

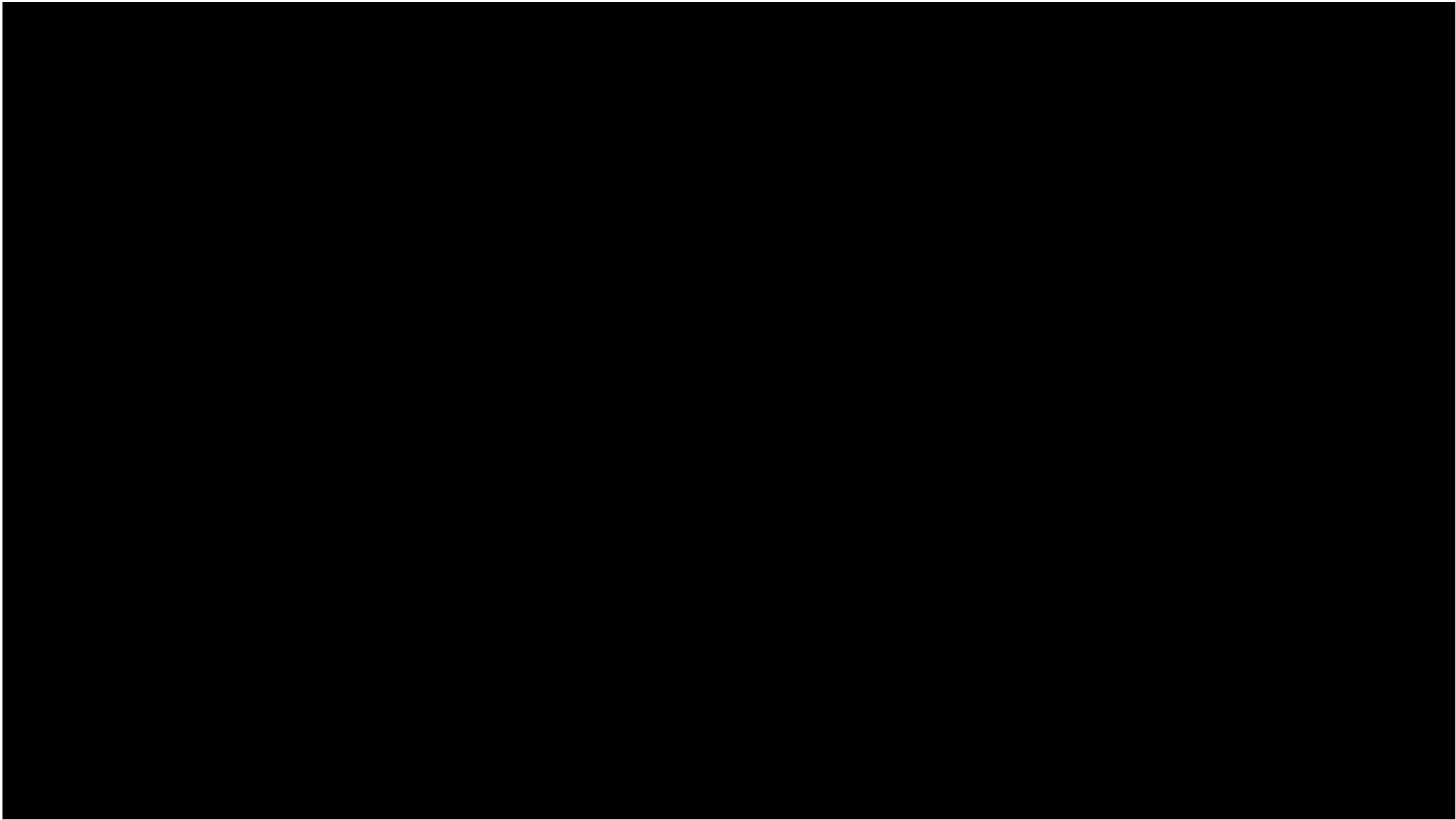


Interesting Information About Groundwater

In the Past, Now and In the Future

Robert Mace

How the Aquifers were Created



Texans use about 16.5 Million Acre-Feet/yr

- 1 acre foot = 325, 851 gallons
- 60% is groundwater
- 40% is surface water
- 80% of all groundwater is used for irrigating crops
- Texas has about 6.3 million acres of irrigated agricultural land
- Texas has 32 Aquifers state wide
- 9 of these Aquifers supply about 97 percent of the GW we use
- Ogallala aquifer supplies about 2/3 of all GW we use in Texas
- Ogallala is one of the worlds largest aquifers – underlies 174,000 square miles and 8 states



What Can
You Do To
Help

RAINWATER HARVESTING



BURLESON AND MILAM
COUNTIES AVERAGE
= 37 INCHES
OF RAIN PER YEAR



1000 SQUARE FOOT ROOF

CATC 600 GALLONS OF WATER
IN A 1" RAIN



= 320 GALLONS

AVERAGE HOME WATER
USE PER DAY



100 GALLONS

USED OUTDOORS
DAILY

RAINWATER HARVESTING BENEFITS

- REDUCES DEMAND ON EXISTING WATER SUPPLY
- REDUCES RUN-OFF
- REDUCES EROSION
- REDUCES CONTAMINATION OF SURFACE WATER



Garden and Flower Beds

Emergency Back Up

Washing Car and Pets

Cattle and Livestock

Lawn/Landscape

Filling Aquarium

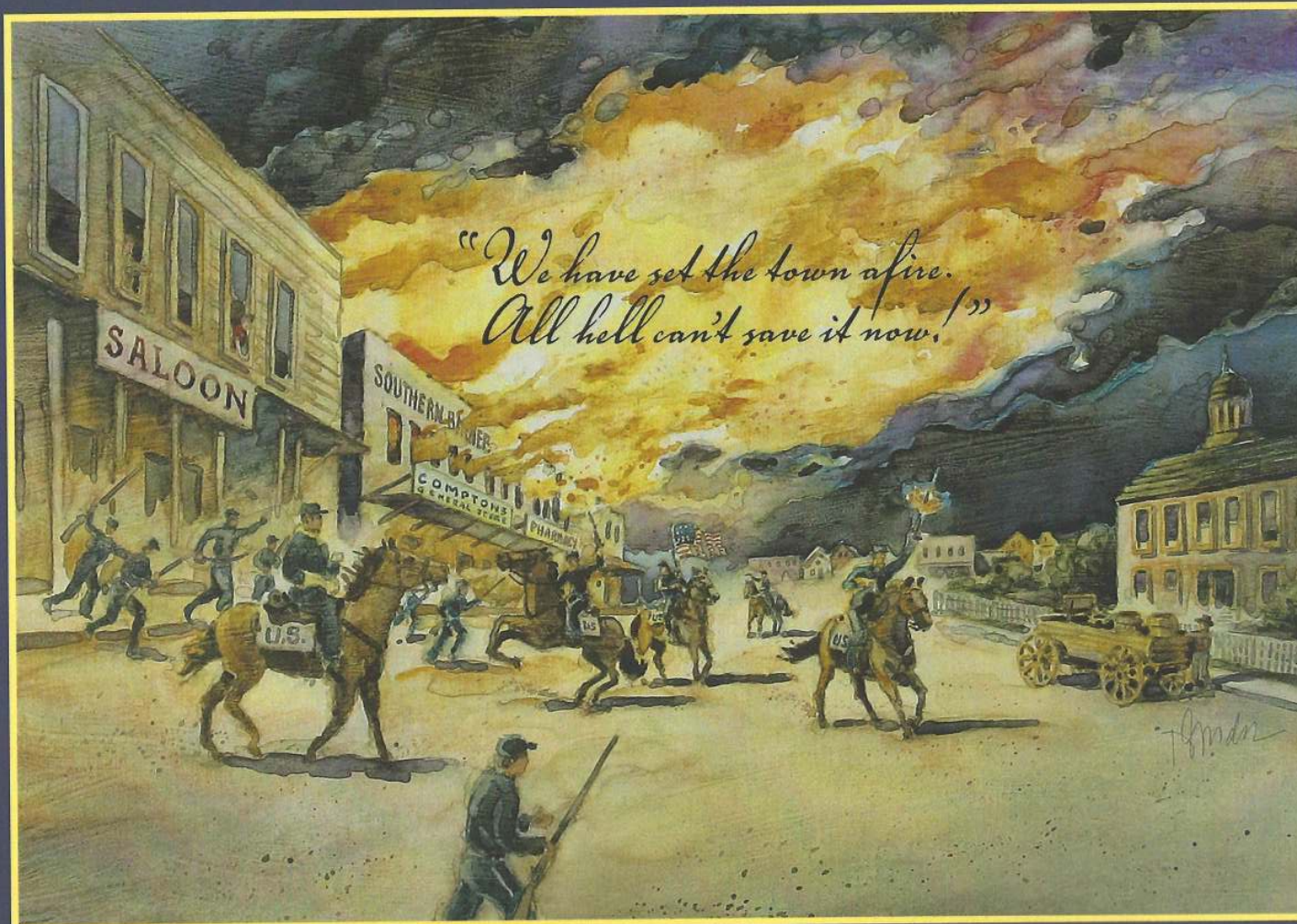
Fire Protection

USES FOR RAINWATER



The Burning of Brenham

Discover Washington County's colorful past.



Second Edition

by Sharon Brass



Get Your Own Cistern!

Water conservation is a growing concern in the United States. In many areas, water is scarce and expensive. A cistern is a simple, effective way to collect and store rainwater for use in your home or business. It can help you save money on your water bill and reduce your environmental footprint. A cistern is a simple, effective way to collect and store rainwater for use in your home or business. It can help you save money on your water bill and reduce your environmental footprint.



There are many reasons to install a cistern. It can help you save money on your water bill and reduce your environmental footprint. A cistern is a simple, effective way to collect and store rainwater for use in your home or business. It can help you save money on your water bill and reduce your environmental footprint.

1861
(25 years after TX
Independence)

15,500 people
lived in
Washington Co

At the same time
9,000 in Houston
and
4,000 in Austin

Also in 1861
RR from Brenham
to Galveston was
finished

For 10 yrs
Houston,
Galveston and
Brenham were
the only RR
towns in TX

2

EARLY BRENHAM

Wild West Boom Town

The railroad brought a surge of people and prosperity to Washington County in a very short time. It had the largest population of all Texas counties during the Civil War.

The 15,500 residents of Washington County far exceeded Houston with 9,000 people, and Austin with only 4,000. Slaves accounted for over half the population – there were numerous extensive ranches and plantations here, some with large elegant homes in the Southern tradition.

Brenham streets were alive with businessmen, merchants, shoppers, farmers, plantation owners, travelers, military troops, horses, wagons and stagecoaches.

Looking west on Railroad Street
(from Commerce Street)

The large train station was the hub of activity. Because Brenham was the end of the rail line from Galveston and Houston, the busy depot was the distribution point for people and cargo.

Incoming trains brought pioneers from Europe and northeastern U.S. who sailed into Galveston and rode the train to Brenham. They unloaded their possessions from railroad platforms onto carts and horse-drawn wagons. Some settled in the area. Others headed west in wagon trains or stagecoaches.

Trains also brought merchandise and supplies that were loaded into wagons and warehouses at the depot. Brenham's hardware stores sold many of these goods, and the rest were hauled in freight wagons to Austin, San Antonio and beyond.

Trains returned to the coast loaded with cotton, corn, cattle and manufactured goods made here. From Galveston, Washington County products were shipped to world-wide markets bringing necessity and prosperity to local planters, ranchers and businessmen.

Although the constant flood of travelers brought wealth to the community, it also brought problems. Like any boom town, frequent violent crimes kept lawmen busy. Washington ranked 9th, of 129 Texas counties, for frequency of crime.

Violence swelled at the end of the War when slaves were freed, some turning to crime. Many "freedmen" refused to harvest crops for wages, believing that freedom meant they no longer had to work. As a result, wealthy plantation owners lost their fortunes and developed quick tempers.

"The freedmen are rapidly learning their names and evince a better disposition to earn their bread by the sweat of their brow. Let us give them a fair, remunerated trial by doing every honest effort to make them so labor."

The interest of the Planter is doubled with the success of the freedmen. One cannot flourish without the aid of the other."

Brenham Enquirer, January 20, 1866

When the famous General George Custer passed through Brenham with his wife, Elizabeth, in August of 1865, she wrote in her diary about the town.

"New business houses are being opened weekly. New buildings are being erected, while the old tenements are repaired and stocked with goods. The cars on the Washington County Railroad have made regular trips...with extensive freights of merchandise and departing with long trains of cotton. The days are kept busy from early dawn to dusky eve in removing freight from the Depot to the numerous stores...the sales seem to keep pace with the arrivals. We hear of a number of lots having changed hands at good prices, having been purchased by persons who contemplate building and settling in this place."

Brenham Enquirer, February 3, 1866

"It was a lawless country. Each man, even the boys of twelve, went around with knives, bullets and buckshot and everything their own way. They had not their hearts of temper when the attack of rage came on. It was a common occurrence to shoot down men here for any offense whatever. It was so easy, if a crime was committed, to slip into Mexico."

Courtesy of Texas State Library and Archives Commission

With the town full of transients, outlaws and racial tensions, most people walked the streets with weapons. The mood was tense, and conflicts were frequent. This atmosphere prevailed at the end of the Civil War, leading to devastating events in Brenham.

This plaque graciously sponsored by Dr. Buddy & Judy Krieger

EARLY BRENHAM

3

Union Soldiers Bring Trouble

Before the Civil War, 95% of Washington County voters supported secession. No battles took place in the region, but many local men joined the Confederate Army and went off to fight.

At the end of the War, Union Major General P.H. Sheridan was put in charge of bringing Texas and Louisiana back under Union control. Sheridan was known as an arrogant upstart, and he openly disliked Texas.

Brenham was one of Sheridan's first priorities because it was Texas' largest economic center, and had more slaves than whites. He sent two companies of Federal troops here in July of 1865, numbering 200-300 men.

Leading this force of armed soldiers was Brigadier General George W. Smith who set-up camp a short distance east of Brenham's first house. The large, tired Texas army quickly became and he as "Campus."

He also sent him, the newly-arrived Freedmen's Bureau men descended on Washington County with arms. Their purpose Texas protect the rights of freedmen and help them from wrongdoers. He sent Confederates.

Samuel A. Craig was in the middle of this descent. Brenham's Freedmen's Bureau quickly joined forces with the army. They set-up Texas protect the rights of freedmen and help them from wrongdoers. He sent Confederates.



Major General Philip H. Sheridan

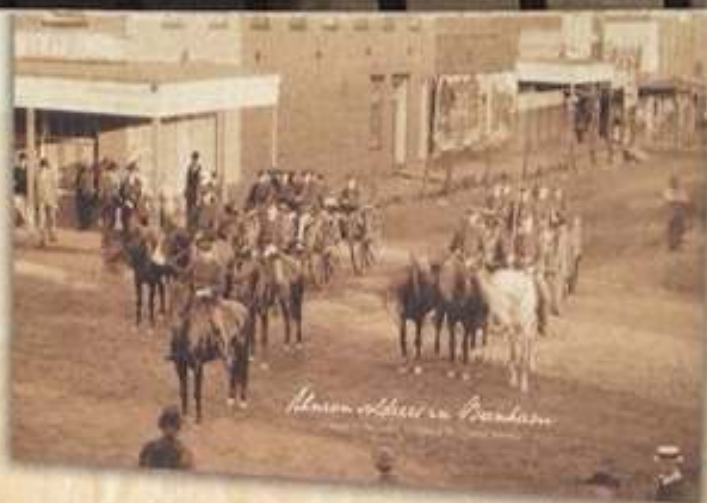
"If I owned Texas and Hell, I would rent Texas and live in Hell."

Major General Philip H. Sheridan, in charge of Union troops in Texas and Louisiana after the Civil War. This was one of his famous quotes, spoken in 1865. He was known for his harsh treatment of the South and his dislike of Texas. He was also known for his love of horses and his love of the South.



This Army map of 1865 shows their large "Campus" 114 miles from the Brenham courthouse, off Sandy Street which is now Adams Street.

It's interesting to see additional landmarks the Army highlighted on this map including the distillery and brewery.



Courtesy of Brenham Heritage Museum

The rowdy soldiers under Smith and Craig were allowed to terrorize local residents at all hours. They roamed the streets, often drunk, hurling insults and threats. Many conflicts with townspeople resulted in violence and arrests. A church was burned. The murder rate escalated, and lynchings were sometimes discussed on both sides.

So much turmoil and violence kept Brenham's newspaper quite busy. The editor of the *Southern Banner*, Daniel L. McGary, enthusiastically criticized the Federal. Affectionately called "Uncle Dan" by his readers, McGary wrote entertaining articles about the dastardly deeds of the Union soldiers and Freedmen's Bureau. The more he wrote, the more he angered Smith, Craig and Sheridan.

By the summer of 1866, Brenham residents believed they had endured enough military rule. In July, Craig returned from a Houston trip

to find that he had been kicked-out of his office. The sign had been torn down and his possessions were in the street.

Craig was furious. He blamed McGary, and his incessant articles in the *Banner*, for the public hostilities towards him.

Craig arrested McGary on August 8th, with Sheridan's permission and Smith's help. McGary was ordered to stop his "persistent abuse" and "false accusations" of the Freedmen's Bureau. He was fined and released.

McGary used his arrest incident as fuel for more stories in the *Banner*. His humorous articles further endeared him to readers.

Craig threw McGary in the Brenham jail again. Guarded by local authorities, McGary was allowed to receive visitors. He continued writing fiery articles from his cell, that ended up in print. Each edition of the *Banner* brought McGary more support from the public.

4

The Burning of Brenham in 1866

It was Friday night, September 7th, and the atmosphere in Brenham was downright hostile. During the past year of living under military rule, residents had been relentlessly harassed by Union soldiers. Violence was routine.

Lynch were further appalled by the recent arrival of their beloved "Chin Duct" McGary, editor of the *Southern Banner* newspaper. He had been released four days earlier, but residents continued to build between citizens and the soldiers living at nearby Camptown. All that was needed was a spark to trigger the inevitable explosion. On this night, that spark was provided. Henry Foster, a black community leader, had organized a demonstration. Since the start of 1866, it was well attended.



"It is too much to bear to have our city burned. We doubt to burn up McGary's property."

J.D. Goldings from Austin, September 9, 1866, in a letter to his son in his hometown, Brenham. J.D. was a prominent businessman, lawyer, banker, and founder of the Washington County Railroad. When Brenham burned, he was serving as Austin on the first Texas Legislature after the Civil War.

to meet funds for a new black school.

After only the second dance, Foster's guests saw a half-dozen blue uniforms appear at the door. The soldiers were also black men and drunk. Foster welcomed them, asking them to pay. The soldiers were insulted. "We never pay for anything!"

Two soldiers threw Foster aside and charged into the room, followed by loud companions. They grabbed Foster and swung him out to the dance floor, trying to force them to drink from whiskey bottles. The women were terrified.

Foster announced that the hall was over, asking everyone to go home. The room quickly emptied. Enraged, the soldiers badly beat Foster and a

stranger who was trying to get away. Other slow runners, mostly women, were viciously thrown down in the dirt street.

"We have broken up the negro ball and we are going to break up the white ball at Duke's!" declared Private John Mackey who wanted to be leading the soldiers.

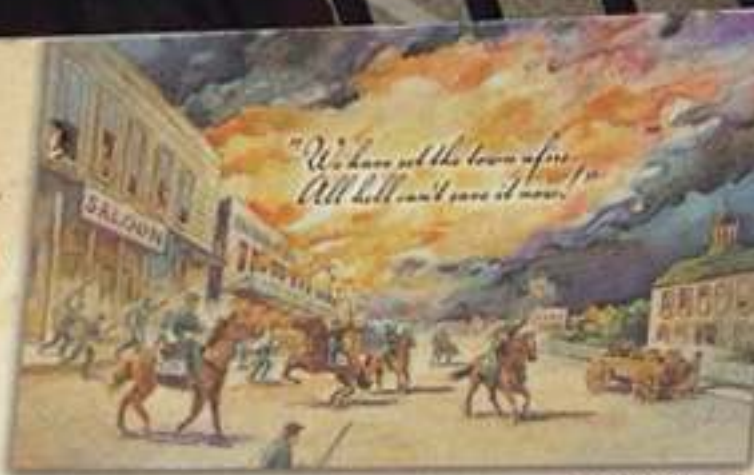
Just a few blocks away, a group of white community leaders were also hosting a dance at Duke & Brothers Dancing Academy, a room on a second floor.

As the soldiers entered the second dance, they threw an unbroken down the stairs and into the street, where they beat him senseless. They were loudly laughing, singing and cursing.

The ruckus broke up the dance. W.H. McAllister came halfway down the stairs and tried to calm the soldiers. "This is no place to raise a row. There are ladies upstairs and we do not wish any difficulty." He was seized on the stairs by W.R. Wyatt. The soldiers drew bayonets, knives and revolvers on the unarmed citizens.

McAllister and Wyatt backed off and the soldiers showed them out the door. Most guests were still upstairs, and the soldiers had possession of the street.

Within minutes, Wyatt and McAllister returned with Tommy Lusk and Oscar Compton. All were holstered six-guns. They easily found the group of soldiers, about six men, still in the street.



Mackey reached for his revolver, trying to shoot Wyatt. Wyatt was faster, and pistol-whipped Mackey on the head. Mackey's gun went off. A barrage of gun shots followed, from all ten men, in the dark of the night. Two soldiers were wounded—one seriously. The Brenham men had been faint on the dance.

The shooting drew a crowd. Captain Samuel A. Craig, head of the Freedmen's Bureau office in Brenham, ran up the street with a drawn revolver. The local shooters disappeared into the crowd. Craig found a doctor to dress the soldiers.

wounds and then took them home to Camptown. There he found Major Smith, commanding officer of the Union troops in Brenham, furious with the news of his wounded men. The two officers immediately rode back into town with about 10 trusted soldiers. The rest of the company followed on foot.

After searching Brenham, only two of the local shooters could be found. They were sent to Camptown for confinement. Their escorts had orders to shoot them if they tried to escape.

Wyatt's saloon was looted and ransacked. In the same block, Compton's Dry Goods Store was also wrecked, and everything of value was hauled off to Camptown.

Soon smoke and sparks belched out of Compton's store and it went up in flames. Several young men had been sleeping upstairs in the *Southern Banner* newspaper office. They ran down the stairs, dodging gunshots and flames, and barely escaped with their lives.

As the last soldiers darted out the door they shouted, "We have set the town afire. All hell can't save it now!"

Some soldiers mounted their horses and raced down the street. Others stayed outside the burning buildings laughing, singing, smoking cigars and drinking from whiskey bottles.

When flames had spread through the entire block, the last soldiers finally rode away. Townsfolk gathered, but they could see the

inferno was far too advanced to put out with their buckets of water.

It was about 3:00 am. The entire block of buildings burned while residents helplessly watched.

The fire of 1866 destroyed a dry goods store, a drug store, a saddler's shop, two saloons, a bookstore, a soda fountain, two & medical offices, and a warehouse full of goods. And the office of D.I. McGary's *Southern Banner* newspaper was totally demolished. The fire was started in Compton's store, directly below the *Southern Banner* office on the second floor.

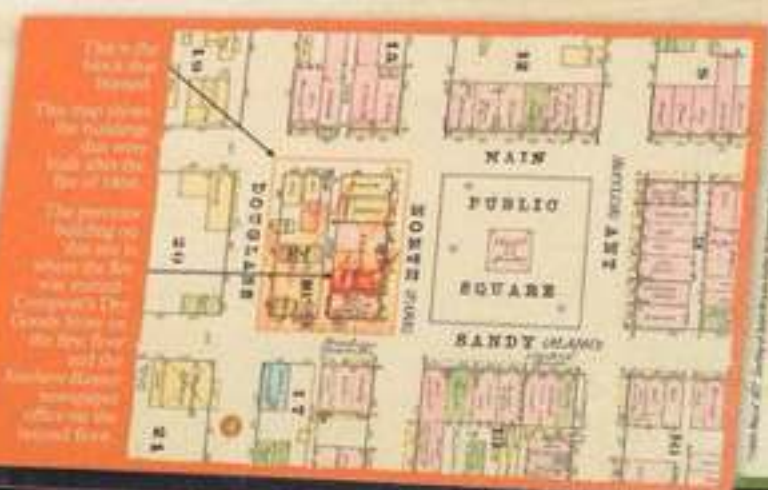
Although it was never proven, it was widely believed that the fire was set to destroy McGary's printing equipment and to silence him. Otherwise, many people would have been content to just loot and ransack Compton's store. This also explains why soldiers stood guard in the street until the block containing McGary's press had thoroughly burned.

Source: *History of the State of Texas*, by George W. Davis, Jr., published by the University of Texas Press, Austin, Texas, September 22, 1900.



"The burning of the ground was a terrible loss to the people of Brenham. I doubt to burn up McGary's property."

D.I. McGary, editor of Brenham's *Southern Banner* newspaper, September 12, 1866, in a letter to his Austin office.



5

Aftermath of the 1866 Burning of Brenham

On Saturday morning, September 8th, Jabez Demming (J.D.) Giddings awakened in Austin to the devastating news that his hometown had burned during the night.

A prominent Brenham attorney, J.D. was serving in the Texas Legislature. He and Governor James W. Throckmorton both received messages by telegraph that morning. Reports placed responsibility on Brevet

"Those soldiers who violate the laws shall not go unpunished!"

Texas Governor James W. Throckmorton in a telegram to Union Colonel E.C. Mason, September 14, 1866. Throckmorton was the first Texas governor after the Civil War. Brenham burned one month after he took office.



Governor James Webb Throckmorton

The Brenham Fire of 1866. A Texas Reconstruction Story. William L. Burtch, 1973

Major George W. Smith, commander of the Union army post in Brenham, and Captain Samuel A. Craig, head of Washington County's Freedmen's Bureau office. Both men had been seen giving orders that led to burglaries, looting and arson by Federal soldiers.

Throckmorton immediately wrote U.S. President Andrew Johnson, demanding that the two Union officers face civil courts. He appointed J.D. to lead a Texas Congressional committee that would investigate the events in Brenham.

Photo courtesy of the Western Archive Collection, University of Oklahoma Libraries

Photo courtesy of the Western Archive Collection, University of Oklahoma Libraries



Major General Philip H. Sheridan

"I received a dispatch yesterday of the burning of Brenham by Federal soldiers, the Gov[ernor] also received a dispatch at the same time. It is too much to bear to have our city burned. The Gov will try and get the troops all removed to the frontier where they should have been long since. Efforts have been made by the Gov ever since he was inaugurated."

Texas Congressman Jabez Demming Giddings from Austin, September 9, 1866, in a letter to his son in his hometown, Brenham.

Courtesy of Heritage Society of Washington County

Meanwhile in Brenham, word quickly spread and the hated army commander was dubbed "Houseburning Smith." Dr. J.T. Norris made his normal Saturday medical visit to Camptown, the nearby army post. Smith told him, "I have little doubt that my men set fire to the town."

But Smith changed his story by Monday. The morning train from Galveston brought his superior officer, Colonel E. C. Mason, to investigate. Smith told Mason that Brenham residents had looted and set fire to the town, disguised in U.S. army uniforms to place blame on him and his soldiers.

Mason's report to his commanding officer, Major General Phillip H. Sheridan, declared Smith and Craig innocent along with their men. Mason told Sheridan that a sheriff's posse of 50 armed men was patrolling Brenham streets, forcing Smith to enclose his camp.

"I doubt if much justice could be done in a community which compels our officers and soldiers to remain inside the defenses thrown around their camp."

Union Major General P.H. Sheridan to Texas Governor James W. Throckmorton, September 20, 1866.

On Sheridan's command, Smith issued an official U.S. order to disarm local citizens and disband all civil law enforcement in Washington County. His letter to Throckmorton and local officials threatened the arrest of any armed persons.

In the meantime, J.D. Giddings and his Texas Congressional committee began their investigation. They interviewed dozens of eyewitnesses to the events on September 7th. Their 54-page report was widely distributed on September 28th, revealing the horrible details.

The next day, Sheridan and Throckmorton negotiated a truce agreeing to no further charges or arrests on either side.

But no one was satisfied with the outcome. The people of Washington County wanted only to be rid of "Houseburning Smith" and his Union troops. Residents continued to live with rowdy, intoxicated soldiers roaming their streets at all hours. Hostilities continued into the spring of 1867.

A project of



This plaque graciously sponsored by Keith & Elizabeth Twigg



Sheridan's Letter Courtesy of Texas State Library and Archives Commission

Brenham's Earliest Cisterns

The first known cistern in Brenham was built by Jabez Denning (J.D.) Giddings. This is no surprise, as J.D. was known for his innovations. With his brother's help, J.D. pioneered the second railroad in Texas, brought the first Methodist church to Brenham, established a prominent law firm, started the local Masonic Lodge, founded Brenham's first bank, and named the town of Giddings.

Before these events, young J.D. finished building a home in 1843 for his bride, Ann. Renovations to the home in the early 1860's added a flat reservoir roof, lined with zinc, to catch and hold rainwater. Downspouts delivered water to a cistern below the ground, just outside the kitchen.

Water was brought into the home through pipes from the roof. A cistern pump, much like the one displayed in this park, was most likely in the kitchen.

The cistern system was a unique feature of the early home, almost unheard of at the time. The cistern top is still visible today on the west side of the house at 508 Crockett Street.

In 1870 the J.D. Giddings family moved into their second, newly-built home south of Brenham. This home also had a rain-catching roof that fed water into two underground cisterns. Today, visitors at the Giddings Stone Mansion can see one of the cistern locations behind the home, covered with brick.

Public cisterns began appearing in the downtown area in 1867, just after the Hook & Ladder Company was formed. Due to Brenham's recent troubles with arson, its business leaders worked together, enabling the city to build these cisterns.

These first cisterns were above ground and made of wood. Their primary purpose was to provide water for the Hook & Ladder Company to fight fires. It is believed that they were also used for horse-watering troughs that were abundant on Brenham streets.

It didn't take long for City officials to begin building underground cisterns. The earliest underground cisterns were made of brick and lined with plaster or stucco.

At least seven cisterns had been built for public use in Brenham by 1877, three of which were located in the courthouse square. On October 31, 1878, the Brenham City Council voted to build four additional cisterns "in convenient



J.D. Giddings' first cistern, built in the early 1860's, is still visible today at the Giddings William House Museum. Downspouts and pipes brought water from the reservoir roof into the cistern.



J.D. Giddings
1815-1885

"My Dear Ann, I hope your cistern will hold out until the fall rains. Whenever it gives out, have Theodore come and fix it."

Jabez Denning (J.D.) Giddings in a letter to his wife in Brenham, while he was in Austin serving in the Texas Legislature, August 24, 1866.



J.D. Giddings built this cistern at the home he founded in 1870. It has been covered with brick and can still be seen at today's Giddings Stone Mansion.



This 1877 map shows seven cisterns in Brenham for public fire fighting.

parts of the city for fire purposes."

The city's building of cisterns was a very progressive achievement, putting Brenham ahead of most other Texas towns. In those days, cisterns were not widely used, and it was not common for governments to provide public works.

The pump currently housed by The Brenham History Club



Brenham's Extensive Cistern Systems

By 1878, the success of cisterns in Brenham was proven, and the new contraptions were quite popular. Construction of cistern systems accelerated throughout Washington County. Many new buildings were designed with reservoir roofs, feeding rainwater into cisterns.



This drawing of Brenham in 1891 shows the prevalence of reservoir roofs that caught rainwater for cisterns.

Private households and small businesses usually couldn't afford underground cisterns, so above-ground tanks were the most common. The most affluent businesses installed underground cisterns which were often larger, and moved water away from the sun. This kept the water cooler, cleaner and free of bacteria. In those days it was common for "business houses" to include living quarters, and their cisterns provided water for cooking, bathing, drinking and fighting fires.

Construction of public cisterns also accelerated. By 1885, there were 27 cisterns available for public use in Brenham, a remarkable number to be built in only eight years. Most were under public streets and quite large, their tops sealed with man-built covers.

Rainwater was fed into these underground cisterns through downspouts and pipes from the roofs of adjacent buildings. Brenham's brand new Silsby fire truck was designed with hoses to draw water from the cisterns, filling its large tank that was pulled by horses or men.



This 1887 map shows 27 cisterns in Brenham available for public use for fire fighting.

The proliferation of cisterns in Washington County created a demanding market for the devices. A local cistern factory was established in 1884 by Adolph Seelhorst and his partner, W.E. Reichardt. They began making cisterns of galvanized iron, which greatly improved the quality and performance.

Although Reichardt & Seelhorst also made flues and other products, cisterns were their most popular items. They supplied the local market and also shipped many cisterns across Texas, the Indian Territory and Old and New Mexico.

Seelhorst lived in a large, stately home that was built in about 1878. It had a copper-lined roof to catch rainwater that was piped to a cistern under the back porch. Today the private residence displays a Texas Historical Marker, and the roof and cistern are still intact.

Many cisterns that were built during this era are still under Brenham streets and buildings. But since most cisterns were installed above ground, there is no longer any evidence of them.

No other example of such extensive cistern systems has been found in Texas. It is believed that, when the City of Brenham began building cisterns, it became the earliest Texas government to offer public works. The unique venture was driven by local, innovative businessmen who couldn't bear to see their properties burned again.

Most other cities didn't begin building water systems until the late 1880's through the early 1900's. Soon after that, the installation of fire hydrants stimulated the need for public cisterns.

In 2000 the City of Brenham uncovered an underground cistern while doing street work at a downtown intersection. A cistern expert, from the Texas Historical Commission in Austin, inspected the large cistern and validated its historical significance.

Shortly after, Brenham's public cistern systems were named a State Archaeological Landmark.



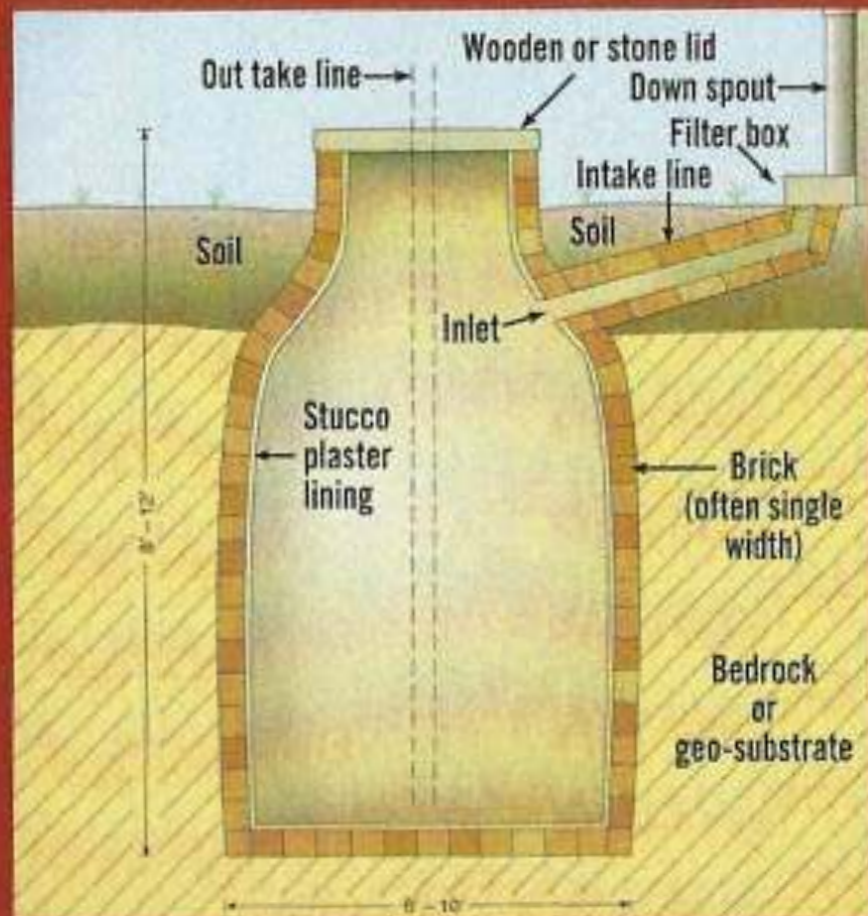
In 2000, the City of Brenham uncovered this large underground cistern, while working at the intersection of Main and Commerce Streets. Underground pipes were still visible, leading into the cistern from the buildings at each corner of the intersection.

A project of
Brenham
The paper previously sponsored by
Lower Sulfur in Memory
of Ernest Henry Sulfur



How Cistern Systems Worked

This 1881 drawing (left) shows the prolific use of reservoir roofs that caught rainwater. Some of the rooftops were quite deep, forming basins that stored a great deal of water. This kept buildings cooler in the summer and provided extra insurance against droughts. Today, some of these original roofs are still intact in Downtown Brenham.



Typical underground cistern.

How Cisterns Were Used

This authentic cistern pump is typical of the ones used to draw water from private cisterns. Most often, the pump was located at the cistern or in a kitchen, connected to the cistern with pipes.

Many buildings constructed in Breamham between 1866 and 1900 had rooftops that were designed to catch rainwater and deliver it into cisterns through pipes. Many of these roofs were lined with zinc or copper to make water-holding basins.

Some rooftops actually stored a great deal of water, giving the buildings' inhabitants extra insurance against droughts. As water was used from a building's

cistern, the rooftop storage system automatically kept the cistern full, using only gravity. A body of water on a rooftop also made the building cooler in the summer. Remarkably, this type of water-harvesting system was seen in Brenham as early as 1866.

Private cisterns could be located inside or outside the buildings they served. Most early underground cisterns were made of brick and lined with plaster or stucco. Later cisterns, mostly cylindrical, were made of galvanized iron and other metals.

Downspouts were attached to a building's exterior walls, catching water from drain holes in the floor of the roof's basin. Naturally, water pressure was greatest where the pipes connected to the drain holes, so the downspouts were reinforced

and largest at these junctions. This made interesting shapes for the downspouts, and some were highlighted as architectural design features. Many decorative downspouts can still be seen on downtown Brenham buildings.



This drawing of the Giddings & Giddings Bank Building, built in 1872, shows a typical rooftop that was designed to catch and store rainwater before delivering it to a cistern.



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This drawing shows the construction and operation of a typical early cotton gin.

In 1879, Brenham's Mechanics Engine Company became the proud owners of a state-of-the-art Sissy fire truck. This truck was designed to draw water from basins and cisterns through hoses, into its large water tank. The Sissy is on display today at the Brenham Fire Museum.



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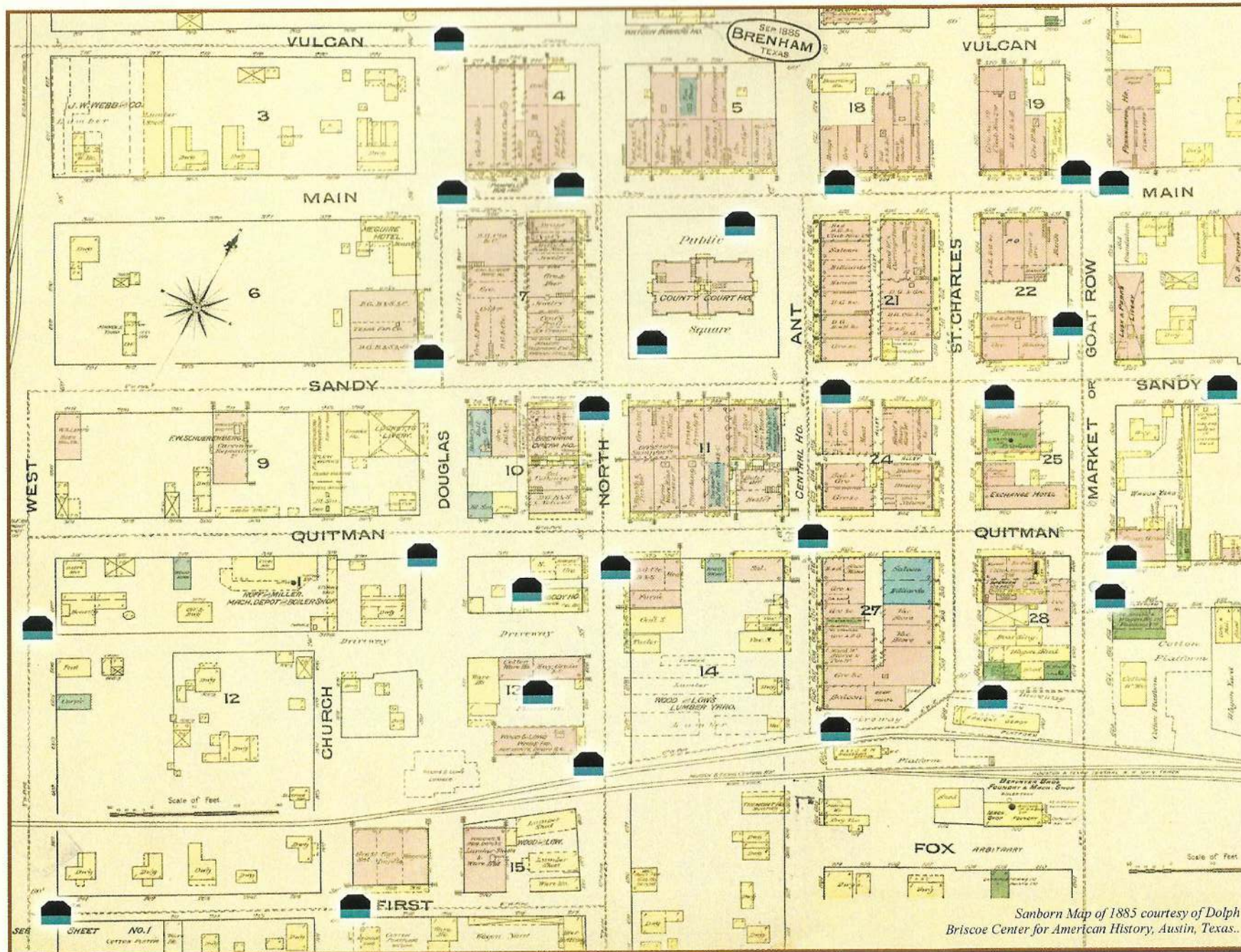
A project of



*This plaque
graciously
sponsored by
Dr. Henry & Tishley
Dresden, Pa.*

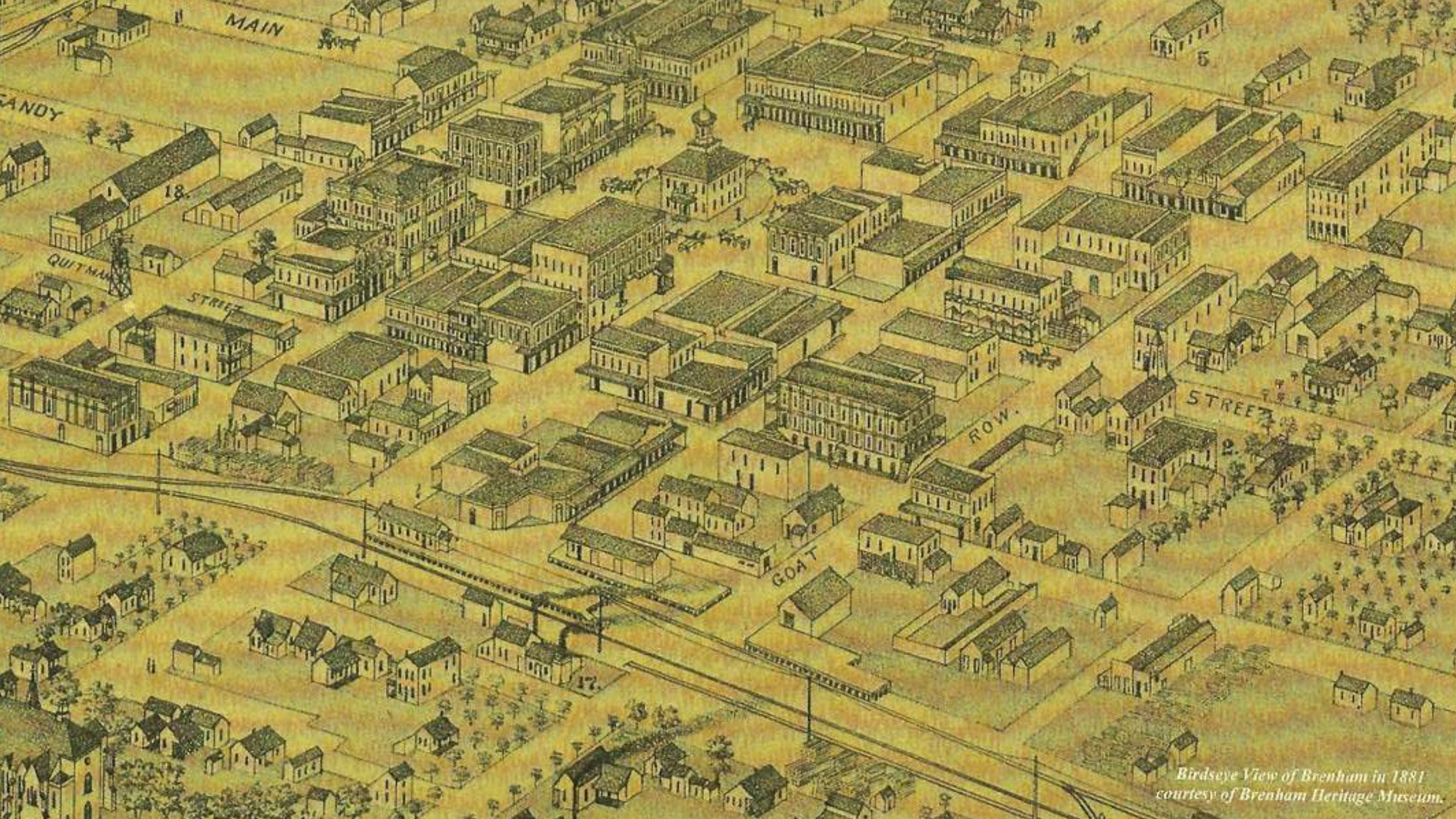


Toubin
Park



Sanborn Map of 1885 courtesy of Dolph
Briscoe Center for American History, Austin, Texas..

This 1885 map shows 27 cisterns available for fire fighting in Brenham.



*Birdseye View of Brenham in 1881
courtesy of Brenham Heritage Museum.*

Get Your Own Cistern!

Water conservation is a growing concern today – especially in Texas with its droughts and long, hot summers. With ever-increasing populations and decreasing water resources, it makes perfect sense to look to the skies for help.

The centuries-old practice of harvesting rainwater is widespread around the world, and quickly gaining popularity in the U.S. Rainwater can be used for irrigation, livestock, appliances, and even for drinking. Some are using rainwater for landscape features such as ponds, streams and waterfalls.

Rainwater is very pure. Unlike most other water, rain has no hardness, no sodium, and no harmful minerals or chemicals. That means it is the healthiest possible water for plants, and can be easily treated for a high-quality drinking source.

Rainwater is also free. By catching and wisely using it, households and businesses can greatly reduce their water bills. For every inch of rain that falls on a 1,000 square foot catchment area, about 600 gallons of water can be collected and stored for use as needed. With normal local weather

conditions, this equates to over 54,000 gallons annually for a home with a 2,000 square foot roof.

From the roof, water naturally flows through gutters and downspouts using gravity. It is fed into tanks or cisterns for storage until it's needed. Above-ground tanks are easiest and least expensive to install and, if elevated, they can provide water pressure without pumps. Underground cisterns keep water cooler and offer better protection against bacteria and algae due to sun exposure.

Stored rainwater can be used, as is, for watering landscapes and crops through simple hose connections. For indoor purposes, filters are used to remove particles that can enter the system from a roof. Further treatment is required for delicious drinking water, automatically managed by the system.

A handy homeowner can install a simple system without help, using supplies available locally. Larger systems use



This attractive cistern collects rainwater that is used for landscape irrigation at a local car dealership.

Courtesy of Republic of Breda

This small rainwater harvesting system was made by the local homeowner from a plastic tank that is readily available in stores. Used for landscape irrigation, the cistern is elevated to give water pressure without a pump.



Courtesy of Jeff Hill, American Rainwater Catchment Systems Association



This large residential system takes care of the homeowner's herb garden, vegetable garden, landscape plantings and car washing. The 2000 gallon cistern is fed from the home and garage rooftops, and a pump in the garage provides good water pressure.

Courtesy of Jimmy Kline, Nature by Design

multiple tanks or cisterns with controls, gauges, pumps and filters – these systems should be designed and installed by professionals who specialize in water harvesting systems.

In Texas there are currently no taxes on rainwater harvesting systems or supplies, and some counties even offer rebates for buying these items. Businesses with rainwater systems can earn points towards LEED certification (Leadership in Energy and Environmental Design) by the U.S. Green Building Council – this can also bring financial benefits.

A project of



This plaque graciously sponsored by Bank of Breda

For more information: American Rainwater Catchment Systems Association



RAINWATER HARVESTING GRANT PROGRAM



Program Details & Qualifications

1. Applicants must reside or own land within the District (Burleson or Milam County).
2. Applicants must complete an approved Rainwater Harvesting 101 course to qualify for reimbursement.
3. Only one application per-household can be filed within a 12 month period with a lifetime reimbursement maximum of \$3,000.
4. Reimbursements are limited to \$1.00 per gallon of rainwater storage capacity of the completed system; *this includes tank, gutter, tank foundation, overflow, and other misc. materials needed to create the system.*
5. Site plans must be approved by District staff before the purchase of reimbursable rainwater equipment and inspected following installation.
6. Short-term financial assistance may be available for qualifying applicants. Contact the office for details.

U

Collect and Use Rainwater

RAINWATER HARVESTING

In September of 2017, Post Oak Savannah Groundwater Conservation District (POSGCD) and Texas A&M AgriLife Extension Service (AgriLife) collaborated to offer a Water Conservation Program through the District. The program includes: a rainwater harvesting system, rainwater harvesting rebate program, drought-tolerant garden and irrigation demonstration sites, and series of educational workshops.

223 TOTAL ATTENDEES THIS YEAR IN 7 WORKSHOPS

RWH, TWON, Irrigation and EarthKind classes

10 SYSTEMS INSTALLED in 2019
23 TOTAL



Through education workshops and the POSGCD rebate program, to date thirteen, rainwater harvesting systems have been constructed throughout the District.

42,280 TOTAL STORAGE
93,780 TOTAL



Gallons of storage. The rebate program is based on \$1/gallon of tank capacity up to \$3,000 per household. Despite the maximum of 3,000 gallon cistern or \$3,000 reimbursement, participants have installed an average about 4,000 gallon cisterns per system.



24 CISTERNS INSTALLED
47 TOTAL

The 13 installed systems consist of 23 total cisterns. Rainwater harvesting system has benefited the environment by reducing erosion around the office and by providing an outlet for heavy rains to be diverted into storage tanks then applied slowly through drip emit-



650,929 GALLONS
1,309,252 TOTAL

The potential to collect 658,323 gallons* of water per year. (*based off collection surface and average rainfall). These systems will reduce erosion, divert and slow down flood water, promote groundwater recharge, and lessen the burden on groundwater and surface water.



Charles Porter Old Wells & Fire Hydrants



Fun Groundwater Facts according to NGWA.org

- According to National Geographic Society, Hydrologists estimate United States GW reserves to be at least 33,000 trillion gallons
- Equal to the amount of discharged into the Gulf of Mexico by Mississippi River in the past 200 years!
- At any give time, GW is 20-30 greater than the amount in all the lakes, streams and rivers in the United States
- Calif pumps 17.4 billion gallons per day of GW – 2.4 times as much as second ranked state – Texas (7.2 bgd)

Fun Groundwater Facts



- Groundwater is a renewable resource
- About ¼ of all US rainfall becomes groundwater
- More than 15.9 million water wells serve the USA
- Private household wells constitute the largest share of all water wells in the United States 13 million year round occupied households have their own wells
- In most states, the state owns the GW and the landowner has the right to make “reasonable use” of the GW beneath their property
- Texas is one of the few states that the landowner owns the GW



Fun Groundwater Facts

- Irrigation is largest use of GW in United States
- Today, 57.2 billion gallons used daily from 475,796 wells for agricultural irrigation
- In 1900 United States only used 2.2 billion gallons used daily from 17,000 wells
- 90% of GW pumped from Ogallala represents about 1/3 of ALL United States irrigated agriculture and creates \$20 billion annually in food and fiber
- Texas leads the nation in the number of irrigation wells with 81,511

George King – Water and Energy



completions and unconventional formations and includes 73 presented and published papers, book chapters and journal articles.

His education includes a BS, majoring in Chemistry from Oklahoma State (1972), a BS in Chemical Engineering from University of Tulsa (1976) and a MS in Petroleum Engineering from University of Tulsa (1982), where he also taught engineering courses at night for 11 years while working for Amoco.

**GROUND-
WATER
SUMMIT**

George E King

1:25 PM - 2:10 PM

Hydraulic Fracturing - Industry Advances in Water Recycling, and Reductions in Chemicals, Noise and Truck Traffic



Fun Groundwater Facts

- True or False
- Groundwater moves rapidly? – T or F
- Groundwater migrates thousands of miles? - T or F
- There is no relationship between groundwater and surface water? T or F
- Groundwater removed from the earth is never returned? T or F
- Groundwater is mysterious? T or F
- Groundwater is not a significant source of water supply? T or F
- In our District – Household wells (exempt wells) require a permit? T or F



Fun Groundwater Facts

- True or False
- 25% of household water use it for flushing the toilet – T or F
- Water is the only substance on earth found naturally in three forms – solid, liquid and gas – T or F
- Groundwater is the water that fills cracks and other openings in beds of rocks and sand? T or F
- It takes about 20 gallons of water to make one pint of beer? T or F
- About 6,800 gallons of water is required to grow a day's food for a family of four? T or F

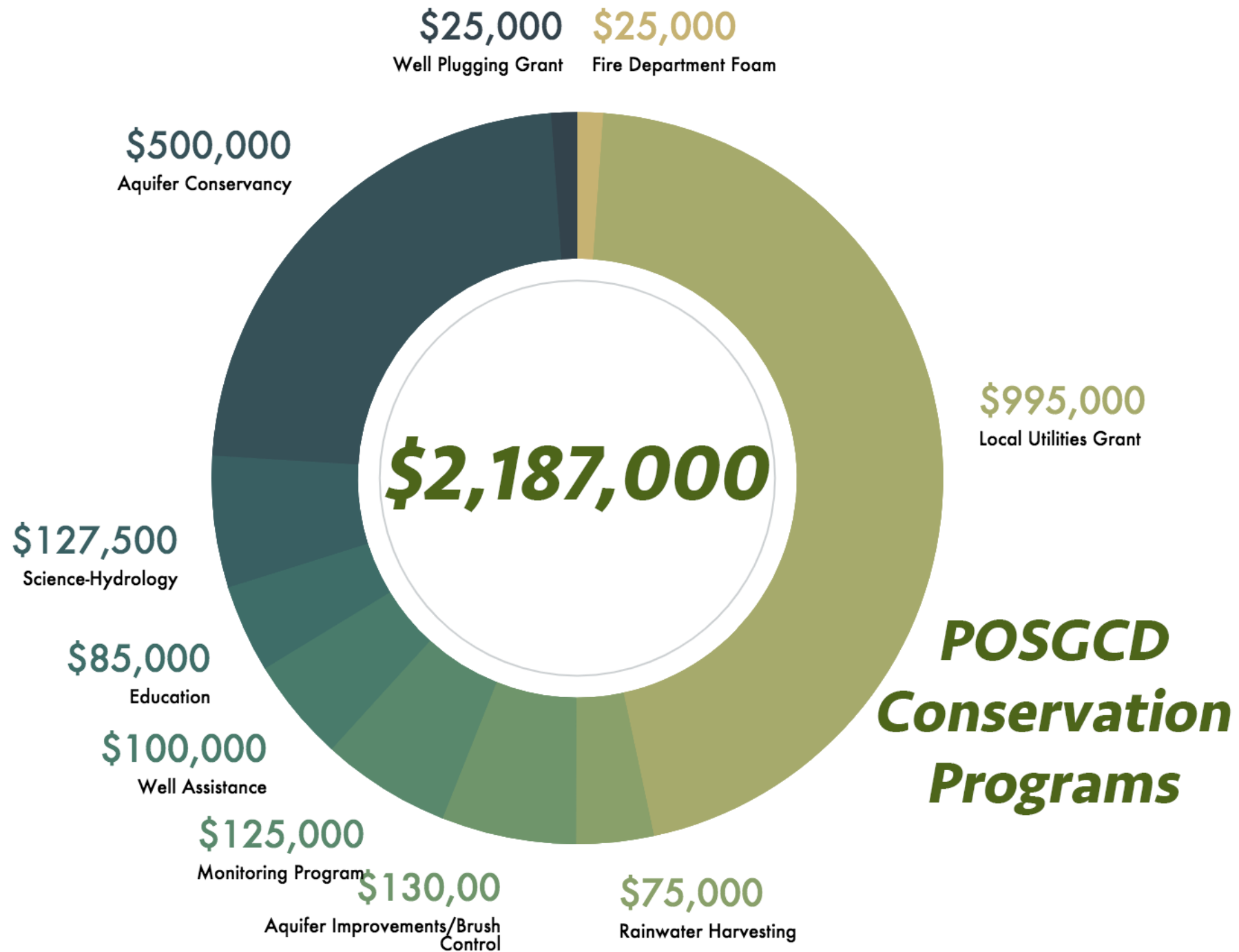
Fun Groundwater Facts



- True or False
- Over 90% of the world's supply of fresh water is located in Antarctica? T or F
- Producing a gallon of corn ethanol consumes 170 gallons of water in total? T or F
- To make a gallon regular gasoline takes 5 gallons of water? T or F
- If everyone in the United States flushed the toilet one less time per day, we could save a lake full of water about 1 mile long, 1 mile wide and 4 feet deep. T or F
- If everyone in the United States used one less gallon of water every per day, we could save 85 billion gallons of water per year. T or F



Public Interface



What Can I Do to Help?



- Support water conservation efforts.
 - Install water efficient taps and shower heads
 - Install a Dual Flus toilet
 - Keep your showers short (or shower with a friend ;-)
 - Don't leave tap running when brushing teeth or shaving
 - Rinse vegetables in tub instead of under a running tap (use the wash water on house plants)
 - Scrape your dishes in the trash instead of rinsing in sink
 - If possible install a grey water system
 - Install drip irrigation
- Support the Aquifer Conservancy Program.
- Support POSGCD by attending meetings and help get the word out.

Find Out What
We Are Doing
to Protect
Groundwater
in our
District

Come to our
Meetings

2019
ANNUAL REPORT
Post Oak Savannah
Groundwater Conservation District



 **POSGCD**
www.POSGCD.org

GROUNDWATER SUMMIT - AUGUST 3, 2020



Questions?



Aquifer Conservancy Program

***Conserving Groundwater
for Future Generations***

Sign up now at POSGCD.org