Agenda Item 6d. Status Update on Municipal Water Conservation and the TWDB Conservation Tool

Municipal conservation is a recommended strategy for Region F. This agenda item will discuss the status of the evaluation of this strategy and the new tools that are available to the regions.

Attachments:

1. TWDB Municipal Water Conservation Planning Tool Flyer
2. Excerpt from the 2016 Region F Water Plan, Chapter 5B, *Water Conservation*

Texas Water Development Board

Municipal Water Conservation Planning Tool

A Tool for Planning and Tracking Municipal Water Conservation Programs

The Texas Water Development Board announces the release of the Texas Municipal Water Conservation Planning Tool, a user-friendly resource that can be used in the development of conservation plans and regional water plans.

The Municipal Water Conservation Planning Tool:

- Contains pre-loaded baseline water use projections for more than 450 Texas municipal water systems
- Includes a library of common water conservation measures and their estimated cost and water savings, with many of the TWDB's recommended Best Management Practices
- Offers flexibility for custom water conservation measures to be entered
- Provides an accounting framework for projecting future conservation program costs and water savings as well as estimating the water savings from previous implementation of conservation measures

The Municipal Water Conservation Tool is an Excel-based model developed to assist:

Water utility staff developing conservation plans and reporting conservation savings	Regional water planning groups developing their municipal water conservation management strategies.

The Municipal Water Conservation Planning Tool, along with the User Guide, can be found on the Texas Water Development Board's web site at:

www.twdb.texas.gov/conservation/municipal/plans/index.asp

If you have any questions about the Conservation Tool, please contact wcpteam@twdb.texas.gov.

demand. As an alternative to using water, Region F, in consultation with representatives of the power generators in the area, developed an analysis of alternative cooling technologies that use little or no water. Because these technologies reduce the amount of water needed for power generation, using these technologies can be considered a water conservation strategy and are discussed in this subchapter.

Agricultural water shortages include shortages for livestock and irrigation. Most of the livestock demand in Region F is for free-range livestock. Region F encourages individual ranchers to adopt practices that prevent the waste of water for livestock. However, the savings from these practices will be small and difficult to quantify. Therefore, livestock water conservation is not considered in this plan.

For municipal and irrigation users, additional conservation savings can potentially be achieved in the region through the implementation of conservation best management practices (BMPs). These additional conservation measures were considered for all municipal and irrigation water user groups in Region F.

Although water conservation and drought management have proven to be effective strategies in Region F, the RWPG believes that water conservation should not be relied upon exclusively for meeting future needs. The region will need to develop additional surface water, groundwater and alternative supplies to meet future needs. However, each entity that is considering development of a new water supply should monitor ongoing conservation activities to determine if conservation can delay or eliminate the need for a new water supply project.

The RWPG recognizes that it has no authority to implement, enforce or regulate water conservation and drought management practices. The water conservation practices described in this chapter and elsewhere in this plan are intended only as guidelines. Water conservation strategies determined and implemented by municipalities, water providers, industries or other water users supersede the recommendations in this plan and are considered to be consistent with this plan.

5B.1 Municipal Conservation

Each public water supplier is required to update and submit a Water Conservation Plan (WCP) to the Texas Commission on Environmental Quality (TCEQ) every five years. Per Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, some specific conservation strategies are required to be included as part of a water conservation plan.

At a minimum each plan must include:

- Utility Profile that describes the entity, water system and water use data
- Record management system that is capable of recording water use by different types of users
- Quantified five-year and ten-year water savings goals
- Metering device with a 5 percent accuracy to measure the amount of water diverted from the source of supply
- A program for universal metering
- Measures to determine and control water loss
- A program of continuing public education and information regarding water conservation
- A non-promotional water rate structure

If a public water supplier serves over 5,000 people, they are additionally required to the have a conservation oriented rate structure and a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system.

Both the water conservation plans and water loss audit reports for water suppliers in Region F were reviewed to help identify appropriate municipal water conservation measures. The data from the water loss audit reports for Region F water providers are discussed in more detail in Chapter 1 of this plan.

Forty-six water providers in Region F submitted water loss audits in 2010. Based on these reports, the percentage of real water loss for Region F is approximately 13 percent, which is slightly greater than the accepted range of water loss (less than or equal to 12 percent). This is likely due to the large service areas with low population densities characteristic of rural water supply corporations. For the water suppliers that fall under the water supply corporation category, there may be few cost effective options in reducing water loss.

5B.1.1 Identification of Potentially Feasible Conservation BMPS

To assess the appropriateness of additional conservation BMPs for Region F, 68 potential strategies were identified and a screening level evaluation was conducted. Due to the differences in the water needs and available resources between the larger municipalities and smaller rural areas, the screening evaluation was performed both for entities with populations less than 20,000 people and entities with populations greater than 20,000.

The evaluation considered six criteria:

- Cost
- Potential Water Savings
- Time to Implement
- Public Acceptance
- Technical Feasibility
- Staff Resources

Each criterion was scored from 1 to 5 with 5 being the most favorable. Scores for all the criteria were then added to create a composite score. The strategies were then ranked and selected based on their composite score.

Selected Strategies for Entities under 20,000

Based on the screening level evaluation and requirements from the TCEQ, the following strategies were selected for consideration for entities in Region F with less than 20,000 people during every decade of the planning period:

- Education and Outreach
- Water Audits and Leak Repair
- Conservation – Oriented Rate Structure
- Water Waste Ordinance

Selected Strategies for Entities over 20,000

Based on the screening level evaluation and requirements from the TCEQ, the following strategies were selected for consideration for entities in Region F with more than 20,000 people during any decade of the planning period:

- Education and Outreach
- Water Audits and Leak Repair
- Conservation – Oriented Rate Structure
- Water Waste Ordinance
- Landscape Ordinance
- Time of Day Watering Limit

Each of the selected strategies above, was considered and evaluated for the appropriate water user groups (greater than or less than 20,000). Details of the strategy evaluation are included in Appendix C.

5B.1.2 Recommended Municipal Conservation Strategies

Published reports and previous studies were used to refine the description for the selected BMPs, including the potential water savings and costs. Water savings for some BMPs are difficult to estimate since there is little data for an extended time period. Also, most entities tend to implement a suite a strategies at the same time, which makes it difficult to estimate the individual water savings. These factors were considered in developing the assumptions defined below for each BMP. As more data becomes available through more rigorous water use tracking, the ability to estimate water conservation savings will improve.

Education and Outreach

Local officials would offer water conservation education to schools, civic associations, include information in water bills, provide pamphlets and other materials as appropriate. It was assumed that the education outreach programs would be needed throughout the planning period to maintain the water savings. It was assumed that education and outreach would save 2 percent of the total water demands. Per person costs were based on data obtained from municipalities and water providers. The costs for entities with populations less than 20,000 are greater on a per person basis than for the larger cities.

Water Audits and Leak Repair

Local officials would perform a water audit system wide and create a program of leak detection and repair including infrastructure replacement as necessary. It was assumed that 20 percent of an entity's losses could be recovered through a water audit and leak repair program, and that the leak detection and repair program would be an ongoing activity to maintain the level of water loss reductions. This strategy was considered for all cities with greater than or equal to 15 percent losses and WSCs with losses greater than or equal to 25 percent. If no water loss data was available, this strategy was considered for an entity with a gpcd over 140. A constant 5 percent savings rate was assumed until an entity's gpcd was equal to 140. Costs were estimated at $10 per person per year.

Rate Structure

Local officials would implement an increasing block rate structure where the unit cost of water increases as consumption increases. Increasing block rate structures discourages the inefficient use or waste of water. Many cities already have a non-promotional rate structure. This strategy assumes that the entity adopts a higher level of a non-promotional rate structure. It is assumed that increasing block rates would save 6,000 gallons per household per year and that 10 percent of the households would respond to this

measure by reducing water use. Since it is likely that the entity would conduct the rate structure modifications themselves, this BMP has no additional costs to the water provider.

Water Waste Ordinance

Local officials would implement an ordinance prohibiting water waste such as watering of sidewalks and driveways or runoff into public streets. A water waste ordinance saves about 3,000 gallons/household/ year. It is assumed that 75 percent of the households would respond to this measure by not wasting water. Costs for this strategy would be those costs associated with enforcement.

Landscape Ordinance (Population over 20,000)

Local officials would implement an ordinance that would promote residential plantings that conserve water for all new construction. This strategy is assumed to be implemented by 2030 and would only apply to new construction for both residential and commercial properties. This BMP would save 1,000 gallons per increased number of households per year. Costs for this strategy would be those costs associated with enforcement.

Time of Day Watering Limit (Population over 20,000)

Local officials would implement an ordinance prohibiting outdoor watering during the hottest part of the day when most of that water is lost (wasted) through evaporation. Many ordinances limit outdoor watering to between 6 p.m. and 10 a.m. on a year round basis. It is assumed that time of day watering limits save 1,000 gallons/household/year and 75 percent of the population would realize these savings. (The other 25 percent is either not irrigating or already abide by this practice.) Costs for this strategy would be those costs associated with enforcement.

5B.1.3 Municipal Conservation Summary

It is estimated that the municipal conservation strategy outlined in this plan will save, on a regional basis, over 4,300 acre-feet in 2020 and over 6,100 acre-feet in 2070. The unit costs vary considerably between water user groups depending on the population size, and implementation of a water audit and leak repair program for entities with high water losses. Generally, conservation programs are funded through a city's annual operating budget and are not capitalized. However, in some cases, an entity may choose to capitalize a portion or all of their program. These kinds of costs are difficult to estimate for each individual entity due to the wide variety of factors at play. For this plan, it is assumed that only water audits and leak repairs are capitalized. However, all capital expenditures for conservation are

considered consistent with Region F Plan. The savings and costs associated with water audits and leak repairs are shown separately in Table 5B-3.

Estimates of municipal conservation savings for Region F water users are shown in Table 5B- 1. This table shows the amount of water savings that are estimated through conservation water management strategies, which is above the amount assumed to be achieved through the Plumbing Act. Table 5B- 2 shows the estimated costs for municipal conservation.

Table 5B- 1
Estimated Savings from Municipal Conservation (acre-feet per year)

Water User Group	2020	2030	2040	2050	2060	2070
Andrews	82	99	136	157	183	213
Ballinger	21	22	22	22	22	22
Bangs	9	9	9	9	9	9
Big Lake	18	21	22	23	24	24
Big Spring	181	191	193	193	193	193
Borden County-Other	4	4	4	4	4	4
Brady	32	33	33	33	33	33
Bronte	5	5	5	5	5	5
Brookesmith SUD	44	45	45	45	45	45
Brownwood	126	129	129	129	129	129
Coahoma	5	5	5	5	5	5
Coleman	26	27	27	27	27	27
Coleman County SUD	19	19	19	19	19	19
Colorado City	28	31	32	32	32	33
Concho Rural WSC	33	35	37	38	40	41
Crockett County WCID	21	23	23	24	24	24
Crane	20	21	23	24	25	26
Early	16	16	16	16	16	16
Ector County UD	83	94	102	135	149	162
Eden	16	16	16	16	16	16
Eldorado	11	11	11	11	11	11
Fort Stockton	50	53	57	60	63	66
Greater Gardendale WSC	16	19	21	23	26	28
Iraan	7	8	8	9	9	10
Junction	14	15	15	15	15	15
Kermit	32	32	32	33	33	33
Loraine	3	4	4	4	4	4
Madera Valley WSC	11	12	12	13	13	14
Mason	12	12	12	12	12	12
McCulloch County-Other	3	3	3	3	3	3
McCamey	11	12	13	13	13	14
Menard	8	8	8	8	8	8
Mertzon	5	5	5	5	5	5
Midland	813	879	973	1,062	1,150	1,236
Midland County-Other	145	164	183	202	220	239
Miles	5	6	6	6	6	6

Water User Group	2020	2030	2040	2050	2060	2070
Mitchell County-Other	26	27	28	28	29	29
Millersview-Doole WSC	24	25	25	26	26	27
Monahans	41	43	45	47	48	48
Odessa	716	825	924	1,026	1,128	1,231
Pecos	53	56	59	62	63	64
Pecos WCID	19	20	22	23	24	25
Reeves County-Other	19	20	21	22	23	23
Rankin	5	5	5	5	6	6
Richland SUD	13	14	14	14	14	14
Robert Lee	6	6	6	6	6	6
San Angelo	656	753	793	842	894	949
Snyder	75	86	93	100	104	134
Santa Anna	6	6	6	6	6	6
Sonora	18	20	20	20	21	21
Stanton	15	17	18	19	20	20
Sterling City	5	5	5	5	5	5
Ward County-Other	22	23	24	25	25	26
Winkler County-Other	6	10	12	15	18	20
Wink	6	6	7	7	8	8
Winters	14	15	15	15	15	15
Zephyr WSC	25	26	26	26	26	26
Total	**3,705**	**4,096**	**4,430**	**4,775**	**5,101**	**5,455**

Table 5B- 2
Estimated Costs for Municipal Conservation

	2020	2030	2040	2050	2060	2070
Region F Annual Cost	$1,503,911	$1,666,784	$1,773,862	$1,879,557	$1,976,548	$2,081,743
Annual Cost per acre-foot	$406	$407	$400	$394	$388	$382
Annual Cost per 1,000 gal	$1.25	$1.25	$1.23	$1.21	$1.19	$1.17

Table 5B- 3
Estimated Savings and Costs of Water Audits and Leak Repairs

Water User Group	Capital Cost	2020	2030	2040	2050	2060	2070
Ballinger	$2,669,400	37	37	36	36	36	36
Big Lake	$2,708,800	29	32	33	35	36	37
Borden County-Other	$701,400	9	9	9	9	9	9
Bronte	$900,000	12	12	11	11	11	11
Coahoma	$848,000	9	9	9	9	9	9
El Dorado	$1,471,200	25	24	24	24	24	24
Junction	$1,891,700	31	31	31	30	30	30
Madera Valley WSC	$1,673,300	69	73	76	78	80	82
Mason	$1,568,400	26	26	26	25	25	25
McCamey	$1,698,600	39	41	42	44	45	45
Menard	$1,183,200	17	17	17	16	16	16
Mitchell County-Other	$3,361,800	42	43	43	43	43	44
Pecos	$6,834,400	157	165	173	178	183	186
Rankin	$876,900	14	15	15	16	16	16
Sonora	$2,486,600	77	82	83	85	86	86
Ward County-Other	$2,946,700	37	39	39	40	41	42
Winkler County-Other	$1,787,400	11	16	20	25	28	32
Total	**$35,607,800**	**641**	**671**	**687**	**704**	**718**	**730**

Although water conservation is part of the culture of the region, the challenge for future water conservation activities in Region F will be the development water conservation programs that are cost-effective, meet state mandates, and result in permanent real reductions in water use. Development of water conservation programs will be a particular challenge for smaller communities which lack the financial and technical resources needed to develop and implement the programs. Any water conservation activities should take into account the potential adverse impacts of lost revenues from water sales and the ability of communities to find alternative sources for those revenues. State financial and technical assistance will be required to meet state mandates for these communities.

5B.2 Agricultural Water Conservation

The agricultural water needs in Region F include livestock and irrigated agriculture. New water supply strategies to meet these needs are limited. For irrigated agriculture, the primary strategies identified to address irrigation shortages are demand reduction strategies (conservation). The agricultural water conservation practices considered include:

- Changes in irrigation equipment
- Crop type changes and crop variety changes