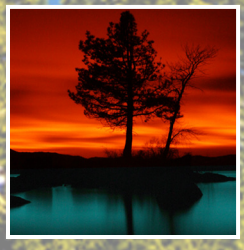
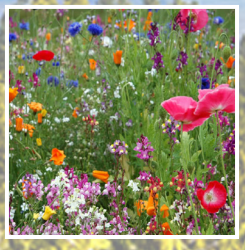
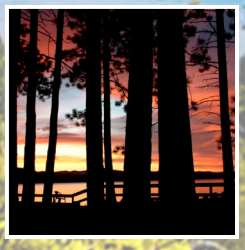
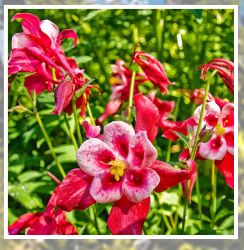
South Tahoe Public Utilities District

Draft 2010 Urban Water Management Plan

April 2011

WINZLER & KELLY



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SECTION 1.0 PLAN PREPARATION

1.1 INTRODUCTION

1.1.1 Purpose

The purpose of developing an Urban Water Management Plan (UWMP) is to evaluate whether a water supplier can meet the water demands of its water customers as projected over a 20- or 25-year planning horizon and under a range of water supply scenarios. This evaluation is accomplished through analysis of current and projected water supply and demand for normal, single-dry and multiple-dry water year conditions. In addition, the purpose of the UWMP is to:

- Identify measures to be implemented or projects to be undertaken to reduce water demands and address water supply shortfalls;
- Identify stages of action to address up to 50 percent reduction in water supplies during dry water years;
- Identify actions to be implemented in the event of a catastrophic interruption in water supplies;
- Assess the reliability of the sources during normal, single-dry and multiple-dry water years; and
- Identify when, how and what measures the water supplier could undertake in order to meet the State Legislature's call for a 20 percent per capita reduction in urban water use statewide by 2020, as prescribed in Senate Bill SBx7-7.

1.1.2 Law

The California's Urban Water Management Planning Act (Act) is codified in California Water Code Sections 10610 though 10656. The Act requires urban water suppliers that have 3,000 or more connections, or that supply at least 3,000 acre-feet per year (AFY) of water, to submit a UWMP to the California Department of Water Resources (DWR) every five years. The South Tahoe Public Utility District (District) provides potable water delivery to just under 14,000 connections [1] and delivers a little less than 7,000 acre-feet of water annually. The District meets the thresholds for this State requirement.

The Act was modified in 2009 by Senate Bill x7-7 (SBx7-7). SBx7-7 requires a 20 percent statewide reduction in per capita urban water use by the year 2020. The percent reduction required by each water supplier varies by region and includes water savings targets, measured in daily per capita use, to be met by 2020 as well as an interim water savings target to be met by 2015. Each water supplier's 2010 UWMP will establish the baseline use from which targeted reductions are made, making the 2010 UWMP a particularly important document. Because of the new requirements, SBx7-7 extended the due date for submittal of the UWMP to DWR to July 1, 2011.

[1] Figure from 2009 Public Water System Statistics report

1.1.3 Structure of the Plan

The outline of this UWMP generally follows the *Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan* developed by DWR. The guidelines can be found in the following website link: *http://www.water.ca.gov/urbanwatermanagement/guidebook/*.

This UWMP organized in six (6) sections and appendices as shown on the table below. The table also includes a description of the key elements in the sections. All of the information requested in the UWMP guidelines and Act is provided within this document.

Table 1.1
Structure of the Plan

Section	Title	Key Elements
1	Introduction and Plan Preparation	Introduction
		Coordination
		Plan Adoption, Submittal and Implementation
2	Service Area	Service Area Physical Description
		Service Area Population
		Other Demographic Factors Affecting Water Planning
3	System Demands	Baselines and Targets
		Water Demands
		Water Demand Projections for Retailers
		Water Use Reduction Plan
4	System Supplies	Overview
		Surface Water
		Groundwater
		Transfer Opportunities
		Desalinated Water Opportunities
		Recycled Water Opportunities
		Future Water Supply Projects
5	Water Supply Reliability and Shortage Contingency Planning	Supply Reliability
		Supply and Demand Comparisons
		Water Shortage Contingency Planning
6	Demand Management Measures	Description of Demand Management Measures
		Implementation of DMMs

1.1.4 Level of Planning

The Act specifies the required content of each UWMP and allows for the level of detail provided in each UWMP to reflect the size and complexity of the water supplier. The Act requires projections in five-year increments for a minimum of 20 years. This UWMP considers a 25-year planning horizon through year 2035.

The Act does not require that a UMWP contain the level of system-specific detail that would be included in a water system master plan. Also, the Act specifically exempts UWMPs from review under the California Environmental Quality Act (CEQA)[2]. In addition Water Supply Assessments (Water Code Section 10631) and

[2] Water Code Section 10652

Water Supply Verifications (Water Code Section 66473.7) may rely on the UWMP as a foundational document for findings required in these documents.

1.1.5 Assumptions

The evaluation and projections in this document are based on the District's current understanding of land use planning in the region and its groundwater supply. This document is a "living" document (i.e., intended to be updated every five years). As the District's water supply picture changes, the updated UWMP will incorporate those changes accordingly.

1.1 COORDINATION

1.2.1 Agency Coordination

The District provides water to portions of the City of South Lake Tahoe and portions of unincorporated El Dorado County. The District is also a member of the bi-state Tahoe Region Planning Authority (TRPA), a regional planning agency which oversees development at Lake Tahoe. The District staff meets regularly with the other members of the TRPA to coordinate on issues affecting the water quality of Lake Tahoe, including development.

On April 15, 2011, the District sent a letter to the agencies listed in Table 1.2 below, notifying them that the District's 2005 UWMP was being reviewed and updated. A copy of the letter is included in Appendix A.

Table 1.2 (DWR Table 1)
Coordination with Appropriate Agencies

Coordinating Agencies	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved/ No information
City of South Tahoe				Yes		Yes	
County of El Dorado				Yes		Yes	
Tahoe Regional Planning Agency				Yes		Yes	
United States Forest Service						Yes	
Lukins Brothers Water System						Yes	
Tahoe Keys Water System						Yes	
Edgewood Water Company						Yes	
Lakeside Park Mutual Water Company						Yes	
General Public						Yes	

1.2.2 Public Participation

Urban water suppliers are required by the Act to encourage active involvement of the community within the service area prior to and during the preparation of its UWMP. The Act also requires urban water suppliers to make a draft of the UWMP available for public review and to hold a public hearing regarding the findings of the UWMP prior to its adoption. The District considered the plan at a Board Workshop on May 5, 2011 and at a Public Hearing which occurred during its June 16, 2011 Board Meeting.

1.3 PLAN ADOPTION, SUBMITTAL AND IMPLEMENTATION

1.3.1 Plan Adoption and Submittal

The findings of the Draft UWMP were presented before the District Board in May and June of 2011. The meetings were publicly noticed and the public was given the opportunity to offer comments to the UWMP and to ask questions regarding the findings. A copy of the Board agenda packet, presentation materials and the resolution of adoption are included in Appendix B.

The Final UWMP incorporates comments made by the District Board and the public. The Final UWMP is available for public viewing at the following website link: _____ and at the District's main office during normal business hours. A copy of the Final UWMP will be submitted to DWR, the California State Library, the City of South Lake Tahoe and El Dorado and Alpine Counties no later than 30 days after adoption by the Board. Comments to the Final UWMP made by DWR and the District's responses to the comments will be added to the website for the public's information.

1.3.2 Plan Implementation

Implementation of the 2010 Final UWMP will be the responsibility of the Manager of Field Operations and consists of the activities shown in Table 1.3.

Table 1.3
Plan Implementation

Description	Guidance Document(s)	Activity	Timeframe
Capital Improvement Program (CIP)	South Tahoe Public Utilities Annual Budget	Preparation of Annual CIP for water supply projects	March, 2011-2015
Water supply reliability	Final UWMP	Continued efforts to protect and improve the water quality of the South Lake Tahoe Basin	Ongoing
Water demand reduction targets	Final UWMP, District Water Conservation Program	Ongoing tracking of GPCD and modifying Water Use Reduction Plan as needed	15% reduction by 2015; 20% reduction by 2020
Voluntary and mandatory water conservation policies and procedures	Water shortage contingency plan in Final UWMP		Ongoing

2 SYSTEM DESCRIPTION

2.1 SERVICE AREA PHYSICAL DESCRIPTION

A special district established in 1950, the South Tahoe Public Utility District encompasses a 27,000 acre service area in eastern El Dorado County on the southern shore of Lake Tahoe. The service area limits extend west to include Emerald Bay, east to the California-Nevada State Line, and south to include Christmas Valley. Figure 2-1 illustrates the District service area and its boundaries. The service area includes most, but not all, of the City of South Lake Tahoe and portions of unincorporated El Dorado County.

The District is the largest water purveyor in the Lake Tahoe Basin. Water supply is provided by 13 active supply wells. The District's Domestic Water Supply Permit lists a total of 23 wells within the service area. In addition to the supply wells, the District maintains several standby wells, several sampling and monitoring wells and several inactive wells. Section 4 provides additional detail on well status and use.

The storage and distribution system is comprised of 16 booster pump stations, 23 storage tanks, 26 pressure reducing valves and 320 miles of potable water pipe. Due to the topography of the District's service area, the overall distribution system is separated into 15 pressure zones to prevent over or under pressurization of the neighborhoods served.

Figure 2-2 illustrates the major water supply features and pressure zones.

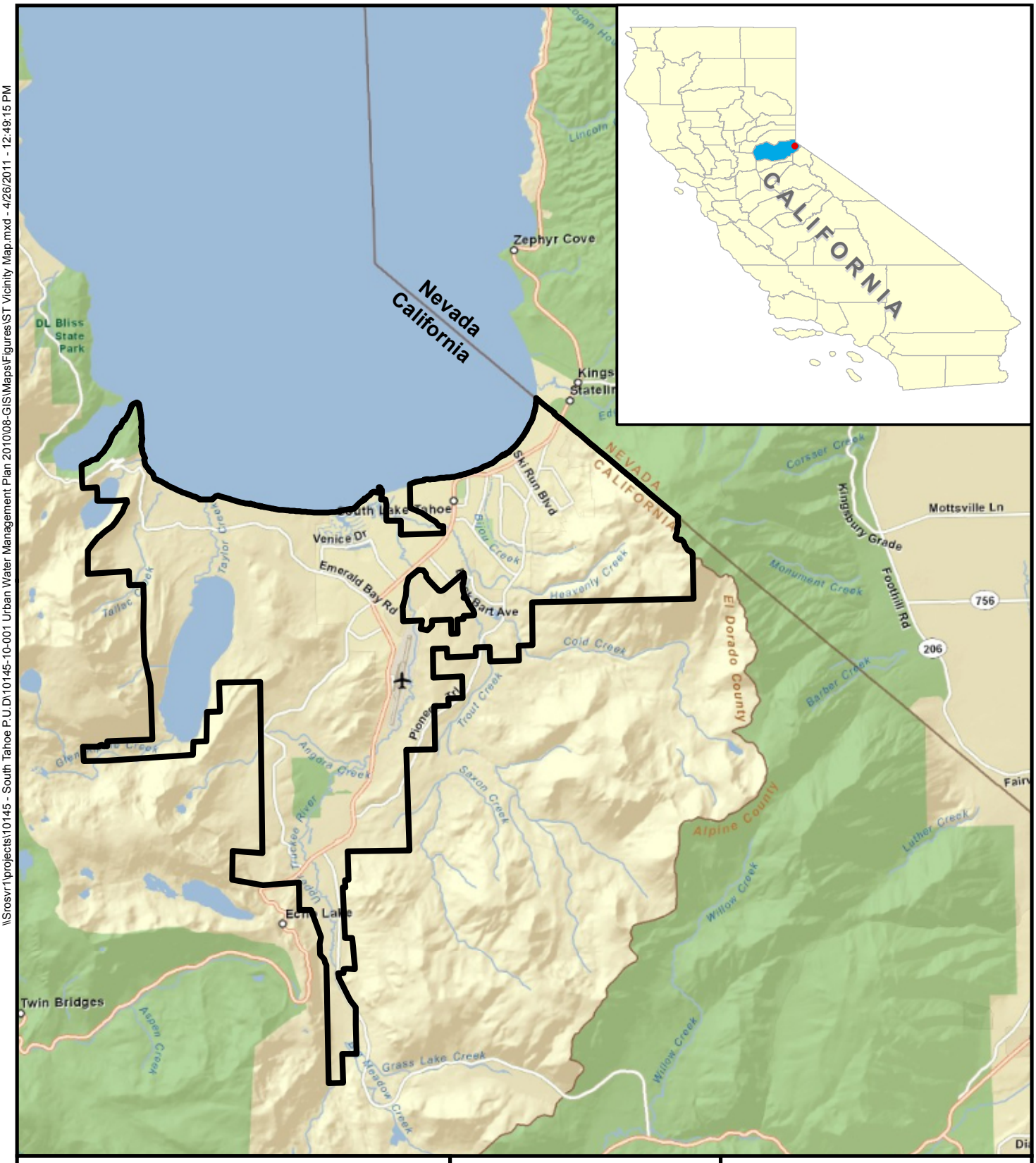
2.1.1 Climate

The District's service area is within the Sierra Nevada Range and included in the North Lahonton Hydrologic Region of California. The summers are typically dry with occasional thunderstorms. Most of the precipitation occurs in the fall and winter as snow.[3] The average annual mean temperature for Tahoe City is 44 degrees Fahrenheit and annual precipitation is 33 inches[4]. There is no CIMIS station located within Tahoe City which could provide localized reference evapotranspiration (ETo) data; however the average annual reference ETo for the Northern Sierra Nevada hydrologic region is 54.3 inches.[5] The regional averages of the rate of evapo-transpiration of common turf grass (ETo), rainfall, and temperature are summarized in Table 2.1 below.

[3] California Water Plan, Update 2009.

[4] California Department of Water Resources, Flood Management website.

[5] California Irrigation Management Information System (CIMIS), Department of Water Resources, Reference Evapotranspiration (ETo) Zones map



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Cartography: RMR

Legend

- South Tahoe P.U.D.Boundary
- El Dorado County

0 1 2 Miles

1 inch = 2 miles

N

Sources: ESRI Basemap:Streets, STPUD GIS: Parcels, City Limits, District Boundaries, Pressure Zones, City Limits.

Figure 2.1
Vicinity Map

South Tahoe Public Utilities District
Urban Water Management Plan

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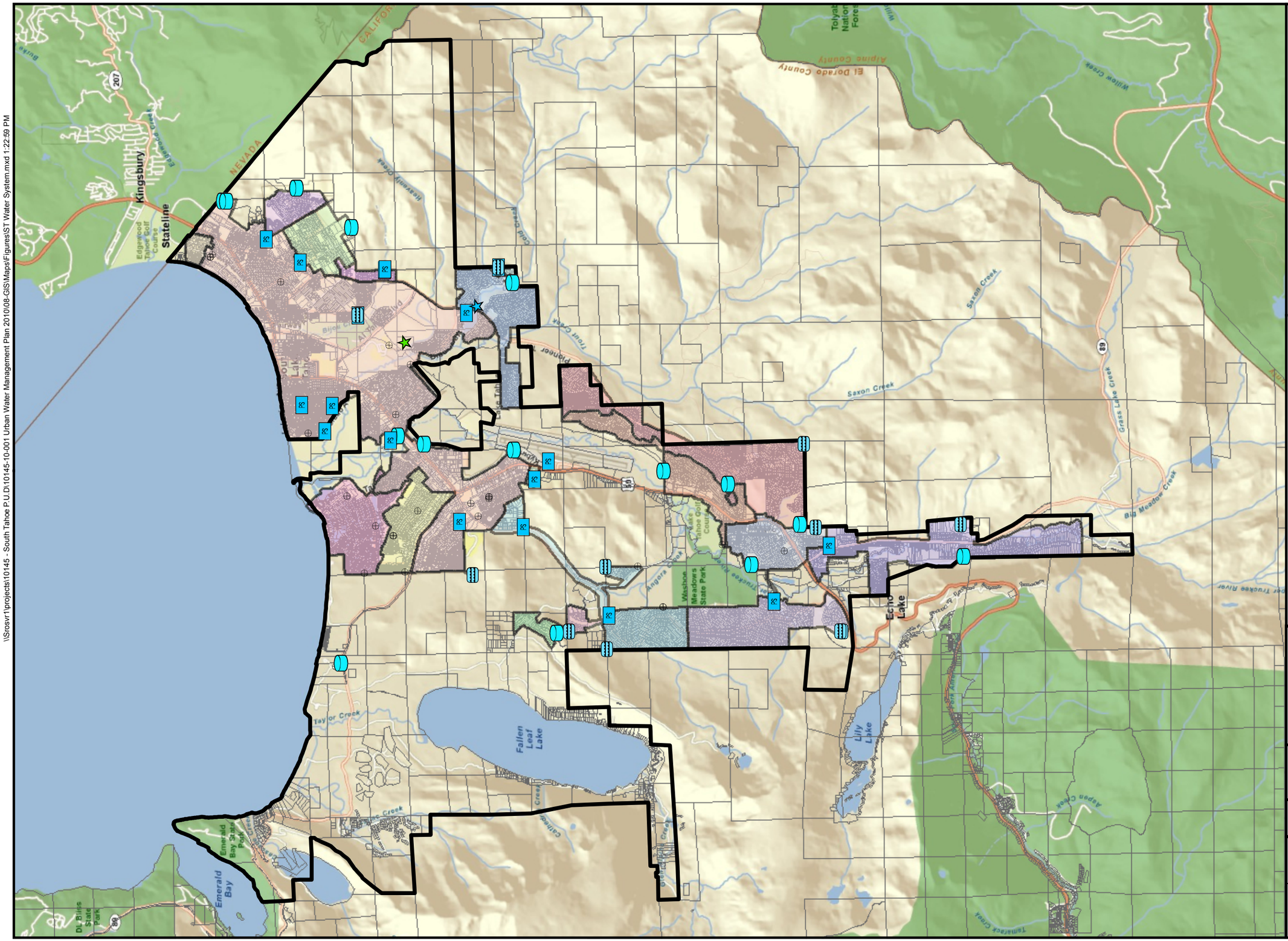

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Table 2.1
Climate

	Standard Average ETo[a], inches North Lahonton Hydrologic Region	Average Rainfall, inches, Tahoe City	Average Temperature, °F Tahoe City and N. Lahonton Hydrolgic Region
January	1.2	6.0	30
February	2.0	5.7	32
March	3.1	4.6	35
April	4.8	1.8	40
May	6.5	1.2	47
June	7.8	0.8	54
July	9.0	0.3	61
August	7.8	0.5	61
September	5.7	0.9	55
October	3.7	2.0	46
November	1.8	4.3	37
December	0.9	4.7	31
Annual	**54.3**	**32.7**	**44**

[a] ETo, or evapotranspiration, is the loss of water from evaporation

2.2 SERVICE AREA POPULATION

As noted above, the District provides water supply within the incorporated City of South Lake Tahoe (City) and the unincorporated communities of Montgomery Estates Tahoe Paradise, Meyers, Angora Highlands, Fallen Leaf Lake and Christmas Valley, all in eastern El Dorado County. Other water purveyors within the City's limits are Lukins Brothers and Lakeside Water Companies, which together serve approximate 1,100 largely non-residential connections, and Tahoe Keyes Water Company which serves 1,529 water connections in the largely built-out Tahoe Keyes community.

All land in the Lake Tahoe region, including the City and the District's service area, falls under the jurisdiction of the TRPA as defined in the Tahoe Regional Planning Compact (Compact). The Compact requires that all local jurisdiction planning be consistent with a series of Environmental Thresholds. It is generally acknowledged that the TRPA Environmental Thresholds effectively provide a growth control mechanism for the region.[6]

2.2.1 Estimating Current Population

In its 2005 UWMP, the District estimated it served a year-round population of slightly over 32,000 and it anticipated a growth rate of 0.4% annually based on past trends and coordination with TRPA. According to the General Plan Background Report – Utilities Section, and the District's records, the District provides water to 14,000 single-family and multi-family accounts and 625 commercial and public accounts. California

[6] City of South Lake Tahoe, General Plan Background Report – 2009 Adopted Housing Element page 4-17 and following

Department of Finance (DOF) data[7] sets the average household size in the South Lake Tahoe area at 2.46 persons per household. When the average household size is applied to the District's service area, current population can be estimated at 34,580, which is within 5% of the estimates developed in the 2005 UWMP and translates into an average annual growth rate of about 1% per year. This growth rate is consistent with the projections of a 0.9% annual growth rate for the area.

The District has also purchased population data from Demographics Now which keeps updated Census Tract Information. According to the Demographics Now data, the 2009 population in the nine Census Tracts that make up the District's Service Area is 33,124, which is within 1% of the estimates developed in the 2005 UWMP. For purposes of this analysis, the Demographics Now data will be used as the basis for current population because it represents a more discrete focus on the District's particular service area.

For comparison, the City's current population is estimated at approximate 24,000, which indicates that approximately two-thirds of the District's served population is within the City and approximately one-third is within the unincorporated County.

2.2.2 Estimating Population Growth

The population projections developed in this 2010 UWMP are based on current population data from Demographics Now, described above, and the information presented in the City's 2030 General Plan Background Reports and Public Review drafts. Population growth rates were developed to be consistent with the City's 2030 General Plan. Because the City's land use strategies are anticipated to be consistent with the TRPA Regional Plan, the growth rates calculated for the City are used to estimate overall population growth within the District's service area. This estimating method acknowledges that planned growth rates within the City of South Lake Tahoe are being applied to the unincorporated area within the District's service area. Because the other water companies serving the City either serve built-out subdivisions or commercial development, it is reasonable to anticipate that the majority of the planned residential growth will occur in the District's service area.

The City's 2030 General Plan provides a very clear and descriptive analysis of planned growth in both the residential and nonresidential sectors. The following descriptions of planned land uses are from the Public Review Draft of the City's 2030 General Plan[8] and were used to estimate demands on the District's water supply in the future. Specifically, General Plan Policy LU-19, reproduced below, provides a description of future growth in the residential sector.

"Policy LU-1.9: Future Residential Development Rights (RDR) Commodities: The City shall pursue the maximum amount of available residential unit allocations from the Tahoe Regional Planning Agency in

[7] City of South Lake Tahoe, General Plan Background Report – 2009 Adopted Housing Element page 4-17 and following.

[8] City of South Lake Tahoe, 2030 General Plan Background Report –page LU -10

order to use them as an incentive for revitalization, including workforce housing, up to an additional 940 market rate units and 222 affordable units."[9].

Based on this policy, the number of new residential units that can be anticipated in the City by 2030 is 1,162 (940 market rate units + 220 affordable units). According to DOF, the current number of units in the City is 15,098[i10]; planned growth would result in that number increasing to 16,260. The average annual growth rate planned in the City can be calculated as follows:

((Total Residential Units in 2030)-(Total Residential Units in 2010)/(Total Residential Units in 2010))/20 years
or
((16260-15098)/15,098))/20 = 0.36% growth annually

This planned growth rate is very consistent with the 0.4% annual growth rate that the District utilized in its 2005 UWMP. As noted above, this growth rate will be applied to the District's entire service area. The average number of new residential units added in the City over the next twenty years would be 58 (1162/20) and the average annual population growth associated with these new residential units would be 143 (58 * 2.46 persons per household). As discussed above, the population in the City comprises two-thirds of the over the overall District population. If the growth rate in the City is assumed to apply to the District's overall service area, annual population growth will be 214 people on average.

Table 2.1 applies these growth rates to the base population rate in the District.

Table 2.2 (DWR Table 2)
Population – Current and Projected

	2010	2015	2020	2025	2030
Service Area Population[a]	33,124	34,194	35,264	36,334	37,404

[a] Service area population is defined as the population served by the distribution system.

2.3 OTHER DEMOGRAPHIC FACTORS AFFECTING WATER PLANNING

The Lake Tahoe Region is known for its exceptional recreational opportunities and tourism is a significant aspect of the region's economy. Visitors to the District's service area, especially during the summer season, can easily double the population numbers presented in Table 2.2. In addition, there is a significant amount of existing and planned nonresidential development that serves the visiting population. In the District's service area, non-residential land uses are primarily concentrated in the City of South Lake Tahoe and City's General Plan serves a good basis for employment projections. The Background Report for the General Plan[11] includes information on developed non-residential square footage within the City and provides clear policy direction on future planned development. The Table 2.3 below presents nonresidential square

[9] GPU Consultants

[10] Department of Finance 2009

[11] General Plan Background Report, Public Review Draft (June 2008)

footage in 1989 and 2005 from the General Plan Background Report. This information is used to calculate an annual growth rate for that 16 year period and estimate the total nonresidential square footage in 2007, which coincides with available data on employees. Table 2.3 also presents the square footage additions allowed by General Plan LU1.7 and uses this information to calculate total nonresidential square footage that can be estimated at General Plan buildout in 2030.

Table 2.3
Nonresidential Square Feet – Existing and Planned

Location	1989	2005	Annual Growth Rate	2007 Estimate	General Plan Additions	2030 Projections
Tahoe Valley Community Plan Area	445,200	447,200	0.03%	447,451	211,000	658,451
Sierra Area	152,150	154,000	0.08%	154,234	0	154,234
Bijou/Al Tahoe Community Plan Area	282,500	296,000	0.30%	297,768	55,000	352,768
Stateline/Ski Run Community Plan Area	300,600	378,000	1.61%	390,166	55,000	445,166
Tahoe Keys Area	30,700	30,700	0.00%	30,700	0	30,700
Other Areas (includes the "Y")	NA	NA	0.00%	-	65,000	65,000
Total	**1,211,150**	**1,307,650**		**1,320,759**	**361,000**	**1,706,319**

The General Plan Background Report provides information on total employees in the City which is presented in Table 2-4 below. New employees can be projected by applying the current ratio of employees per 1,000 square feet (tsf) to the total nonresidential square footage projected in 2030.

Table 2.4
Employees – Current and Projected

2007			2030		
Employees	Nonresidential Development (tsf)	Employees per tsf	Nonresidential Development (tsf)	Employees per tsf	Employees
17,072	1,321	12.9	1,667	12.9	21,504

3 SYSTEM DEMANDS

This section describes the urban water system demands, including calculating its baseline (base daily per capita) water use and interim and final water use targets. It includes a detailed description of how the baseline and targets were calculated. The calculations follow the guidance developed in DWR's publication *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use For the Consistent Implementation of the Water Conservation Bill of 2009*. Background information and the approach used to develop baselines and targets are also included.

This section quantifies the current water system demands by category and projects them over the planning horizon of the UWMP. These projections include water sales to other agencies, system water losses, and water use target compliance. The future water demands are based on the assumed reduction in per capita daily use determined from planning for and implementing actions associated with SBx7-7.

3.1 BASELINES AND TARGETS

The evaluation of baseline water use and the target reduction methodologies is based on information provided by the District on the following:

- Historical water production
- Historical water demand
- Historical connections and population

3.1.1 Baseline Daily Per Capita Water Use

The purpose of developing a baseline daily per capita water use figure is to have a baseline from which to derive the 2015 and 2020 water use targets. The baseline water use is the water supplier's average gross daily per capita use in gallons. The baseline includes all water entering the delivery system, including water losses, except for recycled water delivered within the supplier's service area, water placed into long-term storage or water conveyed to another urban water suppliers.

The methodology used to determine the baseline water use is outlined in SBx7-7 and is calculated as a 10-year average beginning no earlier than 1994 and ending no later than 2010. A 15-year baseline may be used, if the water supplier delivers a significant volume of recycled water in its service area. In addition, a recent 5-year average is calculated in order to determine the maximum allowable 2020 target.

For the development of the District's base daily per capita water use, a 10-year average was used because the Basin Plan for the Lake Tahoe area prohibits the use of recycled water within the basin. The baseline year checks are illustrated in Table 3.1.

Table3.1 (DWR Table 13)
Base Period Ranges – AFY

Base	Parameter	Value	Units
10- to 15-Year Base Period	2008 total water deliveries	6,918	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0	percent
	Number of years in base period[a]	10	years
	Year beginning base period range	1999	--
	Year ending base period range[b]	2008	--
5-Year Base Period	Number of years in base period	5	years
	Year beginning base period range		--
	Year ending base period range[c]		--

[a] If the 2008 recycled water percent is less than 10 percent of total water deliveries, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

[b] The ending year must be between December 31, 2004 and December 31, 2010.

[c] The ending year must be between December 31, 2007 and December 31, 2010.

The District's baseline has been calculated over the ten year period from 1999 to 2008. As shown in Table 3.2, the base daily per capita water use is 201 gallons per capita per day (gpcpd). The base daily per capita water use was developed using the total service area population. The gross water use includes all water entering the water delivery system, including water losses.

Table 3.2 (DWR Table 14)
Base Daily Per Capita Water Use — 10- to 15-Year Range – AFY

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	1999	33,672	3.94	188
Year 2	2000	34,042	3.9	203
Year 3	2001	33,938	4.02	213
Year 4	2002	33,835	4.25	207
Year 5	2003	33,731	4.26	188
Year 6	2004	33,627	4.48	199
Year 7	2005	33,524	4.5	184
Year 8	2006	33,420	4.17	199
Year 9	2007	33,316	4.21	219
Year 10	2008	33,213	4.22	205
Base Daily Per Capita Water Use				**201**

Each urban retail water supplier must reduce its daily per capita water use by at least 5 percent of the 5-year base daily per capita water use. This 5 percent minimum generally affects water suppliers who are using water at or below their hydrologic region's 2020 water use target. For the District, the 2020 water use target cannot exceed 201 gpcpd, which is also the current baseline. This calculation is illustrated in Table 3.3 below.

Table 3.3 (DWR Table 15)
Base Daily Per Capita Water Use — 5-Year Range – AFY

Base Period Year		Distribution System Population	Daily System Gross Water Use (mgd)	Annual Daily Per Capita Water Use (gpcd)
Sequence Year	Calendar Year			
Year 1	2004	33,627	4.26	199
Year 2	2005	33,524	4.48	184
Year 3	2006	33,420	4.5	199
Year 4	2007	33,316	4.17	219
Year 5	2008	33,213	4.21	205
Base Daily Per Capita Water Use				**201**

3.1.2 Water Use Targets

The purpose of SBx7-7 was to establish requirements for the state of California to reduce its statewide urban per capita water use by 20 percent by the year 2020. An interim target is set for 2015 which requires a 10 percent reduction in urban per capita water use. After year 2021, failure to meet the 2020 water use target constitutes a violation of law. Compliance of the 2015 and 2020 water use targets is also a requirement for eligibility for State water grants and loans.

3.1.2.1 Individual Targets

There are four methods that an urban water supplier may use to develop their 2015 and 2020 water use targets. Three methods are provided in SBx7-7 and the fourth was subsequently established by DWR. The four methods are generally described below. A more complete description can be found in DWR's *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* dated March 2011.

- Method 1: 80 percent of Base Daily Per Capita Use;
- Method 2: Performance standards based on actual water use data for indoor residential water use, landscaped area, and commercial, industrial and institutional (CII) water use;
- Method 3: 95 percent of the North Lahontan hydrologic region; and
- Method 4: Savings by water sector (indoor residential and CII) and landscape and water loss savings

The District determined it did not have the data to perform calculations consistent with Method 2 as they are not fully metered and do not have current means to verify indoor residential water use and landscape water use. However, potential targets for the District were calculated using the other three methods.

Urban Water Use Target Method 1 Evaluation: 80% of Base Daily per Capita Water Use

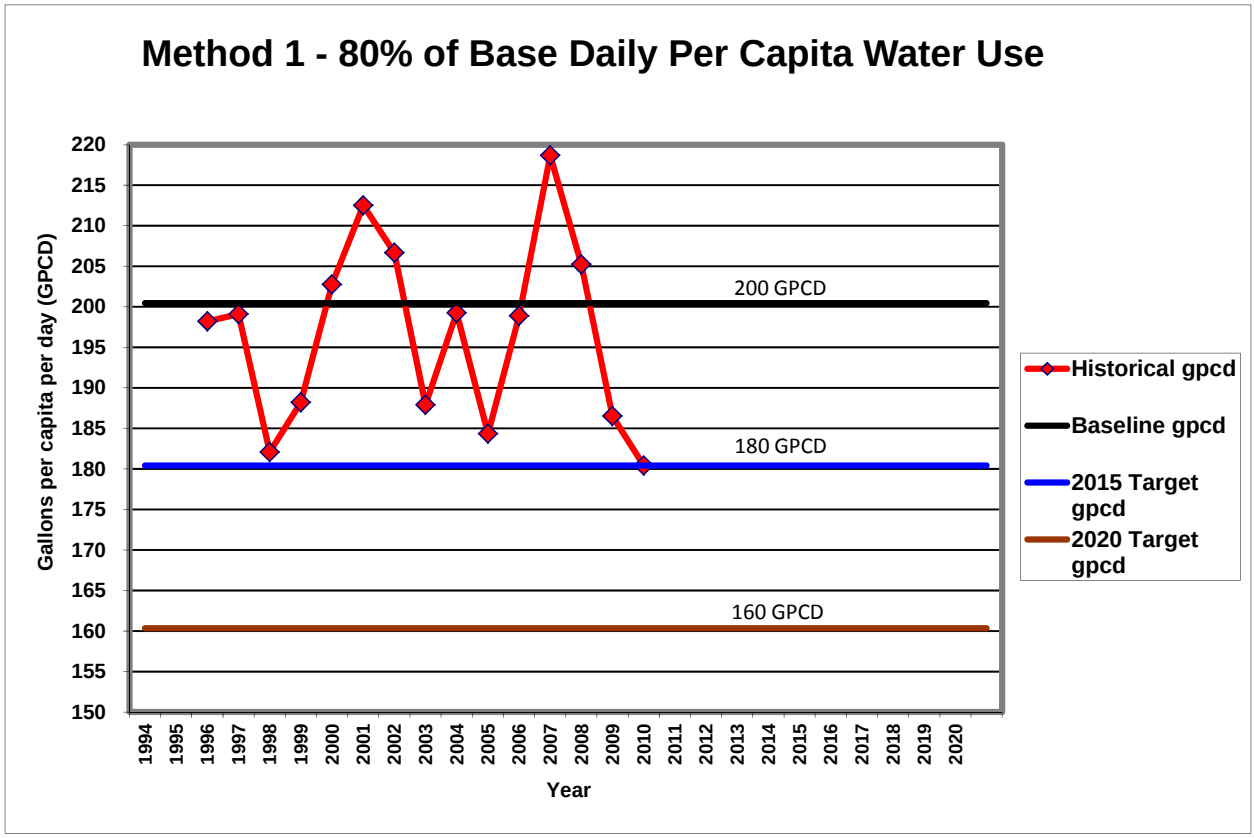
As part of the Urban Water Use Target Method 1 evaluation, the District's historical water use in terms of gpcpd was evaluated using total gross treated water production for each year and estimated population in each year based on the California Department of Finance data.

The value of 201 gpcpd shown in Table 3.2 is considered the base daily per capita water use for Method 1.

- Based on a 10 percent reduction of the base daily per capita water use, the 2015 interim target is 180 gpcpd
- Based on a 20 percent reduction of the base daily per capita water use, the 2020 target is 160 gpcpd

Figure 3.1 shows the historical demand and 2015 and 2020 targets as determined using Method 1.

Figure 3.1 Historical Demand Compared to Baselines and Targets



Urban Water Use Target Method 3 Evaluation: 95 Percent of Hydrologic Region Target

The third method allows the water supplier to select 95% of the hydrologic region's target as its gpcpd goal. The applicable Hydrologic Region for the District's service area is Region 8 – North Lahontan, as shown on Figure 3-2.

- Based on meeting the regional hydrologic target, the 2015 the interim target is 198 gpcpd
- Based on meeting the regional hydrologic target, the 2020 the target is 164 gpcpd

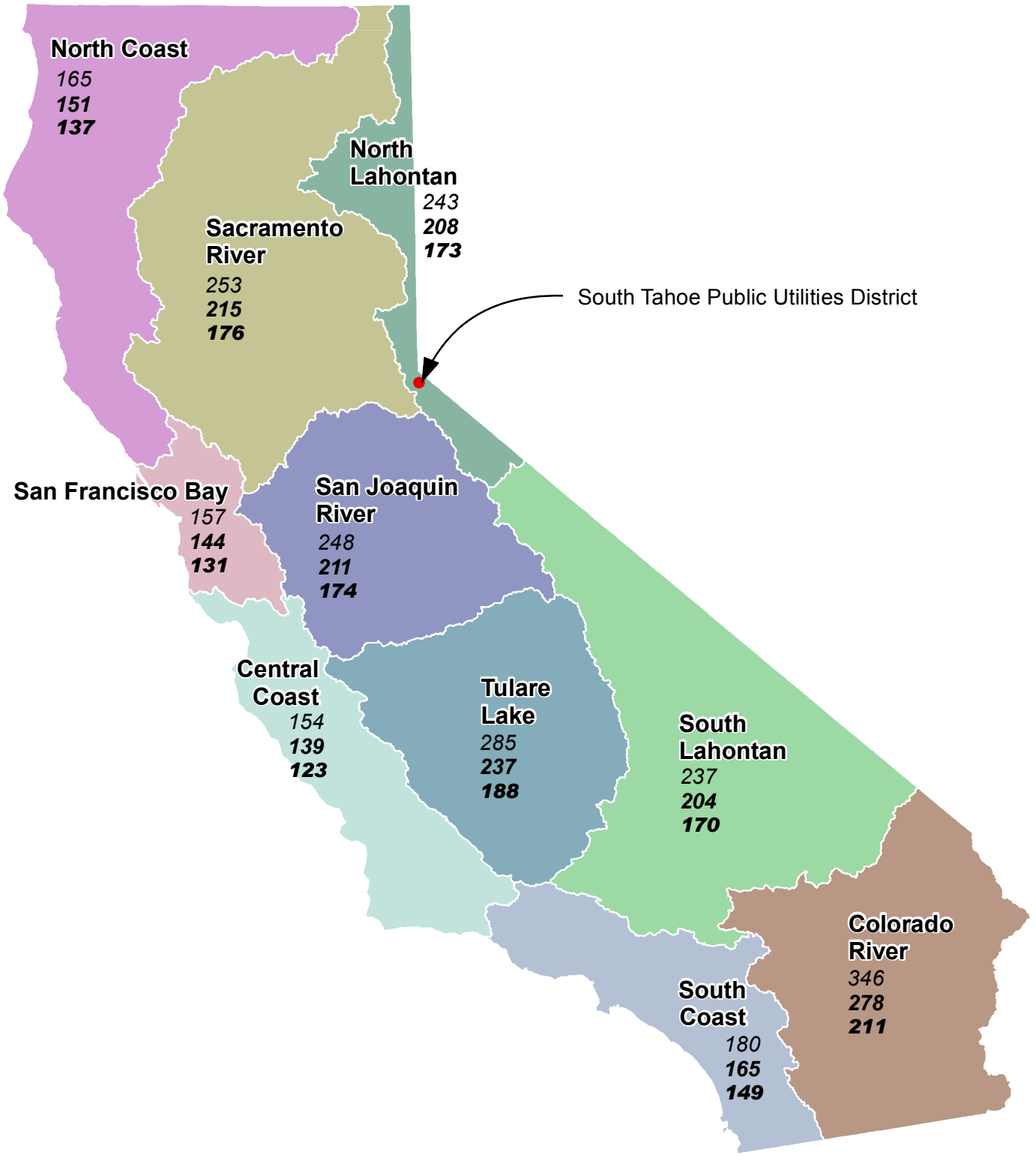
Urban Water Use Target Method 4 Evaluation: Water Savings (Provisional)

DWR developed Provisional Target Method 4 with the assistance of the California Urban Water Conservation Council, the California State Water Resources Control Board, and the Urban Stakeholder Committee, composed of technical experts and representatives of water suppliers and environmental and other organizations.

It is anticipated that improvements will be made to the target method based on new data and analytical techniques in the update. Provisional Target Method 4 described in this UWMP will be in effect until the update by 2014. Urban retail water suppliers that adopt Target Method 4 to determine their 2020 urban water use target must use the provisional procedures provided by DWR.

A Target Method 4 Calculator (Calculator) using an Excel spreadsheet was developed for use with Provisional Target Method 4. The Calculator will be required to accomplish some of the procedures for this method. Other procedures may be accomplished without use of the Calculator but have been incorporated into the Calculator to automate the calculation of the 2020 target.

For this target method, savings are assumed between the baseline period and 2020 due to metering of unmetered water connections and achieving water conservation measures in three water use sectors as shown below for residential, commercial and industrial and landscape. The results of the calculator for the District are provided below.



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Cartography: RMR

Legend

Statewide Conservation Goals

192 Baseline (1995-2005)

173 Interim Target (2015)

154 2020 Target

in gallons per capita per day

0 40 80 Miles

1 inch = 81 miles

N

Sources: USDA: Aerial NAIP 2009 1 meter resolution; Humboldt County GIS: Parcels, Blueline Streams.

Figure 3.2
Hydrologic Region Map

South Tahoe Public Utilities District
Urban Water Management Plan

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Target Calculation -- Provisional Method 4 Target

Step 1. Calculation of Landscape Water Use and System Water Loss

Urban Supplier	1999-2008 Baseline GPCD	—	Assumed Indoor Residential per Capita Water Use GPCD	—	CII per Capita Water Use GPCD	=	Estimated Landscape Water Use and System Water Loss GPCD
South Tahoe Public Utlities District	200.5		70.0		40.3		90.2

Step 2. Calculation of Savings Using BMP Calculators (Alternate) STEP 2 BEING USED TO CALCULATE TARGET

Urban Supplier	Indoor Residential Savings Calculators					+	Metering Savings BMP 1.3	+	CII Savings BMP 4	+	Land-scape + Water Loss Savings 21.6%	=	Total Savings GPCD
	Single Family Toilets	Multi Family Toilets	Resi-dential Washers	Resi-dential Showers	Total IR Savings								
South Tahoe Public Utlities District	XXXX	XXXX	XXXX	XXXX	XXXX		XXXX		XXXX		XXXX		XXXX

(Alternate) Step 2. Calculation of Savings Using Default Indoor Residential Savings

Urban Supplier	Default Resi-dential Indoor Savings	+	Metering Savings BMP 1.3	+	CII Savings BMP 4	+	Land-scape + Water Loss Savings 21.6%	=	(alt) Total Savings GPCD
South Tahoe Public Utlities District	15.0		28.3		4.0		19.5		66.8

Step 3. Calculation of Urban Water Use Targets

Urban Supplier	1999-2008 Baseline GPCD	—	Total Savings GPCD	=	Computed 2020 Target GPCD		Less Than 95% of 5-Year Baseline		Final 2020 Target		Final 2015 Target
South Tahoe Public Utlities District	200.5		66.8		**133.7**		**TRUE**		**133.7**		**167.1**

Selected 2015 and 2020 GPCPD Targets

Methods 1, 3 and 4 were compared to determine which option would provide the best end result for the District. As discussed above:

- Method 1 - the difference between the baseline 201 gpcpd and the 2020 target value of 160 gpcpd represents a reduction of 41 gpcpd
- Method 3 – the difference between the baseline 201 GPCD and the 2020 target value of 164 gpcpd represents a reduction of 37 gpcpd
- Method 4 - the difference between the baseline 201 gpcpd and the 2020 target value of 134 gpcpd represents a reduction of 67 gpcpd.

At the Board Workshop on May 5, 2011, the Method 3 target of 164 gpcpd was selected when compared to Method 1, 2 and Method 4 gpcpd targets.

3.1.2.2 Regional Targets

SBx7-7 provides that urban water retail suppliers may plan, comply and report on the 2020 water use target on a regional basis, an individual basis, or both. The District is one of a number of water agencies in the Lake Tahoe Basin that already work together to develop and implement their Integrated Regional Water Management Plan. This group could be eligible to form a regional alliance which may simplify compliance for all purveyors.

While the District has not had time to evaluate a potential regional alliance during this UWMP cycle, it reserves the option to conduct this analysis over the next several years and present a regional target and regional compliance as part of its 2015 UWMP.

3.2 WATER DEMANDS

Historical potable water consumption by customer type, within the District's service area, for the ten years from 2001 through 2010 is shown in Table 3.4. Water consumption was developed from the District's water production records.

Table 3.4

		Historical Total Water Pumped (Acre Feet)									
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total Use	7,732	8,079	7,833	7,100	7,506	6,922	7,445	8,161	7,635	6,918	6,546
From District's Pumpage Records											

Past and projected District potable water uses for the various customer types metered are shown in Tables 3.5 to 3.9. All District accounts are expected to be metered by the year 2020. The demand projections for the years 2015 to 2035 were created by the Least Cost Planning Decision Support System Model (DSS Model). The DSS Model is Excel based proprietary software created by Maddaus Water Management and is currently endorsed by the California Urban Water Conservation Council. The demand model utilizes the population and employment forecasts, plumbing code and planned conservation measures.

Table 3.5 (DWR Table 3)
Water Deliveries — Actual, 2005 – AFY

	2005				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	21	10	11,826	Not Available	Not Available
Multi-family	146	396	459	Not Available	Not Available
Duplex/Triplex	0	0	826	Not Available	Not Available
Commercial	462	1,460	670	Not Available	Not Available
Industrial	0	0	0	0	0
Institutional/Governmental	0	0	0	0	0
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	7	28	6	Not Available	Not Available
Total	**636**	**1,894**	**13,787**	**4,366**	**6,260**

Table 3.6 (DWR Table 4)
Water Deliveries — Actual, 2010 – AFY

	2010				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	69	25	12,148	Not Available	Not Available
Multi-family	205	337	520	Not Available	Not Available
Duplex/Triplex	0	0	753	Not Available	Not Available
Commercial	462	1,186	676	Not Available	Not Available
Industrial	0	0	0	0	0
Institutional/Governmental	0	0	0	0	0
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	7	20	276	Not Available	Not Available
Total	**743**	**1,568**	**14,373**	**4,352**	**5,920**

Table 3.7 (DWR Table 5)
Water Deliveries — Projected, 2015 – AFY

	2015				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	7,799	1,544	4,724	935	2,479
Multi-family	556	335	86	52	387
Duplex/Triplex	357	78	503	110	189
Commercial	835	1,092	387	505	1,597
Industrial	0	0	0	0	0
Institutional/Governmental	0	0	0	0	0
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	55	22	56	22	44
Total	**9,602**	**3,070**	**5,756**	**1,625**	**4,695**

Table 3.8 (DWR Table 6)
Water Deliveries — Projected, 2020 – AFY

	2020				
	Metered		Not Metered		Total
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	Volume
Single family	12,915	2,190	0	0	2,190
Multi-family	662	363	0	0	363
Duplex/Triplex	887	153	0	0	153
Commercial	1,285	1,411	0	0	1,411
Industrial	0	0	0	0	0
Institutional/Governmental	0	0	0	0	0
Landscape	0	0	0	0	0
Agriculture	0	0	0	0	0
Other	117	36	0	0	36
Total	15,866	4,153	0	0	4,153

Table 3.9 (DWR Table 7)
Water Deliveries — Projected, 2025, 2030, and 2035 – AFY

	2025		2030		2035	
	Metered		Metered		Metered	
Water Use Sectors	# of Accounts	Volume	# of Accounts	Volume	# of Accounts	Volume
Single family	13,306	1,971	13,698	1,998	14,090	2,031
Multi-family	682	343	702	341	723	341
Duplex/Triplex	914	127	941	126	967	126
Commercial	1,349	1,326	1,412	1,388	1,475	1,451
Industrial	0	0	0	0	0	0
Institutional/Governmental	0	0	0	0	0	0
Landscape	0	0	0	0	0	0
Agriculture	0	0	0	0	0	0
Other	123	32	128	34	134	35
Total	16,374	3,800	16,882	3,887	17,390	3,984

Table 3.10 below presents the estimated low income demand within the District's service area. The estimate was based the City of South Lake Tahoe's draft General Plan and Housing Element which estimates that there will be 291 affordable housing units within the District's service area by 2013, which meets the regional housing-share target. These are largely multi-family units and the District's records indicate these accounts typically use 0.6 AFY per year. With 291 accounts the total use is 175 AFY per year or about 4% of the District's total demands. This use is expected to stay constant over the life of this UMWP.

Table 3.10 (DWR Table 8)
Lower-Income Projected Water Demands as a Percent of Total

Water Distributed	2015	2020	2025	2030	2035
Single-family residential					
Multi-family residential	4%	4%	4%	4%	4%
Total	**4%**	**4%**	**4%**	**4%**	**4%**

The District does not regularly sell water to other agencies currently, and has no plans to do so in the future, which is illustrated in Table 3.11.

Table 3.11 (DWR Table 9)
Sales to Other Water Agencies – AFY

Water Distributed	2005	2010	2015	2020	2025	2030	2035
None sold	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Presented in Table 3.12 is the difference between water production and water consumption and represents "lost" water.

Table 3.12 (DWR Table 10)
Additional Water Uses and Losses – AFY

Water Use	2005	2010	2015	2020	2025	2030	2035
Saline barriers	**0**	0	**0**	**0**	**0**	**0**	**0**
Groundwater recharge	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Raw water	0	0	0	0	0	0	0
Recycled water	0	0	0	0	0	0	0
System losses	662	626	658	671	684	700	717
Total	662	626	658	671	684	700	717

Total water use including water losses is projected to decrease to 4,701 acre feet in 2035 as shown in Table 3.13. The total water use is the sum of water use by customer categories, sales to other agencies and additional water uses and losses.

Table 3.13 (DWR Table 11)
Total Water Use – AFY

Water Use	2005	2010	2015	2020	2025	2030	2035-opt
Total Water Deliveries (from Tables 3 to 7)	6,260	5,920	4,695	4,153	3,800	3,887	3,984
Sales to Other Water Agencies (from Table 9)	-	-	-	-	-	-	-
Additional Water Uses and Losses (from Table 10)	662	626	658	671	684	700	717
Total	**6,922**	**6,546**	**5,353**	**4,824**	**4,484**	**4,587**	**4,701**

3.3 WATER DEMAND PROJECTIONS FOR RETAILERS

The District is both the wholesaler and retailer in its service area. Table 3.14 below presents its demand projections.

Table 3.14 (DWR Table 12)
Retail Agency Demand Projections Provided to Wholesale Suppliers – AFY

Wholesaler	Contracted Volume	2010	2015	2020	2025	2030	2035-opt
South Tahoe Public Utilities District		6,546	5,353	4,824	4,484	4,587	4,701

3.4 WATER USE REDUCTION PLAN

As part of the 2010 UWMP Plan all retail water suppliers are to develop an implementation plan for compliance with SBx7-7. The plan described below includes a general description of how the District intends to reduce per capita water use to meet its urban water use target. In developing the implementation plan, the District was careful to avoid placing a disproportionate burden on any customer sector.

SBx7-7 requirements for the District provide an overall goal for community-wide water demand reduction. The state requirements refer to the metric on a per person (capita) amount of water demand per day, which is based on total water demand in the service area divided by number of days in the year, divided by the total number of persons served, presented in terms of gallons per capita per day. The compliance with gpcpd targets required by SBx7-7 is voluntary on behalf of each individual water customer, and the District will need to proceed with more conservation measures over time, if monitoring of progress of the total annual water demand in the service area indicates that targets are not forecasted to be achieved.

The District will be encouraging reductions in customer water demand through mainly the implementation of the 14 Demand Management Measures (DMMs) included in this plan with a particular focus on DMM D (Metering with commodity rates for all new connections and retrofit of existing connections). The District is will being billing their approximately 4,800 residential customers by volumetric rates in 2011 (volumetric residential rates have been identified as a key area of importance for the District's service area).

Over the course of the next nine years, the District's Board may also strengthen some existing policies or adopt new policies to help achieve these targets. Compliance with some of these Board policies may not be voluntary, such as requirements to avoid wasteful practices (e.g., enforcement of the District Board's policy associated fines for water waste violation).

Detailed descriptions of the water reduction plan elements, including intervention targets and budgets for each DMM, are included in Section 6.

4 SYSTEM SUPPLIES

4.1 OVERVIEW

This section describes the District's water supply system. Currently the District's supply is entirely comprised of groundwater, which is pumped from District-owned wells in the Tahoe Valley South Subbasin of the Tahoe Valley Groundwater Basin (DWR Basin 3 6-5.01). The District has had as many as 34 active wells in the basin but has had to reduce the use of its well field because of water quality issues associated with widespread methyl tertiary butyl ether (MTBE) contamination. Arsenic and uranium levels in some wells have also limited their use.

The District is both a wholesaler and a retailer, producing potable water as well as supplying water directly to customers. The District does not receive potable water from other water suppliers. Although the District produces recycled water, this water cannot be used with the Lake Tahoe hydrologic basin because of restrictions in the Basin Plan adopted by the Lahontan Regional Water Quality Control Board. The District does put its recycled water to beneficial use in Alpine County, outside of the Lake Tahoe hydrologic basin. Table 4.1 provides highlights of the various water supply sources. These are discussed in detail in the remainder of this Chapter.

Table 4.1 (DWR Table 16)
Water Supplies – Current and Projected – AFY

Water Supply Sources							
Water Purchased From:	Wholesaler Supplied Volume (Y/N)	2010	2015	2020	2025	2030	2035-opt
Wholesaler 1 (agency name)	NA						
Wholesaler 2 (agency name)	NA						
Wholesaler 3 (agency name)	NA						
Supplier-produced groundwater		9,528	9,528	9,528	9,528	9,528	9,528
Supplier-produced surface water		0	0	0	0	0	0
Transfers in		0	0	0	0	0	0
Exchanges In		0	0	0	0	0	0
Recycled Water		0	0	0	0	0	0
Desalinated Water		0	0	0	0	0	0
Other		0	0	0	0	0	0
Other		0	0	0	0	0	0
Total		**9,528**	**9,528**	**9,528**	**9,528**	**9,528**	**9,528**

4.2 SURFACE WATER SUPPLY AGREEMENTS AND RIGHTS

The District holds a permit to divert up to 2,718 AFY from Cold Creek (UWMP, 2005), however it discontinued this diversion in 1991 due to water quality constraints. The District also has diversion rights to the Upper Truckee River and tributaries for up to 4,424 AFY. These rights have not been utilized in the past and are not planned for use in the future due to supply reliability concerns (UWMP 2005). One issue of concern for the utilization of surface waters is the availability of a consistent and adequate in-stream flow

at diversion points during peak summer months. The District has filed for rights to divert surface water from Lake Tahoe for a total of 12,100 AFY. These permit applications are in review by the State Water Resources Control Board and are therefore not currently a supply source. Table 4.2 presents the data on surface water supplies for the District.

Table 4.2 (DWR Table 17)
Surface Water Supplies – Existing and Planned Sources of Water – AFY

Wholesale Sources	Contracted	2015	2020	2025	2030
Wholesaler	NA	0	0	0	0

4.3 GROUNDWATER

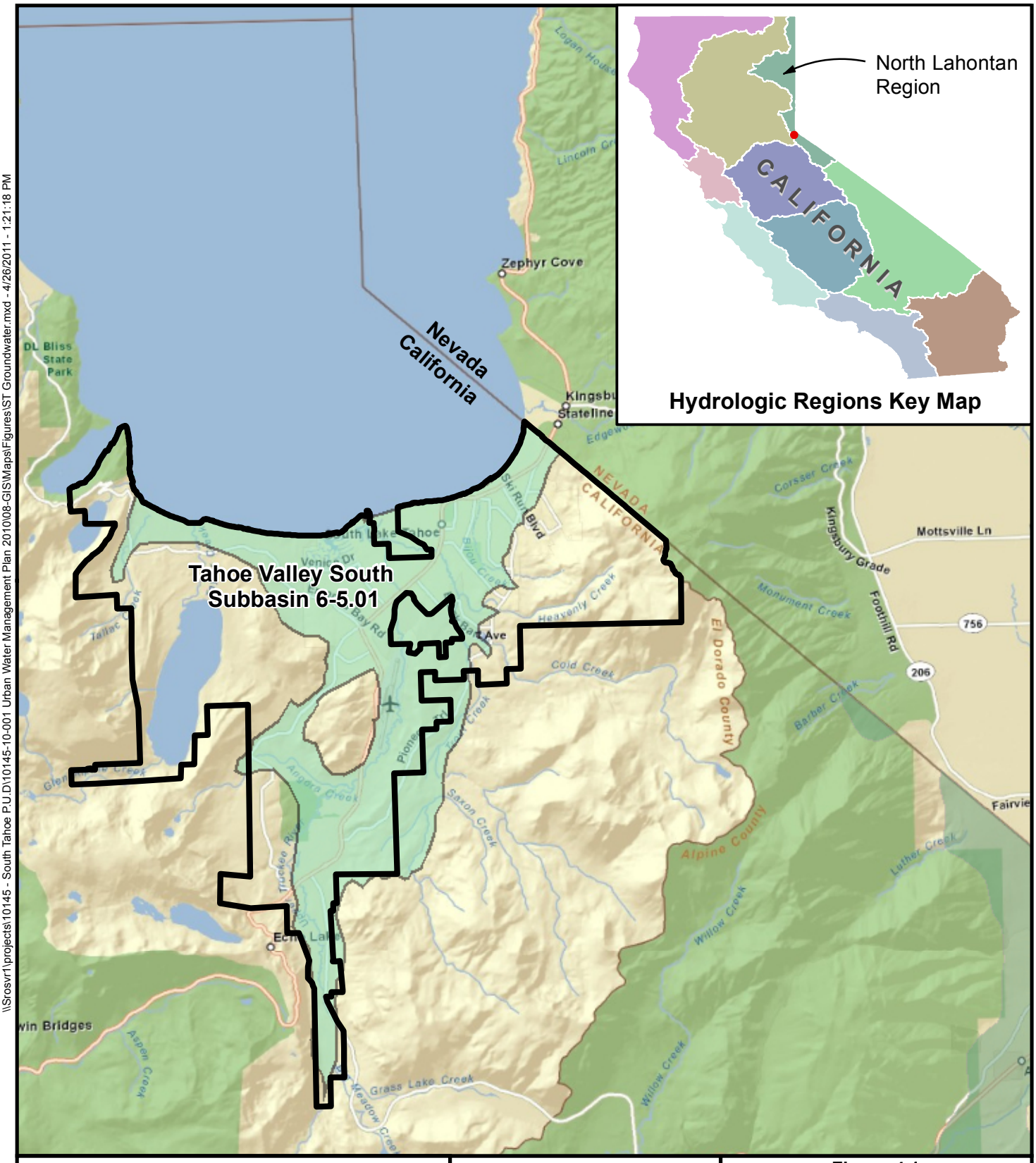
4.3.1 Introduction

The Act requires the following items to be addressed for water suppliers that obtain groundwater.

- Indicate whether or not the water supplier directly obtains its own groundwater, or if it plans to develop groundwater resources within the planning horizon of the UWMP or if they obtain water from another supplier.
- Provide an electronic copy of any groundwater management plan
- Provide a description of any groundwater basin or basins from which the urban water supplier pumps groundwater.
- If basin is adjudicated, provide an electronic copy of the order or decree adopted by the court or the board and provide a description and the volume of groundwater the urban water supplier has the legal right to pump under the order or decree.
- Provide information as to whether DWR has identified the basin as overdrafted or projected overdraft. Describe the efforts being undertaken to eliminate the long-term overdraft condition.
- Provide a detailed description, analysis, amount and sufficiency of groundwater pumped by the urban water supplier for each of the past five years.
- Describe whether there were limitations or challenges obtaining groundwater in the last five years to indicate the sufficiency of groundwater pumped.
- Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier.

4.3.2 Groundwater Management Plan

The District draws its water supply from the Tahoe Valley South Subbasin of the Tahoe Valley Groundwater Basin. The District developed an adopted a Groundwater Management Plan in 2005. An electronic copy of the Groundwater Management Plan can be viewed or downloaded from the District's website at the following location: http://www.stpud.us/plan_doc_Groundwater_Management_Plan.pdf



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Cartography: RMR

Legend

- Tahoe Valley South Subasin 6-5.01
- South Tahoe P.U.D. Boundary

0 1 2 Miles

1 inch = 2 miles

N

Sources: ESRI Basemap:Streets, STPUD GIS: Parcels, City Limits, District Boundaries, Pressure Zones, City Limits.

Figure 4.1
Groundwater Basin/ Subbasin Map

South Tahoe Public Utilities District
Urban Water Management Plan

WINZLER & KELLY
www.w-and-k.com

Within the 2005 Groundwater Management Plan, the District established a safe pumping yield of 9,528 AFY for its operation. Historical and current demand is below the safe yield and has been declining since 2007. This observed reduction maybe a result of combined groundwater management practices, water conservation measures and/or the result of reduced economic activity. The current groundwater production trend and planned development should continue to fall within the range outlined in the Groundwater Management Plan.

4.3.3 Description of Groundwater Basin

4.3.3.1 Hydrogeology of Basin

As described in the District's Groundwater Management Plan and Bulletin 118, groundwater has been developed in the District's service area primarily from unconsolidated sedimentary deposits within the Tahoe Valley South Subbasin of the Tahoe Valley Groundwater Basin (Basin). Glacial deposits are predominant and include moraines and outwash that make up the predominant aquifers. Glacial outwash is more widespread in the District than moraines. The outwash deposits are generally sand, gravel, and cobble layers that are interbedded with silt and clay layers. The outwash deposits were produced by glacial melt waters and streams that drained moraines to the south. Later, glacial outwash deposits in some areas were eroded and replaced with stream channel deposits.

Lake bed (lacustrine) deposits in the District are composed primarily of interbedded fine sand, silt, and clay layers with some interbedded coarse-grained deposits. These lake-bed deposits were deposited during periods of high lake levels, and have been partly preserved along the Upper Truckee River and Trout Creek stream courses. Lake-bed deposits below an elevation of 6,280 feet in and near the District have been referred to as "recent lake-bed deposits". Hardrock assemblages (also known as crystalline rock) include granitic, metamorphic, and volcanic rocks are also common to the District and in the Basin. Granitic out crops are common over a large area east, and within most of the District.

4.3.3.2 Groundwater Quality and Quantity Issues

In 1996, the fuel additive MTBE was detected in one of the District's wells. Gasoline/MTBE leaking from local gas station tanks travels easily through porous granitic soil into groundwater supplies. MTBE is a suspected carcinogen and even at low levels the chemical causes a foul taste and odor. The District has made enormous efforts to combat this contaminant and since 1996 MTBE has become the primary limiting factor to the District's supply and operations.

The District has been very proactive in addressing the challenges that MTBE contamination has caused. The District lobbied legislators and government officials to ban the use of MTBE as a fuel additive. The District was successful in enlisting the help of El Dorado County and the City of South Lake Tahoe to create a MTBE-free zone at South Lake Tahoe that began April 1999. In 2000, the District completed a comprehensive Master Plan Update, MTBE Water System Impacts and Mitigation Evaluation addressing the restoration of water production lost to MTBE contamination. Options studied included constructing new wells, securing surface water rights, purchasing water, rehabilitating its wells, conserving water, and installing treatment facilities to remove MTBE from wells. The District changed operational criteria to meet water demand.

The District had historically reported as many as 34 supply wells within its network. The 2005 UWMP reported 13 previously active wells had been shut down due to MTBE contamination. It documented 19 active wells, two standby wells and one well under construction. In 2010, the District reports 13 active wells, 2 limited-use or stand-by wells and 5 wells used for sampling/monitoring purposes.

The District is a leader in MTBE treatment technology. Advanced oxidation MTBE treatment systems were placed at the Arrowhead and Bakersfield Wells in 2002 and 2004, are the only MTBE treatment systems approved by California Department of Health Services (DHS) to treat to non-detect levels and then safely return the treated water into the potable water supply.

In addition to wellhead treatment, the District has pursued a new drinking water well development program. The Bayview Well, put on line in summer of 2007, produces 3,600 gallons of water per minute, and is the District's highest producing well. Its strategic location is in the heart of the water distribution system. South Upper Truckee Well No. 3, put on line in 2008, adds another 1,200 gallons per minute of supply. These new supplies were accompanied by distribution system improvements the District has nearly returned to pre-MTBE production capability.

Table 4.3 provides a comparative summary of well status between the 2005 and 2010 UWMPs.

Table 4.3
Groundwater Resources 2005 to 2010 Comparison

Well Name	Status		Capacity (gal/min.)	Max. Production (MG/day)	Max. Production (ac-ft/day)	Comments
	2005	2010				
Airport [a]	Standby	Standby	502	0.723	2.219	As > MCL.
Al Tahoe No. 2	Active	Active	2,500	3.6	11.048	Pumps to Main Zone.
Arrowhead No. 3	Active	Active	800	1.152	3.535	Treating for MTBE. As > MCL. Pumps to Arrowhead Zone.
Bakersfield	Active	Active	1,500	2.16	6.629	Treating for MTBE. Pumps to Arrowhead Zone.
Bayview	Active	Active	3,500	5.184	15.909	Pumps to Main Zone.
Blackrock No. 2	Active	Off-line	90	0.13	0.399	MTBE threatened. Used as sampling/monitoring well.
Chris	Active	Active	117	0.169	0.519	Pumps to Main Zone.
Clement	Active	Off-line	180	0.26	0.798	MTBE threatened. Used as sampling/monitoring well.
College [a]	Standby	Standby	0	0	0.000	Uranium > MCL. Uses as sampling/monitoring well.
Elks Club No. 2	Active	Active	300	0.432	1.326	Pumps to Country Club Zone
Glenwood No. 5	Active	Active	1,100	1.44	4.419	Pumps to Main Zone.
Helen No. 2	Active	Active	260	0.374	1.148	MTBE threatened. Pumps to Main Zone.
Industrial No. 2	Active	Off-line	110	0.158	0.485	
Mountain View	Active	Active	150	0.216	0.663	Pumps to Twin Peaks Zone.
Paloma	Active	Active	2,500	3.6	11.048	MTBE threatened. Pumps to Main Zone.
South Upper Truckee No. 1	Active	Off-line	406	0.585	1.795	
South Upper Truckee No. 3 [b]	Under Construction	Active	1,200	2.016	6.187	Installed in 2008. Pumps to Christmas Valley Zone
Sunset	Active	Active	594	0.855	2.624	Pumps to Main Zone.
Tata No. 1	Active	Inactive [c]	308	0.444	1.363	MTBE contamination. As > MCL. Used as sampling/monitoring well
Tata No. 2	Active	Inactive [c]	73	0.105	0.322	MTBE contamination. Used as sampling/monitoring well
Tata No. 3	Active	Inactive [c]	168	0.242	0.743	MTBE contamination. Used as sampling/monitoring well
Valhalla	Active	Active	650	0.972	2.983	Pumps to Main Zone.
Total Installed Capacity			**17,008**	**24.817**	**76.161**	
Total Active Capacity			**15,171**	**22.170**	**68.037**	

Notes (Source - District Water Operations)

[a] Operated only for short-term emergencies of 5 consecutive days and for less than 15 days per year; source capacity of this source is 1,100 gpm (1.584 MGD).

[b] Estimated from design information.

4.3.3.3 Adjudication

Neither the Tahoe Valley Groundwater Basin nor the Tahoe Valley South Subbasin is adjudicated (*Water Facts, Adjudicated Basins in California*, Department of Water Resources, April 2004).

Based on the Bulletin 118, neither the Tahoe Valley Groundwater Basin nor the Tahoe Valley South Subbasin are in overdraft conditions.

4.3.4 Sufficiency of Groundwater

The District has been pumping below the estimated basin safe yield of 9,528 AFY throughout its history. In 2005, the District pumped a total of 6,923 AF. At that time, it was expected that 2010 water production would be 7,585 AF. However, water production dropped each year from 2007 through 2010. As Table 4.X illustrates below, the actual usage for 2010 was 6,546 AF.

Table 4.4 (DWR Table 18)
Groundwater – Volume Pumped – AFY

Basin Name(s)	Metered or Unmetered	2005	2006	2007	2008	2009	2010
Tahoe Valley South		6,923	7,445	8,161	7,635	6,920	6,546
Total groundwater pumped		6,923	7,445	8,161	7,635	6,920	6,546
Groundwater as a percent of total water supply		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: 2006-2009 annual PWSS reports submitted to the DWR. District 1985-2010 water production spreadsheet.

As noted above, the challenges the District has faced with potable water production have been primarily related to water quality associated with leaking underground storage sites and to a lesser extent arsenic and uranium within the Basin.

4.3.5 Projected Groundwater Pumping

The District's projected groundwater pumping will meet the projected demands together with the system losses. Table 4.5 illustrates the projected pumping pattern.

Table 4.5 (DWR Table 19)
Groundwater – Volume Projected to be Pumped – AFY

Basin Name(s)	2015	2020	2025	2030	2035 - opt
Tahoe Valley South Subbasin	5,353	4,824	4,484	4,587	4,701
Total groundwater projected to be pumped	5,353	4,824	4,484	4,587	4,701
Percent of total water supply	**100%**	**100%**	**100%**	**100%**	**100%**

4.3.6 Planned Groundwater Supply Projects and Programs

Based on the District's June 2010 Ten Year Financial Plan and verbal operational plans, no new supply wells are planned to be installed, however, four supply wells are planned to be destroyed during the financial year 2015-2016. Additional groundwater treatment for MTBE is expected during the budget year 2016-2017. Water distribution and supply piping upgrades as well as new booster stations and improvements are planned for the 2010-2011 budget year.

4.4 TRANSFER OPPORTUNITIES

Although there are four water suppliers adjacent to the District's service area, there are currently no viable opportunities or plans for transferring or exchanging water from these suppliers. This is illustrated in Table 4.6.

Table 4.6 (DWR Table 20)
Transfer and Exchange Opportunities – AFY

Transfer Agency	Transfer or Exchange	Short Term or Long Term	Proposed Volume
Edgewood Water Company	0	0	0
Lakeside Park Mutual Water Company	0	0	0
Lukins Brothers Water Company	0	0	0
Tahoe Keys Mutual Water Company	0	0	0
Total	**0**	**0**	**0**

4.5 DESALINATED WATER OPPORTUNITIES

There are no opportunities for desalinated water projects in the District's service area.

4.6 RECYCLED WATER OPPORTUNITIES

This section describes the wastewater characteristics, flows, and treatment facilities within the District's service area. It outlines the regulatory environment that constrains recycled water use within the service area and describes how the recycled water is put to beneficial use outside of the service area. The UWMP Act requires the following items to be addressed for recycled water:

- Information on the recycled water supply including coordination with dischargers
- Description of the wastewater collection and treatment systems in the service area
- Quantity of treated wastewater that meets recycled water standards
- Recycled water currently being used in the service area
- Potential for recycled water use in the service area
- Actions to encourage recycled water use

- Plan for optimizing recycled water use.

4.6.1 Overview and System Description

In addition to supplying water, the District provides all wastewater treatment, collection and disposal/reuse within its service area. From very modest beginnings in 1951, which included two 18,000 gallon redwood septic tanks, the District's wastewater collection, treatment and recycling processes have grown to a 7.7 MGD advanced secondary operation serving 17,000 customers. The District's award winning collection system and wastewater treatment plant produces an average 4.5 MGD, 100 percent of which is recycled. However, the Basin Plan promulgated by the Lahontan Regional Water Quality Control Board, prohibits reuse of treated wastewater within the Lake Tahoe basin watershed, leaving no opportunities for re-use within the service area.

The District's treatment plant is currently permitted for secondary 23 recycled water. This means the water has been oxidized and disinfected so that the median concentration of total coliform bacteria does not exceed a Most Probable Number (MPN) of 23 per 100 milliliters (ml) and the single day maximum does not exceed a MPN of 240 per 100 ml in any 30 day period. This quality of water is generally suitable for agricultural and some industrial uses. It is not suitable for unrestricted irrigation use. Since 1968 the District has delivered its treated effluent through a 26 mile export system, over Luther Pass (a lift of 1,200 feet), to Alpine County. The recycled water is stored during the winter months in 3,800 acre foot Harvey Place Reservoir and distributed to six ranches for irrigation purposes in the dry summer months.

Despite the prohibition on recycling within the District's own service area, through a special legislative act in 2000, the District was able to install 6 fire hydrants along a short section of its export pipeline. These hydrants provide emergency fire suppression to a small residential community (that does not have municipal water service) and the District's critical wastewater pumping station at the base of Luther Pass. The availability of recycled water in the event of a catastrophic fire in this heavily forested area provides a level of security to the residents, the District and the Lake Valley Fire Department. Four additional hydrants in Alpine County provide similar fire protection as the export line makes its way to Harvey Place Reservoir.

Table 4.7 below provides data on planned wastewater production and the volume suitable for recycling.

Table 4.7 (DWR Table 21)
Recycled Water – Wastewater Collection and Treatment – AFY

Type of Wastewater	2005	2010	2015	2020	2025	2030 [a]
Wastewater collected & treated in service area	4,593	4,606	5,004	5,401	5,799	6,196
Volume that meets recycled water standard	4,593	4,606	5,004	5,401	5,799	6,196

[a] Wastewater Collection System Master Plan, Table 3.10, December 2009

4.6.2 Recycled Water Use – Existing and Planned

The District's recycled water facilities include its Luther Pass Pump Station, C-Line Export Pipeline, Harvey Place Reservoir (HPR), Diamond Valley, Diamond Ditch, and contract land application sites. The recycled

water system provides an irrigation supply in Alpine County, which is otherwise quite limited so the District does not have any incentives to encourage recycled water use since 100 percent of the available water is consumed by existing contracts. However, as the volume of recycled water increases over the next 20 years and the available irrigated lands diminish due to development, then additional users may be required to dispose of the annual production.

Table 4.8 below summarized planned recycled water use.

Table 4.8 (DWR Table 22)
Recycled Water – Disposal Outside of District's Service Area -AFY

Method of Disposal	Treatment Level	2010	2015	2020	2025	2030
Export to Alpine County	Secondary 23	4,606	5,004	5,401	5,799	6,196
Total		**4,606**	**5,004**	**5,401**	**5,799**	**6,196**

4.6.3 Comparison of Previously Projected Use and Actual Use and Promoting Recycled Water Use

Because of the Basin Plan restrictions on recycled water use within the District's service area, the 2005 UWMP did not document recycled water as a potential supply and the District has not developed that supply. While it may be appropriate, from time to time, for the District to promote recycled water use with interests outside of its service area, the District has no existing or planned programs to promote recycled water use within its service area, because of the regulatory prohibitions.

Tables 4.9, 4.10 and 4.11 summarize this in DWR's required format.

Table 4.9 (DWR Table 23)
Recycled Water – Potential Future Use – AFY

User Type	Description	Feasibility[a]	2015	2020	2025	2030
Agricultural irrigation	Recycled Water use with the District's service area is not feasible because of restrictions in the Regional Board's Basin Plan for the Lake Tahoe area.		0	0	0	0
Landscape irrigation[b]			0	0	0	0
Commercial irrigation[c]			0	0	0	0
Golf course irrigation			0	0	0	0
Wildlife habitat			0	0	0	0
Wetlands			0	0	0	0
Industrial reuse			0	0	0	0
Groundwater recharge			0	0	0	0
Seawater barrier			0	0	0	0
Getothermal/Energy			0	0	0	0
Indirect potable reuse			0	0	0	0
Other (type of use)			0	0	0	0
		Total	**0**	**0**	**0**	**0**

[a] Technical and economic feasibility

[b] Includes parks, schools, cemeteries, churches, residential, or other public facilities

[c] Includes commercial building use such as landscaping, toilets, HVAC, etc. and commercial uses (car washes, laundries, nurseries, etc)

Table 4.10 (DWR Table 24)
Recycled water — 2005 UWMP Use Projection Compared to 2010 Actual – AFY

User Type	2010 Actual Use	2005 Projection for 2010 [a]
Agricultural irrigation	0	0
Landscape irrigation[b]	0	0
Commercial irrigation[c]	0	0
Golf course irrigation	0	0
Wildlife habitat	0	0
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Getothermal/Energy	0	0
Indirect potable reuse	0	0
Other (type of use)	0	0
Total	**0**	**0**

[a] From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing catagories or modified to the new

[b] Includes parks, schools, cemeteries, churches, residential, or other public facilities

[c] Includes commercial building use such as landscaping, toilets, HVAC, etc. and commercial uses (car washes, laundries, nurseries, etc)

Table 4.11 (DWR Table 25)
Methods to Encourage Recycled Water Use – AFY

Actions	Projected Results				
	2010	2015	2020	2025	2030
Financial Incentives	NA	NA	NA	NA	NA

4.7 FUTURE WATER PROJECTS

The District does not currently have any future water supply projects planned beyond the projects described above in Section 4.3.6.

SECTION 5.0 WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

This section compares the water demand information developed in Section 3 and the water supply information developed in Section 4. Comparisons are provided under DWR's required range of hydrologic conditions including the Normal, Single Dry Year and Multiple Dry Year scenarios. This section also describes the District's water shortage contingency and drought planning as required by Water Code Section 10632.

5.1 SUMMARY OF SUPPLY

The District's supply is provided by local groundwater. The "safe yield" of this supply has been quantified in the District's Groundwater Management Plan. The single largest source of risk for the water supply is groundwater contamination from MTBE, which has required the District to take some wells out of service and carefully plan the location of new wells. As described in Section 4, the District has developed a master plan for mitigating MTBE impacts and this risk is not expected to substantially impact supplies over the period of this UWMP. Table 5.1 summarizes the factors that could result in supply inconsistency.

Table 5.1 (DWR Table 29)
Factors Resulting in Inconsistency of Supply

Water Supply Sources [a]	Specific Sources	Limitation Quantification	Legal	Environmental	Water Quality	Climatic	Additional Information
Supplier Produced Groundwater	Tahoe Valley South Subbain	9,528			x		MTBE with lower risk from arsenic and uranium

[a] From Table 16

5.2 RELIABILITY OF SUPPLY

5.2.1 Hydrologic Reliability

Unlike many of California's water retailers, the District's water supply is not severely impacted by single or multiple dry water years. The District's groundwater studies confirm that the wells that serve as the water supply are *supported* by Lake Tahoe, the largest alpine lake in North America. With a depth of 1,646 feet, surface area of 191 square miles, Lake Tahoe contains about 39.8 trillion gallons of water. During the drought of 1985-1991, lake levels dropped 10 feet but the static water level decline observed in District wells was less than 4 feet and observed in only a few wells.

The reliability of the District's water sources is summarized in Tables 5.2 and 5.3.

Table 5.2 (DWR Table 27)

Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Average Water Year	2005	Series of Normal Years
Single-Dry Water Year	1985	First in series of dry years
Multiple-Dry Water Years	1985-1991	Normal Year followed by series of dry years

Table 5.3 (DWR Table 28)

Supply Reliability – Historic Conditions – AFY

Water Supply Sources [a]	Average/Normal Water Year Supply [b]	Single-Dry Water Year	Multiple-Dry Water Years		
			Year 1	Year 2	Year 3
Tahoe Valley South Subbasin	9,528	**9,528**	**9,528**	**9,528**	**9,528**
Percent of Average/Normal Year		**100%**	**100%**	**100%**	**100%**

[a] From Table 16

[b] See Table 27 for basis of water type years.

5.2.2 Legal & Environmental Constraints

The District has an adopted Groundwater Management Plan and operates in accordance with that plan. There are no anticipated legal or environmental constraints to the District's supply.

5.2.3 Water Quality Constraints

The quality of the District's water deliveries is regulated by the California Department of Health Services (DHS), which requires regular collection and testing of water samples to ensure that the quality meets regulatory standards and does not exceed MCLs.

As discussed throughout this UWMP, water quality presents the single largest challenge to the District's water supply. Groundwater contaminations from MTBE, together with naturally occurring arsenic and uranium, have combined to reduce the number of active District wells from 34 to 13. As illustrated in Table 4.3, the District's active well capacity is approximately 2,000 gpm or 8 AF per day lower than its installed capacity, reflecting wells that have been taken off line due to water quality issues. However, due to ongoing operational practices, the District does not anticipate any additional restrictions on pumping capacity.

The District has developed a master plan for managing groundwater quality and the noted reductions in active well field capacity have not impacted the District's ability to meet demands. The currently active installed capacity of 68 AFY per day is more than sufficient to allow the District to pump its allowable sustained yield.

Table 5.4 summarizes the current and projected water supply changes due to water quality.

Table 5.4 (DWR Table 30)
Water Quality – Current and Projected Water Supply Impacts

Water source	Description of condition	2010	2015	2020	2025	2030	2035 - opt
Supplier-produced groundwater	Impairment due to MTBE, Arsenic or Uranium	0	0	0	0	0	0

5.3 SUPPLY AND DEMAND COMPARISONS

The analysis compares the projected water supply available to the projected customer demands over a series of hydrologic regimes. The projected Normal and Dry Year supplies available to the District are presented in Table 5.5, below.

Table 5.5 (DWR Table 31)
Supply Reliability – Current Water Sources – AFY

Water Supply Sources [a]	Average/Normal Water Year Supply [b]	Multiple-Dry Water Year Supply		
		2011	2012	2013
Supplier Produced Groundwater	9,528	9,528	9,528	9,528
	-	-	-	-
	-	-	-	-
Percent of Normal Year		**100%**	**100%**	**100%**

[a] From Table 16

[b] See Table 27 for basis of water type years.

Comparisons of supply and demand under Normal, Single Dry and Multiple Dry Years are included in Table 5.6 through 5.8. These tables illustrate the fundamental resiliency of the District's supply to a range of hydrologic conditions.

Table 5.6 (DWR Table 32)
Supply and Demand Comparison – Normal Year – AFY

	2015	2020	2025	2030	2035-opt
Supply Totals (from Table 16)	9,528	9,528	9,528	9,528	9,528
Demand Totals (from Table 11)	5,353	4,824	4,484	4,587	4,701
Difference (supply minus demand)	4,175	4,704	5,044	4,941	4,827
Difference as % of Supply	44%	49%	53%	52%	51%
Difference as % of Demand	78%	98%	112%	108%	103%

Table 5.7 (DWR Table 33)

Supply and Demand Comparison – Single Dry Year – AFY

	2015	2020	2025	2030	2035-opt
Supply Totals	9,528	9,528	9,528	9,528	9,528
Demand Totals	5,353	4,824	4,484	4,587	4,701
Difference (supply minus demand)	4,175	4,704	5,044	4,941	4,827
Difference as % of Supply	44%	49%	53%	52%	51%
Difference as % of Demand	78%	98%	112%	108%	103%

Table 5.8 (DWR Table 34)

Projected Supply & Demand Comparison during Multiple Dry Year Periods – AFY

		2015	2020	2025	2030	2035-opt
Multiple Dry Year - First Year Supply	**Supply Totals**	9,528	9,528	9,528	9,528	9,528
	Demand Totals	5,353	4,824	4,484	4,587	4,701
	Difference (supply minus demand)	4,175	4,704	5,044	4,941	4,827
	Difference as % of Supply	44%	49%	53%	52%	51%
	Difference as % of Demand	78%	98%	112%	108%	103%
Multiple Dry Year - Second Year Supply	**Supply Totals**	9,528	9,528	9,528	9,528	9,528
	Demand Totals	5,353	4,824	4,484	4,587	4,701
	Difference (supply minus demand)	4,175	4,704	5,044	4,941	4,827
	Difference as % of Supply	44%	49%	53%	52%	51%
	Difference as % of Demand	78%	98%	112%	108%	103%
Multiple Dry Year - Third Year Supply	**Supply Totals**	9,528	9,528	9,528	9,528	9,528
	Demand Totals	5,353	4,824	4,484	4,587	4,701
	Difference (supply minus demand)	4,175	4,704	5,044	4,941	4,827
	Difference as % of Supply	44%	49%	53%	52%	51%
	Difference as % of Demand	78%	98%	112%	108%	103%

5.4 WATER SHORTAGE CONTINGENCY AND DROUGHT PLANNING

This section provides information required by Water Code Section 10632. The District has adopted Water Shortage and Drought Response Standards within Section 3.4 of its Administrative Code. These are included in Appendix C.

5.4.1 Actions in Response to Water Supply Shortages (Water Code 10632(a))

Water Code Section 10632(a) requires a description of the actions to be undertaken by the urban water supplier in response to water supply shortages of up to 50%. This section also requires the water supplier to outline the specific water supply conditions that are applicable at each stage of action. The District's

strategy for managing water supply reductions includes water supply reliability and authorized mandatory demand management measures. Each of these strategies is outlined below. When actions are required to manage the supply reductions, these are also described.

Supply Reliability

As evidenced by Tables 5.6 through 5.8, the District's supply is highly reliable. The District's developed supply exceeds demand by 44% to over 50% throughout the UMWP planning period which provides a significant buffer against hydrologic variability.

Description of Actions to be Taken

Although the District's supply is hydrologically robust, The District has identified catastrophic loss of supply, particularly from groundwater contamination, as a significant threat to its customers. The District balances this risk through the use of its Emergency Response Plan, which describes a series of operational modifications that can be undertaken to respond to contamination in individual wells and its Water Shortage and Drought Response Standards. Table 5.9 summarizes the consumption reduction methods that the District has the authority to use.

Table 5.9 (DWR Table 35)

Water Shortage Contingency – Rationing Stages[a] to Address Water Supply Shortages

Stage No.	Water Supply Conditions	% Shortage
Continuous	Water Waste Prohibited	**NA**
1 Normal Conditions	Prohibition against runoff from site	**10%**
	Prohibition against irrigating non-landscaped property except to mitigate fire risk	
	Inspection/repair/adjustment of irrigation systems	
	Shutoff nozzle required on hoses used for vehicle washing	
	Encouragement to report water leaks/waste	
2 Minor Water Supply Shortage	All Stage 1 Restrictions	**20%**
	Designated irrigation days	
	Prohibition against washing hard surfaces except to mitigate fire or sanitation concerns	
	Restaurant water service on request	
3 Severe Water Supply Shortage	All Stage 1 and 2 Restrictions	**30%**
	Weekend irrigation prohibition	
	Prohibition agains filling outdoor swimming pools	
	Prohibition against operating non-recirculating fountains and ornamental water features	
4 Critical Water Supply	All Stage 1, 2 and 3 Restrictions	**40%**
	Outdoor irrigation limited to once per week	
	Prohibition against water use for landscaping for new construction	
	Prohibition against hydrant use except for fire fighting	
5 Water Emergency	All Stage 1, 2, 3 and 4 Restrictions	**50%**
	Prohibition against water use for other than domestic and commercial purposes (no irrigation)	
	Prohibition against water use for construction dust control	
	Prohibition against hydrant flushing	
	Prohibition against water use for air conditioning where an alternate source of fresh air is availalble	

5.4.2 Minimum Water Supply during the Next Three Years (Water Code 10632(b))

The minimum water supply available during the next three years during a multiple year drought is shown in Table 5.5, above.

5.4.3 Catastrophic Supply Interruption Plan (Water Code 10632(c))

In accordance with the Emergency Services Act, the District has developed an Emergency Operation Plan (EOP). This EOP guides response to unpredicted catastrophic events that might impact water delivery including regional power outages, earthquakes or other disasters and outlines standard operating procedures for all levels of emergency, from minor accidents to major disaster. In addition, in accordance with the federal Disaster Mitigation Act of 2000, the District has prepared a Local Hazard Mitigation Plan. These plans have been coordinated with neighboring agencies. Table 5.10 provides a summary of the actions included in the EOP and Local Hazard Mitigation Plan. The Local Hazard Mitigation Plan can viewed at www.stpud.us/plan_doc_Local_Hazard_Mitigation_Plan.pdf

Table 5.10
Preparation Actions for Catastrophes

Possible Catastrophe	Summary of Actions
Fire	Storage supplies for fire flows
	Mutual aid plans and responders identified
	Portable and emergency generators available for District facilities
	Create defensible space by eliminated fuel sources including trees and vegetation adjacent to structures
	Install solar-powered battery backup at critical facilities
	Examine options for burying power lines
	Guide fire-flow improvement project with hydraulic model results
	Improve fire-flows by increasing water delivery pipe size and number of pumps/pump capacity
	Add/upsize wells, tanks and hydrants to provide fire flow
	Partner with Fire Safety Council to protect District structures
	Determine high risk areas close to wildlands and improve water supply
Severe Winter Storms	Portable and emergency generators available for District facilities
	Review snow removal equipment, snow storage and drainage capabilities
	Assess older structure for snow and wind load capacity
	Assess and remove hazard trees
Earthquake	Shut-off isolation valves
	Storage supplies for service interruption
	Portable and emergency generators available for District facilities
	Evaluate and where necessary upgrade facilities
	Distribute employee guide on techniques to prepare for earthquake
	Purchase pumps and hoses to improve response
	Procedures for assessing water quality, notifying public and disinfecting system
Flooding	Portable and emergency generators available for District facilities
	Storage supplies for service interruption
	Procedures for assessing water quality, notifying public and disinfecting system
	Match exposure of personnel, facilities and equipment to flood risk
	Build inventory of pumps, standbags and related equipment to combat erosion. Designate a quick response team
	Establish a safety zone and evacuation plan
	Consider upgrades of pump stations with 45 feet of maximum lake level to resist waves
Landslide	As part of District Erosion Control Program, inspect road cuts and fills for signs of slope failure and stabilize if necessary
	Identify questionable hillsides and stablize
Drought	Develop and distribute resident's guide to water conservation
	Initiate landscaping rebates, commercial water savings program and incentives
	Improve back-up well capacity
Avalanche	Educate District personnel on survival techniques
	Train personnel in operation of Snow Cat Vehicles and become a mutual aid resource
	Assess threat to District facilities and install additional protection where appropriate
Security	Perform SCADA vulnerability assessment and add upgrades
	Perform security fence assessment and install upgrades

5.4.4 Prohibitions, Penalties and Consumption Reduction (Water Code 10632(d)-(f))

As noted above, Section 3.4 of the District's Administrative Code outlines the prohibitions and rationing stages that the District can enforce. These are summarized in Table 5.9 above. Table 5.11 below summarizes the penalties that the District has the authority to enforce.

Table 5.11 (DWR Table 38)
Water Shortage Contingency – Penalties and Charges

Penalty or Charge	Stage When Penalty Takes Effect
First Violation - written warning	Any Stage
Second Violation - $100 fine	Any Stage
Third Violation - $200 fine and installation of flow restricting device	Any Stage
Fourth Violation - $500 fine and discontinuance of service	Any Stage

5.4.5 Effect on Revenues and Expenditures (Water Code 10632 (g))

Based on the analysis presented above, the most challenging situation for the District to manage would be a catastrophic supply interruption that required it to reduce demands. Theoretically, reduced demands would result in reduced water sales revenue, although because about two-thirds of the customer base pays flat rates rather than metered rates, even this situation is unlikely in the near term.

As noted throughout this section, the largest threat to the District's supply is MTBE contamination. In order to counter this risk, the District has established an MTBE reserve and a water rate stabilization reserve that is implemented when the MTBE reserve drops below $ 2 million. In order to allow for prudent management of its enterprise funds, the District has also prepared a 10-year financial plan that models the performance of its enterprise (operating funds) and capital outlay funds. The modeled financial performance for Fiscal Years 2010-11, 2014-15 and 2019-20 are illustrated in Table 5.12 below.

Table 5.12

Water Shortage Contingency – District's 10-Year Financial Model

	2010-11		2014-15		2019-20	
	Enterprise Fund	Capital Outlay Reserve	Enterprise Fund	Capital Outlay Reserve	Enterprise Fund	Capital Outlay Reserve
Beginning Cash Balances	$ 1,700,535	$ 11,037,698	$ 1,930,092	$ 7,517,985	$ 2,164,305	$ 8,353,904
Revenues (1)	$ 16,977,965	$ 2,387,000	$ 11,619,000	$ 2,723,000	$ 13,271,000	$ 2,602,000
Borrowings	$ -	$ -		$ -		
Availalable Funds	**$ 18,678,500**	**$ 13,424,698**	**$ 13,549,092**	**$ 10,240,985**	**$ 15,435,305**	**$ 10,955,904**
Salaries (2)	$ 3,138,700	$ 760,501	$ 3,562,884	$ 872,692	$ 4,231,589	$ 1,036,485
Benefits (2)	$ 1,677,050	$ 289,000	$ 2,052,415	$ 358,020	$ 2,682,425	$ 467,918
Operations & Maintenance (2)	$ 3,230,880	$ 121,750	$ 3,258,894	$ 131,786	$ 3,698,159	$ 145,503
Capital Outlay	$ -	$ 10,628,600		$ 1,292,200	$ -	$ 2,760,700
Debt Service (2)	$ 311,000	$ 838,000	$ 430,000	$ 1,120,000	$ 616,000	$ 293,000
Total Cash Outlays	**$ 8,357,630**	**$ 12,637,851**	**$ 9,304,193**	**$ 3,774,698**	**$ 11,228,173**	**$ 4,703,606**
Balance Before Transfers	$ 10,320,870	$ 786,847	$ 4,244,899	$ 6,466,287	$ 4,207,132	$ 6,252,298
Capital Outlay Fund Transfers	$ (8,649,610)	$ 8,649,610	$ (2,296,322)	$ 2,296,322	$ (2,011,952)	$ 2,011,952
Accrual to Cash Adjustment	$ 56,553	$ (148,800)	$ 15,873	$ (148,800)		
MTBE Contamination/Rate Stabilization Fund	$ -	$ (3,233,304)	$ -	$ (2,264,565)		$ (2,755,190)
Operating and Capital Outlay Reserves (3)	**$ 1,727,813**	**$ 6,054,353**	**$ 1,964,450**	**$ 6,349,244**	**$ 2,195,180**	**$ 5,509,060**
Reserves for MTBE Remediation		$ 3,233,304				
Rate Stabilization Reserve (4)				$ 2,264,565		$ 2,755,190
Total Reserve Balances	**$ 1,727,813**	**$ 9,287,657**	**$ 1,964,450**	**$ 8,613,809**	**$ 2,195,180**	**$ 8,264,250**

1. Enterprise revenue includes service charges, interest and misc. revenue. Capital fund revenue includes capacity charges, grants and capital improvement charges. Service chrage rates increase 2% in 2010/11 and 4% thereafter. Investsments earn 3%. Capacity fees based on projected commercial projects and 30 to 56 residential permits per year

2)&M and depreciation increase @ 2% per year. Benefits increase at 5.5% per year beginning in 2011/12. Salaries incuse 3.5% escalator

3 Operating reserve is equal to two montsh of oeprating costs. Remaining reserves are for capital projects

4 Per District Policy, a water rate stabliszation reserve will be implemented when the MTBE Reserve drops below $2.0 million

The financial model illustrates that the District is planning for a 22% drop in regular revenues, reflecting the planned reduction in use to comply with SB x7-7. The financial model also illustrates that the District maintains between $ 4 and $ 5 million in operational reserves, MTBE reserves, and rate stabilization reserves as well as $8 to $9 million in capital reserves. The financial plan results in reserve balances sufficient to completely offset one year's planned revenue, if necessary, and illustrates that the District has

a revenue management strategy in place that will allow to weather reduced revenues from both planned conservation activities and emergency interruptions.

5.4.6 Water Shortage Contingency Ordinance (Water Code 10632(h))

As noted above, the District has adopted Water Shortage and Drought Response Standards which are codified in Section 3.4 of the Administrative Code, and is included in the Appendix.

5.4.7 Mechanisms for Determining Actual Reductions (Water Code 10632(i))

The District's wells are all equipped with water meters. Commercial and new residential accounts are also equipped with meters. The District has begun an active program of installing meters on unmetered residential account and currently approximately one-third of the customer base is metered.

The District's Water Shortage and Drought Response Standards allow it collect the full cost of enforcing its standards from water users who violate the standards. The District also employs seasonal Water Efficiency Technicians to assist with enforcement of the standard.

SECTION 6.0 DEMAND MANAGEMENT MEASURES

The goal of the Demand Management Measure (DMM) section in a UWMP is to provide a comprehensive description of the water conservation programs that are currently implemented and those planned to be implemented. The section additionally provides general information on how the District plans to meet its urban water use target.

In March 2010, the District became a signatory to the Memorandum of Understanding (MOU) for Urban Water Conservation as overseen by the California Urban Water Conservation Council (CUWCC). According the MOU, the District's base year is set at 2010 and pursuant to Exhibit 1, Section B of the MOU:

> "Implementation shall commence no later than July 1 of the first year following the latter of either: 1) the year the agency signed or became subject to the MOU, or 2) the year this Exhibit is amended."

As such July 1, 2011 is the date that the District needs to begin implementing DMMs and reporting to the CUWCC. Because of this, the District does not have reports to include in this 2010 UWMP.

Because there are no CUWCC reports to include, this section describes the DMMs according to the UWMP guidelines and cross references to the old and new CUWCC numbering scheme. It details the District's progress towards implementing each DMM and outlines the District's proposed schedule for future implementation, which will be key to meeting its water use targets.

6.1 BRIEF HISTORY OF THE DISTRICT'S WATER CONSERVATION PROGRAM

Prior to 1996, the District's water conservation efforts were largely driven by two factors. First, like many other water agencies, "water restrictions" were put in place during periods of drought. When the rain and snow finally came, the restrictions went away.

Second, and unique to the Lake Tahoe Basin wastewater agencies, were specific provisions of the Porter-Cologne Act that required all recycled water, regardless of the level of treatment, be exported from the Lake Tahoe Basin to protect the Lake's clarity. The District's export system is complex and requires the recycled water to be transported 26-miles into neighboring Alpine County. The costs associated with meeting these provisions of the law accounted for nearly 40% of the customer's sewer charges. Therefore, efficient indoor water use minimized the amount of wastewater that would be produced, treated, and exported and directly affected the District water conservation efforts.

During these years, water conservation was a group exercise and responsibilities were shared by the Public Information Officer, Customer Service Department, and the Water Operations Manager. Efforts included public outreach via quarterly newsletters, radio, television, and printed media, public school programs and contests, and the hiring of summertime "Water Educators." In addition the District was one of the founding members of the Lake Tahoe Community College's (LTCC) Demonstration Garden that provides hands-on examples of water efficient landscaping options that are appropriate for the Lake Tahoe Basin.

In late 1996, MTBE contaminated 12 District water supply wells with a loss of nearly 30% of the District's water production capability. Emergency water restrictions were put into place and the prospect of being unable to meet peak summertime demand became a very real possibility. The Board of Directors approved a significant increase in the public outreach budget, a new more restrictive ordinance was enacted, and the public responded very favorably by significantly decreasing water use for the next five years until the associated lawsuit was finally settled favorably. In the interim, operational changes were made, additional wells were constructed and placed into service, and the District slowly recaptured its lost capacity.

The lessons learned from the MTBE years demonstrated that water demand could be significantly reduced and, with that reduction, operational costs could be minimized. Since recycled water could not be used within the Basin, it made little sense, financially or environmentally, to produce some of the highest quality drinking water in the world and have it running down the gutters because of inefficient landscape irrigation. In 2004, the District formed a stakeholder's advisory group consisting of the District, customers, regulators, the school district, the City of South Lake Tahoe, and landscaping professionals (landscape contractors as well as landscape maintenance) to collaboratively craft a water conservation program that met the District's needs as well as the stakeholders needs. That process was complete and a new ordinance adopted in 2006.

The District's Water Conservation Program took a quantum leap forward in 2007 when the District secured a state water conservation grant that mandated hiring of a Water Conservation Specialist, a trained full-time staff person to direct and manage the water conservation program. The grant also provided significant funding for related water conservation programs that included rebates for water efficient washing machines, toilets, and other plumbing fixtures. The District introduced an innovative Turf Buy-Back program patterned after the Southern Nevada Water Authority's program that proved to be very successful. That program continues and currently the District is offering indoor and outdoor water audits for metered customers as well as an ongoing and expanded rebate program. Since 2007, both annual and peak summertime water production has decreased.

The District's current conservation program activities and opportunities are advertised on the District's website and can be viewed at www.stpud.us/water_conservation.html

The District's current metering program is dictated by AB 2572, which passed in 2004, and requires the District to meter all existing connections by 2025. The District has begun this process and a total of 4,800 residential customers and 527 non-residential customers, over one-third of the District's customer base, will begin paying volumetric rates (based on meter readings) in the year 2011.

6.2 DESCRIPTION OF DEMAND MANAGEMENT MEASURES AND ESTIMATED WATER SAVINGS

DMM A – Water survey programs for single-family and multi-family residential customers
(Old CUWCC BMP 1, New CUWCC BMP 3)

Past Residential Program Descriptions

The District received Proposition 40 grant funds to offer water efficient appliance rebate program offered financial incentives for homeowners to purchase water wise toilets, clothes washers, dish washers, fixtures, tank-less hot water heaters, and circulating pumps. Rebates were distributed for one hundred and eighty six low-flow toilets, two hundred and twenty four low-flow faucets, two hundred and two high efficiency clothes washers, fifteen circulating pumps, twenty three tank-less hot water heaters, and forty four water efficient dishwashers.

Water Wise House Call Program Description

The District offers single-family and multi-family residential customers water-use surveys called "Water-Wise House Calls". This program is funded by a California Proposition 50 supplemental grant. For 2011-2012 there will be a minimum of 200 Water-Wise House Calls given. The Water-Wise House Calls involve indoor and outdoor water use surveys. However, at the customer's request the survey can be done for either just indoor or just outdoor areas. At the house call, a Water Efficiency Specialist assesses water usage and provides the customer with customized water savings tips. Program participates are eligible for free water savings devices and rebates for up to $500 per household. The specialist will:

- Check meter reading and water pressure
- Check toilets and other plumbing fixtures for leaks
- Replace toilet flapper valves if needed
- Measure showerhead flow rates and install free low flow showerheads upon request
- Measure faucet flow rates and provide free faucet aerators for kitchen and bathrooms
- Evaluate the efficiency of the irrigation system and provide an appropriate irrigation schedule
- Assess irrigation sprinkler uniformity and water runoff characteristics
- Analyze irrigation and drainage systems and provide maintenance, repair or replacement recommendations
- Provide water conservation program materials, rebate applications and water-wise home and landscaping tips.

By participating in a Water-Wise House Call, customers become eligible for water saving rebates including:

- High Efficiency Toilet Rebate: $100 rebate for replacing a pre-1992 fixture with a Watersense labeled, 1.28 gallon per flush model

- Water Efficient Clothes Washers: $200 rebate for purchasing and installing high efficiency clothes washer with a water factor of 5.0 or less
- Hot Water Demand System: $100 rebate for installing an approved hot water demand system
- Irrigation Efficiency Rebate: Based on the recommendations of the Water Efficiency Specialist up to $400 for high efficiency equipment including 100% of eligible parts and 25% of the labor.

Steps to Implement Measure

Marketing Strategy:

The Water-Wise House Calls are being marketed to metered customers through bill inserts and letters and by our customer service staff.

Tracking of participation and results of participation;

The water-survey form is kept in a file and a copy is provided to the customer. The information from each water survey including APN, devices and rebates received, estimated water savings, and actual water savings will also be tracked in an excel spreadsheet to quantify overall water savings for the program. The results of the water use surveys will be tracked in the Springbrook database for each customer account.

Planned Implementation Schedule and Budget:

Implementation for this program begins in May of 2011. For 2011-2012 the budgeted amount is $90,000, with potential for targeting the top 10% of water users and offering surveys in the future. The planned surveys for 2011 and 2012 are based on grant funds. The planned interventions for 2013 to 2015 are based on the CUWCC annual coverage ratios of 1.5%.

DMM A Planned Interventions					
	2011	2012	2013	2014	2015
# of single family surveys	200	200	182	182	182
# of multifamily surveys	0	0	22	22	22
projected expenditures - $	90,000	90,000	93,000	93,000	93,000

Method for evaluation of effectiveness of DMM

One way to evaluate the effectiveness of residential surveys is to compare metered use data pre-audit and post-audit. By focusing on metered customers with the initial effort, the District has set up a system to facilitate evaluating the effectiveness of this program.

Estimated Water Savings

The water use for residential water surveys can be determined by watching the meter use before and after the survey is completed. Not all residential customers are currently metered so the program is focused on metered customers.

Turf Buy-Back Program Description

While the District recognizes that lawn areas help to provide defensible space, play areas for children and pets, and serve an integral role in a comprehensive landscaping plan, lawns are also the most water intensive landscaping option a property owner can choose. Non-functional lawns - ones that are rarely used - waste water and represent an ongoing cost in both time and resources for the home or business owner.

From an environmental standpoint, lawns tend to be over fertilized and over watered. With Tahoe's porous soils, this combination can serves to push some of the nutrients intended for the lawn past the root zones and into the watershed where they eventually make their way into Lake Tahoe. Once there, they provide nutrients for algae that have significantly affected the legendary clarity of the Lake. While lawns do serve a purpose in soil erosion control, many other combinations of trees, shrubs, and groundcovers can achieve the same soil erosion control benefits at a significantly lower water use demand.

The District ran a turf buy-back program in 2008 and 2009 that included site evaluations. The turf-buy-back program enabled 105 lawns to convert more than 123,075 square feet of landscaping to water efficient landscaping in the 2009 growing season. The program was extremely successful in educating the public on the importance of xeriscaping and providing financial incentives to encourage homeowners to invest the time and energy into a conversion. Each homeowner that had an accepted application received the following services.

- Pre-site inspection with a review using a site inspection data worksheet that also functions as an application for the turf buy-back program. The worksheet gathered irrigation data such as how many sprinklers are in a yard, how many days a week and for how long the homeowner is watering.

- A property owner information packet, which was delivered to homeowner upon application. Packets included an informative contact sheet, a comprehensive backyard conservation brochure, a 'Home Landscaping Guide for Lake Tahoe and Vicinity', and a contact list for the buy-back program's Program Certified Landscapers.

- A final site inspection which included measuring, mapping, photographing and discussing re-vegetation and irrigation system.

In response to the success of the program and the ongoing challenges created landscaping choices, the District applied for a grant to re-instate the program. Property owners within the District's service area can receive a rebate for removing on-site irrigated turf and replacing it with a more efficient landscape outlined by the District. By reducing the District's overall water demands, capital costs for drilling new wells and long-term operation/maintenance expenses for those wells is thereby avoided.

Marketing Strategy:

Future marketing for the Turf Buy Back Program will target more multi-family customers who have high water bills (top 10%) that are attributed to landscape irrigation. These customers will be contacted directly by the District's Water Conservation Specialist. Additionally, the Turf Buy Back Program will be advertised on local radio and television stations, through bill inserts, on the District's website and at community events as it has been in the past. The program will also be offered to eligible customers who receive a Water-Wise House Call and commercial customers who receive an irrigation audit.

Tracking and results of participation:

Results are tracked for each participant with a site plan drawing, before and after photos and information in an excel spreadsheet including name, address, APN, square feet of turf converted, rebate amount, vendor number, issue date and estimated water savings. Additionally, a post-audit is conducted to verify successful landscape conversion to issue a certificate of completion. Moving forward the post audit will include actual water savings calculations for metered customers.

Planned Implementation Schedule and Budget:

This program ended at the end of 2009 due to completion of the Proposition 50 grant. If funding is acquired the District will continue the Turf Buy Back program, the amount rebated will be $1.00 (instead of $2.00) per square foot of lawn converted. If the participant is eligible for the Turf Buy Back Program this can be incorporated with the irrigation efficiency rebate.

DMM B – Residential Plumbing Retrofit to pre-1992 single-family and multi-family residences
(Old CUWCC BMP 2, new BMP 3)

Description

The number of pre-1992 Single Family accounts is 10,320 and Multiple Family accounts is 996. Distribution of water-saving devices was started in the year 2000. A total of 4,800 Outdoor Water Savings Kits and 1,500 Low Flow shower heads were distributed prior to the year 2009. The total number of outdoor conservation kits provided for the year 2009 and 2010 was 1,000 (500 each year). For the indoor kits, the amount has increased from 200 to 400 kits per year. These 400 indoor kits will be distributed in 2011 and 2012.

Steps to Implement Measure

Marketing Strategy

The outdoor and indoor conservation kits are being given away during the Water-Wise House Calls. This program is being marketed to metered customers through bill inserts and letters and by our customer service staff. The indoor water conservation kits are also given to any unmetered customer who requests one, but this is not an actively marketed program because the results are hard to track. Kits will also be given out at community events such as The Landscape Conservation Tour, Earth Day, Autumn Fest and Fire Fest. Additionally, in 2010 the outdoor kits were given out at a Sierra Nevada Alliance "Garden Party" and a "Green Thumb Thursday" Master Gardeners workshop presented at Lake Tahoe Community College.

Tracking of participation and results of participation

The number and type of kits given away are tracked in an excel spreadsheet for each community event. Result are hard to quantify because it is unknown if the kits are being utilized. The number of kits given away at Water-Wise House Calls will be tracked in the Springbrook database for each customer account. Because the Water Conservation Specialist can verify the use of some of the devices in the kits such as aerators, showerheads and toilet flappers an estimate of the projected water savings will be estimated and then verified later during the post audit. The information from each water survey including APN, devices and rebates received, and estimated water savings and actual water savings will also be tracked in an excel spreadsheet to quantify overall water savings for the program.

Planned Implementation Schedule and Budget

This program has already been implemented and will continue with approximately 400-500 kits per year being distributed either through indoor water audits or at annual community events. The annual budget is $3,500 for kits. The District currently has a Proposition 50 grant and plans to order 200 indoor water conservation kits including free showerheads, aerators, toilet flappers, dye tablets and tips/instruction sheet

The CUWCC coverage rates are set at 7.5% of accounts per year. Once a saturation level of 75% for residences this BMP is considered complete. Based on the District's past activities, it is assumed that multifamily accounts have reached saturation levels.

DMM B Planned Interventions					
	2011	2012	2013	2014	2015
# of single family devices	500	500	500	500	500
# of multi-family devices	0	0	0	0	0
projected expenditures - $	$3,500	$3,500	$3,500	$3,500	$3,500

Method for evaluation of effectiveness of DMM

The number of kits purchased and distributed will be tracked.

Estimated Water Savings

It is difficult to know the exact number of kits installed, but estimates can be made on number installed and how much approximate water savings can be achieved based on change of the showerhead and faucet flow rates.

DMM C – System Water Audits, Leak Detection and Repair
(Old CUWCC BMP 3, New CUWCC BMP 1)

Description

The District has an active surface leak detection and repair program. The program was initially started within the Underground Repair Water crew in 2003 using two field employees trained on special audio leak detection equipment. The program was initially started to locate leaks within paved areas and minimize asphalt removal and open cut excavation sites.

The District has also used a contract leak detection company. That company surveyed 14 miles of water main in the years 2001, 02, and 03 as outlined below:

- 2001 – 5 miles water main
- 2002 – 4.5 miles water main
- 2003 – 4.5 miles water main

The District currently has a leak detection company (Utility Services Associates) under contract for services through 2011. They have provided contract services for 2009, 2010, and 2011. They survey predetermined problem areas within the District service area. To date the service has completed the following:

- 2009 - 18 miles water main
- 2010 - 20 miles water main
- 2011 – 25 miles water main projected

The District has budgeted through 2012 to continue with the contract detection services. The service has averaged 4-8 main line leaks during each inspection period. Most leaks are detected on dry barrel fire hydrants. Pre-screening system audits are completed each year. Determining and verifying “Other Uses” within the system is a top priority for the District. Because historical was found to be data inconsistent, improvements to record keeping are being made for the future. This measure will be greatly improved after the installation of the residential meters for the entire service area.

For this plan, it is assumed that water loss is currently at and will remain approximately 10%. This value will be revised in the future when better data is available.

Steps to Implement Measure

Marketing Strategy

Not applicable, this is a measure to be done internally at the District.

Tracking of participation and results of participation

Not applicable, this is a measure to be done internally at the District. Data will be kept on miles of pipeline surveyed and repaired.

Planned Implementation Schedule and Budget

The District plans to continue this program and has contracted for its continuance through 2012.

The CUWCC now requires a methodology from the American Water Works Association for tracking water loss. As a new member of the CUWCC, the District will need to start in 2011 with testing “production”

meters on all wells and surface water sources to ensure that the system input volume is accurate. The AWWA approach is a new accounting system for water meters that the District will have to review and consider in their future operations and data collection efforts.

DMM C – Planned Implementation					
	2011	2012	2013	2014	2015
% of water losses	10%	10%	10%	10%	10%
miles of distribution lines to be surveyed	25	25	25	25	25
miles of lines to be repaired	TBD	TBD	TBD	TBD	TBD
projected expenditures - $	TBD	TBD	TBD	TBD	TBD

Method for evaluation of effectiveness of DMM

The number of miles of pipeline surveyed and then repaired will be tracked, along with annual dollar expenditures.

Estimated Water Savings

The water savings from this measure is difficult to track at this time as the system is not fully metered. However efforts will be made to try to determine water savings based on approximate leak rate and approximate flow volume of repairs made. As the system becomes fully metered, the estimates and calculations for the entire system will become more definitive.

DMM D – Metering with commodity rates for all new connections and retrofit of existing connections (Old CUWCC BMP 4, New CUWCC BMP 1)

Description

All 527 commercial customers in the District's service area are metered. The District has required the installation of meters on all new construction, both residential and non residential, since 1993. Approximately 1,800 new houses have been built since 1993. An additional 3,000 residential meters (on homes built before 1993) were installed during the summer of 2010. Starting in the year 2011, all of the 4,818 residential customers, together with the commercial customers, will be billed volumetrically.

In 2011, the District's service area has total of 5,345 meters, on residential and non-residential accounts. This is more than one-third of the historically unmetered service area. The remaining residential water meter retrofits are to be installed by the year 2018. The total number of existing account meters to be installed by the year 2018 is approximately 9,500. The District installs meters with its mainline replacement program and expects that this program will result in the installation of approximately 150 meters annually.

In order to meet is 2020 water use target; the District is also planning for several targeted meter retrofit projects beginning in the year 2014, depending on grant funding availability. This accelerates the District's original schedule, which would have had meters installed on all connections by the year 2025.

Steps to Implement Measure

Marketing Strategy

The District's current policies require metering on all new commercial and residential development. The District's policy for main replacement also results in meter retrofits along with main replacement. The District has aggressively sought grant funding to allow it to implement a metering retrofit program. Information about the metering program is currently on the District's website. Before the installations occur, the District will make efforts to try to inform their customers of the new meter installations.

Tracking of participation and results of participation

The number of meters installed per year and the expenditures will be recorded.

Planned Implementation Schedule and Budget

DMM D – Planned Interventions					
	2011	2012	2013	2014	2015
# of unmetered accounts	9,594	9,594	9,492	7,472	5,432
# of new and retrofit meters to be installed	0	102	102	2,020	2,020
projected expenditures - $		$170,000	$170,000	$3,400,000	$3,400,000

Method for evaluation of effectiveness of DMM

The District has a volumetric pricing rate structure, recently updated in April 2011. This type of pricing analysis has not been performed by the District in the past given residential connections were not metered, but will be considered in the future as part of the 2015 UWMP report preparation process.

Estimated Water Savings

It is assumed that an average of 20 percent water reduction will occur after a customer who previously did not have a meter becomes metered and pays water bills based on volumetric rates.

DMM E – Large Landscape Conservation Programs and Incentives
(Old and New CUWCC BMP 5)

Description

For Commercial Customers with large irrigated areas, a free irrigation audit is available as component of a CII Water- Use Survey. The Water Conservation Specialist in partnership with Tahoe Resource Conservation

District will visit the site and make recommendations on adjustments for upgrades to irrigation equipment, sprinkler uniformity and plant selection.

The irrigation audit consists of:

- Site inspection and system tune-up
- System test for distribution uniformity
- Calculating a base watering schedule based on:
    - inches of water the plant needs
    - minutes of run time
    - frequency of application that matches the soil's characteristics

Benefits of an irrigation audit:

- Reduced water use and lower water bills
- Improved landscape appearance
- Reduced runoff
- Reduced water lost below the root zone
- Reduced fertilizer and chemical requirements

Based on the findings from the irrigation audit an irrigation schedule is developed and provided to the customer. The customer is eligible to receive an irrigation efficiency rebate for 50% up to $500 of the cost for irrigation equipment and installation.

Steps to Implement Measure

Marketing Strategy

The District will continue to offer this program to their customers via the website and targeted marketing efforts to the large irrigation customers.

Tracking of participation and results of participation

For each property a file is kept at the District and copies provided to the customer of the following: site inspection worksheet, precipitation rate test worksheet, base schedule, site maps, irrigation plans and water use records. A post audit is performed to quantify water savings and to verify the implementation of the irrigation schedule.

Planned Implementation Schedule and Budget

The District's program is based on CUWCC Rates for the year 2012 to 2015. The District plans to continue measuring available large landscape sites and include these sites in the program. The District plans to complete the water use comparison module on water bills for large landscape water customers.

DMM E – Planned Interventions					
	2011	2012	2013	2014	2015
# of budgets to be developed	0	120	120	120	120
# of surveys to be completed	0	20	20	20	20
# of follow-up visits	0	20	20	20	20
projected expenditures - $	0	$90,000	$90,000	$90,000	$90,000

Method for evaluation of effectiveness of DMM

One way to evaluate the effectiveness of large landscape audits and incentives is to compare metering data of a pre-audit versus a non-pre audit. The District has established recording and tracking procedures that will facilitate this.

Estimated Water Savings

Projected water savings could be estimated by subtracting post-survey water use from pre- survey actual water usage, but this calculation would not take into account changes in weather patterns which may affect overall water usage, and therefore was not made.

DMM F – High-Efficiency Washing Machine Rebate Programs
(Old CUWCC BMP 6, New CUWCC BMP 3)

Description

The District offers a $200 rebate for purchase of a water efficient clothes washer. To date a total of 311 rebates have been issued with funds provided by California's Propositions 40 and 50. In the past the clothes washer eligibility required a water factor of 8.5 or less. The water factor is based on the number of gallons of water used per cycle/ per cubic feet of laundry. The lower the water factor, the more efficient the washer is. For the current program, which began on January 15, 2010, the eligibility requirement for clothes washers was reduced to water factor of 5.0 or less. The average water factor for all 311 clothes washers purchased with the rebate is 4.11.

Steps to Implement Measure

Marketing Strategy

The program will continue to be advertised on local radio and television stations, through bill inserts, on the District website and at community events. Local appliance dealers promote the program. The current High Efficiency Washer Website can be found at the following link:
http://www.stpud.us/water_conservation_washing-machine.html

Tracking of participation and results of participation

The rebates are tracked by APN, model number, customer name and water factor in an excel spreadsheet. Copies of the customer application are kept on file at the District. Results of participation are calculated based on the average of water savings statistics provided by the California Urban Water Conservation Council. Based on these statistics the total estimated annual water savings for the program is 2,542,736 gallons per year.

Planned Implementation Schedule and Budget

The District plans to apply for more grant funding for high-efficiency washing machine rebate program. A minimum of 109 rebates is budgeted for each year based on CUWCC target rates. The District also plans to explore a commercial clothes washer program, which would target the District's laundromat customers. The total Proposition 50 grant funds were $89,111, with a current value of $22,911. The remaining total Proposition 40 grant funds are $70, 096.

DMM F- Planned Implementation					
	2011	2012	2013	2014	2015
$ per rebate*	$0	$75	$75	$75	$75
# of rebates to be paid*	50	109	109	109	109
projected expenditures* - $	$0	$10,645	$10,645	$10,645	$10,645

*The dollars and incentive values includes incentives for laundry retrofits, car wash recycling systems

Method for evaluation of effectiveness of DMM

The number of rebates and annual expenditures will be tracked.

Estimated Water Savings

The water savings was not estimated as the data on the new machine and its projected use and the type of machine replaced was not available. An assumption must be made as to the output of the replaced models. An evaluation of water use before and after rebate could possibly provide an estimate. Another way to evaluate water savings is to compare water use ratings of the new HEW's with the ratings of the replaced washers.

Another less accurate method to evaluate the effectiveness of a rebate program is to compare the water usage of an account that did not receive a rebate, versus an account that did get a rebate. In order to track indoor water use, it would be recommended to use the winter months when there is little or no landscape irrigation, thus it would be easier to analyze indoor water use savings.

Results of participation can also be calculated based on the average of water savings statistics provided by the California Urban Water Conservation Council.

DMM G – Public Information
(Old CUWCC BMP 7, New CUWCC BMP 2)

Description

The District distributes public information regarding water conservation in various ways including: mailings, special educational events, reminders in bills, water conservation pamphlet distribution by direct mail and at counters and water conservation booths and on its website. The District currently promotes all WaterSense labeled products to all customer sectors as appropriate. The District has been an official member of the ACWA program and has links to the public outreach information for the "Save Our Water" campaign.

For example the following is a summary of activities documented for 2008:

Workshops:

- Backyard Conservation Program Partner Training: May 22nd/ 40 attended
- Conservation Landscape Tour: August 25th/ 55 attended
- North Upper Truckee Conservation Block Party: June 7/ 30 attended
- Montgomery Estates Conservation Block Party: June 28/ 25 attended
- Angora Highlands Conservation Block Party: July 26/ 30 attended
- South Lake Tahoe Conservation Block Party: September 27/ 15 attended
- 3 Conservation Tailgates: May 29, June 11, June 26
- Conservation Joint Training for Agencies: May 22
- Invasive Weeds Training: May 28

Community Events:

- Lake Tahoe Community College Demonstration Garden's Autumn Festival: Sept 21/ 500 attended
- Fire Festival
- South Shore Earth Day: April 19/ 200 visited booth
- Chamber of Commerce Green Business Expo: March 21

Outreach Material

- Created Turf Buy Back Program: application, program description, Frequently Asked Questions and posted on website
- Created comprehensive brochure with partner agencies (Tahoe Resource Conservation District and Nevada Fire Safe Council)
- Created Water Upon Request Program: application, plaques, menu stickers, pay check stuffers
- Created Water the Right Day…and the Right Way: brochures

Media:

- Ran monthly ads in Mountain News, Tahoe Daily Tribune, KRLT/KOWL, RSN
- Submitted press releases to announce community events and workshops: Conservation Block Parties, Conservation Landscape Tour, Fire Fest, Autumn Fest, Earth Day
- Submitted article addressing Conservation Landscaping as part of the Fire PIT article series for the Tribune

Steps to Implement Measure

Marketing Strategy

Continue to market the conservation programs through television, radio and newspaper ads and passing out informational brochures at community events.

Tracking of participation and results of participation

Results of the public information program are tracked by number of participants or visitors to booths at community events. The overall success of the conservation program is attributed in part to the marketing efforts.

Planned Implementation Schedule and Budget

Public Information Budget includes advertising is approximately $25,000 per year. Implementation schedule is to continue every year.

Method for evaluation of effectiveness of DMM and Estimated Water Savings

There is no current method in the industry to evaluate this program. The popularity of public programs can be measured through the acceptance of brochures, and attendance at various water conservation related events.

DMM H – School Education
(Old CUWCC BMP 8, New CUWCC BMP 2)

Description

Currently, the District participates in Wonders of Water Week, a water education program for South Lake Tahoe students K-5 and is a member of the South Tahoe Environmental Education Coalition (STEEC). The District will continue over the next five years to participate in Wonder of Waters Week and STEEC. The Water Conservation Specialist is certified by Project Wet for professional development in water education.

The Wonders of Water (WOW) education program, part of the STEEC curriculum, consists of an in-class education program coordinated by WOW Program agency staff. The goal of the WOW Program is to provide hands-on, interdisciplinary activities to educate children on the importance of water. The program focuses on meeting state content standards, while providing an interactive learning experience. Students will be able to meet professionals working in the water field and begin exploring the broad range of

conservation work in the Tahoe Basin. This program is modeled after the Trees are Terrific Program that was offered to South Tahoe schools in April, 2009.

The classroom presentations give K-5 students information on watershed health, water conservation, fish life cycles, food webs, water cycles, and water quality. Classroom programs are grade-level specific to meet state content standards utilizing hands-on, interdisciplinary activities. Some program examples are: Project WET (Water Education for Teachers) and SRYCL (South Yuba River Citizens League). Educators from South Tahoe Environmental Education Coalition (a partnership of South Lake Tahoe environmental agencies) are invited to assist with the program. All agency staff participating in this program are certified Project WET Educators.

Specific in-class visits (30 - 45 minutes long, depending on teacher scheduling needs and grade level) are led by trained Environmental Educators from the inter-agency partnership/South Tahoe Environmental Education Coalition (USFS, STPUD, Tahoe RCD, Cal Trout, Lahontan and others). The program is available to all interested K-5 classes in South Lake Tahoe.

Estimates of # of students reached during WOW week-October 12- October, 28th, 2010

Participating Schools	**Total Classes**
Bijou Elementary	23
Tahoe Valley	17
Sierra House Elementary	18
Meyers Magnet School	16
South Tahoe Middle School	10
Total Students Reached: 1,680 (assumes 20/class average)	
Total Volunteers: 22	

Steps to Implement Measure

Marketing Strategy

Continue participation in the STEEC to build a strong relationship with the South Tahoe Unified School District. The goal is to expand Wonders of Water Week to more middle school and high school classrooms.

Tracking of participation and results of participation

Results are compiled by the lead organizer of Wonders of Water Week and that information is provided to the District such as, total number of participating schools, classrooms and children reached. Each teacher is given an evaluation form for each presentation given. Participating agency representatives meet for a post

WOW week gathering to analyze the feedback and look for ways to improve the activities and the program overall.

Planned Implementation Schedule and Budget

The District plans to continue with school workshops and kid's camps along with distribution of school-age educational materials. Budget total for this activity alone is approximately $8,500 per year.

Method for evaluation of effectiveness of DMM

The District currently provides a school education program, but it is not known what occurs once the students take the information home. Thus, it is difficult to evaluate the effectiveness of this program.

Estimated Water Savings

Considering the difficulty of placing a numerical value for water savings, an intangible method of effectiveness can be determined by the amount of voluntary classroom and school participation with available K-12 water conservation programs. The number of students, educators, and schools involved are tracked to evaluate the success of programs.

DMM I – Commercial, Industrial and Institutional (CII) Conservation Programs

(Old CUWCC BMP 9, New CUWCC BMP 4)

South Lake Tahoe is a prime tourist destination. As a result, the District has focused their efforts for CII customers on educational efforts targeting this visiting population. The program currently consists of a commercial water user review program and two outreach programs for hotel/motels and restaurants.

Commercial Water User Review Program Description

The District will provide, upon request, a free water use survey, called a "Commercial Water-Use Review." This program will launch in May of 2011 and is funded by the Proposition 50 supplemental grant. The Water Conservation Specialist will visit the facility and provide Facility Review Report with customized water savings recommendations. Rebates are available for a wide range of commercial applications.

Available Rebates:

- High Efficiency Toilet: $150 rebate for replacing your older (pre-1992) with a new 1.28 gallon per flush, Watersense labeled model.
- High Efficiency Clothes Washer: 50% rebate up to $400 for purchasing and installing a CEE Tier– 3 commercial clothes washer.
- Water Broom: 50% rebate up to $250 for installing an approved water broom. To qualify the water broom must use less than or equal to 0.10 gallons per minute.
- Ice Making Machine: 50% rebate up to $200 for purchasing a CEE Tier-3 Ice making machine.
- Car Wash Recycling System: 50% rebate up to $1000 for an approved car wash recycling system.
- Ozone Laundry System: 50% rebate up to $400 per unit for an approved system.

- Cooling Tower Rebate: 50% rebate up to $500 per unit for an approved conductivity meter.
- Irrigation Efficiency Rebate: Based on the recommendations of the Water Efficiency Specialist, up to $500 for high efficiency equipment, covering 100% of eligible parts and 25% of labor.

Hotel/Motels Water Conservation Program Description

This program was launched on August 12, 2008 at a South Lake Tahoe Lodging Association meeting. As of the end of January 2011, there are currently 34 participating hotels with water savings education materials distributed in 1,819 hotel units. A list of participating hotels is below.

Matterhorn Hotel	A & A Lake Tahoe Inn	Best Western Timber Cove Lodge
El Nido Hotel	Highland Inn	Super 8
Skylake Lodge	Paradise Motel	3 Peaks Resort
Tahoe Valley Lodge	Tahoe Chalet Inn	Camp Richardson Resort
South Lake Tahoe Lodge	Travel Inn	Travelers Inn
Washoe Motel	Mark Twain Lodge	Quality Inn & Suites
Pine Cone Acre Inn	Quality Inn & Suites	Alpine Inn and Spa
High Country Lodge	Aston Lakeland Village	Best Western Station House
Apex Inn	Best Tahoe West Inn	Green Lantern Motel
Lazy S Lodge	Best Choice Inn	Lone Pine Lodge
Budget Inn	Alpenrose Inn	Cedar Inn
		Park Tahoe Inn

Restaurant "Water upon Request" Program Description

Updated materials for local restaurants were distributed including, 1,345 menu stickers, 406 table tents, 100 paycheck stuffers, and 8 participant plaques. Twenty-three restaurants in South Lake Tahoe are currently participating in the program. Many potential restaurants have been contacted to join the program. A list of participating restaurants is below

Swiss Chalet	SATO Japanese Restaurant	QQ Express
Denny's	Freshies Restaurant and Bar	Riva Grill
Heidi's Pancake House	Ernie's Coffee Shop	Grand Central Pizza
Margaritas Mexican Café	Lake Tahoe Pizza Company	IHOP
Echo Restaurant/Lounge	Murphy's Irish Pub	Red Hut
Meyer's Downtown Café	Burger Lounge	Bear Beach Café
Brother's Bar and Grill	Classic Cue	Mayan Mexican Café
Hunan Garden	Bob Dog Pizza	

Other Potential CII Programs

These hotel/motel and restaurants could also use upgrades of pre-rinse spray valves. It is assumed that more efficient pre-rinse spray valves are naturally being upgraded by these customers since the 2006 adoption of more efficient regulations per the California Code of Regulations for Title 20 Appliance Efficiency Standards. The retrofits are considered to be largely saturated given the 5-year useful life is ending from 2006 through 2011, and thus the District is not actively pursuing pre-rinse spray valve retrofits at this time.

It is also assumed the CII toilets and urinals have been upgraded to the national plumbing code standards since they went into effect more than 17 years ago in 1994. The District does currently promote all WaterSense labeled products including toilets.

Industrial Program Description

There are no industrial accounts in the District's service area, so the District does not have program targeted at industrial users.

Steps to Implement Measure

Marketing Strategy

This program will be marketed to commercial customers with bill inserts and direct mail and on the website. The current participants in the other CII programs will be contacted by the Water Conservation Specialist to introduce the program. In May 2011, a presentation is being given to The South Tahoe Lodging Association to gain participation by the local hotels and motels. Also, the South Lake Tahoe Chamber of Commerce will be given information about the program to share with their members.

Tracking of participation and results of participation

The number of surveys and annual data will be tracked and recorded.

Planned Implementation Schedule and Budget

The District plans to start implementation of the program in May 2011 with an annual budget of $34,500 in 2011 and 2012 based on a Proposition 50 grant funds. The values for 2013 to 2015 are based on a CUWCC Coverage annual rate of 1.5%.

Table I1 – Planned Interventions					
	2011	2012	2013	2014	2015
# of on-site surveys to be completed	0	0	18	18	18
Table I2 – Planned Interventions					
	2011	2012	2013	2014	2015
# of commercial replacements	50	50	50	50	50

# of industrial replacements					
# of institutional replacements					
projected expenditures - $	$34,584	$34,584	$110,000	$110,000	$110,000

Method for evaluation of effectiveness of DMM

It is difficult to project water savings since it's not feasible to audit behaviors of employees and patrons of hotel/motels and restaurants. In addition, the water use rating of the specific device being replaced (i.e.: type of spray rinse valve) is not documented.

Estimated Water Savings

The District does not currently track water savings from their CII water efficiency program. If a facility was tracked via meter data it would still be difficult to estimate savings due to the many variables that effect commercial water use including the economy, or change in production. For example, if a restaurant used less water, it might not be due to the District's CII program but could be a result of a decrease in the economy (i.e. less customers visit the restaurant). As a result, the District does not have the data or resources at the current time to fully evaluate projected water savings or expenditures.

DMM J – Wholesale Agency Assistance
(CUWCC BMP 10)

This DMM does not apply to the District because it is not a wholesaler.

DMM K – Conservation Pricing
(Old CUWCC BMP 11, New CUWCC BMP 1)

Description

As required by AB 2572, the District is converting existing residential connections to meters and within 12 months of converting, these accounts will be billed on volumetric rates. The current water rate structure is uniform volumetric charge for all residential customers with no minimum usage included in the bi-monthly service charge. The District is in the process of adopting a rate schedule that incorporates conservation pricing principles.

Steps to Implement Measure

Marketing Strategy

The new rates will be discussed at Board meetings and placed on the District website.

Tracking of participation and results of participation

Not applicable, all customers with meters will be charged the new volumetric rates.

Planned Implementation Schedule and Budget

Rate schedule will go into effect in 2011.

Method for evaluation of effectiveness of DMM

Not applicable. Rates can be studied to see if they change customer water use patterns.

Estimated Water Savings

No method has been identified to determine water savings from conservation pricing at this time.

DMM L – Conservation Coordinator
(Old CUWCC BMP 12, New CUWCC BMP 1)

Description

The District has had a Water Conservation Coordinator since the year 2000. The current Coordinator is:

Sarah Jones
South Tahoe Public Utilities District
1275 Meadow Crest Drive
South Lake Tahoe, CA 96150
Phone (530) 544-6474
Fax (530) 541-0614
E-mail sjones@District.dst.ca.us

The Coordinator has attended numerous outreach activities locally and distributed outreach materials to include brochures, outdoor water conservation kits, and has served on several advisory and planning committees.

Current Activities	Method of Implementation
Communicate programs to District customers	Advertising for the entire water conservation program has been an ongoing task item for the water conservation coordinator. Media publications have been tracked on an on-going basis, and the water conservation specialist also does radio and local television spots to further the message on water conservation. In addition, the coordinator is responsible for one-on-one communications with customers and staffing public outreach events.
Stay informed of regulatory issues, CUWCC information, reports, and activities. Advise the District. Manage and coordinate Compliance.	
Represent the District on the local and regional water efficiency committees	
Manage and administer programs	
Track results and activities of programs	

DMM M – Water Waste Prohibition
(Old CUWCC BMP 13, New CUWCC BMP 1)

Description

The District has complied with this Demand Management Measure by the adoption of Ordinance No. 487-04 that most recently was updated effective April 1, 2004. The ordinance is summarized in Section 5, included in the appendix and can be viewed at www.stpud.us/water_conservation_ordinance.pdf

Historically, two temporary seasonal employees have been hired under the supervision of the Water Conservation Specialist to enforce the water waste ordinance. In 2010, 361 water conservation violations were issued. The enforcement has been and is currently proactive. Customer complaints are also investigated. Water Waste is part of the Public Outreach Program, the slogan is “Water the Right Day and the Right Way.”

Steps to Implement Measure

Marketing Strategy

The District sends out bill inserts and reminders for customers of the water waste ordinances and water conservation. The District advertises the “Water the Right Day and the Right Way” and “There is never

enough water to waste in the Sierra" on the radio, television and newspaper ads and on the District's website.

Tracking of participation and results of participation

Exemptions and violations given are tracked in an excel spreadsheet and in the Springbrook database. Additionally, any letters or correspondence are scanned and saved in Laserfiche and attached to the customer account in Springbrook.

Water use has drastically decreased on Saturdays, which is the only day of the week when irrigation is prohibited.

Planned Implementation Schedule and Budget

Enforcement is ongoing and will continue through 2015. Annual budget: $24,000

For 2011-2012 one temporary seasonal position will be hired, a "Water Efficiency Technician". The job requirement will involve issuing citations but their time will not be fully dedicated to enforcement. The District has had a water educator for the past 7 years.

Estimated Water Savings

The District does not have estimated water savings for the violations given, however water use has gone down on Saturdays during irrigation season since watering that day has been prohibited.

DMM N – Residential ULFT Replacement Program

(CUWCC BMP 14)

Description

The number of pre-1992 Single Family accounts is 10,320 and Multiple Family accounts is 966. The District had a Proposition 40 grant to offer the water efficient appliance rebate program offered financial incentives for homeowners to purchase water wise toilets, clothes washers, dish washers, fixtures, tank-less hot water heaters, and circulating pumps. From the Proposition 40 grant rebates were distributed for one hundred and eighty six low-flow toilets. Currently the District offers a $100 rebate for replacing an older pre-1992 model toilet with a High Efficiency toilet (1.28 gallons per flush).

Steps to Implement Measure

Marketing Strategy

The HET toilet rebate is not marketed separately but as a part of a Water Wise House Call.

Tracking of participation and results of participation

Applications and accompanying paperwork are kept on file at the district and tracked in an excel spreadsheet. Estimated water savings can be calculated based on the flush volume of the toilet replaced. Replacement is verified by the customer who has to submit a photo of the newly installed HET toilet.

Planned Implementation Schedule and Budget

This DMM is planned for implementation in the next 5 years. The target goals for this measure are provided in the table below. The HET toilet rebate program currently receives Proposition 50 Grant Funds.

DMM N – Planned Implementation					
	2011	2012	2013	2014	2015
$ per rebate	100	100	100	100	100
# of rebates to be paid	150	150	150	150	150
projected expenditures - $	15,000	15,000	15,000	15,000	15,000

Method for evaluation of effectiveness of DMM

The number of rebates will be tracked and recorded.

Estimated Water Savings

The water savings can be estimated based on the number of toilets replaced.

6.3 SCHEDULE AND BUDGET FOR DMM IMPLEMENTATION

The District's schedule and budget for implementing each DMM through 2015 was outlined in Section 6.2 above. Its budget detail for Fiscal Year 2011-12 follows.

ACTUAL CURRENT YEAR BUDGET AND STAFF TIME SUMMARY

PROPOSED FY 2011 and 2012 CONSERVATION PROGRAM BUDGET SUMMARY						
CATEGORY			**DESCRIPTION**	**PROP 50 FUNDS**	**MATCH**	**TOTAL BUDGET**
Personnel (Includes Fringe Benefits)	**Hours**	**Hourly Rate**				
Water Conservation Specialist	4160	$45.17	1 WC Specialist FTE for 2 years	$187,907.20	$0.00	$187,907.20
Water Efficiency Technician	1280	$21.85	1 WE Tech FTE for 16 weeks/yr. for 2 years	$0.00	$27,968.00	$27,968.00
Grant Coordinator	82.15	$57.24	10 hours per quarter for 2 years	$2,625.00	$2,077.00	$4,702.00
Grant Program Assistant	40	$43.57	5 hours per quarter for 2 years	$0.00	$1,742.00	$1,742.00
Residential Water Audits	**No of Audits**	**Median Cost per Audit**				
Water Audit	200	$450.00	Inspection/replacement of damaged fixtures and homeowner water savings kits	$90,000.00	$0.00	$90,000.00
Water Savings Information Packets	200	$10.00	Informational handouts and brochures	$2,000.00	$0.00	$2,000.00
Commercial Water Savings Program	**No of Incentives**	**Median Cost per Incent.**				

Water Savings Incentives	50	$692.00	Incentives for laundry retrofits, car wash recycling systems, etc.	$34,584.30	$0.00	$34,584.30
Comm. Water Savings Info. Packets	50	$15.00	Informational handouts and brochures	$750.00	$0.00	$750.00
TOTAL				**$317,866.50**	**$31,787.00**	**$349,653.50**

www.w-and-k.com