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# With dry skies, city takes look at water supply

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The lifeblood of every West Texas community is water. And while prayer works well for some, the prudent use of available water resources requires careful planning.

Planning for the city's water needs — both short-term and long-term — is Will Wilde's job. Last week Wilde, the city's public works director, laid out for city council members the city's water management plan.

A shortage of rainfall this spring coupled with repairs to the leaky Twin Buttes Dam have San Angelo City officials eyeing water resources in Tom Green County and beyond.

Managing water needs for a city of almost 90,000 in a semi-arid environment isn't easy, as

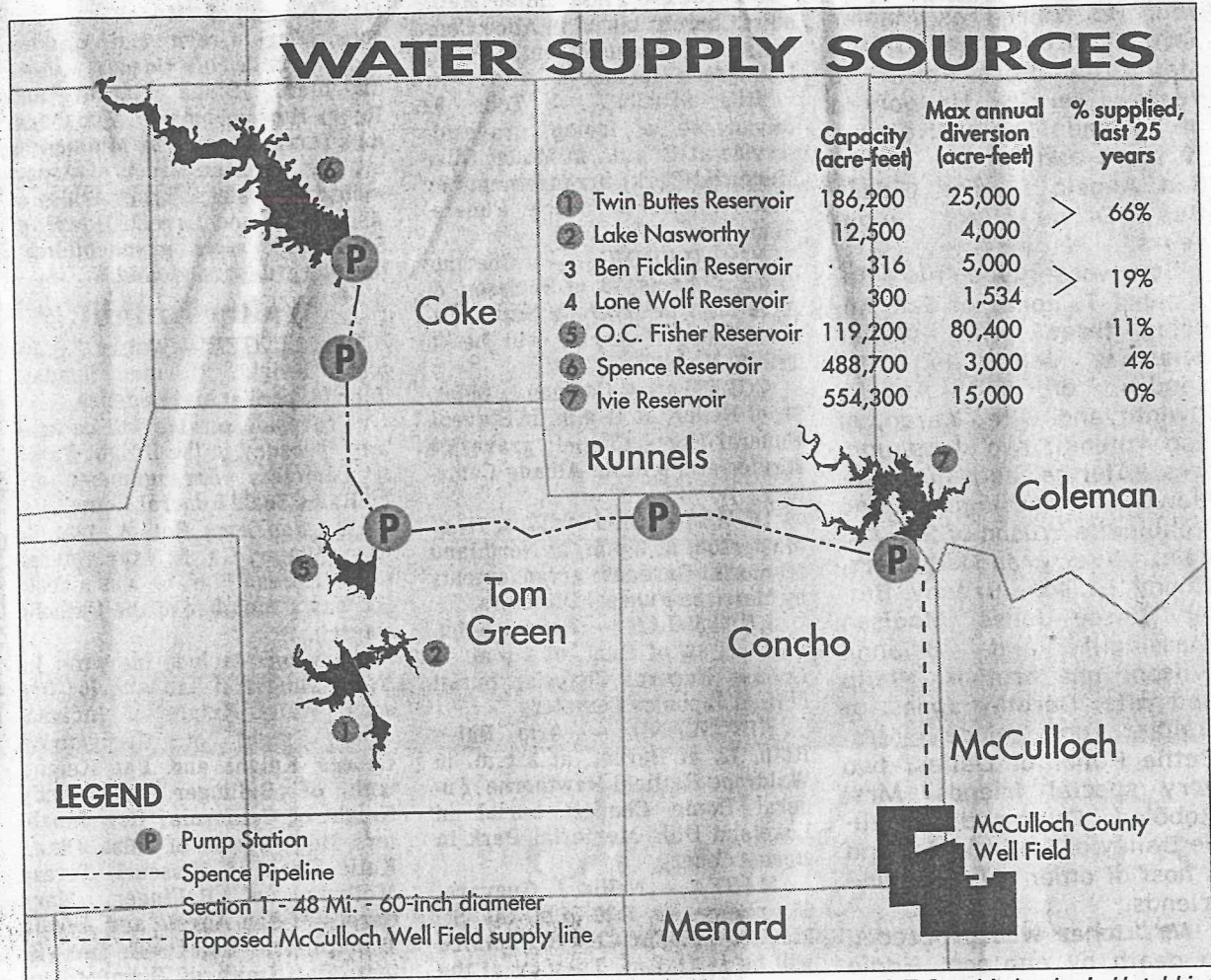
the management plan points out. With average annual rainfall at 20.5 inches and a pan evaporation rate averaging 80 inches a year, water resource management is paramount.

"The city of San Angelo must constantly seek ways to stretch available resources through development, conservation and sound management practices," the plan states.

The first step in managing the city's water resources is comparing the city's annual available supply with demand. According to Wilde, the city uses between 18,000 and 20,000 acre-feet of water a year.

One acre-foot of water is that amount of water needed to cover one acre of water one foot deep. One acre-foot of water contains

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Source: City of San Angelo

S-T Graphic by Janie Hotchkiss



# WATER

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approximately 325,850 gallons.

That means San Angelo uses between 5.9 billion and 6.5 billion gallons of water a year. That's roughly 65,000 gallons a year for every man, woman and child living within the city limits.

To meet supply needs, the city has legal water rights to several local and regional water sources.

Sources by order of use include Ben Ficklin and Lone Wolf reservoirs, Lake Nasworthy, Twin Buttes Reservoir, O.C. Fisher Reservoir, Ivie Reservoir, Spence Reservoir and the McCulloch County Well Field.

Currently, the city has legal rights to approximately 134,000 acre-feet — 43 billion gallons — of water a year from all sources. But that's only in ideal conditions when area lakes are at their optimal levels.

The city can pull about 116,000 acre-feet out of local water storage sources. Local storage sources include Ben Ficklin and Lone Wolf Reservoirs, Lake Nasworthy, Twin Buttes Reservoir and O.C. Fisher Reservoir.

But the local sources don't contain anywhere near that amount of water right now, Wilde said.

As of Friday, the city had roughly 55,592 acre-feet of water in local storage. That's down from about 65,300 acre-feet only six months ago.

"The question is at what point do we begin planning and looking at outside sources to begin supplementing our water needs?" Wilde said. His answer is 50,000 acre-feet.

"As the level keeps dropping, it looks like about September before we'll have to go to other sources beyond our local resources," Wilde said.

Going to outside sources — first Ivie Reservoir, then Spence Reservoir — is a costly proposition because of the added costs associated with pumping the water through the Ivie and Spence pipelines.

The exact cost of pumping water from outside sources is not available. City officials have estimated a cost of roughly \$1 million to pump from Ivie or Spence an extended period of time. The city has about \$500,000 set aside in case the city needs to pump water from Ivie.

Historically, the city has only had to pump water from outside sources seven times in the last 25 years. The city pumped consistently from Spence between 1970 and 1975 and then pumped from Spence again in 1984 and 1985. The city has never had to pump from Ivie.

Wilde is hoping the city can put off pumping from Ivie or Spence. He noted that historically September is a wet month in the Concho Valley, which may help the city get by using local water resources through the winter and spring months.

"If we're going into the fall and winter months, we would probably wait to save that expense until we

## San Angelo water sources

### San Angelo's water sources by order of use

#### Ben Ficklin and Lone Wolf Reservoirs

These reservoirs are formed by two small dams in the main channel of the South Concho River.

The city has had water rights to Ben Ficklin Reservoir since 1916 and to Lone Wolf Reservoir since 1914.

The city can take 5,000 acre-feet of water from Ben Ficklin reservoir and 1,534 acre-feet from Lone Wolf annually.

Historically, these reservoirs have served the city's water needs through the fall and winter months. The water management plan states that both reservoirs should continue to be the city's primary water source when water is available.

#### Lake Nasworthy

Built by West Texas Utilities in 1929, the dam and reservoir are now owned by the city.

The city can take 4,000 acre-feet — 1.3 million gallons — from Nasworthy each year.

The lake is maintained at a constant level for recreational activities and to maintain a constant water supply to the WTU power generation plant, located on the lake's north shore.

The lake can only store about 2,000 acre-feet of excess storm water, making it necessary to utilize the lake for city water needs whenever floodwaters enter Nasworthy.

#### Twin Buttes Reservoir

The Twin Buttes Dam and reservoir are owned by the U.S. Bureau of Reclamation. When the dam was permitted by the state in the early 1960s, city gained water rights to divert 25,000 acre feet — about 8 million gallons — a year for the city's water needs.

Water level restrictions imposed by the bureau significantly restrict the reservoir's ability to store storm water. The reservoir was designed to hold approximately 680,000 acre-feet of water.

But during dam repairs, scheduled to begin this summer, the bureau will only allow 67,000 acrefeet in the reservoir. Construction on the dam is expected to continue into 1998.

#### O.C. Fisher Reservoir

The reservoir is owned by the U.S. Army Corp of Engineers. The city has a contract with the Upper Colorado River Authority to use 80,400 acre-feet of water a year.

But O.C. Fisher hasn't been a consistent source for the city. In fact, the city has only taken water from O.C. Fisher nine of the last 25 years. The last time the city used O.C. Fisher water was in 1992.

The lake's gravity flow pipeline makes water diversion difficult when the lake's capacity drops below 36,000 acre feet. Currently, the lake is only holding about 15,500 acre feet.

The water management plan recommends using O.C. Fisher as a supplemental source after other local sources are depleted.

#### O.H. Ivie Reservoir

The reservoir, located in northern Concho and southern Coleman counties, is owned and operated by the Colorado River Municipal Water District.

Because San Angelo helped out with the cost of constructing the reservoir, the city has permanent right to about 16.5 percent of reservoir's total capacity.

This allows the city to divert about 15,000 acre-feet — about 4.9 million gallons — of water annually. The city has never tapped this water source.

"The substantially higher delivery costs for this water as compared to local sources, however, makes this source a lower priority economically," the plan states.

#### Spence Reservoir

The reservoir, located in central and northern Coke County, is also owned and operated by the Colorado River Municipal Water District.

San Angelo has water rights to 3,000 acre feet — roughly 980,000 gallons — of water annually.

The city has only tapped Spence for its water needs seven out of the last 25 years. San Angeloans last sipped Spence water in 1986.

Like Ivie, Spence water is expensive because of pumping costs. The water management plan recommends Spence be used after Ivie water has been exhausted.

#### McCullough Well Field

When San Angelo's surface water sources reached critical levels between 1967 and 1971, the city began searching for ground water alternatives.

The city has underground water rights to 37,633 acres of land in Concho, McCulloch and Menard counties over the Hickory Sandstone Aquifer.

The city drilled nine test wells in the 1970s. Currently, those nine wells are capped. City officials have plans to drill 19 more wells.

Legal wrangling between the city and the Hickory Underground Water Conservation District over the city's water permit has put drilling plans on hold.

The city's plan includes building a pipeline from the well field to the O.H. Ivie pipeline. The pipeline would have a daily capacity of 20 million gallons per day and a pumping rate of 500 gallons per minute.

needed it in the summer season," He said.

Another drain on local water resources is irrigation, which Wilde said can take up to 25,000 acre-feet — about 8 million gallons — from local water resources.

But the irrigation district can only take water from local sources when water levels in lakes and reservoirs are over certain levels. Currently, most local sources are below those designated levels.

In March, the city council allowed the Tom Green County Water Control and Improvement District to take about 4,300 acre-feet from Twin Buttes Reservoir even though the lake's capacity had dropped below 40,000 acre-feet.

City Manager Tom Adams said the city's long-term water plan

includes possible construction of a pipeline between Twin Buttes and O.C. Fisher that would allow emergency pumping from one reservoir to the next in the event of a major flooding event.

Another plan in the works is to acquire more water rights to Spence Reservoir. Adams said the city has already had preliminary conversations with Colorado River Municipal Water District officials about increasing the city's water rights.

Spence Reservoir has had problems with salt seepage, but Adams said CRMWD officials have assured him they are working to correct that problem.

"Looking long-term, Spence needs to be a part of our total water picture," Adams said.