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CHAPTER 6.0: WATER CONSERVATION AND DROUGHT MANAGEMENT PLANS

This chapter presents the minimum necessary requirements for conservation plans and drought contingency plans, as well as a summary of information provided by water systems in the Lower Colorado Regional Water Planning Area (LCRWPA) regarding water conservation and drought contingency measures that they currently implement.

Irrigation water usage represents 63 percent of the total water used in the LCRWPA in 2000 where irrigation of rice makes up a significant portion of total irrigation water demand. There is a potential for significant conservation savings in rice production, and conservation of water in rice irrigation may have one of the greatest impacts in reducing water usage in the LCRWPA. However, if the amount of water used in the cultivation of rice declines over time, as projected, and municipal and manufacturing demand continues to grow, as projected, the significance of planning for conservation savings in the municipal and manufacturing categories will become increasingly important. The following sections discuss which entities are required to have plans and what the plans, if required, must contain.

6.1 WATER CONSERVATION PLAN

Water conservation plans are required by the Texas Commission on Environmental Quality (TCEQ, formerly the TNRCC) and/or the Texas Water Development Board (TWDB) for the following water users:

- Applicants who apply for TWDB loans
- Applicants for new or amended surface water rights
- Any holder of an existing permit, certified filing, or certificate of adjudication if requested by TCEQ/TWDB for appropriation of a surface water right greater than 1,000 acre-feet per year (ac-ft/yr) for municipal, industrial, and other uses excluding irrigation. For irrigation uses, the threshold is 10,000 ac-ft/yr.
- Public water system suppliers that serve 3,300 connections or more.

Conservation plans developed for submittal with water right applications for appropriation of State water should discuss the evaluation of water conservation with respect to their application. This would include discussions of water conservation as an alternative to the potentially appropriated State water as well as the evaluation of any other conservation best management practices (BMP) as an alternative to the new water right.

Minimum conservation and drought management plan requirements for specific water use categories are discussed in the following subsections.

6.1.1 Municipal Uses by Public Water Suppliers¹

Water conservation plans for municipal water use by public water suppliers (i.e., documented Lower Colorado Regional Municipal Water User Groups) must include specific information. If the plans do not provide information for each requirement, the public water supplier shall include in the plans an explanation of why the requirement is not applicable. The required water conservation plan information for municipal uses by public drinking water suppliers is as follows:

- A utility profile including, but not limited to, information regarding population and customer data, water use data, water supply system data, and wastewater system data.
- Since May 1, 2005, specific, quantified 5-year and 10-year targets for water savings to include goals for water loss programs and goals for municipal use in gallons per capita per day. The goals established by a public water supplier under this subparagraph are not enforceable.
- Metering device(s) within an accuracy of plus or minus 5.0 percent in order to measure and account for the amount of water diverted from the source of supply.
- A program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement.
- Measures to determine and control unaccounted-for uses of water (for example: periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections, abandoned services, etc.).
- A program of continuing public education and information regarding water conservation.
- A water rate structure which is not “promotional,” i.e., a rate structure which is cost-based and which does not encourage the excessive use of water.
- A reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies.
- A means of implementation and enforcement which should be shown by either of the following:
 - A copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier, or
 - A description of the authority by which the water supplier will implement and enforce the conservation plan.
- Documentation of coordination with the Lower Colorado Regional Water Planning Group (LCRWPG) for the service area of the public water supplier to ensure consistency with the appropriate, approved Lower Colorado Regional Water Plan.

Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected population of 5,000 or more within the next 10 years subsequent to the effective date of the plan must also include the following information:

¹ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2.

- A program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system to control unaccounted-for uses of water.
- A record management system to record water pumped, water deliveries, water sales, and water losses that allows for the desegregation of water sales and uses into residential, commercial, public and institutional, and industrial users.
- A requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

If the conservation goals cannot be achieved through the minimum conservation plan requirements, the water supplier can implement water conservation strategies to help achieve their goals. TCEQ can also require the water supplier to implement a conservation BMP strategy to achieve the goals set in the conservation plan. Some of the water conservation BMPs are listed below, and a more detailed list can be found in the *Water Conservation Best Management Practices Guide, Report 362* of the Texas Water Development Board, November 2004.

- Conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates.
- Adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition.
- A program encouraging the replacement or retrofit of existing structures built prior to 1991 with water conserving plumbing fixtures.
- Reuse and/or recycling of wastewater and/or graywater.
- A program for pressure control and/or reduction in the distribution system and/or for customer connections.
- A program and/or ordinance(s) for landscape water management.
- A method for monitoring the effectiveness and efficiency of the water conservation plan.
- Any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

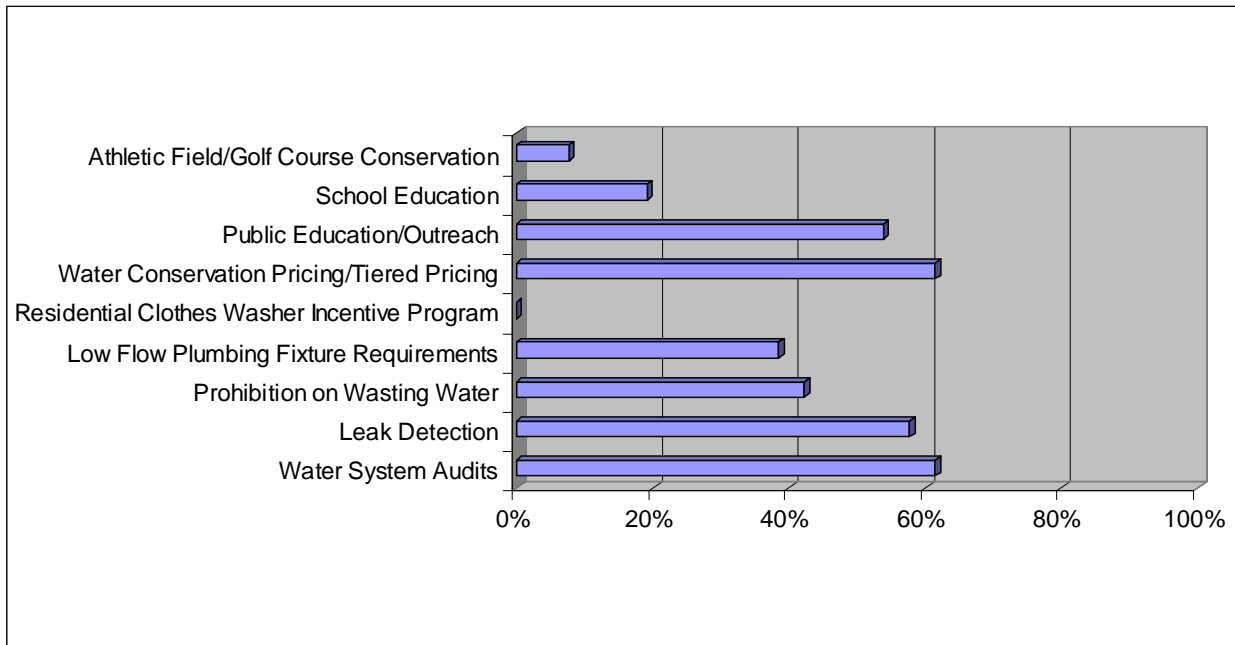
A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the TWDB, and substantially meeting the requirements of this section and other applicable commission rules, may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the TWDB.

Since May 1, 2005, a public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous 5-year and 10-year targets and any

other new or updated information. The public water supplier for municipal use should have reviewed and updated the next revision of its water conservation plan no later than May 1, 2009, and every 5 years after that date to coincide with the Lower Colorado Regional Water Planning Group’s regional water plan update.

Water conservation surveys were sent to all water systems within the Region K area. Of the small percentage of surveys completed and received (294 surveys mailed out, 32 completed surveys received), results indicate approximately 60% use water system audits and water conservation pricing/tiered pricing as one of their conservation measures. Other common measures include leak detection, public outreach and education, prohibition on wasting water and low flow plumbing fixture requirements. Survey results of water conservation measures currently being used by water systems in the Region K planning area are shown in *Figure 6.1*.

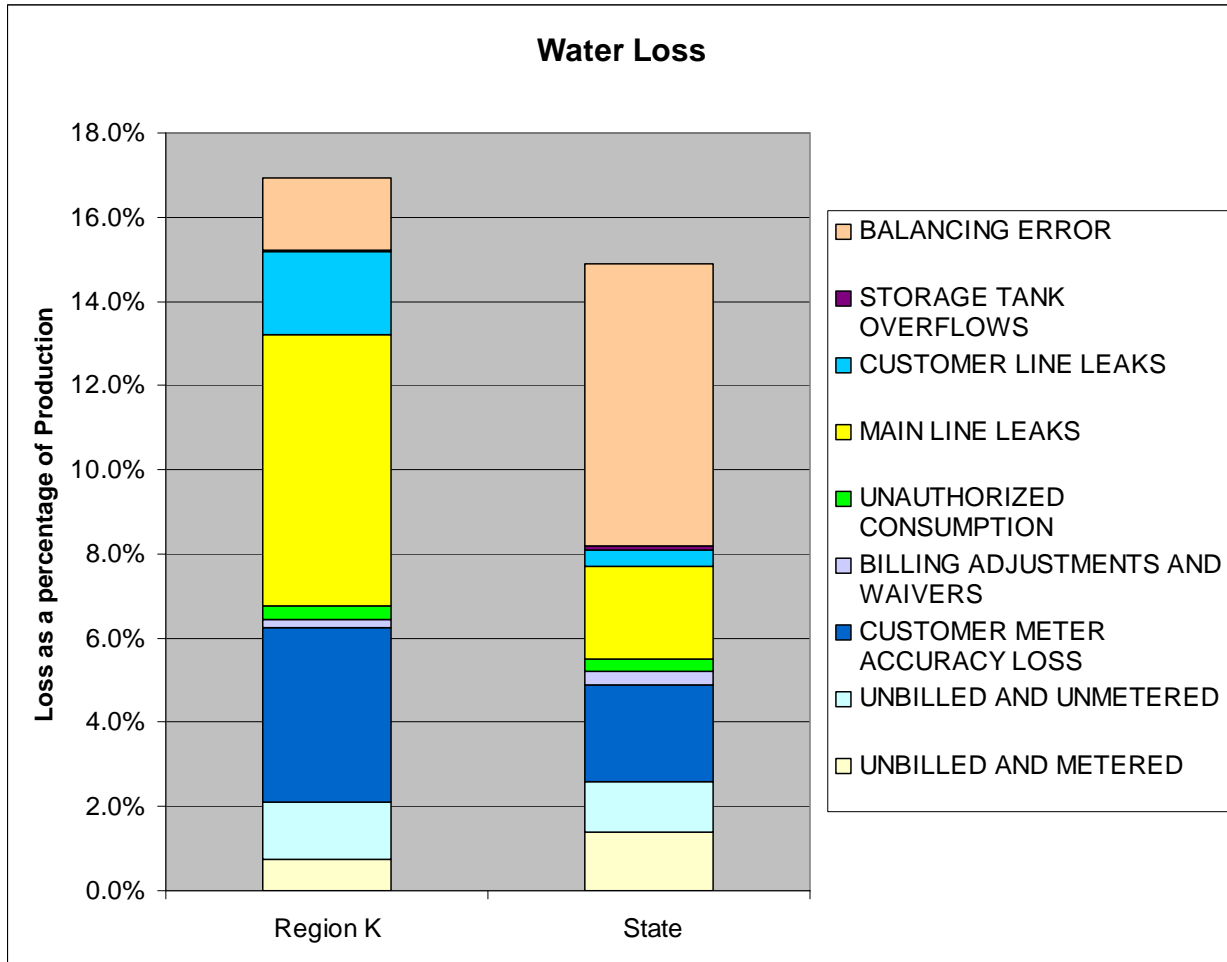
Figure 6.1: Existing Municipal Water Conservation Measures



Water system audits are one of the items shown in *Figure 6.1*. The 78th Texas Legislature passed House Bill 3338, which required retail public utilities that provide potable water to “perform and file with the [Texas Water Development Board] a water audit computing the utility’s most recent annual system water loss” every five years. Under this authority, the TWDB instituted new water audit reporting requirements that require retail public utilities to carefully audit their system water use at least once every five years; to estimate system water use in standard, well-defined categories; and to report their first set of water loss data to the TWDB by March 31, 2006. The results of this statewide data gathering was compiled into the “Analysis of Water Loss As Reported by Public Water Suppliers in Texas”, TWDB, January 24, 2007. A comparison between Region K and the state averages of the various water loss categories is presented below in *Figure 6.2*.

As is shown in *Figure 6.2*, main line leaks are approximately six percent of production for Region K, while averaging closer to two percent for the entire state. Fixing main line leaks is one way that water systems in the region could make a significant impact on water conservation.

Figure 6.2: Water Loss Comparison Between Region K and the State of Texas



6.1.2 Industrial or Mining²

Water conservation plans for industrial or mining uses of water must provide the information as outlined below. If the plan does not provide information for each requirement, the industrial or mining water user shall include in the plan an explanation of why the requirement is not applicable. Water conservation plans for industrial or mining uses of water should include, at a minimum, the following information.

² Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.3.

- A description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal.
- Since May 1, 2005, specific, quantified 5-year and 10-year targets for water savings and the basis for the development of such goals. The goals established by industrial or mining water users under this paragraph are not enforceable.
- A description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0 percent to be used in order to measure and account for the amount of water diverted from the source of supply.
- Leak-detection, repair, and accounting for water loss in the water distribution system.
- Application of state-of-the-art equipment and/or process modifications to improve water use efficiency.
- Any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

Since May 1, 2005, an industrial or mining water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous 5-year and 10-year targets and any other new or updated information. The industrial or mining water user should have reviewed and updated the next revision of its water conservation plan no later than May 1, 2009, and every 5 years after that date to coincide with the Lower Colorado Regional Water Planning Group regional water plan update.

6.1.3 Agriculture³

A water conservation plan for agricultural use of water must provide information in response to the following subsections. If the plan does not provide information for each requirement, the agricultural water user must include in the plan an explanation of why the requirement is not applicable.

For an individual agricultural user other than irrigation:

- A description of the use of the water in the production process, including how the water is diverted and transported from the source(s) of supply, how the water is utilized in the production process, and the estimated quantity of water consumed in the production process and therefore unavailable for reuse, discharge, or other means of disposal.
- Since May 1, 2005, specific, quantified five-year and ten-year targets for water savings and the basis for the development of such goals. The goals established by agricultural water users under this subparagraph are not enforceable.
- A description of the device(s) and/or method(s) within an accuracy of plus or minus 5.0 percent to be used in order to measure and account for the amount of water diverted from the source of supply.
- Leak-detection, repair, and accounting for water loss in the water distribution system.

³ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.4.

- Application of state-of-the-art equipment and/or process modifications to improve water use efficiency.
- Any other water conservation practice, method, or technique which the user shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

For an individual irrigation user:

- A description of the irrigation production process which shall include, but is not limited to, the type of crops and acreage of each crop to be irrigated, monthly irrigation diversions, any seasonal or annual crop rotation, and soil types of the land to be irrigated.
- A description of the irrigation method or system and equipment including pumps, flow rates, plans, and/or sketches of the system layout.
- A description of the device(s) and/or methods within an accuracy of plus or minus 5.0 percent to be used in order to measure and account for the amount of water diverted from the source of supply.
- Since May 1, 2005, specific, quantified 5-year and 10-year targets for water savings including, where appropriate, quantitative goals for irrigation water use efficiency and a pollution abatement and prevention plan. The goals established by an individual irrigation water user under this subparagraph are not enforceable.
- Water-conserving irrigation equipment and application system or method including, but not limited to, surge irrigation, low pressure sprinkler, drip irrigation, and nonleaking pipe.
- Leak-detection, repair, and water-loss control.
- Scheduling the timing and/or measuring the amount of water applied (e.g., soil moisture monitoring).
- Land improvements for retaining or reducing runoff and increasing the infiltration of rain and irrigation water including, but not limited to, land leveling, furrow diking, terracing, and weed control.
- Tail water recovery and reuse.
- Any other water conservation practice, method, or technique which the user shows to be appropriate for preventing waste and achieving conservation.

For a system providing agricultural water to more than one user:

- A system inventory for the supplier's:
 - Structural facilities including the supplier's water storage, conveyance, and delivery structures.
 - Management practices, including the supplier's operating rules and regulations, water pricing policy, and a description of practices and/or devices used to account for water deliveries.
 - A user profile including square miles of the service area, number of customers taking delivery of water by the system, types of crops, types of irrigation systems, types of drainage systems, and total acreage under irrigation, both historical and projected.

- Since May 1, 2005, specific, quantified 5-year and 10-year targets for water savings including maximum allowable losses for the storage and distribution system. The goals established by a system providing agricultural water to more than one user under this subparagraph are not enforceable.
- A description of the practice(s) and/or device(s) which will be utilized to measure and account for the amount of water diverted from the source(s) of supply.
- A monitoring and record management program of water deliveries, sales, and losses.
- A leak-detection, repair, and water loss control program.
- A program to assist customers in the development of on-farm water conservation and pollution prevention plans and/or measures.
- A requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter.
- Official adoption of the water conservation plan and goals, by ordinance, rule, resolution, or tariff, indicating that the plan reflects official policy of the supplier.
- Any other water conservation practice, method, or technique which the supplier shows to be appropriate for achieving conservation.
- Documentation of coordination with the regional water planning groups in order to ensure consistency with appropriate approved regional water plans.

A water conservation plan, prepared in accordance with the rules of the U.S. Department of Agriculture's Natural Resources Conservation Service, the Texas State Soil and Water Conservation Board, or other Federal or State agencies and substantially meeting the requirements of this section and other applicable commission rules, may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and that agency.

Since May 1, 2005, an agricultural water user shall review and update its water conservation plan, as appropriate, based on an assessment of previous 5-year and 10-year targets and any other new or updated information. An agricultural water user should have reviewed and updated the next revision of its water conservation plan no later than May 1, 2009, and every 5 years after that date to coincide with the Lower Colorado Regional Water Planning Group regional water plan update.

6.1.4 Wholesale Water Providers⁴

A water conservation plan for a wholesale water supplier must provide information in response to each of the following paragraphs. If the plan does not provide information for each requirement, the wholesale

⁴ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.5.

water supplier shall include in the plan an explanation of why the requirement is not applicable. All water conservation plans for wholesale water suppliers must include the following elements:

- A description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data.
- Since May 1, 2005, specific, quantified 5- and 10-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable unaccounted-for water, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable.
- A description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply.
- A monitoring and record management program for determining water deliveries, sales, and losses.
- A program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system.
- A requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter.
- A reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir systems operations plans shall include optimization of water supplies as one of the significant goals of the plan.
- A means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan.
- Documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the Lower Colorado Regional Water Plan.

Additional Conservation Strategies

Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of paragraph (1) of this section, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved.

- Conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates.
- A program to assist agricultural customers in the development of conservation and pollution prevention and abatement plans.
- A program for reuse and/or recycling of wastewater and/or graywater.
- Any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

Since May 1, 2005, the wholesale water supplier shall review and update its water conservation plan, as appropriate, based on an assessment of previous 5-year and 10-year targets and any other new or updated information. A wholesale water supplier should have reviewed and updated the next revision of its water conservation plan no later than May 1, 2009, and every 5 years after that date to coincide with the Lower Colorado Regional Water Planning Group regional water plan update.

6.1.5 Other Water Uses⁵

A water conservation plan for any other purpose or use not covered in this subchapter shall provide information where applicable about those practices, techniques, and technologies that will be used to reduce the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water.

6.2 DROUGHT CONTINGENCY PLAN

Drought contingency plans can be required by the TCEQ/TWDB for certain applicants and water rights holders.

- The Commission shall by rule require wholesale and retail public water suppliers and irrigation districts to develop drought contingency plans consistent with the appropriate approved regional water plan to be implemented during periods of water shortages and drought.
- The wholesale and retail public water suppliers and irrigation districts shall provide an opportunity for public input during preparation of their drought contingency plans and before submission of the plans to the commission.
- Specific, quantified targets for water use reductions to be achieved during periods of water shortages and drought. The entity preparing the plan shall establish the targets.
- The commission and the board by joint rule shall identify quantified target goals for drought contingency plans that wholesale and retail public water suppliers, irrigation districts, and other entities may use as guidelines in preparing drought contingency plans. Goals established under this subsection are not enforceable requirements.

⁵ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.6.

The commission and the board jointly shall develop model drought contingency programs for different types of water suppliers that suggest best management practices for accomplishing the highest practicable levels of water use reductions achievable during periods of water shortages and drought for each specific type of water supplier.

6.2.1 Municipal Uses by Public Water Suppliers⁶

Drought contingency plans for retail public water suppliers, where applicable, and for public water suppliers, must include the following minimum elements.

- Preparation of the plan shall include provisions to actively inform the public and affirmatively provide opportunity for public input. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting.
- Provisions shall be made for a program of continuing public education and information regarding the drought contingency plan.
- The drought contingency plan must document coordination with the regional water planning groups for the service area of the retail public water supplier to ensure consistency with the appropriate approved regional water plans.
- The drought contingency plan must include a description of the information to be monitored by the water supplier and specific criteria for the initiation and termination of drought response stages, accompanied by an explanation of the rationale or basis for such triggering criteria.
- The drought contingency plan must include drought or emergency response stages providing for the implementation of measures in response to at least the following situations:
 - Reduction in available water supply up to a repeat of the drought of record.
 - Water production or distribution system limitations.
 - Supply source contamination.
 - System outage due to the failure or damage of major water system components (e.g., pumps).
- The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this subparagraph are not enforceable.
- The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following:

⁶ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2.0

- Curtailment of nonessential water uses.
- Utilization of alternative water sources and/or alternative delivery mechanisms with the prior approval of the executive director as appropriate (e.g., interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).
- The drought contingency plan must include the procedures to be followed for the initiation or termination of each drought response stage, including procedures for notification of the public.
- The drought contingency plan must include procedures for granting variances to the plan.
- The drought contingency plan must include procedures for the enforcement of mandatory water use restrictions, including specification of penalties (e.g., fines, water rate surcharges, discontinuation of service) for violations of such restrictions.

Privately owned water utilities shall prepare a drought contingency plan in accordance with this section and incorporate such plan into their tariff.

Any water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply. A wholesale or retail water supplier shall notify the executive director within 5 business days of the implementation of any mandatory provisions of the drought contingency plan.

The retail public water supplier shall review and update, as appropriate, the drought contingency plan, at least every 5 years, based on new or updated information, such as the adoption or revision of the Lower Colorado Regional Water Plan.

According to the water systems which participated in the water conservation and drought contingency survey, the majority use mandatory water-use restrictions as their most common drought contingency measure. Other systems listed voluntary water conservation as their measure. Of the entities that responded to the survey, water systems who have implemented mandatory water-use restrictions have seen as much as a 20% reduction in water use while those using voluntary water conservation have only seen a small drop in water use.

6.2.2 Irrigation Uses⁷

A drought contingency plan for an irrigation use, where applicable, must include the following minimum elements. Drought contingency plans for irrigation water suppliers must include policies and procedures for the equitable and efficient allocation of water on a pro rata basis during times of shortage in accordance with Texas Water Code, §11.039. Drought contingency plans for irrigation water suppliers should include at a minimum the following information:

- Preparation of the plan shall include provisions to actively inform and to affirmatively provide opportunity for users of water from the irrigation system to provide input into the preparation of the plan and to remain informed of the plan. Such acts may include, but are not limited to, having a

⁷ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2.1

public meeting at a time and location convenient to the water users and providing written notice to the water users concerning the proposed plan and meeting.

- The drought contingency plan must document coordination with the regional water planning groups to ensure consistency with the appropriate approved regional water plans.
- The drought contingency plan must include water supply criteria and other considerations for determining when to initiate or terminate water allocation procedures, accompanied by an explanation of the rationale or basis for such triggering criteria.
- The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this subparagraph are not enforceable.
- The drought contingency plan must include methods for determining the allocation of irrigation supplies to individual users.
- The drought contingency plan must include a description of the information to be monitored by the water supplier and the procedures to be followed for the initiation or termination of water allocation policies.
- The drought contingency plan must include procedures for use accounting during the implementation of water allocation policies.
- The drought contingency plan must include policies and procedures, if any, for the transfer of water allocations among individual users within the water supply system or to users outside the water supply system.
- The drought contingency plan must include procedures for the enforcement of water allocation policies, including specification of penalties for violations of such policies and for wasteful or excessive use of water.
- Wholesale water customers. Any irrigation water supplier that receives all or a portion of its water supply from another water supplier shall consult with that supplier, and shall include in the drought contingency plan appropriate provisions for responding to reductions in that water supply.
- Protection of public water supplies. Any irrigation water supplier that also provides or delivers water to a public water supplier(s) shall consult with that public water supplier(s) and shall include in the plan, mutually agreeable and appropriate provisions to ensure an uninterrupted supply of water necessary for essential uses relating to public health and safety. Nothing in this provision shall be construed as requiring the irrigation water supplier to transfer irrigation water supplies to non-irrigation use on a compulsory basis or without just compensation.

Irrigation water users shall review and update, as appropriate, the drought contingency plan at least every 5 years, based on new or updated information such as adoption or revision of the Lower Colorado Regional Water Plan.

6.2.3 Wholesale Water Providers⁸

A drought contingency plan for a wholesale water provider should include at a minimum the following information:

- Preparation of the plan shall include provisions to actively inform the public, to affirmatively provide opportunity for user input in the preparation of the plan, and for informing wholesale customers about the plan. Such acts may include, but are not limited to, having a public meeting at a time and location convenient to the public and providing written notice to the public concerning the proposed plan and meeting.
- The drought contingency plan must document coordination with the Lower Colorado Regional Water Planning Group for the service area of the wholesale water provider to ensure consistency with the Lower Colorado Regional Water Plan.
- The drought contingency plan must include a description of the information to be monitored by the water supplier and specific criteria for the initiation and termination of drought response stages, accompanied by an explanation of the rationale or basis for such triggering criteria.
- The drought contingency plan must include a minimum of three drought or emergency response stages providing for the implementation of measures in response to water supply conditions during a repeat of the drought-of-record.
- The drought contingency plan must include the procedures to be followed for the initiation or termination of drought response stages, including procedures for notification of wholesale customers regarding the initiation or termination of drought response stages.
- The drought contingency plan must include specific, quantified targets for water use reductions to be achieved during periods of water shortage and drought. The entity preparing the plan shall establish the targets. The goals established by the entity under this paragraph are not enforceable.
- The drought contingency plan must include the specific water supply or water demand management measures to be implemented during each stage of the plan including, but not limited to, the following:
 - Pro rata curtailment of water deliveries to or diversions by wholesale water customers as provided in Texas Water Code, §11.039; and
 - Utilization of alternative water sources with the prior approval of the executive director as appropriate (e.g., interconnection with another water system, temporary use of a non-municipal water supply, use of reclaimed water for non-potable purposes, etc.).
- The drought contingency plan must include a provision in every wholesale water contract entered into or renewed after adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, the water to be distributed shall be divided in accordance with Texas Water Code, §11.039.
- The drought contingency plan must include procedures for granting variances to the plan.

⁸ Information in this subsection was obtained from the Texas Administrative Code, specifically TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2.2

- The drought contingency plan must include procedures for the enforcement of any mandatory water use restrictions, including specification of penalties (e.g., liquidated damages, water rate surcharges, discontinuation of service) for violations of such restrictions.
- The wholesale water provider shall notify the executive director within five business days of the implementation of any mandatory provisions of the drought contingency plan. The wholesale water provider shall review and update, as appropriate, the drought contingency plan at least every 5 years, based on new or updated information such as adoption or revision of the Lower Colorado Regional Water Plan.

6.2.4 Drought Response Triggers

Many of the water supply sources in the region have explicit information regarding what specific factors will initiate a drought response by water providers or users. Available details regarding these triggers are discussed below.

Surface water sources:

- The LCRA Highland Lakes drought triggers are associated with specific lake levels. See below for details.

2010 Water Management Plan - Drought Triggers

When water in the lakes is ...	On this date ...	Action prescribed in 2010 Water Management Plan
<i>Lakes Travis and Buchanan are full at 2.011 million acre-feet</i>		
Less than 94 percent full	Jan. 1 or July 1	Interruptible supplies cease for all customers except irrigation operations.
Less than 1.7 million acre-feet	Jan. 1	Environmental releases for bays and estuaries are reduced to meet 150 percent of critical (to the extent of storable inflows).
Less than 1.6 million acre-feet	At any time	Request voluntary conservation from firm water customers and begin aggressive public information campaign.
Less than 1.4 million acre-feet	Jan. 1	Begin gradual curtailment of interruptible supply to irrigation operations. Amount of curtailment increases when water storage levels are lower. Environmental releases for instream flows are reduced to meet critical needs.
Less than 1.1 million acre-feet	Jan. 1	Environmental releases for bays and estuaries are reduced to meet critical needs.
900,000 acre-feet	At any time	Request firm customers to implement mandatory conservation restrictions. Meet with customers to develop curtailment plan should drought worsen.
600,000 acre-feet	At any time	If criteria indicate that drought is worse than the Drought of Record, then begin pro rata curtailment of firm supply after ceasing interruptible supply (timing based on duration of drought).
325,000 acre-feet	Jan. 1	No interruptible supply available.
200,000 acre-feet	At any time	No interruptible supply available.

- The City of Austin has year-round and summer watering restrictions to conserve water. They also use a combination of demand, supply, and emergency triggers to initiate a drought response. The information below describes the triggers in more detail:

	Triggers	Action	Goal	End Conditions
Demand Triggers	260 mgd ^a for 3 consecutive days	City Manager may order Stage 2 ^b Water Restrictions	Reduce water use by 15% of 260 mgd	City Manager ends based on daily supply and demand of water
	270 mgd for one day	City Manager may order Stage 2 ^b Water Restrictions	Reduce water use by 15% of 270 mgd	City Manager ends based on daily supply and demand of water
Supply Triggers	Combined Lake storage less than 900,000 acre-feet	City Manager may order Stage 2 ^b Water Restrictions	Reduce water use by 15%	City Manager ends based on daily supply and demand of water
	Combined Lake storage less than 681,000 ^c acre-feet	City Manager may order Stage 3 ^d Water Restrictions	Reduce water use to levels deemed necessary	City Manager ends based on daily supply and demand of water or the end of supply constraints
Emergency Triggers	As determined by City Manager, system outage, equipment failure, contamination of water source or other emergencies	City Manager may order Stage 3 ^d Water Restrictions	Reduce water use to levels deemed necessary	City Manager ends based on daily supply and demand of water or the end of supply constraints

^a million gallons per day

^b Austin City Code §6-4-65

^c City of Austin Water Management Ordinance stipulates that the City Manager may prohibit outdoor watering at 681,000, Austin City Code §6-4-72

^d Austin City Code §6-4-66

- The City of Llano uses the flow of the Llano River, water consumption rates, and water pressures within the system to determine whether to initiate a drought response. The City Manager monitors water supply and demand conditions and makes the determination of whether to initiate a drought response, and what level of drought response to initiate.

Groundwater Sources:

- In general, many of the groundwater conservation districts in the Region K planning area use the Palmer Drought Severity Index as published by the TWDB or similar agency to declare drought conditions. Upon declaration of a drought stage of “Moderate drought” or worse, water well owners or well operators or users are encouraged to implement the corresponding drought measures stipulated in any drought plan of the owner, operator, or user.
- The Barton Springs / Edwards Aquifer Conservation District (BS/EACD) monitors the Edwards-BFZ Aquifer and Trinity Aquifer for drought conditions using springflow and well depths. The information below details the various drought triggers and curtailment requirements.

Drought Stage Triggers and Pumpage Curtailment Requirements

Drought Stages	Drought Triggers ¹		Curtailments by Aquifer, Management Zone, and Permit Type							
	Barton Springs <i>springflow rate</i>	Lovelady Mon. Well <i>depth to water</i>	Edwards Aquifer				Trinity Aquifer			
			Eastern/Western Freshwater		Saline	Middle	Lower	Outcrop		
			Historical		Conditional		Hist.	Hist.	Hist.	Hist.
PWS	IRG/IND	Class A	Class B							
No Drought	> 38 cfs	< 175'	0%	0%	0%	0%	0%	0%	0%	0%
Alarm	≤ 38 cfs	≥ 175'	20%	20%	20% ⁴	50%	20%	20%	20%	20%
Critical	≤ 20 cfs	≥ 190.7' ³	30%	30%	30% ⁴	75%	30%	30%	30%	30%
Exceptional	≤ 14 cfs	≥ 196.3' ³	40%	40%	100%	100%	N/A	N/A	N/A	N/A
ERP ²	≤ 10 cfs	≥ 200.0' ³	40%	100%	100%	100%	N/A	N/A	N/A	N/A

¹ only one trigger required to enter a drought stage but both required to exit

² may be declared at Board's discretion with special Board Order

³ pending Board approval (August 2010)

⁴ will permanently convert to Class B schedule upon Exceptional declaration

- The Blanco-Pedernales GCD monitors several aquifers in Blanco County. Information from their rules regarding drought triggers is provided below:

Drought Stages will be initiated and/or terminated by specific watershed. Drought Stages and the associated conservation and management practices shall apply only to the specific watershed designated and described in Rule 7.3. Declarations of initiation or termination of Drought Stages will be provided to Blanco County newspapers, posted at the District Office, or communicated to well owners in such a manner as may be deemed necessary by the District.

A. Initiation of Drought Stages

The District will maintain an ongoing aquifer water level monitoring program to provide the District with data to help identify the onset of drought conditions and stages of severity. The District will also monitor any declarations of drought stages by the City of Blanco and the City of Johnson City and take note of the triggering conditions which warranted such declarations. The District General Manager and District Staff shall review the water levels in the District Monitor Wells and determine if groundwater levels in either the Blanco River Watershed or the Pedernales River Watershed have been in a state of continuous decline. If such is the case, the General Manager may initiate an appropriate Drought Stage. If groundwater levels have not been in a state of continuous decline, or if aquifer, meteorological, Palmer Drought Index, or other conditions exist that need to be addressed by the Board of Directors, the General Manager may bring the

matter to the attention of the Board of Directors prior to taking any official action. The Board may consider the matter, along with any recommendations provided by the District Staff, and may declare the initiation of any of the Drought Stages warranted by this Rule.

If the General Manager recommends initiation of Drought Stage 3 or 4 that does not coincide with initiation by the City of Blanco or the City of Johnson City, the General Manager shall refer the matter to the Board for a decision.

- The Hays-Trinity GCD monitors discharge flow to the Pedernales River near Johnson City to determine whether a drought response is needed with respect to the Trinity Aquifer in Hays County. Discharge flow rates of 31.6 cfs and 10.2 cfs initiate the alarm trigger and critical trigger, respectively.
- The Lost Pines GCD monitors rainfall and water level records to determine whether drought conditions are impacting the aquifers in Bastrop County. According to the Lost Pines GCD, recharge appears to be relatively constant under the current climatic regime and little affected by drought conditions. It is anticipated, though that drought conditions will result in increased pumpage and decreased natural discharge, thereby affecting water levels in the aquifers.

6.3 WHOLESALE WATER PROVIDER WATER CONSERVATION PLANS

Region K has two wholesale water providers (WWPs), the Lower Colorado River Authority (LCRA) and the City of Austin, both of which have approved TCEQ water conservation and drought contingency plans. The water conservation programs for these WWPs are summarized below.

6.3.1 LCRA Water Conservation Programs

LCRA's municipal water conservation programs are predicated on the fact that the implementation of conservation measures must occur largely at the local level. Wholesale water use accounts for more than 90 percent of all LCRA potable water supply use. It is a mandatory requirement for LCRA, as the wholesale water rights holder, to require customers with new and amended plans to develop a water conservation plan. LCRA Water Conservation Rules for Water Sale Contracts, developed in 1991, are used to implement this requirement. LCRA also provides technical assistance with the development and review of wholesale customer water conservation plans and programs. LCRA assists with the development of rules and regulations that encourage water conservation, such as adding water conservation components into landscape ordinances.

LCRA provides public outreach activities in the area of conservation landscaping. LCRA programs that focus in this area are adoption of Hill Country Landscapes in new developments and with new homeowners, landscape irrigation audits for existing retail homeowners, and distribution of Grow Green landscaping materials to nurseries around the Highland Lakes. The Major Rivers 4th grade curriculum teacher workshops and materials are also provided through the LCRA Natural Science Centers.

LCRA's efforts in agricultural water conservation are focused on promoting water conservation at its irrigation districts, Lakeside, Gulf Coast, and Garwood. Proposed conservation efforts in the next 5- to 10-year period include laser land leveling on individual farms, adding automatic check valves and a control system for the Garwood Irrigation District, and replacement of lock control structures in the Lane City Pumping Plant canal system.

Each of LCRA's three power plants has industrial water conservation plans, which address water usage and return flow for the facilities. Opportunities to conserve water in the once-through cooling water process and boiler water treatment are not readily available because of efficiencies in existing processes. However, the plants' specific 5- and 10-year goals focus on reducing losses, reducing use, and reusing water.

6.3.2 City of Austin Water Conservation Program

Currently, the City of Austin has an aggressive water conservation program, one of the most active in the state, and it currently meets 20 of the 22 municipal best management practices recommended by the Water Conservation Implementation Task Force Report of the 79th Texas Legislature. The Water Conservation Program offers its customers a wide variety of initiatives for all customer classes designed to develop awareness of the need for water conservation. These initiatives include incentives to conserve water, services to reduce demand, educational programs, and regulatory measures.

Programs designed to reduce residential indoor water use include free water efficient toilets and toilet rebates, free water-efficient showerheads and sink aerators, high efficiency clothes washer rebates, and free leak detection kits. Programs designed to reduce residential outdoor water use include free irrigation system audits performed by licensed irrigators, WaterWise landscape rebates, rebates for water saving repairs or upgrades of irrigation systems, reduced price rainbarrels and rainbarrel rebates, and rainwater harvesting system rebates.

The Conservation Program also offers a number of free services and incentives for industrial, commercial and institutional (ICI) customers. Programs designed to reduce indoor consumption by ICI customers include helping them modify special equipment and processes to reduce water use or reuse water internally, as well as free water-efficient toilets and toilet rebates, free water-efficient showerheads and aerators, high efficiency clothes washer rebates, medical dry vacuum pump rebates, and free pre-rinse spray valves for food service establishments. Programs designed to reduce outdoor water consumption by ICI customers include free irrigation system audits, free whole system water audits, rebates for water saving repairs or upgrades of irrigation systems, and rebates of up to \$40,000 for large water saving projects. The City of Austin also offers awards and recognition to ICI customers for achievements in water conservation.

The Conservation Program also administers water conservation education programs. One program designed to educate school children about water conservation is the Water in Our World program administered in partnership with the Austin Independent School District for 5th graders. Other educational efforts include conservation brochures, booklets, videos, radio, television and newspaper ads, an electronic newsletter, and the water conservation web page. In addition, the Program organizes rainwater harvesting and WaterWise landscape tours, produces an ICI water conservation newsletter, and offers a WaterWise training course for professional irrigators and ICI workshops. During the summer months, a substantial effort is made each year to educate customers about efficient water use in the landscape.

Regulatory measures include the water waste ordinance, which prohibits water waste year round and has several watering stages for the summer under which water use is further restricted; and building codes that require separate metering of duplexes, triplexes and fourplexes, as well as the installation of plumbing that would accommodate the installation of submeters on larger multifamily properties.

6.4 STP NUCLEAR OPERATING COMPANY WATER CONSERVATION PLAN

STP Nuclear Operating Company has developed an industrial Water Conservation Plan for the South Texas Project Electric Generating Station. Water is an essential component of electricity production. The South Texas Project uses both groundwater and surface water for station purposes. Most of the water used by the South Texas Project is needed to condense steam and provide cooling for plant generating systems. The main consumptive use of water is forced and natural evaporation from the Main Cooling Reservoir and Essential Cooling Pond.

Numerous water conservation measures have been put in place at the generating station. These include maintaining water quality in the Main Cooling Reservoir by selective diversion from the Colorado River during excess flow conditions, conjunctive use of groundwater for maintaining quality and level in the Essential Cooling Pond, and reuse of treated wastewater, HVAC condensate, and storm water. The water right for the South Texas Project includes a special provision to limit diversion from the Colorado River to 55 percent of the flow over 300 cubic feet per second, to protect environmental flows during low river flow conditions. In addition, a Water Delivery Plan has been incorporated into the amended and restated contract between STP Nuclear Operating Company and LCRA for water management during drought conditions, where reservoir water quality is sacrificed to maintain reservoir level during drought conditions.

STP Nuclear Operating Company is committed to operating the South Texas Project in a safe, reliable, economical, and environmentally sound manner. Water conservation is a part of that commitment. In reviewing water conservation measures, the ability to conserve water is most often a function of the design of the installed equipment and therefore there is limited potential to conserve additional water after a system is installed. Including water conservation, and its associated economic benefit, as one of the considerations used when comparing new project alternatives may ultimately have the greatest impact on water use at the generating station in the future.

APPENDIX 6A

Sample Water Conservation and Drought Contingency Survey

APPENDIX 6B

Model Water Conservation Plan and Drought Contingency Plan