WATER EFFICIENCY PLAN

SNOWMASS WATER AND SANITATION DISTRICT

February 2014

Prepared by:

SNOWMASS WATER & SANITATION DISTRICT

SGM

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REVIEWED BY: _____

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1.0 Introduction and Background

This WEP was developed under the direction of the SWSD's Board of Directors, the District Manager, Kit Hamby, SWSD's Water Conservation Officer, Christie Duckett, and an SGM engineer, Shannon Ullmann. Input was solicited from Snowmass Village residents and the Town of Snowmass Village's Environmental Advisory Board and was integrated into this plan.

The District recognizes the value of its water and the need to use this resource efficiently. Conserving water can help insure adequate water supplies are available as demands increase and shortages become more frequent. The purpose of this plan is to (1) develop goals for efficient water use and (2) select water conservation measures to meet these goals. This Water Efficiency Plan (WEP) establishes long-term water conservation goals that encourage efficient use of available water resources and reduce the amount of additional water needed to serve existing and future customers.

This Water Efficiency Plan (WEP) is the first such plan to be adopted by the Snowmass Water and Sanitation District (SWSD), although individual programs and measures have been implemented. This plan builds upon the lessons learned from past measures and pursues new strategies to help educate customers and facilitate long-term efficient water use habits.

A successful water conservation plan is reliant on the buy-in of its customers to change and improve their water use habits and practices. The SWSD will encourage and equip customers to incorporate efficient water use into their daily activities rather than relying entirely on mandates and regulation to enact change. This plan will guide SWSD as it implements the plan's measures, ultimately allowing SWSD to provide assistance to customers in the form of education and incentives designed to promote water use efficiencies.

1.1 SWSD's Need for a Water Efficiency Plan

The SWSD possesses adequate water rights to meet current demand. Projections by the SWSD of available raw water supplies and water rights indicate that they will be able to legally and physically supply sufficient water to meet anticipated future build-out as well.

However, through water conservation, SWSD can reduce the amount of water diverted from the Snowmass Creek basin. The water conservation goals were established with this in mind and are intended to benefit not only SWSD but also its customers and Snowmass' local waterways.

Furthermore, SWSD anticipates meeting CWCB's "Covered Entity" threshold in the very near future. As such, state statues will require that SWSD have an approved WEP on file.

1.1.1 Water Resource Management

Over 95% of the water used in the SWSD's service area originates from the Snowmass Creek and East Snowmass Creek drainages. Therefore, water use in Snowmass Village is linked directly to Snowmass Creek stream health and biology. The principles underlying the District's water management and conservation goals include the goals of protecting stream

flow and water quality in the Snowmass Creek and Brush Creek basins as well as the Roaring Fork River consistent with the District's operational needs.

The CWCB maintains a junior water right to minimum instream flow in Snowmass Creek. Although SWSD's water rights are senior to the CWCB's water right, the SWSD board has adopted maintenance of the Snowmass Creek instream flow as a stewardship goal for 2014. During most operational scenarios, water stored in Ziegler Reservoir can be used to supplement demands in SWSD rather than diverting from Snowmass Creek when stream flow minimums are compromised.

High water demands during the late summer irrigation season and the winter ski season often coincide with low stream flows periods. Efficient use of water through the adoption of conservation measures identified in this plan is also an important component of the SWSD's goal of maintaining and enhancing stream flows. The Water Efficiency Plan will provide guidance in planning programs that are consistent with the SWSD's water resource management strategy.

1.1.2 State Funding Eligibility and Upcoming Regulatory Threshold

The Colorado Water Conservation Act of 2004 (HB 04-1365) requires water providers with annual retail water deliveries in excess of 2000 AF per year to have an approved Water Conservation Plan in place to maintain eligibility for financial assistance from Colorado Water Conservation Board (CWCB) or the Colorado Water and Power Authority for water and wastewater infrastructure projects. Entities which have completed an approved plan also are eligible to apply for CWCB grant funds to implement their water conservation plans.

The SWSD anticipates meeting this delivery threshold within the next 10 years. The District's Board of Directors believes it is prudent to update the current water conservation measures and consider other measures that are consistent with the SWSD's water resource management strategy and the State's statutory requirements.

1.2 Guiding Principles of this Water Efficiency Plan

It is SWSD's policy to manage its water supply and distribution systems to minimize waste and encourage the efficient use of its water supply. It is also SWSD's responsibility to optimize its own operations to minimize excessive water use.

1.2.1 Goal Setting Strategy

SWSD's has set goals in this WEP based on the types of customers that they serve. Ultimately it is SWSD's WEP goal that these initiatives will be appropriately set to target all customer classes to achieve savings from all water customers.

- Single Family Residential - Because the single family residential class is the single largest customer class consumer within the District's water service area, the District has set a goal of developing a stronger connection with its customers in a way that targets this group. This WEP will prioritize communication and incentive measures that will give Single Family Residential customers the resources to reduce their water use.

- Other customer classes – Remaining customer classes, including Multi Family Residential, Multi Family Commercial and Commercial are addressed with this conservation plan; however, it will be necessary to develop additional data associated with the other customer classes to set and monitor meaningful and quantifiable goals. Examples of data that will be developed include:

    - Multi-Family Commercial and Commercial
        - Irrigated Area
        - Types of Business
        - Square Footage of Commercial Space
        - Number of employees

    - Multi-Family Residential
        - Number of Units
        - Occupancy Estimates

1.2.2 Implementation Plan Monitoring, Evaluation and Revision

It is anticipated that goals will be refined as SWSD develops additional data to allow a more accurate establishment of quantitative water conservation goals.

The new measures and programs discussed in this plan and approved by the Board of Directors will be implemented over the next seven to ten years. The measures and programs will be monitored and evaluated to determine water savings and costs. Implementation of the WEP is a long-term endeavor that will require continuous monitoring and evaluation.

The District intends to update the plan, at a minimum, every seven years as required by the Water Conservation Act of 2004. While this plan is intended to layout the strategies that the District will pursue over the next several years to enhance water use efficiency, in order for water conservation planning to be successful the plan needs to be flexible enough to allow for modifications and improvements in strategies.

2.0 Profile of Existing Water System

2.1 Overview of Existing Water Supply System

2.1.1 Water Rights

The District maintains a significant portfolio of water rights on East Snowmass Creek, Snowmass Creek and the West Fork of Brush Creek. The appropriation dates of the primary senior water rights that the District relies upon range from 1882 to 1891. The District also owns several more junior water rights that were developed in the 1950's and 1960's and a snowmaking water right with a 1992 priority. Finally, the District recently completed the construction of Ziegler Reservoir and has confirmed a 2010 junior water right for the fill and refill of this reservoir.

2.1.2 Sources of Water

Surface Water Supplies

SWSD's water supplies include surface water diverted from the East Snowmass Creek and Brush Creek sources. Snowmass Creek water is pumped from the creek to a vault on the divide where it can be fed by gravity to the water treatment plant. East Snowmass Creek water is diverted and fed to the divide vault by gravity. Brush Creek water is diverted and gravity fed directly to the water treatment plant (**Figure 1**).

Ground Water Supplies

In the 1960's the District drilled a series of wells in the Brush Creek basin and encountered high levels of natural gas and hydrogen sulfide. Due to low production rates and poor water quality, the wells were deemed unsatisfactory as a raw water source.

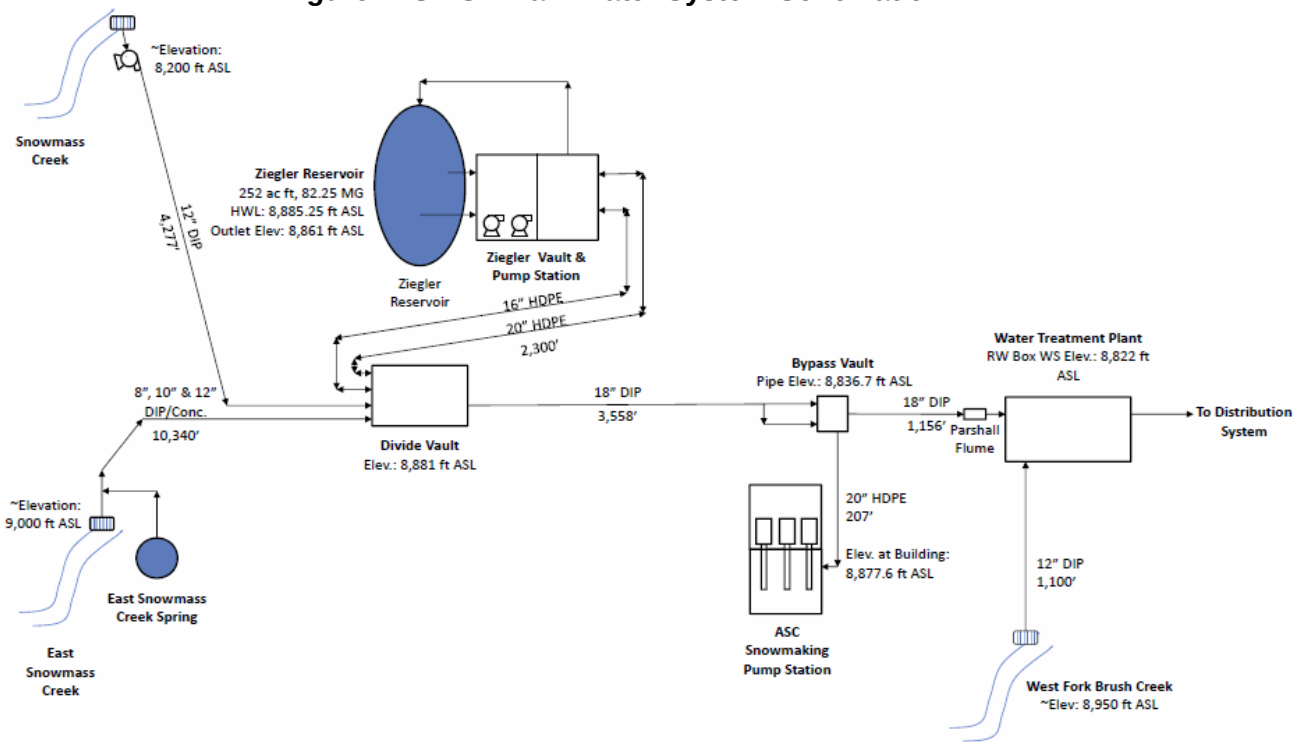
Treated Water Facilities

Raw surface water is treated at the SWSD's single water treatment plant, located on Fanny Hill. It supplies Snowmass Village with potable water for domestic use, emergency needs, irrigation, and other uses. The direct-filtration water treatment plant's design capacity is 5.25 MGD.

Water Distribution System

After treatment, finished water enters the distribution system. The District's water service area is approximately 3,912 acres or 6.1 sq. miles. The distribution system is divided into seven pressure zones and is comprised of over 44 miles of piping and 13 storage tanks, with a total potable water storage capacity of 6 million gallons. The District relies on pump stations and a gravity flow systems through pressure reducing valves designed to control water pressures to distribute water throughout the Village. Most of the tanks, pumps, and valves can be monitored and controlled via radio telemetry and a computer SCADA (Supervisory Control and Data Acquisition) program.

Figure 1 SWSD Raw Water System Schematic



2.2 Water Supply Reliability

2.2.1 Background Documentation and Studies

2.2.1.1 Statewide Water Supply Initiative (2010, CWCB)

The SWSD is located in the Colorado River Basin. The 2010 Statewide Water Supply Initiative (SWSI) report indicates that this basin will likely see the largest rate of growth among the state's major basins. While SWSD is not specifically identified in the report as having significant water supply shortfalls, it is located in a "headwaters" region, and only able to rely upon Ruedi and Wolford reservoir releases by exchange of water up to SWSD facilities when there is sufficient flow available to satisfy intervening water rights.

2.2.1.2 Dry Year Yield Analysis and Evaluation of Raw Water Storage Requirements (2006, W.W. Wheeler and Assoc.)

As background, the Town of Snowmass Village by Ordinance No. 10, Series of 1987 established zoning for undeveloped property with the Town. Subsequently, the District reevaluated its potable water and sanitary sewer systems to insure that adequate capacity existed to serve potential development. During the 1990's, the District water treatment and sewage treatment plants were both upgraded to provide additional capacity and system reliability. Development approvals by the Town during the 1990's were consistent with the zoning parameters established in Ordinance No. 10 and with the District's equivalent residential unit water usage future demand estimates. More recently, the Town granted development approval for Base Village and is considering proposed Snowmass Center and Mall redevelopment. The Base Village approval and the proposed redevelopment anticipated water demand exceeds the District's demand estimates that were based upon prior approved zoning for these projects. To understand the potential impact of the approved

and contemplated redevelopment on District planning for future water demand, the Board of Directors of the District determined that a thorough review of the yield available under District water rights was necessary, in both normal and low flow water years. To supplement initial studies that were prepared in conjunction with the District's service plan, the Board further determined to seek an evaluation of the possible need for, and benefit of, securing raw water storage as a component of meeting future water demands and minimizing diversions from Snowmass Creek during periods of low stream flow. The Board sought the assistance of its water resources engineers, W. W. Wheeler and Associates, Inc., to prepare a report (the "Report" or the "Wheeler Report") to provide information intended to be used as a tool for operational, water resource and capital improvement planning by the District Board.

The District's projected municipal demand was estimated for 3 levels of development, including future water demand resulting from the existing municipal demand including Base Village and Redevelopment projects, demand under the Town Comprehensive Plan Build-Out Chart, and a maximum development demand level that could result from additional redevelopment and infill development within the District. Consistent with historical practice, the supply of water to meet snowmaking demands, contractual service obligations, and other operational requirements was also considered. The Report assumed a voluntary Stream Flow Stewardship Goal of 7.0 cubic feet per second (cfs) bypassing the District's Snowmass Creek Pump Station diversion, provided alternate sources of water were available to meet District demands in lieu of further diversions from Snowmass Creek during periods of low flow. (While the District is legally entitled to divert at times its water rights are in priority, when the flow in Snowmass Creek is below 7.0 cfs the District has contractually agreed to the implementation of conservation measures and increased billing rates to District customers at certain trigger points. The Report also assumed that the District may desire to maintain a raw water storage capacity reserve of potable water usage in the event of catastrophic failure of the primary delivery systems.

The Report analyzed the legal and physical availability of water under the District's water rights in view of a maximum historical diversion scenario for water rights on Snowmass Creek during two historical dry periods represented by the 1977 and 2002-2003 drought years. The analysis indicated that during two historical dry periods, represented by the 1977 and 2002-2003 drought years, the District may not be able to meet all future development demands on a number of days without the implementation of additional mandatory water conservation measures, the creation of raw water storage or a combination of both additional conservation and storage. The Report evaluated the amount of raw water storage that would be required to meet anticipated demand without additional mandatory water conservation measures, maintain the 7.0 cfs Stewardship Goal to the extent possible, and provide storage reserves for a catastrophic event. Neither treated water storage, nor potential additional raw water storage, would be utilized directly to supplement low stream flows to meet the Stewardship Goal, as this could deplete required fire and short-term emergency supplies should a delivery system catastrophe occur. In 1977, the estimated volume of storage required to meet District demand and the Stream Flow Stewardship Goal, as well as maintain catastrophic event storage, ranges from 255 acre-feet to 330 acre-feet for the respective development scenarios. In 2002, the storage requirements were estimated to range from 175 acre-feet to 200 acre-feet. The estimated amount of catastrophic event storage to meet District demand for 3 weeks ranges from 105 acre-feet to 120 acre-feet, assuming East Snowmass Creek and Snowmass Creek delivery systems are rendered unusable.

2.2.2 Supply Limitations

CWCB's Worksheet A template is provided in **Table 1** as a summary of current and future water supply limitations. Additional details are provided in the following sections.

Table 1 Worksheet A - Water Supply Limitations and Future Needs

Limitation and/or Future Need	Yes	No	Comments on Limitation or Future Need	How is Limitation or Future Need Being Addressed
System is in a designated critical water supply shortage area	x		Since completion of Ziegler Reservoir, SWSD had operated from storage during low flow periods to buffer the minimum stream flow in Snowmass Creek. SWSD's Board has also formally established maintenance of the minimum stream flow on Snowmass Creek as a 2014 stewardship goal. But, meeting this goal in late summer and winter has been identified to be potentially challenging in future, dry years.	Implementing District water conservation measures and strategic operation of Ziegler Reservoir are two identified strategies for balancing future demands with stream flow protection during future dry year conditions.
System experiences frequent water supply shortages and/or emergencies		x		
System has substantial non-revenue water	x		Recent water loss analyses have indicated significant lost revenue water. SWSD believe these losses are due primarily to poor meter repair/ maintenance/ replacement as well as inaccuracies in oversized meters.	SWSD has implemented a system-wide meter replacement and repair program in parallel with developing this Water Efficiency Plan.
Experiencing high rates of population and demand growth		x		
Planning substantial improvements or additions		x		
Increases to wastewater system capacity anticipated		x		
Need additional drought reserves		x		
Drinking water quality issues		x		
Aging infrastructure in need of repair	x		Recent water loss analyses have indicated significant lost revenue water. SWSD believe these losses may be due, in part, to aging infrastructure, both customer water meters and buried potable water distribution system mains that have often been constructed in "hot" soils without sacrificial anodes or polywrap.	SWSD has initiated a leak detection and main replacement program in an effort to curb system losses associated with leaks.
Issues with water pressure in portions of distribution system		x		

2.2.2.1 Critical Water Supply Shortage Area – Meeting Minimum Stream Flows

In 1976, the Colorado Water Conservation Board appropriated a 12 cfs year-round instream flow right for Snowmass Creek, from Snowmass Lake to the Roaring Fork River.

In the early 1990s, the Aspen Skiing Company increased its snowmaking capacity and entered into an agreement with the District to obtain additional snowmaking water from Snowmass Creek and East Snowmass Creek. The snowmaking rights are junior to the CWCB's minimum instream flow and restricted to a cumulative diversion rate from both sources totaling no more than 6.0 cfs.

In the 1990s, the CWCB changed the instream flow rights for Snowmass Creek. The stream was divided into three reaches: the upper reach (from Snowmass Lake to the West Snowmass Creek confluence, the middle reach (from the West Snowmass Creek confluence to the Capitol Creek confluence, and the lower reach (from the Capitol Creek confluence to the Roaring Fork River. The District's pump station is located in the middle reach. The CWCB also modified the winter minimum instream flow for the middle reach of Snowmass Creek to a stepped stream flow that is established yearly by analysis of the average daily stream flow in Snowmass Creek at the Snowmass Creek Pump Station between October 11th and October 15th according to the following Figure 2:

Figure 2 Snowmass Creek

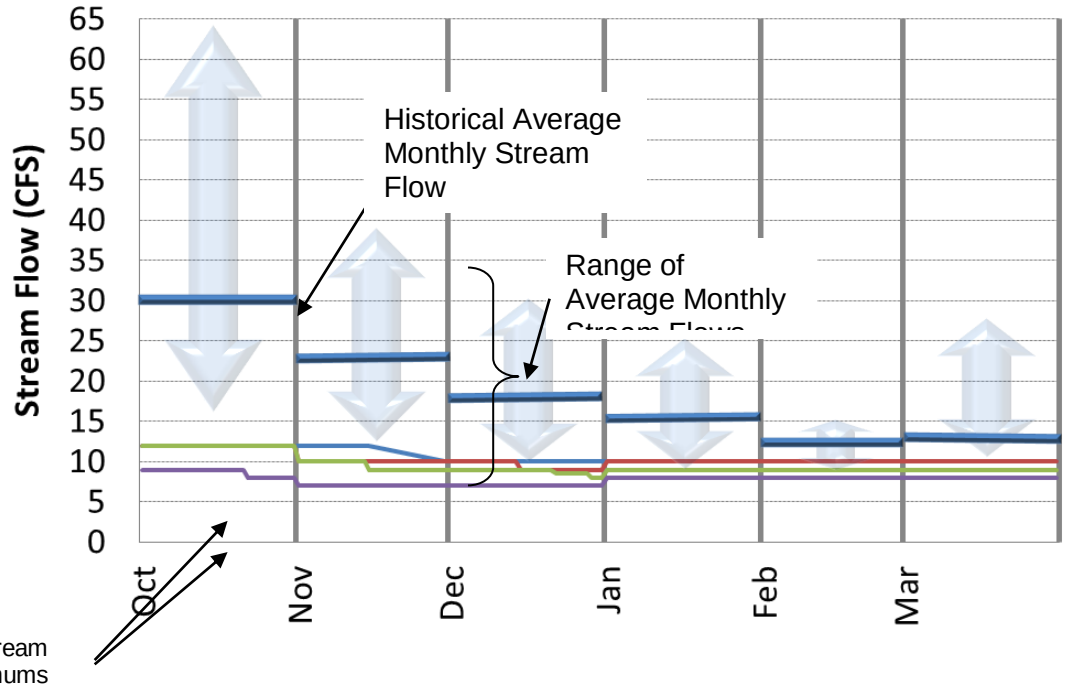


Table 2 CWCB Multi-Stage Winter Instream Flow on Middle Reach of Snowmass Creek

Percentile Water Year	Recurrence Interval	Instream Flow Trigger	Instream Flow
> 50th %	1:2	≥ 29 CFS	12 CFS (10/16 – 11/30) 10 CFS (12/1 – 3/31)
25th % - 50th %	1:4 – 1:2	< 29 CFS and ≥ 27 CFS	12 CFS (10/16 – 10/31) 10 CFS (11/1 – 12/14) 9 CFS (12/15 – 12/31) 10 CFS (1/1 – 3/31)
10th % - 25th %	1:10 – 1:4	< 27 CFS and ≥ 19 CFS	12 CFS (10/16 – 10/31) 10 CFS (11/1 – 11/14) 9 CFS (11/15 – 12/21) 8.5 CFS (12/22 – 12/28) 8 CFS (12/29 – 12/31) 9 CFS (1/1 – 3/31)
< 10th %	1:10	< 19 CFS	9 CFS (10/16 – 10/21) 8 CFS (10/22 – 10/31) 7 CFS (11/1 – 12/31) 8 CFS (1/1 – 3/31)

2.2.2.2 Contractual Requirements with Pitkin County - Stream Diversion Limitations.

In 1978, the District and Pitkin County entered into an agreement with Pitkin County concerning the operation of the Snowmass Creek Pipeline involves diversion of water from Snowmass Creek and pumping it to the District's water treatment plant.

The 1978 Agreement addresses concerns raised by Pitkin County relating to diversions of water from Snowmass Creek and the possible future construction of Sam's Knob reservoir on Snowmass Creek in the vicinity of the Snowmass Creek Pipeline. The District and the County agreed that the District would prioritize its other sources of supply before utilizing Snowmass Creek when diversions from Snowmass Creek would cause the stream flow in Snowmass Creek to fall below the then Colorado Water Conservation Board (CWCB) minimum stream flow of 12 cubic feet per second (cfs). The 12 cfs minimum stream flow was subsequently determined to have been established in error and revised to be consistent with the above Figure 2. In any case, the District presently utilizes all sources of supply other than Snowmass Creek prior to diverting water through the Snowmass Creek Pipeline irrespective of the stream flow in Snowmass Creek.

Later, in 1995, the District and the County entered into a second agreement. The 1995 Agreement provides that the then current minimum stream flows administered by the CWCB (15 cfs during the summer and 7 cfs during the winter), together with the protective provisions contained in the Agreement, are protective of Snowmass Creek and the environment. The protective measures that were agreed upon between the District and the County includes the Trigger Point Methodology Agreement which was approved in 1998 and defines the logistical procedure to administer the stream flow related provisions of the 1995 Agreement.

The 1978 Agreement, 1995 Agreement and the related 1995 Trigger Point Agreement, all combine to require the District to implement conservation measures when flows in

Snowmass Creek drop below certain triggers as a result of the District's diversions. These conservation measures are summarized below in Table 3:

Table 3 Summary of Trigger Point Agreements of 1978 and 1995

Snowmass Creek Stream Flows	Agreement	Diversion Limitations	Agreed Conservation Measures
≥12 CFS		None	
< 12 CFS	1978 Agreement	None	Must first use all Brush Creek sources before diverting from SC
< 9 CFS	1995/Trigger Point Agreements	None	Must commence public awareness program
< 7 CFS	1995/Trigger Point Agreements	None	Must institute mandatory conservation measures through irrigation water year (Ap. 1 – Mar. 31)
< 6 CFS	1995/Trigger Point Agreements	None	Must institute increased billing rates for accts. using over their EQR allotment
< 4 CFS	1978 Agreement	None	Can only drop flows below 4 CFS in emergency situations

2.2.2.3 Ziegler Reservoir

The District owns and operates Ziegler Reservoir, which is now the primary raw water storage component for the District. Ziegler Reservoir is an off-channel, high hazard, jurisdictional reservoir and dam capable of storing 252 AF (82 MG) of raw water at the normal high water line of 8885.25 feet. The reservoir was designed as a terminal storage reservoir that supplies raw water directly to the water treatment plant, by gravity or pump, for processing or snowmaking. The reservoir is normally filled and refilled by gravity flow from East Snowmass Creek. The District can also pump water from Snowmass Creek up to the reservoir as needed, but this pumping generates power costs and gravity flow from East Snowmass Creek is therefore the preferred supply when available.

Ziegler Reservoir benefits from a senior 57 acre-foot storage water right for Lake Deborah, as well as a 2010 300 acre-foot water storage right for the fill and refill of Ziegler Reservoir. The District's 2010 water storage right is junior to the CWCB minimum stream flow water right. Ziegler Reservoir provides system reliability, emergency raw water storage and continued water supplies to the District customers in the event that there is an interruption in or curtailment in the ability of the District to use any of its sources of supply. As noted above in Section 1.1.1, during the District's normal operations, and when sufficient stored water is available, Ziegler Reservoir presently operates as a buffer against diminution of Snowmass Creek minimum stream flows.

2.2.2.4 Potable Water Storage

The District currently has treated water storage of 6.1 MG (approximately 18.9 ac/ft), estimated to provide about 3 days of District municipal water usage. The District will not utilize treated water storage to meet the 7 cfs Snowmass Creek Stream Stewardship Goal, as this could deplete required fire and short-term emergency supplies should a delivery system catastrophe and reduced treated storage volumes occur simultaneously.

2.2.2.5 Shortages and Supply Emergencies

Prior to the purchase and 2011 enlargement of Ziegler Reservoir, the District had historically relied on direct flow sources and had never had an emergency raw water storage facility. The District has now completed the construction of the Ziegler Reservoir enlargement as a back-up water supply to protect the District against a catastrophic event that could result from uncontrollable loss of supply due to a landslide, blockage or other interruption of the District's primary delivery systems, or from contamination or unacceptable turbidity rendering the raw water sources of supply untreatable.

2.2.2.6 Substantial Non-Revenue Water and Aging Infrastructure In Need of Repair

Recent analysis of produced and metered water in SWSD revealed significant percentage of non-revenue water. SWSD has initiated three programs to address the problem.

1. Leak Detection – In 2010, SWSD purchased leak detection equipment and began system-wide testing of the 44 miles of distribution system. SWSD staff test 70-80% of the distribution system in the spring and 40-60% of the system in the fall, such that 100% of the system is tested annually and significant areas are tested bi-annually.

2. Capital Replacement Program – Based on the regular occurrence of water line breaks and leaks in the distribution system, the District coupled the aggressive and effective leak detection program with the capital repair and replacement of its buried infrastructure. In 2013 the voters of Snowmass Village passed a mill levy for the replacement of aging infrastructure and equipment. The mill levy is expected to bring in over $1M/ annually.

3. Customer Water Meter Repair/Replacement Program – The SWSD is in the process of initializing a customer water meter repair/replacement program. The program began in the fall of 2013 and is expected to be completed in 2014. In 2013 the Colorado Water Conservation Board approved a $100,000 grant for the replacement of customer meters.

2.2.3 Legal Limitations

2.2.3.1 Downstream Calls Impacting the District's Water Supply

The District has an extensive portfolio of water rights that it uses to meet its municipal needs. The senior water rights for the District's uses principally consist of transferred senior irrigation water rights. For these senior transferred rights, the season of use is generally limited to the irrigation season. For several of the transfers, the irrigation season is defined as May 1 through October 15. The District's primary and most senior water right for winter supply is the Christensen Ditch No. 1. "Cameo" calls (lower Colorado River calls) and possible future calls from currently inactive energy development water rights (oil shale rights) both pose risks to the legal availability District's water supplies when the District is relying on the Christensen Ditch No. 1 water right as its primary raw water supply, as shown by the following Table 4:

Table 4 Downstream Water Rights Call Summary

Location	Flow Rate (CFS)	Uses	Adjudication Date	Appropriation Date	Administrative No.
Shoshone Hydro (Upstream on Colorado from Colorado/Roaring Fork River Confluence)	1,250	Industrial, Power Generation	Dec. 9, 1907	Jan. 7, 1902	20427.18999
Grand Valley Project (GVWUA)	730	Irrigation	Jul. 22, 1912	Feb. 27, 1908	22729.21241
Grand Valley Canal (GVIC)	119.47	Irrigation	Jul. 25, 1941	Apr. 26, 1914	30895.23491

2.2.3.1.1 Cameo Call

Cameo calls are placed on the Colorado River every year. The Cameo demand consists of a group of moderately senior irrigation and hydropower water rights originating near Grand Junction, Colorado, with a combined demand of over 2,200 cfs during the summer and up to 800 cfs during the winter (Sloan, 2004). The water rights making up the Call are owned by five entities: the Grand Valley Irrigation Company ("junior Cameo" right – 119 cfs), the Grand Valley Water Users Association ("senior Cameo" right – 730 cfs), the Orchard Mesa Irrigation District, the Palisade Irrigation District, and the Mesa County Irrigation District.

A "Cameo" call means that upstream diversions, including Front Range reservoirs and direct diversions, must shut down to satisfy the senior agricultural needs at Cameo and, at times, upstream reservoirs may need to release additional water into the river system to meet the Call. The Cameo Call normally operates only during the irrigation season, which can range from April to October in dry years. In drier years, the Division of Water Resources administers the Call for a longer period of time as it comes on earlier in the season and extends past the irrigation season. The length of the Cameo Call depends on how dry the season is and how much water is diverted by junior users upstream.

While the District's more senior rights are protected against a Cameo Call by releases from Green Mountain Reservoir (as part of the "historic user's pool" or "HUP"), the Christensen Ditch No. 1 is too junior to receive this protection. Historical water calls originating downstream from the Christensen Ditch No. 1 indicate that since 1990, the "Cameo" call was effective on the Christensen Ditch for eleven periods between October 16 and April 30 during those years, for an average period of approximately three days per year, and with a maximum of 22 days during the winter season 2003 through 2004.

2.2.3.1.2 Shoshone Call

Most Cameo calls are prevented by the Shoshone Power Plant call. Shoshone is a non-consumptive hydroelectric power plant owned and operated by Xcel Energy (formerly Public Service Co. of Colorado). The plant is located on the Colorado River in Glenwood Canyon several miles upstream from the confluence of the Colorado River and the Roaring Fork River. The senior Shoshone water right calls up to 1,250 cfs from the upper Colorado River Basin. With Shoshone placing a call on the upper Colorado River above the confluence with the Roaring Fork River, the lower Colorado River and Cameo rights are generally satisfied with the hydropower return flow without the need for a call originating from the Cameo rights, which would call on the Roaring Fork River Basin as well. Thus, by calling water downstream, the Shoshone Call plays a critical role in keeping upstream portions of the Colorado River and its tributaries flowing. The Shoshone call is generally on for

significant periods in nearly every year; however, it has its greatest effect on District water rights during the winter - when the Cameo Call is off and when the Christensen Ditch is the primary supply for the District. The Shoshone call averaged more than 100 days per year between 1990 and 2010. If the Shoshone call were to cease operating, it is expected that the Cameo call would be much more common on the Colorado River, adversely impacting the District's ability to operate its water rights.

Energy Related Water Rights and Potential Calls

Future development of conditional water rights and full utilization of currently under-utilized rights, including energy development (oil shale rights) and other use rights also present a possibility for increasing the frequency and severity of calls originating on the lower Colorado River to impact the ability of the District to provide water to its customers. More than 160 cfs of under-utilized and conditional main stem rights are senior to the Christensen Ditch No. 1 and an additional 1,500 cfs are senior to the majority of the District's more junior water rights.

2.2.3.2 District's Augmentation Supply

Because of Cameo and other senior calls during dry years, the District's Christensen Ditch No. 1 water right and other District junior water rights could be curtailed completely. The Cameo primarily calls during the irrigation season but will occasionally call during the non-irrigation season when the Christensen Ditch is the primary water supply for the District. In addition, should the Shoshone call cease operations, or should conditional and under-utilized water rights including energy development rights be fully operated in the future, the severity and frequency of calls originating from the lower Colorado River could increase. The District has recently purchased 500 af of Ruedi Reservoir water from the United States Bureau of Reclamation to be used in the future as a replacement source to guard against expanded future Cameo calls.

2.2.3.3 Christensen Ditch #1 Augmentation Plan

In 2009, the Wildcat Ranch Association application for exchange and augmentation for a portion of the Christensen Ditch No. 1 was amended to add the District as a co-applicant. The augmentation component of the plan consists of using Ruedi water to replace net depletions associated with the District's diversions pursuant to the Christensen Ditch No. 1 through the Snowmass Creek Pipeline. This upstream exchange can only be implemented when there are no valid water calls within the exchange reaches on the Roaring Fork River and Snowmass Creek, including minimum stream flow and direct flow diversions, and when there is water physically and legally available at the points of diversion. For purposes of legal availability, only those calls originating within the upstream exchange reaches shall have the ability to call out the exchange.

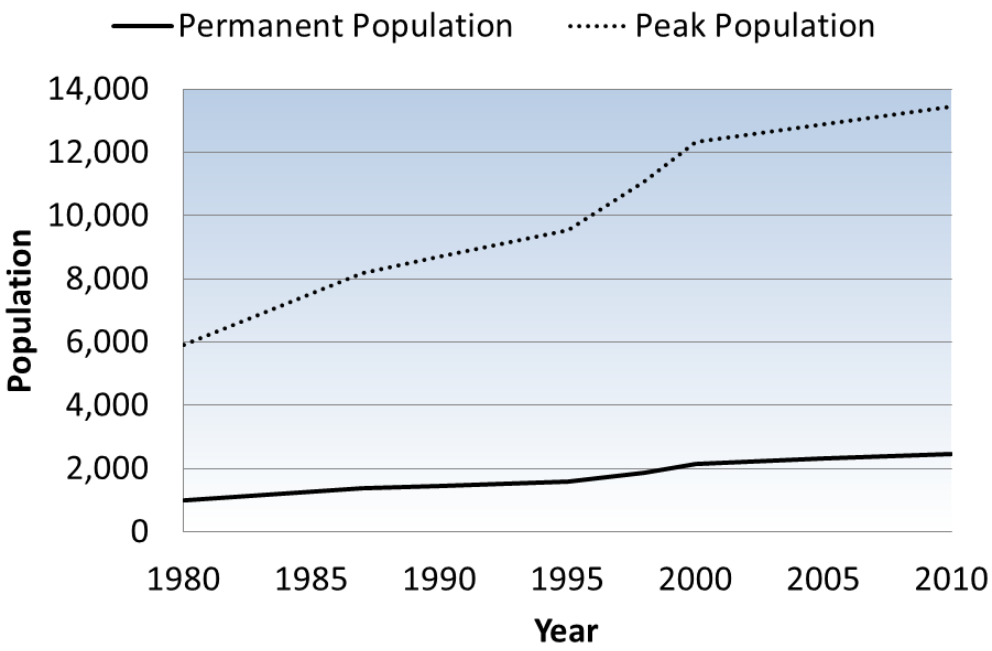
The District's augmentation and exchange plan will firm up the Christensen Ditch water supply in order to meet the District's water demands when there is a call on the river that would otherwise preclude diversion of its Christensen Ditch water right. However, during some late season periods in severe dry years when the Christensen Ditch is called being out, the exchange potential upstream on the Roaring Fork River above the confluence with the Frying Pan River may not exist. During these periods, the exchange, and therefore the diversion by the Christensen Ditch, may not be possible. The newly constructed 252 AF Ziegler Reservoir will act as an alternative supply when Christensen Ditch diversions are needed but the exchange cannot legally be operated.

3.0 Profile of Water Demands and Historical Demand Management

3.1.1 Demographics and Key Characteristics of the Service Area

As a water provider to a resort community, one of the unique challenges facing the SWSD is that of large swings in water demands due to a highly fluctuating service area population. The population within SWSD's service area is heavily influenced by weather, the seasons and the world economy. For example, at the beginning of 2010 the SWSD provided water and sewer service to a population equivalent of approximately 2,500 year-round residents. During the ski season of that same year, the population increased to approximately 13,400 residents (**Figure 3**).

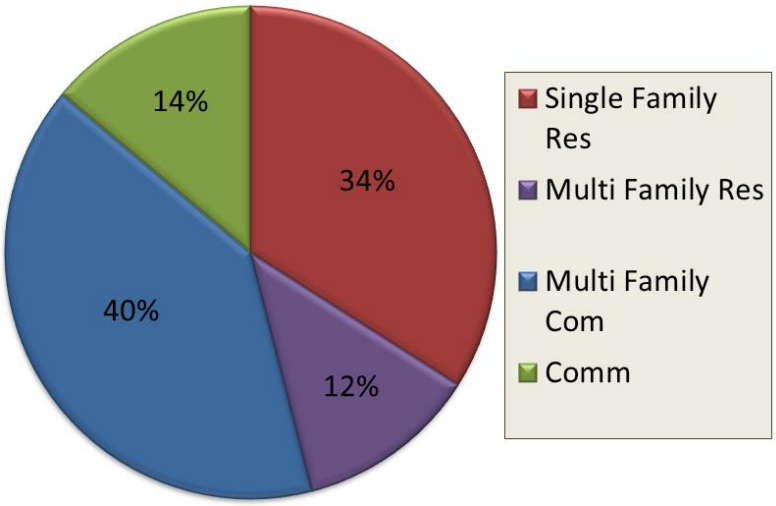
Figure 3 Historical SWSD Sevice Area Population (Permanent vs. Peak)



3.1.1.1 Primary Water Service

The service area is comprised mostly of single-family residential homes with a mix of multi-family dwelling units and commercial development. As of January 1, 2013, there were 1,181 metered connections, servicing approximately 5,196 EQRs to the District's treated water system.

Figure 4 Historical EQR Distribution by Customer Type



3.1.1.2 Additional Water Services

The SWSD also provides treated bulk water deliveries to the extended service area of the Brush Creek Metro District through a single connection point.

Finally, SWSD also provides non-potable water to Aspen Skiing Company in November and December for snowmaking purposes.

3.1.2 Historical Water Demands

3.1.2.1 Total Annual Water Use

SWSD supplies potable water to its customers in the Town of Snowmass Village and through bulk metered transfers to the Brush Creek Metro District. SWSD supplies raw water to The Aspen Skiing Company for snowmaking purposes in November and December of each year. The total historical distributions from 2008 through 2012 are provided in **Table 5**.

Table 5 Historical Total Annual Water Deliveries

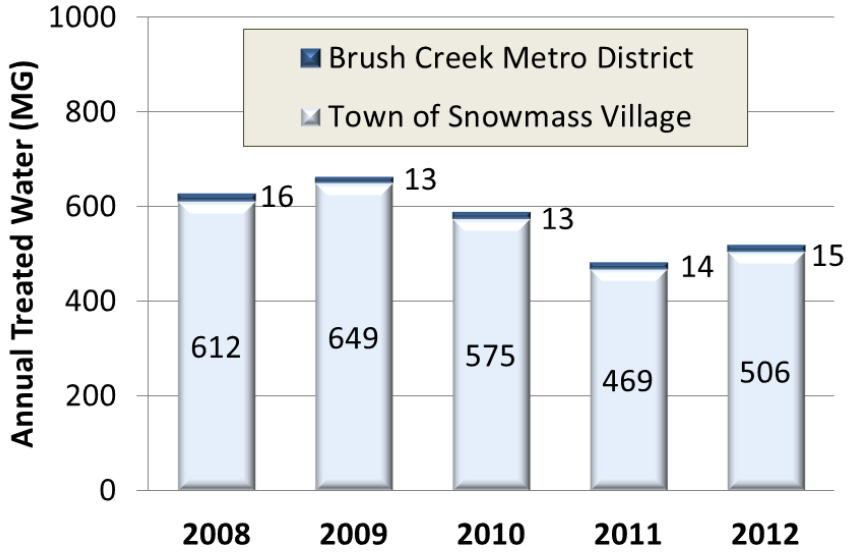
	2008	2009	2010	2011	2012

Potable Water Delivered					
(MG)	628	663	588	483	520
(AF)	1,927	2,034	1,804	1,483	1,597
Non-Potable Water Delivered					
(MG)	68	73	71	89	105
(AF)	208	225	218	269	321
Total Annual Water Distribution					
(MG)	696	736	659	571	625
(AF)	**2,135**	**2,259**	**2,022**	**1,752**	**1,918**

Total Annual Distributed Treated Water

Treated water leaves the water treatment plant for use in both the Town of Snowmass Village and the Brush Creek Metro District. SWSD maintains a bulk meter to account for water transferred to Brush Creek Metro District. Within the period of 2008 through 2012 average annual Water Treatment Plant production was 576 MG/year (1,770 AF/year) of which an average of 14 MG/year is transferred to Brush Creek Metro District. The historical annual potable water distribution and transfer volumes are shown in **Figure 5**.

Figure 5 Historical Total Annual Potable Water Distribution

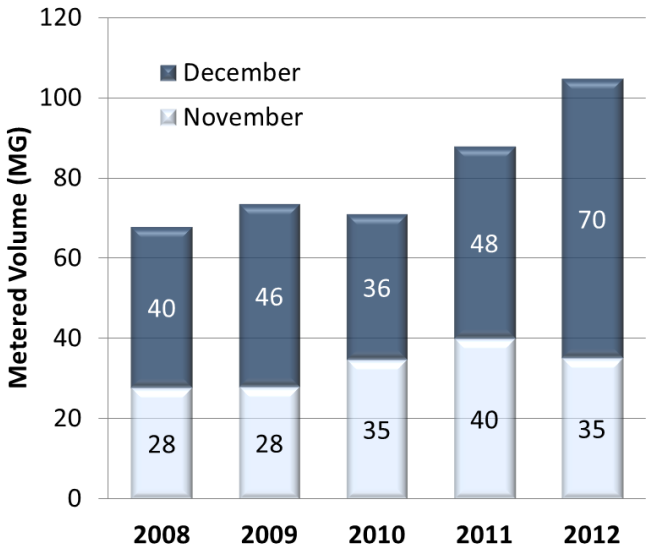


Total Annual Distributed Non-Potable Water

The District also provides non-potable water to the Aspen Skiing Company for snowmaking. Snowmaking water is provided only in November and December. Between 2008 and 2012

the average annual non-potable water distribution has been 81 MG/year. Historical volumes are shown in **Figure 6**.

Figure 6 Historical Total Annual Non-Potable Water



Total Annual Non-Revenue Potable Water

Water losses typically include system leaks, unauthorized water use, meter inaccuracies or data handling errors. Industry standards for non-revenue water as a percent of the total water produced vary greatly up to 70%. Typical goals, however, are generally set to 15-20% or less. Communities with water loss values greater than 25% often include those that are not fully metered, have soil conditions that prevent surfacing of leaked-water or communities that do not maintain an active meter testing/replacement program.[1]

For SWSD, non-revenue potable water was estimated by comparing the total annual volume of water produced and the volume of water metered for billing purposes. Water losses in SWDS range from 30-51% from 2009 through 2012. Historical annual water loss estimates are provided in **Table 6**.

Table 6 Historical Non-Revenue Water Summary

	2008[1]	2009	2010	2011	2012

[1] AWWA M32, 2012.

Annual WTP Production (MG)	**628**	**663**	**588**	**483**	**520**
Total Annual Metered Volume	**NA**	**327**	**321**	**319**	**365**
Town of Snowmass Village (MG)	NA	314	308	305	350
Brush Creek Metro District (MG)	16	13	13	14	15
Non-Metered Potable Water (MG)	**NA**	**336**	**267**	**164**	**155**
(%)		**51%**	**45%**	**34%**	**30%**

1. 2008 2nd-Quarter Billing/Meter Data is not available.

The SWSD Board has identified historical non-revenue water loss as a significant challenge to be addressed in the near term. Up until 2014, SWSD did not have an active meter testing/replacement program and was suspicious of the large meters that may have read inaccurately during low-demand seasons.

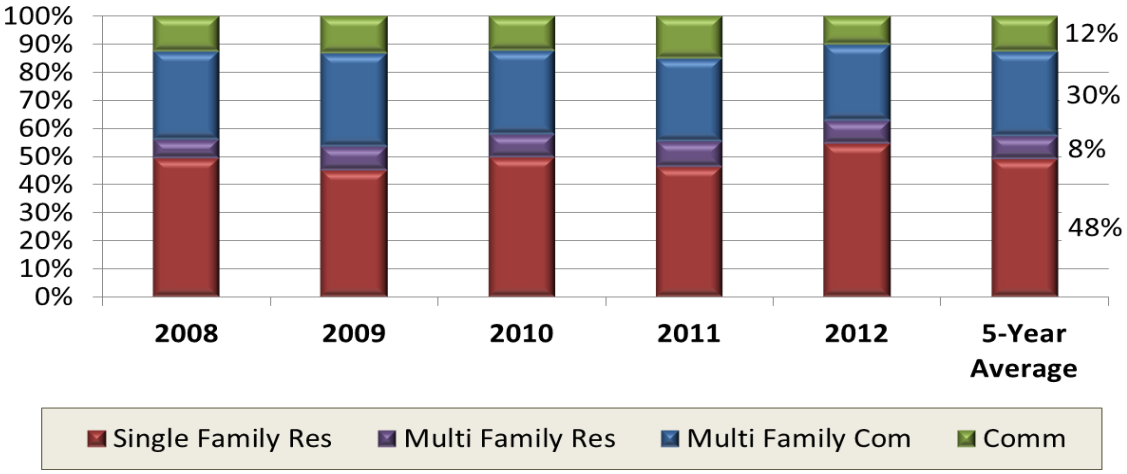
For this reason, the board has initiated a meter replacement/upgrade program in order to alleviate the disparity between produced water and metered water. SWSD board believes that this is a fundamental first step to monitoring and maintaining an effective Water Efficiency Plan.

3.1.2.2 Water Demand by Customer Type

Treated Water Use

Despite apparent inaccuracies in customer meter records, those records represent the best available source for estimating the %-distribution of water demands among SWSD's various customer types. Based on meter records from 2008 through 2012, SWSD's customer type that consumes the most water is Single Family Residential customers, consuming an average of 48% of the metered water within the district. The Multi Family Residential customers consume the least water among the various types at an average of 8% from 2008-2012. **Figure 7** shows the 2008-2012 metered customer demand distribution by customer type.

Figure 7 Historical Water Demand Distribution by Customer Type



The unit water demand, system-wide and by customer type, is estimated based on the volume of water produced by the WTP and distributed to customers within Town of Snowmass Village[2] divided by the number of historically connected EQRs for each year. **Table 7** provides the calculated unit water demand, system-wide and by customer type.

Table 7 Historical Unit Water Demands by Customer Type

	Unit Water Demand (GPD/EQR)					
	2008	**2009**	**2010**	**2011**	**2012**	**Historical Average**
Single Family Res.	440	467	458	346	434	429
Multi Family Res.	190	265	217	185	174	206
Multi Family Com.	244	296	223	182	187	227
Commercial	330	309	252	259	198	270
Combined Multi Family Res. Multi Family Comm. And Commercial	250	294	228	199	187	232
System-Wide Average	350	353	248	248	271	**305**

Raw Water Use

Raw water is provided, via bulk metering to the Aspen Skiing Company, only. The use of raw water is not broken down by customer type.

3.1.2.3 Demand Trends

Peak Day Demands

Peak day demands are often indicative of outdoor water efficiency opportunities. Peak day demands are estimated based on WTP daily production records. Daily meter records for the Brush Creek Metro District are not available; therefore, peaking factors represent potable water demands both in the Town of Snowmass Village and in Brush Creek Metro District. **Table 8** summarizes those trends.

[2] Annual WTP production volume less the volume of water metered for Brush Creek Metro District.

Table 8 Historical WTP Average & Peak Day Production and Peaking Factor

	Average and Peak Day WTP Production (MGD)					
	2008	**2009**	**2010**	**2011**	**2012**	**5-Year Average**
Average Day	1.71	1.81	1.61	1.32	1.42	1.58
Peak Day (Date)	3.25 (June 20)	3.28 (July 23)	3.11 (June 11)	3.08 (June 29)	3.04 (June 27)	3.15
Peaking Factor	**1.90**	**1.81**	**1.93**	**2.33**	**2.14**	**2.02**

3.1.3 Past and Current Demand Management Activities and Impacts to Demands

The SWSD has enacted several "conservation-driven" measures as a means of addressing water conservation ethics. To date, these measures have not been conducted within the context of a formal Water Efficiency Plan. They are summarized below.

Statutory requirements include estimating the amount of water saved as a result of the various measures that have been historically implemented. Inconsistent record-keeping makes these estimations difficult to perform via a demand-trending approach. Estimates are therefore made based on industry literature, case studies, and available SWSD data. **Table 7** (Worksheet B from CWCB Guidance Document), provides a summary of water savings estimates. Assumptions are clearly stated.

3.1.3.1 Foundational Activities - Water Rate Structure and Pricing

The District uses an increasing tiered rate structure to help promote efficient water use. The water rate structure used by the District has strong pricing signals that increase aggressively with the volume of water used. Tiers 3, 4 and 5 have larger allocations of water associated with them to signal the customer that they have crossed a pricing threshold and are using excessive volumes of water.

The tiered rate structure is also designed to encourage and reward water conservation efforts, particularly regarding outdoor irrigation, by charging an increased unit price for water as the volume of water consumed increases. Customers who use low or average volumes of water are charged a modest unit price and rewarded for conservation; those using significantly higher volumes of water pay higher unit prices. **Table 9** provides the SWSD's existing tiered rate structure.

The tiered rate structure recognizes that customers come in different sizes and that indoor water usage varies from home to home and business to business. There is also a base customer quarterly service charge applied to all customer classes, regardless of the amount of water consumed.

Table 9 Quarterly Water Rate Structure and Fees

Tier 1	0– 15,000 Gal	Included in Base Rate ($58.51)
Tier 2	15,001 – 30,000 Gal	$ 2.33/K-Gal per EQR
Tier 3	30,001 – 60,000 Gal	$ 3.94/K-Gal per EQR
Tier 4	60,001 – 100,000 Gal	$ 4.77/K-Gal per EQR
Tier 5	> 100,000 Gal	$ 6.48/K-Gal per EQR

Tier breakdowns were evaluated based on historical average annual consumption. Water use per EQR is expected to average 30,000 gallons/qtr. High summer use commonly averages over 45,000 gallons/qtr. and low winter use may average 16,000 gallons/qtr.

3.1.3.2 Foundational Activities - Leak Detection and Waterline Replacement

The District has instituted an aggressive leak detection program. In 2009 the District tested over 40% of the 44 miles of water distribution system and in 2010 the District tested 100% of its lines. Starting in 2011, the District leak detection program plans to test 60-80% of the water distribution system every spring and test/retest 40-60% of the system in the fall. Leaks are repaired immediately.

The District has analyzed water line breaks and repairs within the distribution system. This analysis identified areas, primarily in the oldest part of the system, which showed an increasing trend in the number of breaks. As a result of the analysis, in 2006 the District developed a strategy for the in-house replacement of approximately 2,000 linear feet of pipe each year to reduce the number of breaks and leaks in the distribution system.

3.1.3.3 Ordinances/Regulations – Indoor Water Fixture Regulations

The SWSD's Rules and Regulations include water conservation design and fixture requirements for indoor water use. For new customers the SWSD has requirements for faucets, showerheads and toilets/urinals. For existing customers, the SWSD has requirements for PRVs and showerheads. These regulations were adopted October, 2004.

3.1.3.4 Ordinances/Regulations – Outdoor Water Use Regulations

The SWSD's Rules and Regulations also include water conservation requirements for outdoor water use. These include watering restrictions during specified times of day, and alternating day watering schedule based on location.

3.1.3.5 Education Activities

In support of the District's goal of instilling a water conservation ethic throughout the community, public outreach efforts are pursued as a component of the overall water conservation strategy. The District regularly provides information to the public to increase community support for wise water use practices and programs. The District undertakes these efforts to help create an increased recognition throughout the community of the value of water and its role in our community. Information about water saving practices and programs are disseminated to the community through a wide host of avenues including: Water Quality Reports, Individual account comparisons and analysis, Mailings/Newsletters, SWSD Web site.

Table 10 Historical Demand Management Activities Summary

Historical and Current Water Efficiency Activities	Period of Implementation	Annual Water Savings for Past Five Years (%)					Total Five-Year Water Savings [AF]	Average Annual Savings [%]
		2008	*2009*	*2010*	*2011*	*2012*		
Foundational Activities								
Water Rate Increase/Structure/Pricing [1]	**Not Available**	**6%**	**6%**	**6%**	**6%**	**6%**	**276** [2]	**6%**
Leak Detection and Waterline Replacement Program [3]	**2009**	**Not Applicable** [4]	**6%** [4]	**11%** [4]	**4%** [4]	**Not Available** [4]	**329** [5]	**7%**
Subtotal							**605**	**7%**
Targeted Technical Assistance and Incentives								
None to date								
Subtotal								
Ordinances and Regulations								
Indoor Water Fixture Regulations [6, 7, 8, 9]	**2004**	**2.4 x 10^{-4} %**	**3.7 x 10^{-4} %**	**1.3 x 10^{-4} %**	**5.8 x 10^{-4} %**	**2.0 x 10^{-4} %**	**0.03**	**3.0 x 10^{-4} %**
Outdoor Water Use Regulations [10]	**2004**	**4%**	**4%**	**4%**	**4%**	**4%**	**170** [11]	**4%**
Subtotal							**170**	**4%**
Education Activities								
Miscellaneous Customer Education/Outreach	**Not Available**	**Not Applicable** [12]						
Subtotal								
	Total Savings	**5%**	**5%**	**7%**	**5%**	**5%**	**775**	**5%**

1. Tiered rate structure was established prior to the 5-year analysis range of this study. However, the SWSD does conduct annual rate increases of approximately 5% annually. Water savings estimates were made based on this annual increase and industry estimated demand elasticity estimates. Elasticity values were applied to each tier category and by customer type (either residential or commercial). Elasticity values were: -Single/Multi Family Residential: Tier 1/2 = 0, Tier 3 = -0.05, Tier 4 = -0.1, Tier 5 = -0.2; - Multi Family Com/Comm: Tier 1/2 = 0, Tier 3 = -0.1, Tier 4 = -0.2, Tier 5 = -0.3 Based on metered demand distribution by customer type, and consumption within each teir, this resulted in an estimated water savings of approximately 6%.
2. Estimated total 5-year water savings assumes consistent elasticity and resulting annual 6% reduction.
3. SWSD implemented its leak detection and waterline repair program. As shown on Table 3, % Non-revenue water has dropped consistently since implementation of the program. Estimated percent water savings are based on the calculated difference in % non-revenue water from year to year.
4. 2008 - Leak detection and waterline replacement program had not yet commenced. 2009 - From 2009 to 2010 the estimated percentage of non-revenue water dropped from 51% to 45%, the estimated difference of 6% is assumed to be attributed to the initiation of the program. 2010 - Similarly, from 2010 to 2011, lost water dropped from 45% to 34%, a difference of 11%. 2011 - From 2011 to 2012 lost water dropped from 34% to 30%, a difference of 4%. 2012 - Lost water data is not available for 2013 to estimate the % water loss reduction between those two years.
5. Δ% Year1-Year2 x Total Annual WTP Production Year2 = Estimated Annual Saved WaterYear2
6. SWSD Indoor Water Fixture Regulations included showers, toilets and faucets. Watersense estimates the following household water use (by percentage) for the applicable fixtures: Toilets (26.7%), Showers (16.8%), Faucets (15.7%). Those values were multiplied by the average annual use/EQR for Single Family Residential and Multi Family Residential for approximate use per EQR for each fixture among SWSD customers. (http://www.epa.gov/watersense/our_water/water_use_today.html)
7. %-Reduction in water use estimated as 38% for Toilets (assumes toilets were c. 1980-1994, 4 GPF, Vickers, 2001), 25% for Showerheads (assumes showerhead were c. 1980, 4 GPM, Vickers, 2001) and 17% for Faucets (assumes faucets were c. 1980, 3 GPM, Vickers, 2001).
8. Average annual "new" customers for Single Family Residential and Multi Family Residential estimated as annual EQR growth per year.
9. Estimated No. New EQR x Use/EQR (by fixture) x % Reduction (by fixture)
10. The efficacy of watering restrictions varies widely depending on voluntary vs. mandatory, level of enforcement, extent of limitation and publicity of the ordinance. Kenny, et. Al. found average 4% per capita water savings occurred for those utilities that implemented VOLUNTARY watering restrictions on a 3-day rotation. It is estimated that similar savings have been achieved among SWSD customers. (Kenney, et. al., 2004. Use and Effectiveness of Municipal Water Restrictions During Drought in Colorado. AWWA Journal).
11. Estimated water savings = Historical Annual Metered Water Volume / (1- 4%); 2008 data not available.
12. It is generally accepted that public outreach campaigns alone do not achieve water conservation savings but rather, create a "culture of wise water stewardship, which over time results in behavior change and effective action…" (Guidebook of Best Practices for Municipal Water Conservation in Colorado, 2010).

3.1.4 Demand Forecasts

3.1.4.1 EQR Projections

The District plans and manages its water supply through a system using Equivalent Residential Units (EQR's). The base unit of one EQR is established to be the typical water use of a 3-bedroom, 2-bath home occupied by 4 persons. **Table 11** provides a summary of the estimated build out for SWSD as EQRs. Detailed development information is provided in **Appendix A**.

Table 11 Projected Build-Out EQRs for Known SWSD Developments

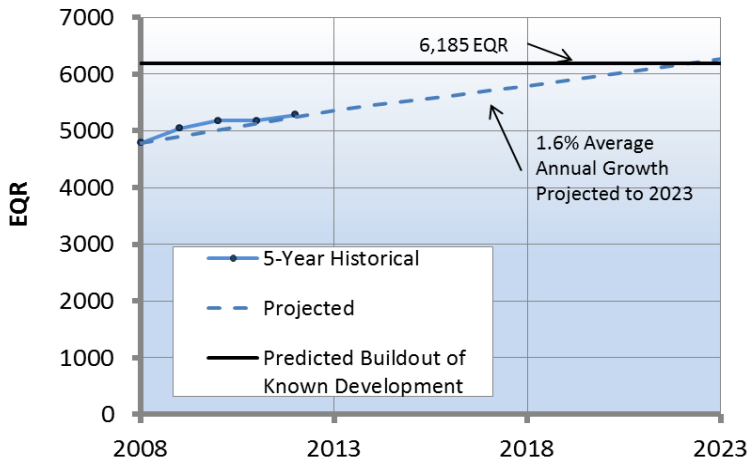
Customer Type	EQR Tally			Percent Increase
	2012	Build-Out	New EQRs Added	
Single Family Res.	1,748	2,040	**292**	16.7%
Multi Family Res.	659	710	**51**	7.7%
Multi Family Comm.	2,115	2,560	**445**	21%
Commercial	760	875	**115**	15.1%
Total	5,282	6,185	**903**	**17.1%**

SWSDs rate of EQR growth since 2008 has ranged from -1.3% (from 2011 to 2012) to 5.4% (from 2009 to 2010). The 5-year average has been approximately 1.7 %. Based on knowledge of planned development projects within the service area, type of customers associated with each planned development project and anticipated project schedule and timing, SWSD staff indicate that rate of growth will vary by customer class as follows:

- Single Family Residential – 0.79% per year
- Multi Family Residential – 0.98% per year
- Multi Family Commercial – 2.3% per year
- Commercial – 1.7% per year

Figure 8 shows the total projected annual EQR growth.

Figure 8 Projected Annual EQR Growth



3.1.4.2 Water Use Forecast

Table 4 provides historical average annual demand per EQR for various potable water customer types. Demands are for In-District water users only. Those values are multiplied by projected annual EQR to estimate future water demand within SWSD. **Table 9** shows annual water use forecast for the next 10-years based on that anticipated growth and historical water consumption[3].

Table 12 Projected Total Annual In-District Water Demands

	Single Family Residential (429 GPD/EQR)		Multi Family Res. (206 GPD/EQR)		Multi Family Commercial (227 GPD/EQR)		Commercial (270 GPD/EQR)		Total (305 GPD/EQR)	
Year	*EQR*	*Annual Demand (AFY)*	*EQR*	*Annual Demand (AFY)*	*EQR*	*Annual Demand (AFY)*	*EQR*	*Annual Demand (AFY)*	***EQR***	***Annual Demand (AFY)***
2012	1,748.0	840.7	659.0	152.1	2,115.0	538.0	760.0	229.9	**5,282.0**	**1,760.7**
2013	1,761.8	847.3	665.5	153.6	2,163.4	550.3	773.1	233.9	**5,363.8**	**1,785.1**
2014	1,775.7	854.0	672.0	155.1	2,213.0	562.9	786.5	238.0	**5,447.2**	**1,810.0**
2015	1,789.6	860.7	678.6	156.6	2,263.7	575.8	800.1	242.1	**5,532.0**	**1,835.2**
2016	1,803.8	867.5	685.3	158.2	2,315.5	589.0	814.0	246.3	**5,618.5**	**1,860.9**
2017	1,818.0	874.3	692.0	159.7	2,368.5	602.5	828.1	250.5	**5,706.5**	**1,887.1**
2018	1,832.3	881.2	698.8	161.3	2,422.8	616.3	842.4	254.9	**5,796.2**	**1,913.7**
2019	1,846.7	888.2	705.7	162.9	2,478.2	630.4	857.0	259.3	**5,887.6**	**1,940.7**
2020	1,861.3	895.2	712.6	164.5	2,535.0	644.8	871.8	263.8	**5,980.6**	**1,968.2**
2021	1,875.9	902.2	719.6	166.1	2,593.0	659.6	886.9	268.3	**6,075.4**	**1,996.2**
2022	1,890.7	909.3	726.6	167.7	2,652.4	674.7	902.2	273.0	**6,172.0**	**2024.7**
2023	1,905.6	916.5	733.8	169.4	2,713.2	690.1	917.8	277.7	**6,270.4**	**2053.7**

Table 13 provides a summary of the total projected water deliveries including Brush Creek Metro District and Snowmaking.

[3] Note: known build-out for Multi-Family Residential, Multi Family Commercial and Commercial is reached in 2021 – growth estimates are projected to 2023 for those customer classes; known build-out for Single Family Residential will not be reached until 2032. However, a 10-year horizon is the appropriate length of time for planning in the area at this time.

Table 13 Projected Total Annual Potable and Non-Potable Water Deliveries

Year	Total Projected Annual Water Demand SWSD (AFY)				
	In-District Demands	*Brush Creek Metro District*[1]	***Total Annual Potable Water Deliveries***	*Snowmaking (Non-Potable)*[2]	***Total***
2012	1,760.7	45	**1,805.7**	321	**2,126.7**
2013	1,785.1	45	**1,830.1**	321	**2,151.1**
2014	1,810.0	45	**1,855.0**	321	**2,176.0**
2015	1,835.2	45	**1,880.2**	321	**2,201.2**
2016	1,860.9	45	**1,905.9**	321	**2,226.9**
2017	1,887.1	45	**1,932.1**	321	**2,253.1**
2018	1,913.7	45	**1,958.7**	321	**2,279.7**
2019	1,940.7	45	**1,985.7**	321	**2,306.7**
2020	1,968.2	45	**2,013.2**	321	**2,334.2**
2021	1,996.2	45	**2,041.2**	321	**2,362.2**
2022	2,024.7	45	**2,069.7**	321	**2,390.7**
2023	2,053.7	45	**2,098.7**	321	**2,419.7**

1. **Based on historical 5-year average and assuming no additional water demands to be met by SWSD.**
2. **This analysis estimates these deliveries based on the most recent historical maximum, which occurred in 2012. Total annual volume of non-potable water to be delivered to Aspen Skiing Company for snowmaking purposes is not fixed or capped, but is based on reservoir fill volume, continuous inflow rate district operational conditions, municipal demand requirements and numerous other conditions.**

4.0 Integrated Planning and Water Efficiency Benefits and Goals

4.1.1 Water Efficiency and Water Supply Planning

Over 95% of the water used in the District's service area originates from the Snowmass Creek and East Snowmass Creek; therefore water use in Snowmass Village is linked directly to Snowmass Creek stream health and biology. The fundamental conservation principles underlying the District's water management and conservation goals are driven by the need to protect stream-flows and water quality in the Snowmass Creek and Brush Creek basins as well as the Roaring Fork River. High water demands during the late summer irrigation season and the winter ski season often coincide with low stream flows periods. Efficient use of water through the adoption of conservation measures identified in this plan is an important component of the District's goal of maintaining and enhancing stream-flows. The Water Conservation Plan will provide guidance in planning conservation programs that are consistent with the District's water resource management strategy.

It is the District's policy to manage its water supply and distribution systems to minimize waste and encourage the efficient use of its water supply.

This Water Conservation Plan was developed under the direction of the District's Board of Directors, the District Manager, Kit Hamby, the District's Water Conservation Officer, Christie Duckett, and an SGM engineer, Shannon Ullmann. Input was solicited from Snowmass Village residents and the Town of Snowmass Village's Environmental Advisory Board and was integrated into this plan.

The Colorado Water Conservation Act of 2004 (HB 04-1365) requires that any water provider with annual retail water deliveries in excess of 2,000 acre-feet develop a Colorado Water Conservation Board (CWCB)-approved Water Efficiency Plan. Water providers are required to have an approved plan in place to maintain eligibility for financial assistance from CWCB or the Colorado Water and Power Authority for water and wastewater infrastructure projects. Entities which have completed an approved plan also are eligible to apply for CWCB grant funds to implement their water conservation plans.

Recent potable and non-potable water deliveries made by SWSD have begun to exceed 2,000 AF/Year (2008-2010). The District's Board of Directors believes it is prudent to update the current water conservation measures and consider other measures that are consistent with the District's water resource management strategy and the State's statutory requirements.

4.1.2 Water Efficiency Goals

The District possesses adequate water supplies to meet current demand. Projections by the District of available raw water supplies indicate that the District will be able to supply sufficient treated water to meet a maximum availability of 6,200 EQR's. Through water conservation, the District can reduce the amount of water diverted from the Snowmass Creek basin thereby reducing the amount that they must ultimately acquire or develop in order to meet its build-out demand. The water conservation goals were established with this in mind and are intended to benefit both the District and its customers.

SWSD's has set goals in this WEP based on the types of customers that they serve. Ultimately it is SWSD's WEP goal that these initiatives will be appropriately set to target all customer classes to achieve savings from all water customers.

- Single Family Residential - Because the single family residential class is the single largest customer class consumer within the District's water service area, the District has set a goal of developing a stronger connection with its customers in a way that targets this group. This WEP will prioritize communication and incentive measures that will give Single Family Residential customers the resources to reduce their water use.

- Other customer classes – Remaining customer classes, including Multi Family Residential, Multi Family Commercial and Commercial are addressed with this conservation plan; however, it will be necessary to develop additional data associated with the other customer classes to set and monitor meaningful and quantifiable goals. Examples of data that will be developed include:

    - Multi-Family Commercial and Commercial
        - Irrigated Area
        - Types of Business
        - Square Footage of Commercial Space
        - Number of employees

    - Multi-Family Residential
        - Number of Units
        - Occupancy Estimates

These initiatives will ultimately target all customer classes to achieve savings from all water customers.

5.0 Selection of Water Efficiency Activities

5.1 Summary of the Selection Process

Step 1. SWSD staff reviewed and screened all potential measures included in the 2012 CWCB guidance document. Details of the Step 1 screening analysis are provided in **Appendix C, Worksheets D-H**. The resulting list includes 37 potential measures that were carried on to Step 2.

Step 2. SWSD staff presented a list of 37 potential measures to the Environmental Advisory Board (EAB) for comment and to the SWSD Board for comment and approval. Both entities ranked each measure 1-5 based on the level of anticipated community buy-in, the level of impact each measure might have on local stream flows.

Step 3. Following Environmental Advisory Board (EAB) and SWSD board review, SGM met with district staff to evaluate and revise the list, and recommend timing for those measures that are not already been in place or initiated.

The results of Steps 2 and 3 are provided in **Table 14** below. A summary of the 37 potential measures presented to EAB, SWSD board are provided in the sections that follow.

Table 14 Water Efficiency Measures Full-List with Review Comments

Category	Measure	EAB Feedback[1]	SWSD Board Review	Final Recommended Prioritization and Timing
1 Water Efficient Fixtures/ Appliance Incentives	a. Establish High-Efficiency Indoor Fixture Requirements for New Developments	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **In Progress**
	b. Toilet Rebates (Residential Only)	Rank-**2** Feedback: Align with Regional WEP	Rank-**1** Approved Comments: Align with Regional WEP	Rank-**2** Timing: **2-4 years**
	c. Free Indoor Water Conservation Kits (Residential Only)	Rank-**4**	Rank-**4** Disapproved	Excluded
	d. New and Retrofit Fixture Incentives (Commercial Only)	Rank-**2**	Rank-**2** Approved	Rank-**3** Timing: **5-7 years** Comments: after rate change, billing system upgrades and monthly service fee implementation (5a-c)
2 Landscape Efficiency	a. Establish Landscaping and Irrigation System Design Requirements for New Development	Rank-**1** Feedback: Consider CML or DOLA model landscape codes	Rank-**1** Approved Comments: Include soil amendments; require rain sensor; GJ Pipe certified landscape planner	Rank-**2** Timing: **In Progress** Comments: include irrigation system controller and soil amendments
	b. Update Water Waste Policies and Enforce a "Water Waste" Ordinance	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **1-2 Years**
	c. Limit Irrigation Watering Times	Rank-**2**	Rank-**2** Approved	Rank-**2** Timing: **In Progress**
	d. Restrict Water Features/Fountains and Charge System Development Fees based on Volume	Rank-**2**	Rank-**2** Approved	Rank-**2** Timing: **1-2 Years**
	e. Rebates for Smart Irrigation Controllers	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **2-4 years**
	f. Rain Sensor Rebate for Existing Customers	Rank-**1**	Rank-**1** Approved Comments: Identify high end customers; require rain sensors for all new customers	Rank-**2** Timing: **2-4 years**
	g. Free Irrigation Audits	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **1-2 years**
	h. Free Outdoor Water Conservation Kits	Rank-**2**	Rank-**4** Disapproved	Excluded
	i. Promote Replacement of Conventional Landscape with Xeriscape	Rank-**2** Feedback: Consider partnership with TOSV to sponsor annual speaker	Rank-**2** Approved	Rank-**3** Timing: **5-7 years**
3 Commercial Efficiency	a. Provide Free Water Audits for Top Ten Water Users Based on Water Consumed/EQR	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **1-2 years**
	b. System Development Fee Incentives for New Development	Rank-**5**	Rank-**5**	Excluded
4 Education/	a. Water-Efficient Landscape and Irrigation System Brochures	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **2-4 years**

Category	Measure	EAB Feedback[1]	SWSD Board Review	Final Recommended Prioritization and Timing
Information Distribution	b. Water Conservation Webpage	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **In Progress**
	c. Public Information and Education	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **Immediate**
	d. Provide Conservation Tips on Water Bills or Newsletters	Rank-**2**	Rank-**2** Approved	Rank-**2** Timing: **1-2 years**
	e. Youth and Teacher Education	Rank-**2**	Rank-**2** Approved	Rank-**2** Timing: **In Progress**
	f. Spearhead the Creation of a District Water Conservation Taskforce	Rank-**2**	Rank-**5** Disapproved	Excluded
	g. Conduct Annual Water Conservation Workshops	Rank-**1**	Rank-**5** Disapproved	Excluded
5 Water Rate Structures and Billing	a. Modify and Adopt a Water Rate Structure That Continues to Promote Water Conservation	Rank-**1**	Rank-**1** Approved	Rank-**1** Timing: **Immediate** Comments: develop initial rate structure modification based on quarterly billing; plan secondary rate structure evaluation after monthly billing takes effect (5b)
	b. Billing System Upgrade	Rank-**2**	Rank-**1** Approved	Rank-**1** Timing: **In Progress**
	c. Monthly Service Fee Billing	Rank-**2**	Rank-**1** Comments: Future consideration	Rank-**1** Timing: **1-2 years** Comments: to follow immediately after upgrade of water distribution system customer meters (7d)
6 Water Reuse/Raw Water Systems	a. Develop Water Conservation Best Management Practices for Water Treatment Plant and Wastewater Treatment Plant	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **2-4 years**
	b. Wastewater Treatment Plant Reuse Water	Rank-**2**	Rank-**2** Approved	Rank-**2** Timing: **5-7 years**
	c. Promote the Use of Non-potable Supplies for Irrigation	Rank-**2**	Rank-**2** Comments: Future Consideration	Excluded Comments: this does not necessarily meet goals to reduce water consumption and was therefore excluded from the plan
7 Water Loss Control	a. Annual Water Line Replacement Program	Rank-**1**	Rank-**1** Approved	Rank-**1** Timing: **In Progress**
	b. Leak Detection Program	Rank-**1**	Rank-**1** Approved	Rank-**1** Timing: **In Progress**
	c. Prompt Repair of Water Line Breaks and Leaks	Rank-**1**	Rank-**1** Approved	Rank-**1** Timing: **In Progress**
	d. District Ownership and Upgrade of Private Water Meters	Rank-**2**	Rank-**1** Approved	Rank-**1** Timing: **In Progress**
	e. Fixed Network AMI Water Metering System	Not Available	Rank-**1** Approved	Rank-**1** Timing: **1-2 years** Comments: to follow immediately after upgrade of water distribution system customer meters (7d)
	f. Improve System-Wide Distribution System Accounting	Rank-**2**	Rank-**1** Approved	Rank-**1** Timing: **2-4 years** Comments: to follow installation of AMI metering system and pending results analysis indicating system losses are still out of range

Category	Measure	EAB Feedback[1]	SWSD Board Review	Final Recommended Prioritization and Timing
8 Other Water Management Activities	a. Water Conservation Officer Staff Position	Rank-**1** Feedback: Position could be filled by an intern	Rank-**1** Approved	Rank-**2** Timing: **In Progress**
	b. Snowmaking Efficiencies and Water Management Practices	Rank-**1**	Rank-**1** Approved	Rank-**2** Timing: **In Progress**
	c. Ziegler Reservoir Operations	Rank-**2**	Rank-**1** Approved	Rank-**2** Timing: **In Progress**

Rank Description

0 High environmental benefit and high community buy-in (Foundation measures were given a rank of 1)
1 High environmental benefit; medium community buy-in
2 Medium environmental benefit; medium community buy-in
3 Low environmental benefit; low community buy-in
4 Not practical

1. The Town of Snowmass Environmental Advisory Board (EAB) is a collaborative group committed to updating and accomplishing the goals for the town's Environmental Sustainability Plan. The EAB provides technical expertise and broad community perspective to develop recommendations concerning projects, programs, policies and operational practices that benefit the natural environment, the local economy and community.

5.2 Demand Management Activities

5.2.1 Foundational Activities

Worksheet D, summarizing foundational activities evaluation is provided in **Appendix C**.

5.2.1.1 Metering

7d. District Ownership and Upgrade of Private Water Meters

- Estimated Cost: $366,000 with $100,000 CWCB Grant initial, $2,400 annual

The biggest accounting loss for water utilities is under-metering. Metering of all customers is required in Colorado as of 2005 pursuant to (CRS 37-97-103) "Water Metering Act" for systems with more than 600 taps and although the District's system is fully metered, inaccuracies are probably the largest accounting point of loss.

Depending on the season, the District sees a significant difference between the amount of water produced at the Water Treatment Plant and the billed water volume. Measuring and accounting for use and billing customers for what they use is fundamental to all water conservation efforts. The District can't manage what they can't measure.

Meters enable the District to bill customers based for their actual consumption and provide customers with direct feedback on their water use. Customers who pay for exactly the amount of water they use consume less water. Older meters – between 10 and 15 years old - tend to lose accuracy, normally under-reporting use, particularly under low-flow conditions. Older high-flow compound commercial meters also tend to under-report within ten years of installation. With the under-reporting of meters there is less incentive for customers to conserve water. Conservation savings will not be quantified if customer meters are not being read and billed appropriately.

As the system currently operates, there are three specific shortcomings with the existing water meters:

1. First, meter repair and maintenance is the responsibility of the customer. And, the SWSD does not currently have non-compliance fees in place to accommodate customer meter repair. As a result, many of the meters are old and have not been well maintained by their owners. Meter failure results in inaccurate customer usage accounting and sends inaccurate use and price-signals to those customers.

2. Second, many of the meters are old, manual-read technology. This requires significant SWSD staff time to collect customer usage information. For this reason, meter-reading frequency is quarterly. The SWSD board will increase meter-reading frequency to monthly, but first must convert manual-read meters to radio-read meters.

3. Third, commercial customer meters are selected based on anticipated "full-capacity" demands. The seasonal nature of Snowmass's commercial industry results in frequent periods of low water use for these customers. The large commercial meters do not accurately account for water during low-demand seasons.

In the fall of 2013, SWSD solicited and obtained grant funding through CWCB's local Colorado River Basin Roundtable Water Supply Reserve Account to conduct a systematic meter repair and replacement program. The SWSD has begun replacing what it considers its most critical customer meters, and will use grant funding to expedite the replacement program and allow "next steps" to occur in a shorter time frame. Those "next steps" include increased billing frequency, ultimately AMI continuous-read capability and WEP implementation monitoring.

7e. Fixed Network AMI Water Metering System

- Estimated Cost: $76,000 initial, $2,000 annual

Customer water use recording frequency can be further increased through installation of a fixed-network AMI system. SWSD is in favor of such a system given the range of benefits it provides both to the customer and to the SWSD. Consumption information will be automatically posted and downloaded to the District's utility billing system. Customers will then be able to visit the District's web site and access their individual accounts where they can view current consumption and compare to their historical consumption. It is anticipated that the system would help SWSD identify system leaks and allow customers to better manage their water use.

As part of **Measure 7d District Ownership and Upgrade of Private Water Meters** SWSD customers will all have T-10 radio-read water meters with R-900 MIU wall transmitter installed. These meters are compatible with the Neptune AMI fixed network radio system.

Once **Measure 7d** is complete, SWSD will initiate this measure. It is anticipated that two or three small weather-proof AMI data collection terminals will be needed. Radio frequency meters will send real-time reads to these data collectors which in turn relay this information directly to the SWSD office. The AMI system can report data at a variety of intervals to help detect leaks *or* reversed flow, and unauthorized tampering.

5.2.1.2 Demand Data Collection and Billing Systems

5b. Billing System Upgrade (Timing: In progress)

- Estimated Cost: $15,000 initial, $625 annual

SWSD purchased Muni-Billing software in the summer of 2013. The software has been installed and will be used for the upcoming 3rd-quarter, 2013 billing cycle. The new software allows customers to pay bills online, receive bills via email, and review water and utility usage data online. This is the first step the SWSD will take towards improving the existing billing system to improve both billing efficiency and ultimately customer water use efficiency.

5c. Monthly Service Fee Billing

- Estimated Cost: $171,000 annual

Billing cycles not only provide the District with the ability to track water usage but can also influence customer rate response. Customers need to be provided with regular consumption information as well as some context for understanding the relative efficiency of their usage.

Quarterly billing is far less successful at influencing customer behavior than monthly billing. Furthermore, the District has received numerous complaints regarding the quarterly billing, disconnect between the timing of billing and actual usage and the amount of money paid for a quarter of use versus less paid on a monthly basis. Prompt monthly billing will allow customers to adjust their water use on a timely basis, in response to their bill.

Two measures were identified as being critical first-steps to be completed before moving from quarterly to monthly billing.

- Completion of **Measure 7d District Ownership and Upgrade of Private Water Meters** was a critical step because the new meters will be radio read capable. Currently, SWSD staff must manually read many of their customers' water meters. This is time consuming and SWSD does not have the resources to conduct manual meter reading on a monthly basis. **Measure 7d** will eliminate manual read requirements and make meter reading more efficient.

- Completion of **5b. Billing System Upgrade** was also a critical step in moving from quarterly to monthly billing. Muni-billing allows bills to be distributed and paid electronically which will increase bill distribution and collection efficiency.

5.2.1.3 Water Efficiency Oriented Rates and Tap Fees

3b. System Development Fee Incentives for New Development

- Estimated Cost: $2,000 initial, $0 annual

System Development or Tap fees can be developed based on anticipated future demand. By tying tap fees to more efficient fixtures, developers are encouraged to implement water conserving fixtures and landscapes from the very beginning. Linking tap fees to water consumption will insure that the low demands projected when tap fees are paid will actually be observed over time. Under an equitable policy where new customers pay their fair share of water system development costs, anticipated demand is an important parameter to include in tap fee calculations which in turn encourages more efficient use.

The District would discount System Development Fees by 5% when customers install high-efficient fixtures. The District will maintain a list of acceptable fixtures and will consider other fixtures not found on their list based on EPA Water Sense ratings or MaP (**Ma***ximum* ***P****erformance*) standardized testing.

5a. Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation

- Estimated Cost: $20,000 initial

Among the remaining water conservation measures under consideration by SWSD, two of the three foundational measures have been systematically undertaken prior to creation and submission of this WEP. Those measures include: (1) Water Loss Control and (2) Metering Accuracy. The SWSD is currently poised to undertake the third foundational measure: Modification of its water rate structure that continues to promote water conservation. The SWSD's mil levy was up for re-election in November, 2013, and SWSD did not want to modify its rates until the results of that election had been finalized. In November, the mil

levy went to a vote and was approved. The SWSD will now begin adjustments of its water rates based on those results.

The SWSD implemented an increasing tiered rate structure in January of 2000 and amended in November of 2005 to help promote efficient water use. While SWSD modifies the rates assigned to each tier on a regular basis, the usage delineations have not been modified since that time. **Table 15** summarizes the existing structure and rates.

Table 15 SWSD Existing Water Rates

Tier	Usage Range (Gal/Qtr-EQR)	Rate
Tier 1	0-15,000	Included in Base Rate ($53.51)
Tier 2	15,001-30,000	$2.33 / K-Gal
Tier 3	30,000-60,000	$3.94 / K-Gal
Tier 4	60,001-100,000	$4.77 / K-Gal
Tier 5	>100,000	$6.48 / K-Gal

Characteristics of SWSD's existing water rates include:

- Base Fee: SWSD charges a standard customer quarterly Base Rate service charge applied to all customer classes, regardless of the amount of water consumed to cover fixed costs and the estimated cost to deliver water to District customers.

- Usage Fees: Pricing designed to encourage and reward water conservation efforts, particularly regarding outdoor irrigation, while discouraging misuse of the District's water supply.
    - Tier 1, no charge, is based on one-half of an efficient level of quarterly indoor use (approximately 25,000 – 30,000 gallons per EQR per quarter). Tier 1 is structured in a way that provides a positive price signal to customers to stay within the 0-15,000 gallons per EQR per quarter range. This water is provided free of charge to Village customers.

    - Tier 2, $2.65 per 1,000 gallons, is charged for water use from 15,001 gallons to 30,000 gallons per EQR per quarter, covers the estimated cost to process water at the Water Treatment Plant including staffing, utility costs, maintenance costs and water treatment plant capital replacement costs.

    - Tiers 3-5, the "conservation tiers", allow for revenue stability while linking excess water use to the cost of developing new supplies. These tiers target customers who have the greatest potential to save water. Although revenue from the upper tiers could be used to fund the development of additional raw water storage and pay towards the District's loan with the Colorado Water Conservation Board for the construction of Ziegler Reservoir, the District can also use this revenue to fund conservation-based programs directed at the customers who use water in the high tiers.

Since implementation of the water rate structure, SWSD has had the opportunity to evaluate the effectiveness of the existing rate structure and consider opportunities for improvements. The 2014 rate structure adjustment will consider:

- Elimination of "free" water in the Tier 1 category

- Delineation of fees by customer type (i.e. commercial vs. residential)
- Adjustment of the "conservation tiers" to better align customer use with SWSD revenue requirements associated with assigned "conservation projects."
- Apply fees that will serve as the basis for anticipated change from quarterly to monthly billing once meter replacement program (Measure 7d.) has been completed.

5.2.1.4 System Water Loss Management and Control

7a. Annual Water Line Replacement Program
7c. Prompt Repair of Water Line Breaks and Leaks

- Estimated Cost: $135,000 annual

The District has analyzed water line breaks and repairs within the distribution system. This analysis identified sections of water lines, primarily in the oldest part of the system, which showed an increasing trend in the number of breaks. These sections are made up of 17.1 miles of cast iron pipe (CIP) that are more prone to water line breaks and leaks than the remaining 32.9 miles of ductile iron pipe (DIP). As a result of the analysis, in 2006 the District developed a strategy for the in-house replacement of approximately 2,000 linear feet of pipe each year to reduce the number of breaks and leaks in the distribution system. The District also maintains a current policy to mobilize equipment and repair major water line breaks immediately. Minor breaks or leaks of less than an estimated 10 gallons per minute are repaired within 48 hours after discovery.

7b. Leak Detection Program

- Estimated Cost: $12,000 annual

Leak detection/leak management is the organized, proactive functions of a water utility to control distribution system leakage to an economic minimum. This includes appropriate combinations of active leakage control including flow analysis, leak detection, water line repair and replacement, pressure zone management, and system rehabilitation. The District's leak detection program is considered one of the most aggressive and successful programs in the State. In 2009 the District tested over 40% of the 46 miles of water distribution system and in 2010 the District tested 100% of its lines. The American Water Works Association recommends an annual leak detection program test on 20% of distribution system. To control water loss the District has purchased leak detection equipment at a cost of $40,000 and currently performs leak detection in the Spring on 80-100% of distribution system and follows-up in the Fall with leak detection testing and retesting on 50-60% of the distribution system. The District plans to continue this successful program.

7f. Improve System-Wide Distribution System Accounting

- Estimated Cost: $30,000 annual

The long-term success of a water conservation program hinges upon the ability to measure and track water within the distribution system. This program would include the installation of

magnetic meters (MAG) in District PRV vaults to measure the water transferred through the PRV vault to lower pressure zones. Real-time information obtained from PRV mag meters is critical in developing historical water use trending patterns for the various pressure zones and subdivisions. The District will be able to track system loss, subdivision use patterns, water line breaks, monitor pressure spikes, measure hydrant fire flows, identify main line flow restrictions and assess water quality by determining the age of water in the distribution system.

While the SWSD Board identifies this as an important piece of its Water Efficiency Plan, the implementation of other distribution system loss measures, including **7a. Annual Water Line Replacement Program, 7b. Leak Detection Program, 7c. Prompt Repair of Water Line Breaks and Leaks, 7d. District Ownership and Upgrade of Private Water Meters and 7e. Fixed Network AMI Watering System** result in some overlap with this measure. As such, the SWSD board will initiate this measure as the last one to address distribution system losses.

5.2.1.5 Planning

None

5.2.1.6 Staff

8a. Water Conservation Officer Staff Position

- Estimated Cost: $12,000 annual

A Conservation Officer facilitates and implements programs, improves customer understanding of conservation, assists in development and dissemination of information, develops and supports conservation planning and program activities, and when necessary assists in implementing mandatory demand restrictions.

In 2012, the SWSD expanded the duties of the existing part-time Billing Manager, Christie Duckett to include Water Conservation Officer. The District's goal was to have a staff member designated to be in charge of water conservation planning and implementation, even if this person's primary work responsibility is in another area. Ms. Duckett has been responsible for the majority of Water Efficiency measures undertaken to date, including creation of the WEP portal of the utility's website, development of education and outreach materials and oversight of the billing system upgrade.

5.2.2 Targeted Technical Assistance and Incentives

Worksheet E, summarizing targeted technical assistance incentives activities evaluation is provided in **Appendix C**.

5.2.2.1 Level 1 Utility Facility Water Efficiency

8c. Zeigler Reservoir Operations

- Estimated Cost: $0

Ziegler Reservoir provides system reliability, emergency raw water storage and continued water supplies to the District customers in the event that there is an interruption in or

curtailment of the ability of the District to use any of its sources of supply. As stated earlier, the fundamental conservation principles underlying the District's water management and conservation goals are driven by the need to protect stream flows and water quality in the Snowmass Creek and Brush Creek basins as well as the Roaring Fork River.

In 2011 the District adopted a Ziegler Reservoir Operating Plan. The objective of the plan is to build flexibility into the daily operation of the District while providing customers with reliable water service and insuring a high level of protection in the event of an interruption in the supply or a catastrophic failure of the raw water delivery system. This reservoir operating plan provides a framework that will help direct staff on the use, filling and refilling of Ziegler Reservoir. Embedded in this plan is a strategy to avoid dropping stream flows below the District's stewardship goal.

5.2.2.2 Level 2 Management of Largest Customer Demands

3a. Provide Free Water Audits for Top Ten Water Users Based on Water Consumed per EQR

- Estimated Cost: $5,000 annual

The SWSD board identified this measure of being valuable, but will roll out the programs together with **Measure 2g Free Irrigation Audits**. **Measure 3a** depends on meter accuracy that the SWSD is in the process of improving as part of **Measure 7d District Ownership and Upgrade of Private Water Meters**. It is anticipated that Measure 7d will be completed by the end of 2015, at which time SWSD will have greater confidence in the metered water usage especially for large commercial customers.

Measure 3a. will focus primarily on commercial customers, however, through program development, SWSD will also consider including residential customers as well. This measure will consider both indoor and outdoor water use. By identifying and targeting the highest use customers, site-specific recommendations can be made to lower water use. SWSD believes this will serve both as a means of cost-effectively targeting "low-hanging fruit" and promote SWSD's water conservation efforts among its customers. It is anticipated that this program would be on-going and audits would be performed twice a year.

8b. Snowmaking Efficiencies and Water Management Practices

- Estimated Cost: $0

Aspen Skiing Company (ASC) obtains snowmaking water from East Snowmass and Snowmass Creek via SWSD's BPS. Their snowmaking right is junior to the Snowmass Creek minimum stream flow. With colder temperatures, natural steam flow drops, limiting ASC's ability to divert water for snowmaking. ASC is then forced to divert water for snowmaking during warmer periods.

However, ideal snowmaking conditions depend on various factors including temperature. Ideal temperatures result in higher snow production per volume of water. Because ASC could not divert when temperature conditions were ideal, snowmaking production per volume of water was not ideal.

The District and the ASC have recently entered into an agreement to provide ASC with snowmaking water from Ziegler Reservoir. With the new snowmaking agreement ASC can now make snow when conditions are ideal. As a result ASC will use less water and energy and achieve better coverage.

In addition to temperature optimization, numerous other technologies exist to further improve snow production per water volume ratios. Such technologies include the use of additives to improve snowflake nucleation, increased air pressure and computerized control systems that monitor weather conditions. SWSD will work with ASC to facilitate such improvements, but ultimately, the implementation and cost will be the responsibility of ASC.

5.2.2.3 Level 3 Management of Remaining Customer Demands

1b. Toilet Rebates

- Estimated Cost: $3,000 initial, $1,000 annual

SWSD board and staff understand that toilet rebate programs offer opportunity for success both in water savings and in public awareness and customer relations. For these reasons, the rebate program is of importance to SWSD. SWSD also understands that neighboring water providers will soon be undertaking a regional water efficiency planning effort, of which SWSD will be a part. EAB and SWSD board anticipate that this measure will lend itself well to regional efforts and expects timing to be aligned with that of the other regional WEP participants.

Toilets account for approximately 30% of residential **indoor** water use. Replacing a pre-1994 toilet with a new high-efficiency model can reduce water used for toilets by at least 60% and save about 16% of total indoor water use. Savings for a typical household would be more than 10,000 gallons per year. Newer toilet models use even less water - 0.8 gallon per flush.

It is anticipated that SWSD would accept toilets with a score of 400 grams/flush, or greater, but recommends a score of 500 grams/flush, or greater. As such, SWSD would provide a $50 rebate for toilets using 1.28 gallons per flush or dual flush toilets and a $75 rebate for 0.8 gallon per flush models. The District Customers interested in this program should confirm they are purchasing the required toilets by visiting the EPA Water Sense web site at: www.epa.gov/WaterSense/product_search.html or the Maximum Performance web site at: www.map-testing.com. Customers interested in this program will need to verify efficiencies and confirm they are purchasing toilets that meet the District's program requirements.

This program would be limited to $1,000 annually and be provided to residential customers only.

1c. Fee Indoor Water Conservation Kits for Residential Customers

- Estimated Cost: $6,400 initial, $1,000 annual

There are numerous inexpensive indoor fixture components that commonly cause in excessive water use within the home.

- Toilet leak detection tablets are readily available dye-tablets placed in the tank of the toilet. If the tablet's color is observed in the toilet itself, it is an indication that the flapper valve is not properly sealed.

- Improperly sealed or deteriorated flapper valves allow water to slowly seep out of the tank causing the tanks fill valve to open and refill intermittently and wastefully. Flapper valves are easy and inexpensive to replace and new valves reestablish a tight seal to eliminate unnecessary tank filling.

- Tank bags are an inexpensive way to reduce an existing toilet's gallons per flush without replacing the entire fixture. The bag is filled with water, sealed and hung in the toilet's tank. The amount of water needed for each flush and fill of the tank is then reduced by the volume of the bag.

- Faucet aerators reduce the amount of water coming out of a faucet by adding air without reducing pressure. They easily fit on the end of most commercially available faucets and are relatively inexpensive.

- Shower heads are often screw-type connections with standard threads and nozzle sizes. As such, most shower heads can easily be replaced with high-efficiency shower heads at relatively low cost.

Upon request, the District will provide free water conservation kits to its customers. Kits can be customized to meet the individual needs of each customer. The customer can choose from toilet flapper valves, tank bags, and toilet leak detection tablets, high-efficiency aerators for sinks, high-efficiency showerheads, and educational materials.

The District plans to budget $1,000 annually to provide approximately 70 indoor water conservation kits to customers on a "first come, first served" basis.

1d. New and retrofit fixture incentives Commercial Only

- Estimated Cost: $4,000 initial, $2,000 annual

This program offers incentives for commercial property owners to install or retrofit their fixtures to achieve greater water efficiency. The District will engage local condominiums and lodges and encourage them to install new toilet flappers, bathroom and kitchen faucet aerators, low-flow showerheads, and use dye tablets for their toilet leak detection programs.

The District will offer commercial property owners and residential HOA's up to 20 of each item found in the District's standard water conservation kit. If condominiums or lodges desire more items the District will work with each owner to place a bulk order for these items at the District's discounted cost.

2e. Rebates for Smart Irrigation Controllers

- Estimated Cost: $3,000 initial, $1,000 annual

While offering similar opportunity for success as that of toilet rebate programs, irrigation controller rebate programs target peak day demands and have potential to significantly impact summer water use among existing customers.

Smart controllers (also called ET Controllers) reduce outdoor water use by using information about site conditions (such as rain, wind, slope, soil, plant type, and more), and applying the right amount of water based on those factors to maintain healthy growing conditions. Because Smart controllers can be more efficient than traditional, time-based irrigation controllers, they often reduce usage by as much as 25%, which saves money and water.

It is anticipated that for this rebate program, SWSD would develop a list of approved controllers from which customers could choose. SWSD would rebate $50 towards the cost of an approved controller. Applicants would have to provide make and model information for their existing controller to show that it is a traditional, timing-based product to receive a rebate. The applicant would be responsible for controller installation.

2f. Rain Sensor Rebate for Existing Customers

- Estimated Cost: $3,000 initial, $1,000 annual

As an “add-on” to the irrigation controller rebate program, those customers that already use or recently upgraded to smart controllers could also obtain rebate for installation of a rain sensor into their irrigation control system.

A rain sensor is a switching device activated by rainfall that causes an automatic irrigation system to shut down in the event of rainfall.

It is anticipated that SWSD would provide a $20/customer rebate for the retrofit of an irrigation system with a rain sensor unit. Similar to **Measure 2e. Rebates for Smart Irrigation Controllers**, SWSD would develop a list of approved rain sensors from which customers could choose. SWSD would limit rebate disbursement to 50 per year, $1,000 annually on a “first come, first served” basis.

2g. Free Irrigation Audits

- Estimated Cost: $12,000 initial, $5,000 annual

The SWSD board identified this measure as being valuable, but will roll out the program together with **Measure 3a. Measure 3a** depends on meter accuracy that the SWSD is in the process of improving as part of **Measure 7d District Ownership and Upgrade of Private Water Meters**. It is anticipated that Measure 7d will be completed by the end of 2015.

For this program, the SWSD will pursue a grant from the Colorado River Water Conservation District and or CWCB to support both programs. The irrigation Audit Program will be primarily geared towards residential properties, although commercial properties with significant green areas will also be considered for participation. Through this program the District will engage a certified irrigation professional to work with interested customers to monitor the efficiencies of their irrigation zones and systems and make recommendations for improvements.

2h. Free Outdoor Water Conservation Kits

- Estimated Cost: $2,400 initial, $800 annual

There are numerous inexpensive outdoor irrigation system components that are inexpensive, easy to install and can inform and impact overall water use.

Upon request, the District will provide free outdoor water conservation kits to interested customers. The conservation kits will include a Water Miser six-position spray nozzle, rain gauge, soil moisture meter and a Water Conservation Wheel along with xeriscape literature and a brochure on outside irrigation. The District plans to budget $800 annually to provide approximately forty outdoor conservation kits to customers on a "first come, first served" basis.

2i. Promote Replacement of Conventional Landscape with Xeriscape

- Estimated Cost: $1,000 initial, $450 annual

This program is to promote the replacement of conventional landscapes (primarily turf) with xeriscape through the dispersal of educational literature to interested customers. The District's Conservation Officer would work with interested local condominiums and lodges to promote xeriscape planting and reduce the amount of conventional landscaping. The District would also work with the TOSV and owners of privately owned or maintained parks to encourage xeriscape projects. The District plans to budget $800 annually for educational literature and brochures.

5.2.3 Ordinances and Regulations

Worksheet F, in **Appendix C**, summarizes the analysis of ordinance and regulation activities.

5.2.3.1 Level 1 Existing Service Area

2b. Update Water Waste Policies and Enforce a "Water Waste" Ordinance

- Estimated Cost: $3,000 initially, $300 annually

A water waste ordinance explicitly prohibits the waste of water from a variety of sources including (but not limited to) excess irrigation runoff or from irrigation that occurs at a prohibited day and/or time, excessive pavement washing, failure to repair leaks.

Conservation through ordinance can have limitations. Enforcement is a key piece of making an ordinance effective. Enforcement requires staff resources. SWSD has historically developed and enforced a water waste ordinance. However, the SWSD found that enforcement administration and penalty fee distribution were not developed in such a way that "encouraged" wise water use. Subsequently, the program was discontinued. SWSD will take lessons learned from the previous ordinance to establish a better enforcement administration policy as part of a revised water waste ordinance.

The District's water conservation officer or employees under his/her direction will first contact customers and issue an initial warning for a first offense. For second, third and

fourth offenses of the ordinance the customer will be issued tickets and assessed $50, $100 and $300 fines, respectively. A fourth offense, including a failure to timely pay fines, will also result in a disconnection of water and sewer service.

2c. Limit irrigation watering times

- Estimated Cost: $0

SWSD began updating its Rules and Regulations in summer of 2013. The update included outdoor irrigation times. The most recent version of the DRAFT Rules and Regulations includes:

- No watering between 10:00 AM and 5:00 PM.
- Alternate day watering.
- Permit requirement for watering exemptions.
- Additional water use restrictions during supply-limited periods:
    - "Shortages" – reduced use of water for paved-area washing, swimming pool filling, lawn watering and irrigation, dust control and request-only water at restaurants.
    - "Crisis" – prohibited use of water for landscaped/vegetated areas and swimming pools, hydrant use except for firefighting; prohibited new water service connections.

An excerpt of the Rules and Regulations that includes the Irrigation Watering Time measure details is provided in **Appendix B**.

5.2.3.2 Level 2 New Construction Regulations

1a. Indoor fixture requirements

- Estimated Cost: $0

2a. Landscaping and irrigation system requirements

- Estimated Cost: $0

SWSD updated its Rules and Regulations in the summer of 2013. The update included review of indoor plumbing fixture requirements as well as outdoor irrigation system requirements. The most recent version of the DRAFT Rules and Regulations includes:

- Water-Sense labeled faucet, toilet and shower heads for new residential development, and the same items for new commercial developments with the addition of dual flush toilets.
- Water-Sense labeled irrigation system controllers and soil amendments for all new development with landscaped areas.

An excerpt of the Rules and Regulations that includes the WEP measures is provided in **Appendix B**.

2d. Restrict Water Features/Fountains and Change System Development Fees Based On Volume

- Estimated Cost: $4,000 initial, $200 annual

While this measure isn't expected to save a significant amount of water, the operation of decorative water features/fountains should be restricted during early morning hours. Timers must be installed to control flows and reduce evaporative loss. If water features/fountains are using water from the District's potable water system and are using an auto-fill mechanism to maintain an adequate amount of water to the pump system, the customer will have to install a separate meter to monitor usage. System Development Fees will be charged for water features based on volume calculations.

6c. Promote the Use of Non-Potable Supplies for Irrigation

- Estimated Cost: $2.9M initial, $5,000 annual

This would be a cooperative program with SWSD, Aspen Skiing Company (ASC) and the Town of Snowmass Village (TOSV) to develop a raw water distribution system to primarily serve Fanny Hill, West Village and along the Brush Creek corridor. A gravity line would have to be installed on Fanny Hill and pump stations installed along Brush Creek.

6a. Develop Water Conservation Best Management Practices for Water Treatment Plant and Wastewater Treatment Plant

- Estimated Cost: $0

The District's WWTP uses non-potable treated wastewater in its operation primarily to wash filters, flush lines, clean District facilities and provide water to the centrifuge polymer-delivery system. Non-potable reuse water is also used for outdoor irrigation at District offices during the summer months.

6b. WWTF reuse water

- Estimated Cost: $3,400 initial, $3,000 annual

This conservation measure involves phasing in a program using reuse water from the Wastewater Treatment Plant for street cleaning and construction water. Trucks would be filled with reuse water at the WWTP instead of discharging this water into Brush Creek. A reuse water line has already been installed from the Filter Building to the northeast corner of the new WWTP garage. The District will need to construct a fill station and install a pump system.

5.2.4 Education Activities

Worksheet G, summarizing education activities evaluation is provided in **Appendix C**.

5.2.4.1 One-Way Education Activities

4a. Water-Efficient Landscape and Irrigation System Brochures

- Estimated Cost: $1,500 initial, $700 annual

The goal of this measure is to provide interested citizens with more tools to help them reduce peak summer water use and associated water bills. SWSD does not intend to develop its own material as part of this measure, but will simply research and purchase brochures to provide interested consumers with more information about outdoor water use efficiency measures.

It is anticipated that brochures will be made available at the SWSD office, local retail suppliers of landscaping and irrigation products and if possible on the SWSD website.

4b. Water Conservation Web Page

- Estimated Cost: $1,500 annual

In March of 2012, SWSD launched a new utility website that included a called “Being H20 Wise.” Currently, the website provides water conservation tips for indoor and outdoor water use, information about this water conservation planning effort, including the measures under review by the SWSD Board and Board comments, watering schedule information and links to a variety of water efficiency websites.

4d. Provide Conservation Tips on Water Bills or Newsletters

- Estimated Cost: $1,100 initial, $900 annual

The SWSD’s former billing system allowed for the inclusion of short water conservation tips. However, with the fall 2013 upgrade to Muni-Billing as part of **Measure 5b**., staff has greater ability to provide water efficiency information to their customers. The District would like to include historical use information specific to each customer. The effectiveness of this data will be limited if meter readings are inaccurate. As such, SWSD opted to complete **Measure 7d District Ownership and Upgrade of Private Water Meters** prior to roll out of a formal informational billing program. The SWSD will also research, purchase and deliver occasional newsletters or other publically available informational material as part of monthly billing distribution that will inform and encourage wise water use among its customers.

5.2.4.2 One-Way Education with Feedback

4e. Youth and Teacher Education

- Estimated Cost: $7,000 initial, $2,400 annual

Local schoolchildren are educated on principles of indoor and outdoor water conservation through instructive materials, water and waste-water plant tours, presentations, and free conservation kits to install at home.

Historically, the SWSD has conducted the following activities:

- Water Conservation Officer has made presentations to local middle school classes in the area and is available for further teaching.

- The District co-sponsors a school program called “Living Wise” that incorporates principles of conservation of water and electricity. In 2011, 1,401 local students participated in the Living Wise program, and in 2012, 1,442 students participated.

- The District is also making modifications to this program to incorporate a water conservation-specific lesson.

Youth and Teacher Education programming will undergo an initial update, with subsequent updates every 5 years and then continue to be implemented annually by allocating the necessary funds for the programs to continue successfully.

4f. Spearhead the Creation of a Water Conservation Taskforce

- Estimated Cost: $2,000 initial, $1,200 annual

Water conservation programs must have community and stakeholder support to be successful. Even though this program has no quantifiable water savings, it is critical to maintain community involvement. This effort would entail creating a group of business owners, residents, District staff, large water users, industry professionals, and others, to make ongoing recommendations to the District Board on how to pursue the measures and programs outlined in this plan.

4g. Conduct Annual Water Conservation Workshops

- Estimated Cost: $5,400 initial, $5,400 annual

The District will hold an annual efficient irrigation and xeric landscaping workshop that will provide interested citizens with information to help them reduce peak summer water use and avoid the highest water rate tiers. The workshops will also showcase low-water use demonstration areas and provide educational materials and demonstrations on indoor water- efficient fixtures and appliances.

5.2.4.3 Two-Way Education Activities

4c. Public Information and Education

- Estimated Cost: $6,000 initial, $2,500 annual

SWSD board and staff believe that their customers must understand the value of water and the importance of wise stewardship and water use efficiency. The District has agreed to participate in regional water conservation planning which will complement and enhance public and stakeholder involvement. The plan will allow the District and all participating entities greater access to informational and educational resources that can be disseminated throughout the District and Roaring Fork Valley.

6.0 Implementation and Monitoring Plan

6.1 Implementation Plan

Worksheet J, provided below, outlines the general schedule in which each of the approved Water Efficiency Measures is anticipated to be undertaken. Conceptual level tasks are included as well as the anticipated staff resources that will initiate and carry out and guide each measure.

Period of Implementation and Measure Dependence: In some cases, measure will not be implemented until completion of other measures. The timing of each measure takes into account that dependence, and where applicable, dependent measures have been identified.

Anticipated Implementation Activities: Those measures that have either been completed or are in progress only require management and maintenance and include:

- Foundational Measures – Billing System Upgrade, Waterline Replacement Program, Leak Detection Program, Prompt Repair of Water Line Breaks and Leaks, District Ownership and Upgrade of Private Water Meters and Water Conservation Officer Staff Position.

- Targeted Technical Assistance and Incentives – Snowmaking Efficiencies and Water Management Practices and Ziegler Reservoir Operations.

- Ordinances and Regulations – Indoor Fixture Requirements, Landscaping and Irrigation System Requirements and Limit Irrigation Watering Times.

- Education Activities – Water Conservation Web Site and Youth and Teacher Education.

Remaining measures will require greater effort to initiate and the anticipated tasks required for each measure include this initiation effort as well as the anticipated on-going management and effort required to carry the measure forward, assuming that measure has been deemed effective.

Entity/Staff Responsibilities: It is anticipated that many of the selected measure will require greater staff than has been identified. Individuals that are identified are expected to guide and delegate responsibilities among other staff (both internal and external) as needed to initiate and manage the effort.

Coordination and Public Involvement: SWSD Board approval should be considered in all measures; where it is not listed, it is assumed that the board has already provided input and approval.

In addition, the success of many of the selected measures relies on the participation of SWSD customers. SWSD has made an effort to select measures that consider what their customers will embrace and while advertising and customer notification is noted here, measures will not likely be continued if they are found to lack participation among customers.

Information for each measure's anticipated costs are included in Worksheet H, in **Appendix C**.

Table 16 Worksheet J - Implementation Plan

Selected Water Efficiency Activities	Period of Implement-ation	Dependent Measures	Implementation Actions	Entity/Staff Responsible for Implementation	Coordination and Public Involvement
FOUNDATIONAL ACTIVITIES					
5b. Billing System Upgrade	Completed				
7a. Annual Water Line Replacement Program	In Progress		1. Manage and maintain existing program	District Manager (Kit Hamby) Field Supervisor (Adrian Aguilar)	SWSD Board Approval
7b. Leak Detection Program	In Progress		1. Manage and maintain existing programs	District Manager (Kit Hamby) Field Supervisor (Adrian Aguilar)	
7c. Prompt Repair of Water Line Breaks and Leaks	In Progress				
7d. District Ownership and Upgrade of Private Water Meters	In Progress		1. Manage and maintain CWCB Grant-proposed meter replacement schedule to complete replacements in Quarter 1, 2015.	District Manager (Kit Hamby) Field Supervisor (Adrian Aguilar)	
8a. Water Conservation Officer Staff Position	In Progress		1. Manage and maintain existing programs 2. Coordinate upcoming programs	Water Conservation Officer (Christie Duckett) District Manager (Kit Hamby)	
5a. Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation	Immediate (2014)		1. Establish lowest tier usage fee 2. Re-allocate tier breaks based on recent historical customer usage 3. Equate base fee with fixed cost 4. Obtain SWSD Board Approval for rate changes 5. Notify customers of rate increase 6. Modify billing system rate assignments 7. Implement new rate schedule	District Engineer (SGM) District Manager (Kit Hamby) Billing Manager (Christie Duckett)	SWSD Board Approval Customer Notification
5c. Monthly Service Fee Billing	1-2 Years (2015-2016)	7d - District Ownership and Upgrade of Private Water Meters	1. Revise billing system/rates to perform monthly protocols 2. Obtain SWSD Board approval of modifications 3. Hire and train new staff to collect and process additional water meter reading and billing frequency 4. Notify customers of rate frequency change 5. Implement new billing frequency	District Manager (Kit Hamby) Billing Manager (Christie Duckett)	SWSD Board Approval Customer Notification
7e. Fixed Nework AMI Water Metering System	1-2 Years (2015-2016)	7d - District Ownership and Upgrade of Private Water Meters	1. Select telemetry equipment, software upgrades (if applicable) and data server upgrades (if applicable) 2. Identify number and location of data collection sites 3. Obtain permits/approval from local agencies for data collection towers 4. Select contractors for installation and programming 5. Install/program data collection system 6. Launch continuous water use monitoring system access site for all customers 7. Establish protocol for monitoring/responding to water use spikes	District Engineer (SGM) District Manager (Kit Hamby) Billing Manager (Christie Duckett)	Customer Notification of data access portal
7f. Improve System-Wide Distribution System Accounting	2-4 Years (2016-2018)	7d - District Ownership and Upgrade of Private Water Meters 7e - Fixed Network AMI Water Metering System 5c - Monthly Service Fee Billing	1. Evaluate water loss estimates from new meters, increased billing frequency 2. Identify strategic locations where water transfer volumes are highest priority 3. Select and intall new flow meters and telemetry for SCADA trending 4. Compare meter results to local customer water use to refine 7a. water line replacement program and/or locate leaks 5. Establish protocol for continuous assessment of local water losses throughout the system	District Engineer (SGM) District Manager (Kit Hamby) Billing Manager (Christie Duckett) Filed Supervisor (Adrian Aguilar)	SWSD Board Approval
TARGETED TECHNICAL ASSISTANCE AND INCENTIVES					
8b. Snowmaking Efficiencies and Water Management Practices	In Progress		1. Monitor snowpack, stream flows, reservoir levels and ASC requirements and modify diversions and reservoir releases accordingly	District Manager (Kit Hamby) Aspen Skiing Company Ops. Manager	
8c. Zeigler Reservoir Operations	In Progress				
2g. Free Irrigation Audits	1-2 Years (2015-2016)	7d - District Ownership and Upgrade of Private Water Meters	1. Develop audit program 2. Select irrigation auditor 3. Advertise free irrigation audits to customers 4. Conduct annual evaluation of top-ten water users and coordinate audits with those users	Water Conservation Officer & Billing Manager (Christie Duckett) District Manager (Kit Hamby)	SWSD Board Approval Customer advertising and participation
3a. Provide Fee Water Audits for Top Ten Water Users Based on Water Consumed per EQR	1-2 Years (2015-2016)				
1b. Toilet Rebates	2-4 Years (2016-2018)		1. Develop rebate program protocol 2. Select rebate-eligible products 3. Apply for CWCB grant funding 4. Advertise rebate program to customers 5. Manage and monitor rebate program	Water Conservation Officer (Christie Duckett) District Manager (Kit Hamby) District Engineer (SGM)	SWSD Board Approval CWCB Grant Approval Customer advertising and participation
2e. Rebates for Smart Irrigation Controllers	2-4 Years (2016-2018)				
2f. Rain Sensor Rebate for Existing Customers	2-4 Years (2016-2018)				
1d. New and Retrofit Fixture Incentives - Commercial Only	5-7 Years (2019-2021)		1. Develop list of available products 2. Prioritize commercial customers and develop eligibility list 3. Contact commercial property owners and establish product request lists 4. Purchase and provide products to participating customers 5. Conduct annual review of eligible customers and program offerings	Water Conservation Officer (Christie Duckett) District Manager (Kit Hamby)	SWSD Board Approval Customer participation
2i. Promote Replacement of Conventional Landscape with Xeriscape	5-7 Years (2019-2021)		1. Develop list of candidate customers or organizations to contact 2. Establish portfolio of key contacts and local xeric experts, audit recommendations, vegetation and landscaping brochures/information, etc 3. Contact candidate customers or organizations 4. Evaluate and present potential improvement opportunities	Water Conservation Officer (Christie Duckett) District Manager (Kit Hamby)	SWSD Board Approval Customer participation
ORDINANCES AND REGULATIONS					
1a. Indoor Fixture Requirements	In Progress		1. Finalize approval of draft ordinances 2. Enforce new ordinances	District Manager (Kit Hamby) District Attorney (Mark Hamilton) District Engineer (SGM)	SWSD Board Approval
2a. Landscaping and Irrigation System Requirements	In Progress				
2c. Limit Irrigation Watering Times	In Progress				
2b. Update Water Waste Policies and Enforce a "Water Waste" Ordinance	1-2 Years (2015-2016)		1. Draft ordinance 2. Solicit approval 3. Establish enforcement mechanisms and fines schedule 4. Notify customers upon implementation	District Manager (Kit Hamby) District Attorney (Mark Hamilton) District Engineer (SGM) Field Supervisor (Adrian	SWSD Board Approval Customer notification
2d. Restrict Water Features/Fountains and Charge System Development Fees based on Volume	1-2 Years (2015-2016)		1. Draft feature design limitation and/or requirements 2. Establish fee structure based on feature characteristics 3. Solicit approval	District Manager (Kit Hamby) District Attorney (Mark Hamilton) District Engineer (SGM)	SWSD Board Approval
(6a.) Develop Water Conservation BMPs for WTP and WWTF (City Facility Requirements) (BP 12)	2-4 Years (2016-2018)		1. Evaluate outdoor irrigation requirements at specific district facilities 2. Determine re-use water availability 3. Install valves/pipe connections/etc.	District Manager (Kit Hamby) District Engineer (SGM)	SWSD Board Approval
(6b.) WWTF reuse water	5-7 Years (2019-2021)		1. Estimate available re-use water availability 2. Design and install fill station at WWTF 3. Establish protocol for re-use water dispursement	District Manager (Kit Hamby) District Billing Manager (Christie Duckett) District Engineer (SGM)	SWSD Board Approval
EDUCATION ACTIVITES					
4b. Water Conservation Web Page	In Progress		1. Maintain and manage existing water conservation web page	Water Conservation Officer (Christie Duckett)	
4e. Youth and Teacher Education	In Progress		1. Continue to host water conservation activities through local school districts	Water Conservation Officer (Christie Duckett)	
4c. Public Information and Education	Immediate (1/2014-6/2014)		1. Participate in Regional Water Conservation Plan effort	District Manager (Kit Hamby) Water Conservation Officer (Christie Duckett)	
4d. Provide Conservation Tips on Water Bills or Newsletters	1-2 Years (2015-2016)	5b - Billing System Upgrade 7d - District Ownership and Upgrade of Private Water Meters	1. Develop template for bill stuffers 2. Work with billing software support to design individualized water use tracking information for each customer 3. Create and follow protocol for information topics/schedule distribution	Water Conservation Officer (Christie Duckett) District Manager (Kit Hamby)	
4a. Water Efficient Landscape and Irrigation System Brochures	2-4 Years (2016-2018)		1. Research sources of available water efficiency materials 2. Select and purchase materials 3. Provide some materials to local nuseries, greenhouses, irrigation equipment installers/vendors 4. Advertise information availability to customers	Water Conservation Officer (Christie Duckett)	SWSD Board Approval Advertise to customers and local retailers

6.2 Water Savings Impact on Revenues

Water use savings have been estimated for each measure and are included on Worksheet H of **Appendix C**. For the selected measures, **Table 17** summarizes the total annual anticipated water savings.

Table 17 Estimated Annual Water Savings by Measure and Total Annual REVENUE Water Savings

Measure	Est. Avg. Annual Water Savings (MG/Yr)
5a. Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation	18
5b. Billing System Upgrade	0
5c. Monthly Service Fee Billing	0
7a. Annual Water Line Replacement Program	21[1]
7b. Leak Detection Program	
7c. Prompt Repair of Water Line Breaks and Leaks	
7d. District Ownership and Upgrade of Private Water Meters	0
7e. Fixed Network AMI Water Metering System	0
7f. Improve System-Wide Distribution System Accounting	0
8a. Water Conservation Officer Staff Position	0
1b. Toilet Rebates	0.2
1d. New and Retrofit Fixture Incentives - Commercial Only	0.9
2e. Rebates for Smart Irrigation Controllers	0.1
2f. Rain Sensor Rebate for Existing Customers	0.2
2g. Free Irrigation Audits	0.1
2i. Promote Replacement of Conventional Landscape with Xeriscape	0.001
3a. Provide Fee Water Audits for Top Ten Water Users Based on Water Consumed per EQR	0.004
8b. Snowmaking Efficiencies and Water Management Practices	0[1]
8c. Zeigler Reservoir Operations	0[1]
1a. Indoor Fixture Requirements	0.6
2a. Landscaping and Irrigation System Requirements	0.2
2b. Update Water Waste Policies and Enforce a "Water Waste" Ordinance	0.002
2c. Limit Irrigation Watering Times	0.4
2d. Restrict Water Features/Fountains and Charge System Development Fees based on Volume	0.0001
(6a.) Develop Water Conservation BMPs for WTP and WWTF	1.2
(6b.) WWTF reuse water	0.6
4a. Water Efficient Landscape and Irrigation System Brochures	0
4b. Water Conservation Web Page	0.007
4c. Public Information and Education	0
4d. Provide Conservation Tips on Water Bills or Newsletters	0
4e. Youth and Teacher Education	0
Total REVENUE Water Savings	**22.5**

1. **Non-Revenue Water; not included in total REVENUE water savings total**

The estimated annual revenue water savings will result in some loss of revenue. This loss of revenue will range from $0 (Tier 1 water rate) to $145,800 (Tier 5) based on the SWSD's existing water rates.

SWSD's 2014 budget includes funding for *Measure 5a. Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation*. Adjustment of the SWSD's water rate structure will be conducted as part of the annual budget approval and any future detailed Water Rate Study. This will include review of historical budgets and estimating of anticipated future expenditures, broken down by "use" vs. "fixed" costs.

In order to address revenue losses as a result of water use savings, the following will be included as part of any future Water Rate Study:

1. Separation of Usage & Fixed Fee Components
   The SWSD currently incorporates a Base Fee (or fixed fee) into their billing structure. Such a fee provides revenue stability regardless of the volume of water sold. In order for the base fee to be most effective as water conservation measures are implemented, it will be adjusted to match the upcoming, anticipated "Fixed Costs" of the district. These costs include those expenses that are independent of the volume of water produced. They include capital outlay, administrative salaries, existing debt service, etc.

2. Elimination of "Free" Tier 1 Water
   The SWSD's current rate structure includes in its base fee, cost of water from 0-15KGal per quarter for each EQR. As such, it does not currently charge a "usage fee" in Tier 1. Customers who use less than 15,000 gallons per quarter are only charged the base fee for that quarter.

   As part of the future Water Rate Study, the base fee will be re-evaluated to match only fixed expenses (see Item 1, above). While this will stabilize revenues for fixed expenses, it will no longer include water use up to 15,000 gallons per quarter. Usage fees will be charged based on the actual volume of water each customer consumes. Therefore, the SWSD will assign a cost for water use in Tier 1.

3. Annual Rate Review and Adjustment
   The amount of water savings, as well as the impact to SWSD's revenues will be based on a number of uncertain variables. Such variables include level of customer participation, the amount of water savings within each billing tier, and the elasticity of its customers to price signals.

   The best way to address the impacts of these variables to the SWSD's revenue is to frequently monitor adjust the water rates. The future Rate Study will also include annual review of revenues to expenditures to verify that water use reductions are appropriately accounted for.

6.3 Monitoring Plan

Development of this Water Efficiency Plan makes use of a broad range of guidance documents, relevant literature, and acquired local knowledge from other planning activities, understanding of SWSD customer culture and priorities, current SWSD obligations and priorities, and many other sources. These form the basis for measure selection and prioritization.

Despite the large amount of available resources, elements that also impact the plan's success, such as customer participation and annual climate patterns are uncertain. Therefore, the outcome and success of each measure is also somewhat uncertain.

Given that uncertainty, this plan includes review of historical information in addition to continuous monitoring of measure elements to gauge their efficacy. This monitoring includes quantitative comparison of demands system-wide, by customer groups or by individual customers/participants. This monitoring also includes qualitative assessments of efficacy through customer feedback and participation tallies.

It is anticipated that the bulk of the monitoring will be performed by the SWSD's existing Water Conservation Officer, that timing and schedule will align with that of **Table 16.** Throughout the duration of the WEP implementation, SWSD's water conservation officer will compile an annual report that summarizes the monitoring results for applicable measures. That report will be provided to the SWSD board. For measures in which SWSD obtains grant funding for implementation, monitoring results summary will also be provided to the appropriate agency at a frequency dictated by the grant. Data collection will occur on an ongoing basis, the timing of which will vary throughout the implementation process (especially in cases where demand data collection changes from quarterly to monthly), but generally on a monthly basis.

Table 18 summarizes the proposed Monitoring Plan and summarizes what type of monitoring will be conducted for each measure.

Table 18 Worksheet L - Monitoring Plan

Selected Water Efficiency Measure	Historical Data Collection	Data Collection Group						Demand/Flow Monitoring Data			Other Monitoring Data						
		Impacts to be monitored as part of Overall WEP Impacts	System-Wide	By Customer Class	By Distribution System Pressure Zone	New EQRs	By Customer or Participant	Specific Quarter Only	Annual – By Quarter	Annual - Total	Parameters to Record	Annual Costs	Lessons Learned	Water Savings Estimate	Administration Data	Relevant Public Feedback	Significant Program Changes
Foundational Measures																	
5a. Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation	Quarterly water use/EQR by customer type; system-wide	*X*	X	X					X		Annual Review Expenditures Revenues by Customer Class & Tier Use per EQR by Customer Class & Tier	X			X	X	X
5b. Billing System Upgrade	*NA - No anticipated impact on demand*											X	X		X		
5c. Monthly Service Fee Billing	*NA - Impact to be evaluated as part of overall Water Efficiency Plan impacts*	*X*	X	X								X	X		X	X	X
7a. Annual Water Line Replacement Program	Annual Water Loss (%); system-wide Size, type, location, length of each repair		X							X	Location Pipe Size Pipe Type Approx. Age Condition Length of each repair	X		X	X		
7b. Leak Detection Program	Annual Water Loss (%); system-wide Test Date, Location Leaks Detected		X							X	Test Date Location Leaks Detected	X		X	X		
7c. Prompt Repair of Water Line Breaks and Leaks	Annual Water Loss (%); system-wide Size, type, location, length of each repair		X							X	Location Break Type/Cause Pipe Size Pipe Type Approx. Age Condition Length of each repair	X		X	X		
7d. District Ownership and Upgrade of Private Water Meters	Quarterly water use/EQR by customer type; system-wide		X	X					X		Customer ID Customer Type Location Meter Size (existing/replaced)	X	X	X	X	X	
7e. Fixed Network AMI Water Metering System	Quarterly water use/EQR by customer type; system-wide		X						X			X			X		
7f. Improve System-Wide Distribution System Accounting	*NA - No meters currently in place to provide historical tracking information*		X		X				X			X		X	X		
8a. Water Conservation Officer Staff Position	*NA - Impact to be evaluated as part of overall Water Efficiency Plan impacts*	*X*	X	X									X		X	X	X
Targeted Technical Assistance and Incentives																	
1b. Toilet Rebates	Quarter 1: 3-years prior to rebate; rebate recipient only						X	1			Customer ID New Toilet Model New Toilet GPF Specification	X	X	X	X	X	X
1d. New and Retrofit Fixture Incentives - Commercial Only	Quarter 1: 3-years prior to fixture improvement; incentive participant only						X	1			Customer ID EQR Assignment Fixture Upgrade Summary						
2e. Rebates for Smart Irrigation Controllers	Quarter 3: 3-years prior to rebate; rebate						X	3			Customer ID						

Selected Water Efficiency Measure	Historical Data Collection	Data Collection Group: Impacts to be monitored as part of Overall WEP Impacts	Data Collection Group: System-Wide	Data Collection Group: By Customer Class	Data Collection Group: By Distribution System Pressure Zone	Data Collection Group: New EQRs	Data Collection Group: By Customer or Participant	Demand/Flow Monitoring Data: Specific Quarter Only	Demand/Flow Monitoring Data: Annual – By Quarter	Demand/Flow Monitoring Data: Annual - Total	Other Monitoring Data: Parameters to Record	Other Monitoring Data: Annual Costs	Other Monitoring Data: Lessons Learned	Other Monitoring Data: Water Savings Estimate	Other Monitoring Data: Administration Data	Other Monitoring Data: Relevant Public Feedback	Other Monitoring Data: Significant Program Changes
	recipient only										New Controller Model Approximate Irrigated Square Feet						
2f. Rain Sensor Rebate for Existing Customers	Quarter 3: 3-years prior to rebate; rebate recipient only						X	3			Customer ID New Sensor Model Approximate Irrigated Square Feet	X	X	X	X	X	X
2g. Free Irrigation Audits	Quarter 3: 3-years prior to audit; audit participant only						X	3			Customer ID Customer Type EQR Assignment						
2i. Promote Replacement of Conventional Landscape with Xeriscape	Quarter 3: 3-years prior to replacement; participant only						X	3			Customer ID EQR Assignment Improvement Summary						
3a. Provide Fee Water Audits for Top Ten Water Users Based on Water Consumed per EQR	Quarters 1-4: 1-year prior to audit; audit participants only						X		X		Customer ID EQR Assignment Audit Summary						
8b. Snowmaking Efficiencies and Water Management Practices	*NA - Historical operations of Zeigler Reservoir and its use for snowmaking deliveries are not yet available*										Monthly Operational Summary Monthly Average Temperature Monthly Average Precipitation Monthly Pumped Volume Monthly Snowmaking Deliveries Average Monthly Reservoir Level		X		X	X	X
8c. Zeigler Reservoir Operations																	
Ordinances and Regulations																	
1a. Indoor Fixture Requirements	Quarter 1: use/EQR; 3-years prior to adoption; new EQRs only					X		1									
2a. Landscaping and Irrigation System Requirements	Quarter 3: use/EQR; 3-years prior to adoption; new EQRs only					X		3									
2b. Update Water Waste Policies and Enforce a "Water Waste" Ordinance	Quarter 3: use/EQR (by customer type); 3-years prior to adoption; system-wide		X					3			Total Number of Citations (Monthly) Customer ID/EQR Customer correspondence records Number of Citations per Customer						
2c. Limit Irrigation Watering Times	Quarter 3: use/EQR (by customer type); 3-years prior to adoption; system-wide		X					3									
2d. Restrict Water Features/Fountains and Charge System Development Fees based on Volume	Survey customers to estimate existing water fountains/features					X		3			Water Feature/Fountain Volume Water Feature/Fountain Flow Rate Estimated Evaporation Rate Approval or Disapproval Result Fee (if approved)						
6a. Develop Water Conservation BMPs for WTP and WWTF	*NA - This will be tracked upon implementation; no historical precedent to reference at this time*						X		X		Metered Reclaimed Irrigation Water Use (Monthly) Reclaimed Backwash Water Use (Monthly)		X	X	X		
6b. WWTF reuse water							X		X				X	X	X		
Education Activities																	
4a. Water Efficient Landscape and Irrigation System Brochures	*NA - Impact to be evaluated as part of overall Water Efficiency Plan impacts*	*X*	X	X							Brochure Request Tally (Annual) Location Replacement Frequency	X	X		X	X	

Selected Water Efficiency Measure	Historical Data Collection	Data Collection Group						Demand/Flow Monitoring Data			Other Monitoring Data							
		Impacts to be monitored as part of Overall WEP Impacts	System-Wide	By Customer Class	By Distribution System Pressure Zone	New EQRs	By Customer or Participant	Specific Quarter Only	Annual – By Quarter	Annual - Total	Parameters to Record	Annual Costs	Lessons Learned	Water Savings Estimate	Administration Data	Relevant Public Feedback	Significant Program Changes
4b. Water Conservation Web Page											Number of Website Hits						
4c. Public Information and Education	*NA - Impact to be evaluated as part of overall Water Efficiency Plan impacts*	*X*	X	X													
4d. Provide Conservation Tips on Water Bills or Newsletters											Issue Date Topic Response Records	X	X		X	X	
4e. Youth and Teacher Education											Date Organization Program Summary						

7.0 Adoption of New Policy, Public Review and Formal Approval

7.1.1 Adoption of New Policy

Within this plan, several measures involve ordinance change that will require adoption by the SWSD board. The following measures are included:

Measures 2b. and 2c. are already included as part of the SWSD's existing Rules and Regulations. However, it is anticipated that they will need to be revised to include better mechanism for enforcement. Revision will be completed through input from SWSD's board and staff, attorney and engineer. Final approval will be made by the SWSD board. Because ordinances will be drafted with input from the SWSD board, it is not anticipated that there will be challenges to their adoptions once input has been incorporated.

- 2b. Updated Water Waste Policies and Enforce a "Water Waste" ordinance
- 2c. Limit Irrigation Watering Times

Measure 1a. and 2a. are NEW and have been included as part of the SWSD's updated Rules and Regulations. Draft ordinances are included in **Appendix B**. These measures will be adopted as part of the whole Rules and Regulations update. The measures have been considered by the SWSD board and it is not anticipated that there will be challenges to their adoption.

- 1a. Establish High-Efficiency Indoor Fixture Requirements for New Developments
- 2a. Establish Landscaping and Irrigation System Design Requirements for New Development

Measure 2d. is a new measure that has not been included as part of the SWSD's updated Rules and Regulations. It is anticipated that this ordinance will some evaluation of existing water features, research into its application in other communities and evaluation of its impact in future development. Drafting of this ordinance will also be completed through SWSD board and staff, attorney and engineer and could also include input from local developers. Final approval will be made by the SWSD board. The ordinance will be adopted as a modification to the existing rules and regulations. It is anticipated that the SWSD board will consider feedback from the community for the development and adoption of this ordinance and, as such, will likely go through some additional revisions during drafting process.

- 2d. Restrict Water Features/Fountains and Charge System Development Fees Based on Volume

7.1.2 Public Review Process

This Water Efficiency Plan makes inclusions for public review process. To begin, development of the plan included greater community input. Through plan development SWSD solicited feedback for measure selection and evaluation from the local EAB (Environmental Advisory Board).
Final plan adoption will also include opportunity for public input and comment. Once a DRAFT plan has undergone preliminary review by SWSD staff and board, it will be submitted to CWCB for preliminary review. CWCB input will be incorporated into the plan at which time it will be made available for public review and comment. SWSD will host a draft copy of the plan on its existing Water Efficiency Website. SWSD will solicit input from the public in two ways:

(1) General Public Input - The general public will be made aware of the draft plan's availability for review either through billing and/or through local news advertising.

(2) Targeted Public Input - Throughout the planning process, numerous organizations and individuals have expressed interest in this plan. These include environmental groups such as the Environmental Advisory Boar and Roaring Fork Conservancy, the Snowmass and Capital Creek Caucus, affected businesses such as Aspen Ski Co., the local municipality Town of Snowmass Village, and local water resources agencies such as the Colorado River District. Many of these groups have already played a collaborative role in helping the SWSD enact measures included in this plan, and it is expected that they will have some input into the plan's measures and implementation. In addition, other organizations have not yet participated, but are expected to have some feedback that would be worth considering. They include developers, retail businesses such as greenhouses/nurseries/landscapers, hotels, etc. SWSD will compile a list of targeted individuals to be specifically contacted for input on the plan.

SWSD will solicit and collect input for the plan for 60 days. Comments will be collected via email, phone or interview. They will be summarized and included in an appendix as part of the final plan.

7.1.3 Local Adoption and State Approval Processes

Upon completion of the 60-day public review process, this plan will be modified to incorporate the collected input. Input will be included in an appendix of this plan to be submitted for final approval by the SWSD board and subsequently by CWCB board. Final CWCB board approval documentation will be included in an appendix in the final document.

7.1.4 Periodic Review and Update

State statues require that all water efficiency plans are updated every 7 years. This will be the time-table for this water efficiency plan. However, it should be noted that this plan is expected to be included in a regional water efficiency plan. Therefore, that plan, if approved, will represent the 7-year trigger mechanism for the SWSD's next required update.

As part of the monitoring plan, SWSD will be continuously collecting data and evaluating the strength of each measure as it is implemented. SWSD will use these evaluations to eliminate, revise or promote the measures that have been selected in this plan. When the SWSD's plan is scheduled for update, it is anticipated that the following steps will be undertaken:

Step 1 - Evaluate success of measures included in this 2014 Plan.
Step 2 - Revise/eliminate measures that have not been successful.
Step 3 - Incorporate new measures that appear to have merit.

Appendix A
System Development Information

Development Information (Source: 2010 Town of Snowmass Village Comprehensive Plan and SWSD)

Single Family Residential Development Lot Summary

Single Family Subdivisions	Existing and Approved Lots	Future Lots	Available Free Market Lots	Available Deed Restricted Lots
Adams Ranch	3	3	1	
Country Club II	32	32	2	
Country Club III *	4	4	0	
Divide	41	41	4	
Faraway Ranch (Parcel N)	1	1	0	
Fox Run	25	25	3	
Gracie's Cabin	2	2	1	
Horse Ranch	96	96	16	
Crossings (Restricted Sales)	35	35		0
Melton Ranch I	58	58	2	
Melton Ranch II	52	52	2	
Melton Ranch III	22	22	0	
The Pines	51	51	14	
Ridge Run I	71	71	2	
Ridge Run II	16	16	0	
Ridge Run III	60	60	4	
Ridge Run IV	41	41	4	
Rodeo Place (Restricted Sales)	24	25		25
Seven Star	1	1	1	
Sinclair Meadows	17	17	17	
Two Creeks	51	51	8	
Wildcat Ranch	15	15	5	
Wildoak	13	13	2	
Wildridge I	15	15	2	
Wildridge II	47	47	1	
Woodrun I	107	107	6	
Woodrun II	10	10	0	
Woodrun III	6	6	0	
Woodrun IV	6	6	0	
Woodrun V	9	9	1	
Total	**931**	**932**	**98**	**25**

**Snowmass Club Parcel 2, Filing No.1*

Multi Family Residential Development Unit Summary

Multifamily Units	Number of Dwelling Units Existing and Approved			Future Buildout Potential	% Future Buildout Increase
	Free Market	E. H.	Future		
Aspenwood	50	0	55	5	10.0%
Brush Creek Apts.	0	27	27	0	0.0%
Carriageway Apts.	12	0	14	2	16.7%
Chamonix @ Woodrun	27	3	30	0	0.0%
Creekside Apts.	0	72	72	0	0.0%
Crestwood	127	14	141	0	0.0%
Divide VMF	0	9	9	3	50.0%
Draw (Parcel C & D)	0	0	60	60	0.0%
Enclave	40	0	40	0	0.0%
Faraway North (Center)	0	0	30	30	0.0%
Hoaglund Ranch	0	1	1	0	0.0%
Interlude	26	1	30	3	11.1%
Krabloonik	0	2	2	0	0.0%
Laurelwood	52	1	59	6	11.3%
Lichenhearth	40	0	44	4	10.0%
Mountain Chalet	64	6	77	7	10.0%
Mountain View	0	129	156	27	20.9%
Palisades	0	26	26	0	0.0%
Pokolodi Lodge	47	3	55	5	10.0%
Shadowbrook	26	0	29	3	11.5%
Silvertree Hotel	262	7	296	27	10.0%
Snowmass Center	0	0	15	15	-------
Snowmass Inn	37	2	43	4	10.3%
Sonnenblick	6	0	7	1	16.7%
Stonebridge	91	1	102	10	10.9%
Stonebridge Inn	95	8	114	11	10.7%
Tamarack	36	0	40	4	11.1%
Terracehouse	29	1	33	3	10.0%
Timberline	96	5	112	11	10.9%
Top of the Village	111	0	123	12	10.8%
Top of the Village Gatehouse	5	3	8	0	0.0%
Wildwood Lodge	146	10	172	16	10.3%
Willows, Center	40	0	44	4	10.0%
Willows, Lower	24	0	27	3	12.5%
Woodrun Place	54	0	54	0	0.0%
Woodrun V Townhomes	45	0	45	0	0.0%
Total	**1,588**	**331**	**2,192**	**276**	**14.4%**

Multi Family Commercial Development (Specific Developments Only)

Name	% Future Build-out *	Associated CPA	EQR's as of Jan 2010	Projected EQR's at Build-out
Anderson Ranch	62.5	Anderson Ranch	18.54	30.12
Carriageway Apts.	16.7	West Village	8.00	9.34
Interlude Condos	11.1	West Village	37.05	41.16
Laurelwood	11.3	West Village	45.00	50.09
Lichenhearth	10	West Village	26.48	29.12
Mountain Chalet	10	West Village	29.51	32.46
Pokolodi Lodge	10	West Village	18.30	20.13
Shadowbrook	11.5	West Village	32.14	35.84
Silvertree Hotel	10	West Village	123.31	135.64
Snowmass Inn	10.3	West Village	23.41	25.82
Sonnenblick	16.7	West Village	9.80	11.44
Stonebridge	10.9	West Village	109.65	121.60
Stonebridge Inn	10.7	West Village	58.09	64.31
Tamarack	11.1	West Village	43.68	48.53
Terracehouse	10	West Village	32.12	35.33
Timberline	10.9	West Village	102.13	113.26
Top of the Village	10.8	West Village	132.66	146.99
Willows, Lower	12.5	West Village	42.80	48.15
	10.67	**Total EQR's**	**892.66**	**999.32**

Appendix B
Rules and Regulations

1a., 2a., 2c. Rules and Regulations WEP Excerpt

SECTION V WATER CONSERVATION

5.0 Water Conservation
5.1 Water Use Efficiency Plan
5.2 Restriction on Use
- **5.2.1 Procedure**
- **5.2.2 Water Shortage**
- **5.2.3 Water Crisis**

5.3 Water Conservation Restrictions
- **5.3.1 Restriction Period**
- **5.3.2 No Use Period**
- **5.3.3 Alternate Day Watering**
- **5.3.4 Exemption Permit**
  - **5.2.4.1 Term**
  - **5.2.4.2 First Extension**
  - **5.2.4.3 Second Extension**
- **5.3.5 Penalties**
- **5.3.6 Further Restriction**

5.4 Water Conservation Design and Fixtures
- **5.4.1 New Customers**
- **5.4.2 Outdoor Requirements for New Customers**
- **5.4.3 Existing Customers**

4.1 Water Use Efficiency Plan. In 2014 the District Board of Directors is expected to review and approve a Water Use Efficiency Plan that will subsequently be submitted to the Colorado Water Conservation Board for approval. The plan will address the following issues:

A. Water efficient fixtures and appliances including toilets, urinals, showerheads, and faucets;

B. Low water use landscapes and efficient irrigation;

C. Water efficient industrial and commercial water using processes;

D. Water reuse systems, both potable and non-potable;

E. Distribution system leak repair;

F. Dissemination of information regarding water use efficiency measures, including by public education, customer water use audits, and water saving demonstration;

G. Water rate structures designed to encourage water use efficiency in a fiscally responsible matter;

H. Regulatory measures, including standards for the use of water use efficiency fixtures and landscapes, and ordinances, codes, or other law designed to encourage water use efficiency; and

I. Incentives to implement water use efficiency techniques to encourage the installation of water use efficiency measures.

A complete copy of the draft Water Use Efficiency Plan may be obtained from the District office upon request.

5.2 Restriction on Use. The District shall implement reasonably practicable water conservation measures during those times when surface water supplies are limited or to lessen the possibility of the flows in Snowmass Creek falling below acceptable levels by reason of the District's diversions.

5.2.1 Procedure. The Board shall determine that a water shortage exists. Thereupon, the plan hereinafter set forth shall be implemented. The duration of each stage shall be determined by the Board, according to the exigent circumstances of the particular situation.

5.2.2 Water Shortage. During the period designated Water Shortage, water supplied by the District shall not be used for:

5.2.2.1 washing of sidewalks, driveways, parking areas, tennis courts, patios, or other paved areas.

5.2.2.2 filling or refilling of swimming pools, hot tubs, spas, or the like.

5.2.2.3 washing of privately owned cars, other motor vehicles, trailers or boats.

5.2.2.4 lawn watering and irrigation, except to the extent determined to be permissible by the District.

5.2.2.5 dust control, street or parking lot cleaning.

5.2.2.6 drinking water to restaurant customers, except upon request.

A public awareness program will be initiated for education as to the types of practices which a successful temporary program will require. The District shall distribute printed material emphasizing the need to schedule water use during off-peak hours, as well as suggested lifestyle changes.

5.2.3 Water Crisis. Prior to the expiration of a Water Shortage, a period known as a Water Crisis shall be designated by the Board, if entry of such stage is necessary. During a Water Crisis, all restrictions under a Water Shortage shall remain in effect. In addition, the following measures shall also be in effect:

5.2.3.1 Except for fire fighting, there shall be no use of water from a fire hydrant.

5.2.3.2 Watering of any lawn, garden, landscaped area, tree, shrub or other plant shall be prohibited.

5.2.3.3 Restaurants will be required to serve patrons with disposable plates, glasses, knives, forks and spoons and to use such other disposable utensils as is reasonable.

5.2.3.4 There shall be no replenishments of swimming pools, normal or otherwise.

5.2.3.5 No new water service shall be authorized; however, existing authorizations shall be honored.

5.3 Water Conservation Restrictions. To insure the proper functioning of the District's water system during periods of peak demand and to promote water conservation in outdoor watering practices, the following water conservation restrictions shall apply daily.

5.3.1 Restriction Period. The watering restrictions shall be in effect daily.

5.3.2 No Use Period. No watering shall occur between the hours of 10:00 o'clock a.m. and 5:00 o'clock p.m.

5.3.3 Alternate Day Watering. At the beginning of each year the District will publish a watering schedule for the watering restriction period that will allow alternate day watering in the north and south zones. The North and South Zones shall be defined and delineated by a line following Owl Creek Road to Brush Creek and up Brush Creek to the Divide. Watering days will alternate between the zones during the watering restriction period.

5.3.4 Exemption Permit. An exemption permit shall not be issued to a Customer except during one (1) calendar year. The District Manager shall issue not greater than one (1) exemption to a customer for the purposes of watering of newly installed landscaping, lawns and trees. The customer shall prominently display a copy of the exemption permit in the area to be watered. During the term of the exemption permit the customer will be authorized to water on consecutive days. This shall not entitle the customer to water during the daily "no use period".

5.3.4.1 Term. The exemption shall be issued by the District Manager for a period of thirty (30) days.

5.3.4.2 First Extension. The District Manager shall issue a first extension to the exemption permit for an additional period of thirty (30) days upon the expiration of the initial term, if the condition warranting the issuance of an exemption permit is still in existence and the applicable fee has been paid.

5.3.4.3 Second Extension. The District Manager shall issue a first extension to the exemption permit for an additional period of thirty (30) days upon the expiration of the first extension period, if the condition warranting the issuance of an exemption permit it still in existence and the applicable fee has been paid.

5.3.5 Penalties. Any violation of this Section (watering on the wrong day or time) subjects the offender to the following penalties:

First Violation	Written warning
Second Violation	$100 fine
Third Violation	$300 fine
Fourth Violation	$500 fine
Fifth Violation	Disconnect of service

Successive violations are determined per irrigation season, and not from year to year. Upon discovery of a violation, the District shall provide the Customer with written notice of the violation and assessment of a penalty, if applicable, by certified mail, except notice of a first violation will be sent by regular mail. After a notice of a violation has been given, each day of continued violation is a separate offense. Penalties may be imposed by any of the District's employees or consultants, and payment of penalties is due within thirty (30) days of the date of mailing the notice thereof by the District, unless a written appeal is filed with the District within said thirty days. The decision of the Board of Directors on appeals shall be final. Until paid, all penalties imposed hereunder constitute a perpetual lien against the subject property pursuant to *Section 6.5, Liability for Payment*, of the District's Rules and Regulations and C.R.S. §32-1-1001(j), which lien may be foreclosed in the manner provided by law for foreclosure of mechanics liens.

5.3.6 Further Restriction. The District Manager is authorized to implement further water conservation restrictions as are necessary to lessen the need to pump water from Snowmass Creek or to insure the proper functioning of the District's water system, as are deemed appropriate at the discretion of the District Manager. Upon implementation of any such further water conservation restrictions by the District Manager, such restrictions shall be enforceable in accordance with the provisions of *Section VII, Enforcement*.

5.4 Water Conservation Design and Fixtures. It is the policy of the District to minimize the waste of water by requiring the use of low flow plumbing fittings and fixtures. Any conflict between the definition of a low flow fixture in this Section and the definition of such a fixture as set forth in the laws of the State of Colorado concerning low flow plumbing fixtures at *C.R.S. 9-1.3-101m et. seq*. are to be resolved by requiring the minimum water usage.

5.4.1 Indoor Fixture Requirements for New Customers. All new customers who connect to the District's system shall be required to meet the following indoor fixture standards:

a. **Single Family Residential and Multi Family Residential customers** shall install the following *WaterSense* labeled fixtures:

i. **Lavatory faucets** shall have a maximum flow capacity of 1.5 gallons per minute at 60 pounds per square inch;

ii. **Tank-type toilets** shall have a maximum gallons per flush requirement of 1.28 gallons;

iii. **Shower heads** of a maximum discharge of not greater than 2.0 gallons per minute at 60 pounds per square inch;

b. **Multi Family Commercial and Commercial customers** shall install indoor fixtures that meet the following criteria:

i. **Public Restrooms**

1. **Faucets** shall be self-closing and *WaterSense* labeled;

2. **Tank-type toilets** shall be dual-flush, *WaterSense* labeled;

3. **Tankless toilets** shall be dual-flush and equipped with flushometer valves;

4. **Urinals** shall have automatic flushing or constant water demands and shall be *WaterSense* labeled.

ii. **Non-Public Restrooms** shall install the following *WaterSense* labeled fixtures:

1. **Lavatory faucets** shall have a maximum flow capacity of 1.5 gallons per minute at 60 pounds per square inch;

2. **Tank-type toilets** shall have a maximum gallon per flush requirement of 1.51.28 gallons;

3. **Shower heads** of a maximum discharge of not greater than 2.0 gallons per minute at 60 pounds per square inch;

5.4.2 **Outdoor Requirements for New Customers.** All new customers who connect to the Districts system shall be required to meet the following outdoor requirements:

a. **Irrigation system controller** will be installed for all properties with landscaped areas. Controllers shall be *WaterSense* labled, Weather-Based controllers.

b. **Soil amendment** shall be added to all landscaped areas to a depth of 2-inches. Soil amendment material can include, but is not limited to manure or compost. Bedded areas may include wood chips or bark. Stones shall be allowed in low water use zones.

5.4.3 **Existing Customers.** All existing customers who are obligated to obtain a connection permit due to alteration or renovation of or addition to existing property, whether or not the installation or relocation of plumbing fixtures is required, shall install:

a. **New or replacement fixtures** in accordance with the provisions of *Section 5.4.1*;

b. **Massage or high-use shower heads** shall be removed and replaced, to comply with the provision of *Section 5.4.1.*

c. **A pressure reducing valve and a water meter** in accordance with the provision of *Section 3.11.2*, Conditions of Service;

d. **A backflow prevention device** in accordance with the provision of Section *3.11.3, Cross-Connection and Backflow Control*.

Appendix C
Applicable CWCB Evaluation Worksheets

CWCB Evaluation Worksheets
Worksheet D – Foundational Activities
Worksheet E – Targeted Technical Assistance Incentives
Worksheet F – Ordinances and Regulations
Worksheet G – Education Activities
Worksheet H – Evaluation and Selection of Water Efficiency Activities

Worksheet D – Identification and Screening of Foundational Activities

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification		Qualitative Screening [5]							Carry to Evaluation [6]	Reason for Elimination [7]
		Existing/ Potential Activity [3]	Targeted Customer Category [4]	*Target winter use to address Min. Stream Flow goals*	*Target largest customer class (Resid.)*	*Improve data collection for remaining customer classes*	*Foundational Measure*	*Easy to Implement with Existing Resources*	*Anticipated Strong Customer Support*	Notes on Additional Pros/Cons to Consider		
Metering (BP1)	V, VII											
(7e.) Fixed Network AMI Water Metering System (Automatic Meter Reading Installation and Operations)		P	All	x	x	x			x		x	
(7d.) District Ownership and Upgrade/Replacement of Private Meters Meter Upgrades Meter Testing and Replacement Submetering for Large Users (Indoor & Outdoor)		P	All	x	x	x	x		x		x	
Identify Unmetered/Unbilled Treated Water Uses		E	All	x		x	x					SWSD conducts these evaluations as part of other administrative audits
Data Collection - Monitoring and Verification (BP2)												
(5c.) Monthly Service Billing (Frequency of Meter Reading)		P	All	x	x	x	x				x	
(5b.) Billing System Upgrade (to track Use by Sufficient Customer Types)												
Track Use by Sufficient Customer Types		P	All	x	x	x	x		x		x	
Tracking Water Use for Large Customers												
Area of Irrigated Lands in Service Area (e.g. acres)		P	All		x							SWSD large water use customers is more associated with snowmaking than irrigation
Water Use Efficiency Oriented Rates and Tap Fees (BP1)	VII, VIII											
(5a.) Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation			All	x	x	x	x			SWSD currently usese a Tiered rate structure, modified volumetric billing and regular rate adjustments but will conduct a rate study to improve existing rate structure	x	
Volumetric Billing		E/P										
Water Rate Adjustments												
Inclining/Tiered Rates												
Frequency of Billing (Billing and Meter Reading frequency will be included with (1) Fixed Network AMI Water Metering System, (2) Meter Upgrades, (3) Billing System Upgrades)												
Water Budgets (Included with Billing System Upgrades)												
(3b.) System Development Fee Incentives for New Development (Tap Fees with Water Use Efficiency Incentives)		P	All	x	x	x		x	x		x	
System Water Loss Management and Control (BP3)	V											
(7f.) Improve System-Wide Distribution System Accounting (System Wide Water Audits) (Control of Apparent Losses with Metering)		P	All	x	x	x	x			SWSD is undertaking significant water loss management measures in the upcoming years; it has identified other measures as higher priority than this measure. While included, timing will be long-term	x	
(7b.) Leak Detection and Repair		E	SWSD	x			x	x			x	
(7a.) Annual Water Line Replacement Program (7c.) Prompt Repair of Water Line Breaks and Leaks (Water Line Replacement Program)		E	SWSD	x			x	x			x	
Planning (BP2)												
Integrated Water Resources Plans		E	SWSD									SWSD will conduct these evaluations a part of its system-wide master planning in sequence with other distribution system planning tasks
Master Plans/Water Supply Plans		E	SWSD									
Capital Improvement Plans		P	SWSD									
Feasbility Studies		P	SWSD									
Staff (BP4)												
(8a.) Water Conservation Coordinator		E	All	x	x	x	x	x	x		x	

Worksheet E – Identification and Screening of Targeted Technical Assistance Incentives

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification: Existing/ Potential Activity [3]	Identification: SWSI Framework Levels [4] Level 1 Municipal Uses	Level 2 Customers with the Largest Water Use	Level 3 Customer Type(s) in Service Area	Targeted Customer Category [5]	Qualitative Screening [6]: Target winter use to address Min. Stream Flow goals	Target largest customer class (Resid.)	Improve data collection for remaining customer classes	Foundational Measure	Easy to Implement with Existing Resources	Anticipated Strong Customer Support	Notes on Additional Pros/Cons to Consider	Carry to Evaluation [7]	Reason for Elimination [8]
Installation of Water Efficient Fixtures and Appliances	I														
(3a.) Provide Free Water Audits for Top Ten Water Users Based on Water Consumed/EQR (Indoor Audits) (Specialized Nonresidential Surveys, Audits and Equipment Efficiency Improvements)		P		x		Commercial	x					x		x	
(1d.) New and Retrofit Fixture Incentives - Commercial Only (Urinal Retrofits) (Toilet Retrofits) (Showerhead Retrofits) (Faucet Retrofits, e.g. aerator installation)		P			x	Commercial	x					x		x	
(1c.) Free Indoor Water Conservation Kits - Residential Only (Toilet Retrofits) (Showerhead Retrofits) (Faucet Retrofits, e.g. aerator installation)		P			x	Residential	x	x			x	x		x	
Water Efficient Washing Machines		P			x	Residential/ Commercial	x	x				x			Anticipated lower % water use among SWSD customers than other fixtures. SWSD will focus on Toilets/Urinals, Showerheads and Faucets)
Water Efficient Dishwashers		P			x	Residential/ Commercial	x	x				x			
Efficient Swamp Cooler and Air Conditioning Use		P			x	Residential/ Commercial		x				x			
Low Water Use Landscapes	II														
(2i.) Promote Replacement of Conventional Landscape with Xeriscape (Drought Resistant Vegetation) (Xeriscape) (Other Low Water Use Landscapes)		P			x	Residential/ Commercial		x				x		x	
Removal of Phreatophytes		P				All									Phreatophytes do not represent a large percentage of water use in SWSD
(2g.) Free Irrigation Audits (Irrigation Efficiency Evaluations/Outdoor Water Audits)		P		x		Residential/ Commercial		x				x		x	
Outdoor Irrigation Controllers (See Incintives, below, and Worksheet F)															
Limit Irrigation Watering Times (See Worksheet F)															
Rain Sensors (See Incitives, below, and Worksheet F)															
Residential Outdoor Meter Installations		P		x		Residential/ Commercial		x	x						low cost benefit ratio
Irrigation Equipment Retrofits (See Incintives, below)															
(2h.) Free Outdoor Water Conservation Kits		P		x		Residential/ Commercial		x			x	x		x	
Water- Efficient Industrial and Commercial Water-Using Processes	III														
Specialized Nonresidential Surveys, Audits and Equipment Efficiency Improvements (Included with Indoor Audits)															
Commercial Indoor Fixture and Appliance Rebates/Retrofits (Included with New and Retrofit Fixture Incentives)															
Cooling Equipment Efficiency		P			x	Commercial									Water use for colling equipment in SWSD not a significant percentage of the overall demand
Restaurant equipment		P			x	Commercial	x								SWSD will include in Water Audits program development
(8c.) Zeigler Reservoir Operations		E	x			SWSD	x				x	x		x	
(6a.) Develop Water Conservation Best Management Practices for Water Treatment Pland and Wastewater Treatment Plant		P	x			SWSD					x			x	
(8b.) Snowmaking Efficiencies and Water Management Practices		E/P		x		Commercial	x							x	
Incentives	X														
(1b.) Toilet Rebates		P			x	Residential	x	x			x	x		x	
Urinal Rebates		P			x	Residential/ Commercial	x	x			x	x			Fixture incentives provided through various other measures
Showerhead Rebates		P			x	Residential	x	x			x	x			
Water Efficient Faucet or Aerator Rebates		P			x	Residential	x	x			x	x			
Water Efficient Washing Machine Rebates		P			x	Residential	x	x			x	x			
Water Efficient Dishwasher Rebates		P			x	Residential	x	x			x	x			
(2e.) Rebates for Smart Irrigation Controllers (2f.) Rain Sensor Rebate for Existing Customers (Efficient Irrigation Equipment Rebates)		P			x	Residential		x			x	x		x	
Landscape Water Budgets Information and Customer Feedback		P			x	Residential		x				x			It is anticipated that this will be part of numerous other measures that will be carried over to evaluation
Turf Replacement Programs/Xeriscape Incentives (Included with 2i. Promote Replacement of Conventional Landscape with Xeriscape)															
Give-aways (Included as part of 2h. Free Outoor Water Conservation Kits)															

Worksheet F – Identification and Screening of Ordinances and Regulations

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification					Qualitative Screening [6]							Carry to Evaluation [7]	Reason for Elimination [8]
		Existing/ Potential Activity [3]	SWSI Framework Levels [4]			Targeted Customer Category [5]	Target winter use to address Min. Stream Flow goals	Target largest customer class (Resid.)	Improve data collection for remaining customer classes	Foundational Measure	Easy to Implement with Existing Resources	Anticipated Strong Customer Support	Notes on Additional Pros/Cons to Consider		
			Level 1 Customer Type(s) within the Existing Service Area	Level 2 New Development	Level 3 Point of Sales on Existing Building Stock										
General Water Use Regulations	IX														
(2b.) Update Water Waste Policies and Enforce a "Water Waste" Ordinance (Water Waste Ordinance) (BP 5) (Water Overspray Limitations)		E	x			Residential/ Commercial		x			x			x	
(2c.) Limit Irrigation Watering Times (Time of Day Watering Restriction) (Day of Week Watering Restrictions)		E	x			Residential/ Commercial		x			x			x	
Landscape Design/Installation Rules and Regulations	IX														
(2a.) Establish Landscaping and Irrigation System Design Requirements for New Development (Rules and Regulations for Landscape Design/Installation) (BP 9) (Soil Amendment Requirements) (BP9) (Turf Restrictions) (BP9) (Irrigation Equipment Requirements)		P		x		Residential/ Commercial		x						x	
Landscaper Training and Certification (BP 8)		P			x	Residential/ Commercial		x							Will be included as part of Audit development
Irrigation System Installer Training and Certification (BP 8)		P			x	Residential/		x							
Outoor Water Audits/Irrigation Efficiency Regulations (BP 10) (Included as part of Incentives Worksheet E)															
Outdoor Green Building Construction (BP 8,9)		P		x		Residential/ Commercial		x							SWSD works with Town of Snowmass Village to develop construction codes that apply specifically to water use; full "Green Building" construction code will continue to be done in partnership with that entity.
(2d.) Restrict Water Features/Fountains and Charge System Development Fees based on Volume		P		x		Residential/ Commercial		x						x	
(6c.) Promote the Use of Non-Potable Supplies for Irrigation		P		x		Residential/ Commercial		x						x	
Indoor and Commercial Regulations	IX														
(1a.) Establish High-Efficiency Indoor Fixture Requirements for New Developments (Indoor Plumbing Requirements) (BP 12)		P		x		Residential/ Commercial	x	x			x			x	
High Efficiency Fixture and Appliance Replacement (BP 12)		P	x			Residential/ Commercial									SWSD will evaluate the effectiveness of voluntary, incentivised use of these measures before they are made requirements
Required Indoor Residential Audits (BP 13)		P	x			Residential	x	x							
Required Indoor Commercial Audits (BP 14)		P	x			Commercial	x								
Commercial Water Wise Use Regulations (Car Washes, Restaurants, etc.)		P	x			Commercial	x								
Commercial Cooling and Process Water Requirements (BP 14)		P	x			Commercial									Does not represent a significant percentage of demand in SWSD
Green Building Construction (BP 12)		P		x		Residential/ Commercial									SWSD works with Town of Snowmass Village to develop construction codes that apply specifically to water use; full "Green Building" construction code will continue to be done in partnership with that entity.
(6a.) Develop Water Conservation BMPs for WTP and WWTF (6b.) WWTF reuse water (City Facility Requirements) (BP 12)		P	x			SWSD								x	

Worksheet G – Identification and Screening of Education Activities

Water Efficiency Activities for Screening [1]	State Statute Requirement [2]	Identification					Qualitative Screening [6]							Carry to Evaluation [7]	Reason for Elimination [8]
		Existing/ Potential Activity [3]	SWSI Framework Levels [4]			Targeted Customer Category [5]	*Target winter use to address Min. Stream Flow goals*	*Target largest customer class (Resid.)*	*Improve data collection for remaining customer classes*	*Foundational Measure*	*Easy to Implement with Existing Resources*	*Anticipated Strong Customer Support*	Notes on Additional Pros/Cons to Consider		
			Level 1 One-Way	Level 2 One-Way with Feedback	Level 3 Two-way communication										
Customer Education (BP6)	VI														
(4d.) Provide Conservation Tips on Water Bills and Newsletters (Newsletters) (Mass Mailings)		P	x			Residential/ Commercial	x	x			x	x		x	
(4c.) Public Information and Education (4a.) Water-efficient Landscape and Irrigation System Brochures (Newspaper Articles) (Social Networking)		P	x			Residential/ Commercial	x	x			x	x		x	
(4b.) Water Conservation Webpage (Web Pages) (Interactive Websites)		E	x			Residential/ Commercial	x	x			x	x		x	
(4e.) Youth and Teacher Education (K-12 Teacher and Classroom Education Programs)		E			x	Residential	x	x			x	x		x	
(4f.) Spearhead the Creation of a District Water Conservation Taskforce (Focus Groups) (Citizen Advisory Boards)		P			x	Residential/ Commercial	x	x				x		x	
Message Development/Campaign		P	x			Residential/ Commercial	x	x				x			SWSD will participate in a regional water efficiecincy plan; it is anticipated that measures such as these will lend themselves well to regionalized effort
Water Fairs		P			x	Residential	x	x				x			
Customer Surveys		P		x		Residential/ Commercial	x	x				x			
Technical Assistance	VI														
(4g.) Conduct Annual Water Conservation Workshops (Customer Water Use Workshops) (Landscape Design and Maintenance Workshops)		P			x	Residential	x	x				x		x	
Xeriscape Demonstration Garden		P	x			Residential		x				x			SWSD does not currently have staff resources to initiate this measure

Worksheet H – Evaluation and Selection of Water Efficiency Activities

Water Efficiency Activities for Evaluation	Existing/ Potential Activity	Targeted Customer Category	Review of Qualitative Screening: Qualitative Goals: Target winter use to address Min. Stream Flow goals	Target largest customer class (Resid.)	Improve data collection for remaining customer classes	Foundational Measure	Easy to Implement with Existing Resources	Anticipated Strong Customer Support	Evaluation: Projected Water Savings: 20-Yr Total Water Savings (MG)	Average Annual Water Savings (MG/Yr)	Projected Costs: Initial Labor Cost	Initial Material Cost	Life (Years)	Initial Total Cost	Est. Annual Cost ($/YR)	Total 20-year Cost ($)	Benefit to Cost Ratio	Approved by SWSD Board	Selected for Implementation
Foundational Activities																			
3b. System Development Fee Incentives for New Development	P	Commercial	x				x		11	0.6	$2,000	$0	20	$2,000	$0	$2,000	0.00556	No	
5a. Modify and Adopt a Water Rate Structure that Continues to Promote Water Conservation	E/P	All	x	x	x	x			360	18	$20,000	$0	20	$20,000	$0	$20,000	0.01799	Yes	X
5b. Billing System Upgrade	P	All	x	x	x	x		x	0	0	$0	$0	20	$0	$5,000	$100,000	0	Yes	X
5c. Monthly Service Fee Billing	P	All	x	x	x	x			0	0	$167,000	$4,000	20	$171,000	$171,000	$3,591,000	0	Yes	X
7a. Annual Water Line Replacement Program	E	SWSD	x			x	x				NA	NA	20	$135,000	$135,000	$2,835,000	0.00015	Yes	X
7b. Leak Detection Program	E	SWSD	x			x	x		429	21	$12,000	$0	20	$12,000	$12,000	$252,000	0	Yes	X
7c. Prompt Repair of Water Line Breaks and Leaks	E	SWSD	x			x	x				$4,200	$42,000	20	$50,000	$50,000	$1,050,000	0	Yes	X
7d. District Ownership and Upgrade of Private Water Meters	P	All	x	x	x	x		x	0	0	$94,000	$273,000	2	$367,000	$2,400	$371,800	0	Yes	X
7e. Fixed Nework AMI Water Metering System	P	All	x	x	x			x	0	0	$26,000	$52,000	20	$78,000	$2,000	$118,000	0	Yes	X
7f. Improve System-Wide Distribution System Accounting	P	All	x	x	x	x			0	0	$5,000	$25,000	20	$30,000	$30,000	$630,000	0	Yes	X
8a. Water Conservation Officer Staff Position	E	All	x	x	x	x	x	x	0	0	$10,000	$0	20	$10,000	$10,000	$210,000	0	Yes	X
Targeted Technical Assistance and Incentives																			
1b. Toilet Rebates	P	Residential	x	x			x	x	4	0.2	$2,000	$1,000	20	$3,000	$1,000	$23,000	0.00017	Yes	X
1c. Free Indoor Water Conservation Kits - Residential Only	P	Residential	x	x			x	x	35	1.7	$1,400	$5,000	20	$6,400	$1,000	$26,400	0.00132	No	
1d. New and Retrofit Fixture Incentives - Commercial Only	P	Commercial	x					x	17	0.9	$2,000	$2,000	20	$4,000	$2,000	$44,000	0.00039	Yes	X
2e. Rebates for Smart Irrigation Controllers	P	Residential		x			x	x	1	0.1	$2,000	$1,000	20	$3,000	$1,000	$23,000	6.3E-05	Yes	X
2f. Rain Sensor Rebate for Existing Customers	P	Residential		x			x	x	4	0.2	$2,000	$1,000	20	$3,000	$1,000	$23,000	0.00016	Yes	X
2g. Free Irrigation Audits	P	Residential/ Commercial		x				x	2	0.1	$12,000	$0	20	$12,000	$5,000	$112,000	2E-05	Yes	X
2h. Free Outdoor Water Conservation Kits	P	Residential/ Commercial		x			x	x	0	0	$1,400	$1,000	20	$2,400	$800	$18,400	0	No	
2i. Promote Replacement of Conventional Landscape with Xeriscape	P	Residential/ Commercial		x				x	0.02	0.001	$1,000	$0	20	$1,000	$450	$10,000	2.2E-06	Yes	X
3a. Provide Fee Water Audits for Top Ten Water Users Based on Water Consumed per EQR	P	Commercial	x					x	0.1	0.004	$12,000	$0	20	$12,000	$5,000	$112,000	6.5E-07	Yes	X
8b. Snowmaking Efficiencies and Water Management Practices	E	Commercial	x				x	x	0	0	$0	$0	20	$0	$0	$0	NA	Yes	X
8c. Zeigler Reservoir Operations	E	SWSD	x				x	x	0	0	$0	$0	20	$0	$0	$0	NA	Yes	X
Ordinances and Regulations																			
1a. Indoor Fixture Requirements	P	Residential/ Commercial	x	x			x		11	0.6	$0	$0	20	$0	$0	$0	NA	Yes	X
2a. Landscaping and Irrigation System Requirements	P	Residential/ Commercial		x			x		5	0.2	$0	$0	20	$0	$0	$0	NA	Yes	X
2b. Update Water Waste Policies and Enforce a "Water Waste" Ordinance	E	Residential/ Commercial		x			x		0.04	0.002	$3,000	$0	20	$3,000	$300	$9,000	4.1E-06	Yes	X
2c. Limit Irrigation Watering Times	E	Residential/ Commercial		x			x		8	0.4	$0	$0	20	$0	$0	$0	NA	Yes	X
2d. Restrict Water Features/Fountains and Charge System Development Fees based on Volume	P	Residential/ Commercial		x					0.002	0.0001	$4,000	$0	20	$4,000	$200	$8,000	2.5E-07	Yes	X
(6a.) Develop Water Conservation BMPs for WTP and WWTF (City Facility Requirements) (BP 12)	P	SWSD							25	1.2	$0	$0	20	$0	$0	$0	NA	Yes	X
(6b.) WWTF reuse water	P	SWSD							12	0.6	$400	$300,000	20	$300,400	$3,000	$360,400	3.4E-05	Yes	X
(6c.) Promote the Use of Non-Potable Supplies for Irrigation	P	Residential/ Commercial		x					0	0	$100,000	$2,800,000	20	$2,900,000	$5,000	$3,000,000	0	No	
Education Activities																			
4a. Water Efficient Landscape and Irrigation System Brochures	P	Residential/ Commercial	x	x			x	x	0	0	$1,000	$500	20	$1,500	$700	$15,500	0	Yes	X
4b. Water Conservation Web Page	E	Residential/ Commercial	x	x			x	x	0.1	0.007	$0	$0	20	$0	$1,500	$30,000	4.9E-06	Yes	X
4c. Public Information and Education	P	Residential/ Commercial	x	x			x	x	0	0	$1,000	$5,000	20	$6,000	$2,500	$56,000	0	Yes	X
4d. Provide Conservation Tips on Water Bills or Newsletters	P	Residential/ Commercial	x	x			x	x	0	0	$600	$500	20	$1,100	$900	$19,100	0	Yes	X
4e. Youth and Teacher Education	E	Residential	x	x			x	x	0	0	$5,000	$2,000	20	$7,000	$2,400	$55,000	0	Yes	X
4f. Spearhead the Creation of a Water Conservation Taskforce	P	Residential/ Commercial	x	x				x	0	0	$2,000	$0	20	$2,000	$1,200	$26,000	0	No	
4g. Conduct Annual Water Conservation Workshops	P	Residential	x	x				x	0.1	0.003	$3,500	$1,900	20	$5,400	$5,400	$113,400	4.5E-07	No	