

2007 Kansas Municipal Water Conservation Plan Guidelines



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INTRODUCTION 1

Definition of Water Conservation 1

Intended Audience 1

Water Conservation Plan Development Assistance 2

Plan Submission for State Approval 2

WATER CONSERVATION PLAN 2

Introduction 3

Long-Term Use Efficiency 3

 Water Use Conservation Goals 3

 Conservation Practices 3

Drought Response 9

 Drought Declarations 9

 Private Wells within a Municipality 10

 Water System Drought Stages 10

 Drought Stage Triggers 11

 Drought Stage Goals 11

 Drought Response Actions 12

Monitoring, Evaluation and Revision 13

 Monitoring the System 13

 Evaluating Effectiveness of the Plan 13

 Plan Revision 14

APPENDIX 15

Appendix A: Review of Water Conservation Statutes 15

Appendix B: Model Municipal Water Conservation Plan 18

Appendix C: Water Drought/Emergency Ordinance 28

Appendix D: Discussion of Water Use Efficiency Practices 32



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GUIDELINES FOR PREPARING A MUNICIPAL WATER CONSERVATION PLAN

INTRODUCTION

The Kansas Water Office develops and maintains guidelines for water conservation plans and practices. The Guidelines are prepared for use by public water suppliers to assist them in preparing a water conservation plan. These guidelines also serve as a general guide for state agencies in reviewing and approving water conservation plans.

Definition of Water Conservation

Water conservation, for the purposes of these Guidelines, is the utilization of cost-effective water use efficiency practices to curtail the waste of water and to ensure that water use does not exceed reasonable needs. The primary goal of water conservation plans is to achieve more efficient use of the state's limited water resources.

Intended Audience

The water conservation plan guidelines provided in this document are intended for use by public water suppliers who are described as municipal water users in the Kansas Water Appropriation Act (K.S.A. 82a-701 *et seq.*).

The Act defines municipal water use as "...the various uses made of water delivered through a common distribution system operated by a municipality, a rural water district, public wholesale water supply district, a group of householders, mobile home parks or any other similar entity distributing water to other water users for household purposes."

All public water suppliers are encouraged to develop and implement water conservation plans. A municipal water conservation plan is a tool for managing both long-term water use efficiency and for short-term drought response. The Kansas Statutes provide direction in regard to which water users should be required to prepare water conservation plans. A review of water conservation statutes is found in Appendix A.

K.S.A. 82a-733(a) authorizes the Chief Engineer of the Division of Water Resources to require the owner of a water right to adopt and implement conservation plans and practices. In selecting when conservation practices and plans should be implemented and adopted, priority is given to water users that share a common source of supply that could be inadequate during times of drought, and to water users who are using significantly more water than their peers in the same geographic area. Adoption and implementation of conservation plans and practices is only mandated by the Chief Engineer when it will result in a public benefit and is in the public interest.

Other Kansas Statutes require water conservation plans for anyone: (1) purchasing water from the State Water Marketing Program; (2) participating in the Water Assurance District Program; (3) sponsoring or purchasing the public water supply portion of a Multipurpose Small Lakes Program project; (4) transferring water under the Water Transfers Act; or (5) applying for a loan from the State Revolving Fund (see Appendix A).



Water Conservation Plan Development Assistance

The Kansas Water Office provides free technical assistance to public water suppliers developing a Municipal Water Conservation Plan, including draft plan development and on-site assistance in personalizing the document to meet the needs of the public water supply system.

Plan Submission for State Approval

Water conservation plans are approved by the Kansas Department of Agriculture, Division of Water Resources or the Kansas Water Office. Public water supply systems may submit their water conservation plan for review and approval to the appropriate agency, based on the underlying reason for developing a plan as outlined below.

Table 1 Where to Submit a Plan for State Approval		
Reason for Developing a Plan	Requiring Agency	Approval Agency
Condition of a Water Right	Division of Water Resources	Division of Water Resources
Multipurpose Small Lake Program		
Water Transfers Act		
Public Water Supply Planning Grant	Kansas Department of Health and Environment	
State Revolving Loan Fund Application		
Water Assurance District Member	Kansas Water Office	Kansas Water Office
Water Marketing Customer		
Voluntary	None	Kansas Water Office or Division of Water Resources

THE WATER CONSERVATION PLAN

Municipal Water Conservation Plans contain the following four sections: (1) Introduction, (2) Long-term Water Use Efficiency, (3) Drought Response and (4) Monitoring, Evaluation and Revision. Plans submitted for approval must also include a Drought/Emergency Ordinance or Resolution which authorizes the implementation of the Drought Response portion of the plan when necessary.

An example Municipal Water Conservation Plan (Appendix B) and Water Drought/Emergency Ordinance (Appendix C) are included in these guidelines to assist public water suppliers as they prepare their plans. It should be noted that the example plan represents the typical requirements for a medium-sized public water supplier whose water use in gallons per capita per day (GPCD) is high compared to their regional average. Specific Municipal Water Conservation Plans may have different requirements depending on the size of the population served and the system's reported water use compared to the region.



Introduction Section

The Introduction Section of the Plan should include a description of current and future water supply sources and a description of the public water supplier's objectives for preparing a water conservation plan.

Long-Term Water Use Efficiency

Water Use Conservation Goals

Water use conservation goals for most water utilities (cities, residential entities and subdivisions, rural water districts and mobile home parks) should be based on GPCD water use. Entities who cannot measure water use in GPCD (public wholesale water supply districts, cities whose public water use is only for fire protection, church camps, schools, prisons, etc.) may simply choose an annual amount of water use as a conservation goal. The water utility should also consider selecting a target date for achievement of the GPCD goal; and any other water conservation goals, such as peak usage, water loss, etc., that may be especially important for its specific situation.

In selecting a water use conservation goal, a water utility should: (1) review the GPCD averages in the latest available [Municipal Water Use](#) publication that pertains to its specific region of the state and population size and review its own GPCD usage during the past several years; (2) determine any opportunities for a beneficial reduction in water use or water loss; and (3) choose a water use conservation goal in GPCD that the water utility should not exceed.

A water utility whose current GPCD is below the regional average may use its current GPCD as its goal. A water utility whose current GPCD is above the regional average should choose a GPCD goal that is lower than its current GPCD. No water utility should choose a GPCD goal that is more than 25 percent above the regional average, regardless of its current usage, unless very unusual local conditions can be substantiated that preclude its use.

Water Conservation Practices

The purpose of this sub-section of the plan is for the public water supplier to focus on long-term water conservation practices, including a strong emphasis on the development and maintenance of a monthly or bi-monthly record keeping system that will ensure the entity's ability to measure the impact of its water conservation efforts on a monthly or bi-monthly basis and on an annual basis. The public water supplier will be prepared to take appropriate action in a timely manner, whenever the monthly or bi-monthly records indicate that a water conservation problem needs to be addressed. It is anticipated that many water utilities will want to go beyond this level of detail and closely examine daily or hourly water use figures.

Table 2 includes long-term water conservation practices that should be developed for three areas: education; management; and regulation. For each of these three areas, the water utility should review the historical and current water use efficiency practices undertaken by the utility; develop a list of specific water use efficiency practices that the water utility will be doing on a long-term basis (with special attention to the specific water use efficiency practices listed in Table 2); and indicate the target date for beginning each specific water use efficiency practice listed by the water utility.



A small water utility with a low or medium GPCD usage rate does not have nearly the impact on local and regional water supplies as does a large water utility with a high GPCD usage rate. Also, small water utilities generally have fewer staff resources available to prepare and monitor a water conservation plan. Consequently, the plan guideline status shown in Table 2 takes this into account and fewer water use efficiency practices are recommended for small water utilities with a low or medium GPCD usage rate than for large water utilities with high GPCD usage rates.

In Table 2, water use efficiency practices for each water utility category are shown as “optional,” “recommended” or “highly recommended”. “Optional” practices will be relevant for some water utilities; water utilities should consider this water use efficiency practice and decide if it should be included in its Municipal Water Conservation Plan, based on the water utility’s perception of the efficiency practice’s merit in achieving a beneficial reduction in water use or loss. “Recommended” practices will be relevant for many water utilities; water utilities should decide if this specific water use efficiency measure should be included in its Municipal Water Conservation Plan. “Highly recommended” practices are relevant for all water utilities and should be included in the water utility’s Municipal Water Conservation Plan; unless very unusual local conditions can be substantiated that preclude its use.

A discussion of the water use efficiency practices that are listed in the table for the education, management and regulation components of the Long-Term Water Use Efficiency Section of the Municipal Water Conservation plan is provided in Appendix D.

These practices have been developed primarily for use by water utilities. Public water suppliers who do not fit within the water utility category should review this subsection of the guidelines and utilize only those aspects that apply to their unique situation. If more appropriate long-term conservation practices are available then those practices should be selected. However, all public water suppliers should emphasize accurate metering of water use as a key element of the Long-Term Water Use Efficiency Section of their Plan.

TABLE 2
Long-term Water Use Efficiency Practices for Water Utilities

Long-Term Water Use Efficiency Component	Water Use Efficiency Practices	Plan Guideline Status					
		Small Water Utilities ^{a/}		Medium Water Utilities ^{b/}		Large Water Utilities ^{c/}	
		Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}
A. Education	1. Water bills will show the amount of water used in gallons and the cost of the water.	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
	2. Water bills will show the amount of water used in gallons during this billing period and the number of gallons used last year during the same billing period.	Optional	Optional	Optional	Recommended	Optional	Recommended
	3. Water conservation tips will be provided with the monthly water bills during the summer months.	Optional	Recommended	Optional	Recommended	Optional	Highly Recommended
	4. Water conservation articles or issues will be provided or discussed each month during the summer by the local news media.	Optional	Optional	Optional	Recommended	Optional	Highly Recommended
	5. The Board of Education and teachers will be encouraged to become involved in water conservation through classroom lectures and incentives for children to conduct home checks.	Optional	Optional	Optional	Recommended	Optional	Recommended
	6. Make available information on water conserving landscape practices through publications, local news media, seminars or other appropriate means.	Optional	Recommended	Optional	Highly Recommended	Recommended	Highly Recommended
	7. Provide information to the general public on lawn watering needs on a regular basis during the summer months.	Optional	Optional	Optional	Optional	Optional	Recommended
	8. Other appropriate education actions.	Optional	Optional	Optional	Optional	Optional	Optional

TABLE 2

Long-Term Water Use Efficiency Component	Water Use Efficiency Practices	Plan Guideline Status					
		Small Water Utilities ^{a/}		Medium Water Utilities ^{b/}		Large Water Utilities ^{c/}	
		Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}
B. Management	1. All source water will have meters installed and the meters will be repaired or replaced within two weeks when malfunctions occur.	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
	2. Meters for source water will be tested for accuracy at least once every three years. Each meter will be repaired or replaced if its test measurements are not within industry standards (such as AWWA standards).	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
	3. Meters will be installed at all residential service connections and at all other service connections whose annual water use may exceed 300,000 gallons, including separate meters for municipally operated irrigation systems which irrigate more than one acre of turf.	Recommended	Highly Recommended	Recommended	Highly Recommended	Recommended	Highly Recommended
	4. Meters at each individual service connection will be replaced or tested for accuracy on a regular basis, per industry standards (such as AWWA standards), if they are one inch or less. Meters between one inch and six inches will be tested for accuracy at least once every five years and meters six inches and above will be tested on at least an annual basis. Each meter will be repaired or replaced if its test measurements are not within industry standards (such as AWWA standards).	Optional	Recommended	Optional	Highly Recommended	Recommended	Highly Recommended
	5. All meters for source water will be read at least on a monthly basis and meters at individual service connections will be read at least once every two months.	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended



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		Small Water Utilities ^{a/}		Medium Water Utilities ^{b/}		Large Water Utilities ^{c/}	
		Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}
B. Management	6. A reading will be taken at each source water meter at the same time that meters for individual service connections are read.	Highly Recommended	Highly Recommended	Recommended	Recommended	Optional	Optional
	7. A water utility will implement a water management review, which will result in a specified change in water management practices or implementation of a leak detection and repair program or plan, whenever the amount of unsold water (amount of water provided free for public service, used for treatment purposes, water loss, etc.) exceeds 20 percent of the total source water for a four month time period.	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended	Highly Recommended
	8. Water sales will be based on the amount of water used.	Recommended	Highly Recommended	Recommended	Highly Recommended	Highly Recommended	Highly Recommended
	9. A water rate structure designed to curb excessive use of water will be evaluated.	Optional	Highly Recommended	Recommended	Highly Recommended	Recommended	Highly Recommended
	10. Develop and implement a program to incorporate water conserving landscape principles into future landscape development projects, including renovation of existing landscapes.	Optional	Recommended	Optional	Recommended	Recommended	Highly Recommended
	11. Develop and implement an irrigation management program for irrigated grounds.	Optional	Recommended	Optional	Recommended	Recommended	Highly Recommended
	12. Encourage the recycling of wastewater for selected industrial or irrigation purposes.	Optional	Optional	Optional	Recommended	Recommended	Recommended
	13. Other appropriate management actions.	Optional	Optional	Optional	Optional	Optional	Optional

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Long-Term Water Use Efficiency Component	Water Use Efficiency Practices	Plan Guideline Status					
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		Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}	Low or Medium GPCD ^{d/}	High GPCD ^{e/}
C. Regulation	1. All new or renovated construction will install toilets that use 1.6 gallons per flush or less and low flow showerheads that use 2.5 gallons per minute or less.	Optional	Optional	Optional	Recommended	Recommended	Recommended
	2. Adopt a landscape water conservation ordinance.	Optional	Optional	Optional	Recommended	Recommended	Recommended
	3. Other appropriate regulation actions.	Optional	Optional	Optional	Optional	Optional	Optional

^a Water utilities who provide water to less than 500 of their own residential/commercial customers.

^b Water utilities who provide water to at least 500, but less than 10,000 of their own residential/commercial customers.

^c Water utilities who provide water to at least 10,000 of their own residential/commercial customers.

^d Water utilities whose gallons per capita per day (gpcd) use shown in the most recent Municipal Water Use publication is not 25 percent or more above the regional gpcd average for water utilities in their regional group.

^e Water utilities whose gallons per capita per day (gpcd) use shown in the most recent Municipal Water Use publication is at least 25 percent above the regional gpcd average for water utilities in their regional group.





Drought Response

Coping with drought presents a challenge for public water suppliers. During drought periods the amount of water available typically is reduced at the same time customer demand for water increases. Also, mechanical breakdowns, line breaks and other problems may be more likely due to the stresses associated with drought. Drought response differs from long-term water use efficiency in the intensity and timing of the appropriate actions needed to manage and conserve water. The level of activity and the desired outcome during drought conditions are obviously more pronounced than under normal situations. Additionally, drought response efforts must occur immediately to enact short-term relief on the water supply system.

While all suppliers may be potentially impacted, some are particularly vulnerable. The Kansas Department of Health and Environment and the Kansas Water Office maintain a list of drought vulnerable Kansas public water suppliers. Those on the list are considered most likely to first experience drought-related problems. All suppliers on the [drought vulnerable list](#) are encouraged to develop and implement a municipal water conservation plan and to resolve the limitation(s) underlying their vulnerability.

As drought is but one of several emergency situations potentially facing a public water supplier, this section of the water conservation plan should be considered part of an overall emergency response plan. All public water suppliers must develop emergency response plans as required by K.A.R. 28-15-18 and authorized by K.S.A. 65-171m. Emergency plan guidance is available from the Kansas Department of Health and Environment, Bureau of Water.

Water system officials should also coordinate with local emergency management officials regarding their community's overall strategy for emergency response.

Drought Declarations

A complex set of statutory authorities govern issuance of drought stage or emergency declarations at the local, state and federal levels. At the local level it is important to recognize the distinction between a water system's declaration of a drought stage and county drought stage declarations issued by the Governor as recommended by the Director of the Kansas Water Office pursuant to K.S.A. 74-2608.

County drought stage declarations provide notice to state and local officials that drought conditions exist and trigger implementation of the Governor's Drought Response Team Operations Plan. This Plan is largely limited to coordination of government actions.

County declarations, in and of themselves, do not trigger implementation of the drought response section of a municipal water conservation plan. However, the county declaration provides a "heads-up" for local water system officials that they should review their system's drought stage triggers to determine if further action is needed. Additional information regarding local drought response is provided in [Responding to Drought: A Guide for City, County and Water System Officials](#) that was developed by the Governor's Drought Response Team in 2006.



Private Wells within a Municipality

The Chief Engineer of the Division of Water Resources has the authority under K.S.A. 82a-733 (a) to require the owner of a water right or a permit to appropriate water for beneficial use to adopt and implement conservation plans and practices. Private water well owners do hold a water right for domestic water use.

Municipal water utilities may wish to address the use of private wells within the city limits while the city is responding to a drought situation by including them in their Water Drought/Emergency Ordinance. Land owners who choose to continue outdoor watering using private wells, when the city is under watering restrictions, may impact both community relations and the shared water source. Under certain conditions and with the authorization from the Chief Engineer as provided by K.S.A. 82a-733(i), private well owners may be required to implement water conservation practices so they are compliant with the cities' water conservation plan.

Conditions under which domestic well owners may be required to implement water conservation measures include (1) when impairment to senior water rights is occurring, (2) when a municipality with a common source of supply is experiencing a period of drought, and water watches, warnings or emergencies are in place, and (3) when the waste of water is occurring. The waste of water is likely during times of high evaporation and during peak hours. Water applied to any outside surface during these times may have a higher percentage of loss than that actually put to beneficial use, and thus water is wasted.

Water System Drought Stages

Every drought response plan should be set up in stages, each one more stringent than the one before it. Triggering mechanisms should be identified to signal the start of a given stage and specific goals should be identified as the desired outcome for each stage. Finally, appropriate conservation practices in the areas of education, management and regulation should be listed under each stage.

Usually three to four stages are appropriate to implement drought response practices or actions. The stepwise approach of using stages is suggested because the impact of conservation practices of a moderate stage may preclude the need for the municipal water entity to enact more severe conservation practices at a subsequent stage. Furthermore, the successful implementation of a drought response plan depends on the education and cooperation of the public or whatever target audience is served by the municipal water entity. The general public and/or other target audience will support actions to curtail water use if they are aware of worsening conditions ahead of time, allowing them to make the transition to the type of water use habits that are necessary for the public water supplier to reach its goals. The first three stages listed below are appropriate for all public water suppliers. A fourth stage is shown for possible use by public water suppliers in an extreme emergency.

1. **Water Watch:** Conditions indicate that the probability of a water shortage is rising and steps should be taken to inform water users and ask for voluntary reductions in water use. No serious threat to water supplies is eminent, but the municipal water entity is watching the situation.
2. **Water Warning:** Water shortage conditions are present and water supplies are starting to decline. Additional curtailment of use is suggested, especially restrictions on nonessential uses. The water system is able to meet demands as they exist, but lowering the demands will extend the municipal water entity's ability to meet future demands without significant disruption.



3. **Water Emergency:** Severe water shortage conditions are present and supplies are becoming limited. Mandatory restrictions of use, especially outdoor use, are in place. System failure is becoming a possibility if conditions do not improve or demands do not decline.
4. **Water Rationing:** Each user is allocated a specific amount of water. Rationing only works in metered systems and must be followed by strict enforcement and penalties, usually monetary. To the extreme degree, service disconnection should be employed. Rationing allocation policies can take several forms. One example would be based on a percentage of normal use, where water may be used up to a set percentage of the amount used in previous months or years. Another example would be based on an amount per person or household, where water use may be limited to reflect a set per capita or per household amount on a monthly basis.

A water utility will have to weigh the equity of the above approaches for rationing based on previous usage and family sizes; and the difficulties in administering and enforcing rationing. A drought response plan should have a goal of avoiding this fourth stage at all costs, which means strong efforts must be implemented in the earlier stages.

Drought Stage Triggers

Triggers are the signals that water shortage or other conditions indicative of drought have reached certain stages or levels. They act as the signal to begin implementation of the appropriate stage. Triggers may be related to supply conditions or demand levels. A given stage should have more than one trigger to confirm that conditions are worsening. A water utility or other municipal water entity should enact the appropriate stage whenever the agreed upon set of triggers is reached. Delay in action may lead to a major disruption of the water supply system at a later time. The following triggers are the most commonly used by public water suppliers:

1. Ground water level decline of a specified amount, either static seasonal level or draw down.
2. Pumping lowers water level a specific amount in relation to the well screens.
3. Lake level in terms of elevation or capacity.
4. Stream level in terms of flow or stage.
5. Water level in relation to the dam.
6. Peak daily demand levels.
7. Percent capacity of treatment plant operations over a number of days.
8. Capacity of water system storage and ability to recover.
9. The provider for purchased water has issued a drought stage.
10. Emergency conditions related to repairs or water quality.
11. The Kansas Water Office has issued a drought stage (for water marketing customers) based on the remaining water marketing storage in a water marketing lake.

Drought Stage Goals

Each drought stage should have a goal associated with it which describes the desired outcome of the activity under that stage. Goals for a water warning and a water emergency should be quantifiable; in other words, a yardstick that can be used to measure progress. Goals should be specifically described and targeted to increase water user awareness; reduce overall demand; and reduce peak demand. Examples of specific goals are:

1. Heighten awareness of the public on water conditions and maintain the integrity of the water supply system (water watch).



2. Reduce peak demands by 20 percent and overall weekly consumption by 10 percent (water warning).
3. Reduce peak demands by 50 percent and overall weekly consumption by 25 percent (water emergency).

Drought Response Actions

Drought response actions should identify the education, management and regulation activities to be undertaken at each stage to conserve the water supply. The three main options a water utility or other municipal water entity has when faced with drought are to expand supply, conserve supply or reduce demand. The timing of drought usually means that supply expansion will not provide immediate relief, unless reserve supplies have been secured prior to the water shortage as part of long-range plans. Additionally, the existing treatment and distribution system must be properly sized to use the additional supply. For those reasons, conserving the existing supply through demand reduction is often the most viable action. The following lists provide public water suppliers with options for drought response that may be employed as appropriate.

1. Education

- a. News releases to the local media describing present conditions and water supply outlook;
- b. A description of present conditions and an indication of the water supply outlook will be made available at designated public location(s);
- c. Summaries of current precipitation, temperature, water levels, storage, demand, etc.;
- d. Public meetings;
- e. Bill inserts sent to water utility customers providing water-saving tips;
- f. School programs, featuring guest talks by water utility staff;
- g. Pamphlets prepared by water utility staff, county extension agents, etc.

2. Management

- a. Once leaks are located they should be repaired within one to two days;
- b. Wells should be cleaned to maintain high efficiency;
- c. Intakes should be adapted to operate with low flows;
- d. Reserve supplies, such as standby well fields or lakes, should be prepared for use;
- e. Pumping should be scheduled in such a way as to reduce draw downs;
- f. Priority areas determined for maintaining irrigation practices on water utility owned grounds;
- g. Emergency supplies should be sought from other users such as irrigators or water utilities;
- h. The water utility or other municipal water entity should contact the DWR for permission to drill;
- i. The municipal water supplier should contact DWR for permission to require private well owners to comply with the city's drought response regulations as authorized under K.S.A. 82a-733(i);
- j. Water utilities should enact excess use charges for the use of water over specified amounts;
- k. The water utility will curtail its own use of water.

3. Regulation

- a. Voluntary conservation at the early stages of drought, through requests to conserve water, especially for outdoor use;



- b. Restrictions on nonessential uses such as lawn watering, car washing, filling swimming pools, watering golf course fairways and washing of pavement and buildings. Curtailment or bans on watering established lawn and landscapes should be implemented prior to the adoption of similar restrictions for new lawns and landscaped areas;
 1. Restrict usage to alternate days or every third day;
 2. Restrict usage to nighttime (after 8:00 p.m.) or early morning (before 10:00 a.m.);
 3. Use water from a hand-held hose or bucket only;
 4. Impose an outright ban on certain water uses. This should be used only in extreme situations and should be preceded by various stages of restrictions.
- c. Restrict usage by commercial car washes, nurseries, hotels, restaurants and golf course tees and greens;
- d. Restrict usage of private, domestic water wells within the city limits when delegated by the Chief Engineer as authorized under K.S.A. 82a-733(i).

Monitoring, Evaluation and Revision

The water conservation plan is a management tool. The plan addresses the water conservation goals of a public water supply system, and identifies specific long-term water conservation practices that help the system achieve those goals. In addition, the drought response portion of the plan provides a means of recognizing the potential for water shortage and a strategy to manage that shortage. The Monitoring, Evaluation and Revision section of the plan sets the schedule for reviewing the status of the system and determining when the plan needs to be revised.

Monitoring the System

Once the water conservation plan is implemented, water production and metered distribution should be monitored and reviewed periodically. This process will either confirm that the system is operating well, or raise a flag that something needs attention.

For example, a public water supplier may plan to review the monthly totals for water production, water sold, water provided free of charge and water lost through system leaks. If the review shows that more water appears to have been sold than was produced for a single month, it may be an indication that one or more of the master meters have malfunctioned and needs to be repaired or replaced. A review that shows a much higher than expected amount of unaccounted for water could be the result of an error in reading the master meter; a bookkeeping error; an indication that an excessive amount of water is being used for free public services; or a significant leak has developed on one of the main distribution lines and needs to be repaired as soon as possible.

Evaluating the Effectiveness of the Plan

The public water supplier should plan to review its water use records at least once annually and evaluate whether its water conservation goal(s) are being met. If the annual goal(s) are not met a review of the long-term efficiency practices should be conducted to answer the following questions:



1. Are the long-term practices fully implemented?
2. Is more time needed for the practices to take full effect?
3. Should the practices be modified or additional practices implemented?
4. Should the water conservation goal(s) be revised?

Plan Revision

Water conservation plans may need to be revised for a number of reasons. Some of the reasons are:

1. Long-term water conservation practices need to be revised or added to help meet water conservation goal(s).
2. A water source has been added or the amount of water available has changed.
3. Storage or treatment capacities have changed.
4. Population changes require a change in the Drought Response triggers for peak demand.
5. Drought Response triggers, actions, or goals need to be modified in order to better manage the availability of water during drought conditions.
6. Agency requiring the water conservation plan has directed the plan be revised.

Revised plans should be submitted to the Kansas Department of Agriculture, Division of Water Resources, or the Kansas Water Office (whichever state agency is responsible for approving the plan as shown in Table 1) for approval, and to ensure that the revised plan meets current Water Conservation Plan Guidelines.



REVIEW OF WATER CONSERVATION STATUTES

K.S.A. 74-2608 outlines the mandatory duties of the Kansas Water Office. Subsection (c) of K.S.A. 74-2608 state one of the Kansas Water Office's three mandatory duties: "The Kansas Water office shall develop and maintain guidelines for water conservation plans and practices. Such guidelines shall:

1. Not prejudicially or unreasonably affect the public interest;
2. be technologically and economically feasible for each water user to implement;
3. be designed to curtail the waste of water;
4. consider the use of other water if the use of freshwater is not necessary;
5. not require curtailment in water use which will not benefit other water users or the public interest;
6. not result in the unreasonable deterioration of the quality of the waters of the state;
7. consider the reasonable needs of the water user at the time;
8. not conflict with the provisions of the Kansas water appropriation act and the state water planning act;
9. be limited to practices of water use efficiency except for drought contingency plans for municipal users; and
10. take into consideration drought contingency plans for municipal and industrial users."

The statute also states that: "When developing such guidelines, the Kansas water office shall consider existing guidelines of Groundwater management districts and the cost-to-benefit ratio effect to any plan."

Subsection (d) of K.S.A. 74-2622 outlines the mandatory duties of the Kansas Water Authority. Paragraph 11 of subsection (d) states that the "Kansas water authority shall approve, prior to adoption by the director of the Kansas water office, guidelines for conservation plans and practices developed pursuant to subsection (c) of K.S.A. 74-2608, and amendments thereto."

K.S.A. 82a-733, passed by the 1991 Kansas Legislature, focuses on water conservation plans and practices. Contained within Subsection (a) of K.S.A. 82a-733 is the statement that: "The chief engineer may require an applicant for a permit to appropriate water for beneficial use or the owner of a water right or permit to appropriate water for beneficial use to adopt and implement water conservation plans and practices."

Also within subsection (a) of K.S.A. 82a-733 is the following statement: "In selecting the application, water rights or permits for which conservation plans and practices are required to be adopted and implemented, the chief engineer shall give priority to: (1) Water users that share a common source of supply that could be insufficient during times of drought; (2) water users whose use is significantly higher than their peers from the same geographical area with comparable circumstances; and (3) water users who apply for any state administered grant, loan or cost-share moneys for water-related projects."



Contained within Subsection (c) of K.S.A. 82a-733 is the statement: “Plans and practices required pursuant to this section shall be consistent with the guidelines for conservation plans and practices developed and maintained by the Kansas water office pursuant to subsection (c) of K.S.A. 74-2608 and amendments thereto.” Subsection (c) of K.S.A. 82a-733 also contains the statement that: “The Kansas water office shall provide, or arrange to provide, technical assistance for water users required to adopt and implement conservation plans and practices pursuant to this section.”

Subsection (d) of K.S.A 82a-733 states: “Before any state agency makes any loan or grant, or provides any cost-share funds, for any water-related projects to any person or entity, the state agency may require the person or entity to submit to, and have approved by, the chief engineer a water conservation plan consistent with the guidelines for conservation plans and practices developed and maintained by the Kansas water office pursuant to subsection (c) of K.S.A. 74-2608 and amendments thereto.”

Subsection (f) of K.S.A 82a-733 states: “The chief engineer may approve the conservation plans and practices required pursuant to the provisions of this section on such terms, conditions and limitations as deemed necessary to carry out the provisions of this section. The implementation of the conservation plan and practices as approved or any subsequent approved modification shall constitute a condition of the water right or permit to appropriate water for beneficial use.”

Subsection (g) of K.S.A 82a-733 states: “Any conservation plans and practices required pursuant to this section with regard to any groundwater right or permit to appropriate groundwater from within the boundaries of a groundwater management district shall be subject to approval by both the chief engineer and the board of directors of the groundwater management district unless such plans and practices are incorporated in the groundwater management district's management program which has been approved by the chief engineer pursuant to K.S.A. 82a-1029 and amendments thereto.”

Subsection (h) of K.S.A 82a-733 states: “The chief engineer may delegate authority to implement and enforce any of the provisions of this section to a groundwater management district on such terms as may be appropriate and necessary to carry out the provisions of this section within the boundaries of such district.”

Subsection (i) of K.S.A 82a-733 states: “The chief engineer may delegate to any city which has conservation plans meeting state guidelines the authority to require domestic water users within such city to adopt and implement conservation plans and practices so that such city can require compliance from private domestic well owners within the city limits.”

K.S.A. 82a-1311a authorizes the Kansas Water Authority to require an applicant for a contract for the sale of water from the State's conservation water supply capacity to adopt and implement water conservation plans and practices that are consistent with the guidelines.



K.S.A. 82a-1348 states that: “Each member of a water assurance district shall adopt conservation plans and practices for such member. Such plans and practices shall be consistent with the guidelines for conservation plans and practices developed and maintained by the Kansas water office pursuant to K.S.A. 74-2608, and amendments thereto.”

K.S.A. 82a-1502, which is part of the Water Transfers Act, was amended by the 1993 Legislature. Subsection (b) of K.S.A. 82a-1502 contains the statement: “No water transfer shall be approved under the provision of this act: (1) if such transfer would impair water reservation rights, vested rights, appropriation rights or prior applications for permits to appropriate water; and (2) unless the hearing officer determines that the applicant has adopted and implemented conservation plans and practices that (A) are consistent with the guidelines developed and maintained by the Kansas water office pursuant to K.S.A. 74-2608 and amendments thereto, (B) have been in effect for not less than 12 consecutive months immediately prior to the filing of the application on which the hearing is being held.”

Subsection (c) of K.S.A. 82a-1502 contains the statement: “To determine whether the benefits to the state for approving the transfer outweigh the benefits to the state for not approving the transfer, the hearing officer shall consider all matter pertaining thereto, including specifically:... (7) the effectiveness of conservation plans and practices adopted and implemented by the applicant and any other entities to be supplied water by the applicant; (8) the conservation plans and practices adopted and implemented by any persons protesting or potentially affected by the proposed transfer, which plans and practices shall be consistent with the guidelines for conservation plans and practices developed and maintained by the Kansas water office pursuant to K.S.A 74-2608 and amendments thereto.”

K.S.A. 82a-1608 relates to the Multipurpose Small Lakes Program and includes the statement: “If public water supply storage is included in such a project, the sponsor shall have a water conservation plan which has been submitted to and approved by the chief engineer.”

K.S.A. 65-163g, passed by the Legislature in 1994, addresses the Kansas Department of Health and Environment public water supply loan program priority list considerations. Subsection (b) states that “the secretary shall: (1) Exclude from the priority list any project of a municipality which has not adopted and implemented conservation plans and practices that are consistent with the guidelines developed and maintained by the Kansas water office pursuant to K.S.A. 74-2608 and amendments thereto.”



MUNICIPAL WATER CONSERVATION PLAN FOR THE CITY OF HOMETOWN



Municipal Water Conservation Plan For the City of Hometown

TABLE OF CONTENTS

INTRODUCTION

LONG TERM WATER USE EFFICIENCY

Water Use Conservation Goals.....

Water Conservation Practices.....

 Education

 Management

 Regulation

DROUGHT RESPONSE.....

 Stage 1: Water Watch

 Stage 2: Water Warning.....

 Stage 3: Water Emergency

PLAN REVISION, MONITORING AND EVALUATION.....



INTRODUCTION

The primary objectives of the Water Conservation Plan for the City of Hometown are to develop long-term water conservation plans (Long-Term Water Use Efficiency Section) and short-term water emergency plans (Drought Response Section) to assure the City customers of an adequate water supply to meet their needs. The efficient use of water also has the beneficial effect of limiting or postponing water distribution system expansion and thus limiting or postponing the resultant increases in costs, in addition to conserving the limited water resources of the State of Kansas.

The City of Hometown has undertaken a number of steps to ensure a dependable water supply for our customers during the past 25 years. The water supply for our City is obtained from wells. These wells were drilled in 1929 and take water from the Ogallala Aquifer. Both wells were completely rebuilt in 2000 and 2001, including new casings and pumps. Treated water storage facilities consist of one 500,000 gallon underground reservoir and one 500,000 gallon elevated tank. Our City water supply and distribution system have ample capacity to meet current customer demands and future projected demands for several years, except during drought periods. The City of Hometown believes that our Municipal Water Conservation Plan represents an additional major step in ensuring our customers of a dependable water supply in future years.

LONG-TERM WATER USE EFFICIENCY

Water Use Conservation Goals

The City of Hometown used 137 gallons per person per day (GPCD) in 2005. This GPCD figure included:

1. water sold to residential/commercial customers;
2. water distributed for free public services (parks, cemeteries, swimming pools etc.); and
3. water lost by leaks in the water distribution system.

However, the GPCD figure does not include municipally supplied water for industries that use over 200,000 gallons per year. According to Figure 1, shown in the 2005 Kansas Municipalities Water Use Publication, our City is located in Region 7. From this publication it was determined that our City GPCD water use was 137, which was 30 percent above the region average of 105 GPCD among cities in Region 7 during 2005. The City desires to set a water use conservation goal for usage not to exceed 107 GPCD based on the regional average of the last five years (2001 thru 2005). Our City anticipates not exceeding this goal by carrying out the specific actions that are outlined in our plan.

Water Conservation Practices

This subsection of the plan summarizes the current education, management and regulation efforts that relate to the long-term conservation of water in the City. Specific practices that will be undertaken to conserve water are listed and a target date to begin each practice is also shown.



Education

The City water bills show the total number of gallons of water used during the billing period and the amount of the bill. Water conservation tips are not normally provided with the water bills. The City has not provided information on water conservation to the local news media on a regular basis and has not encouraged the Board of Education and teachers to become involved in water conservation presentations in schools.

The City has chosen the following conservation practices and target dates for the Education Component of the Long-Term Water Use Efficiency Section of our Water Conservation Plan.

Education Conservation Practices to be Taken	Target Date
1. Water bills will show the amount of water used in gallons and the cost of the water.	Implemented
2. Water conservation tips will be provided with the semi-annual City news letter.	August 2007
3. Make available information of water conserving landscape practices through publications, local news media, seminars or other appropriate means.	June 2008

Management

The City of Hometown has water meters on all water supplies and water pumped to the distribution system. Any new supply will have an individual meter on each source of supply. These meters are read twice each week.

All residential/commercial customers have water meters installed. Customer meters are scheduled for an accuracy check and possible repair or replacement at least once every ten years.

The City of Hometown reads each customer's water meter and mails a monthly water bill to each customer every month. Customer water meters are generally read approximately the 4th week of the month; however, the meter reader sometimes deviates from the scheduled time period.

Water leaks from the City public water distribution systems are repaired when customers report significant leaks from the water mains or are located by City Personnel. Water pressure is not checked unless customers complain that their water pressure is too low.

The water rate structure for the City was passed on June 1, 2006. The minimum monthly water bill is \$12.00 for residential customers, which allows each customer to use up to 2,000 gallons of water each month. Water use in excess of 2,000 gallons is charged \$1.50 per 1,000 gallons. The sewer rate for all customers is \$9.50 for the first 1,000 gallons and \$1.80 per 1,000 gallons thereafter.



The City of Hometown realizes that much greater emphasis must be placed on obtaining accurate measurement of water use at our source and at customer meters and that a water use records system must be developed that can be used to more effectively and efficiently manage the City public water distribution system. For that reason, the City of Hometown has chosen the following conservation practices and target dates for the Management component of the Long-Term Water Use Efficiency Section of our Water Conservation Plan.

Management Conservation Practices to be Taken	Target Date
1. All source water will have meters installed and the meters will be repaired or replaced within two weeks when malfunctions occur.	Implemented
2. Meters for source water will be tested for accuracy at least once every three years. Each meter will be repaired or replaced if its test measurements are not within industry standards (such as AWWA standards).	Implemented
3. Meters will be installed at all residential service connections and at all other service connections whose annual water use may exceed 300,000 gallons, including separate meters for municipally operated irrigation systems which irrigate more than one acre of turf.	Implemented
4. Meters at each individual service connection will be replaced or tested for accuracy on a regular basis, per industry standards (such as AWWA standards), if they are one inch or less. Meters between one inch and six inches will be tested for accuracy at least once every five years and meters six inches and above will be tested on at least an annual basis. Each meter will be repaired or replaced if its test measurements are not within industry standards (such as AWWA standards).	May 2008
5. All meters for source water will be read at least on a monthly basis and meters at individual service connections will be read at least once every two months.	Implemented
6. A water utility will implement a water management review, which will result in a specified change in water management practices or implementation of a leak detection and repair program or plan, whenever the amount of unsold water (amount of water provided free for public service, used for treatment purposes, water loss, etc.) exceeds 20 percent of the total source water for a four month time period.	August 2007
7. Water sales will be based on the amount of water used.	Implemented
8. A water rate structure designed to curb excessive use of water will be evaluated.	August 2007
9. Develop and implement a program to incorporate water conserving landscape principles into future landscape development projects, including renovation of existing landscapes.	May 2008



Regulation

The City of Hometown does not have any water conservation regulations in effect at the present time. Because of our ability to supply water during normal periods, regulatory controls on water use are included only in the Drought Response section of this plan and water drought/emergency ordinance where they constitute the primary means for conserving water during a supply shortage.

Hometown does have a plumbing code, but has not felt the need to incorporate mandatory use of water conservation units in the plumbing code. The enforcement of any regulations to require use of any water conservation plumbing measures would be very difficult. Most new homes and/or remodeling projects do include the use of water conservation toilets and faucets.



DROUGHT RESPONSE

The City of Hometown addresses its short-term water shortage problems through a series of stages based on conditions of supply and demand with accompanying triggers, goals and actions. Each stage is more stringent in water use than the previous stage since water supply conditions are more deteriorated. The City Manager is authorized by ordinance to implement the appropriate conservation measures.

Stage 1: Water Watch

Goals

The goals of this stage are to heighten awareness of the public on water conditions and to maintain the integrity of the water supply system.

Triggers

This stage is triggered by any one of the following conditions:

1. The City storage has fallen below 85 percent capacity and will not recover.
2. Groundwater levels have fallen five feet below the normal seasonal level.
3. Demand for one day is in excess of 1.0 million gallons per day (mgd).

Education Actions

1. The City will make occasional news releases to the local media describing present conditions and indicating the water supply outlook for the upcoming season.
2. Previous months summaries of precipitation, temperature, water levels and storage will be made public at the beginning of each month.

Management Actions

1. The City wells will be cleaned and flushed to maintain them at their most efficient condition.
2. Leaks will be repaired within 48 hours of detection.
3. The City will monitor its use of water and will curtail activities such as hydrant flushing and street cleaning.

Regulation Actions

The public will be asked to curtail some outdoor water use and to make efficient use of indoor water, i.e. wash full loads, take short showers, don't let faucets run, etc.



Stage 2: Water Warning

Goals

The goals of this stage are to reduce peak demands by 20% and to reduce overall weekly consumption by 10%.

Triggers

This stage is triggered by any one of the following conditions:

1. The City storage has fallen below 70 percent capacity and will not recover.
2. Groundwater levels have fallen ten feet below the normal seasonal level.
3. Pumping lowers water levels to within ten feet of the top of the well screens.
4. Demand for one day is in excess of 1.25 million gallons per day (mgd).

Education Actions

1. The City will make weekly news releases to the local media describing present conditions and indicating the water supply outlook for the upcoming week.
2. Previous week summaries of precipitation, temperature, water levels and storage will be made public each week.
3. Water conservation articles will be provided to the local newspaper.

Management Actions

1. The City water supplies will be monitored daily.
2. Leaks will be repaired within 24 hours of detection.
3. Pumpage at well will be reduced to decrease drawdown and to maintain water levels over well screens.
4. The City will curtail its water usage, including operation of fountains, watering of City grounds and washing of vehicles.

Regulation Actions

1. An odd/even lawn watering system will be imposed on City residents. Residents with odd-numbered addresses will water on odd days; even addresses will water on even days.
2. Outdoor water use, including lawn watering and car washing will be restricted to before 10:00 am and after 9:00 pm.
3. Golf courses will restrict watering to tees and greens after sunset.
4. Refilling of swimming pools will be allowed one day a week after sunset.
5. Excess water use charges for usage of water over the amount used in the winter will be considered.
6. Waste of water will be prohibited.



Stage 3: Water Emergency

Goals

The goals of this stage are to reduce peak demands by 50% and to reduce overall weekly consumption by 25%.

Triggers:

This stage is triggered by any one of the following conditions:

1. The City storage has fallen below 50 percent capacity.
2. Groundwater levels have fallen fifteen feet below the normal seasonal level.
3. Pumping lowers water levels to within five feet of the top of the well screens.
4. Demand for three consecutive days is in excess of 1.5 million gallons per day (mgd).
5. Emergency conditions related to repairs or water quality.

Education Actions

1. The City will make daily news releases to the local media describing present conditions and indicating the water supply outlook for the next day.
2. Previous days summaries of precipitation, temperature, water levels and storage will be made public each day.
3. The City will hold public meetings to discuss the emergency, the status of the City water supply and further actions, which need to be taken.

Management Actions

1. The City water supplies will be monitored daily.
2. Leaks will be repaired within 24 hours of detection.
3. Pumpage at wells will be reduced to decrease drawdown and to maintain water levels over well screens.
4. The City will seek additional emergency supplies from other users, the state or the federal government.

Regulation Actions

1. Outdoor water use will be banned.
2. Waste of water will be prohibited.



PLAN REVISION, MONITORING & EVALUATION

The City of Hometown will establish a monthly management practice of reviewing monthly totals for water production, residential/commercial sales, water provided free-of-charge, and “unaccounted for water”. Problems noted during the monthly review will be solved as soon as possible.

The City of Hometown Municipal Water Conservation Plan will be reviewed during the month of April each year and on a more frequent basis during drought or other water shortage conditions. If the water conservation GPCD goals for the previous year are not met, then the City will review the data collected from the previous year in relationship to the status and effectiveness of the conservation practices that are outlined in our plan and will provide a status report to the Division of Water Resources which will also include any additional water conservation practices that may need to be taken in order for the city to achieve and maintain its water use conservation GPCD goals.



WATER DROUGHT/EMERGENCY ORDINANCE

Ordinance No. 2007-1

An ordinance authorizing the declaration of one of three progressive stages of a water supply conservation and / or water supply shortage which shall conserve or curtail the use of water within the City of Hometown ("the City"); establishing three stages of water conservation measures for the City; a water watch, warning or emergency; establishing procedures and voluntary and mandatory conservation measures; authorizing the issuance of administrative regulations; and prescribing certain penalties.

Be it Ordained by the Governing Body of the City of Hometown.

Section 1. Purpose. The purpose of this ordinance is to provide for a progressive water supply conservation program, including the declaration of a water supply watch, warning or emergency and the implementation of voluntary and mandatory water conservation measures throughout the city in the event such a watch, warning or emergency is declared by the governing body of the City.

Section 2. Definitions.

- (a) "Water", as used in this ordinance, shall mean water available to the City of Hometown for treatment by virtue of the City's water rights, water supply, water supply contracts or any treated water introduced by the City into its water distribution system, including water offered for sale at any coin-operated site.
- (b) "Customer", as used in this ordinance, shall mean the customer of record using water for any purpose from the City's water distribution system and for which either a regular charge is made or, in the case of coin sales, a cash charge is made at the site of delivery.
- (c) "Waste of water", as used in this ordinance, includes, but is not limited to:
 - (1) permitting water to escape down a, street, roadway or other surface intended for vehicle driving purposes, and / or any gutter, ditch, or other surface drain; or
 - (2) failure to repair a controllable leak of water due to defective plumbing.
- (d) The following classes of uses of water are established for the purposes of this ordinance:

Class 1:

Water used for outdoor watering; either public or private, for gardens, lawns, trees, shrubs, plants, parks, golf courses, playing fields, swimming pools or other recreational areas; or the washing of motor vehicles, boats, trailers, or the exterior of any building or structure.

Class 2:

Water used for any commercial, agricultural or industrial purposes, except water actually necessary to maintain the health and personal hygiene of bona fide employees of such businesses or interests while such employees are engaged in the performance of their duties at their place of employment.

**Class 3:**

Domestic usage, other than that which would be included in either classes 1 or 2.

Class 4:

Water necessary only to sustain human life and the lives of domestic livestock pets and maintain standards of hygiene and sanitation.

Section 3. In the event that the governing body of the City or the City's designated official determines that the City's water supply may be in subject to a shortage in supply or the governing body of the City determines there is need for conservation of City's water resources for any reason, the City may begin the progressive three (3) stage water conservation program by declaring a water watch as described in section 3(a) or, in times of need and / or duress, the governing body of the City may choose to declare any section of the program described in section 3 in effect at any time:

(a) Stage 1: Declaration of Water Watch. Whenever the governing body of the City finds that conditions indicate that the probability of a drought or some other condition causing a major water supply shortage is rising, it shall be empowered to declare, by resolution, that a water watch exists and that it shall take steps to inform the public and ask for voluntary reductions in water use. Such a watch shall be deemed to continue until it is declared by resolution of the governing body to have ended. The resolutions declaring the existence and end of a water watch shall be effective upon their publication in the official city newspaper.

(b). Stage 2: Declaration of Water Warning. Whenever the governing body of the City finds that drought conditions or some other condition causing a major water supply shortage are present and supplies are starting to decline, it shall be empowered to declare by resolution that a water warning exists and that it will recommend restrictions on nonessential uses during the period of warning. Such a warning shall be deemed to continue until it is declared by resolution of the governing body to have ended. The resolutions declaring the beginning and ending of the water warning shall be effective upon their publication in the official city newspaper.

(c). Stage 3: Declaration of Water Emergency. Whenever the governing body of the City finds that an emergency exists by reason of a shortage of water supply needed for essential uses, it shall be empowered to declare by resolution that a water supply emergency exists and that it will impose mandatory restrictions on water use during the period of the emergency. Such an emergency shall be deemed to continue until it is declared by resolution of the governing body to have ended. The resolutions declaring the existence and end of a water supply emergency shall be effective upon their publication in the official city newspaper.

Section 4. Voluntary Conservation Measures. Upon the declaration of a water watch or water warning as provided in Sections 3(a) or 3(b), the mayor (or the city manager) is authorized to call on all water consumers to employ voluntary water conservation measures to limit or eliminate nonessential water uses including, but not limited to, limitations on the following uses:

- (a) Class 1 uses of water.
- (b) Waste of water.

Section 5. Mandatory Conservation Measures. Upon the declaration of a water supply emergency as provided in Section 3(c), the mayor (or the city manager or authorized city official) is also authorized to implement certain mandatory water conservation measures, including, but not limited to, the following conservation measures:



- (a) Suspension of new connections to the City's water distribution system, except connections of fire hydrants and those made pursuant to agreements entered into by the City prior to the effective date of the declaration of the emergency;
- (b) Restrictions on the uses of water in one or more classes of water use as described in section 2(d), wholly or in part;
- (c) Restrictions on the sales of water at coin-operated facilities or sites;
- (d) The imposition of water rationing based on any reasonable formula including, but not limited to, the percentage of normal use and per capita or per consumer restrictions;
- (e) Complete or partial bans on the waste of water; and
- (f) Any combination of the measures in sections 5(a-e) as the governing body of the City or authorized city official may deem appropriate and / or necessary.

Section 6. Emergency Water Rates. Upon the declaration of a water supply emergency as provided in Section 3(c), the governing body of the City shall have the power to adopt emergency water rates by ordinance designed to conserve water supplies. Such emergency rates may provide for, but are not limited to:

- (a) Higher charges for increasing usage per unit of use (increasing block rates);
- (b) Uniform charges for water usage per unit of use (uniform unit rate); or
- (c) Extra charges in excess of a specified level of water use (excess demand surcharge).

Section 7. Regulations. During the effective period of any water supply emergency as provided for in Section 3(c), the mayor (or city manager or water superintendent or other authorized city official) is empowered to promulgate such regulations as may be necessary to carry out the provisions of this ordinance, any water supply emergency resolution, or emergency water rate ordinance. Such regulations shall be subject to the approval of the governing body at its next regular or special meeting.

Section 8. Violations, Disconnections and Penalties.

- (a) If the mayor, city manager, water superintendent, or other authorized city official or officials charged with implementation and enforcement of this ordinance or a water supply emergency resolution learn of any violation of any water use restrictions imposed pursuant to Sections 4 or 6 of this ordinance, a written notice of the violation shall be affixed to the property where the violation occurred and the customer of record and/ or any other person known to the City to be responsible for the violation and / or the correction of said violation shall be provided with either actual or mailed notice. Said notice shall describe the violation(s) and order that the noted violation(s) be corrected, cured or abated immediately or within such specified time as the City determines is reasonable for such correction, cure or abatement under the circumstances. In the event the order is not cured within the time period given in the notice, the City may terminate water service to the customer subject to the following procedures:
 - (1) The City shall give the customer notice by mail or actual notice that water service will be discontinued within a specified time due to the violation(s) and that the customer will have the opportunity to appeal the termination by requesting a hearing scheduled before the City governing body or a city official designated as a hearing officer by the City governing body;
 - (2) If such a hearing is requested by the customer charged with the violation, the customer shall be given a full opportunity to be heard by the City governing body or the city official designated as a hearing officer by the City governing body before termination is ordered; and



- (3) The City governing body or the city official designated as a hearing officer by the City governing body shall make findings of fact and order whether service should continue or be terminated.
- (b) A fee of fifty dollars (\$50.00) shall be paid for the reconnection of any water service terminated pursuant to subsection (a). In the event of subsequent violations, the reconnection fee shall be two-hundred dollars (\$200) for the second reconnection and three hundred dollars (\$300) for any subsequent additional reconnections within a one year period.
- (c) Violations of this ordinance shall be a municipal offense and may be prosecuted in Municipal Court. Any person so charged and found guilty in Municipal court of violating the provisions of this ordinance shall be guilty of a municipal offense. Each calendar day in which a violation is observed shall constitute a separate offense. The penalty for an initial violation shall be a mandatory fine of one hundred dollars (\$100). In addition, such customer may be required by the Court to serve a definite term of confinement in the city or county jail which shall be fixed by the Court and which shall not exceed 30 days. The penalty for a second or subsequent conviction shall be a mandatory fine of two hundred dollars (\$200). In addition, such customer shall serve a definite term of confinement in the city or county jail which shall be fixed by the Court and which shall not exceed 30 days.

Section 9. Emergency Termination. Nothing in this ordinance shall limit the ability of any properly authorized city official from terminating the supply of water to any or all customers upon the determination of such city official that emergency termination of water service is required to protect the health and safety of the public or for any other emergency as required or authorized by ordinance or as deemed necessity of the City by such city official or the governing body of the City.

Section 10. Severability. If any provision of this ordinance is declared unconstitutional, or the application thereof to any person or circumstance is held invalid, the constitutionality of the remainder of the ordinance and its applicability to other persons and circumstances shall not be affected thereby.

Section 11. This ordinance shall become effective upon its publication in the official city newspaper.

Passed by the governing body this 1st day of July, 2007.

(Mayor's Signature)

ATTEST:

(City Clerk's Signature)



DISCUSSION OF WATER USE EFFICIENCY PRACTICES

The following is a discussion of the water use efficiency practices listed in Table 2 for the education, management and regulation components of the Long-Term Water Use Efficiency Section of the Municipal Water Conservation plan.

A. Education Practices

1. Water Bills Showing Amount of Water Used in Gallons: It is often difficult for a consumer to interpret the price of water when water rate information is not readily available at the time of bill payment or when it is presented in units, such as cubic feet, that may have little meaning to the average consumer. Providing monthly or bi-monthly information on the amount of water used in gallons and its cost provides valuable and usable information to the consumer.

2. Water Bills Showing Change from Corresponding Billing Period Last Year: It is useful and educational for consumers to be able to compare their current water bill with the previous bill and find out how successful their conservation efforts have been. However, water use often changes from month to month as a result of a change in the seasons even in the absence of any special conservation efforts. For this reason, it is useful for consumers to be able to compare their current water use to their water use in the same billing period of the previous year to determine the result of any change in their water use practices.

3. Water Conservation Tips During Summer Months: Water use in the summer is significantly higher than the winter due to outdoor water uses such as watering of lawns and gardens; filling of swimming pools; and irrigation of golf courses, ball parks, etc. This is especially true in western Kansas, due to much less summer precipitation and significantly lower water rates. Water conservation efforts, particularly in the area of education, are most effective during the summer months. Provision of water conservation tips during these months could, therefore, be a very economical and effective step towards promotion of water conservation.

4. Water Conservation Articles in the News Media During Summer Months: The news media can be very helpful in educating the public on water conservation measures. By printing or broadcasting interesting articles and news stories, the media can very effectively draw public attention to this important issue.

5. Promoting Conservation Through Educational Institutions: Promotion of water conservation ethics at an early age can help in forming life long conservation habits in children. Through interesting classroom lectures and incentives, the children may be motivated to conduct home checks for wasteful water use and, to some extent, even educate their parents.

6. Information on Water Conserving Landscape Practices: There is a wide variety of information available from public and private sources on landscape practices and principles that help conserve water. Examples of water conserving practices include proper planning and design; efficient watering techniques; mulching; and use of low water demand plants. Information of this type can be disseminated to the general public and the landscape industry through various means including distribution of publications; newspaper articles; radio and television programs; and seminars. Cooperative programs with local nurseries or professional organizations should be encouraged. Following is a list of some sources for information on water conserving landscape practices.



Sources for Water Conserving Landscape Practices		
Kansas State University Research and Extension Kansas State University Manhattan, Kansas 66506 http://www.oznet.k-state.edu/	Botanica: The Wichita Gardens 701 Amidon Wichita, Kansas 67203-3199 http://www.botanica.org/	Grow Native! Missouri Departments of Conservation and Agriculture Joint Program http://www.grownative.org/
County Extension Offices http://www.oznet.ksu.edu/main/maps.asp	Mid-America Regional Council 600 Broadway Ste 300 Kansas City MO 64105 http://www.marc.org/Environment/	Green Landscaping U.S. Environmental Protection Agency http://www.epa.gov/ecopage/landscape/

7. Provide Information for Summer Lawn Watering: In most communities, a substantial amount of water is wasted due to over watering or unnecessary watering of lawns. Determining the proper amount of water to apply to a lawn involves taking into account the evapotranspiration rate, precipitation and the type of turf. Evapotranspiration (ET) is the amount of water lost from a site due to evaporation and water transpired from plant materials. This information can be provided on a daily or weekly basis to commercial and residential water users through the newspaper, radio, television news reports, telephone hotline and other means. The information should include specific instructions to residents on how to use the information in watering their lawns.

Accurate accounting of water use for landscape purposes can provide useful information for monitoring and managing water use. Incentive programs to encourage separate metering of landscape water use could also be developed.

B. Management Practices

1. Installation of Meters for Source Water: All water utilities and other municipal water entities should have meters for their source water (wells, surface intakes, or points of entry for purchased, treated water). Without meters it is difficult to accurately determine the quantity of water withdrawn during any period. Also, in many cases, water meters or hour meters stop working and are not fixed for months or years. Without accurate data on water withdrawn, it is not possible to measure the effects of water conservation practices. The Division of Water Resources requires accurate measurement and subsequent reporting of water withdrawn from any point of diversion; inaccurate reporting is subject to prosecution as a Class C misdemeanor. It is in the interest of all water utilities and other municipal water entities to install water meters for all source water and to ensure that they are operating properly throughout the year.

2. Regular Testing of Meters for Source Water: Water meters tend to wear out with age and often begin to under register the amount of water that passes through the meter. The Division of Water Resources requires that water meters be maintained in an operating condition satisfactory to the chief engineer whenever water is being diverted. Inaccurate readings, produced by malfunctioning meters, provide misleading information regarding the effects of water conservation efforts and make it more difficult to determine when leaks occur. Inaccurate meters or other maintenance problems that cause under reporting of source water pumpage should be suspected and investigated whenever a water utility finds that one or more monthly values of unsold water are negative.



The monthly values for unsold water by water utilities are determined by adding the amount of water pumped or purchased and subtracting the amount of water sold. Other municipal water users may suspect the possibility of inaccurate meters whenever their monthly amount of water pumped deviates significantly from previous figures, for no apparent reason.

The American Water Works Association (AWWA) Standards (series C700-C750) address meter accuracy requirements and testing frequency. In addition, the AWWA recommends that all meters be tested in accordance with AWWA Manual M6: Water Meters—Selection, Installation, Testing and Maintenance.

3. Installation of Meters at all Service Connections: Some water utilities in Kansas do not meter water that is provided free of charge for public use such as: swimming pools, city buildings, parks, etc. If the water use is not metered it is impossible to determine how much of the unsold water is being provided free and how much is lost due to system leaks. In addition to determining how much water is actually lost each month, metering free water allows a water utility to spot leaks based on sudden increases in water use at a specific location and to better manage irrigation practices at city parks.

4. Regular Testing of Meters at Individual Service Connections: It is important to replace and/or test and repair meters at individual service connections on a regular basis to ensure that widespread meter malfunctions do not result in a serious loss of revenue to the city. Also, accurate information on water use is essential to consumers to enable them to evaluate the effects of their own water conservation efforts.

Domestic meters are the principal revenue registers for most water utilities. In spite of this fact, domestic meters are often the most neglected part of the water system. A domestic meter can run for many years before it stops completely; for much of its operating life it under registers, losing revenue for the water utility. As soon as any meter is installed and begins to operate, its internal parts begin to wear, causing under registration at low flow. The longer the wearing process continues, the greater the degree of under registration occurs, with the rate of wear depending on the properties of the water.

A study published by W.D. Hudson (1980) in *Water Conservation Strategies*, American Water Works Association, indicates that 20 percent of all meters that have been in service an average of 14 years are unable to register flows of 0.75 gallons per minute (gpm) and 50 percent of meters that have been in service an average of 24 years are unable to register flows of 1.25 gpm. Hudson concludes that, ideally, domestic meters should not be left in service more than eight to 10 years and that the service period is shorter if the water is relatively corrosive or if it contains sand and grit.

Under registering water flow amounts to giving away water and if sewer charges are based on metered water consumption, the water utility loses even more revenue.

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5. Reading of Meters on a Monthly Basis: The gallons per capita per day (GPCD) water use for any water utility will vary from season to season and month to month. For most western Kansas cities the GPCD water use during the summer months is three times that of winter months. Summer GPCD use in eastern Kansas is also significantly higher than winter GPCD use, but not to the extent found in western Kansas. For that reason it is especially important to read customer meters during each of the summer months, as a means of keeping the customer informed about current water use. Reading customers meters on a monthly or bi-monthly basis also eliminates the possibility of a customer receiving a very large water bill due to a leak in a customer's line going undetected for several months, as is currently the case of customers in many cities whose meters are not read during the winter months.

By reading source water meters on at least a monthly basis and by reading customer meters on at least a bi-monthly basis, a water utility's monthly or bi-monthly water use figures can provide very useful information to allow a water utility to make economically sound management decisions in regard to water use efficiency. For example, during the summer months, unusually large monthly or bi-monthly quantities of unsold water may indicate a large amount of unmetered water use by public facilities, such as swimming pools and golf courses; and/or significant leaks in the distribution system. On the other hand, an unusually large monthly or bi-monthly quantity of unsold water during winter months generally indicates water loss through leaks or pipe ruptures due to freezing.

6. Reading Source Water and Customer Meters: In order to have accurate monthly or bi-monthly data on unsold water, it is essential that readings of source water meters and customer meters be taken at the same relative time of the month. If this practice is not followed, then it is impossible to determine the amount of unsold water on a monthly or bi-monthly basis, due to differences in when the respective meters were read. Moreover, in order to compare the water use between consecutive months or two month periods and to evaluate the results of any conservation practices, it is essential that the meter readings are taken during the same week of each billing period so that the water use during two consecutive billing periods is compared for an equal or nearly equal number of days. This will also ensure a more uniform distribution of the water bills for the consumers.

7. Water Management Review: A significant amount of water may be wasted through leaks and pipe ruptures. In some cases, this loss may be more than 50 percent of the total water supplied during a month. This loss of water means that the water utility's cost of pumping, treating and distributing water may increase greatly and this cost is passed on to the consumers, without any additional benefit resulting from the increased cost.

If water lost through leaks and ruptures is not detected in time, it may compel a water utility to seek increases in water appropriation rights and to unnecessarily or prematurely build new water intake and treatment structures at high costs to meet the perceived increased demands of their customers. It also may damage roads, streets and other property, thereby creating a safety hazard and costly repairs. This kind of wastage of state and local water resources and resulting large increase in cost to consumers should not occur. Most large water utilities should have leak detection and repair programs. A leak detection and repair program for a small water utility does not require a lot of time to organize and implement and should be done on a regular basis.



Many cities supply free water for public services such as schools, swimming pools, cemeteries and many public buildings and grounds. In some cases, as much as 40 percent of the total water pumped may be provided for free public services. Frequently these supplies are not metered. In such cases, it becomes almost impossible for the cities to take any effective steps toward conservation of water supplies. The cities have no way of knowing whether unusually high water use is due to wasteful practices by consumers, excessive leaks, or due to excessive use of water provided for free public services, etc.

Metering of all individual service connections, including those provided for free use, allows the water utility to determine how much unaccounted for water use is for free service and how much is due to system leaks. A water audit can be designed to pinpoint where the water is being used and to implement changes that will result in minimizing excess free public water usage.

8. Flat Water Rates: Water use studies in Kansas and elsewhere have clearly established that whenever water utilities charge a flat rate to each customer, without regard to the quantity of water used, the per capita water use for those water utilities has usually been significantly higher than water utilities (of similar size and climate region) that charge their customers on the basis of the actual amount of water used. Also, it appears that the average monthly water bill for low income and elderly persons is significantly higher in cities that charge a flat rate to all customers, due to the fact that most low income and elderly persons use relatively small amounts of water per month.

9. Institution of Water Rate Structures to Curb Excessive Use of Water: The pricing mechanism has been recognized as a very effective tool for instituting a conservation ethic among water users of all categories. The rate structure, and not necessarily the actual amount charged, is the real key in reducing water use. For example, no matter how high a flat rate may be, there is no incentive for the water user to conserve any water. On the other hand, a water rate structure with a low minimum rate, which increases steeply with the increased use of water (i.e., increasing block rate) may be very effective in bringing down excessive water use. However, in order to attract industries and not place a heavy burden on commercial customers, many cities use a decreasing water rate, which charges a set amount for a certain minimum quantity and then the rate per 1,000 gallons decreases sharply. This kind of water structure, although very favorable to the large volume users, has practically no incentive for any water conservation. The uniform unit rate structure, which has the same charge per unit of water used, regardless of amount, although fair to all types of consumers, does not have many incentives for water conservation if the rate is too low to seriously affect the consumers' pocket books.

It is desirable that an increasing block rate structure or a uniform unit rate structure be used to deter excessive use of water. If a decreasing block rate is used, it may be possible to accomplish the same objective by using seasonal rates, which involve excess use surcharges. Surcharges are imposed for water use above a specified amount.

10. Water Conservation in Landscape Development Projects: A municipality often manages a variety of landscape areas including parks, building grounds and golf courses. A program can be developed to incorporate water conserving principles into the planning, development and management of new or renovated municipal landscapes. This can reduce municipal water use as well as provide an example for private business and homeowners.



Xeriscape is a method of landscaping that promotes water conservation. This concept utilizes seven basic landscape principles to achieve efficient water use. The seven steps to successful development of a xeriscape project are:

- a. Planning and design
- b. Limited turf areas
- c. Efficient irrigation
- d. Soil improvement
- e. Mulching
- f. Use of lower water demand plants
- g. Appropriate maintenance

11. Irrigation Management Program: Cities that operate irrigation systems for municipal grounds should have a regular management program in place that periodically reviews the operation and maintenance of irrigation systems. This should include training of system managers and operators regarding water use efficiency considerations. Proper irrigation scheduling on a regular basis is extremely important to insure that the right amount of water is being applied at the proper time and in an appropriate manner. Several factors should be considered when scheduling automatic sprinkler systems including site information, evapotranspiration rates, irrigation frequency and water requirements. A means of suspending the operation of automatic sprinkler systems during periods of natural rainfall should be implemented. Maintenance and system efficiency inspections should be performed on a regular basis.

12. Recycling of Wastewater: Studies by the California Department of Water Resources have shown that industries can reduce the costs of water intake and waste discharge by as much as 50 percent by in-plant water conservation efforts. Industrial water demand can often be reduced by increased reuse or multiple uses within the plant. This usually entails treatment of the plant effluent so that the water quality meets effluent requirements and can be returned as part of the intake. Recycling of municipal wastewater is being practiced by a number of cities in Kansas and throughout the nation. There are four potential uses for recycled municipal wastewaters: industrial, agricultural, groundwater recharge and direct reuse. The municipal benefits derived from recycling/reuse programs include a lessened overall demand for water which translates to potential postponement of treatment plant expansion. Meeting demands through recycling has been shown to be cheaper than developing new sources of supply.

C. Regulation Practices

1. Installation of Water Saving Fixtures in New or Renovated Construction: Many devices are available for reducing the amount of residential water use. For example, toilets that use only 1.6 gallons per flush or less instead of the usual five gallon ones can reduce water use by 17.5 GPCD. It should be noted that a federal mandate was passed in 1992 making it illegal to manufacture or sell toilets that use more than 1.6 gallons per flush. Similarly, installing low flow showerheads that use 2.5 gallons per minute or less in place of showerheads that use 5.0 gallons per minute can reduce water use by 8.0 GPCD. Low flow showerheads are inexpensive and a homeowner will recover its cost due to lower water bills and energy costs. Many homeowners may not want to incur the lump sum costs necessary to replace toilets in existing homes that use



5.0 gallons per flush and may not find time in their schedule to install low flow shower heads. However, most persons buying new or renovated homes would readily purchase homes with water saving fixtures installed. The installation of water-saving fixtures may be addressed by amending municipal plumbing codes.

2. Landscape Water Conservation Ordinance: Landscape ordinances can be used to achieve water conservation objectives. This can involve restricting the amount of irrigated turf installed in a new landscape, as well as other factors that affect landscape water use. Landscape plans for new construction should be reviewed and approved prior to installation. For example, the City of Aurora, Colorado, requires proper soil preparation prior to planting new lawns and also limits the amount of high water use turf that can be installed. A lawn permit is issued after proposed site plans have been approved by the city. Another item related to landscape watering is flagrant and continuous waste of water. Ordinances should be adopted which prohibit excessive waste of water and fines should be levied for frequent offenders.