

6.0 ADDITIONAL SUPPLY FROM WATER CONSERVATION

Water conservation is a potential means of reducing the projected water demand in the Sabine Basin, which effectively reduces the projected need. The TWDB has developed different conservation scenarios in their water use projections for municipal, manufacturing, irrigation and power uses. The base projections presented in Section 2 of this report incorporate an expected level of conservation.

In this section of the report, the municipal, manufacturing and power use projections were examined to determine how much water could be saved through advanced conservation. Mining, livestock, and irrigation uses were not examined to determine additional savings through conservation because they represent only a very small portion of the overall water use in the Basin.

Municipal Water Use

Municipal water use calculations incorporate population projections, weather conditions and conservation assumptions. The unique combination of these considerations result in different municipal use projections. As discussed above, the projections used for this report include the “most likely” population, below normal rainfall and expected conservation. Additional conservation savings are projected under two other demand scenarios: the advanced conservation scenario and the low demand scenario.

The advanced conservation scenario reflects the demand reductions resulting from expediting the timing of regulatory requirements and adopting more aggressive conservation programs at the local level. The low demand scenario compares projected demands for average weather conditions with no conservation to average weather conditions with advanced conservation. This evaluates the impact of conservation efforts on municipal use during normal rainfall conditions. A summary of the projected municipal water use conservation savings is presented in Table 6.1.

Table 6.1: Municipal Conservation Savings Projections

Decade	Municipal Conservation Savings (ac-ft/yr)					
	2000	2010	2020	2030	2040	2050
Advanced Savings ¹	2,891	5,803	7,480	6,623	5,738	6,136
Advanced Savings ²	7,108	15,168	21,995	24,320	26,217	27,847
Low Demand Savings	6,482	13,788	19,815	21,862	23,752	25,293

1. Savings compared to the municipal use projections used for this report (expected conservation).
2. Savings compared to municipal use projections with no conservation.

Manufacturing Water Use

Ten counties in the state account for approximately 77 percent of Texas’ total manufacturing water use. Two of these counties, Harrison and Orange, are located in the Sabine Basin. In addition, the industries that demand the largest portion of industrial water in the state (chemical products, petroleum refining, and pulp and paper) are all primary industries in the Sabine Basin. Manufacturing water use in the Sabine Basin is the largest projected use type, accounting for 61 percent of the total demand in 2050.

The manufacturing water use projections used for this report assumed low oil prices with no conservation. Other scenarios developed by TWDB address industrial growth based on oil prices and conservation measures indicated by the implementation of water efficient technologies in existing and new plants.

TWDB projections assume conservation savings accrue from the implementation of water efficient practices in manufacturing processes specific to each industry. Projections assume these practices occur as a result of market forces and the availability of improved technology. Table 6.2 includes data on manufacturing demands for both the “most likely” and low oil price scenarios, with and without conservation.

Table 6.2: Manufacturing Demand and Conservation Savings

Scenario	Manufacturing Demand/ Conservation Savings (ac-ft/yr)					
	2000	2010	2020	2030	2040	2050
Manufacturing Demands:						
Most likely/ No conservation	187,687	226,872	250,228	274,516	301,673	331,427
Most likely/ Conservation	182,110	212,739	225,749	237,677	261,053	286,587
Low oil price/ No conservation	190,956	235,947	265,702	299,170	337,026	383,408
Low oil price/ Conservation	185,284	221,250	239,603	258,880	291,383	331,241
Conservation Savings:						
Most likely Conservation savings	5,577	14,133	24,479	36,839	40,620	44,840
Low oil price Conservation savings	5,672	14,697	26,099	40,290	45,643	52,167

Steam Power Water Use

Power demand was projected using two different series: a High series that assumes current technology will continue unchanged, and a Low series that assumes new technology and conservation will result in net water savings. Steam electric power projections for this plan assumed the High water use scenario (with no conservation).

There are six counties in the Sabine Basin with either existing or planned power facilities: Gregg, Harrison, Hunt, Orange, Rusk and Wood. In 2050, the power demand is projected to account for 18 percent of the total water demand in the Basin. The potential exists to conserve up to 15,000 acre-feet per year by 2050 with aggressive conservation measures. Table 6.3 illustrates the projected conservation savings that could be realized if power facilities in the Basin adopt advanced technologies that Lower the gallon per kilowatt-hour water use.

Table 6.3: Conservation Savings for Steam Power Use

County	Power Conservation Savings (ac-ft/yr)					
	2000	2010	2020	2030	2040	2050
Gregg	-	500	-	-	-	-
Harrison	-	-	-	5,000	5,000	5,000
Hunt	-	-	-	-	-	-
Orange	-	2,500	5,000	5,000	10,000	5,000
Rusk	-	5,000	10,000	15,000	15,000	5,000
Wood	-	2,500	2,500	2,500	(2,500)	-
TOTAL	-	10,500	17,500	27,500	27,500	15,000

Advanced water conservation savings contained in the TWDB water demand projections would suggest that adoption of aggressive conservation practices could significantly assist in meeting projected future water supply shortfalls. Combining projected savings for municipal, manufacturing and power categories could reduce the Basin’s total projected demand in 2050 by 73,300 acre-feet per year. The combined conservation savings by decade are shown in Table 6.4.

Table 6.4: Summary of Potential Conservation Savings

Water Use	Potential Conservation Savings (ac-ft/yr)					
	2000	2010	2020	2030	2040	2050
Municipal	2,891	5,803	7,480	6,623	5,738	6,136
Manufacturing	5,672	14,697	26,099	40,290	45,643	52,167
Steam Power	-	10,500	17,500	27,500	27,500	15,000
Basin Total	8,563	31,000	51,079	74,413	78,881	73,303

These projected amounts of water demand reductions, if realized, could address a significant portion of the Sabine Basin’s projected needs. However, a number of factors suggest that this level of aggressive conservation will be difficult, if not impossible, to achieve. These factors include:

- For municipal use, the projected water demands already include an expected level of conservation. To achieve the additional potential savings of 6,136 acre-feet per year a total commitment to conservation by all municipal entities within the Basin would be required. The Sabine Basin has one of the lowest per capita 1990 water use rates in the state at 138 gallons per capita per day (gpc/day). With no conservation, the projected water use rate is 154 gpc/day throughout the planning period. Expected conservation assumes a reduction of nearly 20 percent in the water demand by 2050. The advanced level of conservation assumes a further reduction of approximately 6 percent in this demand. This corresponds to a very low water use rate (115 gpc/day) and may not be realistically achievable. Surveys of municipalities in the Sabine Basin suggest that public utilities are aware of the advantages of conservation, yet none have formally adopted a conservation program capable of achieving a 20 to 30 percent reduction in demands.
- A large percentage of the potential conservation savings is attributed to manufacturing use. Manufacturing conservation occurs as a result of economic forces as opposed to voluntary activity or regulatory compliance requirements. In the Sabine Basin, approximately 30 percent of the industrial demand exists in the Lower Basin which has an abundance of available water and no current market incentive to increase water conservation. In the Upper Basin, many of the large water users already employ conservation measures, and few indicate plans to implement further measures. The most common measures in place include recycling process and/or cooling water, reuse, education and maintenance of water distribution system.
- Steam power water use is similar to manufacturing use, in that conservation is often a result of market factors. With the potential deregulation of the energy industry, market forces may be in place to increase water conservation measures. However, local power producers indicate there are no plans to implement plant modifications or conversions to improve water conservation. Since there are no regulations requiring conservation in the energy industry, these savings cannot be relied on as additional supply.

The water use projections generated for this Plan account for conservation savings for municipal and irrigation use. The expected savings already incorporated in these projections (compared to no conservation) exceed 20,000 acre-feet per year. It is highly unlikely that additional conservation savings will be realized for municipal use without local commitment for aggressive conservation. There may be water conservation savings associated with manufacturing and power uses, but these savings are industry and market driven. They cannot be relied on by SRA as firm supply. In severely water supply limited locations within the Basin substantial reductions in water demands may be possible, and SRA should investigate targeting implementation of conservation measures for users in these areas. The local communities or industries can initiate aggressive conservation measures that would reduce water demands, but SRA's role in requiring such measures is limited. Therefore, for planning purposes, it is assumed that there is no additional supply from conservation measures beyond those assumed in the water demand projections.