



# *Urban Water Management Plan 2005*



*Municipal Services Department*

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## **Introduction**

Urban water suppliers are required by the Urban Water Management Planning Act to update their Urban Water Management Plans (UWMP) every five years. An UWMP is required in order for a water supplier to be eligible for the California Department of Water Resources (DWR) grants, loans and drought assistance.

In preparing this plan update, City staff used the step-by-step approach listed in the DWR booklet "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan". Information and estimates found in this plan are based on City planning data, the Water Master Plan, and actual metered water use for various sectors. The plan also utilizes most of the Best Management Practices (BMPs) that have been established by the California Urban Water Conservation Council and recognized by the State of California. A list of the BMP's is shown in Appendix C.

## **Public Participation**

The City of Turlock developed its first Urban Water Management Plan in 1985 and this is the fourth revision of the plan. For this plan update, two public meetings were held in which the need for the plan was discussed and input from the public welcomed. In these meetings, water conservation, water recycling opportunities and alternate water sources were discussed. Before the final plan was adopted, formal public sessions before the City Council were held to review the plan. All groups and individuals that were contacted and/or participated in the development are listed in Appendix A.

In order to receive the most public comment possible, the City made a great effort to contact as many interested parties as possible, including other City departments. Local organizations, environmental groups, other public agencies, Stanislaus County, the local university, and developers were contacted. The public meetings were advertised in the local newspapers (Modesto Bee and Turlock Journal) and the quarterly City newsletter to customers. These meeting notices were also posted in City facilities and at the local library. In addition, the meeting notices were prominently displayed on the City's Web site along with the ability to download a copy of the draft document.

## **Plan Adoption**

The City of Turlock prepared the 2005 plan using City staff. This plan is an update to the 2000 Urban Water Management Plan (UWMP) that was previously submitted to the State of California and adopted by the City Council in 2001. Before obtaining Council approval of this plan, a copy was sent to the California Department of Water Resources to insure that the plan met all of their requirements. After their concerns were addressed, the plan was adopted by the City Council in December 2005 and formally submitted to the California Department of Water Resources within thirty (30) days of Council approval. A copy of the signed Resolution is shown in Appendix B. This plan includes all the information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

## Agency Coordination

### Coordination within the City

City Municipal Services staff met and coordinated the development of this plan with all departments within the City, including the City Manager’s office and the City Attorney.

### Interagency Coordination

The City is an active member of the local Turlock Groundwater Basin Association (TGWBA) and this plan includes information that has been developed by the Association. The purpose of the TGWBA is to insure the efficient use of groundwater in the basin and to protect the quality and quantity of the groundwater supplies. The TGBWA is comprised of many of the local water utilities, irrigation districts, and Stanislaus County. The Association developed a model groundwater management plan (AB3030) for the area which most of the members have adopted, including the City of Turlock.

The City submitted draft copies of the UWMP to local water agencies and public interest groups. Table 1 outlines the people contacted and their response. As part of the preparation of this document, the City of Turlock Planning Division was involved in providing statistics on future growth and also commented on the draft plan.

Table 1

### Coordination with Appropriate Agencies

	Participated in UWMP development	Commented on the draft	Attended public meetings	Contacted for assistance	Received copy of the draft	Sent notice of intention to adopt	Not Involved/ No Information
City of Modesto							
Turlock Irrigation District							
Stanislaus County							
Department of Health Services (Stockton)							
Turlock Groundwater Basin Association							
Public Interest Groups							
Other							

In addition to the groups shown above, public meetings were held to receive any additional comments or concerns. The meeting dates and a copy of the responses at these meetings are outlined in Appendix A.

## Supplier Service Area

### Demographic Factors

Prior to the arrival of the Spanish explorers, the Turlock area was settled by Yokut Indian tribes that lived in rancherias located along the rivers.<sup>1</sup> The first European settlers in the region located settlements along the banks of the Tuolumne and San Joaquin Rivers. The area quickly transitioned from stock raising to dry land farming, with winter wheat being the most valuable crop. Once surface water from the Tuolumne was obtained, farming changed to include a much wider variety of crops. However, early irrigation practices resulted in very high groundwater levels that had to be addressed by the local irrigation district. The problem was reduced with better water management and the use of groundwater extraction wells.

The City of Turlock is located in the eastern side of the San Joaquin Valley in California, 15 miles south of Modesto and 20 miles north of Merced. The City has excellent transportation access since it is located next to State Highway 99 and has two major railroad lines. The City was incorporated in 1908 and at that time, water and sewer bonds were obtained in order to create public water and wastewater systems. Since the beginning, the City of Turlock has used only groundwater wells as its source of potable water.

The local groundwater basin is within an area bordered by the San Joaquin River on the West, the Merced River on the South and the Tuolumne on the North. To the East are the foothills of the Sierra Nevada mountain range. The city is surrounded by farmland producing a wide variety of crops.

The current city population is approximately 67,000 and it is the second largest city in the region.<sup>2</sup> Turlock is also home to California State University, Stanislaus that has an enrollment of 8,000 students. In the last few years there has been considerable construction taking place with many new homes being built. Table 2 shows the projected population growth for the next 20 years, based on the General Plan growth rate of 3.38%<sup>3</sup>.

**Table 2**

### **Population - Current and Projected**

	2005	2010	2015	2020	2025
Population	65,970	77,899	91,984	108,616	128,256

Between 1990 and 2000, the median age in Turlock increased from 29.3 to 30.9 years of age, which implies a slowly aging population. According to the 2000 Census, persons who categorized themselves as white represented 72.3 percent of the Turlock population and 69.3 percent of the Stanislaus County population. In the City, 29.4 percent are of Hispanic origin.

In 1990, technical, sales, and administrative support were the prominent occupations for the Turlock labor force; over one third of the labor force was employed in this occupation type. By the 2000 Census, managerial and professional specialties had become the leading occupation type. Generally, the unemployment rate has decreased since a high of 14.7% in 1993 to 9.0 % in 2001. However, in 2002, the City unemployment rate increased slightly to 9.6 %.<sup>3</sup>

A large portion of the area's economy is based on agriculture. The City is home to a variety of major food processing industries that rely heavily on an inexpensive and plentiful source of high quality water and an inexpensive electrical supply. Most of these industries are poultry or dairy related. Fifteen years ago, the industrial group used 20% of the water produced by the City. Over the past fifteen years several businesses have closed, but new industries and the growth of the remaining facilities have kept the water usage for this group about the same. However, because of the increased needs and growth of other water users, the percentage of water use associated with industry has dropped to 16%. All members of the Industrial Users group are metered water users.

Most of the City's commercial accounts are metered (80%) but there are very few residential units on water meters. Currently there are 107 single-family homes that are billed on metered usage. These homes have meters because they are on large lots and have water lines greater than one inch. There are also 100 homes that have a monitor meter, which the City reads monthly but does not bill on metered usage. Based on the billing records and meter data that are available, a fairly close estimation of water usage for the un-metered groups can be determined. Metered commercial water usage has increased over 25% in the last five years but remains at 15% of the total flow.

The per capita residential water usage over the last five years has not changed significantly. Residential and commercial landscape watering is the largest water use within the City and likely the area where the greatest savings in water use can be achieved.

Agricultural growers in our groundwater basin are primarily dependent on surface water supplied by the Turlock Irrigation District (TID) for their crops. Surface water supplies about 80% of the local farmers water needs and excess irrigation water is a large contributor to the recharge of the groundwater basin. Whenever surface supplies diminish, TID and private growers have large groundwater wells that are used to supplement the surface water supply (conjunctive use). On the eastern portion of the groundwater basin, farmers do not have surface water supplies and are dependent on deep ground water wells. This has caused a significant decline in water levels in that area. The over pumping has mostly ceased, however groundwater storage remains substantially depleted compared to levels in the early 60's.<sup>4</sup>

## Climate

Valley weather is typically dry hot summers with cold foggy winters. Rain falls primarily in the winter months with an average yearly precipitation of 12 inches<sup>5</sup>. Summer daytime temperatures can exceed 100°F for several weeks at a time and this greatly increases the evapotranspiration rate. Because of the long hot dry summers, landscape irrigation demand is high and is the largest water use within the City. The change in water consumption related to seasons is dramatic. July daily flows in 2004 were about 33 million gallons per day (MGD) with February flows being less than half at only 13 MGD. Table 3 shows the local climate summary.

**Table 3****Climate- 1948 to 2004<sup>6</sup>**

	Jan	Feb	Mar	Apr	May	Jun
Standard Monthly Average ETo	0.87	1.71	3.43	5.24	6.7	7.4
Average Rainfall (inches)	2.42	2.08	1.83	1.04	0.36	0.06
Mean Temperature (Fahrenheit)	47	52	57.2	61.6	67.7	73.7

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Standard Monthly Average ETo	7.85	6.75	4.93	3.37	1.66	0.87	50.78
Average Rainfall (inches)	0.02	0.03	0.21	0.56	1.43	1.87	11.91
Average Temperature (°F)	78.1	77.2	73.5	65.7	54.4	46.1	62.85

**Water Sources**

During the next five years, the City anticipates meeting all of its service demands with groundwater wells and will supplement supplies with recycled water. Currently, the City uses excess runoff from residential watering to supply irrigation water for Summerfaire Park. The wastewater treatment facility is currently being upgraded to tertiary treatment and that will allow a much greater use of this water for supplying a variety of needs.

The shallow groundwater aquifer contains water that typically does not meet drinking water standards. However, this water can be used for landscape irrigation and the City will continue to expand the use of this resource. An example of this is the residential development currently under construction in the Northeast portion of the City that will utilize this resource for some of the landscaping needs.

In addition to the above supplies, the City and several other water agencies are looking at purchasing treated surface water from the Turlock Irrigation District (TID) to supplement groundwater supplies. This facility would supply the City with up to 15MGD of potable water. Table 4 outlines the anticipated supply sources and system demands for the next 20 years.

**Table 4****Projected Water Needs - Acre feet/year**

Water Sources	2005	2010	2015	2020	2025
Deep Groundwater wells (potable)	26,790	10,001	10,459	6,854	8,411
Surface Water (TID)	0	17,000	17,000	22,400	22,400
Recycled Water	50	100	100	100	100
Recycled Wastewater	570	4,000	6,400	10,000	15,000
Shallow groundwater wells	170	200	250	300	400
Total all Sources	27,580	31,301	37,400	44,200	52,300

## Groundwater Basin

The Turlock sub basin is one of 9 sub basins making up the San Joaquin Valley Basin<sup>7</sup>. The Turlock groundwater sub basin lies on the eastern side of the San Joaquin Valley, and encompasses portions of both Stanislaus and Merced counties. The ground-water system is bounded by the Tuolumne River on the north, the Merced River on the south, and the San Joaquin River on the west. The eastern boundary of the system is the western extent of the outcrop of low-permeability Valley springs formation rocks in the foothills of the Sierra Nevada. Recharge in the basins occurs primarily from percolation of excess irrigation water, seepage losses from canals and ditches, and rainfall within the basin. The City of Turlock obtains its drinking water from the lower confined aquifer beneath the protective Corcoran clay layer existing at depths from 60 to 120 feet below the City. This clay provides a protective shield from the lesser quality of water that exists in the upper unconfined levels. The general direction of regional groundwater flow in the unconfined aquifer is westward and southward towards the valley trough.

Table 5 shows the groundwater pumped by the City of Turlock during the past five years. The City wells are responsible for about 5% of the total water withdrawals from the basin. Table 6 shows the expected groundwater needs for the next 20 years. The drastic reduction in groundwater pumping shown is due to the expected future use of surface water to supplement the City water supplies. In addition to surface water, a much greater use of recycled water is expected over the next few decades.

**Table 5**

### **Amount of Groundwater pumped (AF/Y)**

<b>Basin Name</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Turlock Sub basin	22,901	22,978	25,517	25,121	25,465
% of Total Water Supply	100%	100%	100%	100%	100%

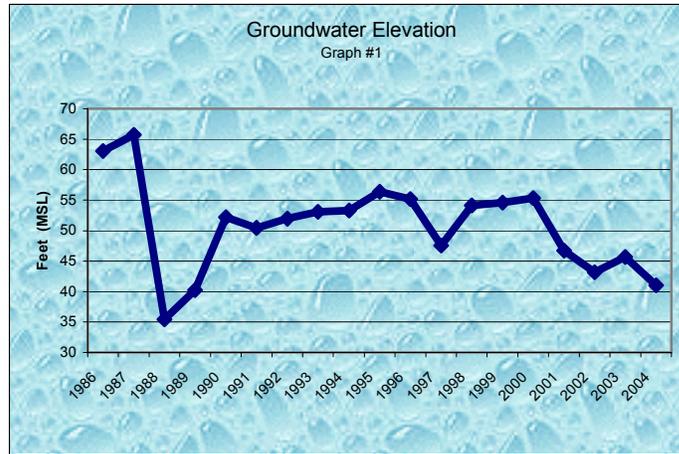
**Table 6**

### **Projected Groundwater Needs - Acre feet/year**

<b>Basin Name</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
Turlock Sub basin	10,201	10,709	7,154	8,811
% of Total Water Supply	35%	29%	16%	17%

Groundwater storage has been depleted within the Turlock basin, primarily on the east side. However, storage depletions did not begin until about 1963 and continued through 1992. Since 1992, the groundwater levels in the basin have essentially been unchanged and the outflows from the groundwater basin are about balanced by the inflows to the basin. Groundwater pumping from the basin totals about 500,000 acre-feet per year<sup>4</sup> under current conditions.

Groundwater levels within the City dropped drastically during the mid 1980's because the drought promoted additional pumping by agricultural users outside the City. The average static levels in the City wells dropped about from 65 feet to 35 feet above mean sea level (MSL), then recovered over time back up to 55 feet. In the last five years the City has seen the average level decline to 40 feet MSL (Graph 1).



### Reliability of Water Supply

Since the City has only used deep groundwater wells for its water supply, it has not had any shortage of water except for one brief period in 1988 when six wells had to have the pump bowls lowered. This was caused by the reduction of surface water supplies to farmers due to the drought. This triggered a large increase in agricultural pumping as farmers had to make up the surface water shortage with groundwater. The City currently has 23 wells available and they have historically been very reliable. A large portion of these wells are used to only meet summer peak demands and because there is excess system capacity, the loss of any one well will not have a deleterious effect on the system as a whole.

During the 1987-1992 dry period, the City of Turlock increased the amount of water produced each year in order to supply growth demands. In this period, the average static water levels declined only during 1988 and started increasing the next year. This indicates that the groundwater available to the City is extremely reliable and can be counted on to provide most of the City's needs over several dry years. If the City receives surface water as an additional supply source, the ability to provide all of the water needs will become even easier. **The City feels that it can supply 100% of its normal water needs during an average and a single dry water year. During multiple dry water years, there may be a need to reduce landscape-watering use in order to meet more critical demands.**

**Table 7**

**Supply Reliability - Acre Feet/Year**

	Normal Water Year	Single Dry Year	Multiple Dry Water Years			
	2004	1989	1987	1988	1989	1990
Water Produced	25,465	14,523	12,949	13,814	14,523	15,372
% of Normal	100%	100%	100%	100%	100%	100%

Except for a major disaster, the City’s water supply is extremely reliable in all seasonal and climatic conditions that have been encountered to date. If an unforeseen event were to occur that resulted in the major loss of production facilities, the City would impose its Emergency Water Shortage Plan adopted by the Council in 1991 until full production could be restored.

Water Transfer and Exchange Opportunities

Currently there is no alternative potable water supply source in the area. There are three small water systems within Turlock owned and operated by the City of Modesto. However, they only have a few small wells and use the City of Turlock as a backup water source; therefore they are not a likely source of water. Other nearby water agencies are also groundwater only systems and they have no excess capacity.

There may be an opportunity to receive irrigation water from the local utility that could be used for landscape irrigation or industrial applications that do not need a high quality of water but the infrastructure is not in place at this time. Because this water is meant for agriculture, there are practical and legal issues that could restrict the availability of this supply. Any substantial use of this water will have to be negotiated and at this time it does not appear to be available.

Water Use by Customer Type

Table 8 shows the various quantities of water used by different customer groups within the City. Due to the lack of metered data for all groups, the estimates in this table are based on planning data, the water master plan, estimates from metered accounts, and land use information. Because the City currently does not meter all users, the amount of unaccounted for water loss cannot be calculated. Therefore, water loss is included in the residential categories.

The City of Turlock also supplies water to three small areas that are owned by the City of Modesto. However, since these are backup and fire fighting water supplies only, the water usage and revenue is very limited.

Since 1980, the overall per capita consumption has essentially remained the same throughout the period at 350 gallons per day per person. When the industrial and metered commercial accounts are removed from the calculation, the adjusted per capita result is 260 gallons per day per person.

**Table 8**

**Past, Current and Projected Potable Water Deliveries**

Year	Type		Single Family	Muti-Family	Com-mercial	Indus-trial	City use	Land-scape	Agri-culture	Total
1990	metered	# of Accounts	500			22	1		0	523
		Quantity (AF/Y)	1875			3,421	64		0	5,360
	unmetered	# of Accounts	10,440		300	0	11		0	10,751
		Quantity (AF/Y)	9,073		569	0	370		0	10,012
1995	metered	# of Accounts	240		550	16	1		0	807
		Quantity (AF/Y)	908		2599	2,887	64		0	6,458
	unmetered	# of Accounts	11,091		299	0	12		0	11,402
		Quantity (AF/Y)	10,772		1413	0	430		0	12,615
2000	metered	# of Accounts	37	269	709	18	1	130	0	1,164
		Quantity (AF/Y)	52	1018	2096	4,188	64	801	0	8,219
	unmetered	# of Accounts	12,166	651	248	0	13	0	0	13,078
		Quantity (AF/Y)	10,800	2464	733	0	490	0	0	14,487
2005	metered	# of Accounts	110	374	955	21	1	150	0	1,611
		Quantity (AF/Y)	166	1171	1928	4,295	64	808	0	8,432
	unmetered	# of Accounts	14,840	654	200	0	15	0	0	15,709
		Quantity (AF/Y)	13,991	3349	404	0	614	0	0	18,358
2010	metered	# of Accounts	8,500	882	1359	22	21	170	0	10,954
		Quantity (AF/Y)	6,885	2762	2744	4,300	600	916	0	18,207
	unmetered	# of Accounts	9,000	300	0	0	0	0	0	9,300
		Quantity (AF/Y)	7,620	1174	0	0	0	0	0	8,794
2015	metered	# of Accounts	20,125	1474	1526	24	25	195	0	23,369
		Quantity (AF/Y)	14,820	3950	2750	4,300	859	780	0	27,459
	unmetered	# of Accounts	0	0	0	0	0	0	0	0
		Quantity (AF/Y)	0	0	0	0	0	0	0	0
2020	metered	# of Accounts	23,144	1695	1797	26	30	225	0	26,917
		Quantity (AF/Y)	15,339	4543	3235	4,300	982	855	0	29,254
	unmetered	# of Accounts	0	0	0	0	0	0	0	0
		Quantity (AF/Y)	0	0	0	0	0	0	0	0
2025	metered	# of Accounts	26,615	1949	2067	28	35	260	0	30,955
		Quantity (AF/Y)	15,680	5224	3514	4,300	1105	988	0	30,811
	unmetered	# of Accounts	0	0	0	0	0	0	0	0
		Quantity (AF/Y)	0	0	0	0	0	0	0	0

## Demand Management Measures

### A. Water survey programs for residential property (BMP #1)

The City of Turlock has not participated in any water survey programs in the past. However, the City has recently partnered with California State University, Stanislaus to explore the water usage of 100 homes in which the City monitors water usage. As part of this study, the University will track water use during the high water use months (Summer). They will study the use patterns and determine why some customers with similar properties use more or less than their neighbors.

The University will also provide selected homes with various educational materials and see which material has the greatest effect on water usage. The City will use the results of this study to target educational material to the whole residential user group. The cost of the whole program is expected to be less than \$10,000 for the 2005 calendar year.

Residential surveys by the City are expected to begin in 2008 after a Water Conservation Coordinator has been allocated as a full time position. This program is likely to expand as the cost of water raises and the demand for conservation increases.

**Table 9**

#### Water Surveys

Planned	2006	2007	2008	2009	2010
# of single family surveys	0	0	100	100	100
# of multifamily surveys	0	0	0	0	10
projected expenditures	\$0	\$0	\$5,000	\$5,000	\$6,000
projected water savings - AF/Y	0	0	4	4	4
Agency construction savings	\$0	\$0	\$264	\$264	\$264
Agency Annual production savings	\$0	\$0	\$360	\$360	\$360
Cumulative savings - AF/Y	0	0	4	8	12

### B. Residential plumbing retrofits (BMP #2)

There are no enforceable ordinances in effect within the City that require replacing water fixtures with a low flow device. However City Code does requires new construction to use low flow (1.6 gallon) toilets to be installed. The City has given out low flow showerheads in the past along with water conservation educational material. However, no records were kept of how many were delivered or when they were delivered.

Starting in 2008, the City is proposing to require a retrofit program for installation of water saving devices whenever property is sold.

**Table 10**

**Residential Plumbing Retrofit**

Planned	2008	2009	2010
# of replacements	240	230	221
projected expenditures	\$3,600	\$3,456	\$3,318
projected water savings - AF/Y	4	4	4
Agency construction savings	\$480	\$461	\$442
Agency Annual production savings	\$568	\$1,122	\$1,650
Cumulative savings - AF/Y	4	8	12

C. System water audit, leak detection, and repair (BMP #3)

A system for conducting water audits does not exist at this time. Because most of the water users are not metered, system wide audits are not possible. The City does help identify leaks upon customer request or when high water usage is identified. Starting in 2006, the City will be converting meter ready accounts to automated meter reading. The new meter reading system will identify accounts with suspected leaks so that City personnel can contact the owners and help identify where the leak is occurring.

During 2004, the City identified and repaired 11 water main leaks and responded to 59 service leaks in a distribution system with over 200 miles of pipe.

D. Metering with commodity rates for all new and existing connections (BMP #4)

By midyear 2006, the City expects to have converted the last of the flat rate commercial accounts to metered rates. In addition, all residential properties that are connected to the system with water services greater than one inch pay metered rates.

Beginning in 2006, the city will start converting to commodity rate billing the flat rate residential accounts that currently have a meter or a service with a meter idler. All new residential accounts will automatically be billed based on water use. This conversion program will be completed by 2010 and will allow the City to meet the initial requirements of AB 2572. Table 11 shows the anticipated costs and benefits. The conversion of older residential accounts that currently do not have meter setups is also expected to begin in 2006 with complete conversion expected by 2010.

A separate metered water service is recommended for all commercial accounts that have large irrigated parcels. Since commercial businesses are billed for sewer based on the water meter usage, having a separate water service for landscaping provides a more accurate billing for sewer usage. This option also has the additional advantage of allowing the City to monitor landscape water use.

**Table 11****Water meters - Converting to commodity rates**

Actual	2001	2002	2003	2004	Projected 2005
# of unmetered accounts	13,504	14,039	14,821	15,270	15,520
# of new meters installed	339	196	260	185	350
# of accounts without commodity rates	13,504	14,039	14,821	15,270	15,520
actual budget expenditures-\$	\$ -	\$ -	\$ -	\$ -	\$ -

Planned	2006	2007	2008	2009	2010
# of unmetered accounts	13520	9520	5520	1520	0
# of new meters installed	300	300	300	300	300
# of retrofit meters installed	2000	4000	4000	4000	1520
# of accounts without commodity rates	13520	9520	5520	1520	0
projected expenditures-\$	\$ 1,200,000	\$2,400,000	\$2,400,000	\$2,400,000	\$ 912,000
projected water savings - AF/Y	423	792	792	792	335
Agency construction savings	\$27,524	\$51,458	\$51,458	\$51,458	\$21,780
Agency Annual production savings	\$38,110	\$109,359	\$180,608	\$251,856	\$282,013
Cumulative savings - AF/Y	423	1215	2007	2798	3133

The construction savings shown in the table above is the estimated savings (prorated) the City will realize from not having to build additional water and sewer facilities. The production savings are the estimated reductions in expenses realized in both the sewer and water systems for lower energy and maintenance costs.

E. Large landscape conservation programs and incentives (BMP #5)

The City has not audited any landscape users in the past. Starting in 2005, the City began tracking water use at metered landscape customers. Beginning in 2006, the City will begin a series of audits of the largest users.

**Table 12****Landscape Water Savings**

Planned	2005	2006	2007	2008	2009	2010
# of metered landscape accounts	148	155	164	175	190	199
# of budgets to be developed		0	0	3	3	3
# of surveys to be completed		11	11	12	12	12
# of follow-up visits		0	0	3	3	3
projected expenditures-\$		\$4,000	\$4,000	\$4,500	\$4,500	\$4,500
projected water savings - AF/Y		24	16	3	3	3
Agency construction savings		\$288	\$192	\$36	\$36	\$36
Agency Annual production savings		\$912	\$1,520	\$1,634	\$1,748	\$1,862
Cumulative savings - AF/Y		24	40	43	46	49

**F. High-efficiency washing machine rebate programs (BMP #6)**

The City of Turlock plans to begin participating in this program in 2006. However, the Turlock Irrigation District (electrical supplier) currently offers a \$75.00 rebate to anyone in the City who purchases a high-efficiency clothes washer.

Beginning in 2006, the City will provide a \$50.00 rebate to the first 200 customers to apply that have a City water or wastewater connection. This rebate will be paid on all washers that are Energy Star compliant. Table 13 shows the projected savings.

**Table 13****High-efficiency washing machines**

Planned	2006	2007	2008	2009	2010
\$ per rebate	\$50	\$50	\$50	\$50	\$50
# of rebates to be paid	200	200	200	200	200
projected expenditures	\$12,500	\$11,000	\$11,000	\$11,000	\$11,000
projected water savings (AF/Y)	2.7	2.7	2.7	2.7	2.7
Agency construction savings	\$321	\$321	\$321	\$321	\$321
Agency Annual production savings	\$383	\$767	\$1,150	\$1,534	\$1,917
Cumulative savings - AF/Y	2.7	5.4	8.1	10.8	13.5

**G. Public Information Programs (BMP #7)**

While the City has provided water conservation programs and education for several years, it has not been keeping track of its efforts. Starting in 2006, a formal program will be initiated with tracking of all of the individual components and expenses as shown in Table 14. This information was not closely tracked in the past since without water meters there was no reliable way to determine how effective any water conservation efforts would be.

**Table 14**  
**Public Information Programs**

Planned	2006	2007	2008	2009	2010
a. Paid advertising	\$3,000	\$3,000	\$4,000	\$5,000	\$5,000
b. Public Service Announcement	\$2,000	\$2,500	\$4,000	\$5,000	\$5,000
c. Bill inserts/Newsletters/Brochures	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
d. Bill showing water usage in comparison to previous year's usage	-	\$2,000	\$1,000	\$1,000	\$1,000
e. Demonstration gardens	-	\$1,000	\$1,000	\$1,000	\$1,000
f. Speaker's Bureau	\$1,000	\$1,500	\$2,000	\$2,000	\$2,000
g. Special Events, Media Events	\$1,000	\$1,000	\$1,000	\$1,000	\$2,000
h. Program to coordinate with other government agencies, industry and public interest groups and media	\$1,000	\$1,000	\$3,000	\$4,000	\$5,000
Projected expenditures	\$12,000	\$16,000	\$20,000	\$23,000	\$25,000

H. School Education Programs (BMP #8)

For the last couple of years, the City has not given any school education programs mainly due to the lack of staff time and the difficulty of scheduling with the schools. The City hopes to again provide a valuable education program starting in 2006 as it realizes the positive impact students have on changing the mindset and habits of their parents and relatives. The following table outlines the planned programs.

**Table 15**  
**School Education Programs**

Planned	Number of classroom presentations				
	2006	2007	2008	2009	2010
Grades K-3rd	0	0	0	0	5
Grades 4th-6th	5	5	10	10	5
Grades 7th-8th	0	0	0	0	0
High School	0	0	0	0	0
projected expenditures	\$5,000	\$5,000	\$10,000	\$10,000	\$10,000

I. Conservation Programs for commercial and industrial accounts (BMP #9)

The commercial and industrial accounts have an additional economic incentive the current flat rate users don't have. They pay metered rates for water coming into their facility and also pay for metered sewer that leaves their business. Since sewer costs are significantly higher than the incoming potable water, the combination of the two charges provides business owners a major reason to focus on conservation.

No water conservation program aimed specifically at commercial and industrial accounts will be instituted during this reporting period. However, those businesses with large landscaping areas will be covered under the Large Landscaping program.

J. Wholesale Agency Program (BMP #10)

The City does not have any wholesale customers.

K. Conservation Pricing (BMP #11)

All metered water users currently pay the same rate based on the volume used but the rates are based on a declining block schedule, i.e. the more you use, the less it costs per unit volume. Under the current pricing structure, there are three tiers of water use and charges. The first tier is 0 to 50,000 gallons, the second is 50,001 to 150,000 gallons and the third is all use over 150,000 gallons. The third tier charge is 1/3 of the first tier charge; therefore our current pricing structure does not encourage conservation.

The City plans to eliminate the declining tier rates by 2007. The proposed change will be to drop tiers two and three while leaving the first tier the same. This new structure has the potential to increase revenues but it is anticipated that the change will actually be revenue neutral since water usage should be reduced. The new pricing schedule will apply to all customer groups.

All industrial and all metered commercial users pay for sewer service based on the actual volume of water discharged to the sewers. As flat rate commercial users are converted to water meters, they will also be charged for metered sewer. When residential accounts are changed to metered rates from the current flat rate, they will continue to be charged a flat rate for sewer based on the number of fixture units.

L. Water Conservation Coordinator (BMP #12)

This position currently does not exist within the City due to lack of staff. However, there are part time employees that respond to water wasting complaints and check for excess landscape water use in the high summer water use period. During the winter months, members of the regular water crew respond to water wasting incidents.

As the City grows and water resources become more limited and expensive, the need for additional water conservation programs will gain in importance. The duties of a water conservation coordinator will initially be only part of the assignments for any new staff. As the water conservation program grows, these duties will increase and additional staff time will be required as shown below.

**Table 16**  
**Water Conservation Coordinator**

Planned	2006	2007	2008	2009	2010
# of full time positions	1/2	1/2	1	1	1
# of part time staff	2	2	2	2	2
projected expenditures	\$40,000	\$40,000	\$60,000	\$60,000	\$60,000

M. Water Waste Prohibition (BMP #13)

The City of Turlock Municipal Code (Chapter 6-7 Water Conservation and Education) has had a water wasting prohibition for many years. This Code section prohibits once thru cooling and general water waste and also requires proper maintenance of water pipes and fixtures to prevent leaks. A copy of this Chapter is attached to this plan. As part of this code, the City established a penalty fee for water wasting. In 2004, employees reported over 2700 watering violations during the peak summer months. Of these violations however, only 8 people had to be fined for non-compliance.

Water softeners can also waste water if not properly operated. In addition, they can discharge excess salt into the sewer system making it difficult to meet State effluent discharge requirements. Starting in 2008, the City is proposing to create an ordinance requiring that only demand-regulating water softeners be installed. These softeners use less water and produce less brine since they regenerate only when needed, not on a timed basis. Educational material related to proper softener operation is currently being developed and will be included with other water conservation material.

As shown in Table 17, the City has recently been more pro-active in response to water wasting. The number of violations recorded has increased dramatically. The increased vigilance and enforcement by the City has been reflected in the per capita water use associated with residential users. The per capita water use has declined about 10% over the last three years.

**Table 17**

**Water Wasting Violations**

Actual	2002	2003	2004	2005 (proj)
Waste Ordinance in effect	Yes	Yes	Yes	Yes
# of on-site visits	290	751	2775	2600
water softener ordinance	No	No	No	No
actual expenditures	\$6,000	\$8,800	\$13,200	\$15,000

Planned	2006	2007	2008	2009	2010
Waste Ordinance in effect	Yes	Yes	Yes	Yes	Yes
# of on-site visits	3000	3000	3000	3500	3500
water softener ordinance	No	No	Yes	Yes	Yes
actual expenditures	\$25,000	\$25,000	\$30,000	\$40,000	\$40,000

N. Residential ultra-low-flush toilet replacement programs (BMP #14)

No City program for replacing high water use toilets exists at this time. Starting in 2008, the City is proposing to partially fund a retrofit program for installation of ultra-low-flow toilets. A rebate of \$100 per toilet is proposed for all customers replacing a higher flow toilet. An additional cost to the City of \$25 per unit is estimated for the expense of verification of the installation by City personnel. Because of funding limitations, the City anticipates replacing up to 500 units per year for the first few years.

Over time, the demand for this program is expected to diminish. Approximately 8100 residents (single family and multiple family) are assumed to be still using the 3.5-gallon per flush (or more) toilets. The savings per toilet is based on the California Urban Water Conservation Council (CUWCC) data of 23 gallons per day.

**Table 18**

**Ultra-low-flush toilet replacements**

Planned	2008	2009	2010
# of replacements	500	500	500
projected expenditures	\$62,500	\$62,500	\$62,500
projected water savings - AF/Y	119	119	119
Agency construction savings	\$14,194	\$14,194	\$14,194
Agency Annual production savings	\$16,937	\$16,937	\$16,937
Cumulative savings - AF/Y	119	239	358

**Planned Water Supply Projects**

In the past, the City has experienced low water pressure in some of the industrial areas during peak water using periods even though overall water capacity is adequate. Because of potential contamination issues in these areas, adding a well is not a practical solution. To meet peak demands, the City will be installing water storage tanks that will provide 1,000,000 gallons of storage at each tank location. While these tanks will not produce additional water, they will meet the peak demands of these areas and provide higher system pressures for the industries and any fire protection needs that might develop.

Several new wells will be developed over the new few years. The City’s Water Master Plan<sup>9</sup> shows six new wells will be needed in addition to the three currently being planned. Each well is expected to produce 2,000 gpm. To reduce drawdown at each well, they will be located at least ½ mile from the nearest City well.

In addition to the above projects, the City is in negotiations with TID to provide 15 MGD of treated surface water. This water will be used to supplement the current well water supply and it will reduce the need for installing more water wells. As part of this project, several new distribution pipelines will be needed in order to move the water throughout the City.

**Table 19****Future Water Supply Projects**

Project Name	Normal-year AF added	Single Dry Year AF added	Multiple-Dry Year AF Added			Start Date	Completion Date
			Year 1	Year 2	Year 3		
2 Storage tanks	0	0	0	0	0	2005	2006
1 Water Well	1500	1500	1500	1500	1500	2005	2006
2 Water Wells	3000	3000	3000	3000	3000	2006	2007
2 Water Wells	3000	3000	3000	3000	3000	2007	2008
2 Water Wells	3000	3000	3000	3000	3000	2008	2009
Surface Water	16,000	16,000	16,000	12,000	12,000	2008	2012
2 Water Wells	3000	3000	3000	3000	3000	2009	2010

**Development of Non-potable Water**

There exists a potential to use additional groundwater sources that do not meet current water quality objectives. The City has used Well 21 at Pedretti Park for irrigation for several years. This well is high in nitrates and is not fit for human consumption but it does make a good source of irrigation water. This well is totally isolated from the potable water system.

At the new Turlock Regional Sport Complex, the City uses a shallow groundwater well to supply all of the irrigation needs of the facility. Like Pedretti Park, this is a separate water system and it is not connected to the potable water system.

The shallow groundwater aquifer that exists above the Corcoran Clay layer is a potential source for additional uses within the City. Because of the large landscaping demand in the area, this water source would not need any treatment to reduce pollutants but as described above, a separate distribution system would be required to isolate this source from the potable water supply. While this water source might meet potable requirements it is much more likely to be contaminated than the deeper aquifer. It also would be more susceptible to a decrease in quantity of water available during an extended drought.

**Table 20****Non-potable Water Sources**

Sources of Water	Yield (AF/Y)	Start Date	Type of Use
Well 21	65	1999	Park Irrigation
Sport Complex	120	2004	Park Irrigation

In the past, wells that no longer were in compliance with standards were simply closed and a new well was drilled to replace the water production lost. In the future however, wells that go out of compliance will be evaluated for installation of a water treatment system that could bring them back into compliance. This will require an economic analysis that will take into

account the age of the well, the availability and cost of water from other sources, and the cost of any treatment system that might be required.

## Projected Wholesale Water Supply

The City has been in preliminary negotiations with TID to potentially provide treated surface water. If this project were completed, it would initially supply the City with up to 15 million gallons per day of water and would supplement the existing groundwater system.

Table 21

### Wholesale Supplies (AF/Y)

Wholesaler	2010	2015	2020	2025
Turlock Irrigation District	16,800	16,800	22,000	22,000

## Water Shortage Contingency Plan

### Stages of Action

Because of the nature of the City’s water system, most of the year there is an excess of water capacity. It is only during the peak hours in the hot summer season when the system has been stressed. The City’s contingency plan was established to help minimize the peak periods of use by initially reducing the time periods when landscape watering is allowed. The City’s **Mandatory Conservation Plan** is shown in Section 6-7-405 of the City Code (See Appendix B).

Table 22

### Water Supply Shortage Stages

Stage No.	Water Supply Conditions	% Shortage
1	Year Round Mandatory Conservation	0
2	Water pressure less than 35 psig during peak hours	10
3	Water pressure less than 30 psig during peak hours	20
4	Well failure(s) that result in inability to meet peak demand and/or provide an adequate reserve for fire fighting	30
5	Major disaster severely limiting water production	50

### Minimum Supply Estimate

The City is fortunate to have a groundwater system that has been minimally affected by past droughts. During the drought in the late 1980’s, the City did have to lower the suction level on several wells by 40 feet but once this was accomplished, no further disruptions in water supply were noted. Currently, wells that are installed within the City water system are typically drilled deeper and have lower bowl settings than the older wells still in service.

Water consumption has more than doubled since the last drought and this has contributed to a significant lowering of the static water levels (aquifer storage) within the City limits. In an extended drought with limited surface water for irrigation, it is expected that water levels will decrease to record low levels and potentially could cause some of the City wells to have their output reduced or be turned off for lack of water.

The City has recently reviewed its existing wells to determine which ones would be most vulnerable to a three-year drought and what the impact of lowered water levels would be. This information was used to determine the minimum supply water outlined in Table 23.

**Table 23**

**Three-Year Estimated Minimum Water Supply (AF/Y)**

Source	Year 1	Year 2	Year 3	Normal
Groundwater	25,400	22,000	19,000	25,400

Catastrophic Supply Interruption

The City has an Emergency/Disaster Response Plan in place for any major catastrophes that could occur. The plan includes notification procedures, agency coordination, water quality testing and the repair guidelines needed to address any disaster. A summary of actions that might be required is shown below.

**Table 24**

**Catastrophes**

Scenarios	Summary of Actions
Regional Power Loss	Ensure emergency generators have come on line. Contact vendors to supply fuel for sites. Strict enforcement of watering restrictions. Increased water quality monitoring.
Earthquake	Check wells status and ensure emergency generators are operating where required. Isolate any distribution leaks and initiate repairs. Start chlorination if needed. Strict enforcement of watering restrictions. Increased water quality monitoring.
Terrorism	Notify law enforcement. Initiate repairs as needed. Increased water quality monitoring.
Water Quality Failure	Notify State and local officials. Initiate chlorination as needed. Increased water quality monitoring. Isolate source and flush system as needed.

Prohibitions and Penalties

There are several prohibitions that may take effect during water shortages. As any water shortage becomes more severe, the penalties and prohibitions increase.

**Table 25**

<b>Mandatory Prohibitions</b>	<b>Water Conservation Stage</b>	<b>Projected Reduction (%)</b>
Using a water hose for outside cleaning	All	
Watering when raining	All	
Using potable water for once thru systems.	All	
Allowing leaks to go unrepaired	All	
Excessive watering	All	
Washing vehicles during restricted hours	All	
Odd/even landscape watering 3 days/week	1	5
Reduced hours for landscape watering but still 3 days/week	2	5
Individual schedules required for large landscapes	2	5
Landscape watering limited to 2 days/week	3	15
Landscape watering limited to 1 days/week	4	20
New or recently drained pools not allowed to be filled	4	1
Construction water from hydrants banned	4	2
Discontinue use of decorative ponds and fountains	4	2
Private vehicle washing prohibited. Commercial facilities ok.	4	5
All landscape watering banned.	5	40
Commercial and industrial users will be required to curtail production.	5	10

<b>Penalties or Charges</b>	<b>Water Conservation Stage</b>
\$25 fine for 1st violation	All
\$50 fine for 2nd violation within a year	All
\$100 fine for 3rd violation within a year	All
\$250 fine for 4th and any subsequent violations within a year	All
Habitual water waster will require meter installation and metered rates	All
Discontinue water service for failure to comply	All

Revenue Analysis

Because only commercial and industrial accounts are metered, any revenue impacts due to reduced water use would be quite limited. Residential users provide 70% of the water sales for the utility and since they are currently billed on a flat rate this revenue stream would be unaffected by any stage of conservation. Commercial and industrial accounts make up the other 30% of the revenue and under the current plan their water consumption would not be curtailed except in a major emergency. The water budget has sufficient reserves to carry the City thru any foreseeable crisis but as the City converts more residential accounts to metered rates, the potential impact of reduced water sales on the revenue stream may require adjustments in the water rates in future years.

### Shortage Monitoring Procedure

The City water system has a radio telemetry system that monitors all of the wells. This system records flow, pressure and electrical use and provides a daily summary of the activity at all of the wells. Examination of these records will allow the staff to determine if there has been a significant change in water use. It can help identify when and where low water pressure areas develop. Also by examining the daily well production, the areas using the most water can be identified thus allowing water conservation personnel to target the heavy water use areas. All of this data is archived so that current water trends can be compared to previous years use patterns.

## **Recycled Water Plan**

### Coordination

The City of Turlock owns and operates a regional wastewater treatment facility. In addition to treating its own wastewater, this facility also receives wastewater from the City of Ceres, Keyes Community Services District and Denair Community Services District. Some of the unincorporated areas of Stanislaus County within the city sphere also have connections to the City system. As the owner and operator of both the water and wastewater systems, the City has taken on the responsibility of developing recycled water uses.

The City is a member of the Turlock Groundwater Basin Association along with other groundwater users within the basin boundaries. This association is in the planning stage of developing recycled water projects within the basin. When the City's current upgrade of the treatment plant to a tertiary facility is complete, there will be more acceptance of this water as a viable option.

### Wastewater Quantity, Quality and Current Uses

The current Water Quality Control Facility is being upgraded to tertiary treatment that is expected to meet current State of California Title 22 drinking water requirements. Once the plant upgrade has been completed, the effluent produced will be available for a much greater range of uses.

Currently the plant effluent is treated to only secondary standards and this has limited the acceptable uses to landscaping and some agricultural use. Except for a small amount of recycled water use, the majority of the current effluent flow is discharged to the San Joaquin River through the Harding Drain.

While water use has increased over 65% during the last 15 years, the volume of wastewater effluent discharged has only increased 27%. For the last few years, the volume of increase has averaged only 1% per year.

**Table 26****Wastewater Collected and Treated - AF/Year**

Type of Treatment	2000	2005	2010	2015	2020	2025
Secondary	11,730	12,300	12,915	13,561	14,239	14,951
Tertiary			12,915	13,561	14,239	14,951

**Current Recycled Water Uses - AF/Year**

Type of Use	Treatment Level	2005
Agriculture	Secondary	570
Landscape	Secondary	50
Discharge to Harding Drain	Secondary	11,680

The potential uses for recycled wastewater in and around the City are many. Some of the uses include industrial cooling water, agricultural irrigation, and landscape watering.

Because there is a large amount of farmland along side the treatment facility discharge pipeline, the cost to supply farmers with this water would be quite low. In the past, farmers have been reluctant to use recycled water because of the stigma associated with secondary treated water and the low cost of surface water. However, as the cost of surface water and well water increases, the economics of using recycled water will improve. In addition, once the tertiary treated water is available and found to be “safe” for crop use, demand for this product is likely to increase. Agricultural use has the greatest potential for increasing the recycled water demand.

Since the summers are very hot and dry, the use of the tertiary treated water for landscaping has a great potential. The use of this water would be most economical at sites that have large acreage. Because the cost of installing distribution pipeline in areas that have already been developed, it would be more economical to install these pipelines in areas slated for future development or where installation can be accomplished at minimum cost. This will initially limit the quantity of recycled water that can be used. Where distribution pipelines are economically feasible, the City may require developers of new areas to install dual distribution systems to facilitate additional recycled water use.

The City already has an industrial user that needs recycled water. The Walnut Energy Center will use up to 2 million gallons per day of recycled water in their power generation facility. There are many other industries located within this area that may also find a use for this water. The purple pipe is already available to supply recycled water to Pedretti Park and any other users the border the pipeline.

**Table 27****Potential Recycled Water Uses - AF/Year**

Type of Use	Treatment Level	2010	2015	2020	2025
Agriculture	Tertiary	1,200	2,000	4,600	8,600
Landscape	Tertiary	600	1,000	2,000	3,000
Industrial	Tertiary	2,200	3,400	3,400	3,400
Total		4,000	6,400	10,000	15,000

As previously noted, the agricultural community did not embrace the use of secondary treated recycled water even though it has been successfully used by one grower for several years. The lack of a distribution pipeline limited the amount of treated water that could be used for landscaping. Also, no industrial users were found during this period that could successfully use the secondary treated effluent.

**Table 28****Recycled Water Uses - 2000 Projection compared with 2005 actual (AF/Year)**

Type of Use	2000 Projection	2005 Actual
Agriculture	6,000	570
Landscape	400	50
Industrial	110	0
Harding Drain	8,060	11,680
Total	14,570	12,300

It is expected that the use of recycled water will increase dramatically in the future for several reasons.

1. A higher quality of recycled water will be available.
2. The price of surface water is expected to increase.
3. Well water supplies will become more expensive and the quality may decline.
4. Mandatory requirements for use of recycled water may be imposed on future projects.
5. Distribution lines will be in place so access to the water will be easier.
6. A low price for recycled water will be established so it will have an economic advantage.

**Table 29**

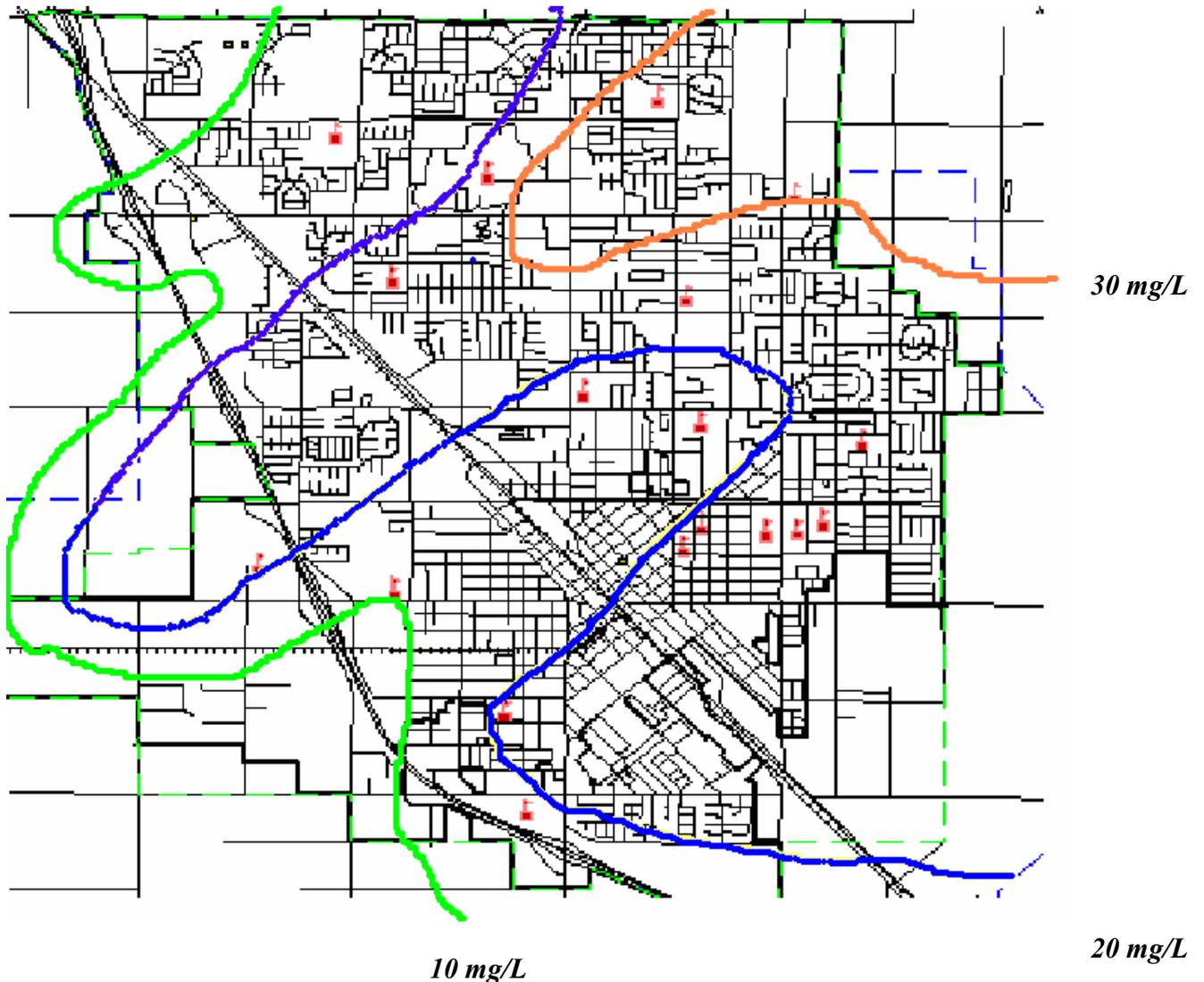
**Methods to Encourage Recycled Water Use**

<b>Actions</b>	AF of use projected to result from this action			
	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
Financial Incentives	500	1,000	2,000	4,000
High quality water	500	1,000	2,000	4,000
Distribution Lines Installed	200	400	800	1,200
Mandatory Use	200	400	800	1,200
Total	1,400	2,800	5,600	10,400

**Water Quality Impacts on Reliability**

The overall water quality within the City of Turlock water system is very good. Over the last five years, no well has been lost due to water quality issues. However, review of water quality records indicates there a gradual decline in water quality over time. A recent review of **Nitrate** levels in the City shows the levels rising from east to west and increasing over time. The movement appears to be following the general groundwater flow.

## 2005 Nitrate Levels



While the west side wells have lower nitrate levels, they tend to be higher in arsenic. All of the wells easily meet the current 50 ppb (parts per billion) limit but the new limit of 10 ppb that will start in 2006 will require treatment units on at least two of the current City wells. These wells will not be lost from production but will require an increase in operational and capital costs to safely remove the contaminant. Several other wells within the City are close to the new limit but remain within the safety parameters established by the new regulation.

There is a known PCE (tetrachloroethylene) plume in the old downtown area of the City. This area will not be used as a groundwater source since it has the potential for contaminating the water supply. On the perimeter of this area, the City has one well that occasionally has minuscule amounts of PCE detected in the well water. If the level of PCE were to rise in this well, an activated carbon filter would be installed to remove the contamination.

Two wells on the outskirts of the City have trace amounts of DBCP (dibromochloropropane). If levels of this compound were to rise in the well water, the addition of activated carbon filters at these locations would be required.

The following table indicates the potential loss due to water quality contamination that would not be economical to treat. The percentage of loss is less in the years following 2010 because of the potential to replace a large amount of the groundwater supply with surface water.

**Table 30**

Current and projected water supply loss due to water quality - %

Water Source	2005	2010	2015	2020	2025
Groundwater	0%	10%	5%	5%	5%

### Water Service Reliability

Because of the large quantity of groundwater available and the potential for surface water supplies to supplement this water source, the City does not anticipate any shortage of water over the 20-year planning period for any single dry year. Therefore, the anticipated demand for water will not exceed the capacity of the system to supply it.

**Table 31**

Projected Normal and Single Dry Year Water Supply - AF/Year \*

	2010	2015	2020	2025
Supply & Demand	31,301	37,400	44,200	52,300
% of 2005 Base Year	113%	136%	160%	190%

\* Includes all water sources

If a severe multi-year drought were to occur starting next year, there would likely be no immediate impact to the groundwater system. However, as farmers and others start relying on their groundwater wells instead of surface water, the impact to the groundwater table could result in the reduced capacity of the City well water system. This could result in demand exceeding supply and trigger need for the Emergency Water Shortage Plan. Beyond this time frame, if surface water becomes available, the City will be less vulnerable to a supply disruption of its well water system since it will have an additional water supply source. This scenario is shown in the following table.

**Table 32****Projected Supply and Demand During Multiple Dry Water Years Ending in 2010- AF/Year \***

	2006	2007	2008	2009	2010
Supply	28,400	29,100	26,900	27,500	28,200
% of projected normal	100%	100%	90%	90%	90%
Demand	28,400	29,100	28,300	29,000	28,800
% of projected normal	100%	100%	95%	95%	92%

**Projected Supply and Demand During Multiple Dry Water Years Ending in 2015- AF/Year \***

	2011	2012	2013	2014	2015
Supply	32,400	33,500	33,000	34,100	34,400
% of projected normal	100%	100%	95%	95%	92%
Demand	32,400	33,500	33,000	34,100	34,400
% of projected normal	100%	100%	95%	95%	92%

**Projected Supply and Demand During Multiple Dry Water Years Ending in 2020- AF/Year \***

	2016	2017	2018	2019	2020
Supply	38,700	40,000	39,400	40,700	40,700
% of projected normal	100%	100%	95%	95%	92%
Demand	38,700	40,000	39,400	40,700	40,700
% of projected normal	100%	100%	95%	95%	92%

**Projected Supply and Demand During Multiple Dry Water Years Ending in 2025- AF/Year \***

	2021	2022	2023	2024	2025
Supply	45,700	47,300	46,500	48,200	48,100
% of projected normal	100%	100%	95%	95%	92%
Demand	45,700	47,300	46,500	48,200	48,100
% of projected normal	100%	100%	95%	95%	92%

\* Includes all water sources

## **Review of 2000 Urban Water Management Plan**

In the 2000 plan, population growth by 2005 was estimated to be 62,322. The current estimate indicates growth was greater than expected with the population at the start of 2005 over 67,000. However, the previous plan predicted an average daily consumption of 25 million gallons per day but the current annual use is only 23 MGD.

The previous plan had six additional water conservation goals planned.

1. All commercial accounts were to have water meters installed. This plan is still active with only 200 flat rate commercial accounts left. The final meters should be in place by the end of 2006.
2. Installing water meters at residential accounts was recommended in the previous plan. To date this has only occurred on new service connections. Based on the recent state legislation requiring water meter installation at all accounts, the City is in the process of developing a bid request for the installation of meters and a remote meter reading system. The City plans to have the whole city metered by the year 2010. The installation cost will be financed with a bond issue. User rates have already been increased in anticipation of the need to pay for this financing and for other system improvements.
3. The 2000 plan indicated that reclaimed water would be used for a proposed golf course. The golf course project did not materialize.
4. Shallow groundwater wells were to be used to provide supplemental water for City parks. To date the City has two shallow wells in use. In addition, excess runoff water is being used to irrigate parkland at Summerfaire Park.
5. The City needs to continue to emphasize the proper operation and placement of sprinkler systems to minimize overspray.
6. Negotiations to obtain surface water as an additional water source for the City continue.

The amount of recycled water that was to be supplied to agricultural users is much less than anticipated in the 2000 plan. However, with the wastewater treatment facility upgrade to tertiary treatment, use of this valuable resource is expected to increase with time. Starting in 2006, up to 2 million gallons per day will be used at the Walnut Power Generation Facility. As the recycled water line expands (purple pipe) additional users are expected to come on line.

## References

1. “Stream In a Thirsty Land”, Hohentahl, Caswell & Others
2. City of Turlock Web Site Home Page
3. 2003 Housing Element Update of the City General Plan
4. “Turlock Groundwater Basin Water Budget 1952-2002”, December 2003, Timothy J. Durbin
5. Table 7.2 - Monthly Precipitation at Turlock, 1952-2002, Turlock Irrigation District records
6. <http://www.wrcc.dri.edu/CLIMATEDATA.html>
7. California Water Bulletin 118 (2003 Update)
8. City of Turlock 2003 Water Master Plan

## Appendix A

### Contacts and Participants

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Calif Water Quality Control Board  
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## Appendix B

### BEFORE THE CITY COUNCIL OF THE CITY OF TURLOCK

IN THE MATTER OF RESCINDING	}	RESOLUTION NO. 2006-013
RESOLUTION 2001-025 AND ADOPTING	}	
THE URBAN WATER MANAGEMENT	}	
PLAN UPDATE	}	
<hr/>		

**WHEREAS**, the California Legislative enacted AB 797 during the 1983-84 regular session of the California Legislative (Water Code Section 10610 et. Seq.) known as the Urban Water Management Planning Act, which mandates that every urban supplier of water providing water to municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan to plan for the conservation and efficient use of water; and

**WHEREAS**, AB 797 requires that the plan be periodically reviewed at least once every five years, and that the urban water suppliers shall make any amendments or changes to its plan which are indicated by the review; and

**WHEREAS**, the City of Turlock did prepare and file said Plan with the California Department of Water Resources in February of 2001 by Resolution 2001-025; and

**WHEREAS**, AB 797 requires that the updated plan be adopted by December 31, 2005, after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption, and

**WHEREAS**, the City is an urban supplier of water providing water to over 10,000 customers, and has therefore prepared and circulated for public review a Draft Urban Water Management Plan Update, in compliance with the requirements of AB 797, and a properly noticed public hearing regarding said Draft Plan Update was held by the City Council on January 10, 2006, and a Final Plan prepared:

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of the City of Turlock as follows:

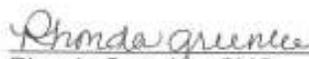
1. Rescind Resolution 2001-025 and adopt the Urban Water Management Plan Update;
2. The City Manager is hereby authorized and directed to file the Plan Update with the California Department of Water Resources within 30 days after this date, in accordance with AB 797;
3. The City Manager is hereby authorized and directed to implement the Water Conservation Programs as detailed in the adopted Urban Water Management Plan Update.,

including recommendation to the City Council regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation programs. Such steps will include further improvement of water use efficiency in all landscape areas under the City's control.

**PASSED AND ADOPTED** at a regular meeting of the City Council of the City of Turlock this 10<sup>th</sup> day of January, 2006, by the following vote:

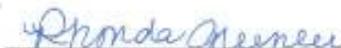
AYES:	Councilmembers Hatcher, Lazar, Vander Weide, Wallen and Mayor Andre
NOES:	None
ABSTAIN:	None
NOT PARTICIPATING:	None
ABSENT:	None

ATTEST:

  
Rhonda Greenlee, CMC  
City Clerk, City of Turlock, County of Stanislaus, State of California

The foregoing is a correct copy of the original on file in this office which has not been revoked and is now in full force and effect.



  
RHONDA GREENLEE, City Clerk of the City of Turlock, County of Stanislaus, State of California

## Appendix C

#	BMP	Requirements
1	Water survey programs for single-family residential and multifamily residential customers.	Survey 15% of residential customers within 10 years
2	Residential Plumbing Retrofit	Retrofit 75% of residential housing constructed prior to 1992 with low-flow showerheads, toilet displacement devices, toilet flappers and aerators
3	System Water audits, Leak Detection and Repair	Audit the water utility distribution system regularly and repair any identified leaks.
4	Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	Install meters in 100% of existing un-metered accounts within 10 years; bill by volume of water use; assess feasibility of installing dedicated landscape meters.
5	Large Landscape Conservation Programs and Incentives	Prepare water budgets for 90% of commercial and industrial accounts with dedicated meters; provide irrigation surveys to 15% of mixed-metered customers.
6	High-Efficiency Washing Machine Rebate Programs	Provide cost-effective customer incentives, such as rebates, to encourage purchase of machines that use 40% less water per load.
7	Public Information Programs	Water utilities to provide active public information programs to promote and educate customer about water conservation.
8	School Education Programs	Provide active school education programs to educate students about water conservation and efficient water uses.
9	Conservation Programs for Commercial, Industrial, and Institutional Accounts	Provide a water survey of 10% of these customers within 10 years and identify retrofiting options; OR reduce water use by an amount equal to 10% of the baseline use within 10 years.
10	Wholesale Agency Assistance Programs	Provide financial incentives to water agencies and cities to encourage implementation of water conservation programs.
11	Conservation Pricing	Eliminate non-conserving pricing policies and adopt pricing structure such as uniform rates or inclining block rates, incentives to customers to reduce average or peak use, and surcharges to encourage conservation.
12	Conservation Coordinator	Designate a water agency staff member to have the responsibility to manage the water conservation programs.
13	Water Waste Prohibition	Adopt water waste ordinances to prohibit gutter flooding, single-pass cooling systems in new connections, non-recirculation systems in all new car wash and commercial laundry system, and non-recycling decorative water fountains.

14	Residential Ultra-Low-Flush Toilet Replacement Program	Replace older toilets for residential customers at a rate equal to that of an ordinance requiring retrofit upon resale.
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## Appendix D

### Advertisement

#### **City of Turlock Notice of Availability (Public Meeting)**

Water agencies within the state are required to update their Urban Water Management Plans every five years. The City has scheduled two public meetings to discuss revisions of its plan and to receive additional comments. The dates for these meetings are:

Wednesday, November 9<sup>th</sup> at 1 pm at 156 S Broadway in the Yosemite Room (Council Chambers) on the second floor of City Hall.

Wednesday, November 9<sup>th</sup> at 7 pm at 156 S Broadway in the Yosemite Room (Council Chambers) on the second floor of City Hall.

At the meeting, the City will review the legislation requiring the plan and the information that must be included in it. Draft copies are available to all interested parties. Copies of the 2005 Urban Water Management Plan are available at the Municipal Services Department office at 156 S Broadway or you can find it on the City Web site at: <http://ci.turlock.ca.us/citydepartments/municipalservices/waterresources/index.asp>

All comments and suggestions received will be reviewed for inclusion into the final document. You can call 668-5590 for more information.



2/18/15

The above advertisement was printed in the “**Modesto Bee**” newspaper on Wednesday, November 2 and in the “**Turlock Journal**” on Saturday, October 29<sup>th</sup> and Tuesday, November 1<sup>st</sup>.