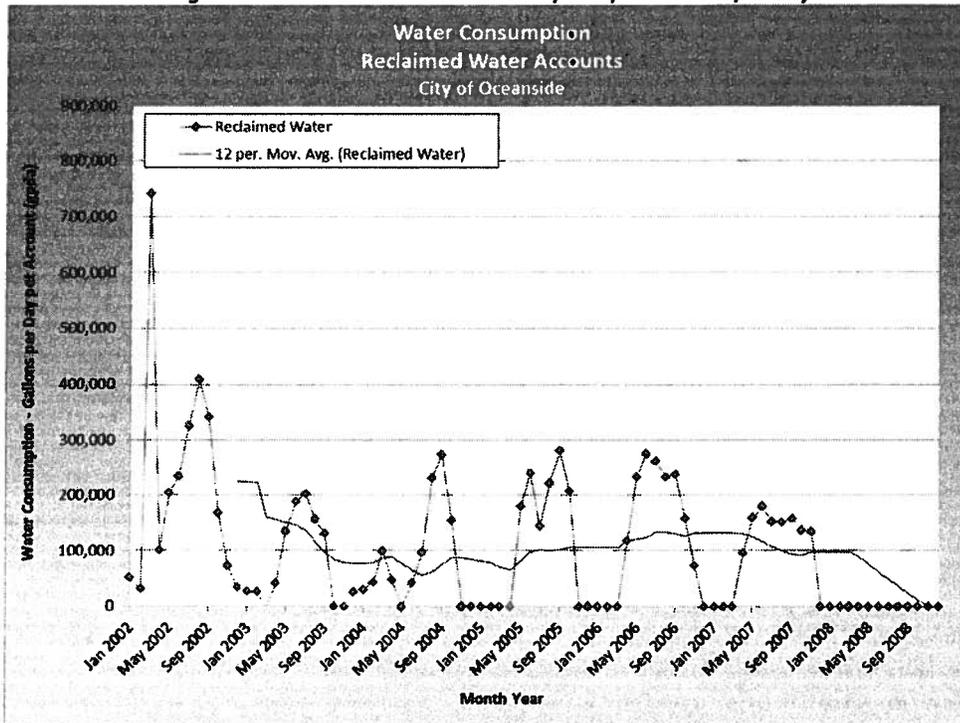


Figure 3-10: Reclaimed Water Consumption per Account per Day



The age of housing was analyzed for the City from the 2005 to 2007 census data and provided in Table 3-1. The table shows that the age of the City homes is mostly older with about 47 percent of the homes built before 1980. Typically, older homes have older fixtures and more leaks and therefore have higher indoor usage. We would expect commercial and governmental buildings to be of a similar age. Building age is important in determining what types of plumbing fixtures were in the buildings when constructed. California began modifying plumbing codes starting in 1977. The latest requiring 1.6 gallon/flush toilets and water efficient shower heads and faucets (US Energy Policy Act) took effect nationally in 1992. Since that time only about 10 percent of the buildings in Oceanside would have been built with these newer fixtures. Prior to 1977 toilets flushed with 4.5-7 gallons and there was no requirement on shower heads and faucets.

However, note that the age of a building is only an indicator of its water usage. Additional analysis is required to determine the number of homes that have been remodeled or upgraded with more water efficient fixtures. This often occurs at the rate of 3-5 percent of fixture replacements per year. In addition, the City has sponsored rebates on fixtures and given conservation kits away. So clearly, although the buildings started out inefficient by today's standards exactly what is the stock of more efficient fixtures is unknown.

Table 3-1: Age of Housing from Census 2005-2007

Age of Housing from Census 2005-2007			
City of Oceanside			
Year Structures Built	No. of Structures	Percentage	Cumulative Percentage
Built 2005 or later	721	1.10%	100.10%
Built 2000 to 2004	4,535	7.10%	99.00%
Built 1990 to 1999	10,967	17.10%	91.90%
Built 1980 to 1989	17,778	27.70%	74.80%
Built 1970 to 1979	16,002	24.90%	47.10%
Built 1960 to 1969	8,320	13.00%	22.20%
Built 1950 to 1959	3,440	5.40%	9.20%
Built 1940 to 1949	1,412	2.20%	3.80%
Built 1939 or earlier	1,024	1.60%	
Total	64,199	100.00%	

Source: American Community Survey 2005-2007.

The breakdown of indoor versus outdoor use taken into account along with the age of buildings indicates that further conservation efforts of City staff focused towards the indoor uses of water may be warranted, however further research is needed to determine saturation of water efficient fixtures due to rebates, replacements and remodels. Subsequent sections of this Master Plan describe the conservation programs already being run by the City, MWD or SDCWA and recommends further programs that the City could consider to reduce its water use.

3.3 Analysis of Large Users

An analysis was conducted of the City's top 100 water users. The users were organized by type of customer such as agriculture, irrigation, commercial, multifamily, government and master metered single family. The top 10 accounts have an average use of more than 100,000 gallons per day. The average daily use falls off dramatically moving down the list, so that the user that is ranked No. 100 uses about 20,500 gallons per day. The higher the use per day the more productive conservation efforts would be because there will be more opportunities to save a significant amount of water. The major top users fall into the following categories:

- Large Commercial Business (Genetech, Hydranautics, Mountain Water Ice, Deutsch)
- City of Oceanside (Parks and City Buildings)
- Irrigation (Golf Courses)
- Country clubs
- Hospital
- Commercial laundries
- Multi-family accounts
- Agriculture

The average use for all 1,575 commercial customers is approximately 1,870 gallons per day. This is about five times the use of a typical single family home. Many of the commercial small accounts use less water than a home.

One use of this data would be to set a goal of water use reduction through targeted conservation efforts. If the City set a goal to save 10 percent of Commercial/Industrial (CII) water use that would amount to 10 percent of 2.85 mgd or 0.285 mgd. This goal could be achieved by working with the top 100 high-water customers and attempting to average 15 percent per large account. Identifying these additional opportunities for conservation may require special surveying techniques to determine customer specific opportunities for water savings.

4. WATER DEMANDS WITH AND WITHOUT PLUMBING CODE

4.1 Future Population and Employment Projections

Description of Population and Employment Forecasts

There are generally three main sources of population and employment projections used to generate future water demands for the Conservation Master Plans.

Available Demographic Projections

- *Local General Plan (population and employment)* – Typically these plans, depending upon when they were published, have a population and jobs forecast for 2030 and build out.
- *San Diego Association of Governments (SANDAG) (population and employment)* - SANDAG published a projections report in 2008 that includes population and employment estimates for each city in the San Diego region. This report provides estimates for 2000, 2005, 2010, 2015, 2020, 2025, and 2030. SANDAG also published on February 26, 2010 the 2050 Regional Growth Forecast which includes data for the year 2020, 2030, 2040 and 2050.
- *Other Water Supply Planning Reports*

Included in the following tables and graphs are the population and employment projections for the City from the following sources:

1. SANDAG Projections 2008 (projections extend to the year 2030)
2. SANDAG Projections 2010 (projections extend to the year 2050)

At the City of Oceanside's request, the population and employment projections were based on the SANDAG 2010 Projections (projections extend to the year 2050) as shown in Figures 4-1 and 4-2 and Tables 4-1 and 4-2.

Figure 4-1: Comparison of Population Projections

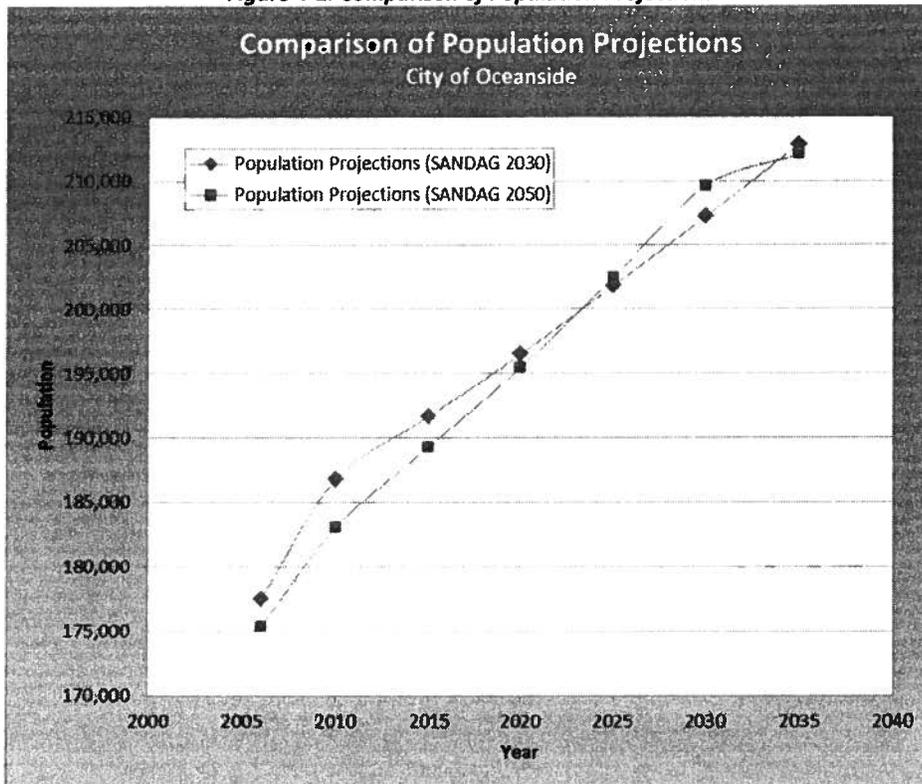


Table 4-1: Comparison of Population Projections

Comparison of Population Projections City of Oceanside		
Year	Population Projections (SANDAG 2030)	Population Projections (SANDAG 2050)
2006	177,506	175,357
2010	186,785	183,095
2015	191,634	189,275
2020	196,482	195,455
2025	201,860	202,529
2030	207,237	209,602
2035	212,816	212,024

Figure 4-2: Comparison of Employment Projections

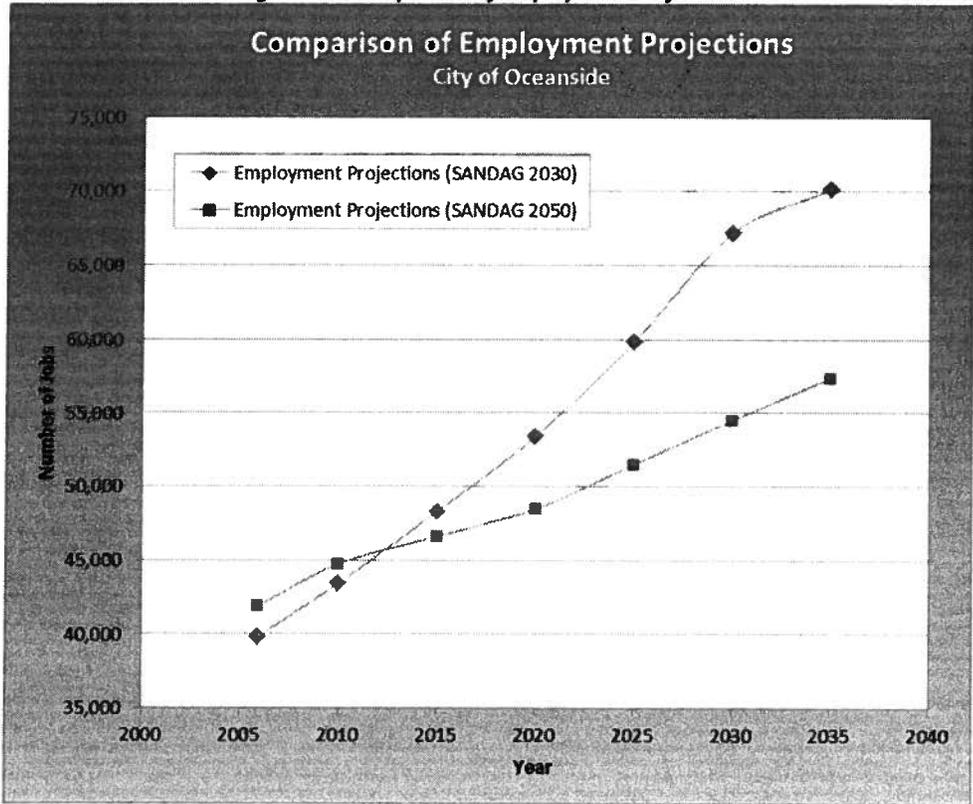


Table 4-2: Comparison of Employment Projections

Comparison of Employment Projections City of Oceanside		
Year	Employment Projections (SANDAG 2030)	Employment Projections (SANDAG 2050)
2006	39,850	41,914
2010	43,423	44,725
2015	48,277	46,594
2020	53,389	48,464
2025	59,847	51,481
2030	67,201	54,497
2035	70,143	57,391

4.2 Water Use and Demographic Data Inputs to the Model

Description of “Water Use Data Input Sheet”

Figure 4-3 is a two-page print out of an Excel spreadsheet. The purpose of this “Water Use Data Input Sheet” is to gather and document basic information about the individual service area. The data shown on the “Water Use Data Input Sheet” can be broken into two main categories, (a) current water use data and (b) demographic data. Each area is broken out below and helps to provide some basic definitions and assumptions.

(a) Water Use Data

- *Model Start Year* – This is the starting year for the analysis. For this project, the start year for the model is 2006. The selection of 2006 as a model start year allowed the historical conservation efforts to be included for the past few years (2007 to 2009). The DSS Model includes 30 years of data projecting information until the year 2035.
- *Base Year for Future Water Factors* - Based on an analysis of historical water billing data, the City selected a year that is representative of current water use and used as a base year demand factor for developing future water use projections. The 2006 year was chosen by the City for the following reasons:
 1. The years selected had relatively “normal” climate conditions – i.e. not a drought or excessively wet year, so no significant weather adjustments were necessary.
 2. The years 2008 and 2009 were affected by drought conditions and water restrictions. The water billing or production data was not weather normalized for this analysis therefore 2008 and 2009 water use data was not used as it was atypical.
- *Average gal/day/acct*- This is the amount of water in gallons that is used per day, per account.
- *Indoor/outdoor water use* – This is the amount of water per account split into the percent that is used indoors and outdoors.
- *Consumption by customer class*- This shows the annual amount of water used for an entire calendar year, broken down by customer class (Single Family, Multi Family, Commercial, Irrigation, etc)
- *Unaccounted for water (UFW) also known as Non-Revenue Water* – This is the sum of all water input to system that is not billed (metered and unmetered) water consumption, including apparent (metering accuracy) and real losses. The values were calculated by taking the difference between the amount of water produced and the amount of water that was sold.
- *Water Produced*– This is the total amount of potable water produced. The water can come from multiple sources including amount purchased from SDCWA, purchased from other agencies, local surface water, recycled water or obtained from groundwater
- *Peak day factor* – The ratio of water produced on the maximum day of the year to that produced on the average day.

(b) Demographic Data

- *SANDAG 2010* – was selected by the City for future population projection source.
- *Census 2000* – The 2000 Census data was used as a general reference when determining household sizes for the City.
- *City of Oceanside Service Area Population*- The 2006 total population for the City of Oceanside of was taken directly from the 2006 selected population source discussed earlier in this report.
- *Single and multi-family dwelling units*- The 2006 single family dwelling units is equal to the number of single family accounts for 2006. The 2006 multi family dwelling unit estimate was calculated by applying a growth factor to the 2000 data as noted on the water use data sheet in Figure 4-3.
- *Employment data*– The employment figures were obtained from the selected source as discussed earlier in this report.

In summary, the key features of this sheet include the existing 2006 level of water use, 2006 baseline accounts in each customer category, and 2006 baseline forecasts for population and employment.

Figure 4-3: Water Use Data Sheet

City of Oceanside Water Service Area DSS Input Sheet						
Base Year Average Use and Indoor Percentages by Billing Category for DSS Model ¹						
Start Year	Single family		Multi Family		Commercial & Industrial	
	Average, gpd/a	Indoor	Average, gpd/a	Indoor	Average, gpd/a	Indoor
2006	369	59%	2198	76%	1868	73%
	Bi-monthly billing - 2005 Winter Use		Monthly billing - 2005 Winter Use Multifamily is two or more dwelling units		Monthly billing - 2005 Winter Use	
	Agricultural		Reclaimed Water		Governmental	
	Average, gpd/a	Indoor	Average, gpd/a	Indoor	Average, gpd/a	Indoor
	16093	0%	132571	0%	3262	40%
	Monthly billing		Monthly billing		Monthly billing - 2005 Winter Use	
	Irrigation					
	Average, gpd/a	Indoor				
	3962	0%				
	Monthly billing					

Data for DSS Model - Base Year 2006						
Category	Number of Accounts FY. 2006 ³	Water Use 2006 gpd/a ²	Water Use, MGD 2006	Use Profile Percent	Water Use (gpd)	Indoor Water Use (gpd)
Single family	37,535	369	13,840	47.92%	129	76
Multi Family	2,007	2,198	4,412	15.27%	78	60
Commercial & Industrial	1,525	1,868	2,847	9.86%	67	49
Irrigation	1,139	3,962	4,514	15.63%		
Governmental	278	3,262	0,907	3.14%		
Agricultural	139	16,093	2,232	7.73%		
Reclaimed Water	1	132,571	0.133	0.46%		
Total Billed in 2006	42,624	160,322	28.88	100.00%	165	Total per capita
Total Non Weather Normalized Water Produced in 2006 ⁴ =			30.63	MGD		
Unaccounted For Water (UFW) Average for 2002 to 2008 ⁵ =			7.9%	Percent		
Estimated UFW for DSS Model =			7.9%	Percent		
Water Produced for use in DSS Model =			31.377	MGD		
Peaking Factor			1.71	City of Oceanside 2005 Water Master Plan Table 3.11		
Peaking Factor for DSS Model =			1.71	If NA use default value of 1.6.		

- Notes**
- 1 - Communities served (includes all or portions of) City of Oceanside and surrounding rural areas
 - 2 - Average gpd/a is based on a 12-month moving average through December 2006. Indoor use is based on average of 2 lowest consecutive months in the winter if meters read bimonthly, or single lowest month if meters read monthly.
 - 3 - Number of accounts is from data provided by water agency for this project (see worksheet with account data in this file). See annual rainfall table for Lindbergh Field and Oceanside Harbor Marina
 - 4 - Total water Purchased (produced) provided by City of Oceanside.
 - 5 - Unaccounted for Water (UFW) is the percent difference between the total water purchased and the total water use.
 - 6 - For reference see additional population estimates provided in population and employment estimates corresponding to service area table.
 - 7 - Initial estimate based on census data for renter occupied units. For reference see table below that has 2005 to 2007 census data for corresponding water service area city or cities.
 - 8 - Group Quarters Population includes Institutionalized and non-Institutionalized and assumes their water use is in the Commercial sector

Figure 4-3: (Continued)

Additional Data			
UFW as a % of Production		Rainfall Data	
Year	UFW Percentage	Lindbergh Field, San Diego	
2002	9.3%	Year	Actual Rainfall (In)
2003	9.2%	2005	22.69
2004	9.3%	2006	6.04
2005	8.4%	2007	3.59
2006	6.1%	Normal Rainfall (In)	10.4
2007	6.5%	% of Normal	218
2008	6.6%		
Average	7.9%	Oceanside Harbor Marina (Oceanside average is 10.7 Inches)	
		Year	Actual Rainfall (In)
		2005	15.63
		2006	6.57
		2007	2.98
		2008	6.66
Definitions / Abbreviations			
ABAG	Association of Bay Area Governments	HHS	household size
DOF	Department of Finance	NA	not available
DSS	Decision Support System Model	MF	multi family
du	dwelling unit	MH	mobile homes
FY	Fiscal Year	MGD	million gallons per day
gpd	gallons per capita / per day	No.	number
gpd/a	gallons per day / per account	Pop	population
gpd	gallons per day	Res	residential
		SF	single family
		UFW	unaccounted for water
Versions			
Data Prepared :	<i>March 22, 2009</i>	By:	M. Maddaus
Revised:	<i>October 1, 2010</i>	By:	M. Maddaus
Revised:	<i>February 28, 2011</i>	By:	C. Matyas

4.3 Key Assumptions for the DSS Model

Table 4-3 shows the key assumptions used in the model. The assumptions having the most dramatic effect on future demands are the natural replacement rate of fixtures, how residential or commercial future use is projected, and finally the percent of estimated real water losses.

Table 4-3: List of Key Assumptions

List of Baseline Demand Projection Assumptions for DSS Model City of Oceanside	
Parameter	Model Input Value, Assumptions, and Key References
Model Start Year	2006
Water Demand Factor Year(s)	Average of Years: 2006
Peak Day Factor	1.71
Unaccounted for Water in the Start Year	7.9%
Population Projection Source	SANDAG 2050 -Total Population
Employment Projection Source	SANDAG 2050 -Total Employment
Number of Water Accounts for Start Year	42,624
Avoided Cost of Water \$/AF (includes 2009 SDCWA cost)	\$1,026
Distribution of Water Use Among Categories	Single family: 47.9% Multifamily: 15.3% Commercial: 9.9% Irrigation: 15.6% Government: 3.1% Agriculture: 7.7% Reclaimed: 0.5%
Indoor Water Use by Category	Single family: 59.1% Multifamily: 76.1% Commercial: 73.2% Irrigation: 0% Government: 39.6% Agriculture: 0% Reclaimed: 0%
Residential End Uses	AWWARF Report "Residential End Uses of Water" 1999
Non-Residential End Uses, %	AWWARF Report Commercial End Uses of Water" 1999
Efficient Residential Fixture Current Installation Rates	U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Reference "High Efficiency Plumbing Fixtures - Toilets and Urinals" Koeller & Company July 23, 2005. Reference Consortium for Efficient Energy (www.cee1.org)
Water Savings for Fixtures, gal/capita/day	AWWARF Report "Residential End Uses of Water" 1999, CUWCC Cost and Savings Study April 28, 2005, Agency supplied data on costs and savings, professional judgement where no published data available
Non-Residential Fixture Efficiency Current Installation Rates	U.S. Census, assume commercial establishments built at same rate as housing, plus natural replacement
Residential Frequency of Use Data, Toilets, Showers, Washers, Uses/user/day	Falls within ranges in AWWARF Report "Residential End Uses of Water" 1999
Non-Residential Frequency of Use Data, Toilets and Urinals, Uses/user/day	Estimated based using AWWARF Report "Commercial and Institutional End Uses of Water" 1999
Natural Replacement Rate of Fixtures	Residential Toilets 3% (1.28 gpf toilets), 4% (1.6 gpf and higher toilets) Commercial Toilets 3% (1.28 gpf toilets), 4% (1.6 gpf and higher toilets) Residential Showers 4% Residential Clothes washers 6.7% A 3% replacement rate corresponds to 33 year life of a new fixture. A 6.67% replacement rate corresponds to 15 year washer life based on "Bern Clothes Washer Study, Final Report, Energy Division, Oak Ridge National Laboratory, for U.S. Department of Energy, March 1998, Internet address: www.energystar.gov
Future Residential Water Use	Increases Based on Population Growth
Future Commercial Water Use	Increases Based on Employment Growth
Future Non-Residential Non-Commercial Water Use	Increases Based on Population Growth

4.4 Water Demand Projections With and Without the Plumbing Code

Development of the Water Demand Projections Table and Graph

Water demand projections were developed out to the year 2035 using the Demand Side Management Least Cost Planning Decision Support System (DSS) model. This model incorporates information from the:

- “Water Use Data Sheet” and the “Key Assumptions”
- Questions asked of agencies
- Agency provided data including the following:
 - Historical water use data on a monthly basis for the different classes of water users.
 - Peaking factors for the water system.
 - Complete descriptions of past, present, and proposed future conservation programs including historic annual participation rates.
 - Results of any independent analyses of water savings due to prior City programs.
 - Historical and projected water system service area population, employment, land use data, and growth projections through the year 2020 or other suitable end year along with maps of the water system, political jurisdiction boundaries, and study area(s).
 - Customer characteristics and data needed to characterize water conservation measures, such as household size, dwelling unit mix, and number of facilities or businesses of a particular type.
- 2000 Census data and 2006-08 American Community Survey 3 year estimates
- Local General Plans
- San Diego Association of Governments (SANDAG) Projections

Water demand projections were input for 30 years using the DSS Model. This model incorporates information from the:

- City selected population and employment forecasts.
- Data provided by City of Oceanside staff including estimates for value of water saved, historical water use, past conservation efforts, and water system facilities.

Table 4-4 shows the projected demands with and without plumbing codes and appliance standards. This page includes both a table and a graph. Each item is described below.

National Plumbing Code

The Federal Energy Policy Act of 1992, as amended in 2005 requires only fixtures meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead - 2.5 gal/min at 80 psi
- Residential Faucets – 2.2 gal/min at 60 psi
- Public Restroom Faucets - 0.5 gal/min at 60 psi
- Dishwashing pre-rinse spray valves – 1.6 gal/min at 60 psi

Replacement of fixtures in existing buildings is also governed by the Federal Energy Policy Act that requires only devices with the specified level of efficiency (shown above) can be sold today (since 2006). The net result of the

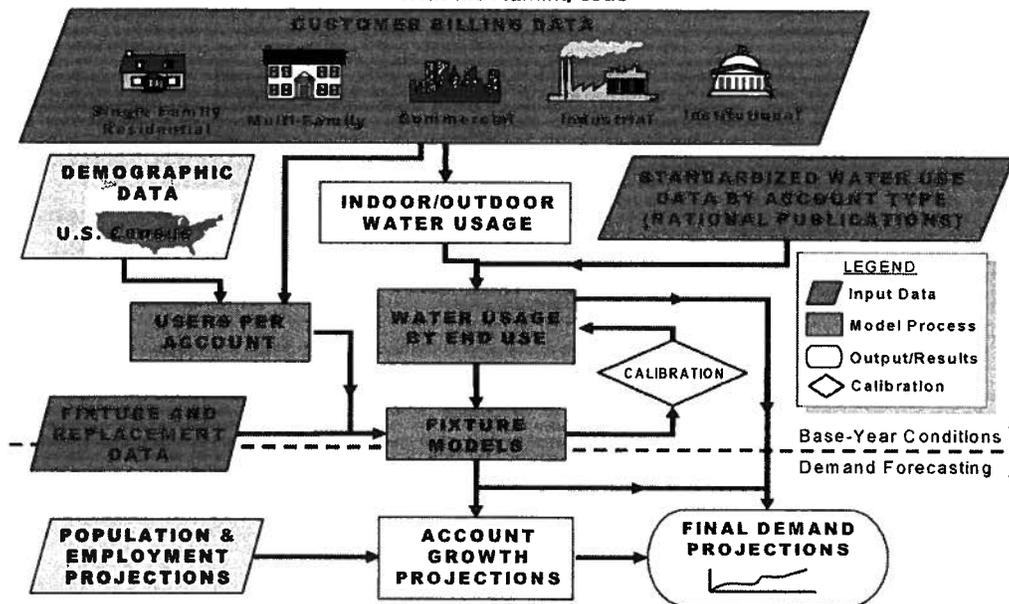
plumbing code is that new buildings will have more efficient fixtures and old inefficient fixtures will slowly be replaced with new more efficient models. The national plumbing code is an important piece of legislation and must be carefully taken into consideration when analyzing the overall water efficiency of a service area.

In addition to the plumbing code the US Department of Energy regulates appliances such as residential clothes washers. Regulations to make these appliances more energy efficient has driven manufactures to dramatically reduce the amount of water these efficient machines use. Generally horizontal axis washing machines use 30-50 percent less water than conventional models (which are still available). In the analysis for City of Oceanside, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 19 gallons or less) so that by the year 2020 this will be the only type of machines purchased. In addition to the industry becoming more efficient, rebate programs for washers have been successful in encouraging customers to buy more water efficient models. Given that machines last about 15 years eventually all machines in the City of Oceanside area will be of this type.

State Plumbing Code

The Plumbing Code includes the new CCR Title 20 California State Law (AB 715) requiring High Efficiency Toilets and High Efficiency Urinals be exclusively sold in the state by 2014. Figure 4-4 below describes conceptually how the above listed items are incorporated into the flow of information in the DSS Model.

Figure 4-4: DSS Model Overview Used to make Potable Water Demand Projections "With the Plumbing Code"



Graph of projected demands (Figure 4-5)

Figure 4-5 shows the potable water demand projection at five-year increments. The graph shows projections for demand with and without the plumbing code through 2035.

Table of water demand projections (Table 4-4)

The table of water demands projections includes:

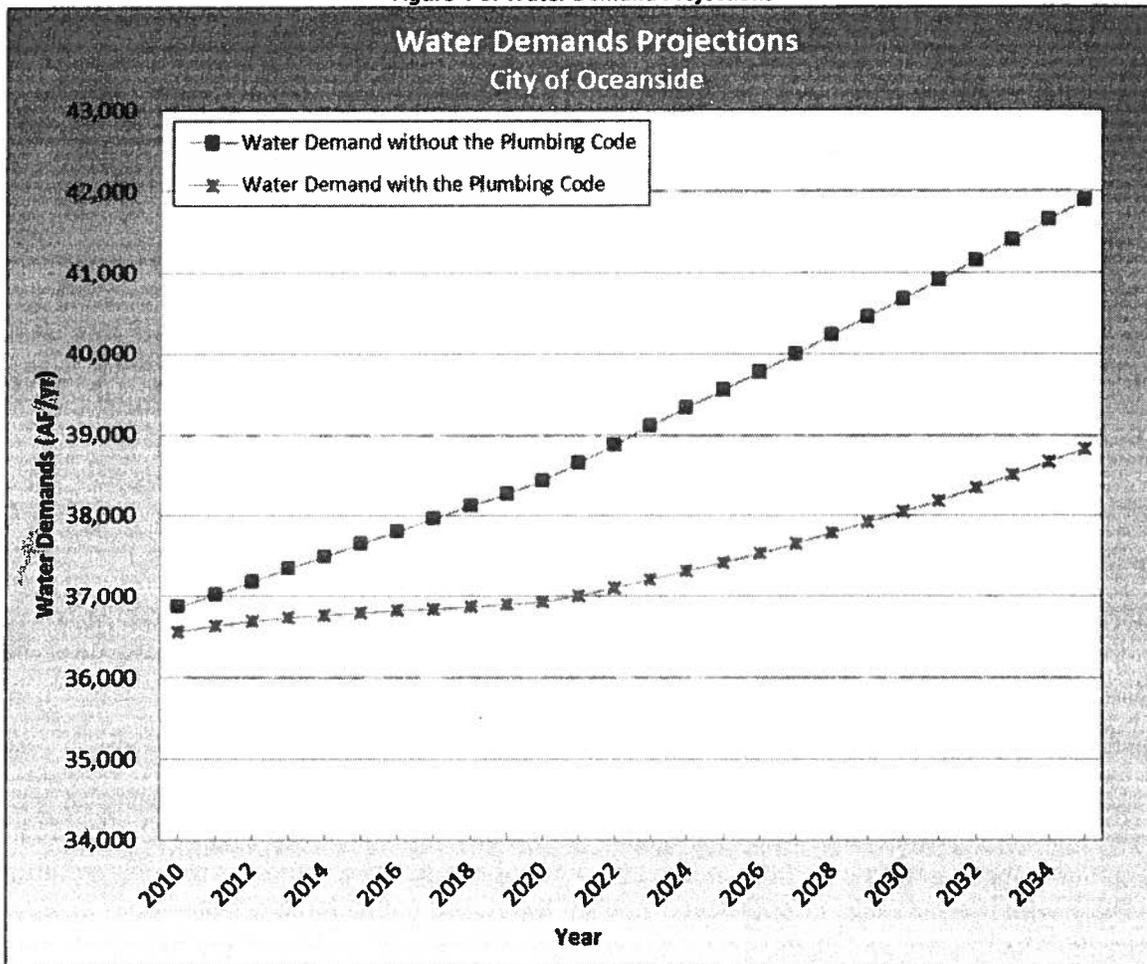
1. The water demand projections shown in Table 4-4 are based on the future population projections provided in Table 1.

2. Projections were made *with and without* the plumbing codes.
3. Projections are for potable and recycled water only.

Dry Year Demands

The demand projections reflect average weather conditions and **do not** reflect drier, hotter, non-drought conditions.

Figure 4-5: Water Demand Projections



Source: DSS Model February 2011

Table 4-4: Water Demand Projections

Water Demands Projections City of Oceanside						
Water Demand (AF/Yr)	2010	2015	2020	2025	2030	2035
Water Demand without the Plumbing Code	36,866	37,649	38,433	39,554	40,677	41,888
Water Demand with the Plumbing Code	36,563	36,793	36,923	37,422	38,044	38,832

Source: DSS Model February 2011. Data is not weather normalized.

5. CURRENT WATER CONSERVATION PROGRAM

The purpose of this section is to evaluate the City's existing water conservation program, and identify appropriate conservation opportunities that would further reduce the City's per capita water use.

The City has been a member of the California Urban Water Conservation Program (CUWCC) since 1997. The City's current water conservation program is a combination of the City's commitment to carrying out the CUWCC Best Management Practices (BMPs) and the City's desire to be water efficient. Since July 2008 the City has been participating in three regional programs that focused on offer services and hardware according to many of the CUWCC 14 BMPs created in 1997. These 14 BMPs were required of the CUWCC signatories until the end of 2008. Effective January 1, 2009, the CUWCC members are expected to comply with the new and revised CUWCC BMPs.

5.1 Description of Current Programs

The following section provides a summary of the City's current water conservation programs broken into three main categories: (1) Programs offered directly by the City of Oceanside, (2) Programs offered by San Diego County Water Authority (SDCWA), and (3) Programs offered by Metropolitan Water District (MWD). As of July 1, 2008, the City offered many new programs and rebates including both Save a Buck and SoCal WaterSmart offered by MWD. As requested by the City, the description for each of these individual programs was obtained directly from the MWD, SDCWA, and City websites.

Public Outreach Programs offered by the City of Oceanside

Water Conservation Brochures and Handouts

Brochures and handouts are distributed both during community events such as fairs and farmer's markets. Brochures and conservation tips can also be downloaded via the website on indoor water conservation, efficient irrigation and sustainable landscaping.

Media Campaign

The City's current water conservation media campaign is the "20 Gallon Challenge" focusing on water customers saving an additional 20 gallons of water per day. An online 20 Gallon Challenge pledge promotes all the water conservation options available for both indoor and outdoor savings. This campaign is being promoted in conjunction with the San Diego County Water Agency and supported by funding from water purveyors countywide. The City has participated in many press releases, tapings, television media and other forms of public outreach via various communication methods.

Website

The City's Water Conservation Programs website is <http://www.ci.oceanside.ca.us>, (click on "Water-Saving Opportunities"). Additionally, the City promotes multiple regional and national water conservation program websites including "The 20 Gallon Challenge", Be Water Wise (MWD), The City of San Diego Landscape Calculator, San Diego Chapter of the California Native Plant Society, San Diego County Water Authority Programs, US EPA's WaterSense, The Water Conservation Garden, H2OUSE Water Use, AWWA Water Wiser, California Water Awareness Campaign and the EPA: Protect Your Drinking Water For Life.

School Education Programs

Water education presentations are given in approximately 10 schools per year. Water education materials are provided to schools. The City participates in the annual 4th grade Water Awareness Poster Contest.

Workshops

The City has offered a variety of workshops in the past two years. The typical topics are landscapes and agricultural use covering areas of irrigation efficiency for agricultural and residential customers and agricultural runoff.

Landscape Hotline

The Water Conservation Garden at Cuyamaca College offers a telephone landscape hotline to help connect residents who want their gardens to be water-wise with an expert who can help advise them. The hotline is open from 9:00 a.m. to 12:30 p.m. on Tuesdays and 1:00 p.m. to 4:30 p.m. on Thursdays.

Demonstration Gardens

The Water Conservation Program has three local low-water using demonstration gardens:

- The Water Conservation Garden at Cuyamaca College
- Quail Botanical Gardens in Encinitas
- The Botanical Building in Balboa Park
- Buena Vista Lagoon Nature Center in Oceanside

Programs offered by SDCWA through the Smart Landscape Program (SDCWA)

Water Efficient Devices/Services

- Multi-Family Smart Landscape Grant (Grants for repairs/upgrades) — up to \$5,000
 - Multi-family properties may qualify for grants of up to \$2,500 per irrigated acre (maximum \$5,000) to replace or upgrade hardware and equipment that will stop leaks, reduce water use, or otherwise improve irrigation efficiency. (Examples: nozzles, flow sensors, valves, pipes, soil moisture sensors, etc.)
- Multi-Family Smart Controller Vouchers — up to \$25/station
 - Property may be eligible for discounts on weather-based irrigation controllers. The smart controllers can help maximize landscape investments and reduce water-related expenses.

Free Landscape Surveys/Audits

- Single-Family Landscape Surveys
 - Free residential surveys are available to single family customers looking for help in reducing outdoor water use. Surveys are designed to identify potential leaks, recommend water conserving devices, assess irrigation efficiency, and determine the proper landscape watering schedule.
- Multi-Family Landscape Audit
 - Free landscape audits are available to over-watered multifamily accounts. The audit is designed to assess the efficiency of the irrigation system, identify potential leaks, and determine the

proper watering schedule for the landscape based on existing plant material. Audits are available to pre-approved customers. In general, mini audits are offered to those with less than one acre of irrigated land, while full audits are offered to sites with one or more acres of irrigated land that may appear to be over-watered. Agency representatives assist interested customers in identifying which service is best for them.

- CII Landscape Audit
 - Free landscape audits are available to over-watered commercial or public sites in excess of 1 acre. The audit is designed to assess the efficiency of the irrigation system, identify potential leaks, and determine the proper watering schedule for the landscape based on existing plant material.

Programs offered by MWD through the SoCal Water\$mart Rebate Program

The SoCal Program Water\$mart program provides rebates for water users to improve their efficiency through appliance and equipment retrofits and replacements. SoCal Water\$mart provides rebates only to residential customers of participating Metropolitan Water District of Southern California (MWD) water agencies. This includes residents of single-family detached homes, duplexes, triplexes and fourplexes.

Water-Efficient Device Maximum Rebate

- Single-Family High Efficiency Clothes Washer \$135.00
- Single-Family High Efficiency Toilet (1.28 gpf or less) \$100.00
- High Efficiency Rotating Nozzles (one rebate per household) \$4.00 / nozzle
- Single-Family Weather Based Irrigation 'Smart' Controller (less than 1 acre) \$230.00 /acre
- Single-Family Weather Based Irrigation 'Smart' Controller (1 acre or more) \$630.00 /acre
- Residential Synthetic Turf (one installation per household for first 1,000 sq. ft.) \$1.00 per sq.ft

Programs offered by MWD through the Save-a-Buck Rebate Program

The MWD Save-a-Buck program provides rebates for Multi-Family and CII water users to improve their efficiency through appliance and equipment retrofits and replacements. Save-a-Buck provides rebates only to multifamily residential and CII customers of participating Metropolitan Water District of Southern California (MWD) and participating water agencies.

Water Efficient Device Maximum Rebate

- Multi-Family High Efficiency Toilet (dual flush or 1.28 gpf or less) \$100.00
- Multi-Family High Efficiency Clothes Washer \$135.00
- Multi-Family High Efficiency Toilet Upgrade/New Construction (1.6 gpf or less) \$30.00
- CII High Efficiency Toilet (dual flush or 1.28 gpf or less) \$100.00
- CII High Efficiency Toilet Upgrade/New Construction (1.6 gpf or less) \$30.00
- CII High Efficiency Clothes Washer \$210.00
- CII and Multi-Family Synthetic Turf \$.50 per sq. ft.

- CII Commercial Ice-Maker Minimum Rebate: \$300
- Urinal (high efficiency - .26 to .5 gpf on existing 1.5 gpf or greater) \$200.00
- Urinal (high efficiency upgrade - 0.26 to 0.5 gpf on existing 1.0 gpf) \$60.00
- Urinal (ultra-low/zero water - 0.125 to 0.25 gpf on existing 1.5 gpf) \$400.00
- Urinal (ultra-low/zero water upgrade - on 1.0 gpf to ultra-low water) \$120.00
- Pre-Rinse Spray Valve \$60.00
- Steam Sterilizer \$1,900.00
- Cooling Tower Conduct Controller/ pH \$625/\$1,900 pH
- Dry Vacuum Pump (per 0.5 HP/max. 2 HP) \$125.00
- Food Steamer - connectionless/pressure less (per compartment) \$485.00
- X-ray Processing Unit \$3,120.00
- Water Savings Performance Program - MWD provides \$195 per acre-foot of water saved or about \$3 per 1,000 gallons saved to multi-family sites within San Diego County. Incentive is based on the potential for savings over five years.

All of the programs and rebate values are subject to change in the future because MWD & SDCWA are reviewing funding available to member agencies (including the City of Oceanside). The values shown were current at the time the Master Plan work was conducted.

5.2 City of Oceanside Water Billing Structure

Water rates provide the City a tremendous opportunity to convey a price signal to its water customers. Customers that use more water pay a higher rate for each additional water unit. Therefore, when rates are designed to recover costs, consideration must be given to the price signal sent from the designed rates. There are several rate objectives that can drive the rate design process, ranging from revenue sufficiency, consumption efficiency, resource conservation, and affordability. Based on the City objectives, the City can choose to use various rate alternatives to meet its objectives.

The following paragraphs outline the existing City water rate structure.

The City's existing rate structure, as governed by the current rate resolution, consists of differing rates on an increasing block rate structure based on customer class, in addition to a base monthly fee. The monthly base minimum fee is dependent on the customer class and size of meter. The usage fee is dependent on the usage volume. The water restriction surcharge is a percentage of the monthly base fee and the water usage fee.

The City's user classification for potable water customers is:

1. Residential - Single Family
2. Residential - Multi Family
3. Commercial/Industrial
4. Governmental
5. Irrigation
6. Agricultural
7. Reclaimed Water

Table 5-1 below summarizes the City's rate structure for its monthly base fee for all customers as of February 2011.

Table 5-1: Water Rates, Fixed Charges

Water Rates, Fixed Charges, February 2011	
City of Oceanside	
Meter Size	Monthly Service Charge
5/8"	\$13.71
1"	\$30.22
1 1/2"	\$57.75
2"	\$90.78
3"	\$167.86
4"	\$222.97
6"	\$553.24
8"	\$883.56
10"	\$1,268.94

As shown in Table 5-2 the City's current rate structure for single family accounts as of February 2011 is a two tier rate structure. The unit rates increase from the first to second tier is 16 percent.

Based on the rate comparison, and a review of the other rate structures in the comparison, it appears that the City's inclining block rate structure provides a modest conservation incentive for this account class.

Table 5-2: Water Utilities Department Single Family Water Rate Tiers

Water Utilities Department Single Family Water Rate Tiers		
City of Oceanside		
Tier	Rate⁽¹⁾ \$/hcf	Percent Increase
First 13 hcf	\$1.99	---
14+ hcf	\$2.28	15%

Notes:

(1) hcf = hundred cubic feet or 748 gallons

(2) Presented tiered rate is used to calculate the user charge. In addition to this charge, the City water bill includes a fixed charged based on meter size.

6. ALTERNATIVE WATER CONSERVATION MEASURES

The Project Team's goal is to develop a plan that will result in the greatest efficiency of program administration, the lowest cost of implementation, and the greatest water savings. As part of this effort, the Project Team held a Measure Screening Workshop with City staff to review existing implementation methods, including pros/cons of current efforts, and develop a plan for moving forward and implementing additional conservation measures.

A screening process was undertaken on April 24, 2009 with the assistance of City staff to identify roughly 20-40 new measures for further evaluation, while taking into account the existing measures are currently implemented.

Appendix A contains the list of measures screened along with the final results of which ones were selected.

6.1 Conservation Planning Goals and Approach

The goal of the Conservation Master Plan is to further enhance the existing water conservation program. To accomplish this goal, additional measures could be added to the existing program.

Programs that consist of a large number of measures are historically difficult to implement successfully; therefore prioritization of measures is important.

6.2 Potential New Conservation Measures

An important step in updating the water conservation program is the review and screening of new water conservation measures. This task includes a review of the current water conservation measures, identification of measures that may be appropriate for the region, and the screening of these measures to a short-list for detailed evaluation (benefit-cost analysis). To complete this process, a list of potential demand management measures for qualitative evaluation (screening) has been compiled. This list in Appendix A includes 79 potential conservation measures in the typical customer categories of:

All Customers

- Residential
- Commercial, Industrial, Institutional
- Distribution System (System)

Found in Appendix A are the potential conservation measures for the City, which includes the conservation measures considered appropriate for this region. The table includes devices or programs (e.g., such as a new high efficiency toilet, that would save water if installed by a water retailer, contractor, or customer) that can be used to achieve water conservation, methods through which the device or program will be implemented and what distribution method, or mechanism, can be used to activate the device or program. The list potential measures in Appendix A was drawn from MWM and the City's general experience and review of what other water agencies with conservation programs are currently implementing.

6.3 Screening of Conservation Measures

A screening process was undertaken to reduce the number of new measures to be considered to a more manageable number and to eliminate those measures that are not as well suited to the City. The result of this process was to model short-listed new measures for further evaluation (water savings analysis and benefit-cost analysis with the DSS Model). This evaluation was specific to the water use characteristics, economies of scale, demographics, and other factors that are unique to the San Diego area and the City.

Each potential measure was screened based on three qualitative criteria (below), scored on a scale of 1 to 5, with 5 being the most acceptable, and 15 being the maximum possible number of points for all criteria. The screening was completed by local conservation professionals, in a one day meeting on April 24, 2009 facilitated by Maddaus Water Management.

Qualitative Criteria

The rating group used the following criteria to evaluate the measures:

- **Technology/Market Maturity** – Refers to whether the technology needed to implement the conservation measure, such as an irrigation control device, is commercially available and supported by the local service industry. A measure was scored low if the technology was not commercially available or high if the technology was widely available in the service area. A device may be screened out if it is not yet commercially available in the region.
- **Service Area Match** – Refers to whether the measure or related technology is appropriate for the area’s climate, building stock, or lifestyle. For example, promoting Xeriscape gardens for multi-family or commercial sites may not be appropriate where water use analysis indicates little outdoor irrigation. Thus, a measure scored low in this category if it was not well suited for the area’s characteristics and could not save water. A measure scored high in this criterion if it was well suited for the area and could save water.
- **Customer Acceptance/Equity** – Refers to whether retail customers within the wholesale customer service area would be willing to implement and accept the conservation measures. For example, would retail customers attend homeowner irrigation classes and implement lessons learned from these classes? If not, then the water savings associated with this measure would not be achieved and a measure with this characteristic would score low for this criterion. This criterion also refers to retail customer equitability (i.e., one category of retail customers receives benefit while another pays the costs without receiving benefits). Retail customer acceptance may be based on:
 - Convenience
 - Economics
 - Perceived fairness
 - Aesthetics

To reduce the list to a more manageable number, normally a score of 12 or more was necessary to pass. The process reduced the measures to be evaluated further down to 46 new measures. Each potential new measure was screened based on the City staff evaluation of each individual measure. Measures with a “No” were eliminated from further consideration, while those with a “Yes” passed into the next evaluation phase, cost-effectiveness analysis using the DSS Model.

Upon inspection of the overall list of 46 conservation measures selected for evaluation, it became apparent that some measures could be combined and others could be separated into two categories as follows:

- Measures that were voluntary and incentive based
- Measures that were regulatory and applied to new development only

After the measure screening a few additional measures were included at the request of the City: Automated Meter Infrastructure (AMI), Additional Recycled Water as per the 2005 Recycled Water Master Plan; Cal Green (New Development Building Code). The Cal Green requirements effect all new development in the State of California after January 1, 2011. As this is a new development law and based on discussions with City, MWM

assumed actual water savings seen by the City would begin to occur in the year 2012. The new development requirements under Cal Green are listed in Table 6-1.

Table 6-1: Cal Green Building Code

Cal Green Building Code						
Building Class	Component	Effective Date ^[i]	Indoor Fixtures Included	Indoor Requirement	Landscaping & Irrigation Requirements	Are the Requirements Mandatory?
Residential	Indoor	>7/1/2011	Toilets, Showers, Lavatory & Kitchen Faucets, Urinals	Achieve 20% savings overall below baseline		Yes
	Outdoor	>1/1/2011			Provide weather adjusting controllers	Yes
Non Residential	Indoor	>1/1/2011	Submeter leased spaces	Only if building >50,000 sq. ft. & if leased space use >100 gpd		Yes
			Toilets, Showers, Lavatory & Kitchen Faucets, Wash Fountains, Metering Faucets, Urinals	Achieve 20% savings overall below baseline		Yes
	Outdoor	>1/1/2011			Provide water budget	> 1,000 sq ft. landscaped area
					Separate meter	As per Local or DWR ordinance
					Prescriptive landscaping requirements	> 1,000 sq ft. landscaped area
				Weather adjusting irrigation controller	Yes	

[i] Effective date is 180 days after published, likely to be 7/1/2011 or later

MWM did include the new California Law SB 407 in the measure description table. In the model MWM worked carefully such that SB 407 takes into account the overlap with the plumbing code (natural replacement) and rebate programs (such as through HET Toilets). SB 407 begins from the year 2017 in residential and 2019 in commercial properties. SB 407 program length continues until all the older high flush toilets have been replaced in the service area. Table 7-1 shown in Section 7 includes a list of all the measures analyzed in this project.

7. COMPARISON OF INDIVIDUAL CONSERVATION MEASURES

7.1 Conservation Measures Evaluated

The following table presents the measure descriptions that were analyzed for the efforts of the Conservation Master Plan.

Table 7-1: Measure Descriptions

Measure Descriptions City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
1	Landscape Financial Incentive Program	SF, MF, CII, GOV, IRR	For SF, MF, CII, GOV, and IRR customers with landscape, provide rebates towards the purchase and installation of selected types of irrigation equipment upgrade including low volume sprinkler heads, check valves, and rain sensors. Rebate is up to \$350 for residential accounts and up to \$650 for mixed use accounts and up to \$10,000 for irrigation accounts. Assume average rebate to be \$300 for single family accounts and \$1,500 for multifamily and non-Residential accounts.
1 - Int	Landscape Financial Incentive Program - Intensive	SF, MF, CII, GOV, IRR	Same as Landscape Financial Incentive Program, except with a more aggressive market penetration after 2011
2	New Development Landscape Requirements	New MF, CII	New ordinance adopted by the City of Oceanside in 2010 or later. Cost of \$100 is for an enforcement inspection fee only.
2 - Prog E	New Development Landscape Requirements - Extended to SF Customers + CalGreen	New SF, New MF, CII	Same as New Development Landscape Requirements, except it is extended to new single family residential development.
2 - Existing	Landscape Requirements	SF, MF, CII, GOV, IRR	Same as New Development Landscape Requirements - Extended to SF Customers, except it is extended to existing residential homes.
3	ND Require Rain Sensors and Smart Irrigation Controllers	New SF, New MF, New CII	Require developers for all residential and all commercial development to provide the latest state of the art SMART irrigation controllers and rain sensors. These SMART controllers have on-site temperature sensors or receive a signal from a central weather station that modifies irrigation times at least weekly.
3 - Early	ND Require Rain Sensors and Smart Irrigation Controllers - Earlier Start	New SF, New MF, New CII	Same as ND Require Rain Sensors and Smart Irrigation Controllers, except it will start in 2011 instead of 2020.
4	Landscape Water Budgets	IRR, GOV	Irrigators of landscapes with separate irrigation account use would receive a monthly or bi-monthly irrigation water use budget. Assume 4% of accounts receive new budgets per year. Budgets would be repeated every 5 years to remain current.
4 - Int	Landscape Water Budgets - Intensive	IRR, GOV	Same as Landscape Water Budgets, except it would be complete in 10 years instead of 24 years and it would extend the reevaluation period from 5 years to 7 years.
5	Landscape Water Audits Contracted	CII	All public and private irrigators of landscapes would be eligible for free landscape water surveys upon request. Normally those with high water use would be targeted and provided a customized report. Assume 10 percent of large turf areas are surveyed per year.
5 - Int	Landscape Water Audits Contracted - Intensive	CII	Same as Landscape Water Audits Contracted, except it will be completed in 13 years instead of 28.
6	Schools Replace Inefficient Equipment and Landscaping	GOV	City of Oceanside currently has 23 schools including 16 elementary, 4 middle schools and 3 high schools. An average of 1 school per year allows each school to be visited once in the 24 year program.
6 - Int	Schools Replace Inefficient Equipment and Landscaping By 2020	GOV	Same as Schools Replace Inefficient Equipment and Landscaping, except an average of 2.5 schools per year are visited allowing for all schools to be complete in 9 years.
7	Artificial Turf Rebate	SF	Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year with turf removal and installation of artificial turf.
8	Landscape Education Training	SF	Utility would run program training homeowners in efficient landscaping and irrigation principals. Target approx 0.5% of homes per year. Classes would be run in the appropriate time of year.
9	Public Education	SF	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include school programs, poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc. Program would continue indefinitely.
10	Graywater Retrofit Rebate	SF	Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year to install gray water systems.

Table 7-1 (Continued)

Measure Descriptions			
City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
11	Hot Water on Demand Requirement on New and Rebates for Existing	New SF, New MF	Require developers to equip new homes or buildings with efficient hot water on demand systems such as structured plumbing systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having an on-demand pump on a recirculation line. All new development of single-family and multi-family residential units shall include hot water pipe insulation and installation of a hot water recirculation device or design to provide hot water to the tap within 15 seconds in accordance with City of Oceanside Ordinance No. 02-OR126-1.
12	Multi Family Submetering Requirement on New Accounts	New MF	Require the metering of individual units in new multi-family, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units). Utility writes the rules as to how it is done.
12 - Early	Multi Family Submetering Requirement on New Accounts - Start Earlier	New MF	Same as Multi Family Submetering Requirement on New Accounts except it would start in 2011 instead of 2015.
13	SF Residential Audits	SF	Conventional indoor and outdoor water surveys for existing single-family residential customers. Normally those with high water use are targeted and provided a customized report to the homeowner on how to save water in their home. Assume 0.15% of accounts surveyed per year.
13 - Int	SF Residential Audits - Intensive	SF	Same as SF Residential Audits except it would survey 1% of accounts per year.
14	MF Residential Audits	MF	Indoor and outdoor water surveys for existing multifamily residential customers (5 units or more). Normally those with high water use are targeted and provided a customized report to owner. 0.5% of accounts surveyed per year.
14 - Int	MF Residential Audits - Intensive	MF	Same as MF Residential Audits except it would survey 1.5% of accounts per year.
15	CII Audits - Level 1 done by Oceanside	CII	High water use accounts would be offered a free water survey that would evaluate ways for the business to save water and money. Assume 0.5% percent of accounts are surveyed per year.
15 - Int	CII Audits - Level 1 done by Oceanside - Intensive	CII	Same as CII Audits - Level 1 done by Oceanside except it would survey 1.28% of accounts per year.
16	CII Audits - Level 2 Contracted by Oceanside	CII	Level 2 Audits will be the more complex sites. These types of audits are planned to be contracted to industry specialists.
16 - Int	CII Audits - Level 2 Contracted by Oceanside - Intensive	CII	Same as CII Audits - Level 2 Contracted by Oceanside except it would survey 1.44% of accounts per year.
17	CII Replace Inefficient Equipment	CII	Provide up to a \$1,000 rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity meters on cooling towers. Pattern after San Diego County Water Authority or Seattle Water Department programs. Assume 30% market saturation.
18	Restaurant low flow spray rinse nozzles by Oceanside	CII	Bulk Purchase and provide free. Take to fairs or markets. There are 214 restaurants where people have a place to sit down. 78 of the restaurants are full service "sit" down restaurant.
18 - Int	Restaurant low flow spray rinse nozzles by Oceanside Intensive	CII	Same as Restaurant low flow spray rinse nozzles by Oceanside except more efficient spray nozzles would be purchased.
19	Washer Rebates run by SoCal Water Smart	SF	40% Savings assume a minimum level of 30 gallons per load starting machine is replaced with an 18 gallon per load machine. Cost for admin and marketing included in the \$153.80 unit cost. Oceanside will continue run program in future if no longer offered by So Cal Water Smart.
19 - Int	Washer Rebates run by SoCal Water Smart	SF	Same as Washer Rebates run by SoCal Water Smart except it would target 3% of accounts per years instead of 1%.
20	Washer Rebates Administered by Save a Buck	MF	Rebate value was \$50, plus \$10.50 per unit cost for Honeywell services. 40% Savings assume a minimum level of 30 gallons per load starting machine is replaced with an 18 gallon per load machine. Cost for admin and marketing included in the \$60.50 unit cost. Customer cost of \$200 is to cover remaining cost difference between high end efficiency machine and a low end low efficiency machine.
20 - Int	Washer Rebates Administered by Save a Buck	MF	Same as Washer Rebates run by Save a Buck except it would target 1.6% of accounts per year instead of 0.5%.
21	HET Rebates Administered by SoCal Water Smart	SF	Provide a \$145 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation. Measure ends in 2011.

Table 7-1 (Continued)

Measure Descriptions City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
22	HET Rebates Administered by Save a Buck	MF, CII	Provide a \$60.50 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation. Measure ends in 2011.
23	HET Rebates Administered by Oceanside	SF, MF, COM	Provide a \$60.50 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation. Measure starts in 2012 and ends in 2014.
23 - Int	HET Rebates Administered by Oceanside	SF, MF, COM	Save as the HET Rebates run by Oceanside except it will start a year earlier, end a year later and target 2% of accounts per year instead of 0.25% of accounts. Measure starts in 2011 and ends in 2015.
24	Commercial Urinal Rebates	COM	Provide a rebate of \$100 for high efficiency urinals to existing high use CII customers (such as restaurants). Eligible replacements would include urinals flushing with no more than 0.25 gpf and best available technology (1 pint). Assume 3% of accounts participate per year.
25	High Efficiency Urinals in Government Buildings	GOV	Install high efficiency urinals in Utility's facilities. Replacements would include urinals flushing with no more than 0.25 gpf or best available technology (1 pint).
26	Fixture Retrofit on Resale, SB 407	Pre-1994 Existing Accounts	Measure will start in the year 2014 to coincide with the California State Law SB 407 which requires HETs be installed on resale. Work with the real estate industry to require a certificate of compliance be submitted to the City that efficient fixtures where either already there or were installed before close of escrow. Consider allowing this certification be a part of the conventional private building inspection report process.
27	Require WaterSense New Homes	New SF	Require all new homes to comply with EPS's WaterSense program. Program requires WaterSense labeled plumbing fixtures and a 40% reduction in landscape irrigation. Requirement would be handled through City Building Permit Process.
28	Irrigation Certification	All new	Require that all new irrigation systems be permitted and designed and installed by professionals who are certified by a third party, such as the Irrigation Association.
29	Agriculture Conservation	Agriculture	City or a contractor would offer water audits and City cash incentives to improve irrigation efficiency for those sites who receive an audit documenting need.
30	Zero Footprint Development	New SF	Utility would require new home developers to contribute money to the Utility's water conservation program to help generate the water needed (through added water savings beyond those already planned) to supply their project.
31	AMI for Customer Leak Reduction	SF, MF, COM, GOV	Utility would use new AMI system to reduce customer leaks
32	AMI for Water Loss Reduction	UFW	Utility would use new AMI system to reduce system losses
33	Recycled Water Phase I&II	Irrigation (IRR)	Implement Recycled Water Master Plan Phases I and II

Abbreviations:

- SF = Single family
- MF = Multifamily
- CII = Commercial, Industrial, Institutional
- GOV = Government
- IRR = Irrigation
- HET = High Efficiency Toilet (1.3 gal/flush)
- ULFT = Ultra Low Flush Toilet (1.6 gal/flush)
- AMI = Automatic meter Infrastructure (System)
- Int = Intensive

7.2 Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs involves comparing the costs of the programs to the benefits provided. This analysis was performed using the DSS Model. The DSS Model calculates savings at the end-use level; for example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account.

Present value analysis using constant 2010 dollars and a real discount rate of 3% is used to discount costs and benefits to the base year. From this analysis, benefit-cost ratios of each measure are computed. When measures are put together in programs, the model is set up to avoid double counting savings from multiple measures that act on the same end use of water. For example, multiple measures in a program may target toilet replacements. The model includes assumptions to apportion water savings between the multiple measures.

Economic analysis can be performed from several different perspectives, based on which party is affected. For planning water conservation programs for utilities, the perspectives most commonly used for benefit-cost analyses are the “utility” perspective and the “community” perspective. The “utility” benefit-cost analysis is based on the benefits and costs to the water provider. The “community” benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy and other capital or operating cost benefits plus costs of implementing the measure, beyond what the utility pays.

The utility perspective offers two advantages. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving versus supplying more water. Second, because revenue shifts are treated as transfer payments, which means program participants will have lower water bills and non-participants will have slightly higher water bills so that City revenue needs continue to be met. Therefore, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. It should be noted that there is a significant difference between the utility’s savings from the avoided cost of procuring water and the reduction in retail revenue that results from reduced water sales due to conservation. This budget impact occurs slowly, and can be accounted for in water rate planning. Because it is the water provider’s role in developing a conservation plan that is paramount in this study, the utility perspective was primarily used to evaluate elements of the plan.

The community perspective is defined to include the utility and the customer costs and benefits. Costs incurred by customers striving to save water while participating in conservation programs are considered, as well as the benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Water bill savings are not a customer benefit in the aggregate for reasons described above. Other factors external to the utility, such as environmental effects, are often difficult to quantify, are not necessarily under the control of the utility. They are therefore frequently excluded from economic analyses, including this one.

7.3 Present Value Parameters

The time value of money is explicitly considered. The value of all future costs and benefits is discounted to the first year in the DSS Model (the base year, which in this case is 2006), at the real interest rate of 3.0%. The DSS Model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%). Cash flows discounted in this manner are herein referred to as “Present Value” sums.

7.4 Assumptions about Measure Costs

Costs were determined for each of the measures based on industry knowledge, past experience and data provided by the City. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the costs to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that will be used in marketing the measure. The model was run for 30 years, (each year between 2006 and 2036) to encompass the 10-year conservation master planning period of 2010 to 2020 and provide water demands needed for the 2010

UWMP. Costs were spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

Lost revenue due to reduced water sales is not included as a cost because the conservation measures evaluated herein generally take effect over a span of time that is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations.

7.5 Assumptions about Measure Savings

Data necessary to forecast water savings of measures include specific data on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur three to ten years after the start of implementation, depending upon the implementation schedule.

7.6 Assumptions about Avoided Costs

The main source of water for the City is SDCWA imported water. The price of the water to the City is set by SDCWA every year and varies by agency location.

For this evaluation the avoided costs were taken from the SDCWA cost of treated water of \$1,026/AF for the calendar year 2011. It is recommended in the future that this cost be updated when new cost information from SDCWA becomes available.

7.7 Measure Assumptions including Unit Costs, Water Savings, and Market Penetrations

Appendix B includes the assumptions used in the DSS model to evaluate the water conservation measures selected by the City. Assumptions regarding the following variables were made for each measure:

- Targeted Water User Group; End Use – Water user group (e.g., single-family residential) and end use (e.g., indoor or outdoor water use).
- Utility Unit Cost – Cost of rebates, incentives, and contractors hired (by the utility) to implement measures.
- Retail Customer Unit Cost – Cost for implementing measures that is paid by retail customers (i.e., the remainder of a measure's cost that is not covered by a utility rebate or incentive).
- Utility Administration and Marketing Cost – The cost to the utility for administering the measure, including consultant contract administration, marketing, and participant tracking. The mark-up is sufficient (in total) to cover local agency conservation staff time and general expenses and overhead.

The unit costs vary according to the type of customer account and implementation method being addressed. For example, a measure might cost a different amount for a residential single family account, than a residential Multi-family account, and for a rebate versus an ordinance requirement or a direct installation implementation method. Typically water utilities have found there are increased costs associated with achieving higher market saturation, such as more surveys per year. Appendix A shows the unit costs and other measure assumptions used in the study for each measure analyzed. The model calculates the annual costs based on the number of participants each year. The general formula for calculating annual utility costs is:

Annual Utility Cost = Annual market penetration rate x total accounts in category x unit cost per account x (1 + administration and marketing markup percentage)

Annual Customer Cost = Annual number of participants x unit customer cost

Annual Community Cost = Annual utility cost + annual customer cost

7.8 Comparison of Individual Measures

Table 7-3 presents how much water the measures would save over 30 years, how much they would cost, and what cost of saved water per unit volume *if the measures were implemented on a stand-alone basis (i.e. without interaction or overlap from other measures that might address the same end use(s))*. Only the net water savings for overlapping conservation measures was included in each program. Savings from measures which address the same end use(s) are not additive. The model uses impact factors to avoid double counting in estimating the water savings from programs of measures. For example, if two measures are planned to address the same end use and both save 10% of the prior water use then the net effect is not the simple sum (20%). Rather it is the cumulative impact of first measure reducing the use to 90% of what it was without the first measure in place and then reducing the use another 10% to result in the use being 89% of what it was originally. In this example the net savings is 19%, not 20%. Using impact factors the model computes the reduction as follows $0.9 \times 0.9 = 0.89$ or 19% water savings.

Since interaction between measures has not been accounted for in Table 7-2, it is not appropriate to include totals at the bottom of the table. However, the table is useful to give a close approximation of the cost effectiveness of each individual measure.

Cost categories are defined below:

- Utility Costs - those costs that the City as the water utility would incur to operate the Water Conservation Program, including administrative costs.
- Utility Benefits - the avoided cost of purchasing water at the identified rate of \$1,026/AF.
- Customer Costs - those costs customers would incur to implement a measure in the City's Conservation Program and maintain its effectiveness over the life of the measure.
- Customer Benefits - the savings other than from reduced water/sewer utility bills, such as energy savings resulting from reduced use of hot water. Reduced water and sewer bills are not included because they are a transfer payment among water users and any lost revenue would be made up with an overall rate increase. Conservation program participants would see lower water and sewer bills but overall there would be no net customer benefit.
- Community Costs and Benefits - Community Costs and Benefits include Utility Costs plus Customer Costs, and Utility Benefits plus Customer Benefits, respectively.

The column headings in Table 7-2, as well as those used later in Table 8-4, are defined as follows:

- Present Value of Utility and Community Costs and Benefits (\$) = the present value of the 30-year time stream of annual costs or benefits, discounted to the base year.
- Utility Benefit-Cost ratio = PV of Utility Costs divided by PV of Utility Benefits over 30 years.
- Community Benefit-Cost ratio = PV of Utility Benefits plus PV of customer energy savings) divided by (sum of PV of Utility Costs plus PV of Customer Costs), over 30 years
- First Year Cost to Utility (\$) = the sum of the annual Utility Costs for the years 2011 to 2015.

- Utility Cost of Water Saved per Unit Volume (\$/AF) = PV of Utility Costs over 30 years divided by the 30-Year Water Savings. This value is compared to the utility's avoided cost of water as one indicator of the cost effectiveness of conservation efforts. It should be noted that the value somewhat undervalues the cost of savings because program costs are discounted to present value and the water benefit is not.

Table 7-2: Estimated Conservation Measure Costs and Savings

Estimated Conservation Measure Costs and Savings						
City of Oceanside						
Measure Name	Present	Present	Water	First Five	Water	Cost of
	Value of Water Utility Benefits	Value of Water Utility Costs	Utility Benefit to Cost Ratio	Years Total Water Utility Costs	Savings in Year 2035 (afy)	Savings per Unit Volume (\$/af)
Financial Incentives/Rebates for Irrigation Upgrades	\$537,075	\$547,098	0.98	\$135,929	60	\$583
Financial Incentives/Rebates for Irrigation Upgrades - Intensive	\$3,139,831	\$3,033,762	1.03	\$878,744	405	\$533
Landscape Requirements for New Systems	\$621,851	\$42,846	14.51	\$3,628	81	\$37
Landscape Requirements for New Systems - Extended	\$837,842	\$166,205	5.04	\$6,327	115	\$105
Landscape Requirements for New Systems	\$5,233,129	\$1,831,175	2.86	\$110,868	841	\$183
Smart Controllers and Rain Sensors for New Systems	\$264,046	\$80,369	3.29	\$0	44	\$153
Smart Controllers and Rain Sensors for New Systems	\$525,374	\$109,733	4.79	\$21,271	65	\$113
Large Landscape Water Budgets	\$852,441	\$403,157	2.11	\$121,258	62	\$285
Large Landscape Water Budgets - Intensive	\$2,069,128	\$645,052	3.21	\$194,012	160	\$185
Large Landscape Audits	\$865,530	\$796,490	1.09	\$191,576	54	\$587
Large Landscape Audits - Intensive	\$3,216,117	\$2,557,467	1.26	\$689,673	237	\$483
School Retrofit	\$693,148	\$96,376	7.19	\$29,006	92	\$76
School Retrofit By 2020	\$1,330,471	\$133,214	9.99	\$86,951	106	\$59
Artificial Turf - SF Residential Program	\$110,750	\$140,895	0.79	\$0	24	\$632
Education/Training External Water Use Efficiency	\$233,704	\$118,651	1.97	\$36,379	31	\$278
Residential Public Education	\$3,232,400	\$1,798,759	1.80	\$508,121	159	\$376
Graywater Retrofit SF	\$135,309	\$378,920	0.36	\$23,025	22	\$1,469
Hot Water System for New Development per City Code	\$1,548,354	\$438,166	3.53	\$91,364	117	\$173
MF Submetering	\$333,897	\$120,777	2.76	\$20,735	34	\$200
MF Submetering - Program E	\$587,267	\$189,785	3.09	\$104,356	50	\$187
SF Residential Water Surveys	\$212,368	\$230,896	0.92	\$55,231	12	\$705
SF Residential Water Surveys - Intensive	\$1,124,897	\$1,351,814	0.83	\$397,660	80	\$728
MF Residential Water Surveys	\$189,493	\$78,238	2.42	\$18,490	11	\$267
MF Residential Water Surveys - Intensive	\$478,517	\$217,593	2.20	\$59,909	32	\$280
Commercial Water Survey - Level 1	\$292,563	\$366,534	0.80	\$77,050	41	\$678
Commercial Water Survey - Level 1 - Intensive	\$292,563	\$398,405	0.73	\$83,747	41	\$737
Commercial Water Survey - Level 2	\$224,256	\$512,025	0.44	\$29,258	37	\$1,195
Commercial Water Survey - Level 2 - Intensive	\$456,399	\$621,498	0.73	\$130,632	64	\$737
CII Replace Inefficient Equipment	\$353,477	\$452,894	0.78	\$108,397	40	\$731
Restaurant Spray Nozzle Replacement	\$61,175	\$8,472	7.22	\$10,423	4	\$84
Restaurant Spray Nozzle Replacement - Intensive	\$122,351	\$16,945	7.22	\$20,846	8	\$84
Washer Rebates - So Cal Water Smart	\$1,102,216	\$678,341	1.62	\$302,022	63	\$386
Washer Rebates - So Cal Water Smart - Intensive	\$2,461,499	\$1,595,352	1.54	\$906,065	153	\$396
Washer Rebates - Save A Buck	\$294,091	\$29,365	10.01	\$13,017	17	\$62
Washer Rebates - Save A Buck - Intensive	\$698,531	\$73,572	9.49	\$41,655	45	\$64
High Efficiency Toilets - So Cal Water Smart	\$254,454	\$169,129	1.50	\$37,506	11	\$445
High Efficiency Toilets - Save A Buck	\$128,585	\$35,287	3.64	\$7,866	6	\$182
High Efficiency Toilets - City of Oceanside Run Program	\$161,073	\$58,597	2.75	\$72,099	9	\$225
High Efficiency Toilets - City of Oceanside Run Program - Intensive	\$1,288,588	\$527,374	2.44	\$648,888	75	\$253
Commercial Urinal Rebates	\$149,605	\$89,114	1.68	\$51,818	6	\$394
High Efficiency Urinals in GOV Buildings	\$7,705	\$15,062	0.51	\$18,257	1	\$1,195
Fixture Retrofit SB 407	\$1,008,693	\$45,152	22.34	\$9,381	126	\$24
Require Water Sense on New Homes	\$1,371,616	\$57,245	23.96	\$5,426	258	\$21
Irrigation Certification	\$1,170,690	\$37,127	31.53	\$7,638	137	\$17
Agriculture Conservation	\$700,228	\$61,635	11.36	\$18,538	59	\$51
Zero Footprint Development	\$914,411	\$110,618	8.27	\$10,485	172	\$62
AMI for Customer Leak Reduction	\$8,898,936	\$2,266,996	3.93	\$173,744	823	\$144
AMI for UFW Reduction	\$6,189,370	\$3,956,424	1.56	\$600,000	570	\$361
Recycled Water Phase I&II	\$25,895,860	\$13,435,693	1.93	\$7,081,313	2005	\$305

Note: some measures have a \$0 Total Utility Cost from 2011 to 2015. That just indicates there are no costs in that particular 5 year period. It does not mean there is no activity before 2011 or after 2011. This column is meant to be helpful for budgeting purposes only.

8. RESULTS OF CONSERVATION PROGRAM EVALUATION

8.1 Selection of Measures for Programs

Table 8-1 provides a summary of which measures are included in each of the seven alternative programs. The seven packages are designed to illustrate a range of various measure combinations and resulting water savings.

8.2 Menu of Water Conservation Alternative Programs (Programs A to F)

These programs are not intended to be rigid programs but rather to demonstrate the range in savings that could be generated if selected measures were run together. In this step MWM account for a percent overlap in water savings (and benefits) and estimated combined savings and benefits from programs or packages of measures.

A description of each program evaluated follows.

Program A– Existing

Savings for the “Existing Program” include the measures that have been run during the time period of 2007 and 2009. For the City the following measures were included:

Existing Program Conservation Measures:

- Financial Irrigation Rebates
- Landscaspe Water Audits
- Pubic Education
- Hot Water System
- Single Family Surveys
- Multi Family Surveys
- Washer Rebates - “SoCal Water\$mart”
- Washer Rebates - “Save A Buck”
- High Efficiency Toilet Rebates - “SoCal Water\$mart”
- High Efficinecy Toilet Rebates - “Save A Buck”
- Fixture Retrofits SB407

Program B

Savings for the “Program B” include the measures that have been run during the time period of 2005 and 2009 in addition to all measures that have a benefit cost ratio of 2.0 or greater.

Program C

This program was designed to be the future program with full compliance for “Program A and B” including all the CUWCC BMPs. Program water savings includes actual achievements for the years 2005 to 2009 and then projected participation rates starting in 2011 in accordance with those specified in the California Urban Water Conservation Council’s Memorandum Of Understanding, which may be higher (or

lower) than the City is currently achieving. Program C includes measures that have lower benefit cost ratios than those included in Program B.

Program C + AMI + Recycled Water

Contains all of the conservation measures included in Program C and include three additional measures:

- Advanced Metering Infrastructure (AMI) System Used to Reduce Customer Leaks
- AMI System Used to Reduce System Losses
- Recycled Water Master Plan Phases I and II Implementation

Program D

Is one step more intensive than Program C. The program goal was to increase water savings.

Program E

Includes all the measures evaluated. The goal of the program was to show the total water savings that would be possible with the measures selected by the City to be analyzed in this study.

Program F

Contains all of the conservation measures included in Program E plus three additional measures:

- Advanced Metering Infrastructure (AMI) System Used to Reduce Customer Leaks
- AMI System Used to Reduce System Losses
- Recycled Water Master Plan Phases I and II Implementation

Figure 8-1 and Table 8-2 present projected water demands with and without the plumbing code and how each program's water savings could affect the water demands. Figure 8-2 and Table 8-4 depict the projected average daily per capita water use and how it could be affected by each conservation program. The per capita values in the figure are calculated from the total water production and divided by the projected population for each given year.

Table 8-1: Conservation Programs and Measures

Conservation Programs and Measures City of Oceanside							
Measure Name	Program A	Program B	Program C	Program C + AMI + Recycled Water	Program D	Program E	Program F
Financial Incentives/Rebates for Irrigation Upgrades	✓	✓	✓	✓			
Financial Incentives/Rebates for Irrigation Upgrades - Intensive							✓
Landscape Requirements for New Systems		✓	✓	✓	✓		
Landscape Requirements for New Systems - Extended						✓	✓
Landscape Requirements for New Systems						✓	✓
Smart Controllers and Rain Sensors for New Systems		✓	✓	✓	✓		
Smart Controllers and Rain Sensors for New Systems						✓	✓
Large Landscape Water Budgets			✓	✓			
Large Landscape Water Budgets - Intensive					✓	✓	✓
Large Landscape Audits	✓	✓	✓	✓			
Large Landscape Audits - Intensive					✓	✓	✓
School Retrofit		✓	✓	✓	✓		
School Retrofit By 2020						✓	✓
Artificial Turf - SF Residential Program			✓	✓	✓		
Education/Training External Water Use Efficiency			✓	✓	✓	✓	✓
Residential Public Education	✓	✓	✓	✓	✓	✓	✓
Graywater Retrofit SF			✓	✓	✓		
Hot Water System for New Development per City Code	✓	✓	✓	✓	✓	✓	✓
MF Submetering		✓	✓	✓	✓		
MF Submetering - Program E						✓	✓
SF Residential Water Surveys	✓	✓	✓	✓			
SF Residential Water Surveys - Intensive					✓	✓	✓
MF Residential Water Surveys	✓	✓	✓	✓			
MF Residential Water Surveys - Intensive					✓	✓	✓
Commercial Water Survey - Level 1			✓	✓			
Commercial Water Survey - Level 1 - Intensive					✓	✓	✓
Commercial Water Survey - Level 2			✓	✓			
Commercial Water Survey - Level 2 - Intensive					✓	✓	✓
CII Replace Inefficient Equipment			✓	✓	✓	✓	✓
Restaurant Spray Nozzle Replacement		✓	✓	✓			
Restaurant Spray Nozzle Replacement - Intensive					✓	✓	✓
Washer Rebates - So Cal Water Smart	✓	✓	✓	✓			
Washer Rebates - So Cal Water Smart - Intensive					✓	✓	✓
Washer Rebates - Save A Buck	✓	✓	✓	✓			
Washer Rebates - Save A Buck - Intensive					✓	✓	✓
High Efficiency Toilets - So Cal Water Smart	✓	✓	✓	✓	✓	✓	✓
High Efficiency Toilets - Save A Buck	✓	✓	✓	✓	✓	✓	✓
High Efficiency Toilets - City of Oceanside Run Program		✓	✓	✓			
High Efficiency Toilets - City of Oceanside Run Program - Intensive					✓	✓	✓
Commercial Urinal Rebates			✓	✓	✓	✓	✓
High Efficiency Urinals in GOV Buildings		✓	✓	✓	✓	✓	✓
Fixture Retrofit SB 407	✓	✓	✓	✓	✓	✓	✓
Require Water Sense on New Homes			✓	✓	✓	✓	✓
Irrigation Certification					✓	✓	✓
Agriculture Conservation							
Zero Footprint Development			✓	✓	✓	✓	✓
AMI for Customer Leak Reduction				✓			✓
AMI for UFW Reduction				✓			✓
Recycled Water Phase I&II				✓			✓

Figure 8-1 shows annual water demand with no conservation, plumbing code only, and the seven programs. Table 8-2 shows the savings in 5 year increments for all seven programs. The savings in Table 8-4 are just from the conservation programs alone and do not include the plumbing code savings. The separate starting points for the demand with and without the plumbing code versus the conservation programs is directly correlated to the fact that the City have existing conservation programs active from 2007 and 2009 that are already saving water by the year 2010.

**Figure 8-1: Water Demand Projections with Conservation Program Savings
(Using SANDAG 2050 Projections and Commercial Growth Following Employment Projections)**

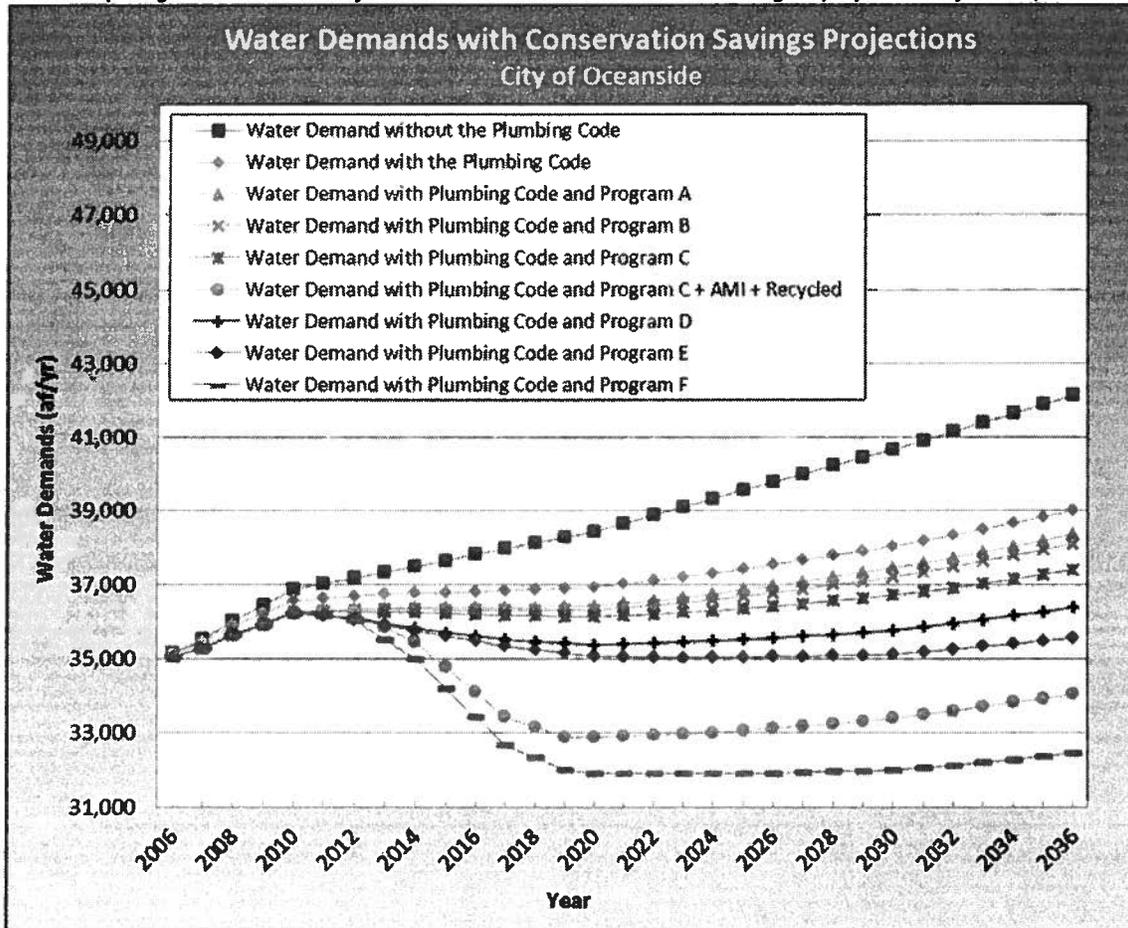
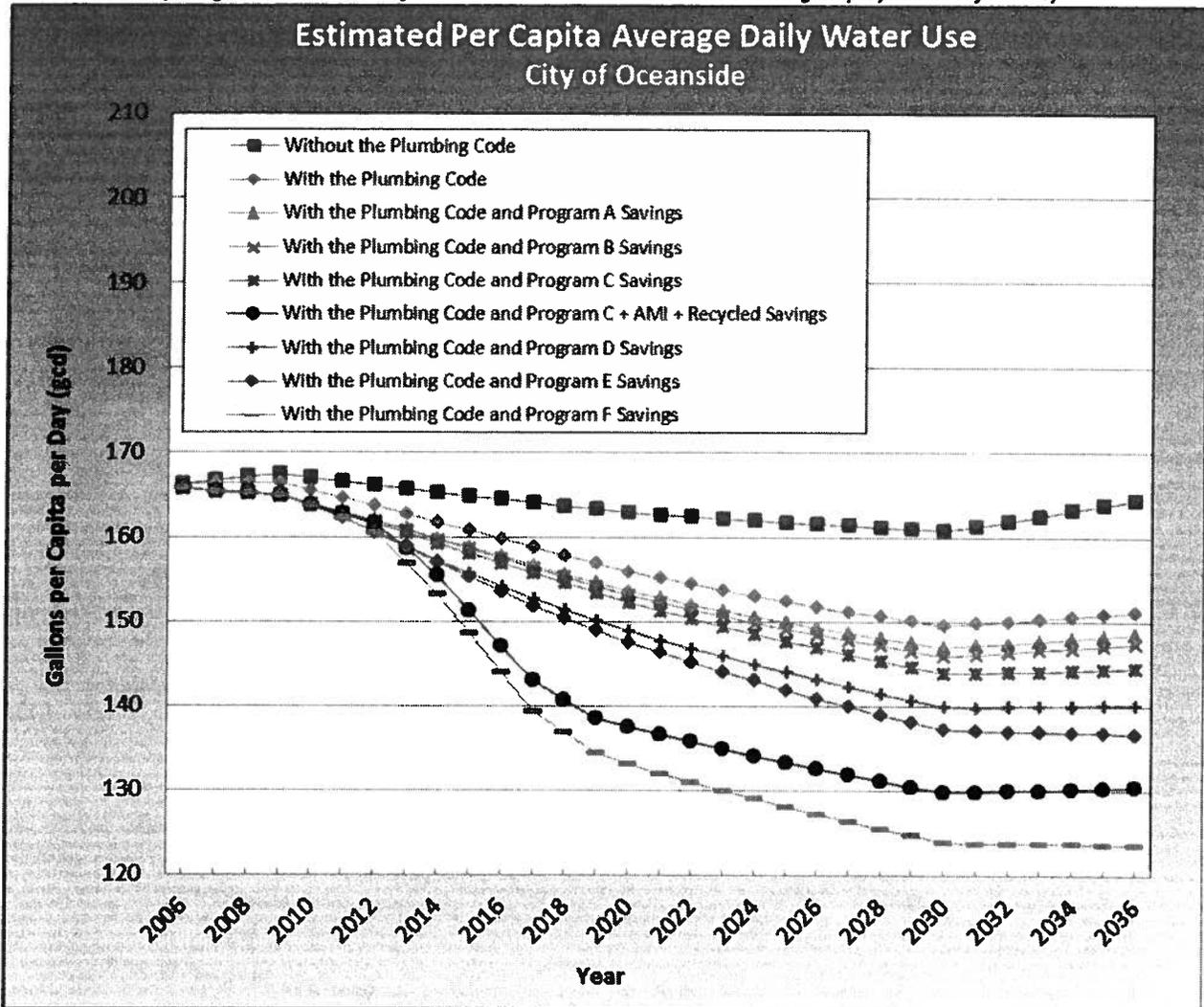


Table 8-2: Long Term Conservation Program Projected Water Savings

Long Term Conservation Program Water Savings City of Oceanside							Water Utility Benefit to Cost Ratio	Community Benefit to Cost Ratio
Water Savings (AF/Yr)	2010	2015	2020	2025	2030	2035		
Program A	318	419	512	560	606	630	1.92	1.84
Program B	318	462	618	734	847	889	2.17	1.84
Program C	328	579	793	1069	1339	1559	2.08	1.22
Program C + AMI + Recycled	328	2014	4046	4348	4648	4892	2.06	1.27
Program D	334	1073	1542	1906	2273	2561	1.82	1.13
Program E	334	1169	1853	2382	2913	3355	2.04	1.10
Program F	334	2580	5005	5517	6036	6468	2.00	1.16

**Figure 8-2: Estimated Per Capita Average Daily Water Use
(Using SANDAG 2050 Projections and Commercial Growth Following Employment Projections)**



**Table 8-3: Estimated Per Capita Average Daily Water Use
(Using SANDAG 2050 Projections and Commercial Growth Following Employment Projections)**

**Estimated Per Capita Average Daily Water Use
City of Oceanside**

Per Capita Average Daily Water Use (gpcd)	Year						Water Utility	Community
	2010	2015	2020	2025	2030	2035	Benefit to Cost Ratio	Benefit to Cost Ratio
Without the Plumbing Code	167	165	163	162	161	164	NA	NA
With the Plumbing Code	165	161	156	152	150	151	NA	NA
With the Plumbing Code and Program A Savings	164	159	154	150	147	148	1.92	1.84
With the Plumbing Code and Program B Savings	164	159	153	149	146	147	2.17	1.84
With the Plumbing Code and Program C Savings	164	158	152	148	144	144	2.08	1.22
With the Plumbing Code and Program C + AMI + Recycled Savings	164	151	138	133	130	130	2.06	1.27
With the Plumbing Code and Program D Savings	164	156	149	144	140	140	1.81	1.13
With the Plumbing Code and Program E Savings	164	155	148	142	137	137	2.03	1.09
With the Plumbing Code and Program F Savings	164	149	133	128	124	124	1.99	1.16

by new customers over the full planning period is the difference between 2006 demand and 2035 demand without the plumbing code. The plumbing code is an additional savings that could be added on top of the water savings shown in Table 8-3. This allows the plumbing code savings percent and water savings in AF/Yr shown in Table 4 and to be additive to the conservation program savings in AF/Yr and percentages shown in Table 8-4.

8.3 Progress to Date in Planning Per Capita Water Use Reductions

The City must comply, as all water suppliers in the state, with the requirements of SBx7-7 Water Conservation Act of 2009, also known as the "20 by 2020" law. Each urban water supplier must include in their 2010 UWMP a gross gallons-per-capita-per-day (gpcd) baseline, a water use target for 2020 and an interim water use target for 2015.

SBx7-7 provides options for the development of water providers' gross water use baseline for the calculation of water use and interim water use targets. The methodologies for calculating the baseline water use are expected to be clarified in the UWMP 2010 Guidelines (planned to be released in January 2011).

The options for calculating gpcd water use targets are as follows:

- Method 1: eighty percent of the urban water supplier's baseline per capital daily water use;
- Method 2: performance standards, e.g. 55 gpcd indoor residential water use, water efficiency standards for irrigated landscape (requires satellite imagery or site visits and dedicated irrigation meter data); and a 10% reduction in non-residential water use;
- Method 3: Ninety-five percent of the applicable state hydrologic region target;
- Method 4: This method was released in February 2011 and will be addressed in the 2010 UWMP.

The preliminary calculations are based on the following figures taken from the current work by MWM on the City's Water Conservation Plan:

Preliminary Per Capita Use Reduction Calculation Results:

- 2020 Projected Population: 196,482 (SANDAG 2030 Regional Projections)
- 2020 Projected Per Capita Use w/o Conservation: 177 gpcd (based on 2006 water use)

Baseline gallons per capita per day: 170 (based on ten year average from 1999-2008)

Preliminary calculations for 2020 Target goals for the City:

Method 1: $170 \text{ gpcd} \times 80\% = 136 \text{ gpcd}$

Method 2: not feasible to calculate without individual volumetric metering and extensive detailed knowledge of irrigated landscape area

Method 3: $95\% \text{ of Region 4 target (149 gpcd)} = 142 \text{ gpcd}$

Method 4: Is currently under review by the City and will be included in the 2010 UWMP.

Figure 8-3 illustrates how marginal returns change as more money is spent to achieve water savings. As the figure shows the cost versus saving curve is starting to decline from Program C to D. This means that the added cost of going from C to D will save less water per unit expenditure. However, the slope of the curve increases going from Program D to E indicating that measures added to form Program E are a good investment. The decision on which program is appropriate for each agency is dependent on many factors. Most recently, it may be impacted by the goals set forth by SBx7-7 which calls for a reduction in per capita water use by 2020, which is independent of the economic analysis.

Figure 8-3: Present Value of Utility Costs vs. Water Saved in 2035

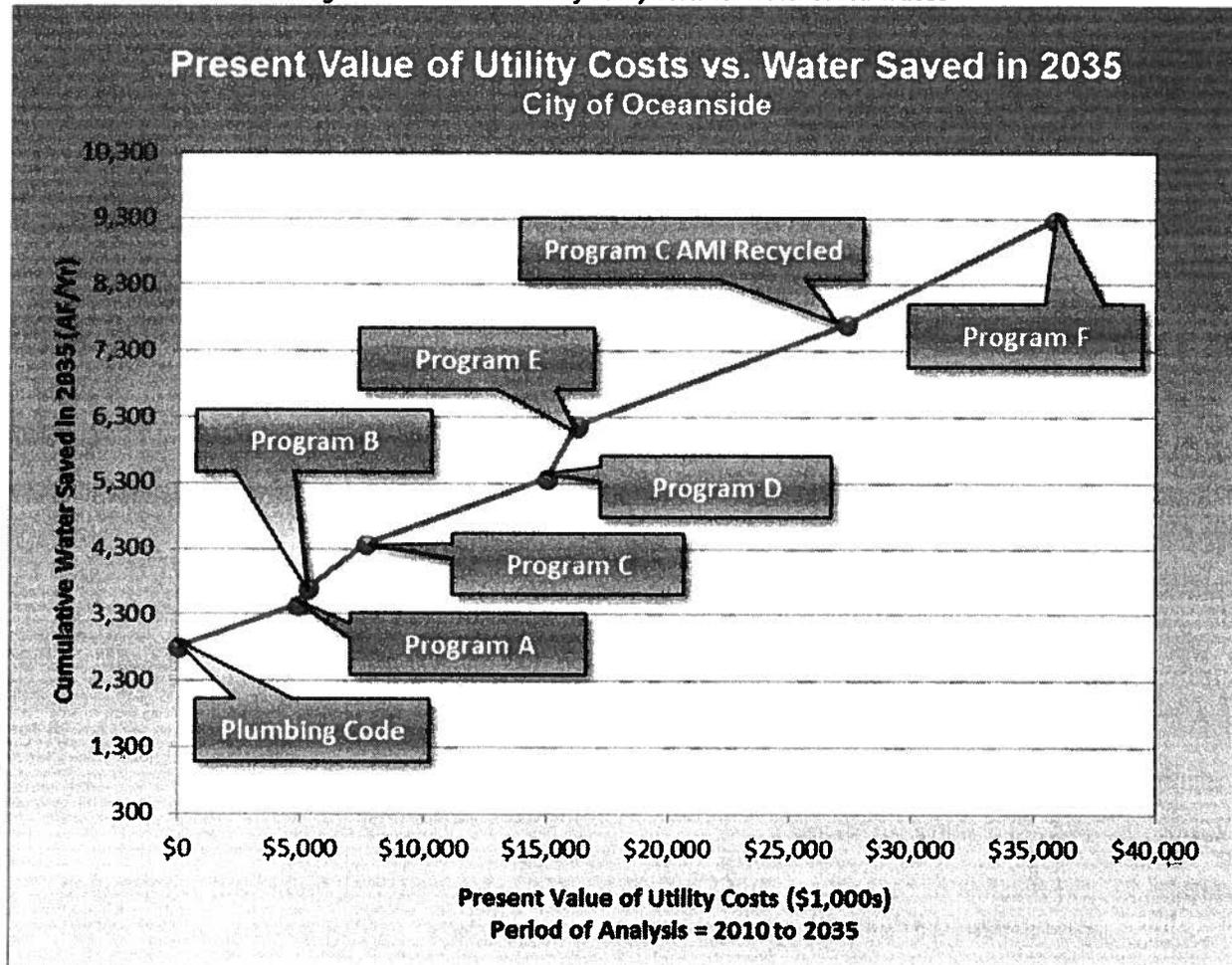


Table 8-4 presents key evaluation statistics compiled from the DSS Model. Assuming all measures are successfully implemented, projected water savings for 2035 in AF are shown, as are the costs of achieving this reduction. Water savings for programs have been shown for 2035 in Table 8-4.

The costs are expressed two ways.

1. Total present value over the analysis period,
2. The cost of water saved. Cost of water saved is presented two ways: for the utility and the total community (customer plus utility).

These cost parameters are derived from the estimated annual utility, customer and community costs.

The water savings are expressed as a percentage of the projected 2035 demand. One column indicates the percentage of the new water demand in 2035 each program could provide. The new water needed

Table 8-4: Comparison of Conservation Program Estimated Costs and Water Savings
Comparison of Conservation Program Estimated Costs and Savings

City of Oceanside

Conservation Program	Water Utility Benefit-Cost Ratio	Community Benefit-Cost Ratio	2015 Water Savings (AF/Yr)		2035 Water Savings (AF/Yr)		2035 Indoor Water-Savings (AF/Yr)		2035 Outdoor Water Savings (AF/Yr)		Total Percentage of Savings as a	Present Value of Water Utility Costs (2011 to 2015)	Total Utility Cost for First Five Years (2011 to 2015)	Water Utility Cost of Water Saved (\$/AF)
			419	630	433	198	1.6%	\$4,846,922	\$1,370,503	\$327				
Program A	1.92	1.84	419	630	433	198	1.6%	\$4,846,922	\$1,370,503	\$327				
Program B	2.17	1.84	462	889	514	375	2.3%	\$5,260,372	\$1,524,651	\$282				
Program C	2.08	1.22	579	1,559	839	721	4.0%	\$7,651,764	\$1,987,747	\$283				
Program C + AMI + Recycled	2.06	1.27	2,014	4,892	2,057	2,835	12.6%	\$27,310,877	\$9,842,804	\$282				
Program D	1.81	1.13	1,073	2,561	1,071	1,489	6.6%	\$15,036,610	\$5,020,864	\$325				
Program E	2.03	1.09	1,169	3,355	1,092	2,263	8.6%	\$16,273,791	\$5,274,243	\$285				
Program F	1.99	1.16	2,580	6,468	2,307	4,160	16.7%	\$35,932,904	\$13,129,300	\$291				

Notes:

- Present Value is determined using an interest rate of 3%
- Cost of water saved is present value of water utility cost divided by total 30-year water savings.
- * % of water saved refers to the demand without the plumbing code
- Total water savings in 2035 as a percent of production is relative to no plumbing code production
- Conversion 1 MGD is equal to 1120 AF/Yr

9. RECOMMENDED PLAN

This section presents an overview of the recommended conservation plan for the City of Oceanside service area. The recommended plan includes several elements: (1) how the plan was selected from the alternatives presented in Section 8; (2) a more detailed description of the components including goals and implementation strategy; (3) the costs and schedule for implementation; (4) the benefits of the plan; and (5) implementation suggestions including financing the plan.

9.1 Selection Criteria and Process

The recommended plan was developed at a regularly scheduled City Water Commission meeting held February 14, 2011. MWM presented the results of the evaluation of water conservation issues and options for Oceanside during a 2.5-hour session at the San Luis Rey Water Reclamation Facility that convened representatives from the City of Oceanside Utilities Commission and Water Utilities Department, Maddaus Water Management (MWM), and Tamayo & Associates (Group).

- **Workshop Purpose:**
Provide Utilities Commissioners an opportunity to learn about and discuss water conservation options.
- **Outcome:**
Commissioners selected a suite of options that will meet the state mandated water use reduction target using Method 3 by 2020.

This activity brought the participants to a common level of understanding of water conservation issues for Oceanside. MWM also explained the various conservation program options that they had prepared for the City.

Decision criteria were reviewed with the group and were as follows:

- Cost-Effectiveness
- Water Savings
- Ease of Implementation
- Availability of Technology
- Average Annual Cost

Table 9-1 presents the estimated per capita use reductions and in particular the two that meet 2020 Method 3 per capita use target of 25 gpcd.

- Program C plus AMI and Recycled Water
- Program F

Table 9-1: Summary of Options to Meet State's Per Capita Use Targets

Summary of Options to Meet State's Per Capita Use Targets City of Oceanside						
Program	Cost Effective to Utility and Community	2015 Potential Water Savings (gpcd)	2020 Potential Water Savings (gpcd)	Ease of Implementation	Availability of Technology	Annual Avg. Cost of Program
Program E	Yes	10 gpcd	15 gpcd	Difficult	Medium	\$1,035,000
Program C + AMI + Recycled	Yes	14 gpcd	25 gpcd	Medium - Difficult	Medium	\$2,290,000
Program F	Yes	16 gpcd	30 gpcd	Very Difficult	Medium	\$2,950,000

Workshop participants were divided into two teams. Each team had Commissioners, City staff, members of the public, and one of the MWM experts. Participants were asked to:

- Review both conservation programs (C++ and F)
- Share their experience with each of the measures in these Programs
- Identify the Pros/Cons of each program
- Present the group's findings to the rest of the participants

This activity enabled the participants to interact, ask questions of an expert and discuss the various merits or liabilities of the many options available for achieving the conservation target. Two groups enabled twice as much interaction opportunity to engage with the experts.

Pros and Cons of Programs C++ and F were as follows:

Table 9-2: Pros and Cons of Conservation Programs

Pros and Cons of Conservation Programs City of Oceanside	
Program C++	Program F
○ Pros	○ Pros
▪ Meets the per capita use reduction goal	▪ Meets the per capita use reduction goal
▪ Easier to implement	▪ Overshoots the target allowing some cushion and options if some measures don't work out
▪ Popular programs	
▪ Possibility to partner with others	
▪ Balanced approach	
▪ Less expensive than F	
○ Cons	○ Cons
▪ Fewer options and less intensive if some options do not work	▪ Harder to implement on conservation elements
▪ Expensive as cost estimated at \$2.1 million/year	▪ Expensive as cost estimated at \$2.9 million/year

At the conclusion of the workshop a consensus was reached on the best way forward. The themes presented by participants were:

- Implement Program C++
- Phase in program elements up to the level of activity and measures in Program F as appropriate or needed over time.
- Partner and engage high water users

- Develop new development offsets

The Group went on to highlight the major benefits of this approach:

- Complies with State SBx7-7 law (and per capita use targets)
- Cost-effective and less expensive than buying additional imported water
- More control of City's future water supply availability

A follow-up recommendation was made to form a 20 x 2020 Working Group to monitor progress and consider modifications to the plan over time to meet the 2015 and 2020 per capita use targets cost-effectively.

9.2 Description of Recommended Plan

The recommended plan consists of the measures described in Table 9-3. Table 9-4 contains measure descriptions for all the measures (elements) contained in the Plan.

Table 9-3: Elements of Conservation Program C+AMI+Recycled Water

Elements of Conservation Program C+ AMI+Recycled Water (The Recommended Plan) City of Oceanside			
General Measures	Residential Measures (Indoor)	Commercial Measures (Indoor)	Irrigation Measures (Outdoor)
Public Education	High Efficiency Toilets Rebates	High Efficiency Toilets Rebates	Financial Incentives for Irrigation Upgrades
School Retrofit by 2035	High Efficiency Urinal Rebates	High Efficiency Urinal Rebates	Landscape Requirements New Accounts except SF
Automated Meter Infrastructure (AMI)	Clothes Washer Rebates	Clothes Washer Rebates	Large Landscape Water Budgets + Audits
Recycled Water (Phase 1 & 2)	Water Use Efficiency Surveys	Water Efficiency Surveys	Artificial Turf Rebate (Single Family)
Senate Bill 407 Fixture Replacement	Hot Water Systems	Kitchen Pre Rinse Spray Nozzles	Weather Adjusting Controller Requirement New Dev start in 2011
Require WaterSense on all new homes (EPA)	Zero Footprint for New Development	Inefficient Equipment Replacement Rebates	Landscape Classes for Residential customers
	Sub-metering for MultiFamily in 2015		Graywater Retrofit Rebate for Single Family

Table 9-4: Description of Recommended Plan Measures

Descriptions of Recommended Plan Measures			
City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
1	Landscape Financial Incentive Program	SF, MF, CII, GOV, IRR	For SF, MF, CII, GOV, and IRR customers with landscape, provide rebates towards the purchase and installation of selected types of irrigation equipment upgrade including low volume sprinkler heads, check valves, and rain sensors. Rebate is up to \$350 for residential accounts and up to \$650 for mixed use accounts and up to \$10,000 for irrigation accounts. Assume average rebate to be \$300 for single family accounts and \$1,500 for multifamily and non-Residential accounts.
2	New Development Landscape Requirements	New MF, CII	New ordinance adopted by the City of Oceanside in 2010 or later. Cost of \$100 is for an enforcement inspection fee only.
3	ND Require Rain Sensors and Smart Irrigation Controllers	New SF, New MF, New CII	Require developers for all residential and all commercial development to provide the latest state of the art SMART irrigation controllers and rain sensors. These SMART controllers have on-site temperature sensors or receive a signal from a central weather station that modifies irrigation times at least weekly.
4	Landscape Water Budgets	IRR, GOV	Irrigators of landscapes with separate irrigation account use would receive a monthly or bi-monthly irrigation water use budget. Assume 4% of accounts receive new budgets per year. Budgets would be repeated every 5 years to remain current.
5	Landscape Water Audits Contracted	CII	All public and private irrigators of landscapes would be eligible for free landscape water surveys upon request. Normally those with high water use would be targeted and provided a customized report. Assume 10 percent of large turf areas are surveyed per year.
6	Schools Replace Inefficient Equipment and Landscaping	GOV	City of Oceanside currently has 23 schools including 16 elementary, 4 middle schools and 3 high schools. An average of 1 school per year allows each school to be visited once in the 24 year program.
7	Artificial Turf Rebate	SF	Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year with turf removal and installation of artificial turf.
8	Landscape Education Training	SF	Utility would run program training homeowners in efficient landscaping and irrigation principals. Target approx. 0.5% of homes per year. Classes would be run in the appropriate time of year.
9	Public Education	SF	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include school programs, poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc. Program would continue indefinitely.
10	Graywater Retrofit Rebate	SF	Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year to install gray water systems.

Table 9-4: (Continued)

Descriptions of Recommended Plan Measures City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
11	Hot Water on Demand Requirement on New and Rebates for Existing	New SF, New MF	Require developers to equip new homes or buildings with efficient hot water on demand systems such as structured plumbing systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having an on-demand pump on a recirculation line. All new development of single-family and multi-family residential units shall include hot water pipe insulation and installation of a hot water recirculation device or design to provide hot water to the tap within 15 seconds in accordance with City of Oceanside Ordinance No. 02-OR126-1.
12	Multi Family Submetering Requirement on New Accounts	New MF	Require the metering of individual units in new multi-family, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units). Utility writes the rules as to how it is done.
13	SF Residential Audits	SF	Conventional indoor and outdoor water surveys for existing single-family residential customers. Normally those with high water use are targeted and provided a customized report to the homeowner on how to save water in their home. Assume 0.15% of accounts surveyed per year.
14	MF Residential Audits	MF	Indoor and outdoor water surveys for existing multifamily residential customers (5 units or more). Normally those with high water use are targeted and provided a customized report to owner. 0.5% of accounts surveyed per year.
15	CII Audits - Level 1 done by Oceanside	CII	High water use accounts would be offered a free water survey that would evaluate ways for the business to save water and money. Assume 0.5% percent of accounts are surveyed per year.
16	CII Audits - Level 2 Contracted by Oceanside	CII	Level 2 Audits will be the more complex sites. These types of audits are planned to be contracted to industry specialists.
17	CII Replace Inefficient Equipment	CII	Provide up to a \$1,000 rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity meters on cooling towers. Pattern after San Diego County Water Authority or Seattle Water Department programs. Assume 30% market saturation.
18	Restaurant low flow spray rinse nozzles by Oceanside	CII	Bulk purchase and provide free. Take to fairs or markets. There are 214 restaurants where people have a place to sit down. 78 of the restaurants are full service "sit" down restaurant.
19	Washer Rebates run by SoCal Water Smart	SF	40% Savings assume a minimum level of 30 gallons per load starting machine is replaced with an 18 gallon per load machine. Cost for admin and marketing included in the \$153.80 unit cost. Oceanside will continue run program in future if no longer offered by So Cal Water Smart.

Table 9-4: (Continued)

Descriptions of Recommended Plan Measures City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
20	Washer Rebates run by Save a Buck	MF	Rebate value was \$50, plus \$10.50 per unit cost for Honeywell services. 40% Savings assume a minimum level of 30 gallons per load starting machine is replaced with an 18 gallon per load machine. Cost for admin and marketing included in the \$60.50 unit cost. Customer cost of \$200 is to cover remaining cost difference between high end efficiency machine and a low end low efficiency machine.
21	HET Rebates run by SoCal Water Smart	SF	Provide a \$145 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation. Measure ends in 2011.
22	HET Rebates run by Save a Buck	MF, CII	Provide a \$60.50 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation. Measure ends in 2011.
23	HET Rebates Administered by Oceanside	SF, MF, COM	Provide a \$60.50 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation. Measure starts in 2012 and ends in 2014.
24	Commercial Urinal Rebates	COM	Provide a rebate of \$100 for high efficiency urinals to existing high use CII customers (such as restaurants). Eligible replacements would include urinals flushing with no more than 0.25 gpf and best available technology (1 pint). Assume 3% of accounts participate per year.
25	High Efficiency Urinals in Government Buildings	GOV	Install high efficiency urinals in Utility's facilities. Replacements would include urinals flushing with no more than 0.25 gpf or best available technology (1 pint).
26	Fixture Retrofit on Resale, SB 407	Pre-1994 Existing Accounts	Measure will start in the year 2014 to coincide with the California State Law SB 407 which requires HETs be installed on resale. Work with the real estate industry to require a certificate of compliance be submitted to the City that efficient fixtures where either already there or were installed before close of escrow. Consider allowing this certification be a part of the conventional private building inspection report process.

Table 9-4: (Continued)

Descriptions of Recommended Plan Measures			
City of Oceanside			
Measure Number	Measure Name	Applicable Category	Measure Description
27	Require WaterSense New Homes	New SF	Require all new homes to comply with US EPA's WaterSense program. Program requires WaterSense labeled plumbing fixtures and a 40% reduction in landscape irrigation. Requirement would be handled through City Building Permit Process.
30	Zero Footprint Development	New SF	Utility would require new home developers to contribute money to the Utility's water conservation program to help generate the water needed (through added water savings beyond those already planned) to supply their project.
31	AMI for Customer Leak Reduction	System	Utility would use new AMI system to reduce customer leaks
32	AMI for Water Loss Reduction	System	Utility would use new AMI system to reduce system losses
33	Recycled Water Phase I&II	System	Implement Recycled Water Master Plan Phases I and II

Abbreviations:

- SF = Single family
- MF = Multifamily
- CII = Commercial, Industrial, Institutional
- GOV = Government
- IRR = Irrigation
- HET = High Efficiency Toilet (1.3 gal/flush)
- ULFT = Ultra Low Flush Toilet (1.6 gal/flush)
- AMI = Automatic meter Infrastructure (System)

9.3 Projected Water Savings of Plan

The City's service area has a relatively high portion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. The City's service area is not a heavy manufacturing sector, and as a result the conservation potential in the commercial sector is relatively low. Based on the assumed avoided cost of new water, water conservation programs are cost-effective. Overall conclusions are:

- For the Plan more than half of the conservation potential in 2035 is in reducing outdoor use; the rest is indoor use reduction potential.
- Benefit-cost ratio of the plan is 2.06 and is cost-effective from the City's perspective.
- Total savings from the Master Plan Program C++ would be about 12.6 percent (without the plumbing code) in 2035 (4,892 AF/Yr.) as shown on Table 8-4.
- The average cost of water saved for the plan from the utility standpoint (as shown on Table 8-4) is lower than the current 2011 price of imported water at \$1,026 per AF.
- The cost for the new development measures is largely funded by the builders of the new homes.

9.4 Implementation Suggestions

The overall strategy is to implement each element over a set schedule so that per capita use targets are met by 2020. The City will prepare an annual work plan and budget for implementation of each respective years activities. Each annual work plan should be reviewed with the 20 x 2020 Work Group.

For overall suggestions, the City may consider the following:

- Partner with SDCWA and other neighboring utilities to leverage outreach and training programs to customers
- Seek Prop 84 funds to use conservation program budget as cost share to leverage into more activities.
- Strengthen relationships with landscape professional associations, non-profits (e.g., Native Plant Society) to gain more word of mouth exposure to the community that is building new or relandscaping their properties to capture the maximum water savings from the point of initial installation of new landscapes.
- Market through accredited programs membership lists as a low cost means to spread the word to other professional grounds (e.g., Green Plumbers, WaterSense Partners, Irrigation Association Certified Professionals, etc.)
- Continue working with regional partners (SDCWA and MWD) on rebates and other conservation programs to minimize administrative costs and prioritize staff time.

Table 9-5 shows the suggestions for each program element based on current technologies and information. As the program is reviewed each year, this list should also be updated with new technologies or opportunities for saving water as they become available. Elements that are not achieving goals should be terminated in favor of new elements that show more promise.

Table 9-5: Implementation Suggestions for Recommended Conservation Master Plan

Implementation Suggestions for Recommended Conservation Master Plan City of Oceanside				
Measure Number	Measure	Customer category	Suggestions for Implementation	Other Comments
1	Financial Incentives/Rebates for Irrigation Upgrades	SF, MF, CII, GOV, IRR	Market this through the media, landscape contractor associations, and to distribution centers and retail stores where irrigation equipment is sold. Provide forms to landscape architects, irrigation designers and contractors.	Post application forms on City web site. http://www.savewateroceanside.com/workshops.asp
2	Landscape Requirements for New Systems	New MF, CII	Work with landscape designers and contractors to ensure that all are informed. Check plans. Provide random site inspections.	May need to offer workshops and training for professionals.
3	Smart Controllers and Rain Sensors for New Systems	New SF, New MF, New CII	Inform builders of new homes and commercial buildings of the requirements. Coordinate with irrigation supply companies. Maintain a list of trained installers.	Provide random inspections to verify installations. May need to offer training for new homeowners and others.
4	Large Landscape Water Budgets	IRR, GOV	Develop an efficient way to measure landscape areas and verify type of landscape in place. Put the water budget on the water bill or have an online way via secured login to post metered use data compared to water budgets, perhaps seek wholesaler support for program like Metropolitan Water District of Orange County http://www.waterprograms.com/wb/	May need to bridge the gap between the bill payer and the landscape contractor. Consider water budget based water rates if voluntary compliance falls short of goals.
5	Large Landscape Audits	CII	Focus on large landscapes with mixed use meters. Maintain a list of qualified water auditors.	Encourage installation of irrigation water meters so can rely on budgets which are cheaper to prepare than audits.
6	School Retrofit	GOV	Model after successful MWD of So Cal program run several years ago. Target high water users based on metrics such as gal/day/student and landscape water application rates.	Start with the highest water demands for schools and work down the list.
7	Artificial Turf - SF Residential Program	SF	Small program so take into account current extent of turf over watering, need to decide on size of area to be replaced, etc. and who gets funded each year.	Measure doesn't start until 2020.
8	Education/Training External Water Use Efficiency	SF	Continue with the "Home Grown" Community Gardening with more classes on appropriate water conservation topics (more than just one class in April). Wild Animal Park has such a garden. Partner with surrounding cities to run regional classes.	Consider a contest with prizes to develop a list of example landscapes for all to see. Publicize classes in media and on City's web site, http://www.savewateroceanside.com/workshops.asp

Implementation Suggestions for Recommended Conservation Master Plan City of Oceanside

Measure Number	Measure	Customer category	Suggestions for Implementation	Other Comments
9	Residential Public Education	SF	Continue current program for "20-gallon challenge" but expand to promote new programs (e.g., classes, rebates, etc.).	Need to frequently change the program and theme to keep public's interest.
10	Graywater Retrofit SF	SF	Small program to promote simple gray water systems.	Concentrate on systems that do not require a permit (single family washing machine reuse).
11	Hot Water System for New Development per City Code	New SF, New MF	Current program. Perform random inspections to verify installations and that ordinance is effective.	Make sure home designers are aware of ordinance.
12	MF Submetering	New MF	Develop requirements after contacting other utilities who have successfully done this. Develop an ordinance. Publicize with apartment builders.	Allow exclusions for certain types of buildings that have a central hot water system, typically like Assisted Living.
13	SF Residential Water Surveys	SF	Market the surveys to high water using homeowners based on neighborhoods. Can contract this out or train students to do audits in the summer.	Mail solicitation is typically not very effective, so use multiple approaches including phone calls and other innovative means (e.g., contests with San Diego Gas and Electric, a cost share and their administrative support)
14	MF Residential Water Surveys	MF	Run in parallel with single family program but market to larger, older complexes first with a screening questionnaire via phone first to learn if they have recently renovated in the past 5-10 years (i.e., already have new fixtures)	Focus on old fixtures in multifamily and inform owner of rebate possibilities. Consider Irvine Ranch WD's program for webinars for property managers. Call around to enroll Property manager in webinars that highlight your programs and their benefits.
15	Commercial Water Survey - Level 1	CII	Target high water users. Level one focuses on replacing old fixtures, particularly those that are high use, such as restaurant/bar restrooms. Inform owners of rebates.	Promote HET rebates. Connect with Chamber of Commerce and seek to have business owners with success stories to share with other business owners at events or with a publication.
16	Commercial Water Survey - Level 2	CII	Target the highest users that are more complex and involve more than just fixture replacements. Contract out to specialists. Inform owners of rebates.	Larger sites in level 2 may have cooling towers, commercial dishwashers, commercial laundries and other complex equipment.
17	CII Replace Inefficient Equipment	CII	Run in parallel with the audits. Should require an audit to qualify for rebate.	Put rebate application forms on City web site. Share success stories with savings in both water and cost to the business owners.

**Implementation Suggestions for Recommended Conservation Master Plan
City of Oceanside**

Measure Number	Measure	Customer category	Suggestions for Implementation	Other Comments
18	Restaurant Spray Nozzle Replacement	CII	Model after state PUC program and send installer door to door to do quick (free) installations. Could outsource this program with careful tracking of who already participated in the CUWCC run Rinse and Save program back in 2003-05.	Make sure statewide programs have not already been done in the City. New federal law as of 2006 requires these fixtures in new buildings and what can be sold.
19	Washer Rebates - So Cal Water Smart	SF	Run program to its conclusion but increase promotion within City, particularly at stores where washers are sold.	Use direct mail, to homeowners. Consider outsourcing quarterly visits to large local retail outlets (e.g., Home Depot, Sears, etc.) to inform and promote program, if not sufficient.
20	Washer Rebates - Save A Buck	MF	Run program to its conclusion but increase promotion within City, particularly at stores where washers are sold.	Target market is building owners.
21	High Efficiency Toilets - So Cal Water Smart	SF	Run program to its conclusion but increase promotion within City, particularly at stores where toilets are sold.	Use direct mail, to homeowners, trade associations, and local plumbing supply houses
22	High Efficiency Toilets - Save A Buck	MF, CII	Run program to its conclusion but increase promotion within City, particularly at stores where toilets are sold.	Target market is building owners, trade associations, and local plumbing houses
23	High Efficiency Toilets - City of Oceanside Administered Program	SF, MF, COM	After other programs cease increase promotion within City, particularly at stores where toilets are sold.	May need to increase rebate amount to hit goals.
24	Commercial Urinal Rebates	COM	Target high use businesses such as bars and restaurants and promote one pint urinals.	Test HEUs at City facilities to determine which types to offer rebates for and rebate amounts.
25	High Efficiency Urinals in GOV Buildings	GOV	Identify high occupant buildings for retrofit program.	Great opportunity to test different types of urinals.
26	Fixture Retrofit SB 407	Pre-1994 Existing Accounts	Consider ways to strengthen measure so it becomes a true retrofit on resale. Work closely with the real estate industry.	Maybe few old fixtures left by the time this measure is active.
27	Require Water Sense on New Homes	New SF	Follow the developments of WaterSense at US EPA as requirements will change over time. Handle through City building department. May need a permit fee increase to cover increased cost of plan review and inspection.	Use this time of low building activity to inform designers and builders of new requirements.

Implementation Suggestions for Recommended Conservation Master Plan City of Oceanside

Measure Number	Measure	Customer category	Suggestions for Implementation	Other Comments
30	Zero Footprint Development	New SF	Develop a fee schedule for new development offsets to mitigate the water needed by new projects.	Depending upon the ultimate fate of WaterSense this program may become unnecessary.
31	AMI for Customer Leak Reduction	System	Work with other utilities to refine methods of identifying presence of a leak on customer's property and successful techniques to get it fixed. Consider modifying water waste ordinance to support citing repeat offenders that have documented continuous reading meters in the residential sector that clearly indicated a leak (and not a medical necessity).	Goal is to communicate electronically with customer so start now to obtain phone number and email addresses. Once AMI is complete, then send courtesy notices to customers with continuous reading meters that may signal a leak.
32	AMI for Water Loss Reduction	System	Set up District Metering Areas (DMAs) to isolate parts of the distribution system and identify areas of relatively high losses. Then use nighttime flow monitoring and proactive leak detection to find and repair leaks. Repeat the process every three years and then as needed to keep losses low.	Goal is to control water losses based on outcomes of water system audit. Determine a goal for reducing non-revenue water
33	Recycled Water Phase I&II	System	Follow the City's Recycled Water Master Plan, Phase II.	Identify any new sites and potential since master plan was prepared.

9.5 Implementation Schedule

Table 9-6 presents a summary of all measures and gives an estimated implementation schedule to guide the City in developing an annual work plan for water conservation. This schedule was developed as part of the DSS Model evaluations for level of activity by year. The City intends to develop detailed annual work plans, and use the DSS Model to monitor progress in attaining per capita use demand reductions, along with updates to the implementation schedule on an annual basis.

9.6 Estimated Implementation Budget

Table 9-6 also presents a summary of all measures and gives an estimated implementation annual average budget to guide the City in developing an annual work plan for the implementation of planned water conservation measures. This budget was developed as part of the DSS Model evaluations for level of activity by year. The budgets shown include labor and expenses. The opportunities for State grants or cost sharing partnership with other County utilities or other means for lowering the cost of a conservation measure would lower the budgetary needs for implementation. The City intends to develop a detailed annual work plan, and use the DSS Model to monitor progress on demand reductions; along with updates to the implementation cost estimates and associated budgets on an annual basis.

9.7 Monitoring Progress

Each year a progress update will be used to analyze the basis for meeting these 2020 per capita use targets and other goals and an annual work plan and budget will be brought before the 20 x 2020 Working Group for to reconfirm the goal of meeting this SBx7-7 mandate, as well as other City goals for the Master Plan.

The water demand for the City customers fluctuates year to year based predominately on climate conditions and other external factors such as the economic conditions and, as a result, the annual average per capita use will fluctuate. It will be important to track activities and also water demand to understand the level of progress being made in reducing overall targets. The City will need to develop a detailed methodology to analyze annual per capita water use and explain variations and isolate the demand reductions that can be attributed to the Plan.

9.8 Recommended Next Steps

Successful implementation of the Master Plan will require a significant increase in level of effort on the part of the City. Many new conservation measures will be employed and high participation rates are needed to achieve Master Plan goals. Recommendations to assist with implementation include the following next steps:

- Prioritize measures for implementation with those that contribute the most to meeting the per capita use targets given highest priority for implementation.
- Consider working with the largest 100 water using customers to try to reduce water use as described in section 3.
- Develop annual work plan for each plan year as soon as budget is adopted (or in concert with budget planning process)
- Form partnerships and apply for grants where appropriate
- Outsource if needed to gain enough staff support to administer the new program.
- Set up a 20 x 2020 Working Group to guide the implementation
- Develop analytical tools to track water use by customer class and overall per capita water use, adjusted for the weather and external factors.
- Set up a database to store and manage measure participation, cost and other data to gauge successes and failures
- Use the tools annually to help decide on priorities for the next plan year
- Use the DSS Model to annually update the plan including actual measure participation, projected water savings and expected per capita water use reductions to ensure plan is on track to meet 2020 targets.
- Use the input from the 2020 Working Group and annual work planning process as the forum to amend the plan, budgets, staffing, outsourcing, schedule etc. to stay on track.

Table 9-6: Implementation Schedule and Budget for Plan Elements

City of Oceanside

Measure No.	Measure Name	Average Estimated Annual Budget (2)	Implementation Period	Planned Average Number of Interventions per Year (3)	Units on Interventions (Accounts, Fixtures or Participants)
1	Financial Incentives/Rebates for Irrigation Upgrades	\$28,536	2007 to 2036	46	Accounts
2	Landscape Requirements for New Systems	\$3,393	2015 to 2036	26	Accounts
3	Smart Controllers and Rain Sensors for New Systems	\$12,912	2010 to 2036	114	Accounts
4	Large Landscape Water Budgets	\$25,644	2011 to 2036	55	Accounts
5	Large Landscape Audits	\$42,270	2007 to 2036	22	Accounts
6	School Retrofit	\$6,130	2011 to 2036	2	Accounts
7	Artificial Turf - SF Residential Program	\$15,809	2020 to 2036	12	Accounts
8	Education/Training External Water Use Efficiency	\$7,532	2011 to 2036	180	Participants
9	Residential Public Education	\$105,203	2006 to 2036	N/A	N/A
10	Graywater Retrofit SF	\$23,934	2015 to 2030	18	Accounts
11	Hot Water System for New Development per City Code	\$18,036	2006 to 2036	142	Accounts
12	MF Submetering	\$11,361	2015 to 2030	9	Accounts
13	SF Residential Water Surveys	\$11,435	2006 to 2036	61	Accounts
14	MF Residential Water Surveys	\$3,913	2006 to 2036	11	Accounts
15	Commercial Water Survey - Level 1	\$21,413	2012 to 2036	9	Accounts
16	Commercial Water Survey - Level 2	\$32,576	2015 to 2036	10	Accounts
17	Cil Replace Inefficient Equipment	\$24,094	2007 to 2036	18	Accounts
18	Restaurant Spray Nozzle Replacement	\$2,085	2011 to 2015	33	Accounts
19	Washer Rebates - So Cal Water Smart	\$60,566	2007 to 2020	394	Accounts
20	Washer Rebates - Save A Buck	\$2,659	2007 to 2020	11	Accounts
21	High Efficiency Toilets - So Cal Water Smart	\$37,506	2007 to 2011	259	Toilets
22	High Efficiency Toilets - Save A Buck	\$7,866	2007 to 2011	113	Toilets
23	High Efficiency Toilets - City of Oceanside Run Program	\$24,033	2012 to 2014	331	Toilets
24	Commercial Urinal Rebates	\$12,955	2007 to 2014	100	Urinals
25	High Efficiency Urinals in GOV Buildings	\$4,564	2011 to 2014	8	Urinals
26	Fixture Retrofit SB 407	\$3,216	2014 to 2036	103	Accounts
27	Require Water Sense on New Homes	\$4,092	2011 to 2036	142	Accounts
30	Zero Footprint Development	\$7,907	2011 to 2036	63	Accounts
31	AMI for Customer Leak Reduction	\$181,592	2015 to 2036	9,084	Accounts
32	AMI for Water Loss Reduction (1)	\$290,909	2015 to 2036	N/A	N/A
33	Recycled Water Phase I&II (1)	\$822,146	2013 to 2036	90	Accounts
	Totals without AMI and Recycled Water	\$561,638			
	Grand Total	\$1,864,192			

(1) Costs for AMI and Recycled Water are the average of the construction and maintenance phases of the projects. AMI has a construction phase from 2015 to 2019 with an annual cost of \$600,000 followed by ongoing annual maintenance costs of \$200,000 starting in the year 2020. Recycled Water has a construction phase from 2013 to 2017 with an average annual cost of \$2,450,000 followed by ongoing annual maintenance costs of \$394,000 starting in the year 2018.

(2) The annual budget is based on the average annual costs over the implementation period. If a measure is not active during a year it will not incur this cost that year.

(3) This is the total number of interventions from all customer classes.

Appendix A - Potential Water Conservation Measures for City of Oceanside Showing Selected Measures

Measures with a **bold** name are Existing City Sponsored Measures

Measures with a name in *Italics* are MWD or San Diego CWA programs offered to City Customers

No.	Measure		MEASURE DESCRIPTION	Pass? Yes or NO
	Device or Program City or MWD/SDCWA or New	Applicable Category		
	ALL CUSTOMER CATEGORIES			
	Indoor			
1	Promote Green Buildings	ALL	Staff a position to work with local Green Building associations, developers, designers, vendors to promote incorporating water efficiency into building design. Co-sponsor award program.	Yes
2	Twenty Gallon Challenge	SF,CII	The 20-Gallon Challenge is a call for residents and businesses to reduce water use on average by 20 gallons per person, per day.	Yes
3	ND Require High Efficiency Toilets	ALL	Require developers to install a high efficiency toilet (HET). HETs are defined as any toilet to flush 20% less than an ULFT.	No
4	ND Require High Efficiency Faucets and Showerheads	ALL	Require developers to install lavatory faucets that flow at no more than 1.5 gpm, kitchen faucets and showerheads at no more than 2.0 gpm.	No
5	Toilet Retrofit on Resale or Name Change on Water Account	ALL	Work with the real estate industry to require a certificate of compliance be submitted to the Utility that verifies that a plumber has inspected the property and efficient fixtures where either already there or were installed at the time of sale, before close of escrow. (Model after County of Los Angeles and San Diego).	No
6	Developer Financed Zero Footprint New Development	ALL	Utility would require developers of new homes to contribute money to the Utility's water conservation program to help generate the water needed to supply their project.	Yes

		Measure		Pass?
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	Yes or No
7	ND Install AMS	ALL	Require that new customers install AMS meters capable of providing hourly consumption data back to Utility and purchase means of viewing daily consumption inside their home/business either through the Internet (if available) or separate device. The AMS system would, on demand, indicate to the customer and Utility where and how their water is used thereby facilitating water use reduction. This system would require Utility to fully install an AMS system.	Yes
8	<i>Financial Incentives for Irrigation Upgrades</i>	Existing Customers SF, MF, CII, IRR	For SF, MF, CII, and IRR customers with landscape, provide rebates towards the purchase and installation of selected types of irrigation equipment upgrade including low volume sprinkler heads, check valves, and rain sensors. Rebate is up to \$450 for residential accounts and up to \$650 for mixed use accounts and up to \$10,000 for irrigation accounts. Assume average rebate to be \$2,500 for non-Residential accounts.	Yes
9	ND Require Smart Irrigation Controllers and Rain Sensors	ALL	Require developers for all properties of greater than two residential units and all commercial development to provide the latest state of the art SMART irrigation controllers and rain sensors. These SMART controllers have on-site temperature sensors or rely on a signal from a central weather station that modifies irrigation times at least weekly.	Yes
10	ND Require Landscape and Irrigation Requirements	ALL	Enforce a regulation that specifies that homes or buildings be landscaped according to Xeriscape principals, with appropriate plant selection and irrigation systems. (Combines with Smart Controller listed above).	Yes
11	<i>Smart Irrigation Controller Rebates</i>	ALL	Provide a \$400 rebate for the purchase of a SMART irrigation controller. Assume 0.25% of eligible accounts take rebates per year.	Yes

Measure			Pass? Yes or No
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION
12	<i>Turf Removal</i>	ALL	A 50¢ per square foot incentive is available for synthetic turf. The replacement of irrigated vegetation with synthetic turf may significantly reduce your outdoor watering needs. Higher incentives are available in some areas.
RESIDENTIAL			
Indoor			
13	<i>Distribute Retrofit Kits</i>	SF	Provide owners of pre-1992 homes with retrofit kits that contain easy-to-install low flow showerheads, faucet aerators, and toilet tank retrofit devices.
14	<i>Toilet Leak Detection</i>	SF	Distribute leak detection tablets for homeowners to test toilets for leaks; offer advice on toilet leak repair.
15	<i>Washer Rebates</i>	SF	Homeowners would be eligible to receive a rebate on a new water efficient clothes washer. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology.
16	<i>Washer Rebates for High Efficiency Machines</i>	SF	Continue existing program with higher rebate is offered for higher efficiency machines. Assume 2% of accounts take rebates per year.
17	<i>High Efficiency Toilet (HET) Rebates</i>	Existing Customers SF, MF	Provide a \$150 rebate or voucher for the installation of a high efficiency toilet (HET). HET's are defined as any toilet to flush 20% less than an ULFT and include dual flush technology. Rebate amounts would reflect the incremental purchase cost. Program will be shorter lived as it is intended to be a market transformation measure and eventually would be stopped as 1.3 gpf units reach saturation.

		Measure		Pass?
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	Yes or No
18	Single Family Water Surveys I	SF	Conventional indoor and outdoor water surveys for existing single-family residential customers. Normally those with high water use are targeted and provided a customized report to the homeowner on how to save water in their home. Assume 0.1% of accounts surveyed per year.	Yes
19	Single Family Water Surveys II	SF	Same as above, except increase to 0.5 percent of accounts surveyed per year.	No
20	Single Family Water Surveys I with AMS	SF	Same as above except that the survey would be enhanced by the availability of hourly consumption data from an Automatic Metering System (AMS) system. This would require Utility install an AMS system. Assume 0.1% of accounts surveyed per year.	Yes
21	Single Family Water Surveys II with AMS	SF	Same as above, except increase to 0.5% of accounts surveyed per year.	No
23	Multifamily Surveys	MF	Indoor and outdoor water surveys for existing multifamily residential customers (5 units or more). Normally those with high water use are targeted and provided a customized report to owner. 1% of accounts surveyed per year.	Yes
24	Multifamily Surveys with AMS	MF	Same as above except that the survey would be enhanced by the availability of hourly consumption data from AMS system indicating to the customer where and how their water is used thereby facilitating water use reduction. This would require Utility install an AMS system. Assume 2% of accounts surveyed annually.	Yes
25	Multifamily Washer Rebate	Existing Customers MF	Provide a \$150 rebate to apartment complexes (5 or more units) for efficient washing machines in buildings over a certain size that has a common laundry room. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology.	Yes

No.	Measure			Pass? Yes or No
	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	
26	Multifamily Washer Rebate Intensive	Existing Customers MF	Same as above except increased market saturation to 25%.	No
27	ND Require Plumbing for Future Gray Water Use	SF	Require that the drain lines in new single-family homes be plumbed for future installation of graywater systems.	No
28	ND Require Efficient Dishwashers	SF	Require developers to install an efficient dishwasher (meeting certain water efficiency standards, such as gallons/load).	No
29	ND Require High Efficiency Clothes Washers	SF	Building departments would be requested to ensure that an efficient washer was installed before new home or building occupancy. Utility can enforce conditions of water service that may include efficiency standards for washing machines.	No
30	ND Require Hot Water on Demand/Structured Plumbing	SF	Require developers to equip new homes or buildings with efficient hot water on demand systems such as structured plumbing systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having a an on-demand pump on a recirculation line..	Yes
31	ND Require Multi Family Submetering on New Accounts	MF	Require the metering of individual units in new multi-family, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units). Utility writes the rules as to how it is done.	Yes
32	MF Submeter Incentive	MF	Provide a rebate (\$300 per unit) to assist 0.5% of MF building owners retrofit and install submeters on each individual apartment unit each year.	No
33	Mobile Home Park Submetering	MF	Require or provide a partial cost rebate to meter all sites within a mobile home park that is currently master metered, pattern after Santa Clara Valley Water District program.	No

Measure		Pass?		
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	Yes or No
34	Efficient Dishwasher Rebates	SF	Provide a rebate of \$50 to \$100 to encourage homeowner to purchase an efficient dishwasher (meeting certain water efficiency standards, such as a limit on the gallons/load) when replacing an existing dishwasher.	No
35	Garbage Disposal SF	SF	Encourage 1% of single family homeowners per year to remove garbage disposals.	Yes
36	Insulate Hot Water Pipes	SF, MF	Provide a rebate to offset the cost of hot water pipe insulation.	No
37	Composting Toilets	SF	Provide a rebate to offset the cost installing a no-water composting toilet.	No
Outdoor				
38	Public Information Program	SF	Public education would be used to raise awareness of other conservation measures available to customers. Programs could include school programs, poster contests, speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc. Program would continue indefinitely.	Yes
39	Conservation Pricing	SF	Water rates or single family customers would be changed from a uniform block or declining block rate to an inclining block rate (tiered pricing) or water budget based billing. Would require a water rate study.	Yes
40	Prohibit HOA or CC&R conditions that mandate planting turf in New Developments	SF, MF	New developments would remove mandate of water intensive landscaping in front yard including cool season grasses, these groups would also not be allowed to require automatic irrigation systems nor specify the amount of watering per week.	Yes
41	Require Model Homes Landscaped with Low Water Use Landscaping	SF	Enforce a regulation that specifies that at least half of the model homes in a subdivision be landscaped according to Xeriscape principals. Information on Xeriscape would be given to new homebuyers. (Model after Arizona RCM)	Yes

No.	Measure			Pass? Yes or No
	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	
42	New Home Award Programs (Patterned after WaterSense)	SF	Provide annual awards to developers that are "Green Builders" and offer homes for sale that meet certain criteria such as EPA's new Water Sense program for new homes. This could be combined with energy efficient homes.	No
43	Rebates for Rain Sensors	SF	Provide a rebate or voucher for purchase of a rain sensor shut-off device for an existing irrigation controller.	No
44	Efficient Outdoor Use Education and Training Programs	SF	Utility would run program training homeowners in efficient landscaping and irrigation principals. Target approx. 0.1% of homes per year. Classes would be run in the appropriate time of year.	Yes
45	Artificial Turf SF Residential	SF	Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year with turf removal and installation of artificial turf.	Yes
46	Cisterns/Rain Catchment	SF	Provide a rebate (\$100) to assist 0.25% of single family homeowners per year with installation of rain barrels or water gardens.	No
47	Graywater Retrofit SF	SF	Provide a rebate (up to \$1,000) to assist 1% of single family homeowners per year to install gray water systems.	Yes
48	Graywater New SF	SF	Provide a \$500 rebate to assist builders of single family homes (1% of current accounts) per year with plumbing for future gray water system installation.	No
49	Require or Rebate Swimming Pool Covers	SF, MF	Provide a \$100 rebate through pool equipment supply stores for purchase of a swimming pool cover.	No
50	Rotating Sprinkler Nozzle Rebates	SF	Programs like SoCal Water\$mart program offers a rebate of up to \$4 per rotating nozzle for single-family properties.	Yes
COMMERCIAL INDUSTRIAL INSTITUTIONAL				
Indoor				

Measure			Pass?
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION
51	CII Surveys	CII	High water use accounts would be offered a free water survey that would evaluate ways for the business to save water and money. Assume 1 percent of accounts are surveyed per year.
52	CII Surveys with AMS	CII	Same as above except survey would be enhanced by the availability of hourly consumption data from AMS system indicating to the customer where and how their water is used thereby by facilitating water use reduction. This would require Utility install an AMS system. Assume A 2% of accounts are surveyed annually.
53	CII Rebates to Replace Inefficient Equipment	Existing Customers CII	Provide up to a \$1,000 rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity meters on cooling towers. Pattern after San Diego County Water Authority or Seattle Water Department programs. Assume 10% market saturation.
54	Replace Restaurant Spray Rinse Nozzles	CII	Provide free installation of 1.6 gallon per minute (or lower) spray rinse nozzles for the rinse and clean operation in restaurants and other commercial kitchens that did not participate in the State Public Utilities Commissions Program.
55	Water Savings Performance Program	ALL	Water Districts such as the Metropolitan Water District of Southern California provide about \$3 per 1,000 gallons saved to sites within the Water Authority's service area. Incentive is based on the potential for savings over 5 years. Eligible project costs include labor, hardware and up to 1 year of water management fees.
56	Award Programs for Water Savings by Businesses	CII	Providers would sponsor an annual awards program for businesses that significantly reduce water use. They would receive a plaque, presented at a lunch with the mayor.

Measure				Pass?
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	Yes or No
57	<i>High Efficiency Urinal Rebate (<0.25 gallon)</i>	Existing CII	Provide a rebate of \$200 for high efficiency urinals to existing high use CII customers (such as restaurants). Eligible replacements would include urinals flushing with no more than 0.25 gpf and best available technology (1 pint). Assume 0.5% of accounts participate per year.	Yes
58	ND Require 0.5 gal/flush urinals in new buildings	CII	Require that new building be fitted with 0.5 gpf (or one liter) urinals rather than the current standard of 1.0-gal/flush models.	No
59	ND Require Plan Review for new CII	CII	Require plan reviews for water use efficiency for all new business customers.	Yes
60	Dental Vacuum Pump	COM	Provide a \$125 rebate to assist 10 dental offices per year with installation of dry dental vacuum pumps.	No
61	Require Car Washes to Recycle Water	CII	Currently required in Oceanside.	Yes
62	Install High Efficiency Urinals in Government Buildings	GOV	Install high efficiency urinals in Utility facilities. Replacements would include urinals flushing with no more than 0.25 gpf or best available technology (1 pint).	Yes
63	Focused Water Audits for Hotels/Motels	CII	Proved free water audits to hotels and motels. Standardize on the types of services offered to reduce costs. Included would be bathrooms, kitchens, ice machines, cooling towers, landscaping, and irrigation systems and schedules.	No
64	Hotels/Motels Retrofit w/Financial Assistance	CII	Following a free water audit offer the hotel a rebate for equipment identified that would save water. Provide a rebate schedule for certain efficient equipment such as air-cooled ice machines so hotels could apply without an audit. Pattern after San Antonio, Texas program.	No
65	School Building Retrofit	CII	Run a program patterned after MWD of Southern California's school retrofit program wherein school receives a grant to replace fixtures and upgrade irrigation systems.	Yes

Measure		MEASURE DESCRIPTION	Pass? Yes or No
No.	Device or Program City or MWD/SDCWA or New		
Outdoor			
66	Irrigation Water Budgets	Irrigators of landscapes with separate irrigation account use would receive a monthly or bi-monthly irrigation water use budget. Assume 10% of accounts receive new budgets per year. Budgets would be repeated every 5 years to remain current.	Yes
67	Updated Irrigation Water Budgets with AMS on existing accounts	Same as above except irrigation water budgets would be enhanced by the availability of hourly consumption data from AMS system indicating to the customer where and how their water is used, possibly irrigation station by station thereby by facilitating water use reduction and adherence to a budget. This would require Utility install an AMS system. Budgets would be repeated every 10 years to remain current.	Yes
68	<i>Irrigation Water Surveys</i>	All public and private irrigators of landscapes would be eligible for free landscape water surveys upon request. Normally those with high water use would be targeted and provided a customized report. Assume 10 percent of large turf areas are surveyed per year.	Yes
69	Artificial Turf Sports Fields	Provide a rebate (up to \$10,000) for customer to install artificial grass on one sports field per year.	No
70	Rebates for Sub meters on Cooling Towers	Offer a rebate to buildings that install submeters to measure the make-up and bleed-off water of the facility cooling towers. Provide educational brochures and a phone contact of a knowledgeable person to provide conservation information.	No
71	Cooling Tower Regulations	Prohibit discharge of cooling tower blow down unless the TDS of the water is at least a certain level (that would ensure 5-10 cycles of concentration). Model regulations after the State of Arizona.	No
72	Financial Incentives for Being Below Water Budget	Link a landscape water budget to a rate schedule that rebates the account holder for using less than its water budget.	No

Measure			Pass? Yes or No	
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	
73	Require Irrigation Designers/Installer be Certified by IA	CII	Require installation of irrigation systems that are efficient and installed by trained/certified contractors. Certification to be done by Irrigation Association (IA). Model after Cary North Carolina's program.	Yes
74	Public Swimming Pool Audits	GOV	Utility / County would provide water audits of public swimming pools and showers in changing rooms. Proper pool maintenance would be taught to operators.	No
75	Xeriscape Demonstration Gardens	CII	Donate or acquire a portion of public or private land to create a demonstration garden displaying living examples of low water-using gardens and landscaping. The Utility would provide signs and brochures to educate those people visiting the garden.	Yes
76	Train Landscape Maintenance Workers	CII	Utility would sponsor bilingual training for managers and workers in landscape maintenance methods that will save irrigation water. (Model after Arizona RCM)	Yes
77	Prohibit Once through Cooling, Non-Recycling Fountains, Water Wasting Fixtures and Practices	CII	Prohibit certain obvious wastes of water in new facilities, such as those listed.	Yes
78	Distribution System Pressure Regulation	System	Utility would install additional pressure regulators to maintain pressure within limits so accounts did not receive excessive pressure.	No
79	Real Water Loss Reduction - I	System	Measure covers efforts to find and repair leaks in the distribution system to reduce real water loss and take other actions (such as meter replacement) to reduce apparent water losses thereby improving the system water balance. A ten year program to reduce real water loss by approximately 0.6% of average water production is proposed for this measure. A sufficient number of data loggers would be installed over 10 years. Leak repairs would be handled by existing crews at no extra cost. Specific goals and methods to be developed by Utility Operations Department.	Yes

		Measure		Pass?
No.	Device or Program City or MWD/SDCWA or New	Applicable Category	MEASURE DESCRIPTION	Yes or No

SF	Single Family	IRR	Dedicated irrigation meters	
MF	Multi Family (greater than 2 units)	ND	New Development Regulation	

Appendix B - Assumptions for Water Conservation Measures Evaluated in the DSS Model

Conservation Measures Assumptions

City of Oceanside

Measure Name	Landscape Financial Incentive Program	Landscape Financial Incentive Program - Intensive	New Development Landscape Requirements	New Development Landscape Requirements - Extended to SF Customers + CalGreen	Landscape Requirements
Applicable Customer Classes	SF, MF, CI, GOV, IRR	SF, MF, CI, GOV, IRR	New MF, CI	New SF, New MF, CI	SF, MF, CI, GOV, IRR
Applicable End Uses	Irrigation	Irrigation	Irrigation	Irrigation	Irrigation
Market Penetration by End Of Program (%)	2.9%	10%SF, 30% Non-SF	70% of new	70% of new	40%
Annual Market Penetration (%)	0.1%	0.1%<2011; 0.35-1.1%>2011	70%	70%	2%
Water Use Reductions For Targeted End Uses	15%	15%	15%	15%	15%
Evaluation Start Year	2007	2007	2015	2015	2015
Evaluation End Year	2036	2036	2036	2036	2036
Program Length, years	29	29	21	21	21
Measure Life, years	Permanent	Permanent	Permanent	Permanent	Permanent
Utility Unit Cost for SF accounts, \$/unit	\$ 350.00	\$ 350.00	\$ -	\$ 100.00	\$ 100.00
Utility Unit Cost for MF accounts, \$/unit	\$ 1,500.00	\$ 1,500.00	\$ 100.00	\$ 100.00	\$ 100.00
Utility Unit Cost for non-res accounts, \$/unit	\$ 1,500.00	\$ 1,500.00	\$ 100.00	\$ 100.00	\$ 100.00
Customer Unit Cost, \$/SF unit	\$ 350.00	\$ 350.00	\$ -	\$ 500.00	\$ 500.00
Customer Unit Cost, \$/MF unit	\$ 1,500.00	\$ 1,500.00	\$ 500.00	\$ 500.00	\$ 500.00
Customer Unit Cost, \$/CI unit	\$ 1,500.00	\$ 1,500.00	\$ 500.00	\$ 500.00	\$ 500.00
Annual Utility Admin & Marketing Cost Affected Units	25%	35%	30%	40%	30%
Comments	For SF, MF, CI, GOV, and IRR customers with landscape, provide rebates towards the purchase and installation of selected types of irrigation equipment upgrade including low volume sprinkler heads, check valves, and rain sensors. Rebate is up to \$350 for residential accounts and up to \$650 for mixed use accounts and up to \$10,000 for irrigation accounts. Assume average rebate to be \$300 for single family accounts and \$1,500 for multifamily and non-Residential accounts.	Same as program above, except with a more aggressive market penetration after 2011	New ordinance adopted by the City of Oceanside in 2010 or later. Cost of \$100 is for an enforcement inspection fee only. Not aligned with CalGreen.	Save as program above, except it is extended to new single family residential development. Aligns with CalGreen.	Same as program above, except it is extended to existing residential homes.

Notes:

- RSF = Residential Single Family
- RMF = Residential Multi Family
- BUS/COM= Commercial
- IND = Industrial

- IRR = Dedicated irrigation meters
- INS = Institutional/Public, buildings / grounds owned by the Water Utility or City
- NRSF = New Single Family Homes
- GOV = Government

Conservation Measures Assumptions
City of Oceanside

Measure Number	Measure Name	HD Require Rain Sensors and Smart Irrigation Controllers		RD Require Rain Sensors and Smart Irrigation Controllers - Earlier Start		Landscape Water Budgets		Landscape Water Budgets - Intensive		Landscape Water Audits		Landscape Water Audits - Intensive	
		New SF, New MF, New CI	Irrigation	New SF, New MF, New CI	Irrigation	IRR, GOV	Irrigation	IRR, GOV	Irrigation	CI	CI	Irrigation	CI
	Applicable Customer Classes	New SF, New MF, New CI	Irrigation	New SF, New MF, New CI	Irrigation	IRR, GOV	Irrigation	IRR, GOV	Irrigation	CI	Irrigation	CI	
	Market Penetration by End Of Program (%)	90% of new	90% of new	90% of new	90%	90%	90%	90%	30%	30%	30%	30%	
	Annual Market Penetration (%)	10%	10%	10%	3.5%	3.5%	3.5%	3.5%	1%	1%	1%	1%	
	Water Use Reductions For Targeted End Uses	2020	2020	2011	2011	2011	2011	2011	2007	2007	2007	2007	
	Evaluation Start Year	2036	2036	2036	2036	2036	2036	2036	2036	2036	2036	2036	
	Evaluation End Year	17	17	26	26	26	26	26	30	30	30	30	
	Program Length, Years	Permanent	Permanent	Permanent	Permanent	5	7	7	5	5	5	7	
	Measure Life, Years												
	Utility Unit Cost for SF accounts, \$/unit	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Utility Unit Cost for MF accounts, \$/unit	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Utility Unit Cost for non-Res accounts, \$/unit	\$ 50.00	\$ 50.00	\$ 50.00	\$ 50.00	\$ 500.00	\$ 800.00	\$ 800.00	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00	\$ 2,000.00	
	Customer Unit Cost, \$/SF unit	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Customer Unit Cost, \$/MF unit	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Customer Unit Cost, \$/CI unit	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Annual Utility Admin & Marketing Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Affected Units	25%	25%	25%	15%	15%	15%	15%	30%	30%	30%	30%	
	Comments	Require developers for all residential and all commercial development to provide the latest state of the art SMART irrigation controllers and rain sensors. These SMART controllers have on-site temperature sensors or receive a signal from a central weather station that modifies irrigation times at least weekly.	Same as program above, except it will start in 2011 instead of 2020.	Same as program above, except it would be complete in 10 years instead of 24 years and it would extend the reevaluation period from 5 years to 7 years.	Same as program above, except it would be complete in 10 years instead of 24 years and it would extend the reevaluation period from 5 years to 7 years.	Large landscape accounts	Large landscape accounts	Large landscape accounts	Large landscape accounts	Large landscape accounts	Large landscape accounts	Large landscape accounts	
	Notes:	RSF = Residential Single Family RMF = Residential Multi Family BUS/COM= Commercial IND = Industrial	IRRF = Dedicated irrigation meters INS = Institutional/Public, buildings / grounds owned by the Water Utility or City NRSF = New Single Family Homes GOV = Government										

Conservation Measures Assumptions

City of Oceanside

Measure Name	Schools Replace Inefficient Equipment and Landscaping	Schools Replace Inefficient Equipment and Landscaping By 2020	Artificial Turf Rebates	Landscape Education Training	Public Education
Applicable Customer Classes	GOV	GOV	SF Irrigation	SF Irrigation	SF AIJ
Applicable End Uses	Indoor and Outdoor use	Indoor and Outdoor use	Irrigation	Irrigation	
Market Penetration by End Of Program (%)	Total of 23 schools, plan to do 0.5% per year or average of 1 school per year	Total of 23 schools, plan to do 1.5% per year or average of 2.5 school per year	0.5%	180 participants per year	100%
Annual Market Penetration (%)	0.5%	1.5%	0.03%	0.450%	50%
Water Use Reductions For Targeted End Uses	15%	15%	90%	5%	1%
Evaluation Start Year	2011	2011	2020	2011	2006
Evaluation End Year	2036	2036	2036	2036	2036
Program Length, years	26	10	17	26	31
Measure Life, years	Permanent	Permanent	Permanent	Permanent	2.0
Utility Unit Cost for SF accounts, \$/unit	\$ -	\$ -	\$ 1,000.00	\$ 950.00	\$ 4.50
Utility Unit Cost for MF accounts, \$/unit	\$ -	\$ -	\$ -	\$ -	\$ -
Utility Unit Cost for non-Res accounts, \$/unit	\$ 3,000.00	\$ 3,000.00	\$ -	\$ -	\$ -
Customer Unit Cost, \$/SF unit	\$ -	\$ -	\$ 2,000.00	\$ 300.00	\$ -
Customer Unit Cost, \$/MF unit	\$ -	\$ -	\$ -	\$ -	\$ -
Customer Unit Cost, \$/CI unit	\$ 3,000.00	\$ 3,000.00	\$ -	\$ -	\$ -
Annual Utility Admin & Marketing Cost	30%	30%	30%	30%	15%
Affected Units			Turf	Education	Education
Comments	<p>City of Oceanside currently has 23 schools including 16 elementary, 4 middle schools and 3 high schools. An average of 1 school per year allows each school to be visited once in the 24 year program.</p> <p>Save as program above, except an average of 2.5 schools per year are visited allowing for all schools to be complete in 9 years.</p>	<p>Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year with turf removal and installation of artificial turf.</p>	<p>Utility would run program training homeowners in efficient landscaping and irrigation principals. Target approx 0.5% of homes per year. Classes would be run in the appropriate time of year.</p>	<p>Public education would be used to raise awareness of other conservation measures available to customers. Programs could include school speakers to community groups, radio and television time, and printed educational material such as bill inserts, etc. Program would continue indefinitely.</p>	

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Conservation Measures Assumptions
City of Oceanside

Measure Name	Graywater Retrofit Rebate	Hot Water Rebate	Multi-Family Submetering Requirement on New Accounts	Multi-Family Submetering Requirement on Existing Accounts	SF Residential Audits	SF Residential Audits - Intensive
Applicable Customer Classes	SF Irrigation	New SF, New MF	New MF	New MF	SF	SF
Applicable End Uses	Irrigation	Faucet and shower end use	Faucet and shower end use	Faucet and shower end use	Internal and External	Internal and External
Market Penetration by End Of Program (%)	0.1% of accounts per year	90% of new, 1% of existing accounts	90% of new	90% of new	0.75%	7%
Annual Market Penetration (%)	0.10%	90%	90% of new	90% of new	0.15%	1.00%
Water Use Reductions For Targeted End Uses	42%	14.2 gpd per house	15%	15%	5% indoor, 10% outdoor	5% indoor, 10% outdoor
Evaluation Start Year	2015	2006	2015	2011	2006	2011
Evaluation End Year	2030	2036	2030	2030	2036	2036
Program Length, years	26	31	26	20	31	26
Measure Life, years	Permanent	Permanent	Permanent	Permanent	7	7
Utility Unit Cost for SF accounts, \$/unit	\$ 1,000.00	\$ 50.00	\$ -	\$ -	\$ 150.00	\$ 150.00
Utility Unit Cost for MF accounts, \$/unit	\$ -	\$ -	\$ 1,000.00	\$ 1,000.00	\$ -	\$ -
Utility Unit Cost for non-Res accounts, \$/unit	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Customer Unit Cost, \$/SF unit	\$ 1,000.00	\$ 500.00	\$ -	\$ -	\$ 30.00	\$ 30.00
Customer Unit Cost, \$/MF unit	\$ -	\$ -	\$ 3,000.00	\$ 3,000.00	\$ -	\$ -
Customer Unit Cost, \$/CII unit	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Annual Utility Admin & Marketing Cost	30%	25%	25%	25%	25%	35%
Affected Units	Graywater	Faucet and shower use	MF Meters	MF Meters	Conventional indoor and outdoor water surveys for existing single-family residential customers. Normally those with high water use are targeted and provided a customized report to the homeowner on how to save water in their home. Assume 0.15% of accounts surveyed per year.	Same as program above except it would survey 1% of accounts per year.
Comments	Provide a rebate (up to \$1,000) to assist 0.1% of single family homeowners per year to install gray water systems.	Require developers to equip new homes or buildings with efficient hot water on demand plumbing systems. These systems use a pump placed under the sink to recycle water sitting in the hot water pipes to the water heater or to move the water heater into the center of the house and/or reduce hot water waiting times by having an on-demand pump on a recirculation line.	Require the metering of individual units in new multi-family, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units). Utility writes the rules as to how it is done.	Same as program above except it would start in 2011. Instead of 2015.		

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Conservation Measures Assumptions

City of Oceanside

Measure Name	MF Residential Audits	MF Residential Audits - Intensive	CI Audits - Level 1 Audit by Oceanside	CI Audits (Level 2) Audit by Oceanside - Intensive	CI Audits - Level 2 Contracted by CI Audits - Level 2 Contracted by Oceanside - Intensive
Applicable Customer Classes	MF	MF	CI	CI	CI
Market Penetration by End Of Program (%)	Internal and External 3.50%	Internal and External 11%	AI	AI	AI
Annual Market Penetration (%)	0.5%	1.5%	13%	13%	13.0%
Water Use Reductions For Targeted End Uses	5% indoor, 10% outdoor	5% indoor, 10% outdoor	0.5%	0.5%	0.5%
Evaluation Start Year	2006	2011	10%	10%	10%
Evaluation End Year	2036	2036	2012	2012	2012
Program Length, years	31	26	2036	2036	2036
Measure Life, years	7	7	25	25	25
Utility Unit Cost for SF accounts, \$/unit	\$ -	\$ -	Permanent	Permanent	Permanent
Utility Unit Cost for MF accounts, \$/unit	\$ 275.00	\$ 275.00	\$ -	\$ -	\$ -
Utility Unit Cost for non-Res accounts, \$/unit	\$ -	\$ -	\$ 2,000.00	\$ 2,000.00	\$ 3,000.00
Customer Unit Cost, \$/SF unit	\$ -	\$ -	\$ -	\$ -	\$ -
Customer Unit Cost, \$/MF unit	\$ 100.00	\$ 100.00	\$ -	\$ -	\$ -
Customer Unit Cost, \$/CI unit	\$ -	\$ -	\$ 2,000.00	\$ 2,000.00	\$ 2,000.00
Annual Utility Admin & Marketing Cost	\$ -	\$ -	\$ 15%	\$ 15%	\$ 25%
Affected Units	account	account	account	account	account
Comments	Indoor and outdoor water surveys for existing multifamily residential customers (5 units or more). Normally those with high water use are targeted and provided a customized report to owner. 0.5% of accounts surveyed per year.	Same as program above except it would survey 1.5% of accounts per year.	High water use accounts would be offered a free water survey that would evaluate ways for the business to save water and money. Assume 0.5% percent of accounts are surveyed per year.	Same as program above except it would survey 1.28% of accounts per year.	Level 2 Audits will be the more complex sites. These types of audits are planned to be contracted to industry specialists.

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City of Oceanside

Measure Name	67	68 - 1st	69	70 - 1st	71 - 1st
Applicable Customer Classes	CI	CI	SF	SF	Water Smart
Applicable End Uses	Indoor use	50% of Spray Valve end use	75% of Spray Valve end use	Laundry	Laundry
Market Penetration by End Of Program (%)	30.0%	90% of sit down restaurants, which is only 10% of total commercial accounts	90% of sit down restaurants, which is only 10% of total commercial accounts	14%	30%
Annual Market Penetration (%)	1%	2%	2%	1.0%	1%-2011, 3%-2011
Water Use Reductions For Targeted End Uses	15%	15%	30%	40%	40%
Evaluation Start Year	2007	2011	2011	2007	2007
Evaluation End Year	2036	2015	2015	2020	2020
Program Length, years	30	5	5	14	14
Measure Life, years	Permanent	Permanent	Permanent	Permanent	Permanent
Utility Unit Cost for SF accounts, \$/unit	\$ -	\$ -	\$ -	\$ 153.80	\$ 153.80
Utility Unit Cost for MF accounts, \$/unit	\$ -	\$ -	\$ -	\$ -	\$ -
Utility Unit Cost for non-Res accounts, \$/unit	\$ 1,000.00	\$ 50.00	\$ 100.00	\$ -	\$ -
Customer Unit Cost, \$/SF unit	\$ -	\$ -	\$ -	\$ 200.00	\$ 200.00
Customer Unit Cost, \$/MF unit	\$ -	\$ -	\$ -	\$ -	\$ -
Customer Unit Cost, \$/CI unit	\$ 5,000.00	\$ -	\$ -	\$ -	\$ -
Annual Utility Admin & Marketing Cost	30%	25%	25%	0%	10%
Affected Units	account	spray valve	spray valve	Clothes Washer	Clothes Washer
Comments	Provide up to a \$1,000 rebate for a standard list of water efficient equipment. Included would be x-ray machines, icemakers, air-cooled ice machines, steamers, washers, spray valves, efficient dishwashers, replace once through cooling, and add conductivity meters on cooling towers. Pattern after San Diego County Water Authority or Seattle Water Department programs. Assume 30% market saturation.	Bulk Purchase and provide free. Take to fairs or markets. There are 214 restaurants where people have a place to sit down. 78 of the restaurants are full service "sit" down restaurant.	Same as program above except more efficient spray nozzles would be purchased.	40% Savings assume a minimum level of 30 gallons per load starting machine is replaced with an 18 gallon per load machine. Cost for admin and marketing included in the \$153.80 unit cost. Oceanside will continue run program in future if no longer offered by So Cal Water Smart.	Same as program above except it would target 3% of accounts per years instead of 1%.

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Conservation Measures Assumptions

City of Oceanside

Measure Name	Commercial Urinal Rebates	High Efficiency Urinals in Government Buildings	407	Require WaterSense New Homes	Irrigation Certification
Applicable Customer Classes	COM	GOV	Pre-1994 Existing Accounts	New SF	All new
Applicable End Uses	Urinals	Urinal End Use	Toilet, urinal, shower, faucet	All	Irrigation
Market Penetration by End Of Program (%)	21%	50 urinals total that effect 500 employees	10%	90%	70%
Annual Market Penetration (%)	3%	1%	Gross 2%-2017 SF, 2019 MF,CII;	Varies with growth	Varies with growth
Water Use Reductions For Targeted End Uses	84%	75%	3%-2017/2019	20%	15%
Evaluation Start Year	2007	2011	varies	2011	2011
Evaluation End Year	2014	2014	2036	2036	2036
Program Length, years	8	4	23	26	26
Measure Life, years	Permanent	Permanent	Permanent	Permanent	Permanent
Utility Unit Cost for SF accounts, \$/unit	\$ -	\$ -	25	25	25
Utility Unit Cost for MF accounts, \$/unit	\$ -	\$ -	25	25	25
Utility Unit Cost for non-Res accounts, \$/unit	\$ 100.00	\$ 400.00	25	25	25
Customer Unit Cost, \$/SF unit	\$ -	\$ -	varies	250	600
Customer Unit Cost, \$/MF unit	\$ -	\$ -	varies	800	800
Customer Unit Cost, \$/CII unit	\$ 400.00	\$ -	varies	1,200	1,200
Annual Utility Admin & Marketing Cost	30%	40%	25%	15%	25%
Affected Units	Urinal	Urinal	Dwelling unit or CII account	Accounts	Accounts
Comments	Provide a rebate of \$100 for high efficiency urinals to existing high use CII customers (such as restaurants). Eligible replacements would include urinals flushing with no more than 0.25 gpf and best available technology (1 pint). Assume 3% of accounts participate per year.	Install high efficiency urinals in Utility's facilities. Replacements would include urinals flushing with no more than 0.25 gpf or best available technology (1 pint).	Measure will start in the year 2014 to coincide with the California State Law SB 407 which requires HETs be installed on resale. Work with the real estate industry to require a certificate of compliance be submitted to the City that efficient fixtures where either already there or were installed before close of escrow. Consider allowing this certification be a part of the conventional private building inspection report process.	Require all new homes to comply with US EPA's WaterSense program. Program requires WaterSense labeled plumbing fixtures and a 40% reduction in landscape irrigation. Requirement would be handled through City Building Permit Process.	Require that all new irrigation systems be permitted and designed and installed by professionals who are certified by a third party, such as the Irrigation Association.

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Conservation Measures Assumptions

City of Oceanside

Measure Name	Agriculture Conservation	Zero-Footprint Development	AMI for Customer Leak Reduction	AMI for Water Loss Reduction	Recycled Water Phase II
Applicable Customer Classes	Agriculture	New SF	SF, MF, COM, GOV	UFW	Irrigation (IRR)
Applicable End Uses	Irrigation	All	Indoor, Outdoor Leakage	NA	Irrigation
Market Penetration by End Of Program (%)	60%	40%	100%	100%	36%
Annual Market Penetration (%)	2%	Varies with growth	20%	20%	7%
Water Use Reductions For Targeted End Uses	10%	30%	30%	2%	36.7% of IRR category use will
Evaluation Start Year	2011	2011	2015	2015	yield 2,016 AF/yr by 2020
Evaluation End Year	2036	2036	2036	2036	2013
Program Length, years	26	26	22	22	2017
Measure Life, years	10	Permanent	500.0%	Permanent	5
Utility Unit Cost for SF accounts, \$/unit		\$	100	\$	Permanent
Utility Unit Cost for MF accounts, \$/unit		\$	15	See Comment Below	\$
Utility Unit Cost for non-Res accounts, \$/unit		\$	25	See Comment Below	\$
Customer Unit Cost, \$/SF unit		1,000	25	See Comment Below	\$
Customer Unit Cost, \$/MF unit			75	See Comment Below	25,113
Customer Unit Cost, \$/CUI unit		\$	150	See Comment Below	0
Annual Utility Admin & Marketing Cost		\$	200	See Comment Below	0
Affected Units	Accounts	Accounts	Accounts	25%	5000
	Accounts	Accounts	Accounts	System	0%
Comments	City or a contractor would offer water audits and City cash incentives to improve irrigation efficiency for those sites who receive an audit documenting need.	Utility would require new home developers to contribute money to the Utility's water conservation program to help generate the water needed (through added water savings beyond those already planned) to supply their project.	Allocate part of cost to Conservation program; costs per account (placeholder values shown above) cover part of installation and part of customer notification and follow up. Total cost is \$13 million capital cost + est. \$11 million meters, assign 25% to conservation or \$6 million (50% to measure 31)	Allocate part of cost to Conservation program; Reduce UFW from 8% currently to 6.5% (~19%) using AMI. Cost to conservation assumed to be \$6 million (50% to measure 32)	Recycled Water projections from Table 4-9, Master Plan; 2,016 AFY or 1.8 MGD by 2020. Plan to finish by 2017 to help with 2015 target. Costs; Phase 1 & 2 Capital \$11.1 million; O&M \$394,000/yr; from Table 8.6 Recycled Water Master Plan, 2005 Capital costs spread over 5 years, O&M continues from 2020 to 2036. Costs spread to 36.3% of 1,217 IRR accounts (442 accounts)

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Conservation Measures Assumptions

City of Oceanside

Measure	
Account Category	Fixture Replacement SB 407
Affected End Uses	Pre-1994 Existing Accounts Toilet, urinal, shower, lavatory faucet
Market Penetration by End Of Program, %	4% SF, 2% MF and CII
Annual Market Penetration Rate, %	1% 2017-2020 SF, 1% 2019-2020 MF, 1% CII 2019-2020
Percent Reduction in Water Use	Varies
Measure Start Year	2014
Measure End Year	2020
Program Length	7
Measure Life (years)	Permanent
Utility unit Cost SF, \$	\$25
Utility unit Cost MF, \$	\$25
Utility Unit Cost CII, \$	\$25
Customer unit Cost SF, \$	Varies
Customer unit Cost MF, \$	Varies
Customer Unit Cost CII, \$	Varies
Administration Cost, percent of unit cost, %	25%
Affected Units	Dwelling unit or CII account
Comments	Measure will start in the year 2017 (SF) and 2019 (CII) to coincide with the California State Law SB 407. Work with the real estate industry to require a certificate of compliance be submitted to the City/Town that the property and efficient fixtures were either already there or were installed at the time of sale, before close of escrow. Consider allowing this certification to be made as a part of the conventional private building inspection report process.