

KAMAS CITY
WATER CONSERVATION
PLAN



KAMAS CITY
170 North Main Street
Kamas City, UT 84036

December 2019

Prepared by:

HORROCKS
|||
E N G I N E E R S

728 West 100 South
Heber City, Utah 84032

WATER CONSERVATION PLAN FOR KAMAS CITY, UTAH

DECEMBER 2019

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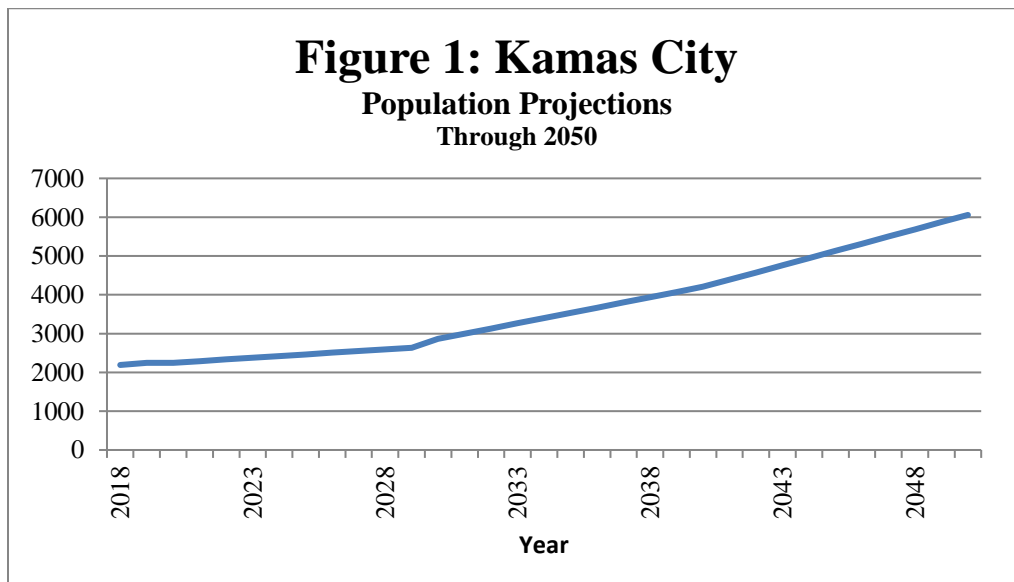
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INTRODUCTION

As Kamas City looks forward into the next two decades its sees a town of approximately 2,300 people growing to approximately 4,200 people. With this kind of growth there comes many challenges but with those challenges comes many opportunities. There has of late been concern over the future cost and availability of the water supply as demonstrated by the state legislature in the Water Conservation Plan Act (House Bill 71) passed and revised in the 2004 legislative session (Section 73-10-32 Utah Code Annotated). Kamas citizens and leaders, having foreseen the continued growth, have taken many steps to ensure that Kamas continues to have a sufficient supply of water for all of its needs. This water conservation plan is written to address any concerns of leaders and citizens of both Kamas City and the State of Utah.

DESCRIPTION OF KAMAS CITY

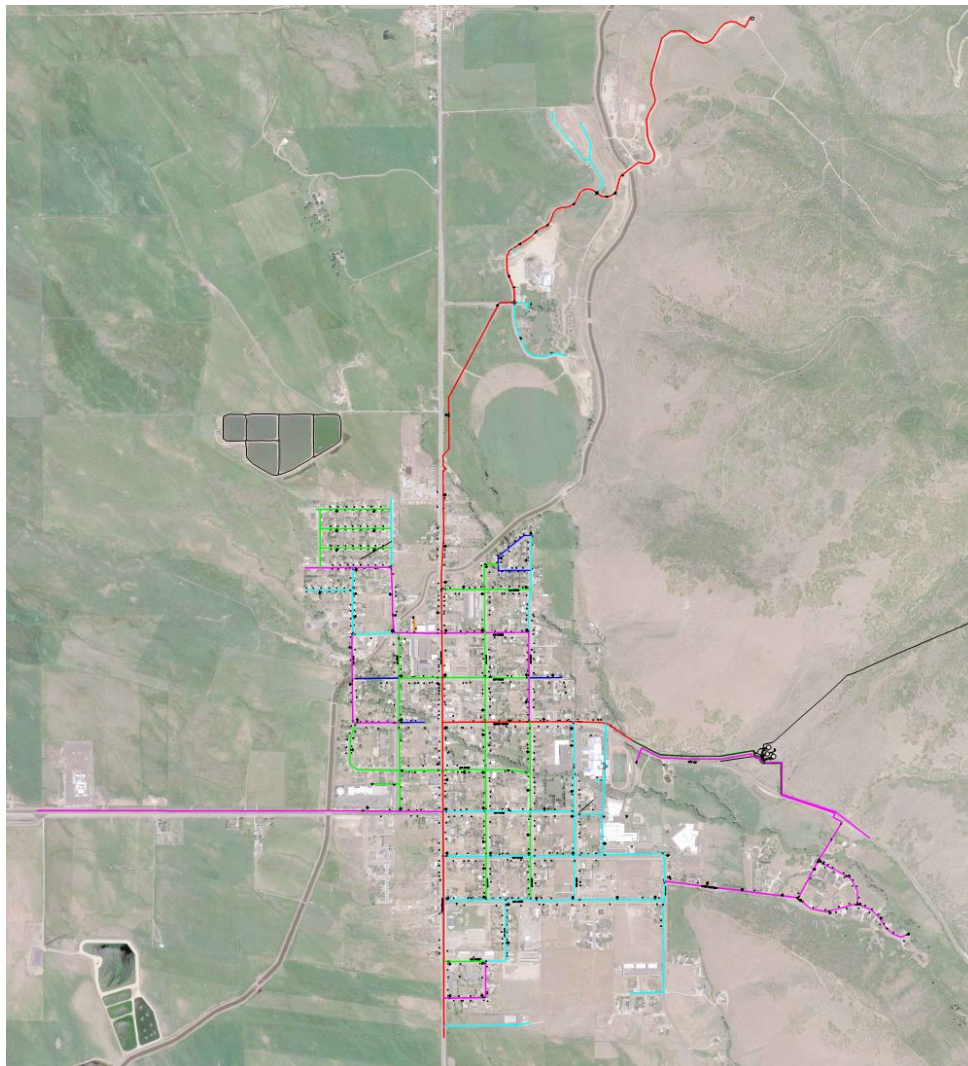
Located in Eastern Summit County, and in Utah the second driest state in the nation, Kamas is growing at a significant rate in residential zones and at a lesser rate in commercial zones. It is expected that the population of Kamas will almost double in the next 20 years. With a current population of approximately 2,191 by the year 2050 the population of Kamas is projected to be approximately 6,000. The projected population through 2050 is shown in the following table:



Kamas City is the largest city in eastern Summit County. Kamas is located about forty-six miles southeast of Salt Lake City in a valley surrounded by the Uinta Mountains to the east, the Wasatch Mountains to the west, the Provo River on the south, and the Weber River to the North. Beaver Creek, a tributary of the Weber, traverses the center of the valley. The City is known as the gateway to the High Uintas and is located near the west-facing slope of the Uinta Mountains. Highway 150 from Kamas to Evanston, Wyoming is designated as a Utah State Scenic Byway, which increases the number of tourists that

visit the community each year, as does the Jordanelle Reservoir Recreation Area located west of Kamas. The South Summit School District and many other South Summit County facilities are located in the City.

The estimated average footprint for new homes is 1600 square feet with an additional 1000 square feet of impervious area (sidewalk, driveway, etc.). On an average quarter-acre lot, this leaves approximately 0.2 acres of potential landscaped area. By subtracting the road from an average subdivision that leaves about 60 percent of Kamas City as landscaping. Consequently, demands on the water distribution system are expected to increase dramatically in the next twenty years. Currently, the water system provides water to 681 residential, 77 commercial, and 15 intuitionial (public) connections.



Kamas City Water System

Water Connections

In 2018 Kamas City provided water to 773 connections. The table below shows the breakdown of the connections based on the type of water connection. The city meters each connection and reads the meters each month.

Type	Number
Residential	681
Commercial	77
Institutional	15
Total	773

Inventory of Water Resources

The current water supply system consists of three wells and two springs. The City is currently not using the Elder Hollow Spring or the High Star Well. The following table shows the City's current approved water supply sources. It also shows the most recent use from each source.

Water Supply Source	Capacity (gpm)	Capacity (ac-ft)/yr	2018 Use (ac-ft)/yr
Cedar Gulch Spring**	600*	324	220.34
Hillside Well	600	969	266.17
Simpson Well	795	1,282	146.43
High Star Well No. 1***	800	1,290	0.00
Total:	2,795	3,865	632.94

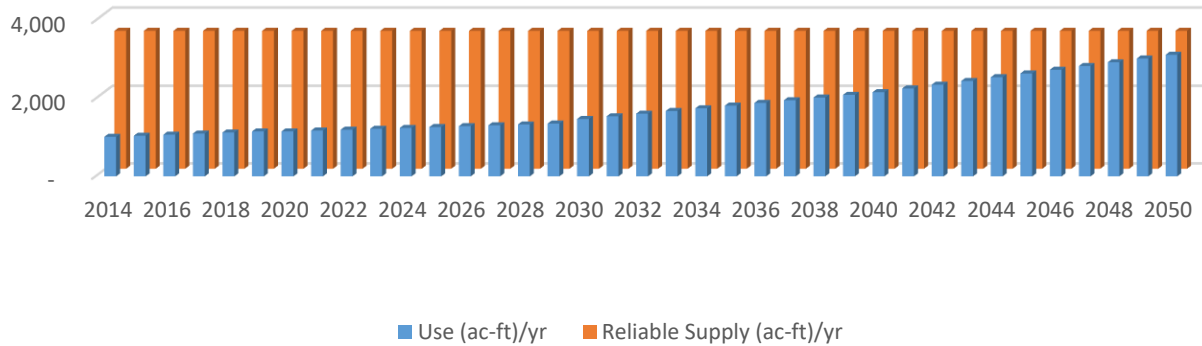
*Average flowrate

**Spring is used June 1 to September 30

***Not Currently in Service

The indoor base flow of 400 gpd per residential connection is currently provided by the wells in the winter months and the spring supplemented by the wells in the summer months. The more expensive wells are operated during the summer months only to supplement the spring when culinary water is used for outdoor irrigation. The current inventory of springs and wells will provide enough water thru approximately 2050, see figure 2. The reliable supply is calculated using the ac-ft/yr of water that the each well can produce compared to the use required in ac-ft/yr. The spring was not included in the calculation.

**Figure 2: Kamas City
Water Supply and Use**



Water Budgets

The following Table shows the amount of culinary water delivered to the culinary water system. The metered outflow to end-users from 2014 through 2018 is also shown.

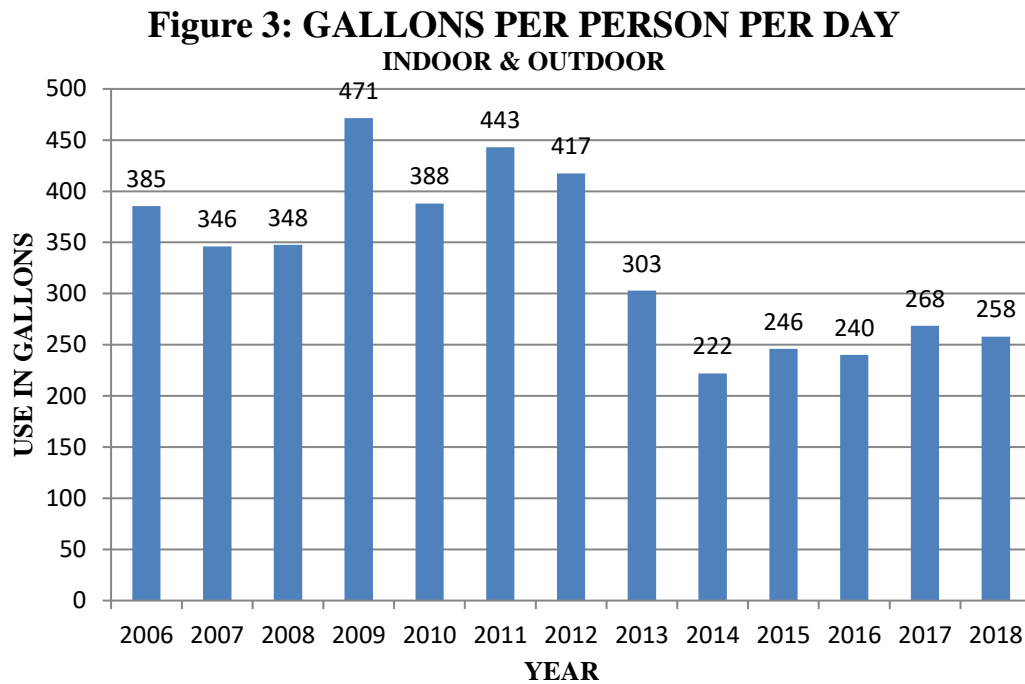
Kamas City's Water Budget			
Year	Inflow (kgal) Total	Outflow (kgal) Total	% Diff.
2014	159,960	127,156	-21%
2015	182,216	138,545	-24%
2016	182,477	143,567	-21%
2017	209,359	198,717	-5%
2018	206,264	168,081	-19%

Typical water losses for a municipality are between 15% and 25%. Water losses from the Kamas City culinary water system in the several years shown range from 24% in 2015 to 5% in 2017. We are not sure why these two years are so different from the other three. Part of this conservation plan's goals will be to analyze and implement improved systems for reading/recording water inflow and outflow to provide a more accurate record of water usage.

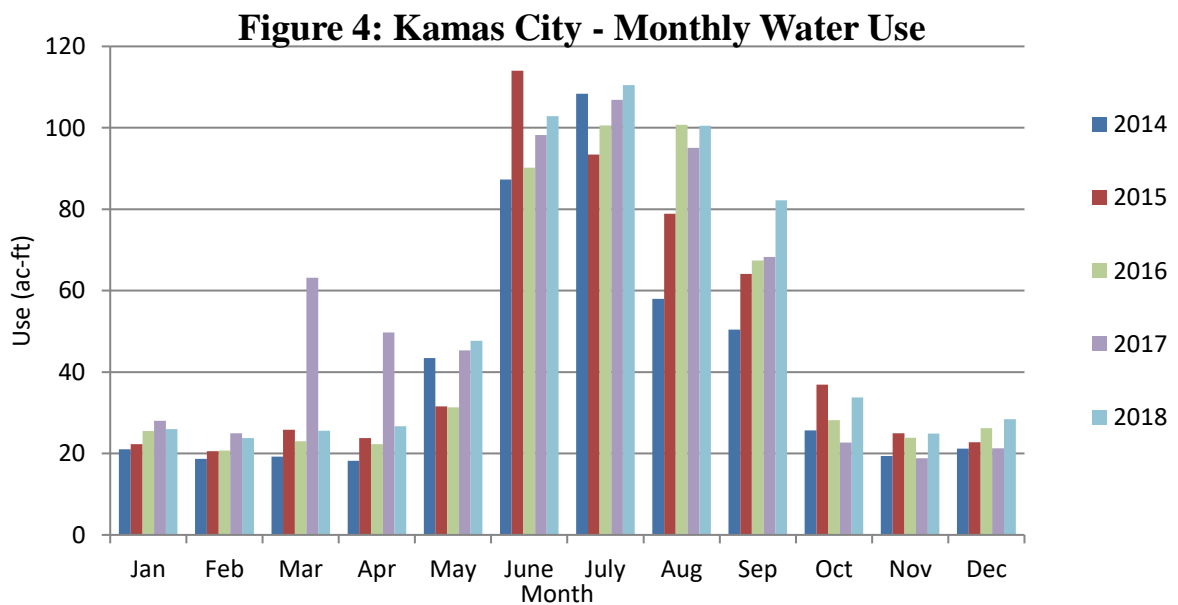
Culinary Water Use

Kamas City is located in a semi-arid region. In the hot summer months, a large demand is placed on the culinary water system for landscape and garden irrigation. This situation is highlighted by the fact that the culinary water system needs to be sized large enough to handle the high volumes and flow rates generated by the peak outdoor water demands. When all uses of culinary water are compared to the number of people living in Kamas City in 2018, residents used 258 gallons of water per capita per day (gpcd). This is close

to the statewide average of 240 gpcd. Figure 3 shows the history of culinary water use per capita per day in Kamas.



One reason this is higher is that Kamas City has a unique situation. Because of the extremely cold winters, Kamas City asks its residents to keep their water running during the winter months to keep the water lines from freezing. Water used between 2014 and 2018 is shown by month in the following figure 4:



2050 Culinary Water Use Projections

Kamas City's population is projected to be approximately 6,058 people by the year 2050 (*Mountain Land Association of Governments 2012 Population Projections*). Using this population estimate and the 247 gpcd total water usage, the 2050 total culinary water usage, including losses, will be 1,496,326 gallons per year.

WATER PROBLEMS AND CONSERVATION GOALS

Problems Identified

Several problems of the current water conservation measure have been identified.

- The previous droughts in Utah have had some positive influence towards water conservation awareness throughout Kamas City. However, there is still a need for a better understanding of landscaping water requirements and efficient water-use habits and practices. Only a small percentage of residents know how much water is required to maintain healthy landscaped areas and how to consistently use water efficiently outdoors. Some citizens' irrigation and outdoor practices are based on convenience rather than plant needs and water supply considerations.
- Some of the old existing water lines are shallow and are prone to freezing in the winter. This promotes leaving water running in homes and flush valves during the winter and causes additional leaks.
- Traditional Kamas City families have landscapes with large garden areas, grass, and other water intensive landscaping. The landscapes irrigation needs usually create a water use peak in July.
- Currently, about 10 percent of the residents use surface irrigation to irrigate lawns and gardens, because pressurized irrigation is not available. The water is delivered to Beaver Shingle Creek Irrigation Company shareholders via a network of small ditches. This method of irrigation is very inefficient, resulting in a significant quantity of lost water.

Each of these problems represents an opportunity for change. The opportunity exists to prepare a new generation of wise-water users who build low-water use landscaping. This can be assisted with a strong sustained water education program in the public and private schools.

Additional opportunities exist to improve other conservation problems. Landscaping along existing and future roads in the city could be more easily maintained if low water use shrubs and mulches were used instead of Kentucky Bluegrass. Methods could possibly be incorporated to decrease outdoor water use to ensure sufficient water for

additional users in the future. All of these measures will help reduce peak demands and the need for expensive water system upgrades.

Water Conservation Goals

As part of Kamas City's Water Conservation Plan, Kamas City has established the following goals in pursuit of solutions to the previously identified problems:

- Goal 1: Reduce Kamas City's total per capita water use, including losses, by approximately five percent in five years. The water-use rate is currently 258 gallons of culinary water per capita day (gpcd). The goal is to bring this down to 245 gpcd by 2024.
- Goal 2: Reduce Kamas City's residential per capita water use, metered at home, by approximately five percent in five years.
- Goal 3: Maintain or improve the appearance of street landscapes, open spaces, and yards. Improved irrigation practices and water efficient landscapes can enhance the beauty of the city while helping to reduce water consumption. Kamas City will continue to provide measures which encourage the use of low water-use shrubs, plants, and mulches in new developments and any existing landscape replacement projects.
- Goal 4: Analyze current system of reading/recording inflow water usage. Develop and implement an improved system for reading/recording water inflow readings to provide a more accurate record of water inflow usage in the future.

CURRENT WATER CONSERVATION MEASURES AND PROGRAMS

Kamas City's water conservation efforts have primarily been directed at finding and fixing leaks in the existing system, and education. This section briefly describes the measures that are now being implemented to help achieve the City's conservation goals. Descriptions of how Kamas City is addressing each item, along with other appropriate details, are listed under the following headings. These current measures appear to be working.

Water Conservation Ordinance

Leak Detection and System Maintenance

Conservation Oriented Rate Structure

Public Information and Education Program

Water Conservation Ordinance

Kamas City currently has the following water preservation ordinance in place. Section 7.04.10, Waste Prohibited: It shall be unlawful for any water user to waste water, or allow it to be wasted, by imperfect stops, taps, valves, leaky joints or pipes, or allow

tanks or water troughs to leak or overflow or to wastefully run water from hydrants, faucets, or stops or through basins, water closets, urinals, sinks, or apparatus or to use water in violation of the rules, regulations, or ordinances for controlling the City water system.

Leak Detection and Meter Replacement

The City has recently installed new radio read devices on all of their residential meters. This update will provide a more automated and correct read of water usage throughout the system. The City inspects water meters yearly to find water leaks. Leaks are repaired when they are found. The City reads the water meters monthly. The meter readings are reviewed each month to check for potential leaks.

Conservation Oriented Rate Structure

Designing an appropriate rate schedule is a complex task. Rate design is a process of matching the costs of operating the water system to the unique economic, political and social environments in which the city provides its service. The cost of delivering the service must be evaluated and understood. Each water system has unique assets and constraints. Based on the characteristics of the system, and past capital and operating costs, revenue requirements can be estimated. City staff has estimated the cost of providing water service and proposed a rate schedule designed to cover such costs. The rate schedule shown below has been adopted by Kamas City.

Month Fee:	Base Rate: \$28.00, includes 15,000 gallons per month
	Overage Rate
	15,001 to 40,000 gallons \$0.75 per 1,000 gallons
	40,001 to 100,000 gallons \$.125 per 1,000 gallons
	100,001 to 300,000 gallons \$2.00 per 1,000 gallons
	300,001 and above \$2.75 per 1,000 gallons

This rate schedule is designed to encourage conservation through an increased overage rate structure.

Public Information and Education Program

Our water conservation education is aimed at enhancing the awareness and understanding of water-related problems and is based on the premise that it will influence people to voluntarily use outdoor water more efficiently and cooperate with regulatory requirements. The public information and education program currently includes bill stuffers and newspaper articles containing water awareness information. It addresses both long-term and short-term water use practices for outdoor use. The program appears to be beneficial. The following are examples of things that are presented as part of the education program.

Outdoor Water Use

- Irrigate landscaping only as needed according to the types of vegetation and the specific weather patterns of your area. In general, water in the early morning or late evening hours.
- Do not water on hot, sunny, and/or windy days. You may actually end up doing more harm than good to your landscaping, as well as wasting a significant amount of water.
- A single lawn sprinkler spraying five gallons of water per minute uses 50 percent more water in just one hour than the combination of 10 toilet flushes, two five-minute showers, two dishwasher loads, and one full load of laundry.
- Sweep sidewalks and driveways instead of using the hose to clean them off.
- Wash your car from a bucket of soapy (biodegradable) water and rinse while parked on or near the grass or landscaping so that all the water running off goes to beneficial use instead of running down the gutter to waste.
- Check for and repair leaks in all pipes, hoses, faucets, couplings, valves, etc. Verify there are no leaks by turning everything off and checking your water meter to see if it is still running. Areas with drip systems will use much less water, particularly during hot, dry and windy conditions.
- Keep your lawn well-trimmed and all other landscaped areas free of weeds to reduce overall water needs of your yard.
- Install water saturation sensors which turn outdoor sprinklers on based on need, and will automatically shut off water during rain events.

FUTURE WATER CONSERVATION OPTIONS

In addition to the current water conservation measures and programs being implemented. Kamas City may consider some of the options listed below to further enhance its water conservation efforts and to help meet the goals set forth above.

Public Information and Education Program

Establish a Water Conservation Committee

Promote Water Efficient Landscaping

Peak Use Reduction

Retrofit Devices

In Home Leak Detection and Water Use Management Assistance

Shortage Management

Rain Water Harvesting

Public Information and Education Program

Kamas City currently educates the public concerning outdoor water conservation. Indoor water conservation is also an important part of controlling culinary water use. The following are examples of things that could be presented as additions to our current public information and education program.

Indoor Water Use

About two thirds of the total water used in a household is used in the bathroom. Concentrate on reducing your bathroom use. Following are suggestions for this specific area:

- Do not use your toilet as a wastebasket. Put all tissues, wrappers, diapers, etc. in the trash can.
- Check the toilet for leaks. Is the water level too high? Put a few drops of food coloring in the tank. If the bowl water becomes colored without flushing, there is a leak. If you do not have a low volume flush toilet, put a plastic bottle full of sand and water to reduce the amount of water used per flush. However, be careful not to over conserve to the point of having to flush twice to make the toilet work. Also, be sure the containers used do not interfere with the flushing mechanism.
- Take short showers with the water turned up only as much as necessary. Install low flow showerheads and/or other flow restriction devices.
- Do not let the water run while shaving or brushing your teeth. Fill the sink or a glass instead.
- When doing laundry, make sure you always wash a full load or adjust the water level appropriately if your machine will do that. Most machines use 40 gallons or more for each load, whether it is two socks or a week's worth of clothes.
- Repair any leak within the household. A minor slow drip can waste up to 15 to 20 gallons of water a day.
- Know where your main shutoff valve is and make sure that it works. Shutting the water off yourself when a pipe breaks or a leak occurs will not only save water, but also eliminate or minimize damage to your personal property.
- Keep a container of water in the refrigerator for a cold drink instead of running water from the tap until it gets cold. You are putting several glasses of water down the drain for one cold drink.
- Stopper the sink when rinsing vegetables, dishes, or anything else; use only a sink full of water instead of continually running water down the drain.

Establishment of a Water Conservation Committee

A technical advisory committee may be useful for evaluating water conservation measures and making recommendations concerning such measures to the local government. This committee could evaluate the success of water conservation measures currently in practice and consider the potential applicability of other practices for future application.

Additional decisions to be made:

- How many persons comprise the committee or should it be a single coordinator
- Would the committee be made of current city employees
- How committee members are, or will be, chosen

- Minimum length of service
- Establish meeting schedule; monthly, bi-monthly etc
- Committee's authority and responsibility
- Types of issues for which the committee will be responsible

Promote Water Efficient Landscaping

During some months, water used for lawn and landscape may comprise more than half of the public water deliveries for many communities. Landscaping with low water use plants and site designs reduces the amount of water needed for irrigation. Such landscapes do not have to be barren, lacking in color, diversity or only consist of thorny desert plants. Succulent plants and other popular ornamentals may be designed into a water wise landscape if placed in a location that does not require excess watering. Landscaping along existing and future roads may also be designed to use low water-use shrubs, plants, and mulches that do not have intrusive root systems. Kamas City has previously researched various plants with non-intrusive roots systems which could be utilized for low water-use areas.

Additional ideas to promote:

- Include water wise landscaping as a major topic in public information and education programs.
- Adopt a policy of applying water efficient landscaping principles to newly landscaped or re-landscaped public buildings, parks, and other sites.
- Monitor and evaluate the results of the water wise landscape information and education.
- Consider including water efficient landscape requirements in a landscaping ordinance.
- Investigate the technologies of Xeriscape and its potential use in Kamas City.
- Use landscape saturation sensors in City parks. These water landscape based on need, and shut off water during rain events.

Peak Use Reduction

Some water systems are capable of meeting average daily demands but have difficulties meeting peak demands. Measures, which reduce peak demand, may forestall the need to develop new resources or expand treatment and distribution facilities. Some methods that may be used to reduce peak demand include:

- Installation of "demand meters"
- Seasonal peak time rates
- Quantity of use restrictions
- Restrictions on landscape irrigation and other outside water uses during peak demand time

If no peak use reduction measure is in place then:

- Define a set of measures to consider
- Evaluate the impact that such measures would likely have on peak water demand
- Analyze the advisability of adopting such measures for their systems.

Retrofit Devices

Installation of water conserving devices in existing structures complements plumbing codes that require low water-use items in new structures. Retrofit requirements should usually be mandatory or devices be provided free of charge in order to achieve a high degree of compliance. Some localities require retrofit devices to be installed before ownership of a property can be transferred.

Possible program features:

- Identify homes, office buildings, and other structures built prior to 1992 and develop a strategy to distribute or install high-efficiency plumbing fixtures such as ultra-low-flow toilets, showerheads, faucet aerators, etc
- Offer rebates for high efficiency appliances to promote water conservation indoors.
- Evaluate the impact that such measures would likely have on water demand.
- Analyze the advisability of adopting those measures.

In Home Leak Detection and Water Use Management Assistance

The utility of local government may provide a free technical assistance outreach program for locating leaks and identifying ways in which a resident or property owner might use water more efficiently. This program would provide staff knowledgeable in leak detection and water conservation methods.

Probable action items prior to program origination are the following:

- Design as assistance program to consider
- Evaluate the impact that the program would likely have on water demand.
- Analyze the advisability of implementing the program in their service areas.

Shortage Management

The city is developing a contingency plan, which spells out climate and political realities related to water use during drought or other water supply shortages. Included here are conservation measures that Kamas City may implement during times of emergency.

They are as follows:

- Eliminate watering on city property during the hottest times of the day
- Water city properties on a minimal watering schedule that does not water during hot daylight hours
- Eliminate watering of city property in cases of severe shortages
- Educate the public on the water supply situation
- Instigate voluntary public conservation measures
- No outside watering from 10:00 a.m. to 6:00 p.m
- Issue information to all customers on conservation procedures each can accomplish around their own property and within their own homes
- Instigate mandatory public conservation measures
- Enforced outside watering restrictions including watering times and quantities
- Instigate emergency conservation measures

- Strictly enforce all conservation policies with significant fines for non-compliance
- Physically restrict water supplies to (in order of priority)
 - All outside irrigation systems
 - Park properties and other non-essential support facilities
 - Commercial businesses, restricting largest users first
 - Residential areas
 - Any other “non-life support” areas, insuring water supplies to hospitals, hospices, all other health care facilities, and controlled designated area water supply facilities
 - Additional non-emergency water conservation measures
 -

Rainwater Harvesting

During the summer months Rainwater harvesting is a possible way for residents to help conserve water. Rainwater harvesting is the practice of collecting and storing precipitation for later use. The State of Utah allows rainwater harvesting but requires the homeowners to register with the Division of Water Rights if they have more than two containers per parcel, or any one container has a maximum storage volume of greater than 100 gallons.

IMPLEMENTING & UPDATING THE CONSERVATION PLAN

Tasks must be set forth to ensure the goals stated above are reached. A person or department must be given the responsibility of completing tasks with deadlines. The Kamas City council will have the responsibility for providing funding for the measures outlined in this plan. Kamas City staff will be responsible to ensure that tasks necessary to meet the goals are carried out within the appropriate time line.

Kamas City’s Water Conservation Plan will be revised and updated as required to meet changing conditions and needs of the city. The plan will help promote the effective use of culinary water if the methods set forth are utilized. Through public awareness and involvement, water may continue to be available for years to come.

REFERENCES

Non-Published references:

HORROCKS ENGINEERS, 2014. *Water Conservation Plan for Kamas City, Utah: Horrocks Engineers.*

KAMAS CITY, 2009-2018, *Culinary Water Use Reports*. Kamas City: *Kamas City's Internal documentation.*

STATE OF UTAH DEPARTMENT OF NATURAL RESOURCES, *Water Conservation Plan Template*. *State of Utah Division of Water Resources.*

RESOLUTION NO. 2020-01

**A RESOLUTION TO APPROVE AND ADOPT THE KAMAS CITY WATER
CONSERVATION PLAN**

WHEREAS, Kamas City operates a culinary water system; and

WHEREAS, the City Council understands the pressing need to use water in a more efficient manner to allow for future sustained growth of the community;

NOW, THEREFORE, BE IT RESOLVED by the Kamas City Council, County of Summit, State of Utah:

The water conservation plan of Kamas City, originally submitted to the Utah Division of Water Resources in January 2005, and revised on this 11th day of February 2020, is hereby approved and adopted. Said water conservation plan is attached hereto and incorporated herein as Exhibit "A". The water conservation plan will be amended no less than every five years and will continue to play a vital role in the future development of Kamas City, Utah.

This resolution is considered with full knowledge of any and all disclosures as required by the laws of the State of Utah concerning any actual or potential conflicts of interest.

This Resolution shall take effect upon adoption by the City Council.

ADOPTED and RESOLVED this 11 day of February, 2020.


Matt McCormick, Mayor

ATTEST:


Kim Peacock, City Recorder

EXHIBIT A

KAMAS CITY

WATER CONSERVATION PLAN 2019

PROOF OF PUBLICATION



STATE OF UTAH, }
County of Summit, } ss.

I, Karen Davis
being first duly sworn, depose and say that I am the Assistant
Editor of The Summit County News, a
weekly newspaper of general circulation, published once each week at
Coalville, Utah, that the notice attached hereto and which is a
Notice

NOTICE
The Kamas City Council will
hold a public hearing on Tues-
day, February 11, 2020 at 7:05
p.m. in the City Hall, 170 N.
Main, Kamas. The purpose of
the hearing is to accept public
comment for a resolution to ap-
prove and adopt the Kamas
City Water Conservation Plan.
In compliance with the
Americans Disabilities Act, in-
dividuals needing special ac-
commodations during this
hearing should notify the City
Clerk (783-4630) at least 3 days
prior to the hearing.
Published in The Summit
County News February 7, 2020.

was published in said newspaper for one
consecutive issues, the first publication having been made on the
7th day of February, 2020, and the last
on the 7th day of February, 2020, that said
notice was published in the regular and entire issue of every number
of the paper during the period and times of publication, and the same
was published in the newspaper proper and not in any supplement.
Same was also published online at utahlegals.com, according to
Section 45-1-101, Utah Code Annotated, beginning on the first
date of publication and for at least 30 days thereafter.

Karen Davis
Subscribed and sworn to before me this 12 day of
Feb, 2020.

Laurie B Wynn
Notary Public

My commission expires 8/25/20.

