DENISON DAM AND LAKE TEXOMA:
From Prehistory to the 1950s

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DENISON DAM AND LAKE TEXOMA: From Prehistory to the 1950s

By

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Present-day Denison Dam and Lake Texoma are located in an area that has a long history of inhabitation dating back many thousands of years. The dam had huge impacts on the region's history and development, and its design revolutionized how dams of its type were built. As the world's first rolled earthfill dam, the Corps' innovative engineers pioneered a new construction technique that became the standard for earthfill dams from that point forward. This 49-page document examines the area of Lake Texoma from prehistory through the construction of the dam into the 1950s.

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Introduction

Dams have long been used to manage the flow of rivers for a variety of purposes. Prior to the early twentieth century, most dams on rivers were constructed by private developers or municipal governments with little involvement from the United States government. Up to that time, the United States government developed rivers as navigable waterways to support the country's burgeoning manufacturing economy that resulted from the Industrial Revolution.[1] By the 1920s, however, the United States government was shifting its focus from river navigation to managing river flow for other purposes, such as flood control and producing electricity.

Although electrification had come to many cities across the country in the first two decades of the twentieth century, there were still large swaths of rural America that did not have electricity. The United States government began exploring ways to bring electricity to rural residents who could not afford to purchase electricity from private companies. Coupled with severe floods in the early twentieth century that caused widespread devastation, the need for affordable electricity gave rise to the United States government's involvement in the construction of large, multi-purpose dams, including those incorporating hydroelectricity like the Denison Dam.[2]

During the Great Depression in the 1930s, President Franklin D. Roosevelt wanted to rebuild the nation. Construction of large, public projects, such as building dams, was one way to put people back to work. Utilizing the ingenuity of the federal government's premier civil engineers at the United States Army Corps of Engineers (Corps), many dams were constructed across the United States during that period. This set the stage for the construction of the Denison Dam, which became a national forerunner in earthfill dam construction and was a pivotal infrastructure project in the region.

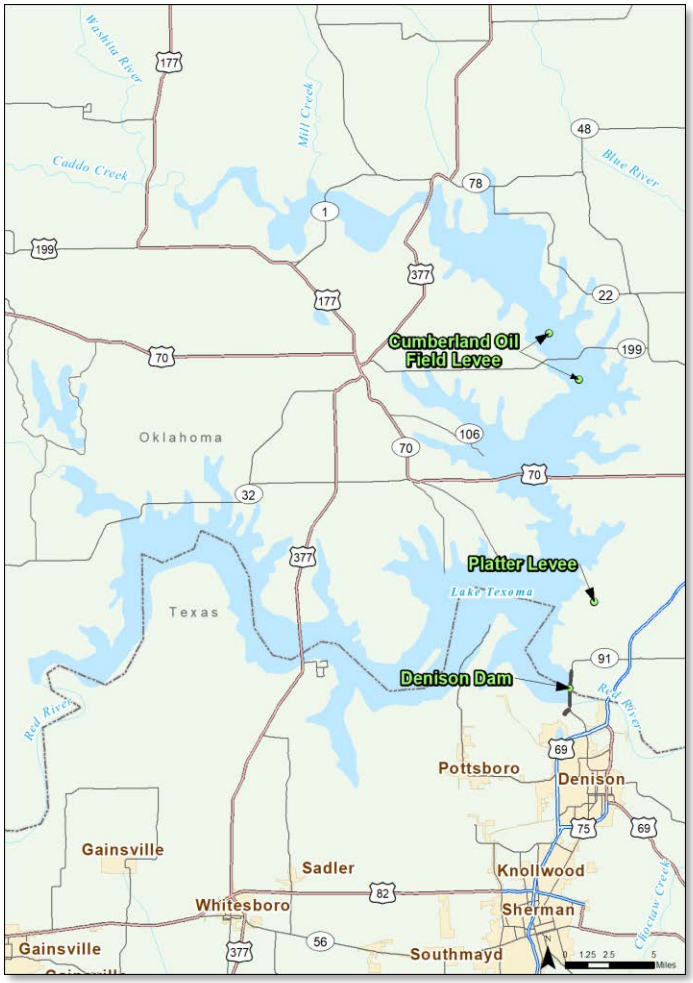

Figure 1. Overview Map of Denison Dam and Lake Texoma.

[1] David P. Billington and Donald C. Jackson, *Big Dams of the New Deal Era, A Confluence of Engineering and Politics, (*Norman, OK: University of Oklahoma Press, 2006), 4-5.

[2] David P. Billington and Donald C. Jackson, *Big Dams of the New Deal Era, A Confluence of Engineering and Politics,* 6-7.

Figure 2. Ca. 1949 aerial photograph of the Denison Dam.

The dam embankment crosses the center of photo from foreground to background. The powerhouse and outlet works are at center right of photo. The intake structure is to the left (west) of the embankment and spillway is partially visible at lower left side of photo. Lake Texoma is at the upper left and center areas of the photo.

The Denison Dam is located on the Red River, which is the border between Oklahoma and Texas. The dam crosses the Oklahoma-Texas state line, with part of the dam in Bryan County, Oklahoma and part in Grayson County, Texas. The Denison Dam impounded the Red River, thus creating the reservoir known as Lake Texoma. This reservoir extends over four counties in Oklahoma and two in Texas. See **Figure 1**. Work began on the Denison Dam in 1939, and it was finished in 1944. In 1945, the reservoir was filled. See **Figure 2**.

The Denison Dam had huge impacts on the region's history and development, and its design revolutionized how dams of its type were built. As the world's first rolled earthfill dam, the Corps' innovative engineers pioneered a new construction technique that became the standard for earthfill dams from that point forward. Together with the creation of an innovative tool, known as the Denison Core Barrel, that was vital to the success of their new construction technique, the Denison Dam is one of the most important dams constructed since the mid-twentieth century.

The Land Before the Dam

Present-day Denison Dam and Lake Texoma are located in an area that has a long history of inhabitation dating back many thousands of years. Throughout history, the Red River has been a blessing and a curse to the many inhabitants who have relied on and used its waters. The area's history is generally divided into four broad cultural periods: Paleoindian (ca. 12,000 to 8,000 Years

Before Present [B.P.]), Archaic (ca. 8,000 to 1,300 B.P.), Late Prehistoric (ca. 1,300 B.P. to 300 B.P.), and Historic (after ca. 300 B.P., or after ca. 1650).[3]

The Paleoindian Period was marked by a climate wetter and cooler than today. During this time, the landscape beyond the riparian zones of rivers and creeks was open grassland. Groups of highly mobile and scattered Early Paleoindian people hunted megafauna and small game on the open grassland as a food source, in addition to plant gathering. The transition to the Late Paleoindian Period was marked by a change in climate to warmer and drier conditions, and it was this climate change, possibly coupled with human hunting pressure, that caused the abrupt extinction of the megafauna except for *Bison antiquus.*[4]

The Archaic Period was marked by Native Americans' transition to a more diversified hunting and gathering strategy focused on bottomland resources of rivers and major creeks, and it is thought that population density increased during this time.[5] During the Late Prehistoric Period, hunting technology took a big leap with the advent of the bow and arrow outfitted with triangular arrow points for hunting bison and other game. Area Native American groups also produced ceramic vessels that exhibited the stylistic influence of the Caddo Tribes of East Texas and Southern Plains Tribes to the north.[6] This period was also a time of increased population that is thought to have limited hunting ranges, which resulted in a gradual trend toward horticulture and sedentary village life.[7]

French and Spanish expeditions of this area began in the 1500s and continued in the following decades. Rene-Robert Cavelier, Sieur de La Salle, proclaimed the Red River Valley French territory in 1682, as Spanish expeditions began along the Trinity River in Texas and moved north toward the Red River.[8] By the 1700s, the introduction of European diseases disastrously impacted native populations and spread far beyond areas of direct Native-European contact. Many indigenous groups, including the Wichita, Comanches, Teuocanas, and Wacos moved into and beyond north-central Texas to Oklahoma, and were documented by traders and explorers.[9] This period of disease and repeated displacement for the indigenous people along the Red River was compounded by the removal of the Choctaw, Chickasaw, and other tribes from east of the Mississippi River to Indian Territory (present-day Oklahoma) in the 1830s.

In the 1820s, Anglo settlement of the Red River started when John Hart, a trapper and trader with Native Americans, began to settle along the southern edge of the river in an area called Washita

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[3] Timothy Perttula, ed., *The Prehistory of Texas* (College Station, Tex: Texas A&M University Press, 2004).
[4] C.V. Haynes, "Clovis-Folsom Geochronology and Climate Change," *From Konstenki to Clovis,* (New York: Plenum Press, 1993), 219-236.
[5] J.L. Hofman, "Prehistoric Culture History – Hunters and Gatherers in the Southern Great plains," *From Clovis to Comanchero: Archeological Overview of the Southern Great Plains,* Research Series No. 35 (Arkansas Archeological Survey: Fayetteville, 1989) 25-60.; M.J. Lynott, "A Model of Prehistoric adaptation in Northern Texas," *Plains Anthropologist 26*, 1981, 97-110.
[6] D. Prikryl, *Lower Elm Fork Prehistory: A Redefinition of Cultural Concepts and Chronologies along the Trinity River, North-Central Texas,* Office of the State Archeologist Report 27 (Austin, Tex: Texas Historical Commission, 1990).
[7] R.K. Harris and I.M. Harris, "A Bison Kill on Dixon's Branch, Site 27A2-5, Dallas County, Texas," *The Record*, 27(1), 1970, 1-4; V. Morris and B. Morris, "Excavation of Bison Remains in Northwest Dallas County," *The Record*, 27(1), 1970, 2-5.
[8] Natalie Clountz Bauman, *The Many Faces of Texoma's Red River: Including Ferries, Bridges, and the Construction of the Denison Dam* (Coppell, Tex: CreateSpace Independent Publishing Platform, 2017), 9.
[9] Natalie Clountz Bauman, *Gone with the Water: The Saga of Preston Bend and Glen Eden* (Coppell, Tex: CreateSpace Independent Publishing Platform, 2018), 9.

Bend.[10] Washita Bend was located across the Red River from the mouth of the Washita River and approximately one mile west of the present-day Denison Dam.[11] By the late 1830s, Hart and his partners James Baker and William Baker had cleared seventeen acres of land and built three cabins at Washita Bend (later known as Preston Bend), Texas.[12]

Holland Coffee, another trader, moved into Preston Bend and illegally occupied portions of Hart's land.[13] Coffee established a trading post in Preston Bend that catered to the Comanche, Kiowa, Wichita, and Tawakoni tribes. In 1837, Texas President Houston appointed Coffee as an Indian Agent, and he enacted a treaty between the Republic of Texas and the Kichai, Tawakoni, Waco, and Tawehash tribes at a Shawnee Village near present-day Denison, Texas.[14] Coffee continued to build up Preston Bend in the following years. After his marriage to Sophia Suttenfield Aughinbaugh in 1839, he constructed the Glen Eden Plantation. Glen Eden included a Red River ferry, orchards, and freighting, and it became a social center for neighboring communities.[15]

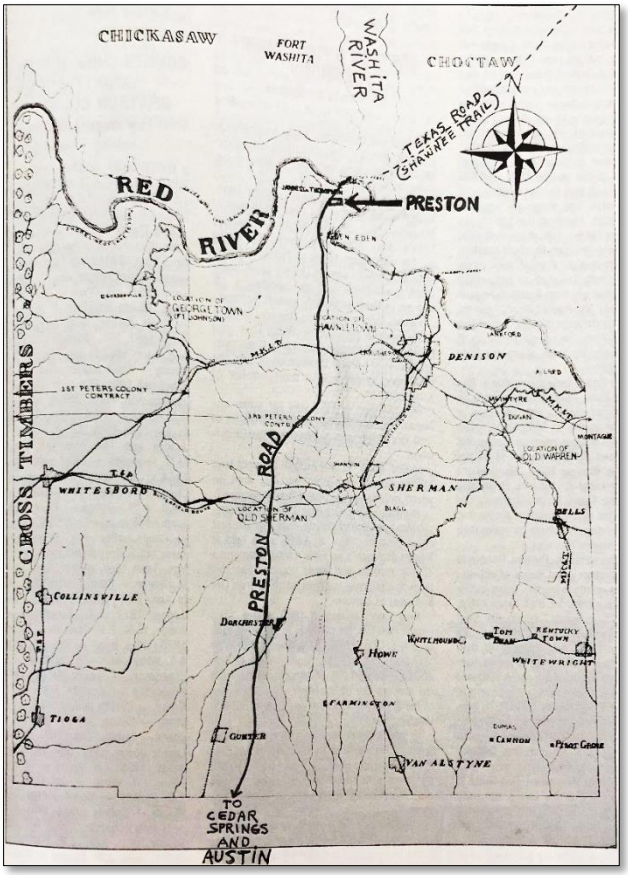

Figure 3. Mid-nineteenth century map showing location of Preston, Texas Road, and surrounding area.

On the north side of the Red River, the land under and around present-day Lake Texoma was located within Indian Territory and became the home of the Choctaw and Chickasaw tribes after removal. See **Figure 3.** The Choctaw were the first of the two tribes to arrive in Indian Territory. In the first few years of the 1830s, over 11,000 Choctaw settled on their new lands. Unlike in the eastern United States where the tribal members maintained compact villages, they settled on more widely spread farms when they arrived in Indian Territory.[16] In 1837, the Choctaw began negotiations with the United States government and the Chickasaw Nation for the Chickasaw to purchase some of the Choctaw's land in Indian Territory. The

[10] Resources inconsistently refer to this area as Washita Bend, Preston, and Preston Bend. Research does not indicate when the area was more often referred to as Preston or Preston Bend over Washita Bend.
[11] Grayson County Frontier Village, *The History of Grayson County Texas*, (North Carolina: Grayson County Frontier Village, Inc. and Hunter Publishing Company, 1979), 29.
[12] Grayson County Frontier Village, *The History of Grayson County Texas,* 13.
[13] Hart sued Coffee for his land and lost. Hart was eventually murdered by Coffee's partner in the following years. Natalie Clountz Bauman, *Gone with the Water: The Saga of Preston Bend and Glen Eden*, 11.
[14] Natalie Clountz Bauman, *Gone with the Water: The Saga of Preston Bend and Glen Eden*, 11.
[15] Morris Britton, "Glen Eden Plantation," *Handbook of Texas Online,* Texas State Historical Association, https://www.tshaonline.org/handbook/entries/glen-eden-plantation, Accessed March 18, 2022.
[16] Clara Sue Kidwell, "Choctaw (tribe)," *The Encyclopedia of Oklahoma History and Culture, https://www.okhistory.org/publications/enc/entry.php?entry=CH047,* accessed March 24, 2022.

negotiations resulted in the 1837 Treaty of Doakville, which stipulated the Chickasaw would lease, not purchase, the land from the Choctaw. The Treaty also allowed the Chickasaw to become a fourth district of the Choctaw Nation with representation on the Choctaw Council. In 1838, the Choctaw Nation adopted a new constitution to accommodate the new governmental structure.[17] Many Chickasaw members completed their removal to Indian Territory in 1837 and 1838, settling primarily in camps near Choctaw towns, rather than on their new lands in the central and western parts of Choctaw-owned country (present-day south-central and southeastern Oklahoma) due to security concerns.[18]

During the 1840s, Lyman Wight, a pioneer Mormon leader, moved his followers from present-day Oklahoma across the Red River to Preston Bend. The congregation made many contributions along the banks of the river, including helping with the construction of Glen Eden.[19] By the middle of the 1850s, more settlers took note of Coffee's and Preston Bend's successes and moved their businesses to the area. Eventually, the town would become known as "Preston," dropping "Bend" from its name.

By the mid-nineteenth century, the Coffees had amassed over 4,000 acres of land and substantial personal property, including 25 enslaved Africans or African Americans.[20] The Coffees were one of several prosperous families in present-day Grayson County who held the majority of land, political power, and property (including enslaved Africans and African Americans). Not all of the affluent families in the area were white. For example, in his 1857 *New York Journal* article, Journalist Waterman L. Ormsby described one successful mixed race indigenous man who owned Colbert's Ferry (which was down river from Preston): "Mr. Colbert, the owner of a station and of the ferry, is a half breed Indian of great sagacity in business tact…He owns about 25 slaves and says he considers them about the best stock there is, as his increase in about four per year."[21]

It was also around the late 1840s to early 1850s that the Chickasaw Nation finished removal to their new land in Indian Territory, which was located around present-day Ada (tribal headquarters) in Pontotoc County. At the same time, they began the process to separate from the Choctaw Nation. The separation was formally accomplished through a treaty ratified by both tribal councils and the United States Senate in 1856.[22] In the following decades, each tribal nation established schools and missions within the vicinity of the present-day location of the Denison Dam.

In the second half of the nineteenth century, the land on each side of the Red River saw increased settlement, and several towns that would later be inundated by Lake Texoma were established in the area. (See the section entitled "Lake Texoma and the History Beneath the Surface" below for a discussion of the inundated towns.) Increased settlement of the area was aided by the construction of several railroads. The Texas Road originally served as the primary north-south transportation route

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[17] Clara Sue Kidwell, "Choctaw (tribe);" James P. Pate, "Chickasaw," *The Encyclopedia of Oklahoma History and Culture,* https://www.okhistory.org/publications/enc/entry.php?entry=CH033, accessed March 24, 2022.
[18] James P. Pate, "Chickasaw."
[19] Martin Donell Kohout, "Wight, Lyman (1796-1858), *Handbook of Texas Online,* Texas State Historical Association, https://www.tshaonline.org/handbook/entries/wight-lyman, accessed March 18. 2022.
[20] "Texas, County Tax Rolls, 1837-1910," *FamilySearch* (https://familysearch.org/ark:/61903/1:1:Q2QG-75JJ : 20 February 2021), Holland Coffee, 1846. Accessed April 5, 2022.
[21] Graham Landrum, *Grayson County: An illustrated history of Grayson County, Texas,* (Fort Worth: University Supply & Equipment Company, 1960), 23-24. (https://texashistory.unt.edu/ark:/67531/metapth24647/: accessed March 30, 2022), University of North Texas Libraries, *The Portal to Texas History*, https://texashistory.unt.edu.
[22] James P. Pate, "Chickasaw."

throughout the nineteenth and early twentieth centuries. This route went through the Cherokee, Creek, and Choctaw Nations of Indian Territory (present-day eastern Oklahoma) and across the Red River to towns north of present-day Denison.[23] In 1901 and 1902, the St. Louis, Oklahoma and Southern Railway laid tracks alongside the Texas Road for a faster, more reliable transportation option.[24] Other rail lines, such as the Western Oklahoma Railroad and the Arkansas and Choctaw Railway also constructed tracks in the area to provide additional access across the Red River and to other neighboring states.[25]

In the early twentieth century, another impetus for settlement of the area north of the Red River was Oklahoma becoming the 46th state of the United States. When Oklahoma became a state in 1907, Indian Territory merged with Oklahoma Territory, and the Five Tribes, including the Choctaw and Chickasaw, dissolved their governments. This opened their lands in the former Indian Territory to settlement by non-tribal members.[26]

The Need for a Dam in Denison: Plan of Action

During this time of widespread settlement in the region, the Red River had a history of flooding. It drenched area farms and crops and washed away roads, bridges, and railroads. Sometimes, cattle and people drowned in the extreme rain and flooding. In the 1920s, two men from Denison, Texas, George Moulton and Dr. Alex Achison, thought that building a dam along the Red River might reduce the area's flooding problem.[27] In 1923, the United States Supreme Court declared the south bank of the Red River the boundary between Oklahoma and Texas.[28] Three years later, Moulton wrote to Oklahoma Congressman Charles Carter, and requested maps of the area. Using those maps, Moulton assessed and surveyed the landscape. He returned the maps to Congressman Carter with the location of a proposed dam marked at Baer's Ferry, and he outlined a future lake (Lake Texoma).[29] See **Figure 4.**

Figure 4. Ca. 1935 photograph of George Moulton, the Father of the Denison Dam, pointing to the marker indicating where the dam should be built.

Some local residents thought Moulton's plan to build a dam was not practical. Over time, though, he gained supporters.

[23] Bobby Weaver, "Texas Road," *The Encyclopedia of Oklahoma History and Culture,* https://www.okhistory.org/publications/enc/entry.php?entry=TE023#:~:text=During%20the%20nineteenth%20century%20the,Indian%20Territory%2C%20present%20eastern%20Oklahoma, accessed March 17, 2022.
[24] Larry O'Dell, "Johnston County," *The Encyclopedia of Oklahoma History and Culture,* https://www.okhistory.org/publications/enc/entry.php?entry=JO013, accessed March 17, 2022.
[25] Larry O'Dell, "Johnston County."
[26] Clara Sue Kidwell, "Choctaw (tribe)."
[27] Edward Southerland, "Building Denison Dam," *Texoma Living!,* August 5, 2010, https://www.texomaliving.com/denison-dam, accessed November 2, 2021.
[28] Glen Roberson, "Red River," *The Encyclopedia of Oklahoma History and Culture,* https://www.okhistory.org/publications/enc/entry.php?entry=RE007, accessed November 2, 2021.
[29] "George Moulton's Dream Comes True As Dam Finished," *The Denison Herald,* June 29, 1944, available at the United States Army Corps of Engineers Texoma Lake Office.

In 1929, representatives from Oklahoma, Louisiana, Arkansas, and Texas met in Denison to launch a campaign urging the United States Congress to build a dam along the Red River. The representatives from the four states formed the Red River Flood Control and Navigation Association. The association members elected Orville Bullington, of Wichita Falls, Texas, as President and Moulton as Secretary.[30] The association outlined the main benefits of the dam, including decreased flooding, improved irrigation for farms, and better navigation upriver from the Mississippi River.[31] They argued that the project would put thousands of people to work during the years it would take to build the dam. The association hired two private engineers, J.L. Lochridge and O.N. Floyd, to decide whether it was even possible to construct the dam.[32] The initial plan was to build a dam north of Denison across the Red River. The dam was originally proposed to be two miles and 440-feet long, 160 feet high, and hold 275 square miles of water in the reservoir. The association's engineers agreed with Moulton's original recommendation of building the dam at the Baer's Ferry site, northwest of Denison, because there was a solid rock formation on both sides of the river. At that location, it was reported that a dam would take 1,500 years to silt up.[33] See **Figures 5** and **6**.

Figure 5. March 9, 1939, photograph of the view across the Red River before the Denison Dam was constructed.

Over the next several years, Moulton traveled to various places and spoke to city councils in Texas and Oklahoma about the benefits and the anticipated expenses associated with the project. In 1930, he estimated that the project would cost $35 million. That cost included removing or relocating roads, railroads, and bridges, purchasing right-of-way, and building the dam and hydroelectric project.[34] In 1933, Moulton, Floyd, and other delegates of the association travelled to Washington, D.C., to present their plans to United States Representative Sam Rayburn and United States Senator Morris Sheppard from Texas. Although the country was mired in the economic trouble of the Great Depression at the time, President Franklin D. Roosevelt's New Deal programs were on the horizon. By 1936, Representative Rayburn was able to procure $500,000 to conduct a survey for the dam and associated reservoir. Just two years later, the United States Congress passed the Flood Control Act of 1938, which authorized the Corps and other agencies to undertake projects to construct dams, levees, and

[30] "Improvement of Red River Urged by Association," *Ardmore Daily Ardmoreite,* October 25, 1929, www.newspaperarchives.com.
[31] "Improvement of Red River Urged by Association," *Ardmore Daily Ardmoreite.*
[32] "Denison River Dam Would Prevent Disastrous Flood," *The Paris News*, July 7, 1938, www.newspapers.com.
[33] "Red River Dam Indorsed at Sherman," *Fort Worth Star-Telegram*, September 04, 1930, www.newspapers.com.
[34] "Red River Project Presented to C. of C. Men," *Ardmore Daily Ardmoreite,* October 13, 1930, www.newspaperarchive.com.

other flood control measures. This act ultimately allowed for the construction of the Denison Dam and a reservoir for flood control and hydroelectric power.[35]

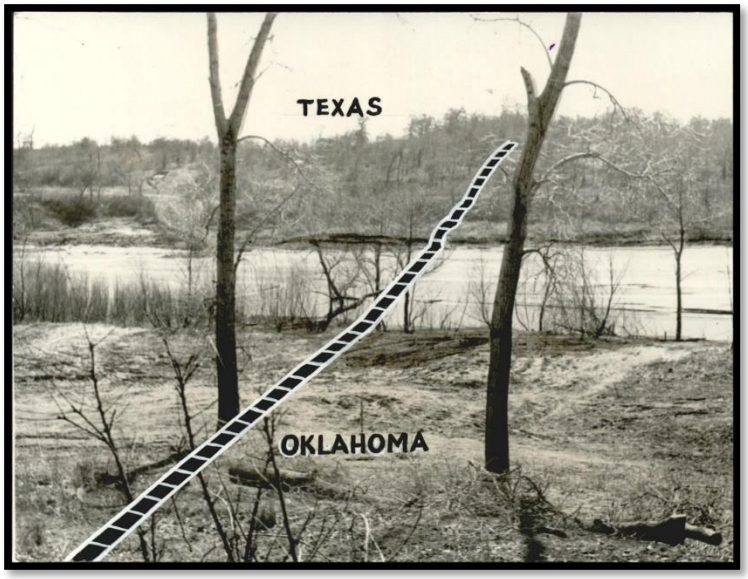

Figure 6. March 19, 1939, annotated photograph of the view across the Red River from Oklahoma toward Texas showing where the center line of the Denison Dam would be constructed.

On June 9, 1939, Congress approved funding for the Denison Dam. Congress set aside $5.7 million to begin construction. To build the dam, the Corps' Southwest Division created the new Denison District. While construction of the Denison Dam was the new district's primary focus, the District's personnel also built other projects, including military airfields, camps, and hospitals.

After the congressional approval of the dam, the residents of Denison held an impromptu celebration, and the town exploded with sirens and whistles. Stores closed, the high school band played, and the town fire and police departments led a parade headed by George Moulton and other local supporters of the project. Residents from nearby towns travelled to Denison to join the celebration.[36] Work to clear land for the dam had already started, and construction began in 1939.[37]

While many were delighted about the approval of the dam, not everyone was happy. In July of 1939, Oklahoma Governor Leon Phillips announced that he would fight the construction of the dam. Phillips argued that the costs of potential impacts to the state and property owners in Oklahoma had not been properly assessed. He also argued that since the dam would be built on the Texas side, hydroelectric power would go to Texas, but Oklahoma's residents would be displaced from their land and unfairly impacted by the lake. He did not think Oklahoma would be fairly reimbursed for the impacts. Phillips also claimed the project would destroy valuable farmland in Oklahoma and negatively impact roads and bridges.

In September of 1940, Phillips filed a federal lawsuit against several individuals and the chief contractor to halt the completion of the dam. The lawsuit demanded that all work on the project and any land acquisition suits against the state of Oklahoma be stopped immediately.[38] Phillips' lawsuit argued that of the 150,000 acres that would be impacted or underwater with the dam's construction, 100,000 acres were in Oklahoma, on land where 2,000 families lived. The lawsuit also questioned the United States Supreme Court's 1923 decision, which established the southern bank of the Red River

[35] "Denison River Dam Would Prevent Disastrous Flood," *The Paris News*.
[36] "Sherman and Durant Join Denison in Dam Celebration," *Fort Worth Star-Telegram,* June 30, 1939, www.newspapers.com.
[37] "Denison Dam Will Transform Red River," *The Times (Shreveport)*, August 28, 1929, www.newspapers.com.
[38] "Phillips Starts Lawsuit to Tie Up Denison Dam," *Miami Daily News Record,* September 6, 1940, www.newspaperarchive.com.

as the boundary between Oklahoma and Texas. The lawsuit stated that money the state of Oklahoma would lose after Oklahoma properties were bought to build the project was worth approximately $1.5 million, excluding oil and mineral rights. Phillips thought the construction of the dam was in violation of Oklahoma's power and rights. He believed the dam would destroy the banks of the Red River and would wipe out 40 miles of the Oklahoma-Texas boundary. Despite the lawsuit, project engineers continued as planned.[39] In 1941, the United States Supreme Court upheld the construction of the dam as constitutional.[40]

With World War II on the horizon in the early 1940s, most Corps projects stopped due to lack of supplies and labor shortages. However, defense related projects were given priority, and the construction of new hydroelectric dams were considered important to national defense, as their hydroelectric power would potentially power defense plants.[41] As a result, the Denison Dam and Norfolk Dam, another project the Southwest Division of the Corps was constructing during that time, were given priority due to their proximity to defense-related factories in the region.

To manage the sale of electricity generated at the Denison Dam and other dams built around the same time, Representative Rayburn initiated the creation of an agency to guarantee rural residents with an adequate supply of affordable electricity. As a result, the Southwestern Power Administration was created within the Power Division of the United States Department of the Interior in 1943.[42]

A year after the Corps finished the Denison Dam, the reservoir was filled in 1945. The construction of the dam and reservoir took six years to complete, at the total cost of $55,250,000, which was $1.2 million over the original estimate.[43] With the Denison Dam completed, the Corps' Denison District merged with the Tulsa District in 1945.

A few months after the reservoir was filled, Lake Texoma became the stage for a military demonstration that attracted a large number of visitors from the surrounding area. On June 3, 1945, approximately 35,000 people turned out for a military demonstration held on Lake Texoma to raise money for the war bond drive effort. Visitors turned out to watch Higgins landing boats, airplanes, and approximately 200 infantry men demonstrate how amphibious landings were made in the Pacific theater during World War II. A B-17 Flying Fortress bomber also demonstrated a mock search and rescue mission for a flight crew in the lake. The B-17 bomber dropped a lifeboat to the flight crew, marking the first time a lifeboat was dropped so far inland. The exhibition was dubbed the "greatest military show in the southwest" and likely provided thousands of visitors with an introduction to the newly created lake.[44]

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[39] "Phillips Starts Lawsuit to Tie Up Denison Dam," *Miami Daily News Record*.

[40] "Federal Power Sale Upheld by Supreme Court," *Cedar Rapids Gazette,* June 02, 1941, www.newspaperarchive.com.

[41] D. Clayton Brown, comp., *Southwestern Division U.S. Army Corps of Engineers July 1, 1937-July 1, 1987*, https://usace.contentdm.oclc.org/digital/collection/p16021coll4/id/59/rec/6, accessed October 7, 2021.

[42] D. Clayton Brown, "Sam Rayburn and the Development of Public Power in the Southwest," *Southwest Historical Quarterly*, Vol. LXXVIII, Number 2, October, 1974: 146.; *Southwestern Power Administration* website homepage, Available at https://swpa.gov/, accessed October 28, 2021.

[43] "Completed Denison Dam Carries $55,250,000 Price Tag," *The Denison Herald,* June 29, 1944. Available at the United States Army Corps of Engineers Texoma Lake Office.

[44] City of Allen – ACTV. Taming the Raging Red – Denison Dam Documentary. https://www.youtube.com/watch?v=7qu2MkNndzU. Accessed October 19, 2021, and June 24, 2022.

Denison Dam Design and Construction

The Denison Dam not only changed the face of a region, but it also significantly impacted dam construction for similar types of structures from that point forward. The Denison Dam is an earthfill dam, the most common type of dam in the United States. Out of the 70,000 dams built in the United States during the twentieth century, 85 percent of them are earthfill dams.[45] These types of dams have been around since ancient times, with the first known earthfill dam dating to 3000 B.C.[46] Prior to the Denison Dam's construction, earthfill dams were built with hydraulicly placed materials, which were consolidated using water. With the Denison Dam, the builders stacked thin layers of wet soil on top of each other and then rolled the layers with large machines to compress the layers, thus creating the world's first "rolled" earthfill dam. To aid in the success of this innovative construction technique, a new tool (the Denison Core Barrel) was invented to test the compaction of layers. The rolled earthfill dam type was so successful that its use on the Denison Dam revolutionized earthfill dam construction. Additionally, the Denison Core Barrel is now used in a wide variety of industries and applications to obtain subsurface core samples.

The Denison Dam is composed of four main parts, each with its own function and purpose: the embankment, the spillway, the outlet works, and the powerhouse. See **Figure 7.**

Figure 7. Overview of the Denison Dam and its components.

[45] David P. Billington and Donald C. Jackson, *Big Dams of the New Deal Era, A Confluence of Engineering and Politics,* 207.
[46] David P. Billington and Donald C. Jackson, *Big Dams of the New Deal Era, A Confluence of Engineering and Politics,* 207.

Dam Embankment

The dam embankment is the largest of the dam's four main parts. This embankment runs perpendicular to the Red River and is approximately three miles long. At the widest point, the embankment is 1,100 feet and just 40 feet wide at its most narrow point.[47] The top, or highest point of the embankment is 670 feet in elevation.[48]

As the first of its type, the Denison Dam represents an advancement in dam construction techniques that continue to be used today. The name for this type of dam – rolled earthfill dam – comes from the techniques used to construct the embankment. For the rolled earthfill dam, construction crews built this strong embankment by spreading, then moistening impervious materials (which does not allow water to flow through them), pervious materials (which allow water to pass through them), and a combination of these two material types. Crews then rolled each layer to compact the materials. This layering and compacting process provided the dam with its strength. The placement and organization of materials for each location within the dam helped to provide additional strength and stability. See **Figures 8** through **10.** On the Denison Dam, a section of impervious materials was used in the reservoir side of the embankment with two stacked sections of pervious materials on the embankment's river side.[49]

Figure 8. February 28, 1940, photograph of the work to build the Denison Dam embankment.

[47] U.S. Army Corps of Engineers, *Red River Denison Dam and Reservoir Completion Report, Volume Four, Construction of Embankment and Excavation for Spillway*, (Denison, Tex: U.S. Engineer Office, March 1944), 4.
[48] William A. Settle, Jr. *The Dawning: A New Day for the Southwest. A History of the Tulsa District Corps of Engineers 1939-1971, (*Tulsa, OK: U.S. Army Corps of Engineers Tulsa District, 1975), 64, https://apps.dtic.mil/dtic/tr/fulltext/u2/a637016.pdf, accessed September 28, 2021.
[49] Lowe, III, John. "Section 5: Earthfill Dams." Development of Dam Engineering in the United States. (New York: Pergamon Press, 1988), 682; C.H. Vivian, "The Denison Dam," *Compressed Air Magazine,* Volume 49, Number 5, May, 1944: 113-114.

Figure 9. October 17, 1940, photograph of the construction process of placing, moistening, and rolling the materials that make up the interior of the dam embankment.

Figure 10. February 1, 1942, photograph of crews placing and rolling the impervious fill materials for the dam embankment.

Note: intake structure in the background of photo.

Construction crews obtained all their fill materials for the Denison Dam from local pits near the dam site. Once the fill for the embankment was in place, limestone riprap (a layer of rocks) was laid on the reservoir side of the embankment to prevent erosion. On the river side, topsoil and grass were placed on the embankment slope for erosion control.[50] See **Figure 11** for an image of the dam embankment prior to the placement of limestone riprap.

Figure 11. November 26, 1943, photograph of the reservoir side of dam embankment (at right side of photo) before placement of the limestone riprap.

Note: intake structure at left side of photo.

Another aspect of the advancement in earthfill dam construction was the development of the Denison Core Barrel, a tool used to test samples of the soil within the embankment. See **Figures 12** through **14**. Corps engineer Henry L. Johnson created this tool specifically for the Denison Dam to allow engineers to assess the dam embankment layers' compaction strength without damaging the sample or contaminating it with drilling mud or cuttings of overburden.[51] It was particularly helpful for extracting samples of soft or unconsolidated soils below the natural water table.[52]

[50] C.H. Vivian, "The Denison Dam," 113.

[51] United States Patent Office, "Apparatus for Undisturbed Overburden Sampling," Patent No. 2,403,002, Patented July 2, 1946.

[52] Eugene Shuter and Warren E. Teasdale, "Techniques of Drilling, Coring, and Sampling Techniques to Test Holes and Wells," *Techniques of Water-Resource Investigations of the United States Geological Survey*, Chapter F1, Book 2 (United States Geological Survey, 1989) 63, Available at https://pubs.usgs.gov/twri/twri2-f1/, accessed October 18, 2021.

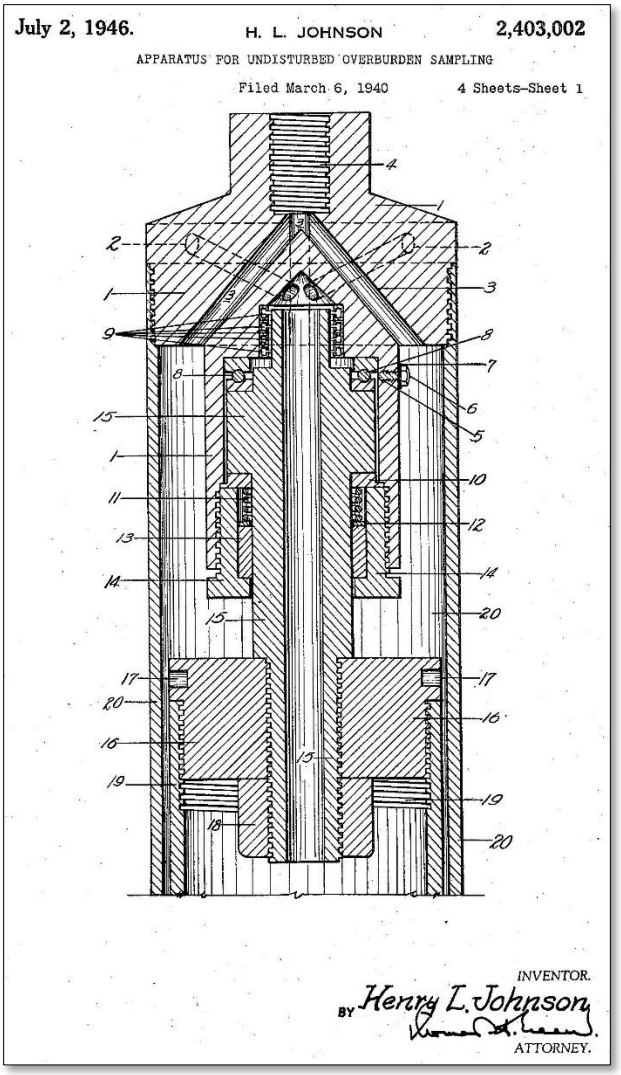

Figure 12. Overview cross-section of the top portion of the Denison Core Barrel.[50]

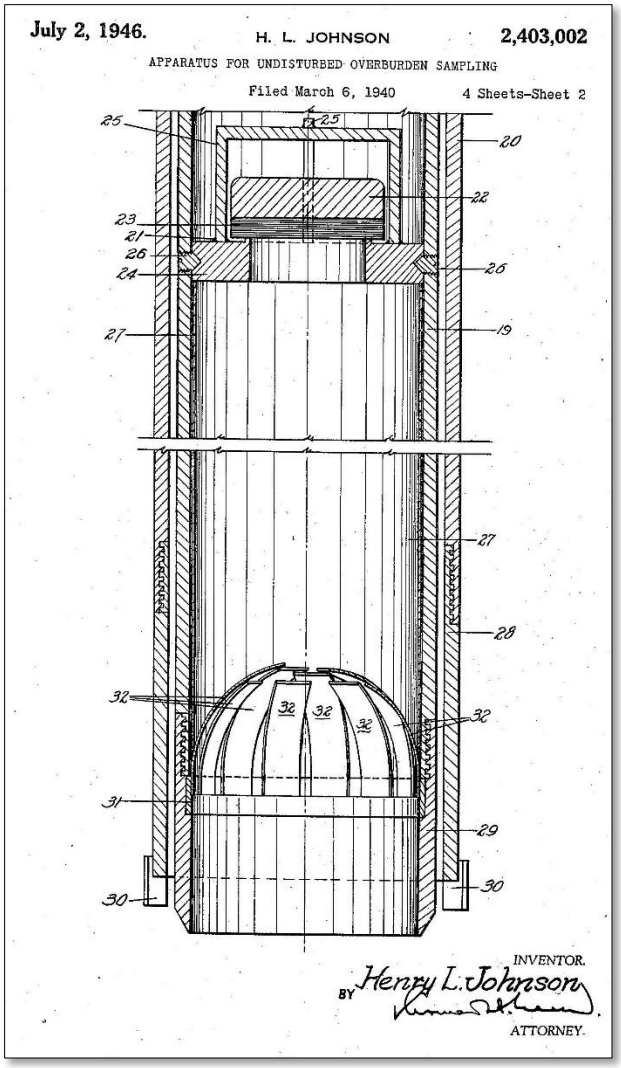

Figure 13. Overview cross-section of the bottom portion of the Denison Core Barrel.

[53] For more information about the patented tool, visit https://patft.uspto.gov/netahtml/PTO/patimg.htm and enter "2403002" into the box that reads "View Patent."

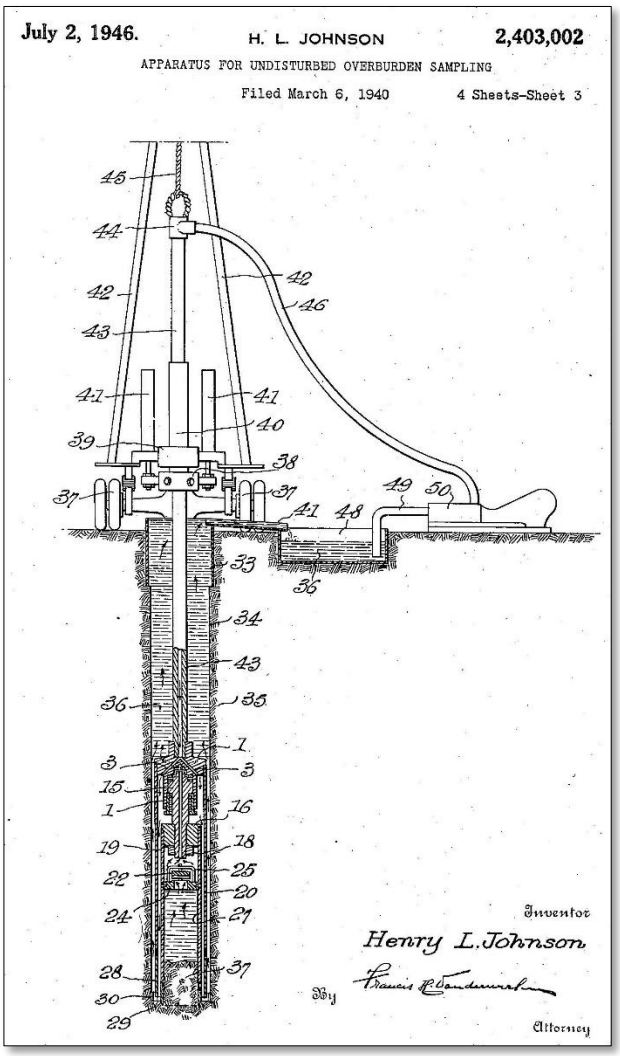

Figure 14. Overview of the Denison Core Barrel attached to a drilling rig and down a hole, with the pump circulating drilling mud at the right side of the drilling rig.

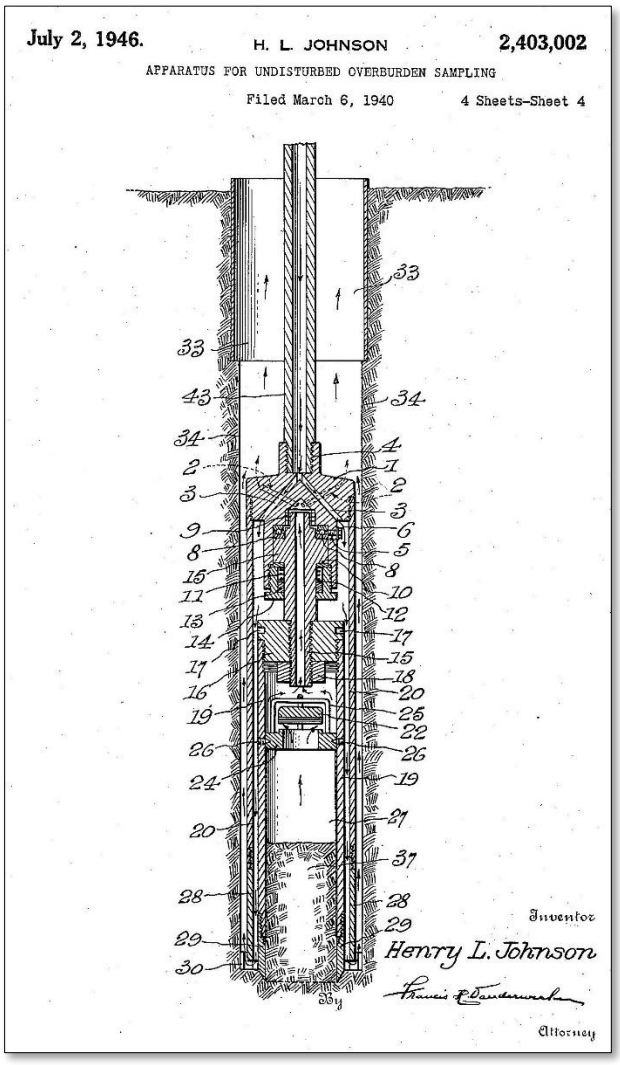

Figure 15. Enlarged view of the Denison Core Barrel within a drill hole.

The tool consisted of two tubes, one inside the other. The inner tube remained stationary to cut through the layers of soil, and it pushed the soil sample upward into a thin liner. The outer tube rotated around the inner tube and protected the layers from being mixed with drilling mud during the sample test. See **Figure 15**. As the sample was pushed upward, the drilling mud was vented to the outside tube through a valve.[54] After the sample was cut and the engineers pulled the tool out of the drill hole, they removed the liner and inspected a sample of the compacted layers from inside the embankment. Patented in 1946, the tool provided a simple, economical, and durable device that could easily and quickly be attached to a drilling rig.[55] Since its creation, the Denison Core Barrel has been used by soils engineers, foundation designers, and others in a wide variety of soil types, including soft shales, rare earths, sands, and sea bottom.[56] See **Figure 16.**

Figure 16. May 28, 1957, photograph of a Denison Core Barrel being used to take samples at flood prevention dam no. 7 on Owl Creek near Purcell, Oklahoma, to determine the cause of the failure shown in the photo.

Spillway

The spillway plays an important role for dams. It prevents the dam from being damaged during extreme floods by moving water.[57] The Denison Dam spillway is located at the south end of the dam embankment. It is a 2,000-foot-long concrete, chute-like structure that carries water from the lake to the river in high water events. The spillway is made up of five components: the approach channel, weir, upper chute, lower chute, and stilling basin.[58] The top of the weir, which is concrete and the most visible component of the structure, is located at 640 feet in elevation. See **Figure 17**. The other parts of the spillway are generally not visible as they are located under concrete and soil or are under water.

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[54] Eugene Shuter and Warren E. Teasdale, "Techniques of Drilling, Coring, and Sampling Techniques to Test Holes and Wells," 63.

[55] United States Patent Office, "Apparatus for Undisturbed Overburden Sampling," Patent No. 2,403,002, Patented July 2, 1946.

[56] Acker Drill Company, "Bulletin 11, Denison Core Barrel (Sampler)," Available at https://www.ackerdrill.com/denison-core-barrel, accessed September 27, 2021.

[57] David P. Billington and Donald C. Jackson, *Big Dams of the New Deal Era, A Confluence of Engineering and Politics,* 248.

[58] U.S. Army Corps of Engineers, *Red River Denison Dam and Reservoir Completion Report, Volume Five, Construction of Spillway*, (Denison, Tex: U.S. Engineer Office, February 1944), 2.

Figure 17. March 26, 1944, photograph of the completed spillway and stilling basin.

Outlet Works and Powerhouse

The Denison Dam's outlet works and powerhouse are located northeast of the spillway at the southeast end of the dam embankment. See **Figure 18.** The outlet works regulate how much water is released from the reservoir to control its water level. The outlet works also supply water to the hydroelectric (electricity produced by flowing water) powerhouse. One of the primary purposes for the construction of the Denison Dam was production of hydroelectric power. The outlet works has multiple components: an intake structure, an approach channel, eight conduits, and a stilling basin.

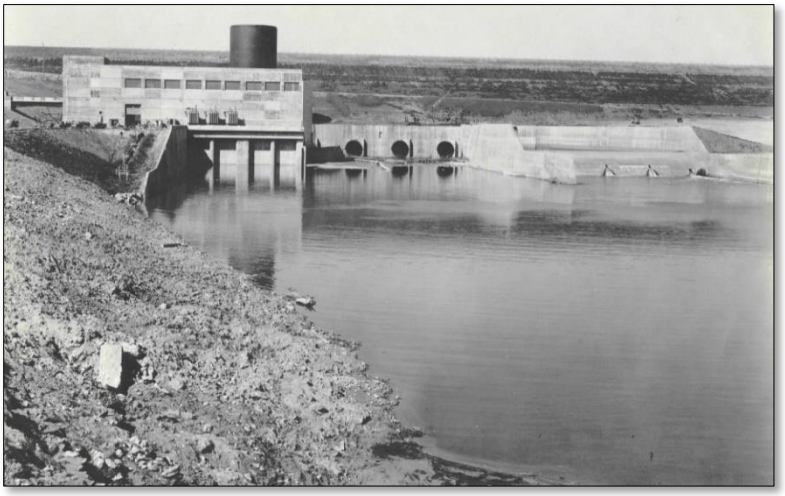

Figure 18. March 17, 1944 photograph of the powerhouse (left), outlet works (center and right), and stilling basin (foreground) with dam embankment in the background.

The intake structure is a concrete structure with gates that control the flow of water through the outlet works. See **Figure 19.** An approach channel is connected to the intake structure on the upstream side. The approach channel is an approximately 245-foot-wide concrete channel that directs water into the intake structure. Water moves through the intake structure's gates into the eight conduits under the dam embankment. A conduit is a closed pipe that acts as a tunnel for water to move through. A gantry, the structure that supports equipment to open and close the intake structure gates to water flow, runs on top of the intake structure. See **Figure 20**.

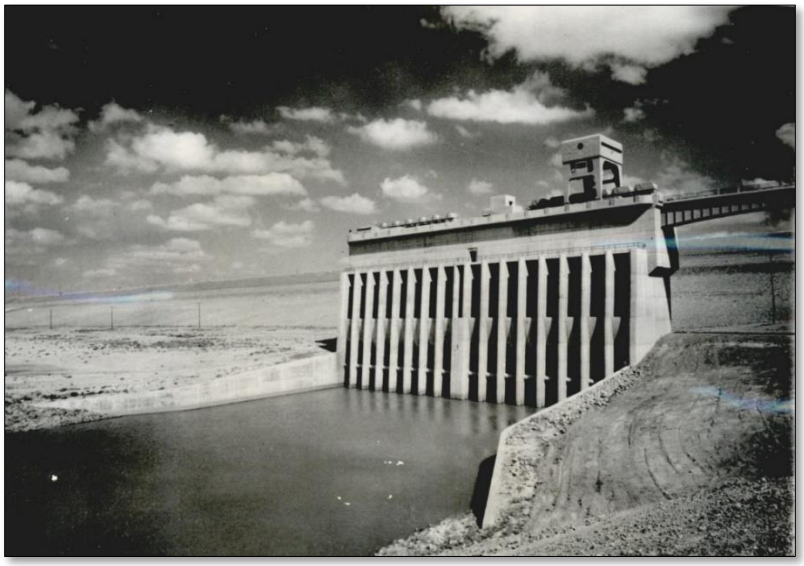

Figure 19. November 26, 1943, photograph of the upstream side of the intake structure and approach channel.

Note: dam embankment in background of photo.

Figure 20. October 19, 1943, photograph of the intake structure that directs water into the outlet works' eight conduits. It is located upstream from the dam embankment.

Note: gantry atop the structure operates the gates that open and close the conduits.

Water flows through the eight conduits under the dam embankment. Five of the conduits were constructed to move water to the powerhouse for power generation. The other three conduits were intended for flood control. Today, only two of the conduits are used for the powerhouse, and the other six are used for flood control.[59] Each of the concrete conduits used for flood control efforts is 20 feet in diameter and 800 feet long. The conduits supplying water to the powerhouse are concrete with steel lining and range in length from 808 to 844 feet.[60] See **Figure 21**. A concrete stilling basin is located at the downstream side of the conduits and dam embankment. After water flows through the conduits, it pools in the stilling basin before it flows down river. See **Figure 22.** This reduces the velocity or speed and energy of the water to help prevent erosion near the dam embankment.

Figure 21. June 11, 1943, photograph of the progress on construction of draft tube forms for powerhouse.

[59] United States Army Corps of Engineers, *Tulsa District Civil Works Projects Pertinent Data Sheets*, February 2021: 117.

[60] United States Army Corps of Engineers, *Red River Denison Dam and Reservoir Completion Report, Volume Three, Outlet Works Structures*, (Denison, Tex: U.S. Engineer Office, April, 1942), 3.

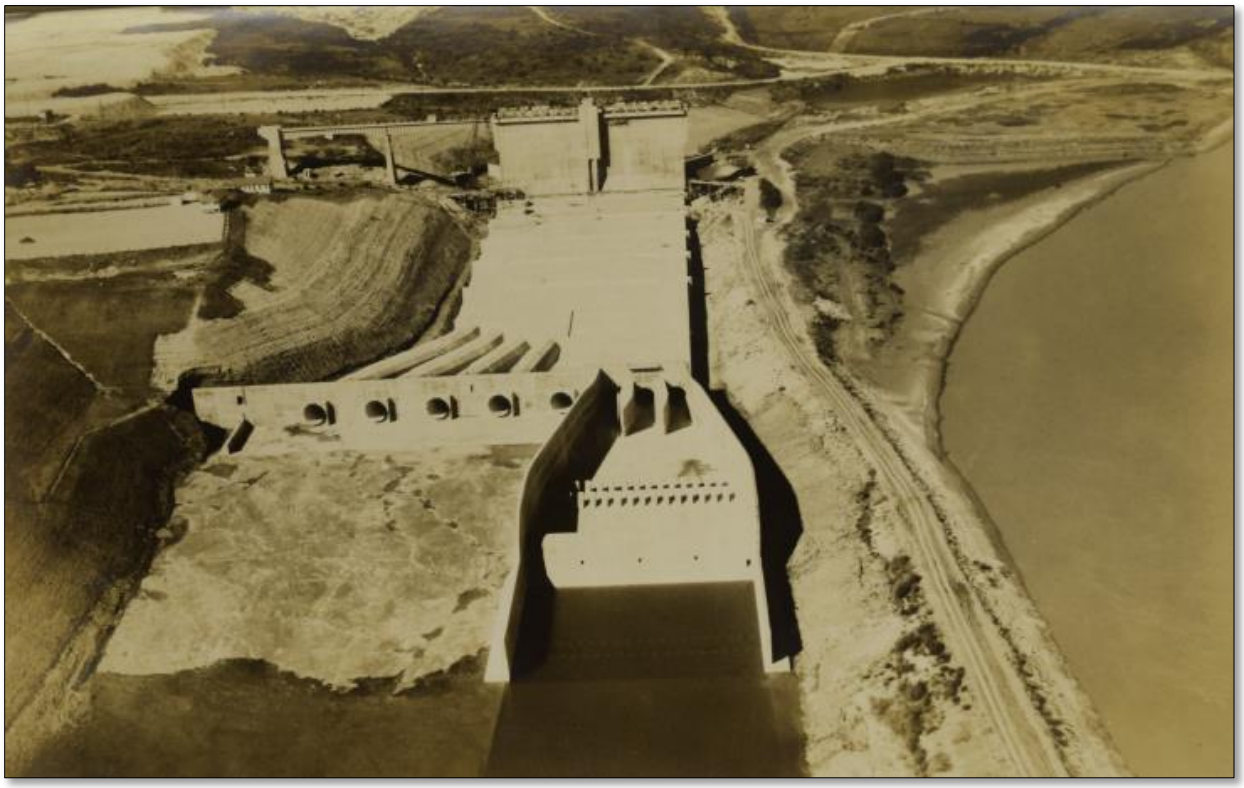

Figure 22. October 10, 1941, photograph of outlet works (center), stilling basin (foreground), and intake structure (background) as construction neared completion. Ultimately, the powerhouse was constructed at the left side of the foreground (in front of the conduit openings visible in the photo) and the dam embankment filled in over the top of the flat concrete area in the center of the photo.

The concrete powerhouse was designed in the Streamlined Moderne style, one of the most popular architectural styles of the 1930s and 1940s. See **Figures 23** and **24.** In addition to housing the power generating turbines and associated equipment, the building included offices and a control room. When originally constructed, the powerhouse had one turbine. See **Figures 25** and **26.** In 1949, the Corps enlarged the powerhouse to accommodate a second turbine. Between 2002 and 2019, the average annual net energy output of the powerhouse was 179,021,000 kilowatt hours.[61] The Southwestern Power Administration provides power generated by the Denison Dam to multiple states within the region.

The original turbines, called Francis type turbines, could produce 40 megawatts of electricity. See **Figure 27.** They were used until 2020 when a project was started to upgrade the turbines. Today, you can view one of the original turbines at an exhibit about the powerhouse located on the river's south bank a short distance east of the powerhouse.

[61] United States Army Corps of Engineers, *Tulsa District Civil Works Projects Pertinent Data Sheets*, February 2021: 118.

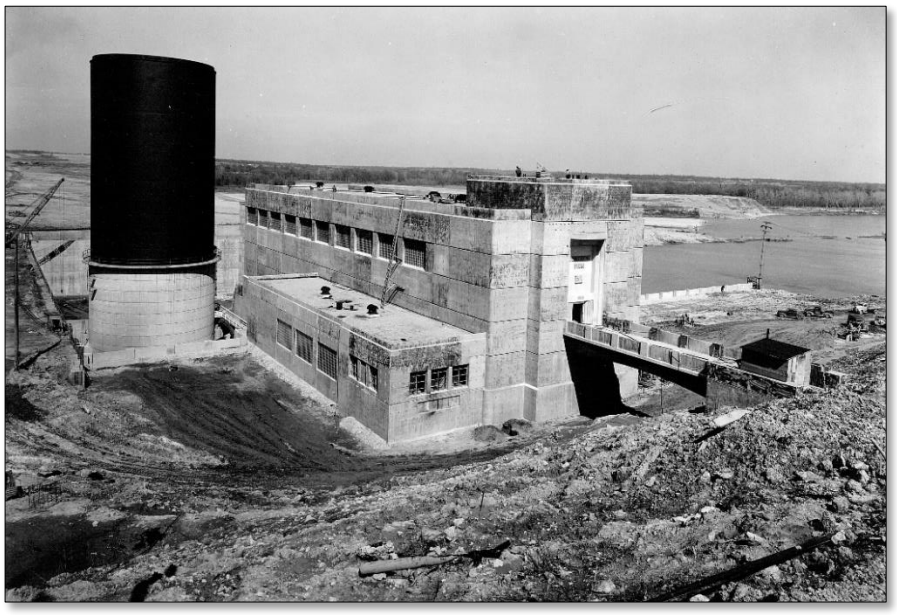

Figure 23. March 2, 1944, photograph of the exterior of powerhouse as it was completed.

Note presence of only one surge tank at left side of photo. The second turbine and associated surge tank were not installed until 1949.

Figure 24. March 11, 1944, photograph of the primary entrance to the powerhouse illustrating the Streamlined Moderne architectural style of the building.

Figure 25. January 15, 1943, photograph of the interior of the powerhouse during construction, looking north.

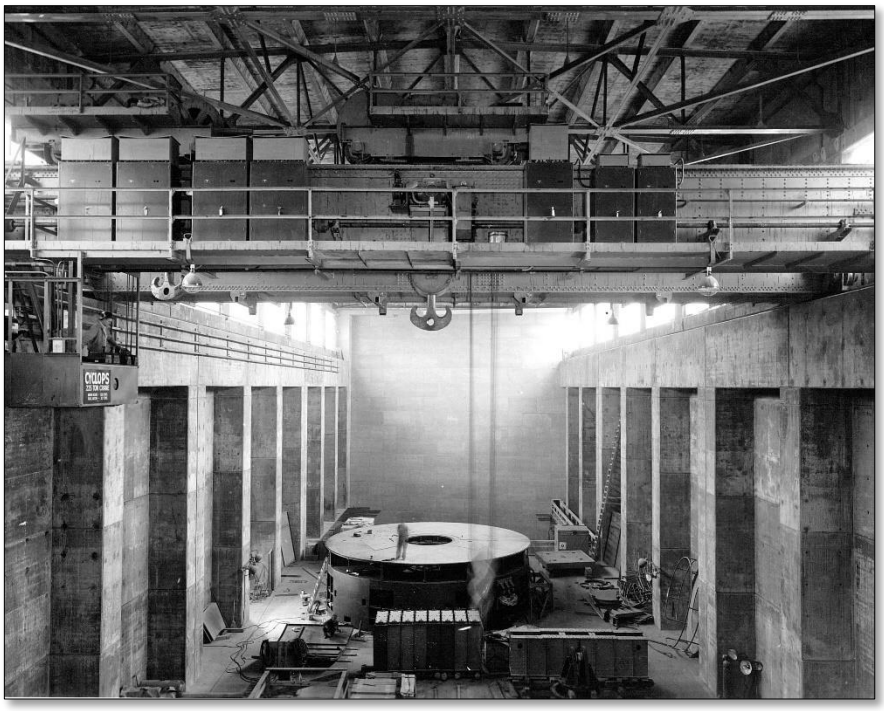

Figure 26. March 11, 1943, photograph showing the progress of turbine installation in powerhouse.

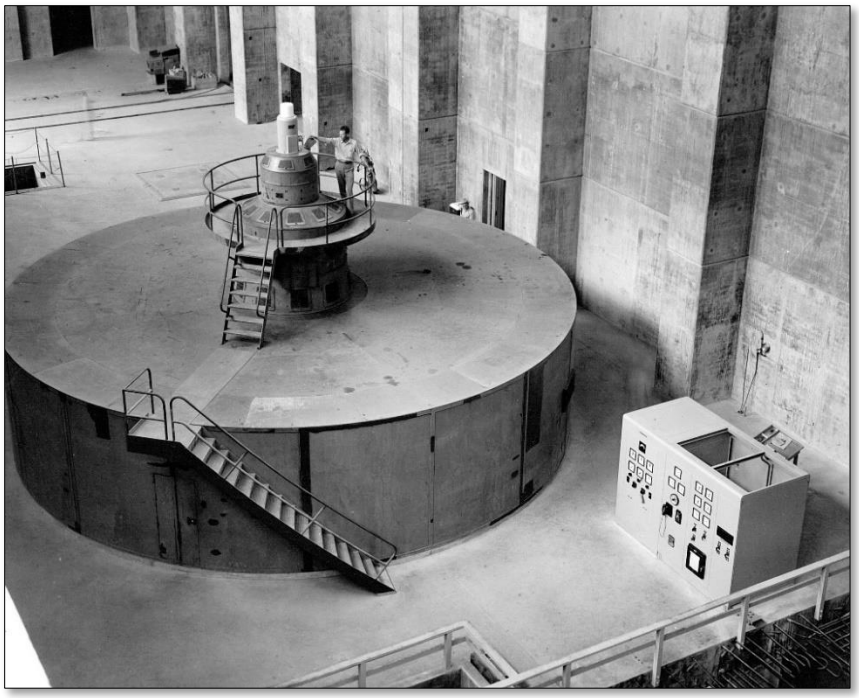

Figure 27. May 17, 1943, photograph of the interior of powerhouse and first electrical generating unit.

Note: several years after this photo was taken, a second generating unit was added in the open area at the upper left side of the photo.

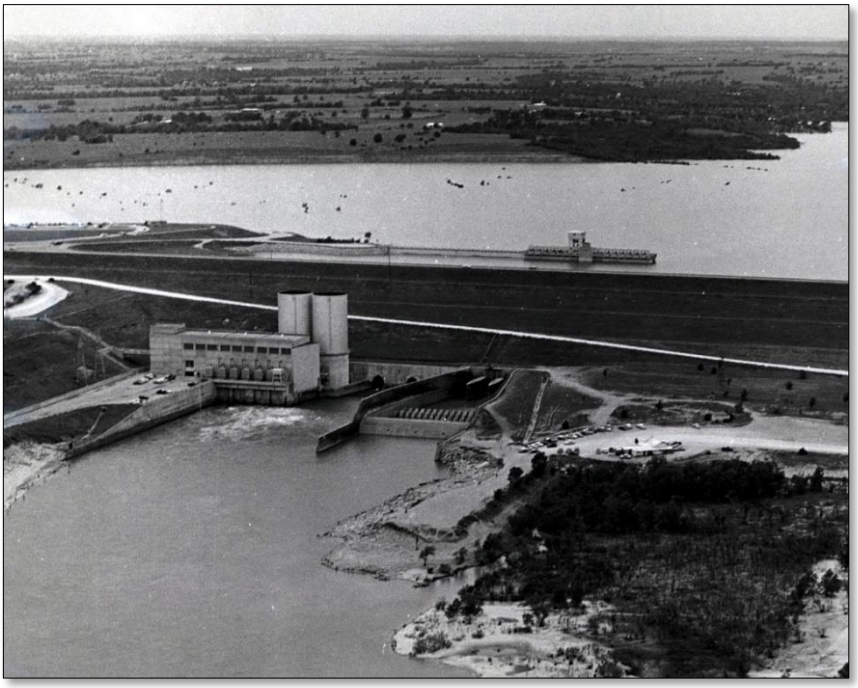

Figure 28. Ca. 1950 overview photo of Denison Dam, intake structure, powerhouse, and outlet works.

The "Who's Who" of the Denison Dam

Building the Denison Dam and Lake Texoma was a huge infrastructure project. The Corps utilized 3,000 contracts to finish the job, and it took nearly 23 million man-hours to construct the dam.

Four contracting firms were responsible for the major construction of the Denison Dam project:

- The Guy F. Atkinson Company of San Francisco, California, was responsible for the construction of the dam embankment and the excavation of the spillway site.
- The George W. Condon Company and John Kerns Construction Company, both of Omaha, Nebraska, excavated the site for the outlet works.
- The C. F. Lytle Company of Sioux City, Iowa constructed the outlet works and the powerhouse. They also finished the concrete work at the spillway.

In addition to the contracted labor building the dam, the Corps used German prisoners of war (POWs) to help clear the way for the reservoir. During World War II, many German and Italian POWs were brought to the United States. Over 500,000 POWs were held in 511 camps across the country by the time the war ended.[62] In Oklahoma, there were over thirty camps established to house primarily German POWs.[63] Texas had seventy camps located across the state.[64] Some camps were located on military installations while others were located on land the federal government leased or purchased from private citizens. During World War II, many Americans were fighting overseas, and there was a lack of workers in the United States. POWs sometimes filled the gaps in labor. POW labor could be used by American military officials on military installations for work such as land clearing (as was the case for the Denison Dam project), maintenance, and housekeeping work, and as contract labor for

Figure 29. 2019 aerial photograph showing the location west of the Denison Dam spillway where Camp Denison, the former German POW camp, was located.

[62] Arnold P. Krammer, "When the Afrika Korps Came to Texas," *Southwestern Historical Quarterly,* Vol. LXXX, No. 3, January, 1977: 248; Richard Paul Walker, M.A., "Prisoners of War in Texas During World War II" (PhD dissertation, North Texas State University, 1980), iii.

[63] Bill Corbett, "Prisoner of War Camps," *The Encyclopedia of Oklahoma History and Culture,* https://www.okhistory.org/publications/enc/entry?entry=PR016, accessed March 10, 2022.

[64] Richard Paul Walker, M.A., "Prisoners of War in Texas During World War II," 2.

private businesses and farms. With the majority of the construction on the Denison Dam project occurring during World War II, the use of POWs helped get the project done while so many American workers were fighting in the Pacific and European arenas.[65]

One group of German POWs in Madill, Oklahoma, and another group from base Camp Howze in Texas were put to work on clearing land for the future Lake Texoma. The Corps established Camp Denison on the Texas side a short distance northwest of the Denison Dam spillway for the POWs from Camp Howze. See **Figures 29** and **30.** Operated from 1944 to 1946, Camp Denison had 200 prisoners.[66] Using axes and saws, the German POWs cleared 30,000 acres of woodland between 1944 and early 1946. See **Figure 31.** POWs from Camp Denison also worked at grading and planting vegetation around Denison Dam.[67] The men, who ranged in age between 19 and 42 years old, were paid $0.80 per day for their work, which was the amount of pay for an American private at the beginning of the war.[68] This work project at Denison Dam helped create the rules for POW work programs in other locations.[69]

Figure 30. 1951 aerial photograph showing the location of Camp Denison on the Texas side of Lake Texoma and the buildings that remained at the camp five years after its closure.

[65] Arnold P. Krammer, "When the Afrika Korps Came to Texas," 264.

[66] "War Prisoners Lose Jobs As Local Men Need Work," *Denison Herald*, January 20, 1946, available at the United States Army Corps of Engineers Texoma Lake Office; Richard Paul Walker, M.A., "Prisoners of War in Texas During World War II," 105.

[67] Richard Paul Walker, M.A., "Prisoners of War in Texas During World War II," 105.

[68] Richard S. Warner, "Barbed Wire and Nazilagers: PW Camps in Oklahoma," *The Chronicles of Oklahoma, Vol. 64, No. 1 (Spring 1986),* 41.

[69] "Still Fanatical Nazis, War Prisoners in Dam Basin Camp Less Cocksure of German Victory," *Denison Herald*, January 2, 1944, available at the United States Army Corps of Engineers Texoma Lake Office; Fran Higginbottam and Roy Tucker, *History of Denison Dam & Lake Texoma, Short History & Some Facts about the Lake Texoma Area*, Available at the United States Army Corps of Engineers Texoma Lake Office electronic files, accessed November 4, 2021, 1971 (updated 2008): 10.

Figure 31. June 21, 1943, photograph of German POWs returning to their camp near Madill, Oklahoma, after a day of clearing trees from the reservoir site.

Life as POWs in the Madill camp (and likely other camps, too) was not all work for the Germans. In 1943, the Germans celebrated Christmas and the New Year in much the same way they would have celebrated at home. They decorated their barracks and mess hall, and exchanged Christmas presents. The holiday season that year also included an exhibit of POWs' art. In the evenings after a hard day's work, some POWs would occupy their time creating works of art, including pictures, jewel boxes, picture frames, and other items.[70] See **Figure 32.**

As Americans returned home from the war, there was a shortage of jobs for them, and the federal government began identifying ways to solve the problem. One of the solutions was to transfer the POWs' jobs to returning soldiers. As a result, the Corps published notifications to hire 25 laborers to work on such projects as "cutting grass, digging ditches, aiding in construction of additional rip rapping along Denison Dam, and other general labor tasks" in January 1946.[71] Around the same time, the Corps closed Camp Denison, and the POWs returned to Camp Howze to prepare for repatriation.[72] The POWs from the Madill Camp also left the Denison Dam project, and by mid-May 1946, all POWs interred in Oklahoma had left the state.[73]

Figure 32. Ca. 1943 photograph of German POWs at the Tishomingo unit of the Madill Camp celebrated Christmas with an art exhibit of chess boards and other items they made laid out on the table. The art items were blotted out by government censorship.

[70] "Still Fanatical Nazis, War Prisoners In Dam Basin Camp Less Cocksure of German Victory," *The Denison Herald*, January 2, 1944.
[71] "War Prisoners Lose Jobs as Local Men Need Work," *The Denison Herald*.
[72] Richard Paul Walker, M.A., "Prisoners of War in Texas During World War II," 105.
[73] Bill Corbett, "Prisoner of War Camps.".

Lake Texoma and the History Beneath the Surface

After the Denison Dam was completed in January 1944, Lake Texoma began filling up. On March 15, 1945, the water level reached its typical elevation of 617 feet above sea level. The very next day on March 16th, water poured over the spillway for the first time due to heavy rains, and the surrounding area flooded. Lake levels have reached the spillway at least four times since 1945.[74] The reservoir has 1,600 miles of shoreline, a surface area of 145,500 acres, and a maximum depth of 130 feet. It also has a storage capacity of over 5.8 million acre-feet of water.[75] The reservoir ranks as one of the largest in the United States and a number of resources, including whole towns, had to be relocated to make room for it.[76]

The United States government acquired nearly 200,000 acres of land for the reservoir. Additionally, the federal government had to relocate railroads, roads, cemeteries, important historic and cultural buildings, and other resources prior to them being inundated. Twenty-seven miles of rail lines and 16 miles of highway were relocated, which created a need for the construction of new bridges in some locations, as well. See **Figure 33.** Approximately 2,000 graves were also relocated from several cemeteries.[77]

Figure 33. July 23, 1943, photograph of the substructure of the new bridge to carry a relocated railroad over the Washita arm of the reservoir.

In addition to the resources identified above that had to be relocated, several towns on both sides of the Red River were abandoned or moved to a new location. These included Preston, Cedar Mills, and Hagerman in Texas, and Woodville, Aylesworth, and Isom Springs in Oklahoma.

[74] Fran Higginbottom and Roy Tucker, *History of Denison Dam & Lake Texoma, Short History & Some Facts About the Lake Texoma Area,* 13.
[75] C.H. Vivian, "The Denison Dam," 111.
[76] Tulsa Branch of the Oklahoma Section, American Society of Civil Engineers, *Nomination of Denison Dam as a National Historic Civil Engineering Landmark,* July 1992: A-1, Available at the United States Army Corps of Engineers Regional Planning and Environmental Center; United States Army Corps of Engineers, Tulsa District, *Lake Texoma Master Plan – Red River Basin,* January 2017, 1-3, Available at the United States Army Corps of Engineers Tulsa District Office.
[77] C.H. Vivian, "The Denison Dam," 111-112.

Like Preston, which is discussed above, the other towns inundated by Lake Texoma were settled in the late nineteenth and early twentieth centuries. Cedar Mills, Texas, was settled in the 1870s around quickly growing gristmills and sawmills on the southern banks of the Red River. Cedar Mills' population reached a height of 500 residents in the late 1880s and dropped to just 50 residents in the 1930s after the town was bypassed by several railroads.[78] J.P. Smith established Hagerman, Texas, in 1910. See **Figure 34.** The village thrived as a trade center but quickly fell to ruin after a Christmas Day fire destroyed several stores and businesses downtown just ten years after its founding.[79] Many residents moved away, and pessimism swept through those who remained as talks of building a new dam in the area increased and desires to rebuild the community decreased. See **Figure 35.**

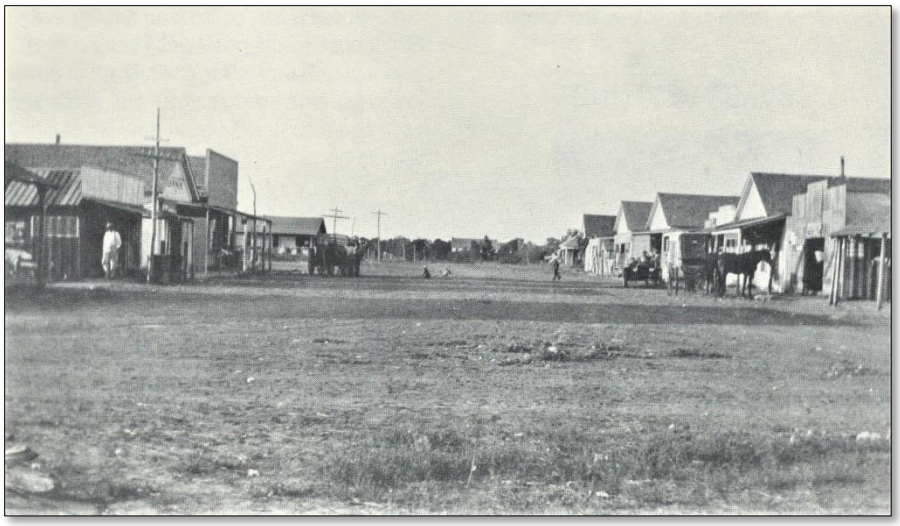

Figure 34. Hagerman, Texas in the early twentieth century.

Woodville, Oklahoma, was established in 1881 as a frontier town with a school and a St. Louis, Oklahoma and Southern Railway depot on the north side of town. The population rose from 390 residents when Oklahoma received statehood designation in 1907, to 443 residents in 1920.[80] Aylesworth was another small Oklahoma town along the Red River with one post office in operation and an agriculturally driven economy from 1903 until the 1930s. Isom Springs, Oklahoma, also operated with one post office from 1902 until 1924. The area was named after a local Chickasaw member who aided in trades between the settlers and Native Americans.[81]

Figure 35. Aerial photograph of Hagerman, Texas, taken just prior to it being abandoned.

[78] David Minor, "Cedar Mills, TX," *Handbook of Texas Online,* Texas State Historical Association, https://www.tshaonline.org/handbook/entries/cedar-mills-tx, Accessed March 18, 2022.

[79] "Hagerman, Now in Lake, Founded in 1910", Available at the Dolph Briscoe Center for American History - Hagerman, Texas Vertical File.

[80] Marshall County Genealogy and Historical Society, "Woodville," *The Encyclopedia of Oklahoma History and Culture,* https://www.okhistory.org/publications/enc/entry?entry=WO015, accessed March 17, 2022.

[81] "In Search of the Morrison Trail," *Isom Springs,* freepages.rootsweb.com/sturnbo/history/index.html, accessed March 18, 2022.

Figure 36. Photograph of the Glen Eden plantation house (undated).

Note: Based on a comparison of the vegetation in this photo to one included in Bauman's book Gone with the Water: The Saga of Preston Bend and Glen Eden (page 182) that was taken by the Corps in 1937, this photo appears to date to around the same time.

One of the important historical buildings slated for relocation prior to the impoundment of Lake Texoma was the Glen Eden plantation house. See **Figure 36.** As previously discussed, Holland Coffee built the Glen Eden plantation house for his wife Sophia in 1843.[82] In the late 1930s and early 1940s, Federal Judge Randolph Bryant of Sherman, Texas, owned the property on which the Glen Eden plantation house stood. When he learned the location where the house stood for almost 100 years would be inundated by the reservoir, Judge Bryant had the house dismantled, with each component being carefully labeled, so that it could be reconstructed in a new location. Judge Bryant planned to make a museum of the house after it was relocated. As the house was dismantled, a local reporter documented how the house was constructed and how it evolved over time. As fate would have it, the reporter's documentation preserved the house in the written word when it could not be physically preserved as Judge Bryant intended. Judge Bryant sold the house and its remaining land that would not be inundated by the reservoir to Grayson County for the creation of a county park centered around the reconstructed, historic Glen Eden house. The *Denison Herald* reports that a group of soldiers camped in the area mistakenly burned some of the dismantled house's logs before the house could be relocated and reconstructed.[83] According to local lore, a group of German POW's burned the logs.

In addition to the resources that had to be relocated for the new reservoir, there were two locations where levees or dikes were constructed to protect sensitive resources. The Cumberland Levees were constructed north of the Denison Dam to protect the Cumberland Oil Field. In 1940, oil was discovered near Cumberland, Oklahoma, an area north of the Denison Dam that originally would have been inundated by the impoundment of Lake Texoma. Due to the high yields of the oil field, it was determined that protecting the oil field from inundation was needed. As a result, the two Cumberland Levees were constructed along the east and southeast sides of the oil field. Additionally, the work diverted the Washita River a mile eastward away from the oilfield.[84] Combined, the two structures are 23,480 feet in length. The second levee, known as the Platter Levee, was constructed during the same period to protect the community of Platter, Oklahoma, from major flood events. Like the Denison Dam,

[82] Natalie Clountz Bauman, *Gone with the Water: The Saga of Preston Bend and Glen Eden*, 182.

[83] Natalie Clountz Bauman, *Gone with the Water: The Saga of Preston Bend and Glen Eden*, 187-198; "Van Zandt Rules County Exceeded Authority in Purchasing Glen Eden, Judge Bryant to Restore Home," *The Denison Herald,* May 29, 1946.

[84] C.H. Vivian, "The Denison Dam," 112

the Platter levee is a rolled earthfill structure. It is 5,870 feet long and is the same height as the Denison Dam.[85] As of 2021, the Platter Levee has never been overtopped.[86]

Recreation at Lake Texoma

With six million residents within a four-hour drive of the reservoir in 1944, the formation of the reservoir provided the region with a unique chance to develop into a recreational destination.[87] The lake had fishing and boating, with areas around the lake for camping and hunting. Recognizing the reservoir's recreational potential, the Corps enlisted the assistance of the National Park Service (Park Service) to develop a robust recreational plan.

In June 1944, *The Denison Herald* published a special issue for the completion of the Denison Dam. Included in the issue were the Park Service's detailed recreation plans, including drawings, around the Denison Dam Reservoir (later named Lake Texoma). The plans included several fishing villages, vacation cabins, and other overnight accommodations. They also highlighted floating cabins, floating boat slips and repair barges, private boat shelters, a concession area, and swimming floats.[88] A few months later, the Red River Lake Improvement Association unanimously agreed to name the reservoir Lake Texoma, which is a combination of the names Texas and Oklahoma. In 1945, local newspapers reported that Park Service plans included two major recreational areas and six minor areas, divided equally between Texas and Oklahoma.[89]

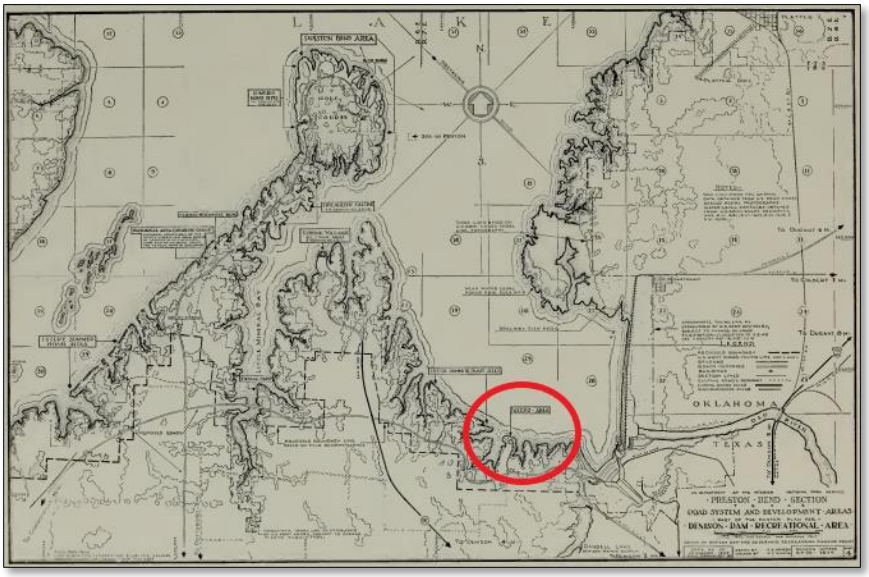

Figure 37. Overview map of the Preston Bend Section of the Denison Dam Recreation Area, with "Negro Area" circled in red, as shown on Figure 19 in the Park Service's 1943 *Recreational Resources of the Denison Dam and Reservoir Project*.

[85] United States Army Corps of Engineers, Tulsa District, *Lake Texoma Master Plan – Red River Basin,* January 2017: 1-5.
[86] Jacob Ellison, Lake Manager, U.S. Army Corps of Engineers Texoma Lake Office, personal communication with Heather Goodson, Sr. Architectural Historian, Blanton & Associates, November 3, 2021.
[87] "Recreation at Lake Promises Denison A Post-war Boom," *The Denison Herald*, November 5, 1944, available at the United States Army Corps of Engineers Texoma Lake Office.
[88] "National Park Service Plans Show Highlights of Future Playground of Southwest For Dam," *The Denison Herald,* June 29, 1944, available at the United States Army Corps of Engineers Texoma Lake Office.
[89] William C. Barnard, "Millions of Vacationists, Hungry for Outings, Eye Lake Texoma, Big Fishing Resort Near Denison," *The Bryan Daily Eagle,* July 24, 1945, www.newspapers.com.

As part of the recreation planning process, the Park Service conducted an analysis of the population within 200 miles of the reservoir. In the analysis, the African American population was the only racial group having "sufficient numerical importance to require special consideration in planning recreational facilities."[90] Thus, the Park Service plans included a "first-class development located on a convenient site."[91] See **Figure 37.** The "Negro Area," as it was labeled in the plans, was to be located on approximately 100 acres within the Preston Bend major recreational area about a mile west of the Denison Dam spillway. Plans called for campgrounds, cabins, a concession building, and facilities for picnicking, fishing, swimming, baseball, and other activities.[92] See **Figure 38.** However, there is no indication from the research that these plans were ever realized, and the "Negro Area" development was not included in the subsequent 1952 Corps master plan for the reservoir's recreational amenities.[93]

Figure 38. Detail map of the "Negro Area" as shown on Figure 33 in the Park Service's 1943 *Recreational Resources of the Denison Dam and Reservoir Project*.

Along with the Park Service plans, the Tulsa District of the Corps developed a proposal for a less expensive recreational development plan. They budgeted the plan at $420,000, which was much smaller compared to the $6 million required for the Park Service plan. The Corps' plan was not well received by local leaders. Local residents were concerned that the Corps' proposal would reduce public facilities along Lake Texoma. *The Denison Herald* reported that much of the Corps' budget

[90] United States Department of the Interior National Park Service, *Recreational Resources of the Denison Dam and Reservoir Project,* October 1943, available at the U.S. Army Corps of Engineers Regional Planning and Environmental Center, 43.

[91] United States Department of the Interior National Park Service, *Recreational Resources of the Denison Dam and Reservoir Project,* 43.

[92] United States Department of the Interior National Park Service, *Recreational Resources of the Denison Dam and Reservoir Project,* XII, 11, and 64.

[93] United States Army Corps of Engineers, Tulsa District, *Master Plan for Reservoir Development, Denison Dam and Reservoir, Red River, Texas and Oklahoma,* March 1952, available at the United States Army Corps of Engineers Texoma Lake Office. For more information about segregation in recreation, see the 2023 report entitled *Lake Texoma Recreation during the Jim Crow Era,* Report of Investigations Eight, by Portia D. Hopkins, Ph.D. with contributions by Diana Hernandez, M.A., Duane E. Peter, M.A., and Genessis Rodriguez, B.A., on behalf of Swift River Environmental Services-Versar Joint Venture, prepared for the U.S. Army Corps of Engineers Regional Planning and Environmental Center.

would be spent on roads, turn-arounds, and a small handful of public beaches, instead of the public facilities that the Park Service plan offered.[94]

In March of 1946, Representative Rayburn met with Park Service leaders and Corps officials to discuss the ongoing efforts to develop recreational amenities in the Lake Texoma area and to formally codify the Park Service's role in those efforts. As a result of the discussions, the agencies signed an agreement for the Park Service to take over supervision of the recreational development and to establish an official Park Service unit called "Lake Texoma Recreation Area" on April 18, 1946.[95] The agreement said the development of recreational facilities would be the Park Service's responsibility except for the following areas:

1. The area immediately next to the dam and spillway,
2. The headquarters of the Texas and Oklahoma Game and Fish Commission, and
3. The Hagerman and Tishomingo National Wildlife Refuges, which were established earlier in 1946.[96]

Also in 1946, the Corps made plans for a $99,000 project to construct office space for engineers above the Denison Dam powerhouse, as well as for construction of an overlook station and parking area at the south end of the dam. In 1947, the Corps designed the overlook station to include an information center, ranger headquarters, restrooms, and space for concession facilities.[97] See **Figure 39** for the floor plan of the proposed overlook station, which was designed with segregated facilities for "white" and "colored" people.[98] See **Figure 40** for a zoomed image of the restroom section of the floorplan showing the segregated facilities. In May 1947, the Chief of Engineers only approved construction of restrooms, sewage disposal system, electrical distribution system, exterior utilities, grading, and paving, rather than the entire overlook station plan, at the south end of the dam. See **Figure 41** for a photograph of the standalone, segregated restroom building completed in December 1948.[99] In the early 1950s, the Corps' subsequent analyses and master plan discussed construction of the overlook station; however, it was never constructed, presumably due to lack of available funding.[100] The 1948 restroom building was demolished in September 2018.

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[94] "Modified' in the Extreme," *The Denison Herald,* January 6, 1946, available at the United States Army Corps of Engineers Texoma Lake Office.

[95] "Senator Rayburn Sees Promise of Accord in Park Work," *The Denison Herald,* March 17, 1946, available at the United States Army Corps of Engineers Texoma Lake Office; Barry Mackintosh, "Former National Park System Units: An Analysis," *National Park Service,* 1995, https://www.nps.gov/parkhistory/hisnps/NPSHistory/formerparks.htm, accessed March 23, 2022.

[96] "Federal Jurisdiction of Lake Texoma Area Is Clarified," *The Madill Record,* May 23, 1946, www.newspapers.com.

[97] "Engineer Offices Above Powerhouse Planned," *Fort Worth Star-Telegram*, April 19, 1946, www.newspapers.com; United States Army Corps of Engineers, Tulsa District, *Plans for Construction of Overlook Shelter & Parking Area, Red River, Denison Dam,* May 1947, available at available at the United States Army Corps of Engineers Texoma Lake Office.

[98] United States Army Corps of Engineers, Tulsa District, *Plans for Construction of Overlook Shelter & Parking Area, Red River, Denison Dam,* Sheet DRC-104.

[99] U.S. Army Corps of Engineers, Tulsa District, *Analysis of Design for Construction of Overlook Shelter – Denison Dam and Lake Texoma, Red River, Texas and Oklahoma,* July 1950, available at the United States Army Corps of Engineers Texoma Lake Office.

[100] U.S. Army Corps of Engineers, Tulsa District, *Analysis of Design for Construction of Overlook Shelter – Denison Dam and Lake Texoma, Red River, Texas and Oklahoma,* July 1950, available at the United States Army Corps of Engineers Texoma Lake Office.

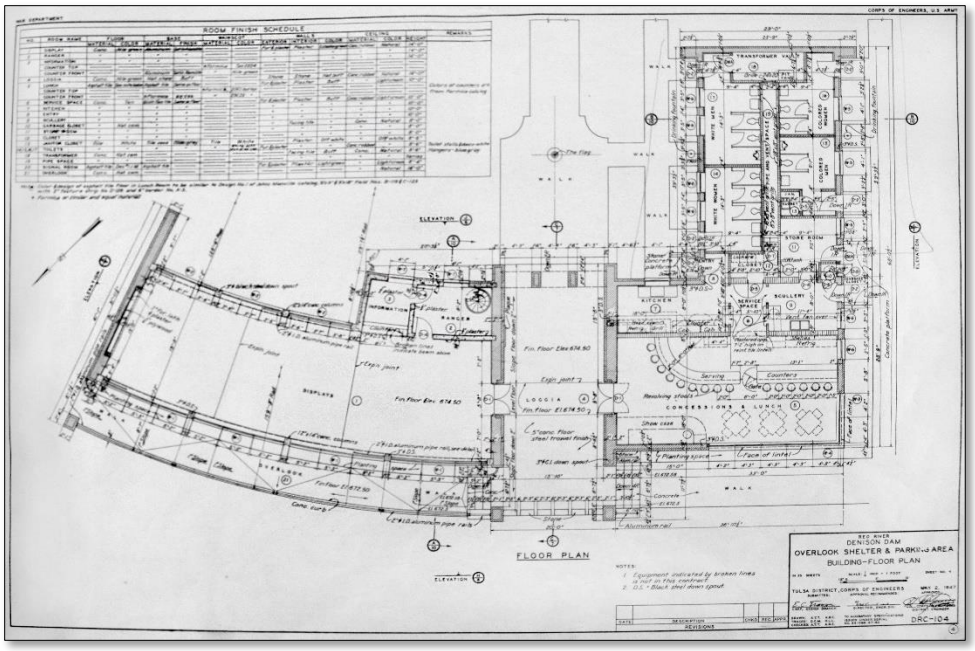

Figure 39. Overview of 1947 floor plan for the proposed overlook station.

Note: Overlook station was never constructed. A stand-alone restroom building was the only building the Corps ultimately constructed at the overlook.

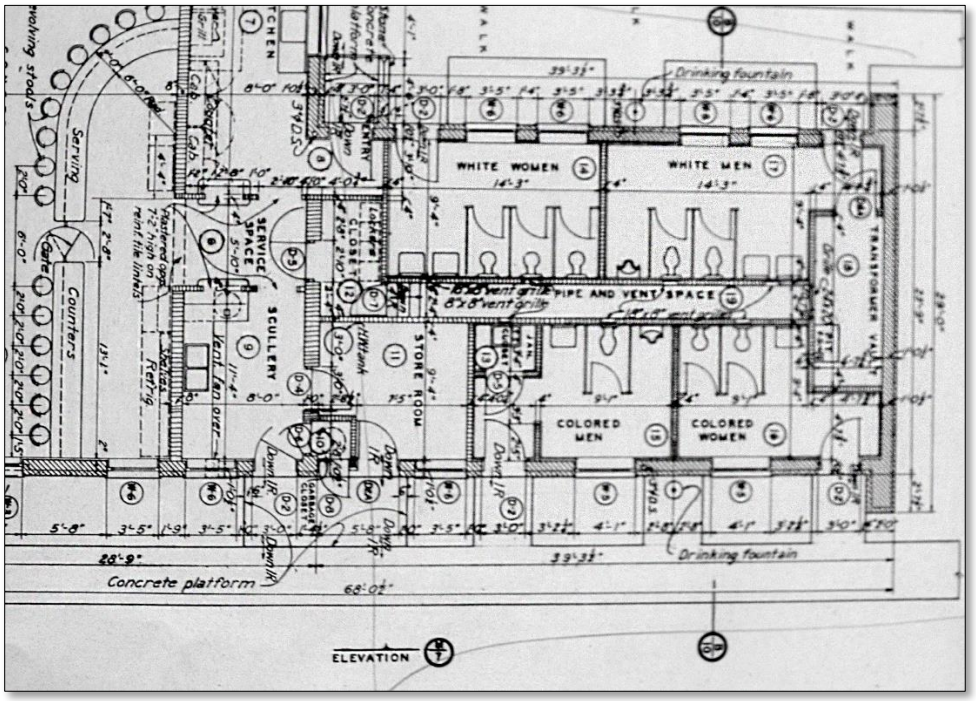

Figure 40. Excerpt of 1947 floor plan for the overlook station showing the restroom section of the proposed building.

Note: Overlook station was never constructed. A stand-alone restroom building was the only building the Corps ultimately constructed at the overlook.

Figure 41. Photograph of the restroom building prior to its demolition in September 2018. This was the only building the Corps constructed at the spillway overlook area.

Lake Texoma quickly became a popular regional destination with nearly 2.4 million visitors in 1948.[101] Despite the overwhelming number of visitors, recreational facilities were slow to advance under the management of the Park Service because the agency was unable to secure the necessary funding to construct all their original plans. By the late 1940s, area business owners grew frustrated with the Park Service. They asked for supervision of the recreational facilities to return to the Corps, who locals thought would do better at securing funding and who would open the area to more private development. Under increasing pressure, the Park Service gave control of the area back to the Corps in 1949.[102] That year, there were 24 resorts or concessions on government-owned land around Lake Texoma. [103]

Lake Texoma Recreation Area's designation as a Park Service unit was short-lived, lasting only three years. However, it was not the only Park Service unit to be delisted during this time. The Park Service delisted other western United States reservoir-based Recreation Areas during the mid-twentieth century including Shasta Lake Recreation Area (1945-1948), Millerton Lake Recreation Area (1945-1957), Shadow Mountain Recreation Area (1952-1979), and Flaming Gorge Recreation Area (1963-1968).[104] From 1930 to the mid-1990s, a total of twenty-three Park Service units were delisted for various reasons. For the reservoir-based units like Lake Texoma Recreation Area, the Park Service involvement was the result of an agreement with the reservoir-managing agency (the Corps, in the case of Lake Texoma), not as the result of an act of the United States Congress. Thus, the Park Service was not "deeply committed to reservoir recreation management," making it easier for the agency to relinquish management of certain Park Service units to other agencies willing to accept them.[105]

[101] "Army Engineers Take Over Control of Lake Texoma," *The Bonham Daily Favorite*, May 6, 1949, www.newspapers.com.
[102] United States Army Corps of Engineers, Tulsa District, "History of Lake Texoma," https://www.swt.usace.army.mil/Locations/Tulsa-District-Lakes/Oklahoma/Lake-Texoma/History/, accessed November 11, 2021.
[103] "Increase Forecast in Texoma Facilities," *Fort Worth Star-Telegram,* April 10, 1949, www.newspapers.com.
[104] Bob Janiskee, "Pruning the Parks: Lake Texoma Recreation Area (1946-1949)," *National Parks Traveler,* June 30, 20210, https://www.nationalparkstraveler.org/2010/06/pruning-parks-lake-texoma-recreation-area-1946-19496110, accessed March 14, 2022.
[105] Barry Mackintosh, "Former National Park System Units: An Analysis."

In 1952, the Corps issued their Master Plan for Reservoir Development for the area. This master plan noted that the overlook area consisted of a "parking area and stone building for public toilets" (the segregated restroom discussed above). At that time, it was still anticipated that an overlook structure would be completed, with an information lobby, lookout roof, and restaurant that would operate as concessions on the main floor.[106] As discussed above, the lobby and restaurant were ultimately not constructed, however. Although the recreation areas were still under development in the early 1950s, the area's popularity continued to grow. In 1955, the Lake Texoma region reported 6 million visitors.[107]

In the later decades of the twentieth century, visitors, mostly from Oklahoma and Texas, continued to travel to Lake Texoma for recreation. In 1969, striped bass were introduced to Lake Texoma, followed by walleye and Florida bass in 1975, making it a premier destination for fishermen. Hunting was also popular, along with swimming, boating, and camping. In 1979, Lake Texoma reported 11 million visitors.[108]

According to the 2016 *Lake Texoma Master Plan,* the average annual visitation to the Lake Texoma area between 2000 and 2012 was 5.8 million visitors, which included campers, full and part-time residents, hunters, fisherman, hikers, day visitors, swimmers, bikers, and wildlife enthusiasts. In the early 2000s, Lake Texoma reported the highest number of visitors of all Corps lake projects in the United States. At that time, there were four developed public parks/recreation areas in Texas and eight in Oklahoma surrounding the lake. There were also 14 commercial concession leases, including marinas and resorts, open to the public in Texas and nine located in Oklahoma. Additionally, the Corps had 22 leases to non-profit organizations, referred to as quasi-public use areas, and 14 leases to private organizations for recreation purposes.[109] Today, the Lake Texoma area continues to boast of these numerous recreational opportunities.

Conclusion

When the Denison Dam was largely completed for flood control purposes and hydroelectric production in 1944, it was the largest rolled earthfill dam in the world.[110] Today, the Denison Dam is the 11th largest earthfill dam and Lake Texoma is the 12th largest reservoir in the United States.[111] The Denison Dam changed earthfill dam construction throughout the United States with new construction methods and tools. The dam proved to be a learning laboratory for engineers who transitioned from earlier hydraulic earthfill dams to the rolled type. The construction methods of compacting and consolidating the soil through rolling developed as part of the dam's construction made the Denison Dam the forerunner of rolled earthfill dams in the world. The Denison Core Barrel was an innovative new tool designed to improve soil sampling methods during construction. These new techniques and tools

[106] United States Army Corps of Engineers, Tulsa District, *Denison Dam and Reservoir, Master Plan for Reservoir Development*. (March 1952), 14. Available at the United States Army Corps of Engineers Texoma Lake Office.
[107] "Texoma Report," *The Denton Record Chronicle*, August 7, 1955, www.newspapers.com.
[108] United States Army Corps of Engineers, Tulsa District, "Lake Texoma (brochure)," no date, available at the United States Army Corps of Engineers Texoma Lake Office – Lake Texoma Vertical File.
[109] United States Army Corps of Engineers, Tulsa District, *Lake Texoma Master Plan – Red River Basin,* (September 2016), 2-45 through 2-51.
[110] Tulsa Branch of the Oklahoma Section, American Society of Civil Engineers, *Nomination of Denison Dam as a National Historic Civil Engineering Landmark,* 3.
[111] Tulsa Branch of the Oklahoma Section, American Society of Civil Engineers, *Nomination of Denison Dam as a National Historic Civil Engineering Landmark,* A-1; United States Army Corps of Engineers, Tulsa District, *Lake Texoma Master Plan – Red River Basin,* January 2017: 1-3.

advanced the practices of dam engineering and construction throughout the United States and were used on dams after the Denison Dam's construction. Denison Dam's importance in the world of dam engineering and technology was recognized when the American Society of Civil Engineers designated the structure a National Historic Civil Engineering Landmark in 1993.[112]

[112] American Society of Civil Engineers, "Denison Dam," https://www.asce.org/about-civil-engineering/history-and-heritage/historic-landmarks/denison-dam, accessed March 14, 2022; Tulsa Branch of the Oklahoma Section, American Society of Civil Engineers, *Nomination of Denison Dam as a National Historic Civil Engineering Landmark,* July 1992.

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