

## EXECUTIVE SUMMARY

Meeting the challenges of developing, managing, conserving and protecting precious water resources requires proactive leadership that understands the problems, identifies the solutions and empowers implementation. Completion of a regional water and wastewater planning study is one of the first steps to meet the challenges.

The study examines population projections, projected water supply needs, existing water resources, proposed water plans, and proposed cost estimates. The study also examines the current availability and viability of the proposed projects in the 2006 South Central Texas Regional Water Plan (Region L Plan) developed under guidance from the Texas Water Development Board (TWDB) to meet the water supply needs of Caldwell County. Potential regional water and wastewater projects were identified for consideration to meet the needs of the county.

In addition, management strategies are identified that could be considered for implementation to reduce potential non-point pollution loads into the surface water and groundwater resources of Caldwell County

Caldwell County, located in South Central Texas, is poised to grow at an increasing rate with a population estimate of 35,843 in 2008 to over 100,000 by the year 2040. The addition of over 64,000 citizens to Caldwell County will pose new demands on local resources for basic services including potable water for consumption. In addition, new strategies will be needed to protect the quality of surface water and groundwater.

These increased demands are occurring at a time when the availability of surface water and groundwater to serve new growth is limited. Surface waters in Caldwell County have been appropriated and only innovative strategies that scalp flood

flows without impacting environmental stream flows can be considered to develop additional surface water supplies. There is no additional “run-of-the-river” surface water available for permitting in Caldwell County.

Groundwater that is suitable for use with minimal treatment is available in Caldwell County from the Carrizo-Wilcox Aquifer. Studies completed by the Plum Creek Conservation District (PCCD) estimate that about 23,000 acre-feet (ac-ft) of water per year is the sustainable yield from the Carrizo-Wilcox Aquifer for Caldwell County. However, groundwater laws, developing groundwater regulations and a limited amount of groundwater are creating a permitting frenzy as potential users try to secure water for their needs. Water suppliers from outside the county and river basin have come to the Carrizo-Wilcox Aquifer in Caldwell and Gonzales Counties as a source for inexpensive high quality water. There may be little groundwater remaining to be permitted for increasing local demands because the water has been permitted to others for use out of the county or river basin. According to PCCD, as of February 2009, 16,514 ac-ft per year of groundwater withdrawals have been permitted in Caldwell County. Other large permits are pending.

Groundwater in the Carrizo/Wilcox Aquifer in Gonzales County is also subject to intense permitting pressure. Water modeling studies in Gonzales County indicate that a sustainable yield of about 13,600 ac-ft per year of water can be withdrawn on the east side of the county with a 100-foot drawdown and a sustainable yield of about 15,400 ac-ft of water can be withdrawn on the western side of the county. Permits totals of more than 15,400 ac-ft per year have been applied for on the western side of Gonzales County. The Gonzales County Underground Water Conservation District (GCUWCD) is refining its groundwater management plan for Gonzales County and it appears that permits will be granted with terms and conditions that curtail use when drawdown limits are reached. Pending permit applications are for the Hays/Caldwell Public Utility Agency and the San Antonio Water System.

The planning horizon for this study was selected as the period through the year 2040. Based on input from the Stakeholders and the State Demographer, during the approximate 30 year period, the population is projected to increase approximately 180% from 35,843 in 2008 to 100,000 in the year 2040. When a per capita demand of 150 gallons per day per person is applied, the yearly demand for municipal water will increase from 6,164 ac-ft to 16,803 ac-ft. Adding demands identified for mining, manufacturing, irrigation and livestock indicate a total current demand of 8,155 ac-ft per year in 2008 increasing to 18,495 ac-ft in the year 2040.

The population and water demand projections developed and adopted for this study are higher than the population and water demand values adopted for the 2006 Region L Plan. The 2006 Region L Plan estimated that the year 2040 population of Caldwell County would be 83,250 (compared to 100,000 adopted for this plan). The 2006 Region L Plan estimated the year 2040 total water demand for all uses would be 12,247 acre-feet per year (compared to 18,695 acre-feet developed for this plan). The larger population projections result from a higher migration rate to the county for this plan compared to the Region L population projections. The larger future water demands result from larger population projections and the adoption of larger per capita consumption rates for this plan than those adopted for the 2006 Region L Plan.

Over the planning horizon, a total of 8,432 ac-ft of water supply must be developed to meet projected water needs. Other types of water uses will collectively diminish and result in no need for additional water to supply mining, manufacturing, livestock or irrigation needs.

The proposed water management strategies contained in the 2006 South Central Texas Regional Water Plan were reviewed for applicability to meet the needs of Caldwell County. The only strategies identified in the 2006 Plan that are still

viable for Caldwell County are water conservation, additional development of the Carrizo/Wilcox, the Hays/Caldwell PUA and purchase from other wholesale water providers such as GBRA and CRWA.

Water conservation is a viable option. Public education, water use restrictions and inverse water rates are tools to implement water conservation. An aggressive water conservation program could reduce municipal water consumption from 150 gallons per capita per day to as low as 120 gallons per capita per day. The amount conserved would be 3,361 ac-ft on an annual basis and the new water required would be 5,071 ac-ft per year.

Carrizo/Wilcox groundwater can be developed in southeast Caldwell County or in Gonzales County. This is the approach taken by the Hays/ Caldwell PUA. However, uncertainty regarding the long-term availability of this water is questionable as groundwater conservation districts adopt policies that will grant permits for all requests for water and limit future drawdown conditions. A regional water supply project yielding 8,432 ac-ft of water per year could be developed from the Carrizo/Wilcox aquifer. However, the possibility of future curtailment exists if groundwater district rules require reducing consumption when water table drawdown limits are reached.

Purchase of water from wholesale water providers is a viable option if there is water available. All surface water rights are currently appropriated and there are no viable strategies in the 2006 Water Plan that bring water to Caldwell County. Thus, regional development of a new conjunctive use groundwater/surface water project would appear to be a possible solution to meet future needs.

A conjunctive use project that combines storing water ordinarily lost in excessive flood flows with groundwater for firming up the project yield appears to be an option for developing a water supply project to serve a region larger than Caldwell County. It has been estimated by the Guadalupe-Blanco River Authority

that 20,000 ac-ft - 25,000 ac-ft per year could be developed out of a conjunctive use project with surface water diversions occurring on the Guadalupe River at Gonzales (Mid-Basin Project). This water could be diverted, treated and piped through Caldwell County up to Comal and Hays County. The water providers in Caldwell, Hays and Comal Counties could benefit from this project.

The cost of development of water from the local Carrizo/Wilcox Aquifer to serve Caldwell County using a regional approach is estimated as \$34 million including collection, treatment and transmission to a regional distribution point. If a total of 8,432 ac-ft of water is developed by the project, the cost per ac-ft is estimated as \$4,032. The estimated unit cost of treated water at the regional water delivery point is estimated as \$3.46 per 1,000 gallons.

A main distribution system to disperse treated water from the regional distribution point near Lockhart along US Highway 183 and State Highway 130 is estimated as \$29 million.

Development cost for the Gonzales Mid-Basin Project has not been published but the total project cost will be spread over a larger annual water yield.

These water supply projects appear to be most reasonable to meet the long term needs of Caldwell County. Other opportunities may occur in the future but moving forward with these projects is a reasonable course of action.

Wastewater treatment in Caldwell County is currently accomplished with two centralized systems and numerous on-site sewage facilities (OSSF). As growth and densification occurs and subdivisions are constructed in the northern part of the county, the entities providing wastewater treatment and disposal will be faced with using a centralized, regional approach with a limited number of plants or a de-centralized approach with numerous plants each plant having its own operating

parameters and needs. For purposes of this plan, the centralized treatment plant approach was analyzed with plants located in the Martindale area, the Lockhart area and the Luling area. A fourth plant would be placed in the Peach Creek Basin once sufficient development has occurred in this area. These plants will provide service generally within topographic basins and be managed by public utilities to ensure proper operation and maintenance.

The total wastewater flow estimated for 2040 is 10.2 million gallons per day with total project development cost of the plants estimated as \$39 million. The cost is only associated with developing the treatment facilities and the network for collecting the sewage is not included in this number.

The new wastewater treatment plants would be permitted and constructed to enable reuse of the plant effluent for non-potable purposes. The reuse water would offset a portion of the need for development of new water. Water reuse systems generally require extensive piping networks to take the water to its point of use. For this reason, it is not cost-effective to retrofit current facilities, but rather incorporate into new systems.

Growth often results in degradation of surface water quality and can result in pollution of groundwater. Return wastewater plant discharges to streams can degrade water quality. Pollutant wash-off from impervious cover is a large contributor to increased pollution of streams but recent studies have shown that runoff from fields, pastures and lawns can add significant non-point pollutant loads. Inefficient and failing OSSF systems can add to pollutant loads in streams. The Plum Creek Watershed Protection Plan has identified point-source and non-point pollutant contributors which have impaired Plum Creek.

The following measures are recommended for consideration to assist in protecting water quality in streams:

- Reuse water from treatment plants without discharge to streams
- Implement water quality protection requirements for new impervious cover
- Review and if warranted, revise the OSSF permitting rules for setbacks from water bodies and increase separation distance
- Require periodic inspections and reports for all OSSF systems
- Develop and carry out an urban-oriented water quality protection education program that targets pollutants normally generated in urban areas
- Develop and carry out an agriculture-based water quality education program that targets pollutants ordinarily generated in rural areas
- Work with leaders in the county to make water quality protection an everyday concern

The limited depth of the study results in many generalizations and assumptions. Some opportunities have been identified for further consideration as additional planning and implementation work is done.

In the course of the study, the energy and interest of the leaders and citizens of Caldwell County were clearly identified. Water and water quality is important to Caldwell County and its citizens. Working together as a group, water needs can be met and long term, cost-effective solutions can be developed. Lack of water should not be the limiting factor that prevents the citizens of Caldwell County from realizing their potential.