TOWN OF SPRINGDALE

WATER MANAGEMENT
AND
CONSERVATION PLAN

July 2017

MAYOR---------- Stan Smith
COUNCIL MEMBER---------- Mike Alltucker
COUNCIL MEMBER---------- Mark Chambers
COUNCIL MEMBER---------- Adrian Player
COUNCIL MEMBER---------- Lisa Zumpft
TOWN MANAGER ---------- Rick Wixom
TOWN CLERK ---------- Darci Carlson
TREASURER ---------- Dawn Brecke
PUBLIC WORKS SUPERINTENDENT ---------- Robert Totten

PREPARED BY:

SUNRISE ENGINEERING, INC.
11 North 300 West
Washington, UT 84780
TEL: 435-652-8450
FAX: 435-652-8416

TOWN OF SPRINGDALE
WATER MANAGEMENT AND CONSERVATION PLAN

INTRODUCTION

In response to the increasing demands and concerns pertaining to water resources throughout the State of Utah, the state legislature has passed and revised the Water Conservation Plan Act in the 2004 legislative session (Section 73-10-32 Utah Code Annotated). This water management and conservation plan is written to address the concerns of leaders and citizens of both the Town of Springdale and the State of Utah. The main reasons for concern regarding water conservation entail being able to meet future water needs, saving citizen's money, the fact that we live in a desert, and preserving the environment and our natural resources.

DESCRIPTION OF SPRINGDALE AND MUNICIPAL WATER SYSTEM

The Town of Springdale is located in Washington County, Utah, just before the south entrance of Zion National Park, along S.R. - 9. Springdale has an approximate population of 584 residents, in addition to several commercial facilities. The Town currently owns and operates its own culinary water system which provides water to the residences and businesses in the Town. The Town currently services approximately 281 residential/other connections and 118 commercial connections. The Town and the Springdale Consolidated Irrigation Company (SCIC) provide irrigation service to much of the Town through a separately operated distribution system.

Since the Town is located at the entrance of Zion National Park it is actively involved in maintaining the natural features, vegetation, and views of Zion Canyon surrounding the Town as well as the overall village character of the Town itself. The Town and Zion National Park are mutually dependent on each other. The Town's economy relies on the tourists visiting the Park, and the Park depends on Springdale as a gateway community to provide services that Park visitors want. Springdale's businesses include hotels, restaurants, and various retail shops. Consequently, meeting water demands in the Town requires considerable amounts of water.

One recent management and conservation accomplishment has been updating the Town's landscaping ordinance. This ordinance works to incorporate the natural beauty of the surrounding landscape and scenery, while keeping water conservation practices in mind. Additional comments regarding current practices can be found in later sections of this plan.

Springdale is growing, and is expected to continue to grow. This growth changes the utilization of the land and can put a strain on the water supply and distribution system

in order to meet demands. By means of careful preparation and efficient utilization of the available water supply these increased demands can and will be met.

EXISTING WATER RESOURCES

The Town of Springdale along with the Springdale Consolidated Irrigation Company (SCIC) have approximately 1,908.14 acre-feet of water that can be diverted annually from several water sources including wells, springs, and the North Fork of the Virgin River.

Of the 593.44 acre-feet owned by the SCIC, the Town of Springdale owns 28.8 of the approximate 445 shares in the company. These 28.8 shares equate to 38.4 acre-feet. Table 1 shows the water rights and the total allowable annual withdraw.

Table 1. Springdale Town Water Rights Summary

Springdale Town Water Rights Summary		
W.R. #	Source	ac-ft
81-105	Spring above ZNP Campground	11.58
81-220	Birch Springs East - West of ZNP Museum	30.41
81-274	Birch Springs West - West of ZNP Museum	50.68
81-585	Hummingbird Well	238.91
81-1326	Cemetery Well	104.98
81-2413	Big Springs	380.08
81-3392	North Fork Virgin River	365.95
	Subtotal	1182.59
Springdale Consolidated Irrigation Company		
81-1142	North Fork Virgin River (Irrigation)	725.55
	Total	1908.14

Currently, the water rights located at Birch Springs West, Birch Springs East, and the Zion National Park Campground are not being used. However, an upcoming project should provide the infrastructure needed to use these water rights regularly. The Cemetery Well water right is also not being used, but needs to be tested. If test results show poor water quality, a change in the point of diversion may be necessary.

PRESENT WATER USE AND FUTURE WATER NEEDS

Using the population and usage data from the Town of Springdale culinary water system master plan, residents use approximately 61.9 gallons per capita per day (gpcd) for mostly indoor use. The 61.9 gpcd also includes minimal outdoor usage since the secondary irrigation system is not accessible to all residential connections. This is compared to the average indoor water use of 58.6 gpcd according to statistics provided by the American Water Works Association (AWWA). In addition to residential use, the

total average usage per commercial connection per day is 875.7 gallons. This has been reduced substantially since 2009, when the average usage per commercial connection per day was 1185. Such a significantly high figure is accounted for by the fact that the commercial sector of the Town includes large hotels and restaurants. Total average monthly culinary water usage, including both residential and commercial, between years 2013-2014 is shown in Figure 1.

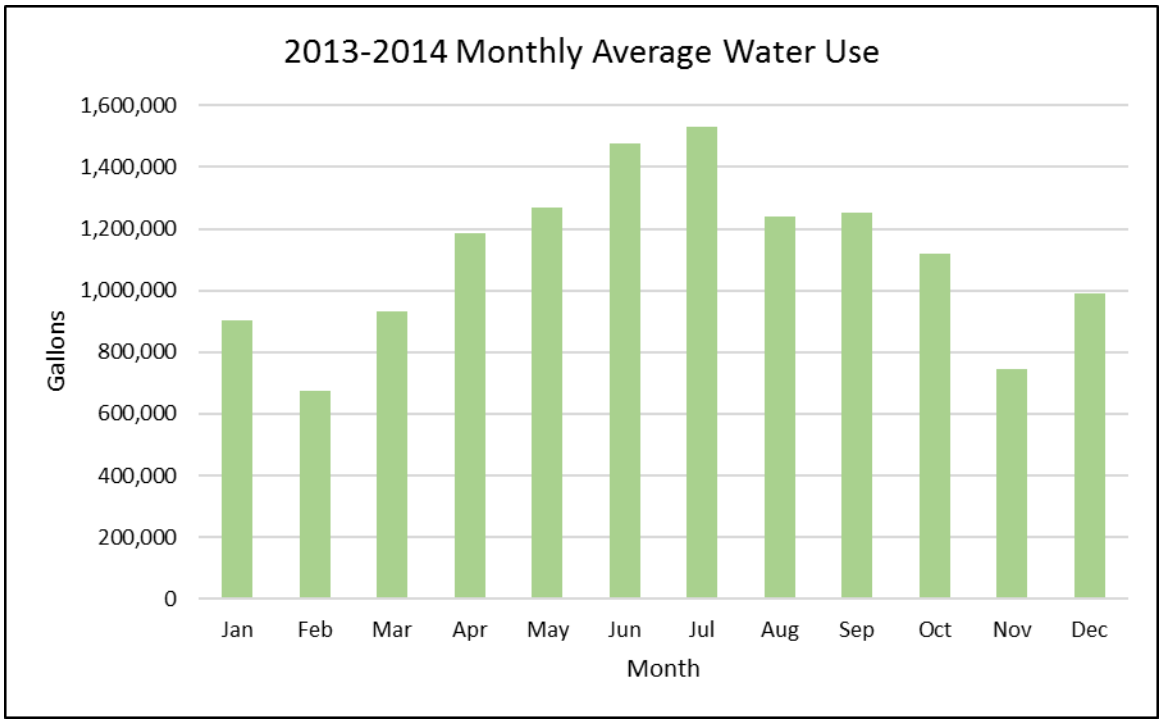

Figure 1. 2013-2014 Monthly Average Water Use

A secondary irrigation system is being used for outdoor water needs in the Town of Springdale. Recent connection data shows that there are 72 connections to the secondary irrigation system that are managed and billed through the Town. The additional connections are managed by the SCIC shareholders. Currently, there are approximately 120 shareholders within the company which own a total of 445.5 shares. Each shareholder pays an annual assessment of $60 per share. These shares do not directly correspond to the number of connections to the irrigation system; hence the total number of actual irrigation connections is unknown.

The total acre feet of water allotted for the culinary and irrigation systems is approximately 1,776.14 acre feet. The average yearly culinary water production or the water treatment plant out flow is just over 180 acre feet a year. If that amount is subtracted from the total acre feet of water allotted to the Town and Irrigation Company, 1,596.14 acre feet remain available for irrigation. Just to put this figure into perspective, if the entire remaining water right were to be used by the irrigation system then each person in Town would need to use nearly 2,600 gallons of water a day for secondary purposes. This would not be representative of the population of Springdale

as a whole, since the majority of this water is consumed by a handful of water users. As the population grows, it is expected that irrigation usage will decrease while residential and commercial usage will increase. This conversion from agricultural usage to residential and commercial usage is expected to provide water for the growth of the Town. To ensure future demands are met, the surrendering of these irrigation water rights at time of development, will be discussed later on in this plan.

The Town is expected to grow at a rate of 2.0% and the expected growth trend through year 2040 is shown in Figure 2. This population projection is based on past trend data and may deviate from the actual population experienced in the future.

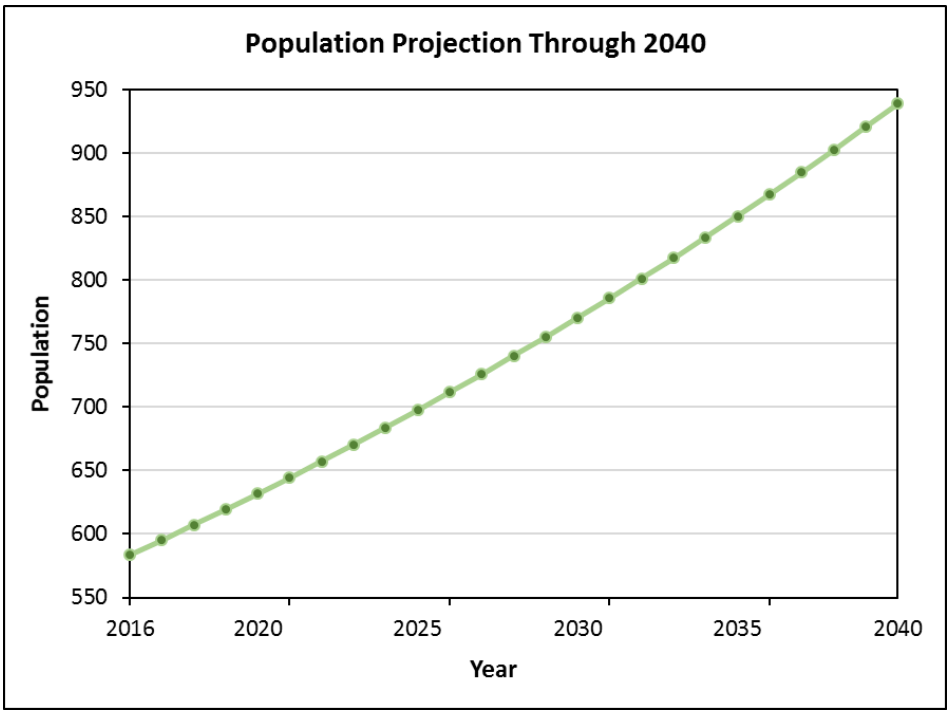

Figure 1. Population Projection Through 2040

In addition to a growth in population, the Town of Springdale must also plan for an increase of hotels, restaurants, and retail businesses. New parks and other open spaces are planned in conjunction with new residential and commercial developments, all of which will require both culinary and irrigation water connections.

WATER SYSTEM PROBLEMS

There are several conservation problems with the culinary and secondary water systems that can be addressed by standard conservation measures and goals as recognized by this plan. These problems include:

1. Citizens lack information and understanding of landscaping water requirements and efficient in-home water-use habits and practices. Very few residents know

how much water is required to maintain healthy landscaped areas and how to consistently use water efficiently indoors. Most citizens' irrigation and indoor practices are based on convenience rather than plant needs and water supply considerations. Also, some plumbing fixtures in the users systems are old, outdated, and less efficient than newer models.

2. The Town has improved its efforts to replace older and at-risk meters, but has not yet developed a structured replacement program to replace older and at risk meters on a continuous basis. Older meters have a greater chance of producing inaccurate flow data and decreased revenues from billing. Life expectancy of most meters is about 20 years. A portion of meters in the Town were replaced in 2000 and another portion in 2007, which makes many of the meters 10 to 17 years old. As these meters age, they are more likely to fail or produce incorrect flow data. A structured replacement program would help mitigate the amount of failures and inaccurate readings. The Town is currently working on a method to audit all the water meters on an at least annual basis. The Town audits meters that read zero monthly.

3. The secondary billing system lacks incentives and sufficient information for residents and businesses to use water more efficiently.

4. The secondary system has two separate entities governing and managing it. There is no way for the Town to obtain the majority of the shares in the near future using the acquisition methods of the past.

5. There is no method to meter and charge irrigation users for the amount of water they use. This provides no incentive to conserve irrigation water and no accountability for those using more than their share.

6. Finally, the irrigation system lacks the funds necessary to implement aggressive solutions to the above problems.

Each of these problems can be resolved through a progression of well thought-out and implemented plans. Possible plans are outlined and addressed in detail in the "Additional Conservation Measures" section.

WATER CONSERVATION GOALS

The following three goals have been identified to help monitor and track the success of the various programs and conservation measures being implemented.

1. **Goal 1 - Reduce the Town's per capita usage by 10 percent over the next five years.** This will reduce the average gallons per person per day of treated water from 62 to 56.

2. **Goal 2 - Retain a financially sustainable and well maintained water system.** The water rate structure determined by the Town for the culinary water system should continue to encourage the user to conserve water; yet ensuring that revenues meet the financial needs of the water system. Implementing water audit and leak detection programs will keep the system financially stable and physically maintained. Establishing a meter replacement program will ensure that water meters remain accurate and precise in their measurements.

3. **Goal 3 - Pursuit of a well managed and maintained secondary system.** Continue to improve efficiency of the community's secondary water system. By doing so, programs and systems can be implemented by the Town to ensure accountability for water usage. Metering irrigation water must become a priority. The Town has already implemented a dedication ordinance for development purposes to provide water for future growth. Springdale Consolidated Irrigation Company should be paying an equitable portion of costs for the system. Presently, SCIC pays only a third of the costs, but approximately 75% of the water being pumped is for irrigation. Springdale should make it a priority to meter irrigation water and should work with the SCIC to ensure costs are distributed equally.

CURRENT CONSERVATION PRACTICES

The Town has installed meters on all residential, commercial, and industrial water connections. The Town reads the meters on a regular basis, providing them with critical data used for billing and to inform the customers of their water usage.

The Town has shown its desire to conserve water by adopting a progressive water rate structure that encourages users to take less water where possible. This rate structure is also designed to cover the estimated costs of providing water service to the Town. The following table summarizes the water user rates.

Base Rate

Base Rate Residential/Commercial.....$16.12 per month

Overage Rates Residential

Tier #1……$4.90 per 1,000 gallons for usage from 0 to 5,000 gallons
Tier #2……$6.91 per 1,000 gallons for usage from 5,000 to 10,000 gallons
Tier #3……$8.58 per 1,000 gallons for usage from 10,000 to 25,000 gallons
Tier #4……$9.91 per 1,000 gallons for usage from 25,000 to 50,000 gallons
Tier #5……$10.92 per 1,000 gallons for usage from 50,000 gallons and over

The Town has also adopted several ordinances associated with water conservation. One such ordinance specifies that water efficient landscaping is to be used in all new

residential and commercial developments. This includes efficiencies in the watering system itself and plants are to be chosen from an acceptable plant list, consisting of native and naturally occurring plant species. Another such ordinance sets up regulations regarding limited water use in the foothills, and limited use of culinary water for irrigation. Lastly, the Town has adopted an ordinance prohibiting the general wasting of water. For specifics regarding code please refer to the Town Code available on the Town of Springdale website, www.springdaletown.com. At present, conservation in the secondary system consists of a schedule adopted by the Secondary Water Advisory Board, which specifies the time-of-day and day of week when watering can take place. The northern and southern portions of the Town each have three days to water. Additionally, lower pasture water users have their own times on Sunday and Thursday afternoon for watering.

ADDITIONAL CONSERVATION MEASURES

Additional conservational efforts need to be implemented in order to effectively meet the Town's goals and solve the problems previously identified. This section will focus on possible programs and actions that can be executed to reach those goals.

1. Plumbing Fixture Replacement Program

The Town may be able to provide education on the incentives to home owners and businesses to exchange their old high water-use plumbing fixtures for more efficient ones.

The first program works on educating the public about high water-consuming devices potentially found in their homes or businesses. Applicable information should be extracted from the following figures when educating the public about high-flow plumbing fixtures.

Water saving fixtures can provide an inexpensive and long-lasting approach to conservation. Plumbing fixtures can be installed and used without major disruptions in water use habits, making replacement of these fixtures a conventional way to conserve. The following paragraphs provide conservation information regarding three major plumbing fixtures in the home: the toilet, shower, and sink.

Toilets are the highest water-consuming devices in the home, accounting for about 27% of indoor water use. In 1992, the U.S. Congress passed legislation prohibiting construction of certain high-flow plumbing fixtures, which brought manufacturing standards down from 3.5 or 5 gallons per flush to 1.6 gallons per flush. If a home or business owner has these high flow toilets still in use then the problem can be resolved by either placing a water-resistant object in the tank to displace a portion of the toilets flush volume or replace the older toilets with newer and more efficient models.

According to previous calculations, the average person in the Town of Springdale uses 61.9 gpd of water for indoor use. From this figure, it was determined that the average flush in the Town of Springdale consumes 2.09 gallons, 0.49 more gallons than a high efficiency toilet. The following calculation configures the equivalent total savings per year if all remaining high-flow toilets were replaced with low-flow toilets.

> .49 Gallons per Flush * 8 Flushes per Day per Person * 584 People * 365 Days per Year = a total savings of 836,000 Gallons per Year.

The average total residential culinary water usage from 2011 to 2014 was 13,202,500 gallons per year. Reducing that figure by 836,000 gallons results in a reduction of about 6.3%, meaning that over half of the total conservation goal of 10% could be accomplished through toilet replacement or modification measures.

Installing a water efficient toilet can range anywhere from $100 to $500 a toilet. By replacing high flow toilets, it was determined that a family of 4 would save nearly 40,000 gallons or $190 a year, according to the current cost of water in Springdale.

Pre-1992 showerheads put out about 5 gpm, where as post-1992 showerheads put out half that, 2.5 gpm. Calculations show that the average showerhead for the Town puts out just under 2.5 gpm. Therefore, information regarding shower head efficiencies should be distributed and savings should be determined by the user on a case by case basis. Similarly, installing a faucet aerator will reduce the output of a non-aerated faucet from 2.5 gpm to 1.5 gpm. Water savings should be determined by the user on a case by case basis.

Educating the public about high water consuming devices can come in many forms and include many resources. Some of these programs include the following:

1. **School Programs** – Picture Presentations, Slide Shows, Movies, Fairs, etc…
2. **Water-Utility-Assisted Programs** – Envelope Stuffers, Pamphlets, etc…
3. **Media Programs** – Newspapers, Radio, Television, Video, Documentaries, etc…

The Division of Water Resources (DWR) and the Washington County Water Conservancy District (WCWCD) are major resources for educational programs and materials. The Washington County Water Conservancy District provides incentives for residents and businesses for replacing older plumbing fixtures with modern water efficient fixtures. The WCWCD also offers free water checks by an irrigation specialist from May 15 to September 30, that provides participants with a free recommendation on an efficient watering schedule. The DWR has many educational resources for the youth. There are also teacher resources that include PowerPoint presentations, games, and lesson manuals to help educate children on water conservation. The DWR also offers many different brochures and mailers that could be sent out with the monthly water bill. The

DWR also has different ideas for ordinances to promote water conservation. Getting in contact with the WCWCD and DWR and their staff would prove beneficial when starting up or conceiving any new programs.

For current programs offered by the WCWCD, visit
http://www.wcwcd.org/conservation/programs/

Understanding this information and conveying it to the public is the first step in any replacement program. The public must first determine if high-water consuming devices can be found in their homes. Next, they should be educated about the incentives to replace them. These incentives can be a result of their own investment in new fixtures and the subsequent savings and increased value of the home.

Other groups such as environmental organizations, local civic groups, or volunteers (Boy Scouts, religious organizations) may also be enlisted for help. These groups could be a great help in distributing information and educating the public on water conservation.

2. Consumer Education Program

The greatest results will come from informing the community of the conservation goals made by the Town and the conservation methods endorsed by them. Getting the community involved and having information about efficient outdoor and indoor practices readily available to them is important. Distribution of the information may include posting it on the Town's website, at the Town Hall, the library, and occasionally circulated with the water bill and Town newsletter. The dispersed information should include some of the following well known tips and methods of proven conservation practices provided by the Utah Division of Water Resources.

Outdoor Water Use:

- Try planting drought-tolerant and regionally adapted plants in areas that are hard to water or that receive little use. This may include narrow strips near sidewalks or driveways and steep hills.
- Cover pools and spas to avoid evaporation.
- Sweep your driveways and sidewalks with a broom instead of spraying them off with a hose.
- Check outdoor faucets, pipes, hoses, and pools for leaks.
- Change your lawn mower to a 3-inch clipping height and try not to cut off more than one-third of the grass height when you mow.
- Consider replacing infrequently used lawn areas with low water use plants or ground covers.

- Apply as little fertilizer to your lawn as possible. Applying excess fertilizer increases water consumption and actually creates more mowing for you. Use iron-based fertilizers to simply "green-up" your lawn instead.
- Recycle and reuse the water in fountains and other ornamental water fixtures.
- Check the level in your pool using a grease pencil. Your pool shouldn't lose more than ¼ inch each day. If it is losing more than this, check elsewhere for leaks.
- Avoid bursting or freezing pipes by winterizing your outdoor spigots.
- Use a bucket of soapy water to wash your car, or simply place a shut-off nozzle on the end of your hose. Make sure to turn the faucet off when done using it.

Indoor Water Use:

- Perform an annual maintenance check on your evaporative (swamp) cooler. Check for, and fix any leaks you find.
- Wash only full loads in your washing machine, or adjust the water level to reflect the size of the load.
- Pay attention to your water bill; use it to track your water usage and detect leaks.
- Purchase appliances that offer water- and energy-efficient cycle options.
- Fix leaky plumbing fixtures, faucets and appliances in the house.
- Show children how to turn off the faucets completely after each use.
- Locate your master water shut-off valve so that water can be saved if a pipe bursts.
- Install aerators on every faucet. This could save you as much as 1 gallon every minute you use them.
- Be aware! Listen for drips and leaks around the house.

For a more in-depth list of conservation tips for each room in the home, visit https://conservewater.utah.gov/tips.html

According to the American Water Works Association, leaks make up about 14% of indoor water usage. In the Town of Springdale this results in nearly 9 gallons per person per day. With a population of about 584, this results in nearly 1.9 million gallons a year lost through leaks in the home. Cutting this quantity in half would account for a reduction in water usage of about 7%. The Town may assist in checking homes for leaks or provide home owners with methods of checking for leaks themselves. Information for detecting leaks could be sent out with the monthly water bill.

Detecting a leak involves making sure that all water-using devices in the home are turned off. Next, find the water meter, carefully removing the lid and locate the meter dial. The Town may provide assistance with this step to prevent users from tampering with their meters. Then, check to see if the dial is moving. If it is, you either have a leak or something in your home is using water. Go find it. If the leak can't be found a

professional should be contacted. Leaks can be in fairly inaccessible spots and can be quite severe.

Due to the large number of hotels and restaurants in the Town of Springdale, it would be beneficial to identify those users which have high water usage and approach them with specific water conservation plans for their facilities or encourage them to create their own. As mentioned previously, the WCWCD offers programs and ideas for residents and businesses. One program, Save the Towel, encourages guests to reuse towels and sheets during their stay. Hotels can display door hangers and place cards notifying guests of their conservation efforts, and that they will only wash sheets and towels if requested.

The potential for water conservation programs should be discussed, including the planning of water conservation programs, rationale behind certain proposed actions, and monetary benefits to the customer. The newly implemented increased water rates provide a good opportunity for people and businesses to become more conscientious about their water usage and how to save money. In combination, the Town should also ensure that any proposed programs or increased rates don't compromise the financial viability of the system operating costs.

3. Meter Replacement Program

A meter reading less than the actual amount of water used by a service occurs primarily from meter slowdown with age and from meter malfunction at low flows. This meter inaccuracy can also be a result of low flows on larger connections. Having meter accuracy is essential in assessing total system leakage and in collecting accurate revenues from the customers. Having an active meter replacement program is essential to good water management practices. The program should consist of separate sections of the Town being replaced all at once on a consistent timeline according to the expected design life of the actual meter installed. Replacing different sections of the Town at different time periods allows funds to be extracted in smaller portions, making it easier to budget for.

The Town should also be aware of combination meters or other devices that enable meters on larger connections to read and record low flows more accurately. These kinds of meters should be researched and implemented into the system during meter replacement periods. Finally, having accurate meters allows the Town to audit the water system by comparing the total metered flow from all recorded service connections with the total metered flow leaving the water treatment system.

4. Water Audit and Leak Detection Program

A water audit is effective in determining the water distribution system's efficiency. The overall goal is to identify, quantify, and verify water and revenue losses. Once the total

losses in the system have been identified, a leak detection program may proceed. Leak detection is a systematic approach to surveying the system and identifying the exact locations of hidden underground leaks.

It may be difficult to conduct a thorough and economic survey of the water system for leaks unless the unaccounted for loss is 15 percent or more. Unaccounted for losses within the Town of Springdale this last year was at nearly 18 percent. This means that the Town could launch a limited water audit and leak detection program to decrease the unaccounted for losses within the system. If substantial results are anticipated from the limited program then a full scale program may be initiated. A recommended source for information with regards to conducting an audit in conjunction with a leak detection program comes from the American Water Works Association's *"Water Audit and Leak Detection"* Guidebook.

5. Irrigation Accountability

Conservation is dependent upon two primary concepts: education and accountability. As of last year, just over 83% of the water taken from the Town's water sources was used for irrigation purposes. This means that roughly 83% of the water pumped into the Town's irrigation and culinary systems has no accountability affixed to the amount used or its application. The Town cannot afford to have such large quantities of water going unaccounted for in their system. In order to implement accountability into the system the Town should seek to accomplish the following objectives.

1. The Town should work to obtain the majority of shares in the SCIC and manage all the shares within the community. This would allow the Town to implement accountability and incentives through methods involving meters and a rate structure that promotes conservation. Individual users would then be charged for the volume of water used as opposed to providing unlimited usage for a simple base rate charge. The water rate structure should be set up to provide incentive to control outdoor irrigation and to increase the program funding for system maintenance and expanding infrastructure. Charging each customer in proportion to their usage will also provide an incentive to use only the required amount of water for each specific application. While acquiring the SCIC and managing all the shares within the community would be beneficial, it may also be time consuming and challenging. In the meantime, the Town should implement methods to hold the SCIC accountable for the usage of their system. The SCID needs to be paying their fair share of the costs.

   The Town realizes the importance of managing the irrigation water for the community and has been working to acquire a majority of the shares from the Springdale Consolidated Irrigation Company. Past methods of acquiring these shares have proven ineffective given that the Town owns 28.8 shares of the over 445 shares within the company. Even though the Town owns just 6.5% of the

shares, they contribute about 67% of the cost for pumping irrigation water. By managing the system themselves, the Town would be able to fairly manage the system costs and implement system upgrades. Those who currently own shares in the company would keep their shares and have the rights to the water they own, but would no longer be held unaccountable for any excessive usage. Additionally, new system users would be able to share or buy into a pool of water shares owned by the Town, making it easier to gain access to the secondary water system and easier for the Town to track and manage system users.

2. In conjunction with the first objective, the Town should seek to integrate individual meters into the irrigation system. The Town faces three fundamental problems preventing them from presently doing so. First, the SCIC lacks the funds necessary to buy and install meters on all current shareholders and irrigation water users. Second, there's inadequate coordination between the Town and the SCIC. The Secondary Water Advisory Board is not a functioning board and should be dissolved. The Town should also look at the existing agreement between the Town and the SCIC and revise. Work to procure and offer a solution in the past has proven difficult and unsuccessful. Therefore, a possible immediate action might involve the Town meeting with the SCIC, and determining a new restructured base rate that would be sufficient to set aside a small portion of funds to pay for installing the meters at some set time in the future. This point in the future might be 2 years or 10 years, but would be selected according to the amount of money by which the Town and the SCIC would feel comfortable increasing the base rate by. An efficient way of applying accountability to the largest quantities of water as soon as possible would be to divide the Town up into sections. Once funds accumulate, meters will be placed on all connections within a predetermined section of the Town. The foremost sections of Town to receive meters would be the highest consuming sections, therefore producing a more rapid rate of accountability on the greatest volume of water possible. To be fairer, the Town would continue to charge the original base rate to every customer in the system until the entire Town was equipped with meters. It would then be decided by the Town whether it is equitable to assess a penalty to those being monitored and are using more than what they have the rights to. However, just by simply having meters on individual users the Town could at least monitor and account for a larger portion of the irrigation water used.

   If at any time during the process a user is suspected of excessive usage but does not have a meter placed on their connection, then the Town should be able to mandate that one be installed. The decision of whether the usage is excessive or not should be mandated by the Secondary Water Advisory Board and all decision should be based on objective and consistent reasoning. Excessive usage may be deemed as those not adhering to the Town's water restrictions and ordinances.

3. The quality of the irrigation water is the third problem preventing the installation of meters on the irrigation system. The Town either needs to install meters that are capable of working with unfiltered water, or install filters in the irrigation system that would prevent unwanted debris and material from entering the system. This debris has caused problems with both irrigation customers and the Town alike with sprinklers being plugged and personal filters getting clogged. On the other hand, the logistics of incorporating a filter system may be a difficult and expensive process. The Town should weigh both alternatives and establish the relative costs and benefits of each to determine which solution is more practical. Once a solution has been obtained the Town should take the necessary steps to execute it. Ideally, a solution would be found and implemented before funds to install the irrigation meters become available.

SUMMARY

In conclusion, the Town of Springdale is growing and will continue to grow into the future. Increasing water demands can be a concern, but water conservation can provide a critical component in overcoming these concerns and help meet future needs.

The State has made a goal of reducing the 1995 per capita water demand from public community systems by at least 25% before 2050. To ensure this goal is met, the Town of Springdale has incorporated their own goals for water conservation. These goals were to: reduce the Town's per capita usage by 10 percent over the next 5 years, retain a financially sustainable and well maintained culinary water system, and to pursue a well managed and maintained secondary system. Many problems associated with accomplishing these goals have been identified and outlined in this plan. Moreover, possible solutions and suggested actions to these problems have also been addressed in this plan.

Several options were given stronger recommendations throughout this plan and are summarized as follows.

- It is recommended the Town educate the community about the conservation goals made, and help to instruct them about wise water practices.
- The Town should formalize a meter replacement program.
- The Town needs to implement accountability into irrigation system usage.
- For the culinary water system, the Town should execute a water audit and leak detection program.

The Town is confident that executing these measures will produce the desired effect in accomplishing the Town's conservation goals.