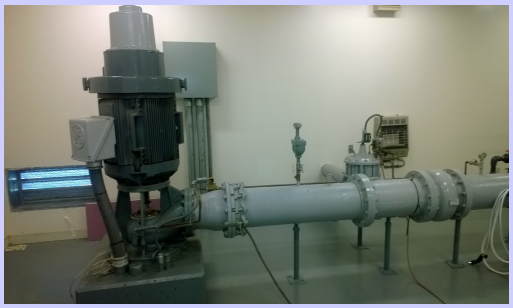
Smithfield City
WATER CONSERVATION PLAN



Adopted - November 2013

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SMITHFIELD WATER MANAGEMENT AND CONSERVATION PLAN

BACKGROUND

The City of Smithfield is located in Cache Valley, seven miles north of Logan, Utah. Historically, the area was predominately dependent on the agricultural industries of farming and ranching. Today, Smithfield is the second largest community in Cache Valley and has grown to a population of 10,658 residents as of January 2013. Although much of the community is still surrounded by agricultural activities, Smithfield is experiencing its greatest residential expansion while continuing to establish itself as an employment and commercial center.

The city owns and operates a culinary water system serving all classes of customers, including agricultural, residential, commercial, and industrial users. Most of these customers are located within the municipal limits, but service lines have been extended to a few customers located outside the city. Most notably, residential users in Smithfield Canyon and scattered residential users south of the city limits.

Service connections to the water system, as of September 2013, include the following:

2948	Single family residential
106	Multiple family serving 345 units
4	Mobile home parks serving 70 units
30	Residential users in the unincorporated Cache County
113	Commercial and industrial
29	Institutional (churches, schools, municipal buildings, etc.)
3469	Total

Smithfield City furnishes water to its residential and commercial customers primarily for indoor use. Approximately 55% of the residential and commercial customers have access to a secondary water system which provides lower quality water for outside use. As the city grows, the percentage of users with access to the secondary system will likely decrease because many of the developing areas are in locations where adequate water pressure in the secondary system is not possible without pumping.

CURRENT WATER SUPPLY

Smithfield's water supply comes from a variety of different sources including two wells and multiple springs located in Smithfield Canyon. The springs serve as the primary source of water with wells providing supplementary water during the summer months.

The majority of the springs are located within the boundaries of the U.S. Forest Service. These springs, which are known collectively as the eight upper springs, were developed in the 1930's as part of an ambitious public works project which included the construction of a 10 inch water transmission line and a half million gallon storage reservoir. For the most part, the eight upper springs have been carved out of bedrock and are capable of delivering up to 2000 gallons a minute during high runoff periods. During 2011 there was 2,310 ac-ft of water delivered from the eight upper springs. This equates to an average flow of 1432 gallons per minute with the average low flow coming during the month of February and high flow during the month of May.

Further down Smithfield Canyon the city has three smaller springs known as the Peterson Springs (25-6623). Collection for these springs is done via a series of underground collection lines. Until 2013, flow rates from these springs were only estimated. With the installation of a permanent flow meter we now know high flows during the early spring months approach 350 gallons per minute which can decrease to less than 150 gallons per minutes during drier periods.

In the vicinity of the Peterson Springs, the city owns Miles Spring which like the Peterson Springs is a shallow spring. Water flow from the Miles spring is generally twice that of the three Peterson Springs. The city doesn't have a continuous reading flow meter on the Miles Springs, so a clear and accurate picture of the production of this source is not possible. There is however, a V-notch weir in place which allows the city to estimate the instantaneous flow from the spring. Construction of a stilling basin is planned for the Miles Spring during 2014 which will allow the installation of a permanent recording devise.

Up until 1968, Smithfield relied exclusively on springs for their water supply. As the population grew the existing water sources were unable to meet the increased demand. In an attempt to resolve this matter, the city drilled a well (25-4791) on the west side of the community on a recreational parcel of land known as Forrester Acres. At the time the well was first put into service it was capable of providing nearly 1000 gallons per minute which easily met the demands of the time. Yet as the community continued to grow, the demand outgrew the supply until the city once again faced a water shortage.

To solve the short water supply of the day with an eye to the future, the city attacked the problem on three different fronts. First in 1992, the city modified the pump and motor on the Forrester Acres well which increased the capacity of the well from 1000 gallons per minute to 1500 gallons per minute. During 2012, total flow from the Forrester Acres Well was 483 acre feet. The well operated on a part-time basis as needed from mid-May until early October.

Second, the city made arrangements to obtain the water rights in three wells owned by the DeMonte Corporation (25-4887, 25-3212, 25-3164, and 25-6177). The wells, which had been used to provide the stable water supply necessary for the canning of fruits and vegetables, and for agricultural purposes, had been abandoned with the closing of the plant. Once obtained, the city filed a change application to change the use to Municipal and their points of diversion to a site of a future well on the city owned Birch Creek Golf Course. The combined water rights from Del

Monte provided the city with 5.56 cfs or 1330 acre feet of additional water.

The third and final action was taken by the city in 1997 to drill and develop a new well on the Birch Creek Golf Course to utilize the 25-3212 water right for 2.22 cfs and 830 acre feet. With the completion of this well, the city's water supply increased by 1000 gallons per minute with the balance of the right being left in Non-Use status. During the test pumping of the well, it was determined the well could be pumped at a rate of 2200 gallons per minute without significant drawdown. With the unused water rights the city obtained from the Del Monte Corporation it is anticipated the flow from the Birch Creek well could be doubled in the future as the demand may dictate. During 2012, the flow from the Birch Creek well was 335 acre feet. The well operated from late May until early October.

Water from the eight upper springs is secured through a water right (25-7884) dated May 1985 up to a maximum of 5 cfs from November 1st until March 31st. During the period from April 1st until October 31st Smithfield Irrigation Company was granted earliest water rights for 33.5 cfs of water originating in Smithfield Canyon and Birch Canyon as the result of a State adjudication study known as the Kimball Decree. During this period of time, flow from Summit Creek in Smithfield Canyon is often less than the total right award to Smithfield Irrigation Company particularly during the summer and fall months. In order for the city to use water from the eight upper springs during this period of time, an agreement was reached in 1931 between Smithfield City and Smithfield Irrigation Company which in essence states the two parties agree the city will exchange gallon for gallon all waters it uses from the springs with water it is entitled to in the Logan, Hyde Park and Smithfield Canal. Unfortunately, the city is located at the end of the canal and although the city has shares representing over 20% of the water in the canal, during periods of drought it can be a challenge to deliver the required shares of water to make the exchange.

Historically, much of the water in the Logan, Hyde Park, and Smithfield Canal, which originates at the Logan River in Logan Canyon, has been lost due to seepage primarily through Logan Canyon and along the bench between Logan and Smithfield. In 2013, the canal was encased in a box culvert in the Logan Canyon area, and also in a 66 inch pipe from the canyon northward for an additional 1.1 miles. The project significantly reduced the amount of water that was being lost and as a result improved the ability of the canal to deliver water to Smithfield making it possible to meet it's exchange responsibility with Smithfield Irrigation Company.

WATER USAGE

From late fall until late spring during a typical water year, natural flow from the city's springs is adequate to meet the demands of the residents and businesses of Smithfield while allowing for overflow back into Summit Creek. By late spring, the city's two wells are put on line to supplement flow from the city's springs. As the summer months progress, there is a greater demand placed on the city wells resulting in longer run times.

All water connections within the city are metered with the exception of those connections to municipal buildings, parks and other landscaped areas. Meter readings provide information on the amount of water actually used by city residents, businesses, and industries. In 2012 there was 1,665 ac-ft of water delivered to residential connections for an average residential flow of 145 gallons per capita per day. When all water deliveries are accounted for including those estimated for direct municipal uses, the average flow becomes 196 gallons per capita per day. This compares with 293 gpcd statewide and 184 gpcd nationally. The lower average usage for Smithfield can be attributed to on-going improvements to the distribution system, public education on the value of water conservation, and the extensive use of the secondary water systems available in the city which supplies a lower quality, but highly beneficial quantity of water to many residents and businesses.

The secondary water is supplied to many of the city's customers through one of the available distribution systems. 1) Smithfield irrigation Company; 2) Smithfield City; or 3) a much smaller and less organized secondary system operated by the North Bench Ditch Company. The Smithfield Irrigation System, which is the largest of the systems, obtains its water from a wide variety of sources including Summit Creek, the Logan, Hyde Park and Smithfield Canal, Logan Northern Canal, and numerous wells. The city's owned system, which services primarily residents in the southeast quadrant of the city, derives its water from the Logan, Hyde Park and Smithfield Canal. With the exception of the wells, the water supply for these two secondary systems is dependant on annual precipitation and snowmelt. During dry years, the canals and Summit Creek have been known to be very unreliable sources which creates several management problems which are often beyond the city's control.

WATER STORAGE

The culinary water system includes four concrete storage reservoirs. The oldest of the reservoirs was built in two stages. In 1905, a 40,000 gallon rectangular reservoir was constructed which met the immediate needs of the community. But shortly thereafter in 1922, the reservoir was expanded to 500,000 gallons. For the next 40 years the city relied exclusively on this half million gallon reservoir until a new 1 million gallon reservoir was added in 1963. In 1979 a second one million gallon reservoir was added bringing the total storage capacity for the city to 2.5 million gallons. This second one million gallon reservoir is hydraulically tied to the original half million gallon reservoir which allows them to work in tandem with one another.

An updated water master plan completed in April 2005 recommended three (3) additional water storage reservoirs be constructed The reservoirs are projected to the demand expected at build out of the city with build out being complete development of the city based on current long range planning documents. The suggested reservoirs locations are on the northeast bench, southeast bench and in Dry Canyon. The combined storage of the three reservoirs would increase the overall storage capacity of the system by 7.5 million gallons. The first of the three reservoirs, a 1.5 million gallon reservoir located in the mouth of Dry Canyon, was completed in

2007. The reservoir is expected to meet the future water storage demands of the existing east bench area above 1000 East. The other two reservoirs, one to be located on the northeast bench at approximately 1000 East 800 North and the other on the southeast bench at approximately 700 South 1400 East will serve their respective areas. Construction of the remaining two reservoirs will be dependent on growth in the area.

TRANSMISSION/DISTRIBUTION

Water collected in Smithfield Canyon is transmitted to the city through a ten inch lead jointed cast iron pipeline installed in 1931 in conjunction with the development of the eight upper canyon springs. Despite it's relative small size and lead joint construction, the pipeline has been relatively trouble free and adequate to convey the water collected from the springs.

Water is conveyed through the canyon transmission line to the upper one million gallon reservoir located adjacent to the Miles and Peterson Springs. From this reservoir, water continues down the canyon through two separate transmission lines. The first of these lines is the original 10 inch line which conveys overflow water from the upper reservoir and also collects and conveys water from the Miles and Petersen Springs. This line terminates at the lower 500,000 gallon and one million gallon reservoirs.

The second line, originating at the upper reservoir, is in reality two lines, a 12 inch cast iron line and a 16 inch ductile iron line laid side by side. The 16 inch line, which was laid in 2001, terminates and ties into the 12 inch transmission line which it parallels, approximately 4300 feet down the canyon from the reservoir. This line was installed to meet the growing demand due to growth on the east bench of the city and to improve water pressure which had decreased due to the inadequate capacity of the 12 inch cast iron line. Although the newer 16 inch line did not extend to the city, it did solve the immediate pressure problems that were being experienced by residents. Greater improvement in pressure was realized as the 16 inch line was extended the balance of the distance to the distribution system. The last leg of this extension consisted of the abandonment of the 12 inch waterline and the combining of water from the 16 inch and 12 inch waterlines into a single new 20 inch waterline.

With the addition of the Dry Canyon storage reservoir in 2007, a booster pump station was added to the water system. The pump station draws water from an 18 inch water transmission line that originates at the Birch Creek well, boosts the pressure at its location at the intersection of 300 South 1000 East and then transmits the water through a 14 inch transmission line to the reservoir. The station was designed to be able to easily double its current capacity as growth and demand requires.

From the 1920's until the late 1970's few improvements were made to the distribution system. As a result, a majority of the water lines comprising the distribution system were undersized and in poor condition. Large sections of the system could not be isolated or shut off to make repairs

because of the absence of water valves or presence of inoperative water valves. Fire protection throughout the majority of the city was inadequate due to the large number of water mains that were two inch in diameter or smaller. Many of the larger distribution lines were old lead jointed steel lines that were in poor condition. Simple ground vibrations or movements of the soil due to frost often weakened the lead joints resulting in leaks within the system. Most service lines were galvanized steel in various levels of deterioration. These same service lines in many cases, also suffered with a heavy calcium buildup within the pipe resulting in reduced flow and pressure to the individual water customer.

Beginning in the late 1970 through today, the city has been involved in an aggressive campaign to upgrade the water system. Significant improvements have been made, especially over the last 5 years, to replace many of the aging waterlines that have accounted for much of the City's water loss. The majority of these inefficient and inadequate waterlines have been replaced along with the water services lines that are associated with them. Today the distribution system is comprised primarily of ductile iron water lines ranging in size from 4 inch to 10 inch. All service lines being installed in new construction are of Type "K" copper material. Prior to 1983 all service lines were galvanized steel and as they are being replaced as part of a city wide update program, they are being replaced with Type "K" copper.

For nearly 50 years Smithfield has used water meters as the basis of assessing customers for water use. Over the past 30 years an effort has been made to standardize the meters being used, allowing the city to stock and be familiar with only one meter style. This process is now complete, but a change out program to convert from a touch-read meter to a radio-read meter is now in progress. The city water department is striving to replace meters that have been in service for more than seven years with radio read meters. Electronics are being added to existing meters otherwise not scheduled for replacement to speed the conversion process. Once complete it will become possible for the city to read meters during the winter months which will allow the city's water department to more closely monitor abnormalities in water usage.

WATER QUALITY AND TREATMENT

Water obtained from the springs and wells is tested per state regulations and monitored for continued compliance with the Safe Drinking Water Act. Chlorine for disinfection is currently injected into the water supply in four different locations to insure adequate distribution. The first of these locations is near the upper one million gallon reservoir in Smithfield Canyon. At this location chlorine is injected into the water from the eight upper Smithfield Canyon Springs where it then flows into the reservoir to allow for adequate chlorine contact time before it is used for culinary purposes. The second location is at the Birch Creek Well on the Birch Creek Golf Course. As water is pumped from the well chlorine gas is injected into the water and it is then conveyed through a large 18 inch water line to 300 South at 1000 East where it enters the distribution system. Contact time for the chlorine is achieved during its detention time in this large diameter waterline. The third location is at the Forrester Acres Well located on the west

side of the city in the Forrester Acres Recreation Area. Here chlorine tables are used to disinfect the water as it is pumped from the well into a 30 inch diameter ductile iron waterline. As is the case with the Birch Creek Well, contact time is achieved as a result of the slow travel time through the 30 inch waterline prior to the water being introduced into the distribution system. The fourth and final location is located on Upper Canyon Road where a chlorine facility was constructed in 2012 for the purpose of adding chlorine to the water collected from the Miles and Peterson Springs in the lower reaches of Smithfield Canyon.

Residual chlorine is monitored throughout the system to insure equal distribution of the chlorine. Based on readings from these various monitoring sites, the amount of chlorine is periodically adjusted to obtain optimum levels.

PRESENT AND FUTURE NEEDS

Smithfield has been fortunate to be able to meet the water needs of its residents and businesses even during recent periods of drought and increased growth. As the population of the city continues to grow the challenge of meeting the community needs will also grow. To best meet this challenge, consistent water development and water conservation policies will be necessary.

The population of Smithfield is expected to grow to more than 2.5 times its current population by 2050. If water were to continue to be consumed at the same rate as it is today, the city would need to provide 4057 acre feet of water annually. Currently, the city is only providing 3220 acre feet of water with an ability to increase that amount only through additional pumping of city owned wells. Due to unpredictable future costs associated with pumping and the unlikely potential of acquiring additional spring water from local canyons the, the best alternative to meeting the future water needs of the city is through conservation and using our existing water resources wisely.

One of the advantages Smithfield enjoys as it strives to supply adequate water to its customers, is the presence of secondary water systems that service nearly 55% of the community. These systems, some privately owned and other city owned, allow relatively low quality water to be used on lawns and landscaping thereby preserving culinary quality water for drinking and other domestic and commercial uses. Even though secondary water is available at low cost, it must be wisely used and conserved with the same intensity as culinary water in order to continue providing a lasting benefit to the city.

As agricultural areas are developed that historically have been using secondary water, the city has encouraged, and in some areas required, the installation of a secondary water system. Moderate growth continues in the core of the city and in areas on the west side. These areas have access to the secondary systems and incentives have been put in place to encourage their use. However, the areas with the greatest percentage of growth are located along the city's east bench

above the sources of secondary water making secondary water unavailable to most of these developments.

WATER SERVICE POLICY

Up until 1988 Smithfield City willingly extended culinary water service to anyone who submitted a request and met certain minimum requirements. In response to dwindling water reserves, the city adopted more restrictive regulations governing the sale of water outside the corporate limits of the city. Of greatest impact to those desiring city water was the doubling of the water rates for nonresident customers and the requirement that all new applicants needed to convey to the city certain water shares in the local canal or irrigation companies in exchange for the use of city water. Current state law prohibits the doubling of water rates for users that reside outside city limits. There have been no requests for water service by non-residents in recent years due to the continuing requirement to convey secondary water shares to the city.

In the opinion of the city, restricting water sales to users outside of the city is necessary to protect and preserve the limited supply of water for current and potential users within the city. The existing policy is also intended to discourage urban sprawl by making it more difficult for future homeowners to obtain water outside the controlled areas of the city.

WATER RATES, HOOK-UP AND IMPACT FEES

The service rate for culinary water as of December 1, 2008 are as follows:

Base Rate:	$9.00 per unit/month
Overage Rate:	$0.60 per 1000 gallons up to 20,000 gallons
	$0.70 per 1000 gallons over 20,000 gallons

Hook-up fees are fees which have been set to compensate the city for costs incurred by the city in extending water service to the customer. In establishing these fees, the city recognizes the variations in cost that occur in providing service to users within subdivisions where service lines have been installed by developers as opposed to those outside subdivisions where the city must install the service line. Also recognized is the cost difference associated with extending services of different sizes, i.e. one inch and 3/4 inch services. Listed below is a summary of the hook-up fees assessed by the city.

3/4 inch service within subdivision	$230.00
1 inch service within subdivision	300.00
Services above one inch within sub'd	City's cost for meter and installation

3/4 inch service city installed	$1,300
1 inch service city installed	1,400
Services above one inch	City's cost for line and meter install

Impact fees are established to compensate the city for impacts on its water systems that are directly related to new customers. These fees were established as a result of a study completed in 2005. The study, among other things, considered the improvements that would need to be made to accommodate the anticipated new growth. Included in this list of improvements was the 1.5 million gallon water storage reservoir, pumping station and related transmission line on the east bench (Dry Canyon), Chlorination facilities at the Forrester Acres well, and a new pressure reducing station near 600 South and 800 East. Results of the study produced the following impact fees based on geographic zones within Smithfield.

CULINARY WATER IMPACT FEES

Zones 1,2,3	
3/4 inch meter size	$2,100.00
1 inch meter size	3,000.00
1.5 inch meter size	6,000.00
2.0 meter size 9,000.00	
**Multiple family unit	1,575.00
Zone 4	
3/4 inch meter size	$1,700.00
1 inch meter size	2,500.00
1.5 inch meter size	5,000.00
2.0 meter size 7,500.00	
**Multiple family unit	1,275.00
Zone 5	
3/4 inch meter size	$1,500.00
1 inch meter size	2,200.00
1.5 inch meter size	4,500.00
2.0 meter size	6,800.00
**Multiple family unit	1,125.00

The current rate structure for water sales was adopted in the summer of 2012, generates sufficient revenue to provide for the operation and maintenance of the system, as well as contribute to a reserve account. The rate adjustment at the time was necessary due to the number of capital improvement projects the city needed to undertake, and to insure the improvements could be completed in a timely manner. The rate was tiered so as to increase the cost per gallon as the amount consumed increased. This tiered approach has proven to be an effective deterrent to those who may not practice the wise and prudent use of culinary water.

WATER MANAGEMENT ORDINANCES

Over the years, Smithfield City has enacted various water management ordinances which were created to meet the water challenges of the day. Today, some of these ordinances may appear to be laws of common sense but they have only become part of our everyday life because of the public education effort that accompanied the enactment and the lifestyle changes that resulted.

There is an ordinance which prohibits the wasting of water. At the time of the enactment of the ordinance, the public was not charged for the amount of water they used, but were rather assessed a set fee for their right to access it and use it as they deemed necessary. As a result, the public often used more water than necessary and were not wise users of this valued resource. Today there is a charge for the amount of culinary water used which has a direct effect on the water use habits of the customer. However, despite this financial incentive to conserve, the city is still faced with those who chose to use water unwisely, particularly secondary water which is not metered. The ordinance on the prohibition of the wasteful use of water, allows the city to require customers to be responsible consumers and to use their water wisely.

The city has ordinances which empower the mayor to take extraordinary steps in the event of a water scarcity. These steps range from encouraging customers to be conservative in their use of water, to regulate outside water use, to limiting the amount of water that can be taken from the water distribution system. During periods of drought and short water supplies the city has been forced to put secondary consumers on turns thereby limiting the days and, in some cases, even the hours they can use secondary water.

Poor maintenance of service lines belonging to customers can be a significant source of water loss. Ordinances have been enacted which regulate the quality of the private service line materials, as well as, requiring that services lines and individual lines on private property be kept in good repair.

Other water management ordinances have been enacted which prohibit unauthorized individuals from using city water. Taking water without permission is also prohibited.

RECENT AND PAST CONSERVATION EFFORTS

While served by sources adequate to meet current needs, the city recognizes the importance of wise water management and attempts to instill these values into its citizenry. The city has consistently used its city newsletter which is published bi-monthly, as a means of educating the public on good water conservation practices.

From 1988 to 1990, the city worked in conjunction with Smithfield Irrigation Company in the installation of a pressure irrigation system which currently serves approximately 55 percent of the community. In doing so, Smithfield Irrigation Company has been successful in eliminating open

ditch irrigation and made secondary water available to a wider segment of the population. As the city grows, this system is being expanded, wherever feasible, in order to preserve the higher quality culinary water.

In addition to the added convenience offered by the pressure system, the secondary system allows for the use of water formerly lost through seepage and evaporation (estimated between 20 and 50 percent in an open-ditch system), increasing the supply available for beneficial use by residents.

Historically, Smithfield has been a city with large residential lots and past zoning ordinances have encouraged their development. There is typically a high percentage of water being used to maintain landscaping and the larger the lot, the more landscaping and thus the greater demand for water. During the summer months nearly 80% of all water used goes to water public and private landscaping. Realizing this, the city began to trend away from larger lots. Not too many years ago, zoning in the city required most lots to be a minimum of 12,000 square feet in area. Recent zoning changes have reduced the minimum lot size to 10,000 square feet for a much greater area. The city has also welcomed multiple family developments which lend themselves to greater building density and less landscaped area.

The city has been actively involved in the conversion of their manual landscape sprinkling systems to automated systems with timer-controlled valves. As of this date the city's cemetery, library grounds, recreation fields, and nearly all park areas have been converted. The city has also taken advantage of personnel at the municipal golf course who specialize in the science of growing turf to train and direct park personnel in the efficient use of water application and turf care. Included in this training are the setting of proper application rates, fertilization, aeration procedures, and chemical application.

Most of the new and converted landscaped beds are being constructed using more drought tolerant perennial plants with landscape rock, weed block, and a drip system. As a result there is less maintenance, healthier plants, and less water is needed when compared to the typical landscape beds of the past. Also, as new landscape areas are being developed a more drought tolerant seed mix has been used. This new mix not only provides turf that is more drought tolerant but produces a deeper green color.

In an effort to educate the public on the different types of water efficient landscaping, the city created a demonstration area utilizing drought tolerant plants, drip systems, and a variety of native plants in a natural setting. The demonstration area is located adjacent to the Heritage Trail which, as a result, receives substantial exposure as residents walk along the trail. The city has also been active in landscaping along street right-of-ways using xeriscape techniques which have been popular and copied by many residents.

In the past, the city has been plagued with a high percentage of deteriorated water service lines. Most of these service lines were constructed of galvanized steel which has a typical life span of 15 to 40 years. Because of the fact the city had poor and inadequate waterline

maintenance practices up until the last 30 years, many of these service lines had reached the end of their usefulness and deteriorated to the point that they were losing significant quantities of water. Many of these leaking service lines were in well graded alluvial gravels and as a result the subsurface was able to absorb the water lost leaving little visible evidence of the leak or the amount of water being lost. Recognizing this, the city has aggressively been replacing the older service lines regardless of whether or not there is evidence to suggest a need to do so.

In addition to many of the service lines approaching the end of their life cycle, there have been countless lines with insufficient cover to prevent them from freezing during the colder winter months. To protect homeowners from freezing water service lines, the city had a policy which allowed and in some cases encouraged the running of a small continuous stream of water during the winter. To promote the practice of running a small stream, customers were not charged for the additional water.

Freezing water service lines became such a problem during certain winter periods the city was faced with the necessity of operating a supplemental well to meet the demand. To reverse the trend, the city began using freezing as an additional criteria along with leakage for prioritizing service lines to be replaced. Only in those cases where the service line is susceptible to freezing on the city's side of the water meter is the customer given an allowance for running a small stream of water and then only after the customer has been given notice of the deficiency.

The city doesn't maintain usage records for more than a few years making it difficult to quantify the effect the service line replacement program has had on reducing the amount of water lost or wasted. There are indications to validate the effectiveness of the service line replacement program. Despite a significant period of residential growth over the past ten years, the service line replacement effort has all but eliminated the problem of frozen waterlines which has limited the number of customers required to run their water during the winter month to prevent freezing. Also, the number of water leaks being repaired annually has diminished to a fraction of what had historically been observed. And finally, despite the greater demand, the city no longer has to supplement flow from the canyon springs during the winter months, but rather enjoys a consistent overflow.

FUTURE CONSERVATION METHODS

In an ongoing effort to conserve water now and into the future the city plans to:

BMP 1 - Comprehensive Water Conservation Plans

-- Develop a water management and conservation plan as required by law.
-- Plans are to be adopted by the city council and updated every five years.

BMP 2 - Water Meter Upgrades

-- Continue replacing older water meters on a seven year change out program.
-- Install radio read meters which would allow for meter reading during the winter months. It is during this time of the year that water loss is best determined because of the absences of outside usage which can skew the results particularly during periods of hot or drought plagued summers.

BMP 3 - Waterline Upgrades

-- Continue replacing the remaining older distribution lines, particularly those which are lead jointed and others prone to developing leaks.
-- Maintain the current program to replace old and deteriorating galvanized service lines with either poly or copper lines.

BMP 4 - Public Information Program

-- Continue to mail periodic newsletters, urging conservation of both culinary and irrigation water. Also, to provide information and educational opportunities on the most beneficial and efficient means of watering turf and other landscape plants.

BMP 5 - Visual Inspection of Water Transmission Line

-- Make semi annual inspections of the supply system by walking the length of the transmission line from Smithfield Canyon and visually inspecting the individual springs.

BMP 6 - Plumbing Standards Enforcement

-- Enforce plumbing codes requiring low-flow fixtures and encourage residents to replace older fixtures with water-efficient models.

BMP 7 - Conservation Education with Commercial, Industrial and Institutional Users

-- Work with industry, commerce, and schools to implement conservation practices, including the installation of reuse systems for both culinary and irrigation water.

BMP 8 - Promote Water Wise Landscaping

-- Encourage residential and commercial xeroscape plans that require less water to maintain.

BMP 9 - Encourage Use of Secondary Water

-- Encourage residents to connect to and use secondary water for outside watering purposes where available.

PUBLIC EDUCATION EFFORTS

The vast majority of water used in Smithfield and in cities and communities across the state is to water landscaping. Therefore any conservation effort must include an effective public education program designed to inform the public on the important role they play in water conservation which demonstrates how they can contribute to the solution rather than the problem.

Educating the population on a subject that doesn't reach priority status in their busy lives can be challenging. As long as they're able to turn the water on in the morning and throughout the day to get the water they need, not only are their expectations met but their interest is satisfied. To best achieve a response from the public which accomplishes the goal of meaningful water conservation, we must be persistent, patient, and diligent as we search for educational opportunities. When those opportunities are identified, they must be pursued and presented in a manner that will allow them to take a prominent role in the mind set of the community. In an effort to educate the public on the importance of water conservation, Smithfield will be doing the following:

- ★ Keep the message of wise water usage front and center in the minds of the public by publishing tidbits of information on where water is used in and around the home using the city's web page, Facebook page, newsletter, and utility billings:
- ★ Using those same forms of media, provide information on how much water is being used by residents and businesses as a whole on a monthly basis comparing that information with the same information from the two preceding years.
- ★ Partner with local professionals in conducting seminars in the spring of the year designed to educate home owners and business owners on watering techniques that minimize water usage while enhancing the health of lawns and gardens.
- ★ Publish and distribute an annual flier to all residents and businesses which summarizes the information that is being taught in the Spring seminars.

GOALS

To achieve true water conservation requires traveling a road riddled with obstacles, wrong turns, and steep inclines. A water conservation program must be understood and have the support of all users of the system including residential, commercial, industrial, and institutional in order to achieve any measure of success. In many cases these users not only need to be educated, but habits need to change and a totally different mind set must emerge. Some will be eager to emerge themselves in the plan, make changes in their use of water habits, and encourage those around them to do also. While others will oppose any suggested changes and continue to hold on to the old ways which has served them well for decades.

Goals that are set should always be achievable. When goals are meaningless or too ambitious, they are often abandoned and the effort is lost. Recognizing this, Smithfield City, in

the quest to obtain a more efficient use of our culinary water resource, has established the following goals for the term of this plan.

Goal 1 **Reduce residential per capita water consumption by 15% over the next 15 years.**

Water consumption per capita is highly variable particularly when used to measure the effectiveness of a conservation plan. Given the fact the majority of the water consumed in a residential setting is used outside the home and is heavily dependant on environmental factors such as rainfall, temperature, and humidity meaningful results may be difficult to measure. Long term averages of five to ten years will be used to evaluate the success of this goal.

Goal 2 **Replace 15 to 20 galvanized water service lines each year with either poly or copper service line.**

Galvanized water service lines represent the greatest contributor to water loss in the distribution system. With most leaks being too small for detection, replacement should be either age based or within groups. Replacing 15 to 20 galvanized service lines a year will result in replacement of nearly all remaining galvanized service lines in the city.

Goal 3 **Promote and encourage, by example, the use of xeriscape landscaping.**

Small or confined landscape beds often require higher amounts of water while being difficult and time consuming to maintain. Converting these areas into xeriscape beds or areas utilizing drip irrigation systems, weed block, and 2 inch minus landscape rock or a combination of bark or mulch results in water savings and a reduced commitment to maintenance while producing an attractive landscaped area. The city is committed to converting many of their existing areas to xeriscaping, as well as using the technique in the development of new areas. The goal is to see a transformation to this type of landscaping over the next five years.

Goal 4 **Reduce the amount of landscape area developed on single family residential lots**

With landscaping accounting for nearly 80 percent of all water used in residential areas during the summer months, it stands to reason that smaller lots would result in water savings. Smithfield requires all lots in a residential area be at lease 10,000 square feet with little opportunity to deviate from it. The current generation of home buyers are far more willing to accept, and in some cases are seeking lots that are smaller, require less maintenance thereby affording them more time to do other things. Allowing for a wider variety of lot sizes including lots smaller than 10,000 square feet would translate into the need for less water per lot. This goal would be satisfied if discussion and consideration were given by the city planning commission and city council for an amendment to the zoning ordinance allowing for a wider variety of lot sizes.

GOVERNING BODY

The municipal culinary water system is managed by the mayor and city council, under whom the city manager, work coordinator, and lead water employee oversee the daily operation.

UPDATE

As required by Section 3-10-32(4)(a), Smithfield City will review and update the Water Management and Conservation Plan every five years. Should unforeseen growth or other conditions change, resulting in a need to reevaluate the water system, this plan will be updated more frequently.

ADOPTION DATE

This plan was adopted by the Smithfield City Council on November , 2013.