

An Era of Change: The Tulsa District, U.S. Army Corps of Engineers, 1971-1997



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An Era of Change:
The Tulsa District, U.S. Army Corps of Engineers, 1971-1997

by

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Lake photo courtesy Tulsa World.

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Graves and Neushul Historical Consultants

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Preface

This history of the Tulsa District, U.S. Army Corps of Engineers, covers the organization's activities during the 1970s, 1980s, and through much of the 1990s. In civil works, including water resources development, recreation, emergency management, and regulatory activities, this was a period of great change and challenge for the Corps and the Tulsa District. Likewise, in military construction activities, the Army engineers and Tulsa District personnel responded to a complex array of national defense needs, including housing, training facilities, and environmental restoration. From national development demands and constraints to geopolitical transformations, the Corps of Engineers and districts like Tulsa strove to meet local needs and cope with international challenges of the modern world. What follows is the story of one Corps district and its activities in Oklahoma, and parts of Texas, Arkansas, and Kansas.

The production of this book would not have been possible if not for the work of others. The authors would like to acknowledge the late William R. Settle, who wrote *The Dawning: A New Day for the Southwest: A History of the Tulsa District, 1939-1971* (1975). Another work on the district is Ann Patton's *Fifty Years Remembered: The First Fifty Years of the Tulsa District, U.S. Army Corps of Engineers*. Finally, we dedicate this work to Barbara Cravens of the district's Public Affairs Office, who passed away during its editing.

Gregory R. Graves has published several works about the U.S. Army Corps of Engineers, including *Saving California's Coast, Army Engineers at Oceanside and Humboldt Bay* (1991), *Pursuing Excellence in Water Planning and Policy Analysis: A History of the Institute for Water Resources, U.S. Army Corps of Engineers, 1969-1992* (1995), and *A History of the Southwestern Division, U.S. Army Corps of Engineers, 1986-1994* (1998). He has also written extensively on the subjects of environmental history, conservation, and the American West. He holds bachelors and masters degrees from Oklahoma State University and a doctoral degree from the University of California, Santa Barbara.

Peter Neushul has co-authored several books on the Corps of Engineers, including *A History of the Southwestern Division of the U.S. Army Corps of Engineers 1986-1994* (1998). His publications include articles in history of science, history of technology, environmental history, and military history. Neushul is currently a visiting researcher at the University of California at Santa Barbara. He received his Ph.D. in History of Science and Technology from the University of California at Santa Barbara.

Chapter One

The Tulsa District's First Thirty Years

Shortly before the first shots of the Second World War were fired, Chief of Engineers, Major General Julian L. Schley, issued General Orders Number 3, establishing the U.S. Army Corps of Engineers, Tulsa District. On July 1, 1939, the district officially began operations in downtown Tulsa, Oklahoma. The new district was part of the Southwestern Division of the Corps of Engineers then headquartered in Little Rock, Arkansas. Establishment of the Tulsa District was the product of regional water resources needs, federal legislation, local promotion, and the size and rapid growth of the city of Tulsa. Since its beginnings, the Tulsa District has helped to transform the economic life of Oklahoma, the Texas panhandle, southwestern Arkansas, and southern Kansas with a variety of water resources projects. Although its establishment was largely coincidental with the onset of World War II and the inability of the Memphis District to handle all of the regional workload, Tulsa District also soon became important for military construction, providing engineering, construction, and maintenance work for the U.S. Army, Air Force, and Navy.¹

The progression toward a Corps of Engineers district office in Tulsa in many ways parallels the history of Oklahoma dating back to its territorial days. Originally established by the United States government as Indian Territory, present-day Oklahoma was the primary removal area for eastern tribes before the Civil War. After the war, the territory became the resettlement grounds for many subjugated Plains and Rocky Mountain Indian tribes. During the 1880s, non-Indian settlers moved into unassigned lands in the western half of what became the state of Oklahoma. Shortly thereafter the federal government designated two territories:

Oklahoma Territory in the west and Indian Territory in the east. Much more of the unassigned land was opened to general settlement in the 1890s. By 1900, more than one million people lived in the territories, which were joined together as the state of Oklahoma in 1907.² Situated in the basins of the Arkansas and Red rivers and their tributaries, Oklahoma periodically experienced heavy flooding that sometimes brought tragedy to the growing population as small rivers and creeks turned into raging torrents during floods. Their sediment-laden waters provided at best an unreliable municipal water source. Although fresh water abounded, few natural lakes existed, and Oklahoma's continued growth depended on extensive water resources development.³

As Oklahomans looked to the federal government to solve the problems of flooding and water supply, they also hoped to increase the navigability of some of the state's rivers. The desire for navigation improvements coincided with the late 19th and early 20th-century movement for inland waterway development planning. The primary transportation mode of the day was the railroad. Railroad companies had connected the cities and towns of the West in a massive construction effort that began about the time of the Civil War. The rails provided freight, passenger, and communication services to the nation. In rural America, farmers, miners, and livestock growers complained of excessive shipping rates and monopoly control over their lives and livelihoods. Railroad critics cried out for competing modes of transportation, and their complaints became planks in the platform of the Populist party in its bid to elect William Jennings Bryan president in 1896. The broader Progressive movement of urban reformers also abhorred monopoly, and looked to government to break the power of the railroads. One way was through anti-trust legislation, but Progressives also advocated

¹ William A. Settle, Jr., has written the definitive history of the Tulsa District in his 1975 *The Dawning: A New Day for the Southwest: A History of the Tulsa District, 1939-1971* (Tulsa, OK: U.S. Army Corps of Engineers, 1975). Another work on the District is Ann Patton's, *Fifty Years Remembered: The First Fifty Years of the Tulsa District, U.S. Army Corps of Engineers* (Tulsa, OK: U.S. Army Corps of Engineers, 1989).

² See Arrel M. Gibson, *Oklahoma: A History of Five Centuries* (Norman, OK: University of Oklahoma Press, 1981), passim, for a general history of the state.

³ Settle, *The Dawning*, p. 17.



Dreams of inland navigation on the Arkansas River date back at least to the turn of the 20th century. Here a commercial tugboat and barge navigate the river at Muskogee, Oklahoma, in 1906.

inland waterway improvements to create alternatives to railroad transit. The quintessential Progressive president, Theodore Roosevelt, created the Inland Waterways Commission in 1907 to identify, survey, and develop multiple-purpose plans—including navigation—for most of the nation's larger rivers.⁴

In Oklahoma and Arkansas, entrepreneurs looked to the wide and sandy Arkansas River as an eventual navigation channel to the Mississippi River and the sea. Paddle-wheel steamboats had transported passengers, cotton, and other goods from the mouth of the Arkansas to Muskogee, Oklahoma in the late 1800s. Between 1905 and 1910, two Muskogee-based steamship companies attempted to regularly navigate the Arkansas.⁵ Yet the river, that seasonally varied from a lazy, meandering stream to a raging river more than a mile wide, proved too unreliable for consistent shipping. Proponents hoped to link their navigation dreams to the broader national movement for inland waterways. In 1907, the Trans-Mississippi Conference, one of several navigation development organizations, met in Muskogee. The conference focused on development of the Arkansas River.⁶

As Oklahoma's water resources needs grew, the U.S. Army Corps of Engineers was becoming the federal government's principal water resources developer. When Congress passed the

Flood Control Act of 1917 authorizing federal improvements on the Sacramento and Mississippi Rivers, it expanded the Corps' water resources development role beyond navigation of rivers and harbors.⁷ In 1923, the Arkansas River at Tulsa overflowed its banks, causing widespread damage and the evacuation of 4,000 people. In the same year, the North Canadian River caused extensive damage in Oklahoma City and other communities. In 1927, the year of the great Mississippi River flood, Arkansas towns below Fort Smith experienced floods of record. Throughout what would become the Tulsa District, community leaders urged the federal government to increase its involvement in flood control. At the forefront of the effort was Ernest E. Blake, a civil engineer and lawyer from Oklahoma City, who chaired a 14-man flood control committee funded by the Oklahoma City Chamber of Commerce. Blake devised a system of reservoirs that would enhance flood control, navigation, and other water resources functions. Eventually, the committee's ideas made their way into congressional hearings in 1927 and 1928.⁸ Already in progress were comprehensive river basin studies authorized in the Rivers and Harbors Act of 1927 and based on funding estimates in the 1926 House Document 308, 69th Congress, 1st session. Influenced by the devastating 1927 floods—and by

⁴ See Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement* (Cambridge, MA: Harvard University Press, 1958).

⁵ Patton, *Fifty Years Remembered*, pp. 63-65.

⁶ See *Muskogee* (Oklahoma) *Phoenix*, (4 March 1907).

⁷ The original legislation regarding navigation was the Rivers and Harbors Act of 1899. Settle, *The Dawning*, p. 21.

⁸ William A. Settle, Jr., "Years of Challenge and Change: The Tulsa District, 1971-1983," (unpublished manuscript, ca 1985), p. I-1-I-3, manuscript available at Tulsa District Public Affairs Office.



The great flood of 1927 inundated vast areas of the Great Plains, the Arkansas Valley, and the Mississippi Valley.

Blake's study—Congress amended the legislation to include the tributaries of the Mississippi River.⁹

In the resulting "308 Reports," the Corps of Engineers identified the nation's major river basins, and assessed the possibilities of constructing flood control, irrigation, hydroelectric power, and navigation projects on them. In July 1935, the Corps released its three-volume report on the Arkansas River and tributaries. Although acknowledging the need for comprehensive flood control works throughout the basin, the report did not find a navigation system economically feasible. Another 308 Report, released in 1936, found insufficient economic justification for navigation on the Arkansas River. The reports came as a blow to navigation advocates, especially in the rapidly growing city of Tulsa. By this time the principal proponent was Tulsa banker Newton "Newt" R. Graham, who set out to have a restudy of the Arkansas River basin based on new benefit/cost criteria.¹⁰

In 1936 and 1938, Congress enacted flood control acts. The pivotal 1936 law stated that "flood control on navigable waters and their tributaries is a proper activity of the federal government."¹¹ The

⁹ Ibid.; Also see Jamie W. Moore and Dorothy P. Moore, *The Army Corps of Engineers and the Evolution of Federal Flood Plain Management Policy* (Boulder, CO: University of Colorado Institute of Behavioral Science), p. 4, for a discussion of 1920s legislation.

¹⁰ Much of Tulsa's rapid growth was the result of large oil discoveries in the 1910s and 1920s. Tulsa was known for some decades thereafter as the Oil Capital of the World. Settle, *The Dawning*, pp. 27-30.

¹¹ See Joseph L. Arnold, *The Evolution of the 1936 Flood Control Act* (Fort Belvoir, VA: U.S. Army Corps of Engineers Office of History, 1988), passim, for an analysis of this act.

act authorized, among many others, one flood control structure in Colorado, four in Oklahoma, and one in New Mexico. At that time, the Corps of Engineers directed its civil works activities in Oklahoma through the Lower Mississippi Valley Division's Memphis District.¹² The 1938 Flood Control Act authorized construction of Canton Reservoir in western Oklahoma and directed the Corps to designate six other sites. The chief of engineers in turn selected four sites in Oklahoma, including Denison Dam on the Red River, and two in Arkansas.¹³ The Flood Control Acts of 1936 and 1938 accelerated the movement of the Corps of Engineers toward building large structures to hold back flood waters. The so-called "Big Dam Era" public works projects were generally part of Franklin D. Roosevelt's New Deal objective to inject money into local economies during the Great Depression.¹⁴

In light of the proposed water resources developments in Oklahoma, boosters stepped up their efforts in the late 1930s for a federally funded waterway on the Arkansas River. Newt Graham actively promoted navigation through the Arkansas Valley and the Southwestern Valley associations, two groups established to lobby Congress for a waterway in Oklahoma and Arkansas. Graham

¹² D. Clayton Brown, *The Southwestern Division: 50 Years of Service* (Dallas, TX: U.S. Army Corps of Engineers, 1987), pp. 4-5.

¹³ Settle, *The Dawning*, pp. 27-30; Settle, "Years of Challenge," p. 1-6.

¹⁴ See John Ferrell, *Big Dam Era: A History of the Pick-Sloan Plan* (Alexandria, VA: U.S. Army Corps of Engineers Office of History, 1987), Chapter One, for a discussion of the Corps' large dam construction.

presented the Corps and Congress with a continuous flow of information proving the economic feasibility for a waterway, and argued that hydroelectric power and water supply benefits be considered as part of the economic analysis for the waterway. In addition, Graham and other community leaders urged the federal government to establish a Corps of Engineers district office in Tulsa.¹⁵

The Corps responded in several ways to its increasing water resources development responsibilities in the Southwest. In 1937, the Southwestern Division began operations in Little Rock, with that office moving to Dallas in 1941. The Corps also established the Little Rock District in 1937. The new district included Oklahoma in its area of civil works operations. With construction underway on Denison Dam, the Corps opened a district office in that northern Texas community in January 1939, primarily to build that structure and plan development in the Red River basin.¹⁶

Distances and inaccessibility presented significant challenges to the Corps as it assumed its expanding civil works responsibilities. Congress had recently authorized ten major water resources developments in Oklahoma, Colorado, New Mexico, and five local flood protection projects in Kansas—all of which were to be constructed by the Little Rock District. Some of the projects were more than 600 miles from Little Rock. Air service was minimal in the 1930s, and existed only between large cities. The U.S. highway system, although begun 20 years before, still had large stretches of gravel roads, one-lane bridges, and, over many small streams, no bridges at all. The interstate highway system was still two decades away. A trip from Little Rock to projects in western Oklahoma took two days and trips to New Mexico and Colorado at least three. It soon became clear that area offices in the upper Arkansas River valley needed closer communication than the Little Rock District office could provide. In response, Colonel Eugene Reybold, the Southwestern Division Engineer, established the Tulsa District in July 1939. Because of its size, location, and the efforts of local promoters like Newt Graham, Tulsa won out over

competing cities as the site for a Corps of Engineers district. The new district, under the command of Colonel Harry A. Montgomery, immediately had 278 employees, most of whom had been working in area offices of the Little Rock District.¹⁷

The Corps established the Tulsa District solely for civil works in the upper Arkansas River basin; however the district's responsibilities soon expanded. In December 1940, the U.S. Army Quartermaster Corps transferred 83 Air Corps construction projects to the Corps of Engineers and the Tulsa District picked up a share of that work. Thirteen months later, Congress turned over all military construction functions to the Corps of Engineers.¹⁸ As American entry into the war neared, the federal government increased military spending dramatically. Throughout the nation, Corps districts adjusted to meet the new demands of military construction. Most civil works projects were suspended while the Army engineers hastily designed, planned, and constructed military installations and defense plants.¹⁹ Oklahoma, with inexpensive real estate and level land in abundance, became a logical location for air bases and plants. Often working with Denison District personnel, Tulsa District employees built many facilities throughout the region, including aircraft plants in Tulsa and Oklahoma City; air bases at Enid, Altus, Clinton, and Muskogee; Camp Gruber, a training facility in eastern Oklahoma; municipal airfields in Tulsa, Enid, and Perry; flight schools in Pampa and Dalhart, Texas; and an Army ordnance plant in Chouteau.²⁰ During the war, the Tulsa District placed about \$800 million in military construction and procured more than \$100 million in equipment. The Tulsa and Denison Districts were responsible for about 5.5 percent of the total World War II Army domestic construction.²¹

Although Tulsa District personnel were consumed with military construction, other individuals kept the civil works program in focus during the war years. Newt Graham persisted in

¹⁵ Settle, *The Dawning*, pp. 34-35; Settle, "Years of Challenge," pp. I-5-I-6.

¹⁶ Graves and Neushul, *The History of the Southwestern Division*, p. 2.

¹⁷ Barry W. Fowle, ed., *Builders and Fighters: U.S. Army Engineers in World War II* (Fort Belvoir, VA: U.S. Army Corps of Engineers Office of History, 1992), pp. 3-17, 21-23.

¹⁸ Patton, *Fifty Years Remembered*, pp. 69-74.

¹⁹ Settle, "Years of Challenge," p. I-9.

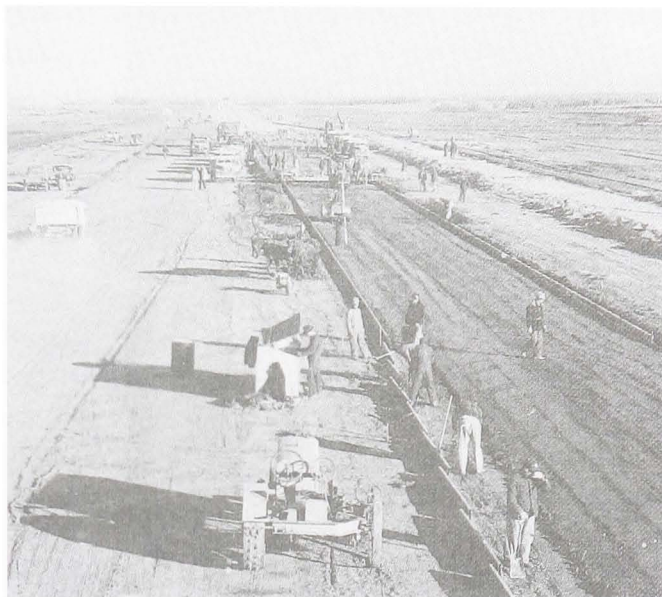
¹⁵ Settle, *The Dawning*, pp. 34-35.

¹⁶ Gregory Graves and Peter Neushul, *The History of the Southwestern Division: U.S. Army Corps of Engineers, 1986-1994* (Dallas, TX: Southwestern Division, 1998), pp. 1-2.

his advocacy for construction of a waterway on the upper Arkansas River. The Corps completed a restudy of the 308 Report on the Arkansas in 1943, concluding that the proposed navigation system was economically feasible. Inclement weather in wartime Oklahoma and Arkansas, combined with continued advocacy, guaranteed postwar interest in water resources projects. In 1941 and 1943, widespread flooding occurred on the Arkansas River in Oklahoma, with a flood of record taking place at Muskogee in May 1943. The massive flood pushed its way southward to cause damage at Webbers Falls, Oklahoma, and Fort Smith, Little Rock, and Pine Bluff, Arkansas. In its wake, Oklahoma water resources proponents like Graham gained a powerful new ally in Governor Robert S. Kerr. The governor lamented the hardship caused by the 1943 flood that resulted in more than \$31 million in damages. Until his death in 1963, Kerr championed multi-purpose water resources development, including flood control, navigation, hydropower, water supply, and recreation on the Arkansas River.²²

As World War II wound down, Congress prepared for a peacetime that included resumption of many water resources development projects. The Flood Control Act of 1944 authorized many new projects nationwide and also authorized recreational facilities at Corps projects. Within the Southwestern Division, major realignments took place in 1945. The most significant for Oklahoma was the merging of the Denison and Tulsa Districts. Because of declining military construction and civil works in the Denison area of operations, the Corps closed the Denison office and moved most of the employees to Tulsa. Tulsa District acquired responsibility for the Red River above Fulton, Arkansas, which included Lake Texoma and Denison Dam.²³ Now the district had more than 1,500 employees, civil works responsibilities in all of Oklahoma and parts of six other states, and military construction in Oklahoma and northwestern Texas.

While the Tulsa District built numerous water resources projects in the post-war years, the



Tinker Field, later Tinker Air Force Base, under construction (above) and after completion in 1942.



magnum opus was the McClellan-Kerr Arkansas River Navigation System. At the end of the war, however, construction of the waterway was far from certain despite another favorable Corps study released in 1945. The Arkansas River Survey Board, a team assembled from the Southwestern Division by General Eugene Reybold, Chief of Engineers from 1941 to 1945, altered the original 308 Report to extend the waterway up the Arkansas to Muskogee, and from there up the Verdigris River to Catoosa, 13 miles east of downtown Tulsa. Using the Verdigris increased the benefit/cost ratio in several ways: the Verdigris had a narrower channel, was 11 miles shorter than the Arkansas to Tulsa route,

²² Ibid.; Settle, *The Dawning*, p. 44; See also Robert S. Kerr, *Land, Wood, and Water* (New York: Fleet Pub. Corp., 1960), for Kerr's views on water resources development.

²³ Settle, *The Dawning*, pp. 67-68.



Senator Robert S. Kerr of Oklahoma (above) and Senator John L. McClellan of Arkansas were instrumental in obtaining congressional approval for the massive Arkansas River Waterway Project later known as the "McClellan-Kerr Arkansas River Navigation System."



and was more than 100 feet lower in elevation.²⁴ In September 1945, the Board of Engineers for Rivers and Harbors examined the 1943 restudy and the Arkansas River Survey Board report, both of which economically and technically justified the project. Skepticism surrounded the board's review; while it acknowledged economic justification, the review gave a low priority to funding the project.²⁵ Even with the added benefits of hydropower, recreation, water supply, and the terminus at Catoosa, the waterway had a minimal positive benefit-to-cost

²⁴ Ibid., p. 47; *The History of the U.S. Army Corps of Engineers*, pamphlet EP360-1-21 (1986), p. 124.

²⁵ Settle, "Years of Challenge," p. 1-7.

ratio because of anticipated siltation problems. The Arkansas and its tributaries carried large amounts of sediment, and all reports had acknowledged siltation as a maintenance problem. Congress included the Arkansas River waterway in the 1946 Rivers and Harbors Act despite the board's evaluation. But now the authorized project joined 900 others awaiting funding. Of those 900 projects, the waterway fell into the lowest third in priority of the authorized projects because of its marginal benefit-to-cost ratio.²⁶

The waterway might have remained on the federal government's backburner had it not been for Robert S. Kerr and John L. McClellan. After his gubernatorial election in 1942, Kerr became an active waterway proponent. In 1948, Kerr was elected to the U.S. Senate. McClellan, a U.S. senator from Arkansas, had introduced legislation for navigation improvements on the Arkansas and White Rivers in the 1940s.²⁷ With two powerful proponents in Congress, the waterway's chances seemed better.

To deal with the silting problems, the Corps of Engineers modified its overall plan to include at least two "silt trap" reservoirs, one on the South Canadian River near its confluence with the Arkansas (Eufaula), and the other on the Arkansas below its confluence with the Cimarron River (Keystone). When, in 1956, the Bureau of the Budget revoked funding for these dams and for another key project, Dardanelle in Arkansas, Senator Kerr stepped in. As chairman of the Senate Public Works Committee, Kerr withheld his support for the \$27.5 billion Interstate Highway Act until the committee approved start-up funds for the three waterway reservoir projects. When that approval came and construction began in 1957, the navigation project was finally underway.²⁸

Over the next 14 years, the Tulsa and Little Rock Districts constructed the locks, dams, levees, and bridges of the waterway. By first completing the upstream dams, Oologah (1963), Keystone (1964), and Eufaula (1964), the Corps saved

²⁶ Graves and Neushul, *The History of the Southwestern Division*, pp. 4-5.

²⁷ S. Charles Bolton, *25 Years Later: A History of the McClellan-Kerr Arkansas River Navigation System in Arkansas* (Little Rock, AR: U.S. Army Corps of Engineers, 1995), pp. 14-16.

²⁸ Graves and Neushul, *The History of the Southwestern Division*, pp. 4-5.

perhaps millions of dollars. With the floodgates closed on the Arkansas, South Canadian, and Verdigris Rivers and the reservoirs filling behind them, stream flow declined rapidly. Engineers then built the locks from the bottom up and did not need to construct expensive cofferdams to divert the rivers' flow.²⁹ In April 1964, construction began in Oklahoma on the Robert S. Kerr Lock and Dam at navigation mile 336.2. By October 1966, construction was underway on the other four Oklahoma locks and dams: Newt Graham on the Verdigris River at navigation mile 421.7; Chouteau on the Verdigris at navigation mile 401.4; Webbers Falls on the Arkansas at navigation mile 366.6; and W.D. Mayo at navigation mile 319.6.³⁰

Upstream reservoir projects supported the navigation system construction and ongoing operation. The district completed Oologah, on the Verdigris River to help regulate water flow and to control sediment.³¹ Four other lakes, Tenkiller Ferry on the Illinois River, and Pensacola, Markham Ferry, and Fort Gibson on the Grand River, also play a role in regulating waterway flow. Markham Ferry and Pensacola are Grand River Dam Authority state of Oklahoma dams. Tulsa District completed Fort Gibson in 1953 and Tenkiller in 1961. Both projects also provide flood control, hydropower, water supply, and recreation.³²

Construction had begun earlier on the locks in Arkansas and, as a result, they were completed sooner. Navigation came to Little Rock in December 1968 and to Fort Smith in December 1969. With completion of the five Oklahoma locks and dams in December 1970, the entire waterway was ready for navigation. The route follows the White River from its confluence with the Mississippi River upstream for 9.2 miles and then the man-made Arkansas Post Canal to the Arkansas River at navigation mile 19. From there it follows the Arkansas to Muskogee, where, at Three Rivers Junction, it joins the Verdigris for fifty miles to Catoosa, Oklahoma. The total length of the waterway is 448 miles through 17 locks and dams—5 in Oklahoma and 12 in Arkansas. Four of the locks and dams on the waterway have hydroelectric power capabilities.

²⁹ Settle, "Years of Challenge," p. I-12.

³⁰ U.S. Army Corps of Engineers, Tulsa District, "Civil Works Projects: Pertinent Data," Sept. 1993, pp. 28, 94, 115, 137, 138.

³¹ Settle, "Years of Challenge," p. I-12; "Pertinent Data," p. 97.

³² "Pertinent Data," pp. 39, 126.

Two of those, Kerr and Webbers Falls, are in the Tulsa District. The four generating dams have a 374,000-kilowatt capacity.³³ On January 21, 1971, the first tow arrived at the Port of Catoosa, having traversed 448 miles from the mouth of the White River. The barge carried newsprint paper for area newspapers shipped from Calhoun, Tennessee.³⁴

Six months later, on June 5, 1971, President Richard Nixon formally dedicated the \$1.2 billion waterway, the largest civil works project of that era, in a ceremony at the Port of Catoosa.³⁵ Thirty-thousand people attended the dedication that culminated decades of dreams and perseverance on the part of waterway promoters. In his remarks, President Nixon declared the navigation system was, "a bold dream when we came to the Congress, but is now a grand reality, and for generations to come will be a living monument to what man and nature together can accomplish."³⁶

While the major projects of the waterway were under construction, the Tulsa District became primarily involved in civil works. Tulsa District experienced a significant decline in military construction after the expansion of the war years. Military construction revived, however, with the beginning of the Korean War in 1950. During most of the 1950s, about 16 percent of the district's employees were involved in military construction. The work included expansion of air installations such as Tinker in Oklahoma City, Vance in Enid, Clinton-Sherman near Clinton, Altus, and Sheppard in Texas. The large Army training base at Fort Sill, the Army Ordnance Plant at Chouteau, and the Naval Ammunition Depot at McAlester also became customers of the district.

Despite the ongoing work, military construction ended altogether for the Tulsa District in 1961. A Corps-wide reorganization consolidated military work into 17 of the 42 districts. In the Southwestern Division, only Albuquerque and Fort Worth retained military construction. Most of the Tulsa District employees involved in military construction transferred either to Albuquerque or Fort Worth district.³⁷

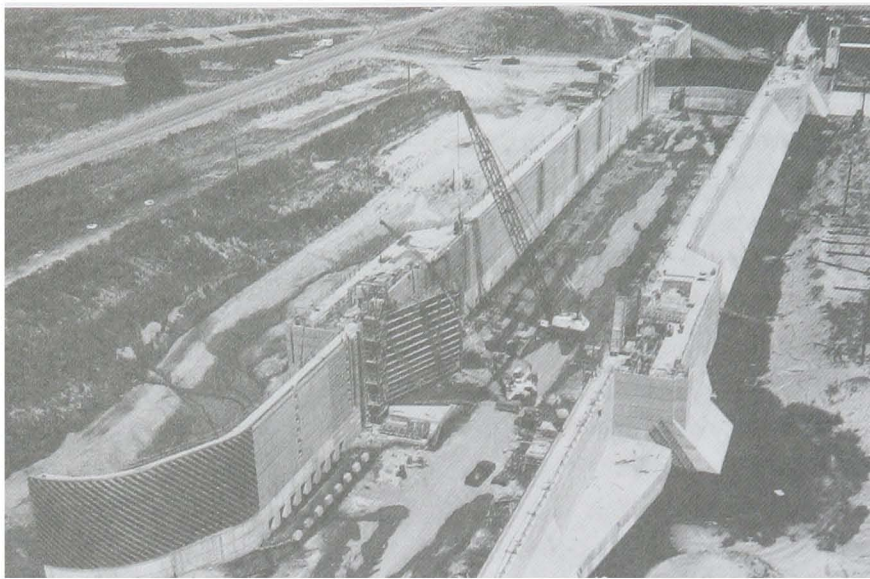
³³ *Ibid.*, pp. I-10-I-11.

³⁴ Settle, "Years of Challenge," p. XII-1.

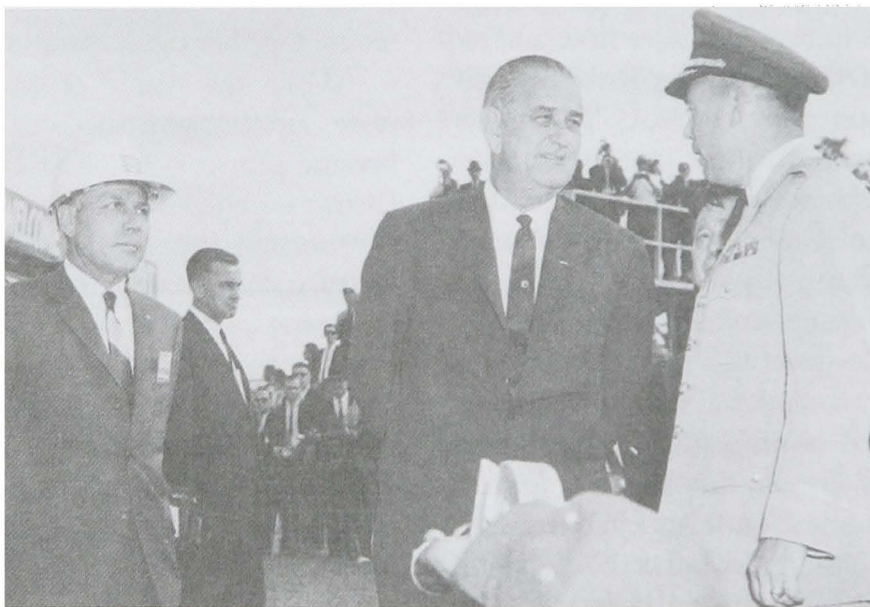
³⁵ Patton, *Fifty Years Remembered*, p. 24.

³⁶ Quoted in Settle, *The Dawning*, p. 2.

³⁷ Graves and Neushul, *The History of the Southwestern Division*, p. 7; Settle, "Years of Challenge," pp. I-9-I-10.



Construction of the W. D. Mayo Lock and Dam (above) nears completion. In 1964 President Lyndon B. Johnson dedicates Eufaula Dam in southeastern Oklahoma. On Johnson's left is Colonel John W. Morris, Tulsa District Engineer.



When the Corps announced the military construction consolidation, members of the Oklahoma congressional delegation expressed their concern about its impact on the Tulsa District. In a March 1961 letter to Senator Kerr, Major General Robert J. Fleming, Southwestern Division Commander, explained the situation: "The expanding civil works program in the Southwestern Division will to a considerable extent compensate for the decline in the military construction program. This is certainly the case in the Tulsa District where the civil works programs for the next few years will be of an unprecedented magnitude."³⁸

Certainly, the projects of the McClellan-Kerr

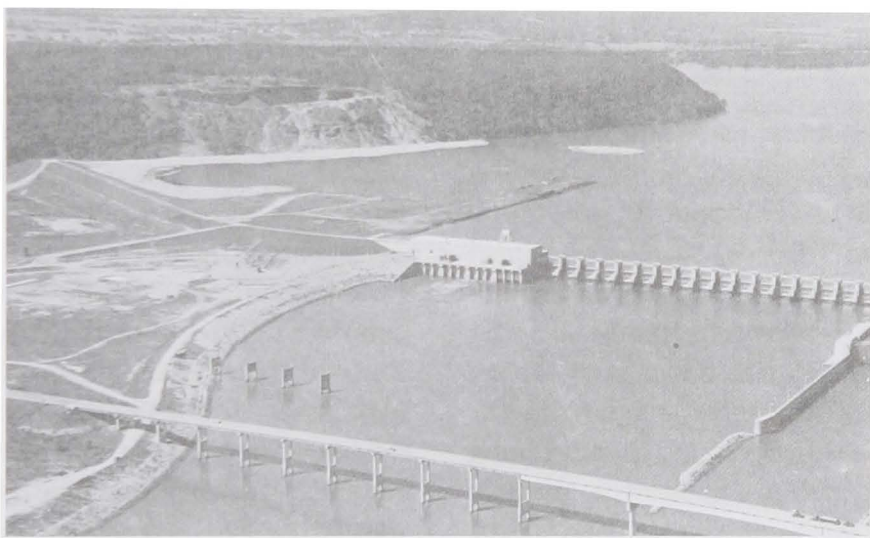
dominated the civil works tasks of the Tulsa District during the 1960s, but they were not the only large water resources developments. In that decade, the Tulsa District had the largest civil works program in the entire Corps of Engineers. Five district engineers, Colonel Howard W. Penney (1959-1962), Colonel John W. Morris (1962-1965), Colonel George A. Rebh (1965-1968), Colonel Harley W. Ladd (1968, acting), and Colonel Vernon W. Pinkey (1968-1971), oversaw construction of the navigation system and other major civil works projects.³⁹ Toronto Dam on the Verdigris River in southern Kansas was completed in 1960. It was followed by the 1964 completion of three other dams in southern

³⁸ Quoted in Settle, *The Dawning*, p. 83.

³⁹ *Ibid.*, pp. 117-119.



In June 1971, President Richard M. Nixon dedicates the Port of Catoosa at the head of navigation on the Oklahoma part of the McClellan-Kerr Waterway (above). The completed Robert S. Kerr Lock and Dam is below.



Kansas: Council Grove and John Redmond on the Grand (Neosho) River and Elk City Dam on the Elk River. The district finished a fourth dam in 1964, Millwood on the Little River in southwestern Arkansas. In 1967, Pat Mayse Dam on Sanders Creek near Paris, Texas, began impounding water. In 1968, Marion Dam on the Cottonwood River near Marion, Texas, and Broken Bow Dam on the Mountain Fork River near Broken Bow, Oklahoma, began operations. And in 1969, Pine Creek Dam on the Little River in southeastern Oklahoma was complete. In addition, the Tulsa District built 15 local flood protection projects throughout its area of operations.⁴⁰ This included the finishing

⁴⁰ Settle, "Years of Challenge," p. I-13; "Pertinent Data," pp. 17, 20, 30, 35, 71, 88, 102, 104, 128.

work on an extensive local protection project in Wichita, Kansas, wherein the district constructed a floodway on the Little Arkansas River through the city's central business district.⁴¹

Other civil works activities included comprehensive studies and water quality studies. For most of the 1960s, Tulsa District personnel were engaged in discussions and evaluations of expanded navigation. The Central Oklahoma Project, first devised in the 1940s by Oklahoma City entrepreneurs, would extend navigation to near the state capital. As Senator Kerr became increasingly involved in water resources development—and once the Arkansas River navigation project was underway—he became the Central Oklahoma

⁴¹ Settle, *The Dawning*, pp. 113-115.

Project's strongest proponent. While several possible routes were developed, the most feasible appeared to use the South Canadian River from its confluence with the Arkansas above Robert S. Kerr Lock and Dam via Dirty Creek to Lake Eufaula. Following the lake through its channel to the Deep Fork River, the navigation route then would use that river to a terminus northeast of Oklahoma City. A 31-mile route within Lake Eufaula would also bring navigation to the vicinity of McAlester, on the southern reach of the lake. In all, the system would have a total lift of 462 feet and would require eight locks. Two reservoirs, Arcadia and Wellston, both near Oklahoma City, would also be required. In 1964, the Tulsa District completed a feasibility study on navigation that gave the project a benefit/cost estimate of 1.4 to 1. Total estimated cost of the project was slightly more than \$400 million, of which approximately \$54 million was non-federal cost. In response to interest among residents in south central Kansas, the Tulsa District also conducted preliminary investigations into the feasibility of extending navigation on the Arkansas River to Arkansas City and Wichita.⁴²

At the same time, District Engineer Colonel John Morris issued a feasibility report on a water conveyance plan for central Oklahoma. Senator Kerr was also a proponent of this plan to ensure an adequate water supply for this rapidly growing part of the state. The conveyance plan would bring water from the water-rich southeastern part of Oklahoma to the Oklahoma City area via a 163-mile canal. The route would originate near Hugo Lake in extreme southeastern Oklahoma, and water would be pumped through six levels to the Elm Creek Reservoir near Oklahoma City. The total lift of the canal would be 804 feet, with first federal costs estimated at \$263.2 million. Non-federal interests would be required to bear the costs of operation and maintenance and to fully reimburse the federal government for the entire cost of the project over a 50-year period.⁴³

Other water resources studies of the 1960s resulted in construction by the end of that decade. The Arkansas-Red River Chloride Control Project grew out of the Kerr Committee reports published in 1962: *Water Quality Study, Arkansas-Red River*

Basins (Senate Document 105, 87th Congress, 2d session), and the 1965 *Arkansas-Red River Basins, Water Quality Control Study, Texas, Oklahoma, and Kansas* (Part I) in five volumes (Senate Document 110, 89th Congress, 2d session). Those reports were inspired by a Public Health Service report of 1959 that identified an ancient and subterranean dry sea bed in the Texas and Oklahoma panhandles as the source of the extraordinarily saline water in the Arkansas and Red Rivers. In 1964, the Tulsa District completed the first in what was planned to be a series of projects aimed at reducing the chloride content of those rivers. The project was an earthen dike 9 feet high and 340 feet in diameter surrounding a salt water source at Estelline Springs, Texas. Salt contribution from that spring declined to 20 percent of what it was before the dike.⁴⁴

In addition to projects and studies, the district's recreation program underwent unprecedented expansion in the 1960s. After the federal Flood Control Act of 1944 assigned recreation to the Corps, Tulsa District undertook a major new responsibility at their many lakes. In 1946, District Engineer Colonel C. H. Chorpene established a Reservoir Management Division to handle the increasing recreation workload. Over the coming years, the district's Reservoir Management Division (later the Operations Division) undertook increasing responsibilities, including fish and wildlife management, archeology, and cultural resources management. The division also managed the Corps extensive leasing program for docks, private clubs, and Oklahoma's luxury lodges built on federal property managed by the Corps of Engineers. With state parks at 12 Corps reservoirs and several other recreation sites in operation by the end of the 1960s, the Tulsa District was at the forefront of innovation in recreation management. As visitation increased steadily, so did associated challenges.⁴⁵

As the Tulsa and Little Rock Districts constructed one of the most elaborate waterway projects of the 20th century, sweeping changes in public demands began to challenge all federal resource agencies. The challenges to traditional federal water resources

⁴⁴ Ibid., pp. 120-121; Graves and Neushul, *The History of the Southwestern Division*, p. 54. The Chloride Control project is ongoing and will be discussed in detail in Chapter II.

⁴⁵ Settle, *The Dawning*, pp. 120, 150-154.

⁴² Ibid., pp. 124-126.

⁴³ Ibid.; This project was never constructed.

development ranged from economic, aesthetic, and environmental to questions of heritage, religion, and eminent domain. Large water projects inundated entire towns and Indian tribal lands, and opposition arose to future developments. As early as the 1940s, trained economists and planners questioned the federal criteria for evaluating water projects. Arguing that projects needed more objective economic evaluation, economists found voice in Harvard University professor of government Arthur Maass' book, *Muddy Waters*, and Arthur Morgan's, *Dams and Other Disasters*. Both books were highly critical of the Corps of Engineers. Not necessarily interested in stopping federal water projects, economists and planners wanted to ensure that better economic analysis be applied to evaluations. During the 1960s, the quest for better economic analysis resulted in creation of Senate Document 97 (1962) requiring substantial revisions in evaluation criteria. The Corps responded by hiring more economists to assist in project planning.⁴⁶

Challenges to economic evaluation were joined by aesthetic and environmental concerns. The methodology of the Corps was to build quality projects in the most efficient manner possible. By the 1960s, however, public concern with appearance and impact on the environment changed. Federal legislators responded with passage of laws such as the Wilderness Act of 1964, which set aside from development 9 million acres of public land, and the 1968 Wild and Scenic Rivers Act, which made it a national policy that "certain selected rivers . . . which possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values shall be preserved in free-flowing condition."⁴⁷ For an organization that developed rivers, such laws presented new challenges. However, the most sweeping law of the period was the National Environmental Policy Act (NEPA) signed into law by President Richard Nixon on New Year's Day 1970. Among many

other provisions, NEPA required all federal agencies to prepare environmental impact statements for their development projects significantly affecting the environment.⁴⁸

Similar to other federal organizations, the Corps of Engineers grappled with the new laws. NEPA required that historical, cultural, archeological, and anthropological concerns be assessed along with environmental ones. Since the Corps professional staff of the 1960s consisted predominantly of civil engineers, the organization began to recruit non-engineers to participate in the planning process. Botanists, biologists, archeologists, and urban planners contributed to a changing Corps workforce by decade's end—a trend that would continue in the coming years. Even in a district office such as Tulsa's, where design and construction were dominant, the changing Corps workforce was revealed in the fact that by 1970 the Operations Division where most of the non-engineers worked had more employees than the Engineering and Construction Divisions combined.⁴⁹

In the 32 years since its establishment in 1939, the Tulsa District experienced many milestones and had an enviable record of achievement. With several large water resources projects inherited when established, the Tulsa District immediately had a significant workload. With the coming of World War II, the district became heavily involved in military construction. With both civil works and military construction, the district remained robust during the post-war years. By the 1960s, the Tulsa District had the largest civil works program in the Corps, and had the third largest district workload in the Corps despite losing military construction in 1961. As the decade of the 1970s began, and the McClellan-Kerr waterway approached completion, the Tulsa District faced new challenges.

⁴⁶ See Gregory Graves, *Pursuing Excellence in Water Planning and Policy Analysis: A History of the Institute for Water Resources, U.S. Army Corps of Engineers* (Alexandria, VA: Institute for Water Resources, 1995), Chapter One, for a discussion of challenges to the Corps program.

⁴⁷ Quoted in Elaine Moss, ed., *Land Use Controls in the United States: A Handbook on the Legal Rights of Citizens* (New York: The Dial Press, 1977), p. 133.

⁴⁸ See Jeffrey K. Stine, "The Corps of Engineers and the Environmental Organizations," (Unpublished Ph.D. dissertation, University of California, Santa Barbara, 1986), for an analysis of the Corps response to environmental challenges.

⁴⁹ Settle, *The Dawning*, p. 155.

Chapter Two

The Military Construction Mission

The national defense support role of the U.S. Army Corps of Engineers underwent sweeping changes from the 1970s through the mid-1990s. Such transformations led to restoration of Tulsa District's military construction program that had been terminated in 1961. Cold War tensions increased after the Soviet Union's invasion of Afghanistan in 1980 and the 1983 downing of a Korean Airlines passenger plane by a Soviet aircraft. Consequently, annual defense expenditures increased steadily throughout the 1980s, rising to \$333 billion in 1989.¹ As each of the armed services underwent modernization and expansion, military construction organizations strove to meet the increasing workload. As construction agent for the U.S. Army and Air Force, the Corps of Engineers faced a host of new challenges.

One of the most important national defense initiatives of the late 1970s and 1980s was conversion of the armed forces to all-volunteer status. The conflict in Vietnam tested the selected service system in which young men were drafted into the military. In the wake of Vietnam, the Department of Defense developed long-range plans for an all-volunteer fighting force. Increased pay was an important feature of this new plan, but equally significant was providing the new armed forces with better living quarters, and modern medical, shopping, and recreational facilities. To attract enlistees into the all-volunteer Army, the Department of Defense sought to improve the quality of life for soldiers.

New barracks, or older ones upgraded to meet new standards, were needed to house unaccompanied enlisted personnel. Bachelors' quarters, in some cases, could be upgraded to meet the Army's need for family housing units. The most common solution, however, was to build additional new family housing units and childcare facilities at U.S. military installations worldwide.

In addition to developing an all-volunteer armed services, the Department of Defense stepped up efforts to incorporate more applied technology.

The post-Vietnam armed services relied on advanced technologies as a mainstay of the new military. Moreover, during the Reagan presidency, there was renewed resolve to find technological solutions to the deadlock of mutually assured destruction from thermonuclear war. New policies included development of strategic weapons systems and support facilities for these advanced technologies. These systems highlighted a comprehensive effort to apply modern technology to all aspects of national defense.

As the 1980s defense buildup began, the only district in the Southwestern Division with military construction responsibilities was Fort Worth. Major General Hugh G. Robinson, who served as Southwestern Division commander from 1980 to 1983, believed that in light of military construction projects increasing throughout the division, other districts needed to become involved. Robinson feared that the recent decline in civil works activities would lead to an uneven workload and compromise the division's engineering capabilities. He therefore sought permission from Corps headquarters to restore military construction to other Southwestern Division districts.²

Although the Tulsa District's substantial civil works program prevailed through the 1960s and compensated for the loss of military construction responsibilities, the workload began to decline with completion of the Arkansas River Waterway in 1971. General Robinson, Colonel James J. Harmon, the Tulsa District commander, and leading district civilians argued that military facilities in Oklahoma and Arkansas would be better served if Tulsa District regained the military construction role. The Chief of Engineers, Lieutenant General Joseph K. Bratton, eventually concurred and restored military construction to the Tulsa, Seattle, and Louisville districts. In so doing, Bratton declared "this action will increase the number of divisions and districts with military construction experience to support

¹ United States Statistical Abstracts, 1996.

² Gregory Graves and Peter Neushul, *The History of the Southwestern Division, 1986-1994*, pp. 10-11.



Tulsa District area of operations for military construction.

mobilization, balance the workload to eliminate unmanageable peaks, and provide . . . experience which can then employ a full range of specialists.”³

Tulsa District therefore regained its military construction mission in 1981. Military facilities in Oklahoma and Arkansas included five Air Force bases, two Army posts, one Army ammunition plant, and one Army arsenal. During the early 1980s, the district operated an area office at Tinker Air Force Base to perform services at Tinker, Altus, and Vance Air Force Bases; the McAlester Army Ammunition Depot; and Fort Sill. The district also opened an area office for its work at Blytheville and Little Rock Air Force Bases and the Pine Bluff Arsenal.⁴ By 1986, military construction returned to the Albuquerque and Little Rock Districts, and Tulsa District’s responsibilities were changed to include all the Oklahoma and, Arkansas installations, and those in the Texas panhandle.⁵

Transfer of military construction responsibilities from Fort Worth to Tulsa began quickly after the Department of Defense issued the permanent orders. Soon, the Tulsa District became responsible for the design of 11 projects totaling \$42 million. In fiscal year 1982, the district’s military construction engineering and design workload increased to \$81 million, while projects already under construction totaled \$40 million.⁶ To meet the military construction employment needs, the district hired new people, while also transferring current personnel from civil works.⁷ By the end of fiscal year 1983, 259 of the district’s 1,230 employees were involved in a \$190 million military construction program.⁸ The district maintained an area office at Tinker Air Force Base, which had resident offices at Fort Sill and Little Rock Air Force Base.⁹ Within the district significant internal changes occurred. The new Military Branch incorporated the Architect-Engineer Contract Branch in Engineering

³ Tulsa District News Release, 20 Nov. 1981; Interview, Gregory Graves and Peter Neushul, with John Roberts, Deputy District Engineer for Project Management, 1 Apr. 1999. Hereafter cited as Roberts interview.

⁴ Interview, Peter Neushul with Donald Sanders, 1 June 1999 (telephone). Hereafter cited as Sanders interview.

⁵ Ibid.; Roberts interview; Department of the Army, U.S. Army Corps of Engineers Permanent Orders 27-1, 2 Aug. 1982; *Tulsa District Record*, July 1981; Col. Harmon, “Lean Times Ahead,” *Tulsa District Record*, Sept. 1981; TD News Releases 20 Nov. 1981, 30 June and 1 July 1982.

⁶ *Tulsa District Record*, Vol. 3, No. 10, Nov. 1981.

⁷ Ibid., Dec. 1981.

⁸ Ann Patton, *Fifty Years Remembered: The First Fifty Years of the Tulsa District, U.S. Army Corps of Engineers* (Washington, DC: Government Printing Office, 1989), p. 91.

⁹ Interview, William A. Settle with Lt. Col. Mark Fritz, Tulsa, OK, 12 Oct. 1983. Hereafter cited as Fritz interview; Tulsa District Civilian Personnel Strength Subject to Manpower Ceilings, 30 Sept. 1982 and 30 Sept. 1983; U.S. Army Corps of Engineers Tulsa District Organization Charts, 1 Feb. 1983, p. 2.

and a Military Accounting Section appeared in the Comptroller's Office. Meanwhile, the district's Real Estate office leased recruiting stations, acquired land and property for facilities expansion, and handled out-leasing of surplus military lands for Fort Sill.¹⁰

To meet the challenges of the new mission, the Tulsa District obtained authority to recruit personnel with military construction experience. For GS-12 and below positions, the district advertised throughout the Southwestern Division; for higher-level positions, the district advertised throughout the Corps of Engineers. Most of the transfers ultimately came from Fort Worth District. Current employees with military construction experience in many cases transferred to the military side of the district.¹¹ Despite the complications of a concurrent reduction-in-force (RIF) in civil works and the transfer of civil works design from the Little Rock District, by early 1982 the district had done a quick transformation.

Initiating what it called "One-Stop Engineering Service," the district's Facilities Engineering Support Section provided a wide range of assistance for bases and posts in Oklahoma and Arkansas. Installation facility engineers on Army posts, and base civil engineers on Air Force bases did not have the resources to respond to the Reagan defense buildup.¹² As one base engineer told Colonel James J. Harmon, Tulsa District Commander, "The base engineering expertise we have left is only enough to put out the brush fires."¹³ Nonetheless, base engineers had discretion in what organization they chose, and One-Stop Engineer Service was aimed at making the Corps of Engineers the construction agent of choice. "If we did not give them good, fast service," noted Colonel Harmon 1983, "they would not be coming back for more assistance."¹⁴ By the end of fiscal year 1982, the district was well on its way to meeting the needs of the Army and Air Force, having completed 121 projects at a cost of approximately \$22 million.¹⁵ The district also became the construction agent in several Support for Others projects for the Oklahoma Air and

Army National Guard, and the U.S. Army Reserve. For those services, the Tulsa District built support facilities, reserve centers, and offices in an overall program ongoing through the decade.¹⁶

Beginning in 1981, Tulsa District handled a deluge of repair projects on the bases for which it now had responsibility. Over the coming years, the district rebuilt large portions of some bases, while substantially refurbishing others.¹⁷ Military construction work diversified and expanded during the 1980s and 1990s. Customers included the U.S. Army, Air Force, Navy, and Department of Energy. By the 1990s, the district's tasks included environmental restoration of military sites designated for closure and clean-up of others with toxic or hazardous waste problems. An overview of the Tulsa District's military construction work at specific sites follows.

Fort Sill

When the Tulsa District regained military construction in 1981, it took over activities at the U.S. Army's Fort Sill Military Reservation, near Lawton, in southwestern Oklahoma. This sprawling military complex had been an active fort since Major General Philip Sheridan designated the site in 1869. First used as a cavalry facility during the Plains Indian Wars of the late 19th century, Fort Sill (named after Sheridan's friend, Brigadier General Joshua W. Sill, who was killed in the Civil War) became a center for field artillery training during the early 1900s.¹⁸ By the time Tulsa District took over, Fort Sill was the Army's Field Artillery Training Center and one of the largest military bases in the world. The rapid defense buildup of the 1980s aimed in part to transform the old wooden World War II-era structures of the base into modern facilities, since about 18,000 Army, Marine Corps, and allied nations' artillerymen trained at Fort Sill annually.¹⁹

¹⁰ Fritz interview; "Military Real Estate Activities," *TD Congressional Fact Book*, 1 May 1983, Oklahoma, Military.

¹¹ *Tulsa District Record* Vol. 3, No. 12 (Dec. 1981).

¹² *Tulsa District Record* (July 1982, June 1983).

¹³ Quoted in Settle, "Years of Challenge," p. XIII-6.

¹⁴ Quoted in *Ibid.*, p. XIII-7.

¹⁵ *Ibid.*

¹⁶ *Joplin (Missouri) Globe* (1 Oct. 1982); TD New Releases, 2 Dec. 1982, 25 Nov., 22 Dec. 1983; *Tulsa Business Chronicle* (5 Dec. 1983); *Tulsa World* (23 Dec. 1983); *Tulsa District Record* Vol. 14, No. 6 (Dec. 1991/Jan. 1992).

¹⁷ Sanders interview.

¹⁸ "History of Old Fort Sill," <http://sill-www.army.mil/pao/pahist.htm>

¹⁹ "History of Fort Sill," <http://sill-www.army.mil/acs/fswelhis.htm>

Tulsa District opened its first bids for Fort Sill construction in 1982, with restoration of Building 2183. The following year, the district initiated work on rail maintenance improvements; construction of a two-story, steel frame classroom and missile lab building; an applied instructional facility; and re-roofing of several older buildings on the base.²⁰ A construction and maintenance program continued through the mid-1990s. Beginning in the late 1980s, the Corps built five barracks complexes, each of which housed 1,120 trainees, and included dormitories, mess halls, and supply facilities, while also constructing a new physical fitness center for the post.²¹

The largest project at Fort Sill, and the largest district military construction project of the 1980s, was the \$52.2 million, 430,000-square-foot Reynolds Army Hospital.²² Hospital facilities were outdated and inadequate at Fort Sill, with various clinics and operating rooms scattered across the base. Tulsa District began work on the two-phase project in 1986. Phase I consisted of a 211,000-square-foot outpatient clinic and central plant building. Groundbreaking for Phase I occurred during the summer of 1986.²³

While construction on Phase I was underway, the district planned and designed Phase II, consisting of two 3-story buildings, an ancillary building, and an inpatient tower. The buildings of Phase II totaled 227,000 square feet. The buildings were connected with horizontal passageways on each floor, and the ancillary building was to house emergency services, radiology, pathology, occupational therapy, dental clinic, surgery, recovery, Infant Care Unit and Critical Care Unit, inhalation therapy, pediatrics, delivery rooms, and a nursery. The inpatient tower would include a pharmacy, chapel, nuclear medicine clinic, medical, surgical, obstetric, and psychiatric units.²⁴ By early 1987, the district had several other projects underway at Fort Sill, including three

trainee barracks complexes, an enlisted soldiers' club, and the physical fitness center.²⁵

In order to maximize the utility of the hospital, Tulsa District personnel drew from recent Corps experience in design and construction. Both phases of the project incorporated an "integrated building system," developed by the Corps at Brooke Army Medical Center, Fort Hood, San Antonio, Texas, and Tripler Army Medical Center in Honolulu, Hawaii.²⁶

A different but perhaps more familiar challenge arose at Fort Sill during 1989. Lake Elmer Thomas, straddling Fort Sill and the Wichita Mountains Wildlife Refuge, had developed seepage beneath the dam that forced its complete drainage. The reservoir was a popular recreation lake for Fort Sill personnel, whose 100,000 visits per year included boating, fishing, swimming, picnicking, and camping. Impounded by an earthen dam built in the 1930s, the reservoir was owned and operated by the U.S. Fish and Wildlife Service, whose decision to drain the lake was made for safety reasons based on tests performed in 1988. About the same time, the Army stood ready to provide at least \$8 million in non-appropriated funds for facilities improvements at the lake. With drainage of the lake, however, the Army withheld its plan for improvements.²⁷

Since Lake Elmer Thomas provided readily accessible recreation for the soldiers at the post, Fort Sill officials were disappointed when the U.S. Fish and Wildlife Service announced that it did not have the funding to replace the dam. From 1989 to 1991, negotiations between Fish and Wildlife and the U.S. Army resulted in funding for a replacement dam and an unusual agreement wherein the Corps of Engineers would construct a dam for another federal agency. Based on the Corps' extensive work at Fort Sill, and Tulsa District's proven dam design and construction acumen, the Fish and Wildlife Service broke tradition and contracted with the Corps of Engineers. Construction began in March 1992, and, at the request of Fish and Wildlife and the Army, the district employed an "as fast as possible" approach to the project. To expedite

²⁰ Tulsa District News Release, 10 Aug. 1982, 8 Sept. 1983, 20 Sept. 1983, 22 Sept. 1983, 27 Oct. 1983.

²¹ Interview, Peter Neushul with David Webster, Tulsa District, 13 June 1995 (telephone). Hereafter cited as Webster interview; *The Lawton (Oklahoma) Constitution* (16 June 1986, 30 Jan. 1987).

²² *Tulsa District Record* Vol. 12, No. 1, (Jan. 1990), p. 14.

²³ *Tulsa District Record* Vol. 8, No. 1 (Jan./Feb. 1986); *Lawton Constitution* (30 Jan. 1987).

²⁴ *Tulsa District Record* Vol. 8, No. 1 (Jan./Feb. 1986).

²⁵ *Daily Oklahoman* (14 May 1988); *Lawton Constitution* (30 Jan. 1987, 15 Sept. 1989).

²⁶ *Tulsa District Record* Vol. 8, No. 1 (Jan./Feb. 1986).

²⁷ *Ibid.*, Vol. 15, No. 3 (May 199); *Lawton Constitution* (8 Sept. 1989).



Severe tornado damage to Altus Air Force Base is revealed in this May 1982 aerial photograph.

the project, Tulsa District personnel used a “roller compacted concrete method” (RCC) that was more economical and faster, but which required a temperature range of between 40 and 70 degrees Fahrenheit. The Corps began using this technique during the early 1970s at the Portland District. RCC construction used a mixture of cement and fly ash, requiring 17 to 18 gallons of water per cubic yard. In comparison, conventional concrete requires 23 to 25 gallons per cubic yard. After completing excavation and tower construction, the contractor, ASI/RCC, Inc., began RCC pouring on January 7, 1993. The pouring continued (with seven weather-related pauses) until February 27. Ultimately, the 421-foot-long dam included a cap of conventional concrete over the RCC core. The new Elmer Thomas Dam impounded a 350-acre lake with a capacity of approximately 8,000 acre-feet of water.²⁸

Altus Air Force Base

As construction agent for the U.S. Air Force, the Army Corps of Engineers builds many Air

Force facilities. However, the Air Force Base Civil Engineers have some latitude in selecting what agency will build a specific project. Therefore, the Corps of Engineers must win much of the work it does for the Air Force. Base Civil Engineers at the three Oklahoma bases, Altus, Tinker, and Vance, have overwhelmingly turned to the Tulsa District since the district regained military construction in 1981. At Altus, located in extreme southwestern Oklahoma about 50 miles west of Fort Sill, the Tulsa District’s work began abruptly. Altus sustained extensive tornado damage in May 1982 and required extensive structural repairs.²⁹ Within four days of the disaster, the Corps had personnel at the base to appraise the damage and write scopes of work for repair and replacement. Within four months, Congress had appropriated \$14 million, and the Tulsa District had contracted most of the repair work.³⁰

Home to the 97th Air Mobility Wing, Altus Air Force Base was the service’s only strategic airlift and air refueling training center. As one of the Air Force’s Education and Training Centers, the base

²⁹ Patton, *Fifty Years Remembered*, p. 90; Settle, “Years of Challenge and Change,” p. VIII-5.

³⁰ Ibid.

²⁸ Ibid.



Tulsa District provided support for operations at Vance Air Force Base, a major fighter aircraft training facility. Above, AT-38 sepersonic jet trainers on the runway at Vance Air Force Base.

grew increasingly important as the Department of Defense consolidated training into selected sites. The base's primary mission was to provide training for combat aircrews in a three-phase approach: academic, simulator, and flying. Altus also served as the primary wartime embarkation port for more than 27,000 soldiers at Fort Sill.³¹

The defense expansion and modernization efforts of the 1980s and 1990s resulted in extensive construction at Altus Air Force Base. The first major project for the Tulsa District was design and construction of new housing for unaccompanied enlisted personnel. Groundbreaking took place in the same celebration that observed the base's 40th anniversary -- September 27, 1982. Other work followed: a dining hall, environmental medicine facility, electrical switching station, expansion of the base data processing facility, a three-story barracks, an additional runway, and an operations/maintenance facility.³² By the end of the decade,

Tulsa District had essentially rebuilt Altus Air Force Base from the ground up, and work was ongoing into the 1990s.³³

Vance Air Force Base

Vance Air Force Base is located about five miles south of Enid, in north central Oklahoma. Tulsa District built the base, officially named the Enid Army Flying School, in 1941. In 1949, the installation became Vance Air Force Base, named after Lieutenant Colonel Leon Robert Vance, Jr., an Enid flyer who was posthumously awarded the Medal of Honor for valor in World War II. Since its establishment, the base has operated as a pilot training facility and, in 1971, the Air Force redesignated Vance as home of the 71st Flying Training Wing.³⁴ Vance provided undergraduate pilot training to qualified U.S. Air Force, National Air Guard, and Reserve officers. A total of 450 pilots a year graduated from Vance. Congress appropriated

³¹ "Altus Air Force Base," website: <http://www.lts.aetc.af.mil/mission.html>

³² *Tulsa District Record*, Vol. 4, No. 10 (Oct. 1982): TD News Releases (2, 23 July, 9 Aug., 30 Sept., 16 Dec. 1982, 15, 20 Sept. 1983)

³³ Sanders interview.

³⁴ Vance AFB (Riverside, CA: Armed Services Press, 1981, pp.2-3).

\$7.7 million in 1983 to build 200 family housing units (\$6.4 million), a base-flight operations center and flight facilitator building (\$327,000). The unaccompanied officer personnel housing consisted of five two-story brick buildings with about 11,000 square feet each. By expanding these housing facilities from 172 to 320 units, Vance doubled its capacity to accommodate unaccompanied officers. The new building would also prevent officers from having to seek private housing or hotels.

When the Tulsa District took over responsibility for construction at Vance in 1981, the average base population was around 1,400 military personnel, 120 Air Force civilians, 1,100 Northrop Aviation employees, and various other employees.³⁵ As the mission of the base increased so did the need for upgraded and expanded facilities. After congressional appropriation of funds for officers housing at Vance, Tulsa District contracted the new construction while also replacing housing that it had built in 1942. In addition, the appropriation was to be used to build a flight facilitator maintenance building and a base flight operation facility.³⁶ In July 1983, the Corps invited bids for construction of a base flight operations facility.³⁷ In August, the Corps began work on unaccompanied officer personnel housing.³⁸ The district also constructed the base-flight facility--a masonry building with about 9,000 square feet of space. Exterior work included concrete walks, parking areas, utilities, and landscaping. Work at Vance Air Force Base was ongoing into the late 1990s.

Tinker Air Force Base

In 1941, Oklahoma City won the competition for the location of a War Department air maintenance and supply facility to be built somewhere in the central United States. As World War II began, Tulsa District was constructing the base on land largely donated by Oklahoma City. The base, eventually named for Major General Clarence Tinker who lost his life leading a mission of B-24 Liberators in action over Wake Island during World War II, quickly became one of the largest aircraft

maintenance facilities in the world. Tinker has been responsible for repairing large aircraft such as the B-17, B-24, B-29, and B-52.³⁹

When the defense buildup of the 1980s began, Tinker was poised for expansion and renovation and immediately became the Tulsa District's biggest military construction customer. New residential, medical, and dining facilities were among the most crucial needs at Tinker. In March 1982, Congress appropriated \$7.5 million for construction of 200 family housing units. By the summer, the Tulsa District had begun the contracting process.⁴⁰ In addition, the Oklahoma City Air Logistics Center (also located at Tinker AFB) received a \$650 million contract for modification of B-52s to carry cruise missiles in late 1981. Quickly, the Tulsa District became involved in equipment installation while managing installation of a new \$5.5 million electrical distribution system. In 1984, Tulsa invited bids for emergency backup power facilities at Tinker.⁴¹ Also in 1984, the district built a simulator facility consisting of a 4,000-square-foot single-story building with administrative, mechanical, and flight simulator rooms. In 1985, the Tulsa District invited bids for a base package store at Tinker Air Force Base.

During the late 1970s, the Air Force developed the Advance Warning and Control Systems plane (AWACS) which eventually meant extensive construction for the district at Tinker. Specifically, the E-3 Sentry AWACS was a modified Boeing 707 with a rotating radar dome that had a range of 200 miles looking down, and a much greater range above the aircraft. In 1977, the 552nd Airborne Warning and Control Wing began operations at Tinker Air Force Base, and received the first AWACS. To house the AWACS Alert Facility, Tinker's civil engineers turned to the Corps of Engineers.⁴² The Tulsa District oversaw the purchase of 47 acres adjacent to Tinker, and served as construction manager for the \$17 million alert facility that included runways, aprons, fueling areas, and a 64,000-square-foot alert crew

³⁹ "Central Oklahoma's Salute to Tinker AFB," (1981-1982).

⁴⁰ *Tulsa District Record* Vol. 4, No. 5 (May 1982); *Sapulpa Daily Herald* (25 March 1982).

⁴¹ *Tulsa Tribune* (18 Dec. 1981); *Sapulpa* (Oklahoma) *Daily Herald* (17 Jan. 1982); *The Daily Oklahoman* (9 Apr. 1982).

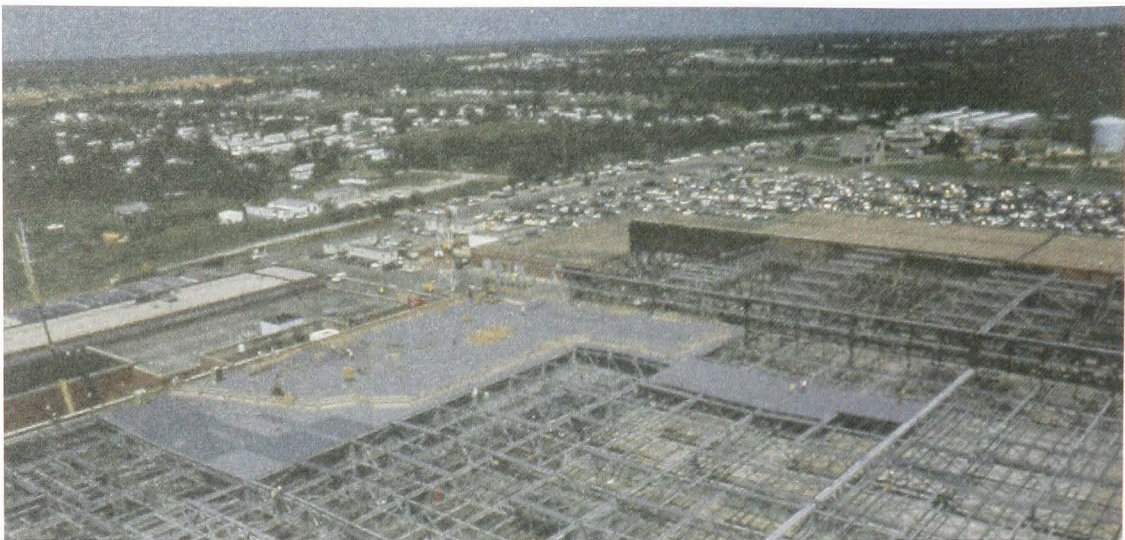
⁴² *Oklahoma City Times* (4 Feb. 1982); Fact Sheet, "E-3 Sentry (AWACS)," website: http://www.af.mil/factsheets/E_3_Sentry_AWACS_.html

³⁵ Vance AFB Fact Sheet (Oct. 1981).

³⁶ *Tulsa World* (29 Apr. 1982); TD News Release (21 July 1983)

³⁷ *Tulsa World* (2 July 1983).

³⁸ TD News Release (9 Aug. 1983); *Tulsa World* (10 Aug. 1983).



After the 1984 fire destroyed much of Tinker AFB's Building 3001, Tulsa District expedited emergency repairs to restore vital services for defense of the nation.

building.⁴³ As the alert facility neared completion in 1983, the Air Force elevated the status of the 552nd to division level. Thereafter, the Airborne Warning and Control Division—which operated 30 Sentry planes and maintained satellite units in Iceland, Okinawa, and Saudi Arabia—reported directly to Air Force command headquarters.⁴⁴

Work at Tinker Air Force Base continued to increase for the Corps in 1983 and 1984. Large construction, repair, and renovation projects included aircraft hangar modifications, two new dormitories for enlisted personnel, a new military clothing store, an auxiliary power system, unaccompanied enlisted personnel housing, a flight simulator facility, and expansion of the AWACS Alert Facility to accommodate 46 aircraft.⁴⁵

Priorities changed dramatically, however, when, on November 12, 1984, a welder's torch accidentally ignited the roof of Tinker's Building 3001. Before some 500 firefighters could extinguish the slow-moving, persistent fire, it burned 17 acres (or 652,500 square feet) of roof on the huge jet-engine repair structure. Because Building 3001 was one of the base's main repair structures—and the only facility of its kind in the Air Force—its repair needed to commence with the utmost efficiency.

Two days after the fire, the Air Force called on the Corps of Engineers to do the repair work and to have it done in only ten months. District Engineer, Colonel Frank Tilton, declared an emergency and instituted special contract procedures. By mid-January 1985, the district awarded the demolition contract to Buckner & Moore, Inc., of Moore, Oklahoma. By February 1985, the Corps had awarded the main reconstruction contract to Hensel Phelps of Greeley, Colorado.⁴⁶ The district employed a "cost-plus-fixed-fee" contracting method for the main reconstruction that facilitated a close working relationship with the Air Force civil engineers, the contractors, and the Corps. Because the actual scope of the project was unknown, the Corps began with an award of \$20 million and later expanded the contract to \$40 million.⁴⁷

Demolition and reconstruction of Building 3001 proved a challenge to all people involved. Since the Air Force estimated that it would incur a \$5 million loss for each month the building was out of production, the Corps of Engineers attempted to keep the 75 percent of the structure that was undamaged in operation. Keeping Building 3001 in service while a major reconstruction project took place added to the challenge, but as Weldon Gamel, Tulsa District Engineering Division Chief, remembered: "They never stopped work in that

⁴³ Tinker Take-Off (June 1982); *Journal-Record* (5 June 1982).

⁴⁴ *Daily Oklahoman* (1 Oct. 1983); Tinker Take-Off (2 Dec. 1983)

⁴⁵ TD News Releases, 17 Nov. 1982, 7 July 1983; *Tulsa World* (20 Nov. 1982, 8 March, 3 Aug. 1984); *Oklahoma City Times* (26 Nov. 1982); *Midwest City (Oklahoma) Sun* (13 July 1983); *Tulsa Business Chronicle* (11 July 1983, 18 June 1984); *Journal Record* (Oklahoma City) (7 March 1984)

⁴⁶ TD News Release, 18 Jan. 1985; Sanders interview; Patton, *Fifty Years Remembered*, pp. 94, 95; *Duncan (Oklahoma) Banner* 10 Feb. 1985.

⁴⁷ *Tulsa District Record*, Vol. 7, No. 1 (Aug. 1985); U.S. Army Corps of Engineers, Tulsa District, "Building 3001: Lessons Learned," p. 1.

building.”⁴⁸ Before demolition work could begin, the contractor had to build temporary shelters, a 35,000-foot building inside 3001, and extend emergency electrical power to the damaged area. Once demolition began, workers found extensive asbestos in the roof and walls. An asbestos abatement crew stood by to remove the hazardous material as it was exposed. The final part of the demolition phase was stabilizing the walls of the building where necessary. Both the demolition and construction contractors worked around the clock, even while snow fell inside the roofless parts of 3001. However, neither the contractors nor the regular workers inside the building ever stopped work during reconstruction.⁴⁹

By September 1, 1985, the Building 3001 reconstruction project—the largest ever undertaken by the Corps—was complete. As “Tinker Team” member Donald Sanders remembered, Building 3001 returned to full service by virtue of a project that was “on time, and under budget.”⁵⁰ Other

Bob Bailey, Harold Chitwood, Elton Watkins, and Reggie Kikugawa.⁵¹ The Southwestern Division Commander, Brigadier General Jerome Hilmes, visited the district in December 1985, and presented a number of Pacesetter Awards to Corps personnel involved in the reconstruction of Building 3001.⁵²

In the aftermath of the reconstruction project, expansion and renovation work resumed at Tinker Air Force Base. By the end of 1985, the Corps had awarded a \$33.6 million contract for construction of a blade repair facility that would centralize jet engine and compressor blade work into one location on the base. Groundbreaking took place in December 1986.⁵³

In 1988, the Tulsa District had the unusual challenge of building a facility for the U.S. Navy on a U.S. Air Force base with the bed-down of E-6A aircraft at Tinker. The U.S. Navy chose Tinker Air Force Base as the home for a squadron of its E-6A TACAMO program. TACAMO (meaning “Take Charge and Move Out”) fulfilled



*At Tinker Air Force Base a U.S. Navy E-6A undergoing service in a base hangar.
Tulsa District built the facilities for these aircraft.*

members of the team from Tulsa District included Weldon Gamel, Ted Holsomback, Jim Tillman, Tom Hensley, Robert Vandegriff, John Weatherly, Lawrence Gage, Eugene Gilbert, Noah Rains, Jerry Camp, Nancy Beeler, Billy Young, Jan McAlister, David Berkeley, Glen Bayless, Beverly Leland, Kenneth Scoggins, Rick Hedrick, William Andrews,

the Navy’s mission of linking ballistic missile forces with national command authority in time of crisis. The E-6A is a converted Boeing 707 that deploys a 28,000-foot trailing-wire antenna and a 5,000-foot short trailing-wire antenna for Very Low Frequency communications with submerged ballistic missile submarines. The aircraft crews fly to the oceans in

⁴⁸ Quoted in Patton, *Fifty Years Remembered*, p. 95.

⁴⁹ Ibid; *Tulsa District Record*, Vol. 7, No. 1 (Aug. 1985); U.S. Army Corps of Engineers, Tulsa District, “Building 3001: Lessons Learned,” p. 1.

⁵⁰ Sanders interview.

⁵¹ *Tulsa District Record*, Vol. 7, No. 2 (Dec. 1985)

⁵² Ibid.

⁵³ TD News Release, 26 Sept. 1985; *Daily Oklahoman* (16 Dec. 1986).



During the 1980s, the Tulsa District was the construction agent for a munitions disposal facility at Pine Bluff Arsenal in Arkansas. Here workers inspect stored binary weapons including nerve gases GB and BX.

time of emergency, winch out the cables into the water, and transmit messages directly from the Joint Chiefs of Staff to nuclear submarines. Because of its record of success at Tinker, the Navy chose the Tulsa District as construction agent for the \$70 million in support facilities for the E-6A. The work included a 127,000-square-foot maintenance and hangar building, a 97,000-square-foot training building, housing, runways, taxiways, and aprons. Construction began in ten phases in 1989 and continued well into the 1990s.⁵⁴

Model District and Boundary Changes

As the military construction program expanded, Corps Headquarters designated Tulsa as the Corps of Engineers' first Model District in December 1985. The Model District program was an extension of the Department of Defense Model Installation Program. It was established by Robert Stone, deputy assistant secretary of defense for facilities, environment, and economic development. The Model District program hoped to improve

⁵⁴ *Tulsa District Record* Vol. 11, No. 8 (Dec. 1989); Navy Fact File: E-6A Mercury (website) <http://www.chinfo.navy.mil/navpalib/factfile/aircraft/air-e6a.html>; *Lawton Constitution* (18 Feb. 1988); Sanders interview.

efficiency, promote innovation, and give managers more authority to make autonomous decisions. Throughout Department of Defense, the Model Installation Program—inspired by the best-selling book, *In Search of Excellence* by Thomas Peters and Robert Waterman, Jr.—was an effort to decentralize command to the field level where it presumably was more efficient and economical. The district's designation was for a three-year period, with indefinite extensions if the program proved successful.⁵⁵ The program welcomed suggestions for improved operations from all district personnel. By the end of June 1985, Tulsa District employees had submitted 381 suggestions, 84 of which were accepted and being implemented.⁵⁶

Later in 1985, the Corps changed the Tulsa District military construction boundaries. When the Little Rock District resumed military construction, installations maintained by Tulsa in Arkansas (Blytheville and Little Rock Air Force Bases, Fort Chaffee, and Pine Bluff Arsenal) were turned over to the Little Rock District. While Tulsa District was the construction agent for the Arkansas installations, major construction projects included training facilities and firing ranges at Fort Chaffee; an aircraft

⁵⁵ TD News Release, 26 Dec. 1984.

⁵⁶ *Tulsa District Record* Vol. 7, No. 1 (Aug. 1985).

maintenance facility and reinforced concrete igloos for air-launched cruise missiles at Blytheville; and incinerator repair, a red phosphorus pilot facility, and a munitions disposal facility at Pine Bluff.⁵⁷ At the same time, Tulsa District assumed the military construction functions of the Fort Worth District's Northwest Area Office based in Amarillo, Texas. Now the district had responsibility for Cannon Air Force Base in New Mexico, Reese and Sheppard Air Force Bases in Texas, and the Department of Energy's Pantex plant in Amarillo.⁵⁸

Toward Partnering and Project Management

The many new challenges presented to the Corps of Engineers regarding military construction were complicated by the federal budgetary constraints of the 1980s. The Corps needed to build infrastructure for the armed forces, but was challenged more than ever before to do so in the most cost-effective manner. The Corps responded in part by developing new methods of contract management. Lieutenant General Henry J. Hatch, Chief of Engineers from 1988 through 1992, formally introduced an approach called "partnering." This approach attempted to defuse the potentially adversarial relationship that sometimes exists among contractors, the Corps, and users by fostering a cooperative spirit among all parties. The ultimate objective of this approach was the timely completion of high-quality projects. District personnel introduced partnering early in the design process. At the beginning of a project, the parties involved often participated in a workshop conducted by a professional facilitator to improve communications and cultivate teamwork. Partnering enabled Corps officials at the district level to ensure that time and cost commitments were met and that progress on a given project proceeded smoothly. Another objective of partnering was to develop and maintain quality working relationships with base civil engineers and installation facilities engineers.⁵⁹

⁵⁷ *Tulsa District Record* Vol. 7, No. 2 (Dec. 1985); TD News Releases 21 Sept. 1982, 11 May, 8, 15 Sept., 14 Dec. 1983, 22 Mar., 14 June 1984,

⁵⁸ *Tulsa District Record* Vol. 7, No. 2 (Dec. 1985)

⁵⁹ Memorandum for District Engineers from Arthur D. Denys, SWD, Subj: Partnering on A-E contracts, 22 October 1991, SWD historical file; *Daily Oklahoman* (3 June 1993); Sally S. Anderson, "SWD Lives 'Partnering' Lifestyle," *Pacesetter* Vol. 19, No. 10 (October 1994), pp. 6-7.

In the Tulsa District, partnering was a key factor in all military construction projects by the mid-1980s, but particularly so in building the E-6A facility at Tinker Air Force Base. Because of the number of parties involved (Navy, Air Force, Army, and contractors), the E-6A bed-down was a logical project to test partnering principles. Using partnering, the district addressed the needs of the Navy, the Air Force, and private sector contractors and helped create an environment in which branches of the military could enhance their fighting capability in an efficient manner.⁶⁰

In time, the Tulsa District established a series of partnering agreements with all of its military construction customers.⁶¹ By 1992, the Tulsa District was involved in partnering projects totaling \$78 million, with many more "on the way," according to Rick Hedrick, chief of the Contracting Division.⁶² Many members of the district had high praise for partnering, which was well established by the early 1990s. Some pointed to the fact that the district was able to take on more work without significant increases in personnel. District Commander Colonel Lee Smith endorsed the practice most succinctly when, in 1992, he stated: "Partnering is not part of our strategy; it is our strategy."⁶³

The concepts of program and project management began to gain momentum on the civil works side of the Corps of Engineers during the late 1980s. First articulated by Robert W. Page, who became Assistant Secretary of the Army for Civil Works in December 1987, these concepts reflected Page's belief that the Corps needed to apply a private enterprise approach to its planning and construction. Project management (at the district level) and program management (at the division level) were departures from the usual Corps contracting and construction procedures. Traditionally, districts managed the technical and monetary aspects of projects within functional elements or "stovepipes" within the organization. Projects were handed from one element to another without anyone responsible for the whole project throughout its entire life

⁶⁰ *Tulsa District Record* Vol. 11, No. 8, (December 1989), p. 1; *Tulsa District Record* Vol. 14, No. 2, (February/March 1992), pp. 6-7; Webster interview.

⁶¹ "A Guide to the Technical Services of the Tulsa District, U.S. Army Corps of Engineers," (pamphlet), Feb. 1995.

⁶² *Tulsa District Record* Vol. 14, No. 2 (Feb./Mar. 1992).

⁶³ Ibid.

cycle. Now districts assumed management of an entire project from beginning to end, and divisions were given responsibility for oversight of entire military construction programs, such as Military Construction Army, Military Construction Air Force, Family Housing, and Non-Appropriated Funds. Under the new system, division program managers did not involve themselves with day-to-day problems, but instead focused on resolving those problems that reached the customer's headquarters, emanated from Corps headquarters, or were identified by districts as requiring divisional attention. Division personnel served as liaisons for communications between Corps headquarters and the districts.⁶⁴ Each of these measures was designed to streamline the contracting process, complete projects on time and within budget, and satisfy Corps customers.

Like other districts throughout the Corps, Tulsa personnel viewed project management skeptically in its early days. Most district employees involved in design and construction were reluctant to abandon the "stovepipe approach" that had worked for so many years. Through this approach, a project passed from branch to branch, and section to section, until completed. Although often cumbersome, Corps employees relied on the stovepipe for a quality—if not timely—project. Giving up "turf" to a project manager who took the project "from cradle to grave" met with great resistance.⁶⁵ Yet it seemed logical that project management could yield the objectives of faster-produced and less-expensive projects, especially with shorter-duration military construction work. Tulsa District, which had only regained military construction in 1981, was not as immersed in the stovepipe approach as other districts with older military construction programs. With its "one-stop engineering service" begun in 1982, the district had an early form of project management already in place. Fully articulated in the late 1980s, project management proved to be in many ways an extension of Tulsa's "one-

stop" program for military installations.⁶⁶ In 1987, the Tulsa District combined its Engineering and Construction divisions, providing for a more thorough adoption of the methods of life cycle project management.⁶⁷ This innovation, pioneered in the Tulsa District, eventually spread throughout Corps field offices.

Environmental Restoration

During the 1980s, in the wake of rapidly expanding environmental legislation, the Tulsa District undertook a significant new environmental restoration mission. Oklahoma Representative Mike Synar stated in 1987 that "the problems at [DOD] installations are 'massive' and could cost taxpayers 'billions of dollars' to clean up."⁶⁸ Synar's words were prophetic, and by the time he spoke them the Tulsa District was heavily involved in environmental restoration at both Department of Defense and Department of Energy sites. The district's environmental restoration work began shortly after the resumption of military construction. In 1983, the Army directed the district to clean up 23 hazardous waste sites at the Pine Bluff Arsenal in Arkansas. Under the provisions of the Resource Conservation and Recovery Act (RCRA), the district built the Corps' first landfill conforming to the specifications of that law. District personnel oversaw the cleanup of pits containing heavy metals such as lead, mercury, cadmium, and white phosphorus, and their deposition into the new lined landfill.⁶⁹ Funding for the cleanup came from military construction operation and maintenance (O&M) funds, and was part of the Department of Defense's Defense Environmental Restoration Program (DERP). For its work, the Tulsa District received a Department of Defense Environmental Quality Award for Excellence.⁷⁰

From this beginning, the district's environmental restoration program grew rapidly. When repairs began on the fire-damaged Building 3001 at Tinker Air Force Base, workers discovered extensive

⁶⁴ Interview, Peter Neushul with Aldo Brazzale, 14 December 1994. Hereafter cited as Brazzale interview. Available in SWD historical files, Dallas, TX.

⁶⁵ See Donita Moorhus, with Gregory Graves, "The Limits of Vision: The History of Headquarters, USACE, 1988-1992," (HQUSACE Office of History, forthcoming, 2008) Chapter One, for an analysis of the Corps' response to project management; Roberts interview.

⁶⁶ Settle, "Years of Challenge," pp. XIII-6-XIII-7; Roberts interview.

⁶⁷ "A Guide to Technical Services."

⁶⁸ *Tulsa World* (28 Dec. 1987).

⁶⁹ Roberts interview; "A Guide to Technical Services."

⁷⁰ Roberts interview.

trichloroethylene (TCE) contamination in subsurface pits. TCE, a widely used industrial solvent, is a known cancer-causing compound. In response, the district oversaw a cleanup that included removal of TCE, grouting of the pits and wells, and backfilling. The Corps found additional contamination in other parts of the base and initiated its cleanup as well. The district also removed large quantities of asbestos from Building 3001. The successful restoration at Tinker earned high praise from Region 6 of the Environmental Protection Agency in Dallas, which had until then been critical of the Air Force's response to environmental hazards at Tinker. For its restoration work at Tinker, the Tulsa District received the Air Force's Environmental Quality Award.⁷¹

Because of its increasing expertise in environmental restoration, Tulsa District became the third Corps of Engineers Hazardous, Toxic, and Radiologic Waste (HTRW) Design Center in 1989. Until then, Omaha and Kansas City Districts provided such services nationwide. Now, Tulsa served the five-state region of Oklahoma, Texas, Arkansas, Louisiana, and New Mexico. The district was responsible for technical support and project management of the Installation Restoration Program (IRP) for the Army and Air Force within its military construction boundaries, the Formerly Used Defense Sites (FUDS) program, and the Environmental Restoration Program (ERP) for the Department of Energy. In addition, the district became executive manager for all 13 of the nation's Air Force Air Education and Training Command (AETC) installations environmental restoration activities.

Work for the Department of Energy: Pantex

During World War II, the War Department built many facilities throughout the nation for the production of munitions. Pantex, located near Amarillo, Texas, was one of those plants, built specifically by the Corps of Engineers for the Army Ordnance Corps in 1942. The principal operation at Pantex was loading bombs and

artillery shells with the explosive trinitrotoluene (TNT). Beginning in 1950, the Department of Defense converted Pantex into a final assembly plant, shipping nuclear weapons components there for assembly and testing. Pantex dealt specifically with weapons designed by the Lawrence Livermore Laboratory in Berkeley, California. In 1975, after the nuclear weapons assembly plant in Burlington, Iowa, closed, Pantex became the only such plant remaining in the nation.⁷²

During the Cold War years, the United States built approximately 70,000 nuclear weapons. As tensions eased during the late 1980s, the dismantling of many of these weapons became a priority. The Department of Energy (DOE) responded by converting Pantex into a weapons disassembly plant, contracting with the Corps to add new facilities under the Work for Others program. By the 1990s, Pantex included 323 buildings and 1,900,000 square feet of work space valued at over \$3 billion. By 1992, following the closure of other Department of Energy facilities, such as the Rocky Flats plant in Colorado, the workforce at Pantex increased to 2,600 employees. New facilities included a \$30 million disassembly building, designed with interlocking 4-inch steel doors and 2-foot-thick steel-reinforced concrete walls to dampen any accidental blasts.⁷³

The Southwestern Division's work at Pantex began in 1981, when a Memorandum of Understanding (MOU) for construction with the Department of Energy was completed. For the first five years of the MOU, the Fort Worth District directed work at Pantex including 16 major Pantex construction projects valued at over \$165 million.⁷⁴ These projects, usually requiring two and a half years to complete, had an average cost of approximately \$10 million. In 1986, the division transferred authority to the Tulsa District. Under the Tulsa District, contracts included construction of a special-purpose assembly bay for housing high-tech testing devices, high-vacuum chambers, and high-energy x-rays.

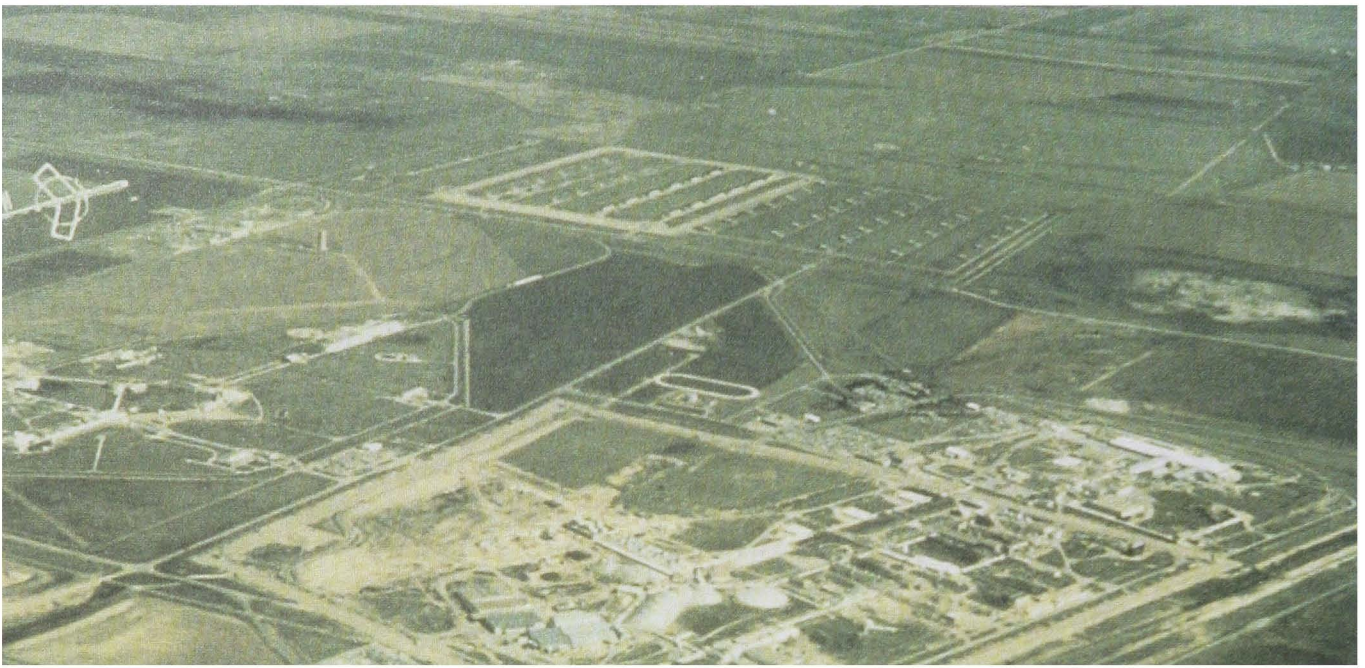
Work at Pantex also included monitoring and cleanup of potentially dangerous pollutants. In

⁷² "Pantex Lays Nukes to Rest," *Bulletin of the Atomic Scientists* Vol. 48, No. 8 (Oct. 1992), pp. 48-49.

⁷³ *Ibid.*

⁷⁴ "Pantex Plant and the Tulsa District," *Tulsa District Record* Vol. 14, No. 2 (Feb./Mar. 1992), p. 4.

⁷¹ Patton, *Fifty Years Remembered*, p. 95; Roberts interview.



The Tulsa District has done ongoing work at the Pantex Nuclear Weapons Disposal Facility since the 1980s.

1989, Tulsa District became the first Corps office to manage an environmental restoration project (ERP) for the Department of Energy. The level of Corps activities in the ERP for Pantex grew from \$30,000 in 1989 to \$2.9 million in 1990, \$8.1 million in 1991, \$16.4 million in 1992, and \$27 million in 1993.⁷⁵

Interest in pollution from activities at Pantex reached a peak in May 1994, when the Environmental Protection Agency (EPA) added the facility to its Superfund list. EPA officials believed that toluene, used extensively as a solvent in weapons production, had leached to 329 feet below the surface at the site, affecting the area's largest groundwater source, the Ogallala Aquifer, some four miles distant.⁷⁶ EPA and local environmental groups were also concerned about on-site storage of plutonium. At EPA's request, Corps personnel installed monitoring wells to measure contamination of groundwater near the Pantex plant. The monitoring wells revealed concentrations of solvents and gasoline constituents in the perched groundwater aquifer, which ranges 50-150 feet above the Ogallala Aquifer. The Tulsa District continued to monitor contamination levels at this site into the late 1990s.⁷⁷

Base Realignment and Closure

In the late 1980s, the collapse of the former Soviet Union had a dramatic impact on the armed forces and the Corps. With the Soviet threat gone, some citizens and elected officials anticipated a "peace dividend" of reduced federal spending on national defense. The federal government responded with accelerated efforts to reduce or "downsize" the armed services.

The Department of Defense responded, with a proposal to reduce its active duty forces by 25 percent by 1997. For the armed forces, downsizing meant not only reductions in force, but also that many of its facilities around the nation and the world were no longer needed. The Corps played a major part in dealing with the physical aspects of downsizing military installations through what became known as the Base Realignment and Closure (BRAC) program.⁷⁸

To oversee the BRAC process, President George Bush appointed an eight-member Defense Base Closure and Realignment Commission with the power to add or delete bases from the Department

⁷⁵ Ibid., p. 5.

⁷⁶ "Superfund List Adds Pantex," *Engineering News Record* Vol. 232 (June 1994), p. 20.

⁷⁷ Jim McBride, "Corps to Probe Aquifer Contamination," *Amarillo Magazine* (26 Jan. 1993), p. 1.; Roberts interview.

⁷⁸ Graves and Neushul *The History of the Southwestern Division 1986-1994*, pp. 85-86. *Dallas Morning News* (6 June 1991).

of Defense list.⁷⁹ The list was then subject to review by the president, who either approved or rejected the list in its entirety. If the president approved the list, Congress had 45 days to act on the recommendations. Rejection of the list required a majority vote in both congressional chambers. If Congress did not act within the allocated time, the closures automatically went into effect. Following approval, bases on the list had at least one year to prepare for closure. All bases on the list had to be closed in six years.⁸⁰

In 1990, 35 bases and facilities were designated for closure. Compared to the rest of the nation, the Southwestern Division, including Tulsa District, was less affected by the first round of BRAC cuts. The warm climate of the region was partly responsible. Defense Department officials and the BRAC Commission recognized that installations in the southwest afforded far more training days per year than those located in colder or wetter parts of the nation.⁸¹ Deliberations on bases targeted for closure continued as President Bill Clinton succeeded President Bush in 1993. The commission continued its work into 1995, and base closings remain a pointed political and economic issue throughout the nation.

Environmental issues also play a major part in the BRAC process. Many defense sites are polluted and must be cleaned up before they can be turned over for civilian use. The Corps oversees cleanup and restoration of Army, Navy, and Air Force sites through their Formerly Used Defense Sites (FUDS) program and Installation Restoration Program (IRP). Both FUDS and IRP are part of the Corps' Defense Environmental Restoration Program (DERP).⁸²

Tulsa District's Geotechnical Branch started working on environmental cleanup as the DERP,

⁷⁹ Appointees included Jim Courter, former U.S. representative from New Jersey; Alexander Trowbridge, former Secretary of Commerce; Will Ball, former Secretary of the Navy; Howard Callaway, former Secretary of the Army; Duane Cassidy, retired Air Force general; Arthur Levitt, former president of the American Stock Exchange; Robert Stuart, former chief executive officer of Quaker Oats; and James Charles Smith, vice president of Brown and Root Construction Company.

⁸⁰ *Dallas Times-Herald* (13 April 1991).

⁸¹ Interview, Greg Graves with Barry Rought. Located in SWD historical files, Dallas, TX. 16 Jan. 1995.

⁸² Seth Shulman, *The Threat at Home, Confronting the Toxic Legacy of the U.S. Military* (Boston, MA: Beacon Press, 1992), pp. 104-108.

IRP, and FUDS programs began. The district was involved in early hazardous/toxic waste site investigations and cleanup program design. At Pine Bluff, Arkansas, for example, the Geotechnical Branch oversaw a 1986 Hazardous Landfill Closure Site project. In 1989, Tulsa was named as the Hazardous/Toxic Waste Design District for Southwestern Division by Corps headquarters. To meet their added responsibilities, the district added 27 new positions, including geologists; chemists; industrial hygienists; physical scientists; and chemical, environmental, and civil engineers. Tulsa's experience in environmental cleanup gave the district a head start in fulfilling Chief of Engineers Lieutenant General Henry Hatch's goal of becoming "an agency that is rightly concerned about the environment and willing to take a step beyond simply complying with environmental law."⁸³

Tulsa District's military construction program underwent significant change during the 1980s and 1990s, as the country moved from military buildup under President Ronald Reagan to downsizing following the collapse of the Soviet Union. Projects included major hospital construction, military housing, and support facilities at armed forces sites throughout the area of operations. As the Cold War ended, the district participated in the disposal of chemical weapons and the Department of Defense's Base Realignment and Closure Program. The district incorporated new program management and partnering methods, along with traditional engineering skills, to meet the challenges of radically changed armed forces military construction requirements of the 1990s.

⁸³ Anita Joyce Bradshaw, "Environmental Watchdogs for the Division," *Tulsa District Record* Vol. 12, No. 5 (May 1990), pp. 1 and 11.

Chapter Three

Civil Works Construction

Responding to public demand for water resources development, the Tulsa District continued to carry out its civil works mission through the 1970s, 1980s, and into the late 1990s. By the early 1970s, the district's predominant civil works project, the McClellan-Kerr Arkansas River Navigation System, was complete. Civil works funding began to decline with completion of the waterway, but the district undertook several multiple-purpose dam projects and flood control projects in the coming years. The district made small extensions to the Arkansas River navigation project in eastern Oklahoma and western Arkansas. Additionally, Tulsa District began construction on an ongoing water supply improvement project for residents living on the Red River. Among the most pressing civil works challenges of this period in the Tulsa District were urban flood protection, inland navigation improvements, water supply and quality, and the completion of multipurpose reservoirs.

Federal water resources development underwent significant transformations that affected all Corps of Engineers field offices. Tulsa District's experiences from the 1970s through the early 1990s reflected such broader trends as the entire civil works program of the Corps underwent important transitions. For the first time in Corps history, expenditures for operation and maintenance of civil works facilities exceeded expenditures for general construction. This trend was particularly evident in the districts of the Southwestern Division, where operation and maintenance expenditures first exceeded general construction in fiscal year 1983 and did so every year thereafter. From 1986 to 1994, the Southwestern Division's operation and maintenance expenditures increased from \$181.2 million to \$250.4 million.¹

Environmental issues arising in the 1960s and 1970s continued to affect the Corps' civil works program during subsequent decades. To comply with environmental laws such as the National

Environmental Policy Act of 1969 (NEPA), Corps planners had to consider many factors, including nonstructural alternatives in flood control and impacts on plants and wildlife. The number of public and private interests involved in civil works planning increased dramatically in the post-NEPA era, when all activities required extensive public review and participation. The Corps pioneered public involvement techniques in the 1970s, and refined those methods while working with residents, local and state governments, and federal agencies such as the U.S. Fish and Wildlife Service and the Environmental Protection Agency (established in 1970). Preparation of NEPA-mandated environmental impact statements (EIS) for all federal development projects expanded the Corps' responsibilities and challenged many projects solely justified on economic grounds. Few federal agencies were prepared for full compliance with the new environmental legislation. The Corps responded in several ways. First, it hired more nonengineers, including biologists, environmental scientists, and sociologists. Second, through its newly established Institute for Water Resources, the Office of the Chief of Engineers began a public involvement program to assist field personnel in conducting the required public review of environmental documents.² Third, the Corps established an environmental advisory board to the Chief of Engineers that consisted of prominent environmental experts from around the nation. In August 1974, the Environmental Advisory Board met in Tulsa, and the major topic of discussion was the Corps' proper role in urban floodplain management.³ Finally, the Corps developed environmental guidelines for field

² The Institute for Water Resources was established in 1969 to help the Corps respond to increasing criticism of its civil works program. Regarding the Corps' public involvement see U.S. Army Engineer Institute for Water Resources, *Public Involvement Techniques: A Reader of Ten Years of Experience at the Institute for Water Resources* (IWR Report 82-R1), May 1983.

³ See Martin Reuss, *Shaping Environmental Awareness: The United States Army Corps of Engineers Environmental Advisory Board, 1970-1980* (Washington, DC: Historical Division, 1983), pp. 35-37, for a discussion of the Tulsa meeting.

¹ Fact Sheet, O&M Expenditures, 1986-1995, Southwestern Division historical files, Dallas, TX.

Fiscal and environmental factors also affected the Corps' civil works activities. A general slowdown in water resources funding occurred through most of the 1970s during the presidencies of Richard Nixon, Gerald Ford, and Jimmy Carter. The terms of Presidents Ronald Reagan and George H. W. Bush coincided with congressional determination to reduce federal spending. Budget-minded congressmen not only opposed many federal water projects, they also ushered in an era of reductions, or downsizing, of federal agencies. The Corps

[illegible]

responded to this new era with reorganization plans that called for fewer personnel and the closing of some field offices. President George Bush's successor, President Bill Clinton, initiated efforts to "reinvent" government that called for streamlining agencies and functional efficiencies.

⁴ See Ibid, for a discussion of the Corps' response to NEPA; U.S. Army Engineer Institute for Water Resources, *Environmental Guidelines for the Civil Works Program of the Corps of Engineers* (IWR Report 70-5), Dec. 1970.

The transformations on the federal level occurred as the urban centers of Oklahoma, southern Kansas,

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eastern Arkansas, and northwestern Texas grew rapidly. During the 1970s, 1980s, and 1990s, the Tulsa District had civil works responsibilities for all or part of these regions. Increased population and new development called for improved navigation, flood control, hydroelectric power, and water supply at the same time that environmental and fiscal constraints hindered the Corps' civil works program. Public involvement complicated the Corps of Engineers planning of water resources projects, as citizens regularly challenged the most cost-effective projects in favor of more aesthetically and environmentally acceptable ones. The push and pull of planning and constructing water projects in the late 20th century made for lively times in Corps offices throughout the nation, and the Tulsa District was no exception. What follows is an overview of the major civil works projects from 1971 to 1997. (Major projects are listed alphabetically, and smaller projects are combined into systems of reservoirs or local protection projects.)

Arcadia Lake

Arcadia Lake impounds water from the Deep Fork River in northern Oklahoma County. As the Oklahoma City metropolitan area grew after World War II, once remote communities like Norman, El Reno, Moore, Mustang, and Edmond became suburbs of the state capital. As a result, urban development encroached into flood-prone areas throughout Oklahoma County, including the Deep Fork River basin near the City of Edmond. In addition, the growing population demanded more water than existing sources could supply.

Congress originally authorized the reservoir in the Flood Control Act of 1970 (Public Law 91-611) as a flood control, water supply, water quality control, and recreation project.⁶ In October 1973, Colonel John G. Driskill, Tulsa District Engineer, presided over two public meetings on Arcadia sponsored by the City of Edmond and the Deep Fork Watershed Association. The meetings provided important public opinion as the Corps of Engineers conducted its preconstruction planning of the project. By 1974, the Corps began to question the quality of

water from the Deep Fork River for a municipal water supply because of excess nutrients, sediment, pesticides, and metals. Modeling conducted at the Waterways Experiment Station in Vicksburg, Mississippi, confirmed the Tulsa District's earlier study, and, as a result, the Flood Control Act of 1976 deleted water quality as a project objective.⁷

By November 1975, the Tulsa District had completed a revised draft environmental impact statement on the project. In advance, the district scheduled another public meeting at Central State University in Edmond to discuss the document. District Engineer Colonel Anthony A. Smith outlined the alternatives and adverse environmental impacts of each and invited public review and comment on the Corps' selected plan.⁸ Preconstruction planning continued, and the Corps developed agreements with local interests on water storage, water allocation, and recreation.⁹

Arcadia was one of only four new construction starts in the entire nation during the administration of President Jimmy Carter (1977-1981).¹⁰ Carter's distaste for large-scale federal water projects and his distrust of congressional funding of such projects continued an impasse in water resources development that began in 1970 and lasted until the mid-1980s. Carter's "hit list" of federal water projects slowed federal funding dramatically, but Arcadia, with its relatively high benefit to cost ratio and strong local support, was one of the few starts. One thousand people attended a July 19, 1980, groundbreaking ceremony at which Governor Henry Bellmon thanked and commended the people of central Oklahoma for their support in pursuing "one of the greatest investments possible—water."¹¹ In October 1980, construction began on the 5,250-foot-long, 102-foot-high, earth-fill dam approximately 1.5 miles from the town of Arcadia. The outlet facilities included an uncontrolled spillway, a gated tower, and a conduit. Project construction included the relocation of one mile of Interstate Highway 44 (the Turner Turnpike)

⁷ TD News Release, 22 May 1974; U.S. Army Corps of Engineers, Tulsa District, *Pertinent Data: Civil Works Project*, p. 4.; See also http://www.state.ok.us/~owrb/reports/arcadia_e.html

⁸ TD News Releases, 24 Oct., 5, 21 Nov. 1975.

⁹ Ibid.

¹⁰ Ann Patton, *Fifty Years Remembered: The First Fifty Years of the Tulsa District, U.S. Army Corps of Engineers* (Washington, DC: U.S. Government Printing Office, 1989), p. 192.

¹¹ *Tulsa District Record*, Vol. 2, No. 8 (Aug. 1980).

⁶ U.S. Army Corps of Engineers, Tulsa District, *Pertinent Data: Civil Works Projects* (Tulsa, OK: U.S. Army Engineer District, 1993), p. 4; TD News Release, 16 March 1971.



Tulsa District completed the Arcadia Lake project in 1986. Soon afterward, the federal government became embroiled in a dispute over financing recreational facilities at the lake.

northeast of Oklahoma City.¹² The Corps completed construction of the dam in November 1986, which eventually impounded a 1,820-acre-foot reservoir.¹³

After completion of the project, controversy arose. During construction, the amount for recreation costs associated with the reservoir had risen because of inflation, although the percentages for federal and non-federal contributions had remained the same. The local sponsor, the City of Edmond, believed that the amount of local cooperation should have remained at the original dollar estimates. The new recreation cost figures soon became an area of dispute. With Edmond and the Corps of Engineers at odds, the Southwestern Division commander stepped in to resolve the issue. Major General Jerome B. Hilmes argued that the local sponsor's increased contributions were legal and mandatory. Hilmes' position angered Edmond officials and members of the Oklahoma congressional delegation such as Representatives Wes Watkins and Mike Synar.¹⁴

The dispute with the City of Edmond continued

throughout the 1980s. During this time, the Corps of Engineers referred the case to the Department of Justice.¹⁵ When the city finally refused to reimburse the federal government for recreational and water supply costs, the government filed suit in the U.S. District Court for the Western District of Oklahoma.¹⁶ Under the aegis of the Department of Justice, a Corps of Engineers team headed by Southwestern Division Engineer Brigadier General Stanley G. Genega and the Tulsa District Office of Counsel presented the federal government's case to the district court in 1991. After reviewing the case, District Judge Wayne C. Alley called all parties into his office. He informed city officials that the federal government's case was compelling and urged them to settle before going to trial. In February 1992, all parties signed a consent decree by which the City of Edmond and the Edmond Public Works Authority agreed to reimburse the federal government \$7.2 million over a 40-year period for recreation works

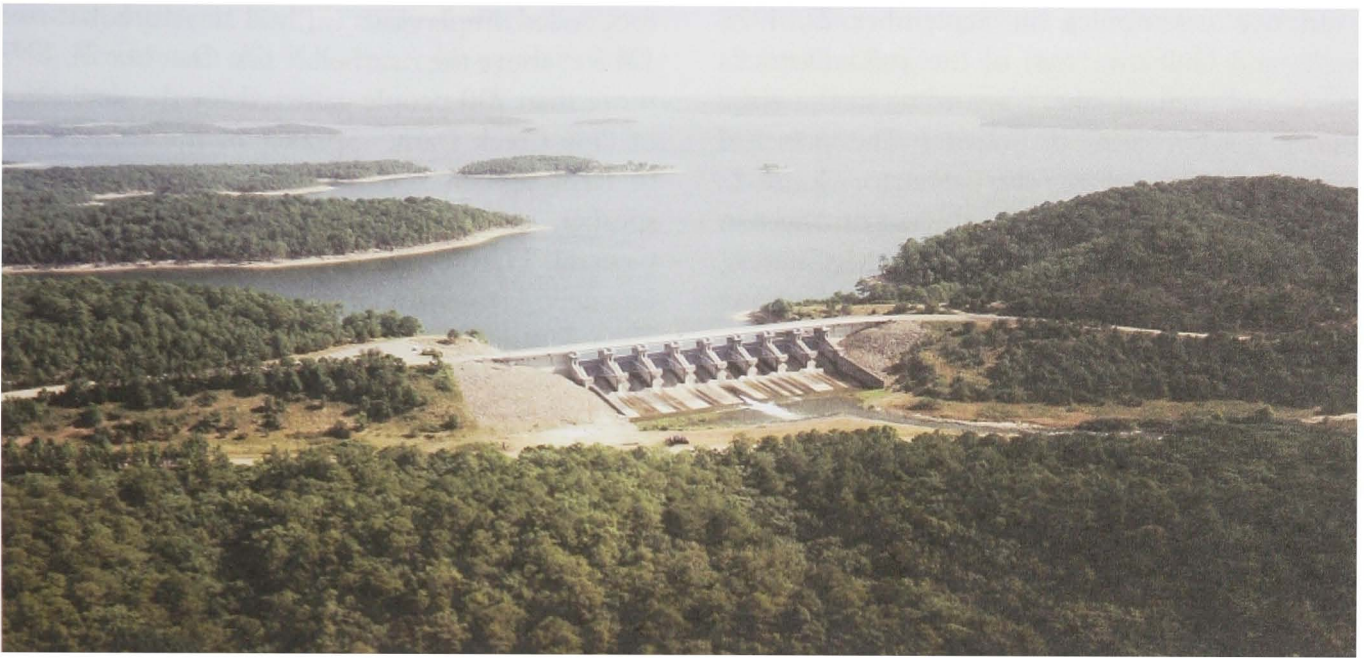
¹² TD News Release, 3 Nov. 1983.

¹³ *Annual Report of the Secretary of the Army on Civil Works Activities, 1988*, pp. 29-2-29-3.

¹⁴ Interview, Lynn Alperin with Maj. Gen. Jerome P. Hilmes, Dallas, Texas, Jan. 1988. Hereafter cited as Hilmes interview.

¹⁵ Interview, Lynn Alperin with Brig. Gen. Stanley G. Genega, Washington, DC., 23 Sept. 1992 and 26 March 1993. Hereafter cited as Genega interview.

¹⁶ See *United States v. City of Edmond and the Edmond Public Works Authority*, CIV-89-1507-A in the Western District Court, Western District of Oklahoma; Interview, Gregory Graves with Patrick Evermon, Southwestern Div., 27 Nov. 1995 (telephone). Hereafter cited as Evermon interview.



Broken Bow Dam and Lake, regarded by many as the most beautiful lake in Oklahoma, provides flood control, water supply, hydroelectric power, and recreation for the southeastern part of the state.

and \$16.3 million over a 43-year period for water supply works.¹⁷

Little River and Tributary Dams

The Flood Control Act of 1958 authorized construction of a system of seven lakes to control and develop the water resources in the Little River Basin in southwestern Arkansas and southeastern Oklahoma. With its source in the Kiamichi Mountains in southeastern Oklahoma, the Little River drains several mountain streams before it empties into the Red River in southeastern Arkansas. Flooding was a periodic problem for residents while an unstable water supply was a consistent inhibitor to growth in the region. Benefits from the dams therefore included flood control, water supply, and recreation. In 1966, the Tulsa District completed Millwood Lake on the mainstem of the Little River in Arkansas, a few miles above its confluence with the Red River as the first element of the overall basin development.¹⁸

The Tulsa District planned and constructed

each of the other lakes in the basin, beginning with the 1963 start-up of Gillham Dam on the Cossatot River in Arkansas. Construction on DeQueen Lake on the Rolling Fork River began in 1966, while the Corps began work on Dierks Lake on the Saline River (both in Arkansas) in 1968. Following passage of the National Environmental Policy Act of 1969, litigation temporarily halted construction on Gillham Dam, which was nearing completion. When federal courts determined that the Corps had met NEPA requirements, construction resumed and the dam went into operation in 1975.¹⁹ DeQueen Dam is a 2,360-foot earthfill structure 160 feet in height above the riverbed, with an uncontrolled spillway 200 feet wide. The DeQueen structures are typical of the dams in the Little River Basin. Only Broken Bow in Oklahoma has a controlled spillway and hydroelectric generators.²⁰ The multiple purposes of Dierks Lake and Dam include flood control, water supply, water quality control, fish and wildlife, and recreation. Corps contractors diverted water from the Saline River through outlet works in August 1972, and began construction of the coffer dams to provide a dry area for the main dam construction.²¹

¹⁷ Interview, Gregory Graves with Barry Rought Southwestern Div., Richardson, TX, 16 Jan. 1995. Hereafter cited as Rought interview; *Annual Report of the Secretary of the Army on Civil Works Activities*, 1993, p. 29-3.

¹⁸ U.S. Army Corps of Engineers, *Report of the Secretary of the Army on Civil Works Activities, FY 1993* (Washington, DC: Government Printing Office, 1994), p. 28-7-28-8; Settle, "Years of Challenge," p. VI-3.

¹⁹ Ibid.; *Annual Report, FY 1993*, p. 28-6.

²⁰ U.S. Army Corps of Engineers, *Water Resources Development in Arkansas* (Dallas, TX: Southwestern Division, 1995), pp. 46-47.

²¹ Ibid.; *Tulsa District Information Bulletin* Vol. XII, No. 11 (Nov. 1972).

In two ceremonies on September 27, 1975, Dierks and Gillham, “two of the Tulsa District’s newest and prettiest lakes,” according to the *Tulsa District Record*, were dedicated. The principal speaker at both events was Senator John L. McClellan of Arkansas. Southwestern Division Engineer, Brigadier General Charles McGuiness, was in attendance along with Colonel Anthony Smith, Tulsa District Engineer, and civilian employees Ira Williams, Billie Bishop, and Harold Chitwood.²² A similar dedication came in 1977 for DeQueen Lake and Dam. In October 1980, a district boundary realignment reassigned the four Arkansas projects to the Little Rock District. By the end of 1996, flood damages prevented by the four Arkansas dams in the Little River Basin exceeded \$30 million.²³

The Little River Basin project also included three dams in southeastern Oklahoma: Broken Bow, Pine Creek, and Lukfata. Construction began on Broken Bow Dam on the Mountain Fork River in October 1961. The dam and lake were named for the town of Broken Bow, in McCurtain County, some 10 miles north of the project. The dam is a rolled earthfill structure of 2,750 feet, rising 225 feet above the riverbed. Broken Bow Dam has a controlled concrete spillway, and the hydroelectric works include two 50,000-kilowatt generators. Below the dam, the Corps constructed a re-regulation dam at the behest of the U.S. Fish and Wildlife Service. The re-regulation dam minimizes low flow and power generation fluctuations downstream caused by hydropower operations. The conservation pool of the reservoir was filled by April 1970, and both generators were operating by June 1970.²⁴ By then, the Broken Bow project had won the Oklahoma Society of Professional Engineers “Wonders of Engineering” award.²⁵

Pine Creek Lake is located on the upper Little River about five miles northwest of Wright City, in McCurtain County. The multiple-purpose project provides for flood control, water supply, water quality, fish and wildlife, and recreation. Dam construction began in February 1963, and the project became operational in June 1969. The dam is a 7,712-

foot rolled, impervious earthfill structure that rises 124 feet above the riverbed.²⁶ On October 24, 1972, more than 700 people gathered for the dedication of Pine Creek Dam. Speaker of the U.S. House of Representatives Carl Albert was the principal speaker, and those in attendance included Major General Harold Parfitt, Southwestern Division Engineer; Lieutenant Colonel Eddie Morris, Acting Tulsa District Engineer; and Ira Williams, James Cyrus, Dean Cummings, and John Thisler of the Tulsa District.²⁷

Completion of Broken Bow and Pine Creek lakes came just as all federal resources agencies were challenged by environmental laws and litigation. With passage of NEPA, federal agencies had to prepare Environmental Impact Statements that justified the adverse impacts of their projects and outlined mitigation measures. These documents were often challenged in court by environmental groups. Passage of the Endangered Species Act of 1973 posed still more challenges to development projects if they adversely affected the habitats of threatened or endangered animals or plants. The Tulsa District’s attempts to complete the Little River Basin project with construction of Lukfata Dam on the Glover Creek in McCurtain County met with strong opposition in the early 1970s from the Sierra Club, the Ozark Society, the Scenic Rivers Association of Oklahoma, and the Audubon Society.²⁸ In addition to environmental groups who decried the damming of the “last free-flowing river in Oklahoma,” and an excellent canoeing stream, the Corps of Engineers faced three additional obstacles to construction. Although authorized in the 1958 Flood Control Act, Lukfata, with its remote location, did not have the strong local support of other dams. Nor did the project have as high a benefit to cost ratio since it only provided for flood control and water supply. Finally, the dam would have impact on two endangered species: a small fish called the leopard darter and a species of crawfish. (The snail darter, a related species, temporarily halted construction of the Tennessee Valley Authority’s Tellico Dam, generating national attention and controversy in the late 1970s.) Given these difficulties, the Corps deferred plans for the

²² Ibid. Vol. XV, No. 10 (Oct. 1975).

²³ *Annual Report, FY 1993*, pp. 28-5-28-9.

²⁴ Tulsa District, *Pertinent Data: Civil Works Project*, pp. 20-21.

²⁵ *Tulsa District Information Bulletin* Vol. XII, No. 9 (Sept. 1972).

²⁶ Ibid., pp. 103-104.

²⁷ *Tulsa District Information Bulletin* Vol. XII, No. 11 (Nov. 1972).

²⁸ TD News Release, 2 Aug. 1974.

authorized project in 1976 and, after a restudy in 1988, continued the deferment.²⁹ As of 2000, Lukfata remains deferred.

Red River Basin Dams

Upstream of the Little River Basin projects, the Tulsa District constructed additional dams for overall flood reduction and water resources development of the Red River Basin in southern Oklahoma and northern Texas. The mainstem Denison Dam and Lake Texoma on the Red River, completed in the 1940s, already protected parts of the floodplain of this rapidly growing region. In 1967, the Tulsa District completed the Pat Mayse Dam in northern Texas on Sanders Creek, a tributary of the Red River.³⁰ For flood protection along the northern drainage of the Red River's tributaries, Congress (in the Flood Control Act of 1946) authorized a three-dam system on the Kiamichi River and its tributaries that drain the western slopes of the Ouachita and Kiamichi Mountains in southeastern Oklahoma.³¹

Hugo Dam, seven miles east of the City of Hugo, Oklahoma, was the largest of the three authorized projects. Responding to residents and civic groups, Congress expanded the original project to include the benefits of water supply, water quality, recreation, and fish and wildlife.³² At the groundbreaking ceremony for Hugo Dam on June 30, 1968, Colonel Vernon Pinkey, Tulsa District Engineer, stated: "The Corps of Engineers project itself is just the first step towards realization of the economic benefits and further economic development possible. The ultimate evaluation of the greatness of this project will not be the size of the dam, nor the beauty of the lake, but will be determined by what the people of this area do to insure that all the purposes of this project are fulfilled."³³

²⁹ Tulsa District, *Pertinent Data: Civil Works Project*, p. 86; See also Lukfata Reservoir file, Public Affairs Office, Southwestern Division, Dallas, TX; Interview, Gregory Graves with Ray Tomasko, Tulsa District, 27 Aug. 1999 (telephone). Hereafter cited as Tomasko interview.

³⁰ *Annual Report, FY 1993*, p. 29-9-29-10.

³¹ "Hugo Dam and Lake," typescript dated 2 Oct. 1975, Tulsa District historical files.

³² *The Paris (Texas) News* (4 July 1976).

³³ "Remarks by Col. Vernon W. Pinkey, DE, Tulsa District, Hugo Groundbreaking," 30 June 1968, Box 1912, Tulsa District historical files.

Indeed, the people of southeastern Oklahoma took keen interest in the construction of Hugo Dam. Completed on January 18, 1974, the 10,200-foot rolled earth embankment dam rose 101 feet above the riverbed and embraced a controlled concrete spillway. The *Hugo Daily News* declared: "A big step in the growth of Hugo and Choctaw County was taken this morning at 10:00 . . . [w]hen the gates closed on Hugo Dam a brighter future opened for southeastern Oklahoma."³⁴ By March 12, 1974, the \$37-million project impounded more than 809,000 acre-feet of water for flood control, inundated 13,250 acres, and created 110 miles of shoreline.³⁵ Even before its formal dedication in July 1976—keynoted by Speaker of the House Carl Albert—area residents celebrated Hugo Dam and Lake. In December 1974, the *Durant Democrat* published an article entitled "Creation of Lake Tremendous Boost to Economy of the Hugo Area."³⁶ Citing substantial economic gains in the area, the *Hugo Daily News* reported in November 1979, "Local Economy Stimulated by Hugo Lake."³⁷ Later that year, the paper called Hugo "America's Recession-Proof City" and boasted that the community had "more fresh water than any town its size in America."³⁸

The two other authorized reservoirs in the Kiamichi River Basin were called Clayton and Tuskahoma. Clayton Lake was authorized in the Flood Control Act of 1962 for flood control, water supply, recreation, and fish and wildlife. Under the provisions of Public Law 97-88 (December 4, 1981), the lake was renamed Sardis after the town that would be inundated by the reservoir. Construction on the dam, located on Jackfork Creek, a tributary of the Kiamichi River, began in 1977.³⁹ By January 1983, the 14,138-foot rolled earthfill dam was complete and impounding water. The dam rose 81 feet above the riverbed and had a 215-foot-wide uncontrolled spillway. At the dedication of Sardis Dam on June 4, 1983, U.S. Congressman Wes Watkins delivered the keynote address, and

³⁴ *Hugo (Oklahoma) Daily News* (18 Jan. 1974).

³⁵ "Hugo Dam and Lake"; *Tulsa District Information Bulletin* Vol. XV, No. 1 (Jan. 1975).

³⁶ *The Paris News* (4 July 1976); *Durant (Oklahoma) Democrat* (29 Dec. 1974).

³⁷ *Hugo Daily News* (9 Nov. 1979).

³⁸ *Ibid.*, (undated).

³⁹ *Annual Report, FY 1993*, p. 29-9

Southwestern Division commander Major General Hugh Robinson presided. The Tulsa District delegation included District Engineer Colonel James Harmon, Gene Dretke, Jerry McNeil, John Thisler, Donald Mahaffey, Steve Shaw, and Sam Cupps.⁴⁰ At maximum pool level, Sardis Lake has a capacity of 974,000 acre-feet and an area of 27,500 acres.⁴¹

The third project in the Kiamichi River Basin, Tuskahoma, was authorized in the 1962 Flood Control Act. Located in the remote upper reaches of the Kiamichi, the project was de-authorized in 1986 because of a marginal benefit-to-cost ratio, lack of local support, and environmental opposition to another dam and lake in Oklahoma.

The Verdigris River Basin Dams

The source of the Verdigris River is the Flint Hills of eastern Kansas. From there, the river flows southward to the Arkansas River at Muskogee, Oklahoma, on its way draining a well-watered section of Kansas and Oklahoma. Federal water resources studies date back to the 1930s and the “308 Report” on potential development of the Verdigris Basin. Congress reviewed the 308 Report on the Verdigris Basin in hearings during the 1940s after communities such as Bartlesville and Claremore requested additional flood control. In the 1950s, Congress incorporated the findings of the Verdigris studies into the broader Arkansas, White, Red River Basin study published in 1957 as Senate Document 13 (85th Congress, 1st Session). Authorization of five reservoirs recommended in the report did not come until passage of the Flood Control Act of 1963.⁴² By that time, the Tulsa District had built four dams in the Verdigris Basin for flood control, water supply, recreation, and fish and wildlife conservation: Fall River Dam in southeastern Kansas in 1948; Hulah on the Caney River in northeastern Oklahoma in 1951; Toronto on the Verdigris in southeastern Kansas in 1960; and Elk City on the Elk River in southeastern Kansas in 1966 (dates are all for completion).⁴³ As

⁴⁰ Ibid.; *Tulsa District Record*, Vol. 6, No. 8 (June 1983).

⁴¹ Tulsa District, *Pertinent Data: Civil Works Projects*, pp. 121-122.

⁴² Remarks of Col. Ernest W. Chapman, Tulsa District, before the Bird Creek Flood Prevention Association, 22 April 1963, Box 1912, Tulsa District Archives, Tulsa District, USACE.

⁴³ Patton, *Fifty Years Remembered*, pp. 150-160.

the McClellan-Kerr Waterway took shape in the late 1950s, engineers determined that the upper reaches of the waterway should be constructed on the lower Verdigris River rather than the Arkansas. This called for additional regulation of the Verdigris. Meanwhile, the population of southeastern Kansas and northeastern Oklahoma increased rapidly and pushed into floodplains.

In response to these challenges, the Corps of Engineers constructed several reservoirs in the Verdigris basin during the 1970s, 1980s, and 1990s. Already under construction when the 1970s began was Oologah Lake on the mainstem of the Verdigris in northeastern Oklahoma. Oologah, named for the Cherokee town of Will Rogers’ birth, was actually built in two phases. The first phase was complete in 1963, but in response to the requirements of the waterway, was enlarged beginning in 1967. The dam is a rolled earthfill structure of about 4,000 feet, rising 137 feet above the riverbed. The controlled spillway consists of seven radial gates. Construction was complete in 1974.⁴⁴ Relocations, a costly and sometimes thorny issue for the Corps of Engineers, significantly increased the cost of Oologah and other large reservoirs associated with flood control and navigation. The relocation process included plugging oil and gas wells; and moving highways, bridges, rail lines, homes, cemeteries, public utilities, and sometimes even entire communities, such as the towns of Keystone (for which Keystone Lake is named) and Mannford. The total construction cost of Oologah Lake was about \$47 million. That figure, however, did not include relocation costs which came to almost \$11.9 million. Relocations of state highways for Keystone, Eufaula, and Oologah totaled almost \$55 million.⁴⁵

In 1974, the Tulsa District opened the Dewey Construction Office to administer four projects in the Verdigris River Basin: Big Hill on Big Hill Creek in southeastern Kansas; Birch on Birch Creek in northeastern Oklahoma; Copan on the Little Caney River in northeastern Oklahoma; and Skiatook on Hominy Creek in northeastern Oklahoma.⁴⁶ The first of the four dams to be completed was Birch. Also authorized in the Flood Control Act

⁴⁴ Tulsa District, *Pertinent Data: Civil Works Projects*, pp. 97-98; *Annual Report*, FY 1993, p. 29-8.

⁴⁵ See Settle, *The Dawning*, pp. 135-137 for a full discussion of relocations for Eufaula, Keystone, and Oologah.

⁴⁶ *Tulsa District Information Bulletin* Vol. XV, No. 1 (Jan. 1975).

of 1962, Birch had the additional use of water-quality control.⁴⁷ In September 1972, Colonel William Read, Tulsa District Engineer, announced completion of the final EIS on the Birch project. The final EIS, Read declared, was prepared after “careful review and consideration of the comments of various federal, state, and local agencies required by Section 102 of the National Environmental Policy Act of 1969 and as prescribed by the Council on Environmental Quality “Guidelines.”⁴⁸ Unchallenged, construction began on the dam in 1973. The completed project of 1977 included a 3,193-foot rolled earthfill embankment rising 97 feet from the streambed and an uncontrolled spillway. U.S. Senator Henry Bellmon delivered the keynote address at the dedication of Birch Lake on May 28, 1977.⁴⁹

Authorized in the Flood Control Act of 1962, the Big Hill Reservoir project included the multiple purposes of flood control, municipal and industrial water supply, recreation, and fish and wildlife conservation.⁵⁰ Construction began in April 1974 and continued until completion in March 1981. In 1978, Public Law 95-625 changed the name to Pearson-Skubitz Big Hill Lake in honor of Kansas lawmakers James Blackwood Pearson and Joe Skubitz. The dam is a rolled earthfill embankment of 3,902 feet that rises 83 feet above the streambed and has a 400-foot-wide uncontrolled spillway. Conservation pool storage is 26,969 acre-feet, and the lake reached that volume by May 1983.⁵¹

Also authorized in the Flood Control Act of 1962 was Copan Lake on the Little Caney River northeast of Bartlesville, Oklahoma. According to Colonel John Morris, Tulsa District Engineer from 1962 to 1965, the primary purposes of Copan were “flood control, municipal and industrial water supply, stream-quality control, recreation, and fish and wildlife [conservation].”⁵² Following congressional

appropriations and an approved EIS, construction began on Copan Lake in November 1972.⁵³ Eleven years later, Copan Dam was completed. The rolled earthfill structure is 7,730 feet long and rises 73 feet above the Little Caney River. The spillway is a gate-controlled concrete structure with four tainter gates. The spillway itself is 495 feet long. The area encompassed in the conservation pool is 4,850 acres, while at maximum the reservoir can expand to 17,850 acres.⁵⁴ At a ceremony in April, 1983, top executives from Phillips Petroleum and elected officials from surrounding communities joined Acting District Engineer Lieutenant Colonel Richard Waldrop and civilian employees including Gene Dretke, Jim Jones, E.W. Woodham, Jr., Dan Bentley, and Jim Cyrus in closing the gates of Copan Dam.⁵⁵

The fourth and fifth components in the system of flood control along the lower Verdigris Basin were Skiatook Lake on Hominy Creek about five miles west of the town of Skiatook and 18 miles northwest of Tulsa, and Candy Lake on Candy Creek, about 25 miles northwest of Tulsa. Both streams are tributaries of Bird Creek, which had flooded several times since the 1940s.⁵⁶ Construction began on Candy in 1976 and on Skiatook in 1977. Both projects experienced delays in construction when the Osage Nation could not come to an agreement with the federal government over compensation for mineral rights lost as a result of inundation. In 1906, when the Osages agreed to allotments of their lands, they reserved the subsurface or mineral rights to the tribe. The tribe balked at federal offers for the mineral rights lost with Skiatook and Candy and, unable to reach an agreement, the government began plans for condemnation of the Osage land. A state court decision in another state held at this juncture that an agency of the federal government could not condemn Indian lands without an act of Congress.⁵⁷

When in 1981, the Justice Department ruled that it would not challenge this decision, the Corps of Engineers faced a dilemma. Construction on

⁴⁷ Memorandum from Col. J.W. Morris, Tulsa District Engr., subj: Birch Reservoir, 22 Mar. 1963, Box 1912, Tulsa District Archives.

⁴⁸ TD News Release, 20 Sept. 1972.

⁴⁹ Settle, “Years of Challenge,” p. VI-6.

⁵⁰ Memorandum from Col. J.W. Morris, Tulsa District Engr., subj: Big Hill Reservoir, 5 Apr. 1963, Box 1912, Tulsa District Archives.

⁵¹ Tulsa District, *Pertinent Data: Civil Works Projects*, pp. 103-104.

⁵² Memorandum from Col. J.W. Morris, Tulsa District Engr., subj: Copan Reservoir, 22 Mar. 1963, Box 1912, Tulsa District Archives.

⁵³ Ibid.; TD News Release, 27 Oct. 1972.

⁵⁴ Tulsa District, *Pertinent Data: Civil Works Projects*, p. 29.

⁵⁵ *Tulsa District Record*, Vol. 5, No. 4 (April 1983).

⁵⁶ Tulsa District, *Pertinent Data: Civil Works Projects*, pp. 23, 124.

⁵⁷ Settle, “Years of Challenge,” pp. VI-7-VI-9; *Tulsa World* (25 Aug. 1981).



Skiatook Lake project, under construction here, nearly came to a halt over mineral rights issues brought forth by the Osage tribe. The Corps, the Osage, and the Oklahoma congressional delegation ultimately resolved the issue, and the project was completed.

Skiatook was proceeding without the necessary land acquisitions. A construction stoppage would cost the federal government an additional \$3 million to \$5 million, and moreover, Skiatook Dam could soon be blocking sufficient water to flood the Osage oil lands. At this point, Tulsa District real estate personnel, District Engineer Colonel James Harmon, U.S. Senators David Boren and Don Nickles, Representatives James Jones and Mike Synar, and Osage tribal officials began intense negotiations to resolve the issues. When Boren agreed to withdraw his support for further funding for Candy Dam, the Osage council accepted a federal offer of \$7.4 million for the land for Skiatook and retention of the mineral rights by the tribe (the initial government offer had been \$4.3 million).⁵⁸ A spokesman for Boren declared: "To our knowledge, this is the first time the Corps and an Indian tribe have had a friendly subordination of mineral rights."⁵⁹

As a result of the agreement and a subsequent act of Congress authorizing the Secretary of the Army to acquire a subordination of the mineral rights, construction continued on the 3,590-foot-long rolled earthfill Skiatook Dam.

When completed in 1984, the dam rose 143 feet from the streambed and had a 100-foot-wide uncontrolled spillway. At the top of the flood control pool, the reservoir encompasses 20,300 acres.⁶⁰ At the official dedication of the lake on July 4, 1990, Colonel Lee Smith, Jr., Tulsa District Engineer, declared: "The Corps is caretaker. This is your lake."⁶¹ Skiatook Lake was Tulsa District's last reservoir constructed during the 1980s and 1990s. Withdrawal of support and opposition of the Osage tribe stopped the Candy Lake project when it was about ten percent complete. As of 1997, Congress recommended the project for deauthorization.⁶²

Other District Reservoirs

Between 1971 and 1997, the Tulsa District built six additional reservoirs. One of those, Lake Kemp, was built for the City of Wichita Falls, Texas, and Wichita County Water Improvement District No. 2. Another, McGee Creek Reservoir, was built for the U.S. Bureau of Reclamation. The other

⁶⁰ Tulsa District, *Pertinent Data: Civil Works Projects*, pp. 124.

⁶¹ *Tulsa District Record*, Vol. 12, No. 8 (Aug. 1990).

⁶² Settle, "Years of Challenge," p. VI-8; *Annual Report, FY 1993*, p. 29-4.

⁵⁸ Ibid.

⁵⁹ Ibid.

four--Kaw, El Dorado, Waurika, and Optima--were congressionally authorized and funded Corps of Engineers projects. Congress authorized Lake Kemp in the 1962 Flood Control Act. The federal project involved expanding a non-federal lake on the Wichita River about 40 miles southwest of Wichita Falls. In an unusual agreement, the City of Wichita Falls and the regional water district enlisted the Tulsa District to raise the existing dam 16 feet and build a new spillway and outlet works.⁶³ Work began in 1970 and the new dam was completed in October 1972 at a federal cost of almost \$8 million, and a non-federal cost of \$1.36 million. The City of Wichita Falls owns Lake Kemp; the Wichita County Water District manages the water supply and conservation; and the Corps of Engineers manages flood control.⁶⁴

The 1962 Flood Control Act authorized Kaw Lake on the Arkansas River about 70 miles upstream from Keystone Lake for flood control, water supply, water quality, recreation, and fish and wildlife conservation. Construction began in June 1966, and the dam was completed and placed into operation in May 1976. Acting in conjunction with Keystone Lake to the southeast, Kaw provides 39,690 acres of flood control capacity and 1.3 million acre-feet of storage.⁶⁵ In 1987, the Oklahoma Municipal Power Authority broke ground on a \$35 million power generation plant at Kaw. The hydropower facility, completed in 1989, provides an average of 22 megawatts of electricity for Ponca City and other surrounding communities.⁶⁶

The Flood Control Act of 1936 authorized Optima Lake on the North Canadian River in the Oklahoma panhandle near Guymon. The long delay between authorization and the construction start of 1966 was because of marginal benefit-to-cost figures, lack of strong local support, and a withdrawal of funding by Congress. Construction of the 15,200-foot-long dam proceeded slowly and was not completed until 1978. The high plains reservoir

provides flood control, recreation, water supply, and fish and wildlife conservation for the residents of Texas County. Due to a significant change in hydrogeologic conditions in the North Canadian River watershed, the Optima Lake has never filled to normal conservation pool elevation.⁶⁷

El Dorado Lake in central Kansas was authorized in the Flood Control Act of 1965. Near the town of El Dorado on the Walnut River, a tributary of the Arkansas River, construction began on the project in 1973. The federal project--providing for flood control, water supply, water quality control, and recreation--inundated two dams and reservoirs that formerly served as the water supply for El Dorado. In an agreement with the federal government, the city agreed to pay for future charges for the water as if it had built comparable facilities. The Tulsa District completed the 20,930-foot-long rolled earthfill dam in June 1981.⁶⁸ At the dedication of El Dorado Lake on September 1, 1984, guests included Kansas Governor John Carlin, U.S. Senators Bob Dole and Nancy Kassenbaum, members of the El Dorado Lake Association, and the Kansas State Park Authority. They joined Brigadier General Robert Dacey, Southwestern Division Engineer; Colonel Franklin Tilton, Tulsa District Engineer; and other Corps civilians. Speakers celebrated the lake as "an outstanding example of the way civil works projects of the future should be formulated." They pointed to cost-sharing, cooperation among agencies, and public participation as methods for water resources projects of the future.⁶⁹

The Waurika Lake project was the only new start of 1971. Authorized by Public Law 88-253 (approved on December 30, 1963), the project was unique in the Tulsa District. Construction began on the project, six miles west of Waurika on Beaver Creek in south central Oklahoma, in July 1971. The completed project included construction of water conveyance facilities for the Waurika Project Master Conservancy District, the provider of municipal and industrial supplies for Waurika, Comanche, Walters, Temple, Lawton, and Duncan. The Tulsa District built 115 miles of pipelines to the communities of the conservancy district. In turn, the water

⁶³ Ibid., p. VI-4; Tulsa District, *Pertinent Data: Civil Works Projects*, p. 79.

⁶⁴ Ibid.

⁶⁵ Ibid., pp. 73-74; See also Tulsa District News Releases for 8 Nov. 1973; 6 and 13 Dec. 1973, 22 Mar. 1974, and 19 May 1975.

⁶⁶ *Ponca City (Oklahoma) News* (30 Aug., 18 Oct. 1987); *Pertinent Data: Civil Works Projects*, p. 73. See pp. 28-29 of this chapter for more information on hydroelectric power at Kaw Dam.

⁶⁷ Ibid., pp. 99-100; Settle, "Years of Challenge," p. VI-3. Letter from David Steel to Edward Engelke, 24 Aug 2005.

⁶⁸ *Pertinent Data: Civil Works Projects*, p. 34; *Tulsa District Record*, Vol. 6, No. 4 (Nov. 1984.)

⁶⁹ Ibid.

conservancy district agreed to reimburse the Corps, with interest, over a 50-year period. The dam itself, completed in August 1977, is 16,600 feet long rising 106 feet above the streambed. The dam impounds a maximum pool of 31,640 acres and 935,480 acre-feet of capacity.⁷⁰ At the 1979 ceremonies for Waurika, Lieutenant General John Morris, Chief of Engineers, returned to Oklahoma to dedicate the project that was authorized while he was Tulsa District engineer.⁷¹

Navigation Projects

With completion of the McClellan-Kerr Arkansas River Navigation System in 1970, the Tulsa District's navigation construction workload declined precipitously. By 1973, the hydroelectric facilities were completed at Robert S. Kerr and Webbers Falls locks and dams, and construction on the main route of the waterway ended. In addition to ongoing operation and maintenance work that includes snagging and clearing projects, the Tulsa District built two extensions to the waterway during the 1970s: the Sans Bois and Poteau River navigation channels, both in southeastern Oklahoma.

The San Bois Navigation Channel was authorized in the 1970 Rivers and Harbors Act. The project called for extending navigation from the Robert S. Kerr Reservoir southwest for 14 miles on Sans Bois Creek. At the navigation terminal, named Port Carl Albert, were large coal reserves. The extension mainly serves coal operators, who load their product onto barges. The nine-foot waterway has a minimum channel width of 225 feet, and the port has a turning basin 400 feet long and 2,000 feet wide.⁷²

The Poteau River Navigation Channel extends the waterway to the Port of Fort Smith. Fort Smith is in Arkansas, but the port is in Oklahoma. The navigation channel extends 1.7 miles upstream on the Poteau River from its confluence with the Arkansas River. The channel is 130 feet wide and nine feet deep. The turning basin is a short distance upstream from the Port of Fort Smith. Construction

began in March 1979 and was completed in October of the same year.⁷³

Local Protection Flood Control Projects

In the decades following World War II, rapid growth took place in Oklahoma, Texas, Arkansas, and Kansas. Cities such as Oklahoma City, Tulsa, Wichita Falls, and Wichita expanded into formerly rural areas, many of which were located in floodplains. Smaller communities, such as Enid and Okmulgee, Oklahoma; Dodge City and Marion, Kansas; and Springdale, Arkansas, also expanded into flood-prone areas. As residences and businesses located near creeks and rivers, the need for flood protection grew dramatically. Local flood control agencies built some small flood control works, but larger projects required federal participation. During the 1950s and 1960s, the Tulsa District built extensive flood control works in Oklahoma City, Tulsa, and Wichita. The Tulsa District undertook a few local protection projects during the 1970s, but once the water resources funding impasse ended with passage of Water Resources Development Act of 1986, local protection work increased and diversified.

During the 1970s, the Tulsa District built local protection projects in Oklahoma, Kansas, and Arkansas. In 1974, the district completed 10,000 feet of channel improvements on Spring Creek as it flows through Springdale, in northwestern Arkansas.⁷⁴ In 1975, the Corps began construction of a 9,000-foot diversion channel and overflow protection levee on Mud Creek in Marion, Kansas. Congress had authorized the project, completed in 1980, based on a resolution of the Committee on Public Works of the 91st Congress.⁷⁵ The Flood Control Act of 1962 authorized construction of a local protection project on the Arkansas River through Dodge City, Kansas. In 1975, the Corps began construction on 7.3 miles of levees on both sides of the river. The project was complete in April 1977.⁷⁶ After a flood of record in October 1973, the district expanded a diversion

⁷⁰ *Pertinent Data: Civil Works Projects*, pp. 135-136; Settle, "Years of Challenge," p. VI-5; TD New Release, 24 June 1975; Tomasko interview.

⁷¹ Tomasko interview.

⁷² Settle, *The Dawning*, p. 146; *Pertinent Data: Civil Works Projects*, p. 120.

⁷³ *Ibid.*, p. 106.

⁷⁴ Settle, "Years of Challenge," p. VI-10.

⁷⁵ *Pertinent Data: Civil Works Projects*, p. 89.

⁷⁶ *Ibid.*, p. 32.

canal on South Boggy Creek in Enid, Oklahoma. The original authorization for the project came in the Flood Control Act of 1954.⁷⁷

The greatest local flood control challenge for the Tulsa District has been its home city. Tulsa continues to expand around the creeks and streams that feed into the Arkansas and Verdigris Rivers, calling for ever more extensive flood control. Corps-constructed levees on the banks of the Arkansas date back to the 1930s, and local protection projects continued into the 1970s.⁷⁸ In October 1973, the Corps began construction of more than 12,000 feet of channel improvements on Flat Rock and Valley View Creeks in northwest Tulsa. The project, authorized by the Flood Control Act of 1948, was completed in 1975.⁷⁹ In south Tulsa, the Corps of Engineers worked with the City of Tulsa and a private developer to complete the Joe Creek project. Construction began on the 10,800-foot channel improvement in 1978 and was completed in November 1980.⁸⁰

The Corps of Engineers and Tulsa County developed plans for three additional projects to provide flood protection for residents of the southern and eastern parts of the city. Plans for Haikey Creek, Fry Creeks, and Mingo Creek solidified in the 1970s as floods damaged recently built subdivisions as well as property in Bixby (12 miles south of Tulsa) on at least five occasions in that decade. Floods on Haikey Creek were so extensive that the Corps and the county developed specific plans for a project that had been authorized in 1948. In 1980, the Corps presented a plan for a 5,860-foot levee costing \$2 million. When the federal government and the county agreed to a cost-sharing formula, construction began. The project was complete in 1985.⁸¹ Authorized in 1986, the Fry Creeks project involved enlarging two creeks, diverting one into the other with the combined creek flowing into the

Arkansas River.⁸² Construction began in 1992 and was complete in 1993. In 1995, the Corps signed a local cooperation agreement with the City of Bixby, Oklahoma, designating operation and maintenance responsibilities for the project.⁸³

Mingo Creek is a tributary of the Verdigris River that drains much of eastern Tulsa. As the city grew in the 1950s and 1960s, many people built homes along the Mingo Creek floodplain. Periodically the creek overtopped its banks, with damages rising from each successive flood. Ten major floods occurred along Mingo Creek between 1959 and 1988, an average of one flood every two to three years. In May 1984, a record flood resulted in five deaths and \$124 million in damages.⁸⁴ During the 1970s and 1980s, Tulsa had more national disaster declarations than any city in the United States, and consequently high flood insurance ratings for residences and businesses.⁸⁵

Following the 1984 storm, local efforts to prevent flooding along Mingo Creek intensified. The Tulsa District had developed plans for Mingo Creek flood control during the 1970s and early 1980s. Plans called for a straight channelization of the stream as the most efficient means of controlling flooding. However, during public meetings regarding the project, residents objected to the proposed concrete channel as not being aesthetically pleasing, even though it provided the greatest flood protection for each dollar spent.⁸⁶

Engineers at the Tulsa District responded by developing alternative plans that incorporated about 9.4 miles of channelization and 23 flood water detention sites. The detention sites were small flood control reservoirs that would retain water during a flood and then release it gradually when the flood had receded. These sites would also have recreational use as picnic and day-use areas. By 1985, Corps Headquarters had approved of the district's modified plans. The completed project

⁷⁷ Settle, "Years of Challenge," p. VI-11; *Pertinent Data: Civil Works Projects*, p. 37.

⁷⁸ The Tulsa and West Tulsa project, completed in 1945, had an extensive rehabilitation done by the Tulsa District during 1992 and 1993. See *Pertinent Data: Civil Works Projects*, pp. 132-133.

⁷⁹ *Ibid.*, p. 43.

⁸⁰ *Tulsa District Record*, Vol. 3, No. 1 (Jan. 1981); *Pertinent Data: Civil Works Projects*, p. 70.

⁸¹ *Bixby (Oklahoma) Bulletin* (24 April 1980); *Pertinent Data: Civil Works Projects*, p. 58.

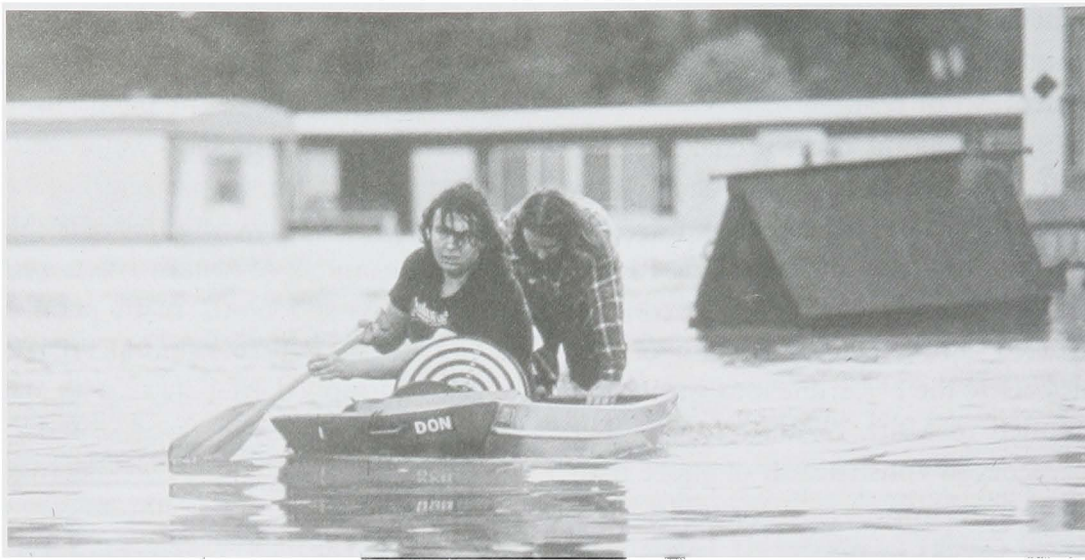
⁸² *Ibid.*, p. 52.

⁸³ *Annual Report, Fiscal Year 2003, of the Secretary of the Army on Civil Works Activities* (1 Oct. 2002-30 Sept. 2003), pp. 38-7, 38-21.

⁸⁴ U.S. Army Corps of Engineers, Tulsa District, *Tulsa District Record*, Vol. 10, No. 1 (Jan/Feb 1988).

⁸⁵ Manuscript, Mary Beth Hudson, Tulsa District Public Affairs Office, 2004.

⁸⁶ Water Resources Development Act of 1986, P.L. 99-662, p. 4123.



The Mingo Creek Valley of east Tulsa experienced periodic and sometimes disastrous flooding before construction of the Mingo Creek project.

would provide a minimum of 65-year protection in the major flooding area.⁸⁷

Another obstacle to flood control on Mingo Creek was funding. The long water resources funding impasse in Congress continued from the Nixon administration into the Reagan administration. The Water Resources Development Act of 1986 authorized Mingo Creek, but also required cost-sharing agreements between the federal government and local sponsors. Non-federal participation substantially increased because of Congress' intent to eliminate projects with marginal national interest.⁸⁸

The constant flooding problems and memories of the disastrous 1984 storm compelled residents of the Mingo Creek floodplain to urge adequate local support for the project. With the support of the Tulsa District and the Southwestern Division, local and federal officials signed a cost-sharing agreement in January 1988. This agreement was one of the first under the new cost-sharing provisions of Water Resources Development Act of 1986. In a ceremony at the Tulsa City Hall, Assistant Secretary of the Army for Civil Works Robert Page and Tulsa Mayor Dick Crawford signed an agreement by which the federal government would provide

⁸⁷ Rought interview; U.S. Army Corps of Engineers, *Annual Report of the Secretary of the Army on Civil Works Activities*, 1991, p. 29-7.

⁸⁸ Water Resources Development Act of 1986, P.L. 99-662, pp. 4082-4083, 4123; see Martin Reuss, *Reshaping National Water Politics: The Water Resources Development Act of 1986* (IWR Policy Study 91-PS-1), October 1991 for cost-sharing formulas and interpretations of their impact.

approximately \$96.6 million and non-federal interests would provide \$58.5 million to complete the project. The Water Resources Development Act of 1986 stipulated that non-federal interests provide land, easements, rights of way, and dredged material disposal areas; oversee modification or relocation of buildings, utilities, roads, bridges, and other facilities during construction; pay five percent of the costs allocated to flood control; and bear all costs of operation, maintenance, and replacement of flood control facilities. The City of Tulsa agreed to these measures in the 1988 agreement.⁸⁹

When construction began in September 1988, the city of Tulsa had already completed 4.75 miles of channel and placed two detention basins in operation. Construction of the Mingo Creek project continued into the early 1990s, and was approximately 45 percent complete at the end of 1993.⁹⁰ In February 1994, the Corps named one of the detention sites after Larry H. Redford, the Tulsa District project manager who had been instrumental in maintaining progress and good relations throughout the Mingo Creek project and who died in 1993.⁹¹ By this time, the National Society of Professional Engineers had named

⁸⁹ *Tulsa District Record*, Vol. 10, No. 1 (Jan/Feb 1988); *Annual Report of the Secretary of the Army on Civil Works Activities*, 1993, p. 29-8.

⁹⁰ *Ibid.*

⁹¹ Larry Redford, whose father, John, had 60 years of service with the Corps at the Southwestern Division in Dallas, was instrumental in maintaining progress and good relations among all interests in the Mingo Creek project. *Pacesetter*, Vol. 19, No. 3 (March 1994), p.9.



The Mingo Creek Flood Control Project provides protection from flooding and diverse recreation opportunities.

two of the detention sites in its top ten list of innovative projects. In the words of the society, the innovations transformed a potentially “effective but unsightly flood control project into a community asset with multiple uses and benefits.”⁹² Tulsa District’s design incorporated recreational facilities into each of the project’s catch basins, providing Tulsans with a wealth of baseball diamonds, soccer fields, playgrounds, and walking trails. The Mingo Creek project resolved longstanding flood control issues while at the same time uniting a city with a recreational greenbelt.⁹³ By 1997, the Mingo Creek project was approximately 80 percent complete, with construction ongoing at two sites.

Other district local protection projects authorized by Water Resources Development Act of 1986 include Arkansas City and Halstead in Kansas and the Lake Wichita, Holliday Creek project in Texas. The Water Resources Development Act of 1988 authorized the McGrath Creek Local Protection Project in Wichita Falls, Texas. Each of these projects was in the preconstruction, engineering, and design phase or under construction as of 1997.⁹⁴

Hydroelectric Power and the Tulsa District

Tulsa District’s hydropower facilities provide a major portion of the electricity for the federal Southwestern Power Administration. Three of the eight Corps of Engineers power stations went on line during the 1970s: Robert S. Kerr, Webbers Falls, and Broken Bow. Those already in service were Keystone, Tenkiller, Fort Gibson, Eufaula, and Texoma. The four turbines at Robert S. Kerr Lock and Dam went on line in 1971. Their capacity is 110,000 kilowatts.⁹⁵ The three power units at Webbers Falls Lock and Dam went on line in 1973 and have a combined capacity of 60 megawatts. Broken Bow’s two 50,000-kilowatt generators went on line in 1970.⁹⁶ The combined capacity of the eight generating dams of the Tulsa District is 585,000 kilowatts.⁹⁷ Along with 15 federal hydropower facilities in Arkansas, Texas, and Missouri, the Oklahoma power plants provide electricity for the Southwestern Power Administration distribution system, which provides low-cost electricity to dozens of customers throughout the region. Hydroelectric power is a significant benefit of the Corps’ extensive multipurpose projects in Oklahoma.

Federal hydropower projects reached their peak with the construction of the large dams of the 1950s

⁹² Quoted in Ibid.

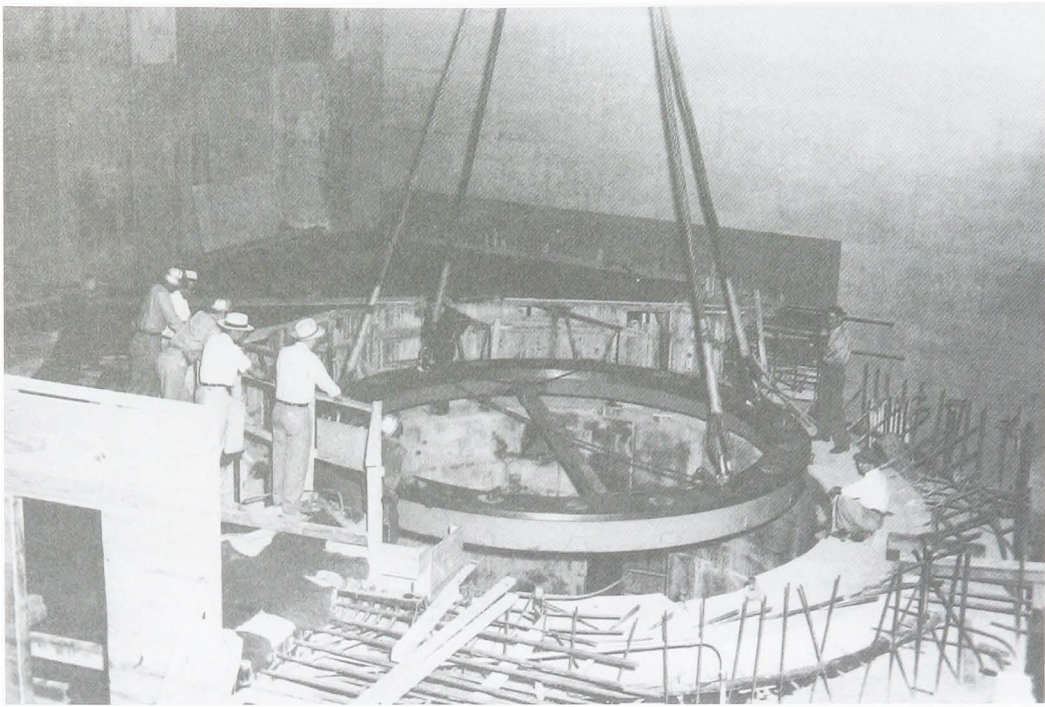
⁹³ Anon, “Mingo Creek Local Protection Project Highlights,” memo generated by the Tulsa District Public Affairs Office. Undated.

⁹⁴ *Pertinent Data: Civil Works Projects*, pp. 5, 59, 92.

⁹⁵ Southwestern Power Administration, “Hydropower for the Southwest,” undated; *Pertinent Data: Civil Works Projects*, pp. 115-116; TD News Release 2 Nov. 1971.

⁹⁶ Ibid., pp. 20, 138; TD News Release 10 Dec. 1973.

⁹⁷ Ibid., pp. 20, 40, 48, 76, 82, 116, 127, 138.



Tenkiller Ferry Dam was among the first Oklahoma dams to include hydroelectric power generating capability. Here workers oversee installation of a turbine at the dam.

through the early 1970s. The potential still existed, however, to incorporate power plants at thousands of existing dams across the nation and, in so doing, increase hydroelectric output dramatically. With the energy crisis and environmental movement of the early and mid-1970s, developing hydropower at existing projects took on new interest. Congress funded a National Hydroelectric Power Resources Study in 1977 directed by the Corps' Institute for Water Resources. The 1979 report noted both the potential for greatly expanding hydropower, and the relatively minimal environmental impact of building power plants at pre-existing dams.⁹⁸

As the energy crisis eased and a privatization impetus transformed government policy beginning in the late 1970s, interest in federal hydropower development dwindled. Most planned developments fell by the wayside because of budgetary constraints and opposition to federal control of power generation and distribution. Hydroelectric power development at the Corps' Kaw Dam in the late 1980s reflected the changing times. Instead of being built by the federal government, the Oklahoma Municipal Power Authority, a local government cooperative, installed power generation there in 1989. The power is distributed to the local area

through this agency.⁹⁹ The Southwestern Power Administration, which by the early 1990s was producing 5.5 billion kilowatts of power each year, also looks to non-federal sources for expansion of its system.¹⁰⁰

Red River Basin Chloride Control Project

Two of the principal river basins of the Tulsa District have extraordinarily high levels of salt in their waters. Both the Arkansas and Red Rivers flow through land on which an ancient inland sea existed during the Permian Age (220–270 million years ago). The sea, located in the high, southern Great Plains, included the present Texas and Oklahoma panhandles and parts of eastern New Mexico and southwestern Kansas. After being isolated in the late Permian Age, the sea slowly evaporated. Rock and silt eventually covered the dry sea bed, but the salt remained beneath. Underground springs, pressured by the Rocky Mountains, flow through the salt deposits, creating brine. The brine eventually makes its way to the surface and flows into the

⁹⁸ See Graves, *Pursuing Excellence in Water Planning and Policy Analysis*, pp. 160-163 for a discussion of the national studies.

⁹⁹ Patton, *Fifty Years Remembered*, p. 182.

¹⁰⁰ "Hydropower for the Southwest."



Bateman Pumping Station at Truscott Brine Lake is part of the Tulsa District's ongoing Red River Chloride Control Project.

tributaries of the Arkansas and Red Rivers.¹⁰¹ In the Great Salt Plains of northwestern Oklahoma, for example, water percolates from the ground as supersaturated brine measuring around 200 parts per million of chlorides.¹⁰²

The high salt content in these rivers has posed significant health problems to residents of Texas, Oklahoma, Kansas, Arkansas, and Louisiana. The salinity has compromised water supplies for agricultural, municipal, and industrial uses. In 1957, U.S. Public Health Service officials began a comprehensive study of water quality in the Red River Basin. They learned that a daily average of 3,600 tons of salt was leaching into the river. Five natural salt sources in northwestern Oklahoma and southwestern Kansas also contributed to the salinity of the Arkansas River. The health service study similarly found ten sites in northwestern Texas and southwestern Oklahoma contaminating the Red River Basin.¹⁰³ In 1959, Congress approved a continuance of the study, while a Senate resolution of the same year authorized the Corps of Engineers to participate in the investigations.¹⁰⁴

The Red River salinity problem was similar to

that of the Arkansas River. In the Red River Basin at Lake Kemp on the Wichita River, the water never met Environmental Protection Agency standards for dissolved salts in municipal water supplies. At Lake Texoma, standards were met only 3 percent of the time; as far east as Shreveport, Louisiana, they were met only 88 percent of the time. To improve the quality of Red River water, Congress authorized in the Flood Control Acts of 1962, 1966, and 1970 structural measures for controlling the flow of brine from eight of ten sites near the Red River.¹⁰⁵

The first phases of the chloride control project included construction and subsequent maintenance of wells and ring dikes for data collection. In 1963, the Corps built an earthen dike nine feet high and 340 feet in diameter surrounding the salt water source at Estelline Springs, Texas. Since completion of the dike in 1964, the flow of brine from Estelline Springs has ended, and the salt contribution from the area has been reduced by 80 percent. About 60 miles west of Wichita Falls, Texas, the Corps began construction in 1976 of the Area VIII project on the South Fork of the Wichita River, designed to capture brine contributing almost 195 tons of salt each day to the Red River. The district installed a first-of-its-kind, low-flow, inflatable rubber dam that collected 84 percent of the brine and then pumped it 23 miles

¹⁰¹ U.S. Army Corps of Engineers, Tulsa District, "Red River Basin Chloride Control Project" (pamphlet), 1993.

¹⁰² Settle, "Years of Challenge," p. VIII-2.

¹⁰³ "Red River Basin Chloride Control Project."

¹⁰⁴ Settle, "Years of Challenge," p. VIII-1.

¹⁰⁵ "Red River Basin Chloride Control Project."

away into the newly constructed Truscott Brine Lake. The Tulsa District completed this phase of the project in 1987. Truscott Brine Lake has no outlet works; natural evaporation keeps the lake level constant.¹⁰⁶

The Water Resources Development Act of 1986 expanded the Corps' efforts to reduce chloride in the water of the Red River Basin. The act authorized the Red and Arkansas River Basins as separate projects.¹⁰⁷ This was significant since support for salt abatement on the Arkansas had never been as strong as for the Red River project. The legislation also exempted the Red River chloride project from cost-sharing provisions, pending an independent evaluation of the effectiveness of Truscott Brine Lake system. A five-member team, chaired by engineering professor Jack Keller of Utah State University, declared in 1988 that the system was even more effective than Corps' estimates. As chair of the panel, Keller wrote "We . . . recommend that authorization be given to continue with the construction of the Red River Chloride Control Project."¹⁰⁸

Construction includes one deep-well injection system, two additional brine storage reservoirs, three additional low-flow dams, two well collection facilities, six pumping plants, and 56.3 miles of pipeline.¹⁰⁹ Each completed phase of the \$192.6 million project meant that water flowing into the Red River improved, significantly augmenting quality of the water supplies of municipalities in Texas, Oklahoma, and Louisiana.

Conclusion

During the 1970s, 1980s, and 1990s, the Corps of Engineers underwent sweeping changes in its civil works program. This affected all aspects of the traditional program of water resources development for navigation and flood control, and augmented new activities such as recreation,

emergency management, and regulation. The changes had a significant impact on planning and construction as is reflected in the projects discussed in the previous chapter. Other concerns included fiscal and environmental constraints, public involvement, the nation's growth, and developing technologies. All Corps field offices felt great pressure to provide traditional services, make adjustments, and add programs with tight budgets and frequent hiring freezes. These statements held true for the Tulsa District, which struggled to meet the new challenges.

¹⁰⁶ Ibid.; *Annual Report of the Secretary of the Army on Civil Works Activities, 1993*, p. 29-22.

¹⁰⁷ *Annual Report of the Secretary of the Army on Civil Works Activities, 1991*, p. 29-3.

¹⁰⁸ Quoted in Patton, *Fifty Years Remembered*, p. 195; Hilmes interview.

¹⁰⁹ *Annual Report of the Secretary of the Army on Civil Works Activities, 1993*, pp. 29-3-29-4.

Chapter Four

Diverse Missions

Recreation

The Tulsa District's recreation program expanded dramatically from the 1970s to the 1990s. Presently, the Corps of Engineers is the second largest recreation provider in the federal government. During the 1990s, the Corps operated 650 campgrounds in 43 states, second only to the number operated by the U.S. Forest Service.¹ The agency is also the nation's largest provider of water-based recreational facilities. Corps involvement with recreation began in 1944 when Congress enacted legislation authorizing the Chief of Engineers to construct, maintain, and operate public park and recreational facilities in reservoir areas. The new laws also gave the agency power to issue permits for construction of facilities. Private investors funded most of the early projects but public interest was so great that water resource promoters added recreation to the benefit-to-cost ratio for Corps construction projects. In 1959, the Corps directed that recreational benefits must be considered as a basic project purpose but could not exceed 15 percent of the overall cost.² During the 1960s and 1970s, the Corps built a solid recreation infrastructure throughout the United States. At the same time, however, federal budget deficits rose, and the Reagan administration in the early 1980s sought ways to reduce the federal presence in activities such as recreation management. The George H. W. Bush administration continued the effort to reduce the \$160 million the Corps spent annually on recreation. Both administrations questioned whether the Corps should be in the recreation management business at all.³

Recreational use of Corps water projects is a significant component of the civil works mission. This was especially true in the Tulsa District where thousands of people use Corps lakes for boating,

water-skiing, fishing, diving, and swimming. Tulsa's many lakes and parks make recreation an important and sometimes vexing challenge. Since the early 1980s, the Southwest experienced the greatest percentage increase nationwide in use of Corps recreational facilities. In 1981, the Southwestern Division had 32 percent of the Corps' total recreational use. By 1995, that number had increased to 40 percent.⁴ Up until the early 1980s, Tulsa District was the largest recreation provider in the Corps with 23 lakes and recreation areas. In the first nine months of 1975, 41.3 million people visited Tulsa District lakes and recreational facilities.⁵ Tulsa's preeminence ended when four projects in Arkansas—Gillham, DeQueen, Dierks, and Millwood—were given to the Little Rock District. As a result, Fort Worth District, which took over the lakes in east Texas from the New Orleans District, replaced Tulsa as the district with the highest visitation in the Corps.

Heavy recreational use of facilities within the Tulsa District presented many safety challenges.⁶ Tulsa District's numerous lakes made drowning a persistent threat. Indeed, between 1945 and 1984, drowning deaths at Tulsa District lakes totaled 950.⁷ Drowning at Tulsa District lakes declined after 1975 in part because of the active water safety program that included training park rangers and maintenance staff to watch out for unsafe activities.⁸ Despite the decline in accidents, there was no way to eliminate all injuries at lakes within the district. By mid-October 1984, personal injury claims pending against the Tulsa District totaled \$21,682,000 and over \$200 million in the Southwestern Division. In 1986, the Corps initiated an agency-wide program to promote water safety at its facilities. Together

⁴ "Recreational Use Table," Southwestern Division, 27 February 1996, SWD historical files.

⁵ "41.3 Million Visit Corps Lakes in First 9 Months," TD News Release, 24 Oct. 1975.

⁶ "Recreational Use Table," SWD, 27 Feb. 1996, SWD historical files.

⁷ Settle, "Years of Challenge," p. X-16.

⁸ Tulsa District water safety measures and statistics appear on the web at <http://www.swt.usace.army.mil/watersaf/stats.htm>

¹ Herbert C. Burkholz, "Camping with the Corps," *Trailer Life* (August 1992), p. 85.

² Settle, "Years of Challenge," p. X-1.

³ *Lincoln* (Nebraska) *Star* (Dec. 1, 1990); USACE News Release 89-19 (16 Nov. 1989).



Some of the recreation activities at Corps lakes throughout the Tulsa district are shown here, including jet skiing and sail boating (photos courtesy Tulsa World).



with the Centers for Disease Control, the Corps reviewed information about drowning and water safety programs and promoted a program called "Your Safety, Our Concern." Radio and television broadcasts, educational posters, and information and advisory posters at each Corps recreational facility supported the program.⁹

Rapid growth of Tulsa District's recreational facilities exceeded the recreation portion of the agency's operation and maintenance budget, prompting introduction of user fees in 1972. Elected officials quickly criticized the Corps fee system. James R. Jones, Clem Rogers McSpadden, and Tom Steed, congressional representatives from the state's First, Second, and Fourth Districts, brought suit in the U.S. District Court in Tulsa to block collection. Judge Allen E. Barrow restrained the Corps for 20 days but then ruled that the Tulsa District was fulfilling an act of Congress and dismissed the case. In August 1973, Congress enacted Public Law 93-81, reaffirming its intent that fees be collected at well-developed Corps facilities. In response, the district announced that fee collection would be imposed at 86 of their 275 campsites.¹⁰

In 1973, the new Corps fee system was used to finance rangers at the district facilities. After special training, district rangers could issue citations to violators of federal lake rules. Their main objective was to prevent vandalism and littering. In addition, the district introduced a "Ma and Pa" gate attendant system whereby retired couples with their own self-contained camping units could contract to collect camping fees, assign camp sites, close the gate at night, and answer questions from the public.¹¹ Beginning in 1978, during heavy use periods, the district contracted with local law enforcement officials to patrol specific public use areas from 6:00 p.m. to 6:00 a.m.. After establishing contracts with 21 county sheriffs and four local police departments, use of outside law enforcement became an integral part of the district's recreation program.¹²

In addition to reservoirs, the Tulsa District administers over 500,000 acres of land. Most of the land is leased to private parties for grazing and also to the Kansas Forestry Commission,

Kansas Fish and Game Commission, Oklahoma Department of Wildlife Conservation, U.S. Fish and Wildlife Service, and the state of Texas. Many leases require the land to be opened to hunters during the appropriate season. Approximately 75,000 acres are designated as wildlife refuges for wildlife, migratory birds, and waterfowl. In a 1978 address to the Oklahoma Wildlife Association, Brigadier General James C. Donovan, Southwestern Division Engineer, commended the Tulsa District's resource management programs for their work to improve "these lands and waters for our outdoor enthusiasts."¹³ Access to district lands is also facilitated by hiking trails, many of which were constructed with the help of volunteers.¹⁴

In 1976, the district joined the Eastern Oklahoma and Indian Nation Councils of Boy Scouts of America in dedicating the 150-mile Jean Pierre Chouteau Trail. Named for the French fur trader Major Jean Pierre Chouteau, the first 64-mile segment of the trail paralleled the McClellan-Kerr Arkansas River Navigation System from Tulsa's Port of Catoosa to the historic old Fort Gibson Stockade in Fort Gibson, Oklahoma. Hikers pass through flat, open grassland and densely wooded bottomlands where massive oak, hickory, sycamore, and pecan trees abound.¹⁵ In 1980, the Chouteau Trail was recognized as a National Recreation Trail. Other Tulsa District hiking trails in Oklahoma include Will Rogers Country Centennial Trail at Oologah, Short Mountain Hiking Trail at Robert S. Kerr Lake near Sallisaw, Eagle View Hiking Trail at Kaw Lake near Ponca City, Walker Creek Trail at Waurika Lake, and Platter-Lakeside Hiking/Equestrian Trail at Lake Texoma near Cartwright. Texas trails include the Cross Timbers Hiking Trail at Lake Texoma near Denison. In Kansas, there are the Elk River Hiking Trail at Elk City Lake and Big Hill Horse Trail at Pearson-Skubitz Big Hill Lake near Cherryvale.¹⁶

Throughout the 1980s and 1990s, recreation was a major part of the public service mission at the Tulsa District. At a time when budget cuts reduced Corps operating funds for recreational facilities,

⁹ Settle, "Years of Challenge," X-18.

¹⁰ Settle, "Years of Challenge," p. X-7.

¹¹ Settle, "Years of Challenge," p. X-9.

¹² Settle, "Years of Challenge," p. X-10.

¹³ Settle, "Years of Challenge," p. X-13.

¹⁴ Ibid.

¹⁵ Tulsa District Information Bulletin Vol. 16, No. 11 (Nov. 1976) and Settle, "Years of Challenge," p. X-14.

¹⁶ Ibid.

demand for the district's facilities increased. Maintaining quality recreational facilities under such circumstances was a great challenge to district personnel. With many facilities built and equipped in the 1950s and 1960s, Tulsa District faced an uphill battle to meet the operation and maintenance costs necessary to keep the parks open. To maintain consistent quality at their recreational facilities, the district considered closing some parks and consolidating others.¹⁷

In early 1981, the Corps convened a public meeting at Arrowhead Lodge on Lake Eufaula to discuss the district's cost-cutting measures. Four hundred people attended with the majority expressing their distaste for the plan to close parks within the district. In response to public outcry over proposed park closings, Colonel Harmon announced in January 1982 that a new consolidation plan would be used to save \$500,000 in operation and maintenance costs. Harmon argued that "it is better to operate smaller numbers of well run, safe, attractive parks than trying to keep each and every park open under poor to unacceptable standards."¹⁸ To meet the district's savings goal, six percent of existing parks would be classified as access points only or closed. In Oklahoma, 14 parks would become access points, six partially closed, and 18 small parks closed. Kansas would have one park closed, two partially closed, and three converted to access points. Texas would lose one park to closure while three became access points. The district would also use the savings to consolidate camping and picnic facilities at larger, more heavily used parks. Closings and consolidations did little to affect the Tulsa District's overall recreation mission. In 1983, the district oversaw 10,389 campsites, 3,360 picnic sites, 99 beaches, 595 boat ramps, and 64 use areas leased to concessionaires with marinas at 57 of the 64. One country, eight municipal, and 39 state parks were also located at Corps lakes.¹⁹

Despite the cutbacks of the 1980s, the increasing disparity between operational costs and revenues prompted the entire Corps to reassess its role as a recreation provider.²⁰ In 1989, the Bush administration proposed a drastic reduction in the

Corps recreation management budget for fiscal year 1990. The budget did not include funds for 25 percent of the recreation areas maintained by the Corps. Based on the proposed reduction, the Corps announced that it would be forced to close 654 recreation areas in 41 states.²¹ In Oklahoma, Senators Don Nickles and David Boren along with Congressman Mike Synar demanded that the Corps withdraw a plan to close 26 sites. In a letter to Synar, Assistant Secretary of the Army Robert W. Page noted that the Corps of Engineers operations and maintenance (O&M) budget for Fiscal Year 1990 "is \$1,283 million, \$88 million less than the Fiscal Year 1989 appropriation." According to Page, "the primary impact of that reduction is the elimination of dredging of low-use (25,000 tons or less) commercial and recreational harbors and a reduction in O&M expenditures of recreation facilities."²² Members of Congress from states with extensive Corps recreation sites successfully persuaded their fellow legislators to restore most of the cuts.²³

The 1990 annual budget for operation of Corps recreational facilities totaled \$160 million. Because the Corps did not charge admission at most of its facilities for day-use activities such as hiking, boating, fishing, bicycling, or bird watching, revenues were less than they might have been. Total recreational revenue in 1989 was \$16 million, all of which came from camping fees.

In 1990, the Corps initiated a National Recreation Study to find ways to "maintain and enhance the quality of recreational opportunities at our reservoirs and cut the Federal cost."²⁴ The study, conducted by the Corps' Institute for Water Resources, explored various methods of improved management at lower federal cost.²⁵ One alternative explored in the study was privatization, a plan the Corps attempted to implement in some areas.²⁶ The Southwestern Division, with 98 lakes

²¹ *Tulsa (Oklahoma) World* (13 Jan. 1989).

²² Assistant Secretary of the Army Robert W. Page to Congressman Mike Synar, 25 Jan. 1989, copy in TD historical files.

²³ Gregory Graves interview with Darrell Lewis, 25 Nov. 1996 (telephone). Hereafter cited as Graves interview with Lewis.

²⁴ *Arkansas Democrat Gazette* (6 July 1993).

²⁵ See Graves, *Pursuing Excellence in Water Planning and Policy Analysis*, pp. 296-297, for more details on the National Recreation Study.

²⁶ "Southwestern Division Command Briefing," December 1993.

¹⁷ Settle, "Years of Challenge," p. X-19.

¹⁸ Settle, "Years of Challenge," p. X-20.

¹⁹ *Ibid.*

²⁰ *Dallas Times-Herald* (4 April 1990).

in its area of operation and 180 parks in Arkansas alone, became one of the test divisions. In 1993, the Corps transferred the Arkansas Highway 27 Recreation Area in Montgomery County to a private operator and shortly thereafter leased two additional sites, Howard Cove on Norfork Lake in Baxter County and a facility on Lake DeGray, to private operators.²⁷

The experiment had several ramifications. Many visitors were skeptical about privatization, fearing that it would force them to pay higher fees at the campgrounds, launching ramps, and entrance gates in these now for-profit parks. The Corps attempted to lessen their fears by requiring that all private operators acquire Corps approval of prices charged for gasoline, food, and meals at restaurants. The Corps would also regulate fees and vendor prices.²⁸ Despite the Corps' efforts, however, elderly visitors to the privatized Arkansas Highway 27 Recreation Area had to pay twice as much because their 50 percent discount at government-operated parks no longer applied. After four years of experimentation, evidence of the effectiveness of privatization remained inconclusive.

Another management alternative proposed in the National Recreation Study was to invite state governments to become involved in managing Corps recreational facilities. Of the five states approached to participate, only Kansas volunteered. Under the agreement, the state would receive a lump-sum payment of \$35 million from the Corps in a trust that user fees would augment. Interest from the trust fund would provide money for maintenance of the facilities. The Corps would retain ownership of the land and lease it to the state on a long-term basis. Nonparticipation in the pilot program did not preclude other states from assuming control of select Corps parks. In Arkansas, for example, Murray Park in Little Rock and DeGray Park near Arkadelphia were turned over to the state.²⁹

In August 1989, after considerable protest from representatives from states afflicted by the proposed cuts, Secretary Page requested that Chief of Engineers Hatch form a task force to conduct a national evaluation of the recreation program. The job of the task force was "to maintain and enhance

public recreational opportunities at Corps projects while reducing federal costs for development and operation of recreational facilities."³⁰ Assembled in late 1989, the Recreation Task Force, chaired by Major General R. S. Kem, Deputy Chief of Engineers, was composed of senior headquarters personnel, who began work on a one-year study. Task force members were from the civil works directorate, the Institute for Water Resources, the Waterways Experiment Station, and several field offices. During the course of the study, the task force conducted six public workshops nationwide in an attempt to understand people's perceptions of federal management of Corps recreation facilities.³¹ Brenda Randolph and Lanny Pricer of the Tulsa District's Real Estate Division served on two of the task force information collection panels. According to Pricer, Tulsa District had "the largest 'actively managed' civil works division in the Corps" with 1.1 million acres of recreation land.³²

In September 1990, the study was complete. It included a history of federal recreation management and pertinent legislation. The findings showed widespread support for the Corps to continue recreation management and to protect the natural environment as much as possible. On the basis of public workshops and surveys, the study argued that recreation consumers appeared willing to pay higher fees if the revenues were returned to the areas where they were collected. The task force also found that the public generally favored potential private sector management of Corps sites. However, the public opposed any exclusive use of those sites by private individuals. While the potential existed for non-federal and private participation in management, few states or individuals had demonstrated interest.³³

The task force explored dozens of options for more efficient, economical, and flexible management of Corps' recreation sites. To increase revenue beyond a simple increase in fees, the task force recommended expanded use of volunteers

³⁰ USACE News Release 89-19 (16 Nov. 1989).

³¹ Graves, *Pursuing Excellence in Water Planning and Policy Analysis*, pp. 296-297; USACE News Release 90-32 (18 Dec. 1990).

³² Anon, "Two Tulsans on National Recreation Study," *Tulsa District Record* 12 (Jan. 1990), p. 6.

³³ Headquarters, U.S. Army Corps of Engineers, U.S. Army Corps of Engineers Recreation Study: A Plan Prepared for the Assistant Secretary of the Army (Civil Works) Vol. I, Main Report (Sept. 1990), pp. 1-15.

²⁷ *Arkansas Democrat Gazette* (6 July 1993).

²⁸ *Ibid.*

²⁹ *Ibid.*

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and cooperative associations to share management costs. The study called for increased non-federal participation and investment in Corps' recreation sites.³⁴ Task force members urged the Corps to take a more businesslike approach to recreation management, and during 1991 and 1992, the Corps experimented with new management techniques, particularly in the Southwestern Division which had the highest annual recreation visitor hours. For example, the agency established a pilot program for private management in Kansas.³⁵ Still, with fewer funds, a strategy for effective recreation management remained elusive. Although it was clear that the public wanted Corps management to continue, the public also clamored for reducing the size of the federal government. Visitors to Corps recreation sites appreciated the low-, or often, no-cost recreational amenities, but often failed to equate the federal government and taxes with recreation opportunities.

Despite the controversy over management of Corps recreation sites, attendance remained high. In 1988, Bill Kitchen, a professor of park administration from Texas Tech University, spent the summer at Greer's Ferry Lake in Arkansas evaluating the Corps' recreation program. In statements to the news media, he cited the high quality of the Corps parks and praised the Corps rangers as more customer-oriented than National Park Service (NPS) rangers. The high quality of the Corps rangers resulted in part from a rigorous training program conducted by personnel of Southwestern Division headquarters.³⁶ Because Corps parks record more visitor hours than NPS parks, Kitchen concluded that the Corps "needs more public recognition of its role." Public use of Corps facilities confirmed Kitchen's assessment when in 1990, the agency recorded more than 2.3 billion visitor hours at its 460 lakes and reservoirs and served an estimated 500 million people.

During the 1970s, 1980s, and 1990s, the Corps of Engineers solidified and further defined its role in mobilization for national emergencies and natural disasters. These years saw significant expansion of the organization's disaster responsibilities beyond provisions of the 1955 amended Public Law 84-99. That law stated: "during flood and other emergencies related to civil works activities, the full capabilities of the Corps of Engineers will be utilized for the common good in accordance with basic policies of the Corps of Engineers."³⁷ The Corps responded with preparedness programs and personnel training, not only for natural disasters, but for any national emergency. In addition to preparation for natural disasters, the Corps developed programs to support the armed forces in the event of national emergency. As a well-trained organization of engineers, the agency provided rapid emergency mobilization.³⁸

The singularly most important step in expansion of the Corps' emergency management functions was Executive Order 12127 in 1979, which created the Federal Emergency Management Agency (FEMA). FEMA replaced the Federal Disaster Assistance Administration and other government organizations that responded to national emergencies and natural disasters. Like several other federal organizations, FEMA divided the country into regions. The Corps' Tulsa District responds through either Region 6 headquartered in Denton, Texas, serving Oklahoma, Texas, Louisiana, Arkansas, and New Mexico, or Region 7 in Kansas City serving Kansas, Missouri, Nebraska, and Iowa. Once the president has declared an emergency or designated a disaster area, either of these regional offices can call upon the Southwestern Division of the Corps of Engineers for assistance. The Southwestern Division commander, in turn, can call upon members of the Tulsa District trained in various emergency and disaster techniques. The district's Emergency Operations Management officer maintains a roster to choose personnel best trained to perform the needed tasks.³⁹

³⁴ USACE News Release 90-32 (Dec. 18, 1990).

³⁵ Headquarters, U.S. Army Corps of Engineers, U.S. Army Corps of Engineers Recreation Study: A Plan Prepared for the Assistant Secretary of the Army (Civil Works) Vol. I, Main Report (Sept. 1990), pp. 1-15

³⁶ Interview, Gregory Graves and Peter Neushul with Linda Noland, Southwestern Division, Dallas, TX, 12 Oct. 1994.

³⁷ Settle, "Years of Challenge," pp. XI-5.

³⁸ Ibid., pp. XI-1-XI-5.

³⁹ Ibid., pp. XI-7-XI-8.



Tulsa District emergency personnel frequently responded to damage caused by tornadoes.

In the event of a large natural disaster or emergency, FEMA may request help from other regions. Tulsa District personnel, like Corps employees across the nation, have assisted in numerous disaster responses since the early 1970s, including Hurricane Camille (1970), Hurricane Agnes (1972), Hurricane Frederick (1980), Hurricane Alicia (1983), Hurricane Hugo (1989), and Hurricane Andrew (1993).⁴⁰ The district also sent personnel to assist in assessing damages in the Loma Prieta Earthquake of 1989 near San Francisco and the Northridge Earthquake in Los Angeles in 1994.⁴¹ Tulsa District also supported the armed forces with their participation in the Desert Storm operations to liberate Kuwait from Iraqi occupation in the spring of 1991.

For the Tulsa District area of operations, the most significant disaster operations have involved the two meteorological phenomena that have defined the region: tornadoes and floods. The district's area

⁴⁰ Ibid., pp. Xi-8-XI-9; Tulsa District Information Bulletin Vol. XII, No. 8 (Aug. 1972); Bonnie B. Pendergrass and Lee F. Pendergrass, *In the Era of Limits: A Galveston District History Update, 1976-1986* (Galveston, TX: U.S. Army Engineer District, 1990), pp. 80-85.

⁴¹ See Moorhus and Graves, "The Limits of Vision," for a discussion of the Corps response to these disasters.

of operations overlays the most active region of the world for violent thunderstorms that often include damaging winds, torrential rains, and tornadoes. Tornadoes have struck Oklahoma, northern Texas, and southern Kansas in every month of the year, but the most volatile weather patterns occur in the springtime. Occasionally, tornadoes or high winds extensively damage entire towns and sections of cities. In such cases, the Tulsa District responds under either Public Law 84-99 authority or under the direction of FEMA. On December 2, 1975, the district responded to a rare late-autumn tornado that touched down in eastern Tulsa, causing extensive damage and injuring dozens of people. The following June 7, the district sent teams of experts to Stillwater, Oklahoma, in the wake of a twister that caused extensive damage and personal injuries at the Oklahoma State University campus. In April 1984, the district responded to tornado damages in the Oklahoma towns of Morris, Terlton, Mannford, and New Prue. Twelve people were killed in these storms. The Tulsa District sent personnel to conduct reconnaissance surveys, search and rescue operations, and emergency debris removal. District teams also installed emergency radio operations and

made video documentation of the damages. The Corps worked closely with Governor George Nigh and state civil defense directors in responding to the series of storms. In June of that year, another tornado struck Tulsa, initiating another Corps mobilization.⁴²

By far the most extensive and deadly storm of the period occurred on April 10, 1979, when a series of Category 5 tornadoes ripped through the Red River Valley between Wichita Falls, Texas, and Lawton, Oklahoma. One funnel struck Wichita Falls, heavily damaging five-and-one-half miles of the city and killing 45 people. At least 7,000 homes were damaged or destroyed, along with 79 businesses, and 8,000 vehicles. Vernon, Texas, some 60 miles west of Wichita Falls, had been struck earlier that day by the same storm cell. Twelve people were killed in this town of 12,000, while nine public buildings and 91 homes were destroyed. The tornado also killed two people in Hanold, Texas, between Vernon and Wichita Falls. At 5:15 p.m., another tornado struck Lawton, Oklahoma, killing three people, injuring 68, leaving 450 families homeless, and causing damages estimated at \$13 million.⁴³

Following a federal disaster declaration by President Jimmy Carter, FEMA directed the Corps of Engineers into action. The Tulsa District's immediate role was to assist in debris removal and provide temporary housing. On April 12, 1979, the district's Emergency Operations Center began service on a 24-hour-per-day basis. Colonel Robert Bening, Tulsa District Engineer, named Gene Dretke as the area engineer. Dretke set up an area office at Sheppard Air Force Base outside Wichita Falls. Soon 205 Corps personnel were onsite mostly from Tulsa, but also from the Fort Worth, Galveston, Little Rock, Kansas City, Pittsburgh, and St. Louis Districts. Corps personnel worked closely with other state and federal agencies, including the General Services Agency and the Department of Housing and Urban Development. The Corps wrote dozens of damage survey reports and awarded contracts for debris removal and temporary housing. In all, the disaster relief efforts placed more than 1,000 mobile homes in the area to house those in need.⁴⁴

Along with the high winds, tornadoes, and hail that accompany the region's violent storms often comes torrential rain. Whether caused by rapid deluges or days of steady rainfall, periodic flooding has been a part of the history of Oklahoma, Kansas, and Texas since the first inhabitants arrived. Severe flooding of the Arkansas River Basin in the early 1940s sparked Corps construction of many flood control dams in Kansas, Oklahoma, Arkansas, and Texas. Flooding remained a persistent problem in the Arkansas, Red, and White River Basins during the late 1970s through the mid-1990s, threatening both urban and rural developments. This was despite the fact that over the past decades, the Corps had constructed numerous systems for flood control throughout the Tulsa District area of operations. Several times during the period, record-setting floods exceeded the capacity of flood control structures. As a result, the Corps' emergency response infrastructure played a critical role in both reducing flood damage and directing flood relief efforts.

During the 1970s, the Corps responded to several floods. "The year 1973," declared the *Tulsa District Information Bulletin* in January 1974, "will long be remembered . . . as the year the rains came . . . and kept on coming . . . a busy, frustrating year for the entire district."⁴⁵ The abnormally high precipitation for 1973 kept most Corps reservoirs in flood control operation, decreasing recreational opportunities and reducing navigation activities on the waterways. During that year, the district estimated that its flood control structures prevented \$22 million in damages.⁴⁶ Heavy rainfall in November 1974 placed all the district's 23 flood control lakes in operation. The *Information Bulletin* noted that the 5.5 million acre-feet of water impounded at that time was enough to supply the city of Tulsa for 75 years. Record high levels were reached on several Oklahoma lakes.⁴⁷ In 1974, district projects prevented \$572 million in potential flood damages.⁴⁸

Five years of relative calm followed localized severe flooding in Tulsa on Memorial Day weekend of 1976. While the 1970s saw several years with

⁴² *Tulsa District Information Bulletin* Vol. XI, No. 3 (June 1984).

⁴³ Settle, "Years of Challenge," pp. XI-9-XI-12.

⁴⁴ *Ibid.*

⁴⁵ *Tulsa District Information Bulletin* Vol. XIV, No. 1 (Jan. 1974).

⁴⁶ *Ibid.*

⁴⁷ *Ibid.*, Vol. XIV, No. 12 (Dec. 1974).

⁴⁸ *Ibid.*, Vol. XV, No. 3 (March 1975).

high precipitation, new records were set in the 1980s. Significant floods occurred in Oklahoma in September 1980, October 1981, January and May 1982, October 1983, and May 1984 when another Memorial Day weekend storm dropped 15 inches of rain on Tulsa in six hours, killing 14 people and causing \$180 million in damages.⁴⁹ Heavy winter rains brought the Caney River in northeastern Oklahoma to flood stage in February 1985. The river reached 3.2 feet above flood stage, but would have reached seven feet if not for Hulah and Copan Lakes, which prevented an estimated \$4.5 million in damage.⁵⁰

These storms, however, paled in comparison to the Great Flood of 1986. During the early autumn of 1986, heavy rains began falling over north central Oklahoma and south central Kansas. During one week of steady deluge in late September and early October, the area received almost one-half its normal annual rainfall.⁵¹ This was only the beginning, however. Continual rains made this a flood of record along many tributaries of the Arkansas River.

Prior to the flood, the Southwestern Division, working with the Tulsa and Little Rock Districts, developed a comprehensive flood release plan for the Arkansas River and its tributaries. The Corps developed the plan at the request of Congressman Wes Watkins of Oklahoma and Senator David Pryor of Arkansas, both of whom wanted to minimize flood damages and navigation downtime in their states. Completed in June 1986, the plan initiated controlled releases from 11 Oklahoma reservoirs during heavy rains that would prevent flooding in both upstream and downstream reaches.⁵² It also called for the reduction of flood storage levels in the reservoirs so that, during heavy rains, releases would not be large or concurrent with the storms.⁵³

During the summer of 1986, the Corps implemented the new controlled release plan and reduced the flood storage levels of reservoirs in

the Arkansas River system. Even at these reduced levels, however, the flood control system in place was not sufficient for the storms that struck the Arkansas River Basin in September and October. On September 26, each of the Corps reservoirs in eastern Oklahoma, including Keystone Lake, had empty flood control pools. The dry summer had resulted in three percent additional flood control capacity. Some reservoirs had even dropped below the tops of the conservation pools. As September concluded, unusual weather patterns produced flooding in several uncontrolled areas of the basin. In response, the Corps released no water from its upstream reservoirs. Southeastern Kansas sustained more than \$60 million in damages to towns and cropland in uncontrolled drainages as the rains continued through the end of September.⁵⁴ Bird Creek crested at 12 feet above flood stage near Skiatook, Oklahoma, on September 30.⁵⁵ Keystone Lake rose steadily to the top of its flood control pool, while flooding in uncontrolled areas caused damage in Bixby, Oklahoma, and at Van Buren, Arkansas, just east of the Oklahoma border. Uncontrolled runoff also resulted in flooding on the Caney River near Bartlesville, Oklahoma, and along the Grand and Illinois Rivers.⁵⁶

Heavy rains continued into early October. Forecasts warned that Tenkiller Lake in eastern Oklahoma would soon reach storage capacity if there were no releases. Rain continued, and the remnants of Hurricane Paine drifted northward into Oklahoma. Paine threatened to bring heavy thunderstorms to Oklahoma. On October 2, Keystone Lake was at risk of overtopping following a seven-inch deluge upstream. With most of the dams above Keystone already at capacity and requiring immediate releases, the Corps began releasing water from the huge dam above Tulsa. At one point the Keystone releases reached 300,000 cubic feet per second (cfs). By October 4, the Arkansas River had reached flood stage near Muskogee, Oklahoma. Two days later, flooding was widespread throughout the drainage basin of the Arkansas River.⁵⁷ The river crested at 34.47 feet in Van Buren, Arkansas, on October 8; flood stage is 22 feet. Oologah Lake stood at 664.56 feet, more

⁴⁹ *The Sunday Oklahoman* (31 Dec. 1989).

⁵⁰ TD News Release (5 Mar. 1985).

⁵¹ "Flood of September-October 1986," Paper presented by Col. Frank M. Patete, Tulsa District Commander, Tulsa, Oklahoma, 13 Oct. 1986.

⁵² *Tulsa World* (31 Jan. 1986).

⁵³ Maj. Gen. J.B. Hilmes to Rep. Wes Watkins, 17 June 1986, subj: Regulating Plan for Arkansas River Basin, SWD historical files; Southwestern Division, "1986 Arkansas River Water Control System Operation Plan," 17 June 1986, SWD historical files.

⁵⁴ *Wichita (Kansas) Eagle & Beacon* (8 Oct. 1986).

⁵⁵ *Skiaook (Oklahoma) Journal* (8 Oct. 1986).

⁵⁶ "Flood of September-October 1986."

⁵⁷ *Ibid.*; *Ponca City (Oklahoma) News* (9 Oct. 1986).



Waters rise nearly to the top of Keystone Dam during the flood of 1986. Below a local artist depicts the Corps holding back floodwater threatening the City of Tulsa.



than three feet above the top of the flood control pool on October 8, forcing the first opening of the dam's floodgates.⁵⁸ Ross Copley, the district's reservoir control chief, said that water was coming into Oologah at 60,000 cfs, and the Corps would need to increase releases from 25,000 cfs to 45,000. The increased releases raised the level of the Verdigris River to 45 feet—all of which poured into the Arkansas River above Muskogee.⁵⁹

As the rains began to subside, the Corps deviated from its normal policy of waiting until downstream flooding was over. Because of the widespread flooding upstream, the agency continued releases from Keystone and the Robert S. Kerr Lock and

Dam. By October 13, the Corps restored area lakes to levels that could handle moderate rain without additional flood damages.⁶⁰ The massive flooding also brought navigation to a complete halt.⁶¹

Flooding throughout the area was extensive. Fifty-five of Oklahoma's 77 counties reported flood damage. Significant damage occurred in Sand Springs (below Keystone) and other cities along the Arkansas River. Damage was also severe in the Verdigris River Basin at Bartlesville, Dewey, Nowata, and Skiatook. The Corps drew intense criticism from flood victims for its decisions regarding the releases. Bartlesville Mayor Arch Robbins demanded an investigation into the Corps of Engineers decisions

⁵⁸ *Collinsville (Oklahoma) Herald* (15 Oct. 1986).

⁵⁹ *The Daily Oklahoman* (9 Oct. 1986).

⁶⁰ *Ibid.*

⁶¹ *The Sunday Oklahoman* (12 Oct. 1986).

on water releases. Soon U.S. Senator Don Nickles, Congressmen Mickey Edwards, and Congressman Mike Synar also sought explanations. Preliminary criticisms surrounded the Corps' decision to hold back releases until it was too late to stop flooding. Preliminary defense of the Corps came from Jack Bowman of the Tulsa area National Weather Service, who said: "The Corps did exactly what it should have done." Bowman called the record rains a "holy cow situation."⁶²

The Corps of Engineers defended its actions with statistics. Using information gathered at the division level to help support his statements, Tulsa District Engineer Colonel Frank M. Patete issued a detailed account of the agency's decisions during the storm at an October 13 public meeting in Bartlesville organized by Senator Nickles.⁶³ Patete maintained that almost one-half of the area's annual normal precipitation had fallen in just a few days, calling the storm a 100-year event. Hurricane-induced rains had caused an eight-inch deluge in a matter of hours. In Patete's estimation, the Corps' releases reduced flooding levels by more than 5 feet at Bartlesville and Tulsa, and more than 14 feet at Muskogee. In several instances, the Tulsa District had obtained approval from Southwestern Division to let reservoir levels rise higher than the safety zones to reduce sudden releases. Patete credited the coordinated efforts of the Corps and its flood control works for saving many lives and millions of dollars in property damage.⁶⁴ Major General Jerome Hilmes, Southwestern Division Engineer, attempted to calm those who had lost property in the flood by stating, "I understand you're all mad at the Corps of Engineers. I got that loud and clear. Please understand that this event was more than the system can handle." Hilmes went on to defend the decisions of the Corps, while acknowledging a need for reviewing policies.⁶⁵

The Corps' emergency response reduced the human costs of the flood. Three days before the official emergency began on October 1, the Corps had received Public Law 84-99 authority to begin around-the-clock emergency operations in eastern Oklahoma. PL 84-99 allowed the Corps to mobilize

through FEMA in advance of actual disaster relief funding. The warnings and relief efforts aided flood victims while extensive sandbagging operations reduced property and human losses.⁶⁶ Relief efforts grew after the floods subsided. By the end of October, 3,307 people had applied for federal flood relief through the FEMA disaster centers throughout eastern Oklahoma.⁶⁷

In January 1987, a General Accounting Office (GAO) preliminary investigation of the flood that caused more than \$300 million in damage found that the Corps of Engineers had "acted reasonably." GAO officials cited two river gauges that malfunctioned as possible contributors to erroneous data collection, but also pointed to the fact that 11 lakes were in full flood control operation during the crisis. After a briefing by GAO, Congressman Synar announced: "It appears to me that the decisions made by the Corps in the operation of the reservoirs during the intense rains and floods . . . were justified, based upon the information available at the time."⁶⁸ Synar also pointed to the fact that the Keystone releases prevented the dam from overtopping, potentially causing dam failure and massive flooding downstream. The final GAO report requested by Synar appeared in July 1987. The report stated that the Corps followed the proper procedures during the flood, which was to hold back releases if downstream flooding was occurring. The study faulted the Corps' forecasting data that underestimated flow into Keystone by 53 percent. However, the report credited the Corps with abandoning its figures and closely estimating anticipated flow into Keystone by using information from the River Forecast Center. The GAO stipulated that the erroneous figures had no impact on the flooding that took place afterward. Ultimately the report called for better communication and data collection to predict floods.⁶⁹

The Oklahoma flood of 1986 revealed the complexity of the Corps' tasks in flood prevention. It demonstrated that flooding in uncontrolled areas is inevitably tied to the entire flood control

⁶² *Ponca City (Oklahoma) News* (9 Oct. 1986).

⁶³ "Flood of September-October 1986"; *Tulsa Tribune* (14 Oct. 1986).

⁶⁴ *Ibid.*

⁶⁵ *Tulsa Tribune* (14 Oct. 1986).

⁶⁶ *Ibid.*; Interview, Lynn Alperin with Alfred P. Hutchinson, SWD, Dallas, Texas, 24 Nov. 1993; "Remarks for BG Robert C. Lee, Commanders Update Briefing," 6 Dec. 1988.

⁶⁷ *Tulsa Tribune* (27 Oct. 1986).

⁶⁸ *Tulsa Tribune* (15 Jan. 1987).

⁶⁹ *Tulsa World* (21 July 1987); *The Daily Oklahoman* (21 July 1987); *Tulsa Tribune* (20 July 1987); *Sand Springs (Oklahoma) Leader* (22 July 1987).



*Flooding was widespread throughout Oklahoma during the great flood of 1986.
Here floodwaters inundate the City of Bartlesville.*

system. The 1986 flood also showed that enough precipitation in a short duration will cause flooding regardless of the system in place.

Less than one year after the flood of 1986, Oklahoma and Kansas were again ravaged by a series of floods from March through July 1987. Corps flood control dams went into operation on several instances during this time, but the storms were less severe and spread out over a longer span of time than in 1986. At no time was the Corps compelled to initiate emergency releases, and the dams held back potential flood waters as designed. Nonetheless, 859 homes in the communities of Oklahoma City, Pauls Valley, and Guthrie, and Great Bend, Kansas, experienced extensive damage. By early June, Lake Texoma replaced Eufaula as Oklahoma's largest lake, as flood waters increased its area to 132,000 acres. Eufaula, normally 105,000 acres in size, had expanded to 120,000 acres during the flood. The timing of the flooding was most detrimental to the Kansas and Oklahoma wheat harvests. Oklahoma agricultural officials estimated that the 1987 wheat harvest would be almost 15 percent below the 1986 amount because of the flood.⁷⁰

Heavy spring rains in 1990 caused extensive flooding in three of the five districts of the Southwestern Division, including Tulsa. Beginning

in April, a series of thunderstorms dropped tremendous rainfall over southeastern Oklahoma, western Arkansas, and northeastern Texas. Few believed that a record flood in the Arkansas River Basin would occur so soon after the 1986 emergency. Few also thought that northern Texas would receive widespread flooding reminiscent of what the area experienced in the summer of 1989. However, three weeks of frequent storms again caused flooding in uncontrolled areas of Texas, Oklahoma, and Arkansas, filling reservoirs throughout the region to capacity.

On Friday, April 27, the Corps Public Affairs Office in Tulsa began distributing information on high lake levels in much of the district. In coordination with Southwestern Division, project offices at Lake Texoma and Lake Eufaula announced the closings of most of the recreation areas at both facilities.⁷¹ Meanwhile, weather forecasters in north Texas correctly warned that more heavy rains would be falling in the Red River basin on April 26 and April 27. Even before this round of storms, north Texas had received more than 19 inches of precipitation for 1990, almost 10 inches more than normal.⁷² By May 3, Lake Texoma had exceeded its flood control capacity, and releases began despite downstream flooding. In Oklahoma, Sardis,

⁷⁰ *Hutchinson (Kansas) News* (25 March 1987); *The Daily Oklahoman* (2 June 1987); *Wichita Falls (Texas) Times* (31 May 1987); *Tulsa Tribune* (28 May, 3, 17 June 1987).

⁷¹ Memorandum by SWD Public Affairs Office. Synopsis of News Media Activity for the Period 27 April-4 May 1990, 4 May 1990, SWD historical files.

⁷² *Fort Worth Evening Star-Telegram* (25 April 1990).

Wister, and McGee Creek Lakes were filled to flood control capacity.⁷³

Following a brief respite, severe storms with heavy rainfall resumed in eastern Oklahoma and north central Texas. Despite significant releases, Lake Texoma flood waters overtopped a reserve spillway at Denison Dam. This was the first time water had gone over that spillway since 1957. The National Weather Service issued flood warnings for 50 counties in Texas and Oklahoma.⁷⁴ Flooding in Texas extended from Cook County, on the Oklahoma border, south to Travis County, north of Austin. Lake Eufaula in southeastern Oklahoma, which had reached its highest elevation ever on April 28, continued to rise in May. On May 3, the lake reached still another record of 599.41 feet above sea level. The dangerously high level forced the Corps to begin releases into the lower South Canadian River, which emptied into the already flooded Arkansas River Basin.⁷⁵

The releases into the Arkansas River meant that additional flooding would occur downstream. On May 3, the Little Rock District Public Affairs Office announced a major flood on the Arkansas River, with flows exceeding 400,000 cubic feet per second. Such flows forced the Corps to close two locks and dams on the McClellan-Kerr waterway.⁷⁶ The following day, the Arkansas River crested 13 feet above flood stage at Van Buren, 15 feet above at Ozark, and 4.5 feet above at Little Rock.⁷⁷

As the flooding worsened, the Corps of Engineers responded to the emergency. Using PL 84-99 funds, Corps personnel oversaw the opening of emergency operations centers (EOCs) in Texas, Oklahoma, and Arkansas. The EOCs responded to thousands of concerned callers and also distributed information on evacuations, sandbagging operations, and weather forecasts.⁷⁸

Rains continued in early May, forcing evacuations

⁷³ "News Release," Tulsa District, U.S. Army Corps of Engineers, 3 May 1990, SWD historical files.

⁷⁴ *Dallas Morning News* (3 May 1990).

⁷⁵ *Dallas Morning News* (4 May 1990).

⁷⁶ "Navigation Notice, McClellan-Kerr Arkansas River Navigation System," U.S. Army Corps of Engineers, Little Rock District, 3 May 1990, SWD historical files.

⁷⁷ "News Release," U.S. Army Corps of Engineers, Little Rock District, 4 May 1990, SWD historical files.

⁷⁸ Summary Report for Southwestern Division from Rita Atkinson, Little Rock District Public Affairs Office, 4 May 1990, SWD historical files; *Tulsa District Record* Vol. 12, No. 8 (June 1990).

in north Texas and central Arkansas. For north Texas, the 1990 flood exceeded the 1989 event, with people calling it "the worst in 80 years." The Dallas-Fort Worth Airport canceled hundreds of flights as floodwaters inundated the runways.⁷⁹

By mid-May, the rains subsided, allowing officials to assess the extensive damage in the three states. General Accounting Office investigators found that the Corps flood control works had functioned as designed and prevented \$126 million in damages in the Red and Arkansas River Basins.⁸⁰ In the wake of the floods, Senator David Pryor of Arkansas called for an investigation of the Corps' management of its reservoirs. The GAO report concluded that the "Corps generally operated the nine reservoirs in accordance with its operating procedures before, during, and after the May 1990 flooding." The study also found, however, that three releases—one at Tenkiller, one at Texoma, and one at Hugo—did not comply with standard Corps procedures and may have prolonged flooding of "rural lands predominantly in Texas and Oklahoma." Yet the report pointed out that the releases were necessary to maintain safe operation of the reservoirs.⁸¹

Based on the experiences of the floods of 1986-1991, the Corps stepped up efforts to coordinate flood control responses at the district level. When slow-moving storms sent reservoirs to their flood control capacities in eastern Oklahoma in May 1993, the Corps anticipated flooding in the Arkansas River Basin. By staggering releases from Keystone, Eufaula, and other reservoirs, and correctly predicting rainfall, the Corps was able to minimize damage, despite Keystone and Eufaula Lakes reaching flood capacity almost simultaneously.⁸² Estimates from this short but intense series of storms showed that Corps' management of its flood control works prevented almost \$2 billion in damages.⁸³

With its large system of flood control structures, the Tulsa District plays a crucial role in the economic and social well-being of Texas, Oklahoma, Arkansas, and Kansas. The district

⁷⁹ *Dallas Times Herald* (4 May 1990).

⁸⁰ General Accounting Office, Briefing Report to the Honorable David Pryor, U.S. Senate, "Water Resources: Corps' Management of 1990 Flooding in the Arkansas, Red, and White River Basins," (Aug. 1991), SWD historical files.

⁸¹ *Ibid.*

⁸² *Tulsa World* (10 May 1993); *Tulsa District Record* Vol. 15, No. 4 (June/July 1993).

⁸³ *Tulsa World* (16 May 1993).

controls the release and storage of flood water from 44 reservoirs in the Arkansas and Red River basins. By the mid-1990s the district was refining its data collection and prediction techniques in coordination with Southwestern Division, the National Weather Service, and other public and private organizations. The district developed the Water Control Data System on the World Wide Web. The system provides instantaneous and constantly updated information on all the district's flood control reservoirs, along with radar and satellite weather images, hydroelectric generation data, and warning and evacuation procedures. District personnel were continuing to expand the system in the late 1990s.⁸⁴ The flood control challenge in one of the nation's most complex river systems is great, as the years 1971-1997 proved.

Murrah

On April 19, 1995, at 9:03 in the morning, a thunderous explosion disrupted the normal hustle and bustle of downtown Oklahoma City. A massive truck bomb exploded outside the Alfred P. Murrah Federal Building, shattering the nine-story structure and ripping its entire front off. The nation was transfixed and disbelieving as emergency workers dug through the rubble to free the victims of the terrorist bombing.

The bomb blast initiated a massive rescue and recovery effort by federal, state, and local government agencies. Because it was a federal structure, Federal Emergency Management Agency was the lead agency, and many governmental organizations, including the Corps of Engineers, supported the effort. The Tulsa District sent dozens of people to Oklahoma City, while Corps personnel specially trained in such rescue efforts came from across the nation. The Corps' primary function in the rescue was public works and engineering. Among many tasks, the Corps built the scaffolding and the catwalks on which the rescue attempts were made. The Corps also installed the lighting for the around-the-clock search.⁸⁵

For almost two weeks, rescuers braved great

perils in their attempts to account for every person in the busy federal building on that fateful day. Fire units from as far as New England and California joined in the efforts. Dogs trained in rescue proved instrumental in locating survivors. Dramatic rescues sometimes involving limb amputations took place in parts of the building that could have collapsed at any second. Too often, however, the bodies of men, women, and children (a day care center was at the bomb's ground zero) were pulled from the rubble. When, after more than two weeks of desperate searching, it became obvious that no more people would be found alive, the death toll had reached 168, with more than 500 injuries.⁸⁶

The demolition of the Murrah building on May 23, 1995, gave some sense of closure to the nation, but the physical and emotional scars of the bombing remain. If anything positive came from this act of senseless terrorism against the federal government, it was the all-out effort of thousands to rescue those trapped inside and relieve the pain and suffering of those involved. FEMA coordinated an operation that overcame immense obstacles—including some powerful springtime thunderstorms and a bomb scare in the Murrah building hours after the initial blast—to ensure that anyone who might possibly be alive would be rescued. The operations carried on continuously until May 5, seventeen days after the bombing. In its engineering and public works support to FEMA, the Corps of Engineers played an integral role in the effort to cope with this tragedy.⁸⁷

Regulatory Activities

Throughout the southwestern United States, the post-World War II development boom resulted in unprecedented growth of cities, creating new water resources challenges for the U.S. Army Corps of Engineers Tulsa District. Environmental legislation passed during the late 1960s and the 1970s gave the Corps a new regulatory role by expanding the agency's ability to permit activities in navigable waters of the United States. Over the next 30 years, there were significant policy changes affecting numerous regulatory agencies, particularly

⁸⁴ See the web at <http://www.swt-wc.usace.army.mil/>.

⁸⁵ "USACE Support to FEMA: Alfred P. Murrah Federal Building Incident, Oklahoma City Oklahoma, April-May 1995," TD Executive Office files.

⁸⁶ Ibid.

⁸⁷ Ibid.



Tulsa District personnel along with other Corps emergency management teams observe the devastation caused by the bombing of the Alfred P. Murrah Federal Building in downtown Oklahoma City.

the Corps of Engineers. Inclusion of wetlands in new clean water legislation gave the Corps a part in allowing or disallowing development of some of the nation's most desirable real estate. The Corps' regulatory role was first defined in the Rivers and Harbors Act of 1899 that called for the agency to eliminate obstructions in U.S. waterways. Until the late 1960s, the Corps limited its permit program to activities affecting navigable waterways. This changed once pressure from the emerging environmental movement caused the agency to revise its regulations to consider work affecting navigation, fish and wildlife, conservation, pollution, aesthetics, ecology, and general public interest.⁸⁸

The Corps' expanded regulations immediately came under scrutiny when Colonel Robert Tabb, Jacksonville District Engineer, denied a permit to dredge and fill 11 acres of tideland property near Boca Ciega Bay in Florida. An unsuccessful lawsuit by the developer in *Zabel v. Tabb* reinforced the Corps' use of Section 10 as an effective means of controlling environmentally damaging dredge and fill operations within navigable waters.⁸⁹ *Zabel v.*

⁸⁸ "Permits for Work in Navigable Waters," *Federal Register* 33 (18 December 1968), 18671. Quoted in Jeffrey K. Stine, "Regulating Wetlands in the 1970s, U.S. Army Corps of Engineers and the Environmental Organizations," *Journal of Forest History* 27 (April 1983), 62. Stine's paper is an excellent source of information on this topic.

⁸⁹ Stine, "Regulating Wetlands," p. 63.

Tabb also contradicted the public's image of the Corps as a despoiler of the natural environment, marking a significant change in the agency's popular perception.⁹⁰

Corps use of Section 10 to regulate wetlands encouraged clean water advocates to examine Section 13, known as the Refuse Act, and called for the Corps to use its authority to regulate the discharge of refuse material into or on the banks of navigable waters or their tributaries.⁹¹ Congress proposed that the Corps assume responsibility for permitting discharge or deposit of anything into a river, stream, or body of water. The new Environmental Protection Agency (EPA), formed in 1970, would act as the determining agency. In December 1970, President Richard Nixon formally created the Corps Refuse Act Permit Program. In April 1971, the Corps implemented the new regulations. Over the next eight months the Corps received nearly 20,000 permit applications, of which 11,000 were processed and referred to the EPA. Of these, EPA approved only 21.⁹² The situation remained at an impasse until October 18, 1972, when congress amended the Federal Water Pollution Control Act (FWPCA), replacing the Refuse Act Permit Program with Section 402. Section 402 gave EPA principal authority over

⁹⁰ Ibid.

⁹¹ Ibid.

⁹² Ibid., p. 64.

permits for effluent discharges into United States waters. Veto power was granted to the Corps if the proposed activity impaired navigation.⁹³ Most importantly, under Section 404 of the amended FWPCA, the Corps would continue to regulate, on a case-by-case basis, the discharge of dredge or fill materials into “the nation’s waters.” The national Audubon Society was pleased with the Corps 404 preliminary regulations and their prospective role in protecting the nation’s wetlands. This approbation was short-lived, however, when the Corps attempted to narrow the program by restricting the final Corps 404 permit program to the traditional definition of ‘navigable waters’ used in the Rivers and Harbors Act of 1899.⁹⁴ To many veteran civilians and military officers, regulating wetlands and waters to prevent environmental degradation ran counter to the Corps’ primary civil works mission: water resources development for economic prosperity.⁹⁵

Environmental groups believed the new 404 regulations could undermine the entire Clean Water Act. Two major environmental litigation organizations—the Environmental Defense Fund and the Natural Resources Defense Council (NRDC)—spearheaded the campaign to revise the 404 regulations.⁹⁶ In 1975, the court case, *Natural Resources Defense Council v. Callaway*, changed forever the Corps’ relationship with environmental organizations.⁹⁷ The NRDC alleged that Corps regulations violated the mandate of the FWPCA wherein Congress recognized that water pollution did not respect the traditional boundaries of navigation. In particular, the statute maintained that pollution must be controlled at its source, and that the whole aquatic ecosystem must be protected and cannot be arbitrarily divided. A favorable ruling for the NRDC led to the revision and expansion of the 404 regulatory program. Shortly thereafter, in 1974, the Corps worked with the U.S. Fish and Wildlife Service to create a National Wetlands Inventory (NWI) that included all the nation’s wetlands.

⁹³ Ibid.

⁹⁴ Gregory Graves, *Pursuing Excellence*, p. 131. See also “Permits for Activities in Navigable Waters or Ocean Waters,” *Federal Register* 39 (3 April 1974), pp. 12115-12137.

⁹⁵ Graves, *Pursuing Excellence*, p. 131.

⁹⁶ Stine, “Regulating Wetlands,” pp. 60-75.

⁹⁷ *Natural Resource Defense Council, Inc. v. Callaway* 392 F. Supp 685 (D.D.C., 1975, Civil Action No. 74-1242); Complaint filed by plaintiffs, 16 Aug. 1974.

The result was a classification system that grouped ecologically similar habitats.⁹⁸ Together, the Corps and the U.S. Fish and Wildlife Service ascertained the desired degree of detail, scale of maps, and types of records that would best satisfy their needs.⁹⁹ The Corps and the EPA jointly defined wetlands as:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.¹⁰⁰

In 1977, the Tulsa District conducted 16 public workshops at locations in Missouri, Kansas, Texas, and Oklahoma to explain the Corps of Engineers new regulatory role under Section 404 of the Clean Water Act. At first, responsibility for issuing dredged and fill material permits was handled by the district’s Navigation Branch, but, beginning in 1981, this responsibility was transferred to the Regulatory Functions Section of the Recreation Resources Management Branch in the Operations Division.¹⁰¹ Tulsa District’s 404 jurisdiction covers approximately 7,735 miles of rivers while their Section 10 responsibility includes over 633 miles of navigable rivers and streams. Beginning in May 1982, the district’s Regulatory Branch complied with a national directive to streamline the permit process by following a detailed schedule for processing permit applications in 60 days.

Planning Studies

The Tulsa District conducted numerous water resources studies under several programs and authorities from the 1970s through the 1990s. The Corps of Engineers Urban Studies program began in the 1970s in response to national demands for better wastewater and storm water management in cities. Rapid urban growth following World War

⁹⁸ Rudolf Nyc, “In Search of Wetlands,” *Water Spectrum* 12 (Spring 1980), 17.

⁹⁹ Nyc, “In Search of Wetlands,” 17.

¹⁰⁰ U.S. Army Corps of Engineers, “Recognizing Wetlands,” pamphlet in PAO Files.

¹⁰¹ Settle, “Years of Challenge,” p. VII-12.

It meant that most American cities had inadequate wastewater treatment facilities that contributed to water pollution. Dating back to the Water Pollution Control Act of 1948, the federal government had comprehensively investigated pollution control programs. The Water Quality Act of 1965 directed various federal resource agencies to develop regional plans for wastewater treatment.

Although controversial, many in the Corps of Engineers believed the agency should make water quality another principal water resources mission. In response, the Civil Works Directorate of the Corps began examining new approaches to wastewater management. One plan called for agricultural areas to be sprayed with partially treated urban wastewater that would filter through the soil. This method would reduce the need for building expensive secondary and tertiary treatment plants advocated by the newly created EPA in its efforts to attain zero effluent.¹⁰² Another approach was to better coordinate wastewater management and storm water runoff programs (urban flood control). As pressure increased on the Corps to look at solutions other than structural for urban flood prevention, the agency recognized that each urban water problem could be better managed through comprehensive solutions. Early in 1970, Congress authorized the Corps to conduct a series of pilot wastewater management studies in several major cities across the nation.

These early studies were the cornerstones of the Urban Studies Program started in 1972. The new program, which had five pilot studies already designated, was a break in tradition from the agency's historic use of river basins as the basic planning units in water resources development.¹⁰³ The new direction was generally favorable to members of Congress and environmental groups who favored changes in urban planning. The Urban Studies Program addressed a wide range of water resource problems, including urban flood control; flood plain management; water supply; wastewater management; regional harbor and waterway needs; bank and channel stabilization; recreation; and protection of lakes, estuaries, and

the ocean. Environmentalists supported the Corps' goal of reducing water pollution by cleaning up urban wastewater treatment facilities. They also supported the Corps' plans to restrict construction in flood plains and provide additional land for recreational areas and greenbelts for controlling urban sprawl.¹⁰⁴

In 1972, Congress authorized the Corps of Engineers in Public Law 92-500 to begin an urban study program for comprehensive planning of water resources in urban areas. By the end of 1975, the Corps had 28 such planning studies completed or underway. The first urban study conducted by the Tulsa District was called the Central Oklahoma Urban Study. It was discontinued due to lack of local support.

In a second study known as the Central Oklahoma Project, the Tulsa District completed a detailed Plan of Study in 1974 that outlined the water resources problems in that part of the state. This survey-scope study consisted of two parts. The first objective was to determine the practicality of "trans-basin water conveyance" from Red River Basin reservoirs in southeastern Oklahoma to drier areas in the north-central part of the state. Secondly, the study investigated the feasibility of extending the McClellan-Kerr navigation system to the vicinity of Oklahoma City. Both parts of the Central Oklahoma Project were suspended by the late 1970s due to insufficient economic justification.

In 1974, at the behest of Tulsa Mayor Robert M. LaFortune and eastern Oklahoma congressional representatives, the district initiated the Tulsa Urban Study, assessing water resources problems, including urban runoff and wastewater management in the Tulsa metropolitan area. Ultimately, the study included the municipalities of Bixby, Broken Arrow, Catoosa, Collinsville, Coweta, Glenpool, Jenks, Kiefer, Mounds, Owasso, Sand Springs, Sapulpa, Skiatook, Sperry, and Tulsa.¹⁰⁵

Two other studies coincided with the Tulsa Urban Study. The Tulsa District prepared an analysis of flood insurance for the area at the request of the Federal Insurance Administration. In 1976,

¹⁰² David Alee and Burnham H. Dodge, *The Role of the U.S. Army Corps of Engineers in Water Quality Management* (IWR Report 71-1) (1972).

¹⁰³ Gregory Graves, *Pursuing Excellence*, pp. 77-79.

¹⁰⁴ Office of the Chief of Engineers, Urban Studies of the U.S. Army Corps of Engineers, Planning with American Cities to Satisfy Total Water Needs through the Year 2020, General information pamphlet, May 1974, Copy at PAO Files.

¹⁰⁵ Tulsa District, U.S. Army Corps of Engineers, *Water Resources Development in Oklahoma 1981, 1982*.

the district began conducting an investigation of wastewater management for the Indian Nations Council of Governments.¹⁰⁶

The Tulsa Urban Study focused on several issues including flood control and water supply. Some of the local protection projects constructed in the 1980s and 1990s, including Haikey and Fry Creeks, were addressed in the Plan of Study. The Plan of Study also offered extensive information on the federal government's Flood Plain Management Services—an ongoing Corps program authorized by Section 200 of the Flood Control Act of 1960. Under this program, the Corps of Engineers was authorized to provide technical services and planning guidance on floods and floodplain issues such as interpreting existing flood data, developing information on nonstructural options, and determining flood susceptibility of existing structures.¹⁰⁷

The Tulsa Urban Study was complete in February 1982. The report addressed issues ranging from flood control to wastewater treatment. Included was a history of eastern Oklahoma's water supply and the early construction of water works. The study examined an area projected to grow rapidly in the late 1900s and early 2000s. Using three projections, the population of the region would increase to as much as 965,000 by 2000 and 1.1 million by 2030. Projected water consumption would approach 284 million gallons per day by 2030. The report was a useful planning tool for the region.¹⁰⁸

Other planning studies of the period included river basins and potential navigation expansions. The Verdigris Basin Study continued into the 1980s, and included additional focus on Bird Creek. The district examined increased hydropower development at Tenkiller and Fort Gibson Dams and Webbers Falls Lock and Dam and the installation of hydropower at Chouteau, W. D. Mayo, and Newt Graham Locks and Dams. It also restudied potential expansion of Heyburn Reservoir and the extension of navigation to Wichita, Kansas. Some

planning studies, including several local protection projects, continued into the late 1990s.¹⁰⁹ Since 1974, the Corps of Engineers has provided planning assistance to states and Indian tribes through its Section 22 program. Congress authorized the Corps to provide this service in Section 22 of the Water Resources Development Act of 1974. Section 319 of the Water Resources Development Act of 1990 required that non-federal interests pay 50 percent of the cost of such studies, reflecting the cost-sharing emphasis of post-WRDA-86 funding. Under the Planning Assistance to States program, the Tulsa District conducted numerous studies during the 1970s, 1980s, and 1990s.¹¹⁰

The Evolution of Data Processing

Changing technology with regard to information management challenged the world in the late 20th century. With its vast amount of engineering, technical, and financial data, the Corps of Engineers benefited from breakthroughs in computer technology, and the organization steadily upgraded throughout the period, increasing automation. Tulsa District was one of the first field offices to implement the new technologies. By 1971, the district had an Automatic Data Processing Center (ADP) that used a large mainframe computer to process Corps business, accounting, and engineering information. The local mainframe computer by then was coordinated with similar computers at division headquarters and Corps Headquarters. Within the ADP was a Computer Program Branch that developed programming formats, standardized punch-card procedures, and kept records of all computer use; a Computer Operations Branch that ran the programs and maintained the equipment; and a Computer Systems Branch that planned and designed future data processing systems based on use, need, and new technology.

As change in computer technology accelerated in the 1970s and 1980s, all businesses and organizations were challenged to keep pace. Within the Corps of Engineers, ADP demands grew faster than

¹⁰⁶ Settle, "Years of Challenge," pp. IX-2-IX-3.

¹⁰⁷ Ibid.; see the web at <http://www.sustainable.doe.gov/pubs/harmsway/ref.shtml>

¹⁰⁸ See U.S. Army Corps of Engineers, Tulsa District, Tulsa Urban Study Summary Report (Tulsa, OK: U.S. Army Corps of Engineers, 1982); Memorandum, Lt. Gen. J.K. Bratton to Sec. of the Army, subj: Tulsa Urban Study and Fry Creeks, Oklahoma, undated 1982, Tulsa District historical files; Memorandum to BERH, Tulsa Urban Study and Fry Creeks, Oklahoma, 18 Jan. 1983, Tulsa District historical files.

¹⁰⁹ See Fact Sheets, 1981 in TD historical files.

¹¹⁰ See the web at <http://www.sustainable.doe.gov/pubs/harmsway/ref.shtml>

programming and technologies could adapt. From single mainframe processing of data, computer applications increased to include graphics, word processing, and drafting. Mainframe computers became less important in the wake of these new needs and the new technology of microcomputers. Administrative services, managed under the Office of Administrative Services (OAS), also became more automated and more closely tied to ADP. As a result, the Corps combined OAS and ADP into a new Information Management Office (IMO) in 1986. The merger took place in most Corps districts after information technology divisions developed specific guidelines. The new office consisted of: Information Integration Branch and Implementation and Information Support Services Branch. The creation of IMO was, in part, a response to changing information needs, but also was an effort to eliminate the "old Army 'stovepipe' system" that often resulted in unnecessary duplication of tasks and products.¹¹¹ Throughout the period, IMO personnel continuously installed new personal computer hardware and software in efforts to increase the district's efficiency.¹¹²

While IMO successfully managed the Corps data for years, new technologies offered still greater automation. Part of the Corps of Engineers reorganization efforts of 1992 included a management plan for both civil works and military construction projects. The chief objective of the plan was to reduce the Corps management costs. Part of the plan called for centralization of financial and accounting data processing through implementation of a Corps-wide data network—the Corps of Engineers Automation Program (CEAP) and a new Corps of Engineers Financial Management System (CEFMS). CEFMS was originally part of the Corps' Information Systems Modernization Program (ISMP) that began in 1988. CEFMS promised to provide fast and reliable Corps-wide data on contracts, schedules, project management, operations and maintenance, and many other data streams. Nonetheless, CEFMS, which was under development through the mid-1990s, was particularly hard to implement because of difficulty designing an accounting

system that conformed with both military and civil procedures.¹¹³ CEFMS overcame this hurdle by using state-of-the-art computer technology and a screen-oriented, menu-driven database designed to replace the existing Corps Management Information System (COEMIS), which had been developed and implemented within IMO during the late 1980s and early 1990s.¹¹⁴ By the end of 1997, CEFMS was on-line throughout the Corps as Resource Management Offices turned over finance and accounting functions to the Corps of Engineers Finance Center in Millington, Tennessee.¹¹⁵

Conclusion

The Tulsa District's civil works functions changed significantly during the late 1900s. To meet the challenges, the district reorganized internally and shifted employees to areas of greatest demand. By 1996, for example, the Project Management Division combined several entities including the Programs Branches for civil works, military, and environmental, and Tulsa was well on its way to being a "model district" for implementation of project management. A year later, the district combined several other branches and divisions into the Planning, Environmental, and Regulatory Division. Included in this division was the continuing authorities program, cultural resource program, water quality program, and flood plain management services.¹¹⁶

¹¹¹ Ely U. Orias, "OAS, ADP Merger into IMO in Place Sept. 14," *Newcastle* Vol. 19, No. 9 (Sept. 1986), 1.

¹¹² *Tulsa District Record* Vol. 20, No. 12 (Dec. 1997).

¹¹³ Interview with Steve Mouk by Peter Neushul and Greg Graves, 20 Oct. 1994, SWDO, Dallas, Texas.

¹¹⁴ Autumn Lowe, "CEFMS to assist in financial management of district," *The Sand Castle* Vol. 11, No. 8, (Aug. 1993), 6.

¹¹⁵ *Tulsa District Record* Vol. 20, No. 12 (Dec. 1997).

¹¹⁶ *Tulsa District Record* Vol. 20, No. 12 (Dec. 1997).

Chapter Five

Reorganization and Beyond

The Tulsa District experienced major transitions during the 1990s. The most significant upheavals concerned a general reorganization of the entire Corps of Engineers that saw several starts and stops during the decade. The second sweeping change revolved around the district's move from downtown Tulsa to new facilities in east Tulsa. By late in the decade, the Tulsa District, like most Corps of Engineers field offices, was an organization with many responsibilities, but also with great uncertainty regarding its future operations.

Reorganizing the Corps

The early 1990s were a turbulent time for Corps field offices, as many members of Congress sought to cut the size of government. One common perception was that there were too many Corps of Engineers districts and divisions. Consequently, Corps personnel faced the possibility of layoff or transfer. No district or division was immune to complete closure. Reorganization, discussed periodically in the Corps during the 1970s and 1980s, took on much broader dimensions in the 1990 Energy and Water Appropriations Act. This legislation called for the first major restructuring of the agency since 1942, when the Corps expanded to meet the requirements of the Second World War.¹

The Corps reorganization was initially part of the Base Realignment and Closure (BRAC) process, under the congressionally appointed Base Closure and Realignment Commission. As a branch of the Department of Defense, offices of the U.S. Army Corps of Engineers would be reorganized and consolidated along with other military installations. Corps efforts for restructuring began in June 1990, with assembly of a task force headed by Fred Bayley of the Lower Mississippi Valley Division. At that

time, Bayley and ten other members presented the criteria for consideration in the general reorganization in a January 1991 report. The criteria were cost, flexibility, and competence. The team prepared six organizational alternatives including realignment, regionalization, decentralization, elimination of divisions, and combinations of each.² After reviewing the report, Assistant Secretary of the Army for Civil Works Nancy Dorn added management efficiency to the list of criteria.³

While the Bayley team proceeded, the Corps established a Reorganization Study Team headed by then Director of Civil Works, Major General Arthur E. Williams. The Corps also created a Reorganization Office, and named senior civilian Donald B. Cluff as chief.⁴ The Reorganization Team developed a report that was incorporated into the (BRAC) process.⁵ However, the Corps unusual position as a civil works and military construction organization resulted in its removal from BRAC in April 1991. Members of Congress who were concerned about the local impact of reorganizing Corps offices (and who did not believe the Corps' civil works program should be in BRAC) persuaded Secretary of Defense Dick Cheney to remove the Corps of Engineers from BRAC. As Cheney explained the situation, "because of the nature of arrangements on Capitol Hill . . . their civic functions fall under the public works committees."⁶ In June 1991, however, the BRAC commission, which had recently identified 79 military installations for closure, restored the Corps to the process.⁷

Despite uncertainty regarding its inclusion in

² Ibid.

³ Ibid.

⁴ Western Resources Wrap-up, series XXIX, No. 22 (30 May 1991); Becky McElhaney, "Reorganization: Taking Care of Business Means Taking Care of People: An Interview with Reorganization Program Manager Don Cluff," *Engineer Update* (May 1991).

⁵ *The Reorganization Wrap-up* Vol. 1, No. 1 (19 Nov. 1992), 6-7.

⁶ "DOD Announces Base Closure List; Corps Deleted from BRAC Process," *Huntsville (Alabama) Bulletin* Vol. XI, No. 3 (April 1991), 1.

⁷ *Los Angeles Times* (1 June 1991).

¹ See for example, Memorandum, LTC Roger C. Higbee to LAD employees, 18 Sept. 1981, subj: Corps reorganization, LAD historical files; Headquarters, U.S. Army Corps of Engineers, U.S. Army Corps of Engineers: Reorganization Plan (Washington, D.C.: U.S. Army Corps of Engineers, 1992), I; *The Reorganization Wrap-up* Vol. 1, No. 1 (19 Nov. 1992), 7.

BRAC, the Corps sent congress the reorganization plan on May 24 1991. As submitted, the plan would create annual savings of \$112 million. Chief of Engineers Henry J. Hatch, Jr., testified it would “reflect the general downscaling of DOD,” and “respond to changes in program and workload.”⁸ On the district level, 13 of 32 civil works offices would close, and military construction would cease at eight of 15 offices. The Tulsa District was included in those scheduled to close entirely. The Southwestern Division office in Dallas, Texas, was also slated to close.

Tulsa District personnel were shocked by the announcement. Tulsa had been named a model district only a few years earlier. While the workload among districts was uneven, Tulsa had one of the largest civil works budgets in the Corps in the early 1990s. Military construction had grown steadily since its reinstitution in 1981, and the district was gaining new customers through Work for Others and non-appropriated funds. The district’s hazardous waste and environmental restoration was rapidly becoming an integral component of the workload along with civil works and military construction. To facilitate project management, the district had set the pace by combining the Engineering and Construction Divisions in 1987. This management change--controversial in the Corps at the time--soon became standard procedure in districts throughout the organization.⁹ The district was heavily involved in recreation management, reservoir flood control management, hydroelectric power, and a host of other services. Although personnel from each of the 13 districts slated to close felt similarly, Tulsa’s significant presence in the region led to particular bewilderment and animosity toward the reorganization process.

Congressional response to the 1991 reorganization plan was swift and strong with regard to closing districts. In Oklahoma, for example, Senators David Boren, a Democrat, and Don Nickles, a Republican, quickly announced their intention to fight the proposed closure of the

Tulsa District.¹⁰ Nationwide, elected officials at all levels denounced the plan to close districts and divisions in their jurisdictions. Within the Corps, Colonel F. Lee Smith, Jr., Tulsa District Engineer from July 1989 to July 1992, vigorously defended the district’s work and its importance. Placing his career on the line, Smith took it upon himself to inform people locally and in Washington, D.C., about Tulsa District’s activities.

The hostile reaction to the 1991 reorganization plan revealed much about the importance of the Corps of Engineers to local economies. In the wake of overwhelmingly negative public and official response, Congress removed Corps field operating agencies conducting civil works activities from BRAC considerations in November 1991. Congress also prohibited fiscal year 92 Energy and Water Appropriations Act funds from being used to close Corps districts or divisions. In the Defense Authorizing Act for 1992, congress, by statute, removed all Corps civil works facilities from BRAC consideration.¹¹ Such actions essentially nullified the 1991 Corps reorganization plan.¹²

In response to negative reaction from Congress to the initial report, the Corps organized a second task force headed by Ohio River Division Commander Brigadier General Al Genetti in July 1992.¹³ Working with headquarters staff, the Genetti task force discussed and refined the findings of the 1991 report and recommended an approach to reorganization based on cost-effectiveness, flexibility, competency enhancement, and managerial efficiency.¹⁴ While district offices were now off-limits for closure, divisions were not. Following the Genetti report, a field advisory committee with representatives from each division and district began reviewing potential field office closures. The committee attempted to evaluate which division headquarters to close based on factors such as cost of living, workloads, and proximity to transportation hubs.¹⁵ A special committee composed of Corps and Army leaders finalized the reorganization plan in November

⁸ Western Resources Wrap-up, series XXIX, No. 22 (30 May 1991); See also Henry J. Hatch, Jr., “Managing Change,” *The Military Engineer* No. 540 (Jan., Feb. 1991), pp. 32-33.

⁹ *Tulsa District Record* Vol. 9, No. 4 (July/Aug. 1987).

¹⁰ *Western Resources Wrap-up*, series XXIX, No. 22 (30 May 1991); Hatch, “Managing Change,” *The Military Engineer*, pp. 32-33.

¹¹ *The Reorganization Wrap-up* Vol. 1, No. 1 (19 Nov. 1992), 6-7.

¹² *Reorganization Update* Vol. 21, 10 Dec. 1991.

¹³ *Ibid.*, 1-5.

¹⁴ Reorganization Plan, I.

¹⁵ *Temple (Texas) Daily Telegram* (20 Nov. 1992).

1992. The committee projected that the cutbacks would eliminate 2,600 employees in headquarters and field offices. The reorganization would cost \$215 million to implement and result in annual savings of \$115 million by 1995.¹⁶

The 1992 reorganization plan called for nearly a 50 percent reduction in the number of stateside divisions (from 11 to 6). Remaining divisions would no longer act as technical and policy review agents. All districts would remain open and be realigned into the remaining divisions.¹⁷ The Tulsa District would become part of a new South Central Division (SCD) located in Vicksburg, Mississippi. The new SCD would replace the existing Lower Mississippi Valley Division. Under the plan, Tulsa would expand its military construction mission to include installations in the states of Kansas and Arkansas. The district was also slated to receive a new technical center in 1994 that would result in the creation of 119 new jobs.¹⁸

The Corps reorganization plan drew quick national attention. Elected officials from cities across the country reacted swiftly and negatively to news of district reductions and division closures. Galveston Mayor Barbara Crews, whose Galveston District was slated to lose more than 100 employees, estimated that the reductions would drain as much as \$8 million a year out of the local economy.¹⁹ Little Rock District was also scheduled to lose positions. In a letter to Deputy Defense Secretary Donald Atwood, Senator Dale Bumpers of Arkansas stated: "I support the goal of streamlining the Corps, but it must be done in a way that all states share the hardship." Opponents to reorganization also noted that, of the twelve people on General Genetti's reorganization task force, eight members, including Genetti, "[would] either have more employees or territory to oversee in the reorganization or else [would] not suffer any losses."²⁰

As the Corps reorganization plan received more publicity late in 1992, opposition grew. The Bush administration, which oversaw the reorganization, had not coordinated its progress with the incoming Clinton administration. Les Aspin, Clinton's

designated Secretary of Defense, announced his concern about the Corps' reorganization plan, especially in light of allegations that "political considerations may have played a role in determining which offices and units to close and which to keep open."²¹ Senator Robert Byrd of West Virginia joined Aspin in criticizing the plan, decrying the decision to cut 365 jobs from West Virginia's Huntington District. Byrd called the plan "a cheap shot at loyal employees by an administration [the Bush administration] with nothing on its mind but leaving. As far as I'm concerned," Byrd commented, "that plan is DOA--that means dead on arrival."²²

Opposition to reorganization again crossed party lines. Republican Senators John C. Danforth and Christopher S. Bond, both of Missouri, issued a formal request that Aspin shelve the entire plan. Democratic Senator David Pryor of Arkansas also urged that the plan be withdrawn. "Reorganization," he announced, "seriously affects the private citizens of my state who use the electric energy, the navigation systems, the recreational and the flood control benefits provided through their tax dollars for these civil works projects."²³ In late January, Aspin, responding to congressional pressure, informed the Corps that no plans could go forward without his approval.²⁴

While congressional opposition increased, federal employee organizations launched their own campaigns against the reorganization. Organizations such as the National Federation of Federal Employees (NFFE), the International Federation of Professional and Technical Engineers, and the American Federation of Federal Employees lobbied congress against the reorganization plan. The employee groups warned that the plan "could cost up to four times as much as officials have estimated, and drain the work force of experience."²⁵ "Reorganization," they predicted, "would leave the Corps with about 64,000 fewer years of experience, and increase the ratio of managers to employees," according to a report from the NFFE.²⁶ Meanwhile, leading Corps officials stated that the

¹⁶ *New York Times* (20 Nov. 1992).

¹⁷ USACE, Reorganization, undated 1992, Los Angeles District historical files.

¹⁸ *Tulsa District Record* Vol. 15, No. 3 (March 1993).

¹⁹ *Galveston (Texas) Daily News* (30 Jan. 1993).

²⁰ *Ibid.*

²¹ Anon, "Aspin has problems with Army Corps of Engineers reorganization plan," *Inside the Army* (11 Jan. 1993), 20.

²² *Herald Dispatch* (14 Jan. 1993), 4.

²³ *Arkansas Democrat-Gazette* (2 Feb. 1993).

²⁴ *Galveston Daily News* (30 Jan. 1993).

²⁵ Christy Harris, Corps employees balk at reorganization plan, *Federal Times* (22 Feb. 1993), 1.

²⁶ *Ibid.*

uncertainty surrounding reorganization threatened to undermine the agency's future. One high-ranking official warned "some of the organization's best engineers and scientists are leaving for jobs in the private sector."²⁷ Although criticism increased, Phase I of the reorganization was scheduled to begin on February 1, 1993. Corps headquarters had planned a ceremony to activate the new divisions and simultaneously close five divisions—including Southwestern Division. However, Les Aspin's decision in January to study the plan further prompted Chief of Engineers Lieutenant General Arthur E. Williams to postpone the ceremony. In the spring of 1993, Williams visited division offices slated to close in town hall meetings intended to boost morale. Williams acknowledged the pain that division members were experiencing, but emphasized the Corps' need to restructure. With the recent criticism of the plan, Williams also noted that the agency was again in a state of uncertainty, and stressed the need to "get on with it."²⁸

Following intense debate in Congress, President Bill Clinton decided to withdraw the reorganization plan from consideration in 1993. Clinton called for another reorganization plan in a budget-cutting bill he subsequently sent to Congress. Congress approved the legislation. The legislators, however, amended the president's request for another Corps reorganization plan, and required that any future study gain prior congressional approval.²⁹ Congress was in part reacting to Vice President Al Gore's National Performance Review (NPR), which recommended that the Department of Defense implement Phase I of the 1992 reorganization plan (closing of division offices and the realignment of districts).³⁰ In the wake of Clinton's decision, Chief of Engineers Williams concurred with Congress, stating that "a new study would be a waste of taxpayer money and hardship for Corps employees... I think it is totally unfair," Williams added, "to leave 40,000 civilians dangling for another year."³¹

²⁷ *New York Times* (28 Feb. 1993).

²⁸ Anne K. Cannon, "Williams talks about reorganization," *Pacesetter* Vol. 18, No. 4 (April 1993), 2.

²⁹ *Herald-Dispatch* (10 Nov. 1993).

³⁰ Memorandum to the Acting Secretary of the Army from G. Edward Dickey, Acting Assistant Secretary of the Army, 9 Sept. 1993, SWD Archives, PAO, Dallas, Texas; Reorganization Update #52, 7 Sept. 1993, Los Angeles District Historical files.

³¹ *Star News* (27 May 1993).

Amid the uncertainty, Tulsa District responded to the Corps' reorganization plan by forming a Reorganization Committee to review the plan, develop a proposed Tulsa District organization structure, and compile issues that might affect the district. Lieutenant Colonel Patrick McDonnell, Deputy District Engineer, chaired the committee. District employees were encouraged to bring issues, questions, and concerns to the committee's attention.³² Such planning stopped, however, when Williams withdrew his support for the reorganization plan. In one of the last Reorganization Updates (Number 54, November 3, 1993), program manager Jill M. Davis wrote, "the following three points are significant: The Corps' 1992 reorganization plan has been withdrawn... [and] a new plan is in the offing."³³ On May 18, 1994, Dr. John H. Zirschky, Acting Assistant Secretary of the Army for Civil Works, informed all division engineers that "all division headquarters will remain open."³⁴

Restructuring the Corps

By 1994, reorganization of the Corps of Engineers proved to be a goal easier planned than implemented. Elaborate designs to streamline and consolidate field offices came face to face with the political realities of the importance of Corps offices to local economies and a perceived need to keep field offices intact to operate and maintain projects. By late 1993, Dr. Zirschky had announced a new "restructuring" approach--instead of reorganization--designed to "change how we do business and not where we do business."³⁵ Restructuring would become part of the continuing National Performance Review effort. Restructuring did not preclude the personnel and budgetary goals that called for a reduction of "a total of 3,400 spaces on the civil works side and estimated 1,000 spaces in military programs" over the next five years. However, discussions and plans for closing field offices ended. In June 1994, Zirschky met with representatives of Corps

³² John Roberts, "Reorganization Update," *Tulsa District Record* (Jan. 1993), p. 5.

³³ Reorganization Update #54, 3 Nov. 1993.

³⁴ Colonel James P. King, "Dallas to remain open," *Pacesetter* Vol. 19, No. 6, (June 1994), 2.

³⁵ *Ibid.*

headquarters, divisions, districts, and laboratories to develop and discuss new strategies for restructuring the Corps. Maintaining the position that the Corps must change in light of changing civil works and military construction workloads, Zirschky called for eliminating “many layers of review.”³⁶ Part of that elimination would be through project management initiatives being implemented throughout the Corps. These initiatives, according to Zirschky, would reduce the time required for completion of projects, and eventually eliminate more than 3,500 employees principally from the civil works side of the organization.³⁷ Part of Zirschky’s urgency was due to the fact that Congress had cut the Corps staffing budget 8.5 percent for fiscal year 1994.³⁸ Another factor was Executive Order 12839 issued by President Clinton in February 1993 that called for each executive department or agency with over 100 employees to eliminate no less than 4 percent of its civilian personnel positions. As part of the program of “reinventing government,” the Corps was required to cut almost 1,100 full-time employees by the end of fiscal year 1995.³⁹

Based on the need to cut positions and the changing civil works needs, General Williams issued new directives for field offices in April 1994. The directorate of civil works at headquarters, divisions, and districts would be restructured, with a planning division, policy review and analysis division, and programs management division. Headquarters would be primarily concerned with “command and control, policy and guidance formulation, resource analysis and distribution, program analysis and management, and national and Washington-level interface.”⁴⁰ Restructuring focused on making the Corps more streamlined in all areas of civil works. The plan was to reduce the layers of review and essentially do more with fewer people.⁴¹ To accomplish the specifics of restructuring, Williams appointed task forces to restructure headquarters

(including divisions), technical review, and districts.⁴²

About one year after the “reinventing government” and the National Performance Review (NPR) began, criticism surfaced. In August 1994, the Brookings Institute released a report highly critical of the plan’s reliance on “savings rather than performance.” National Performance Review, the report argued, unfairly targeted middle-level positions in the federal government while leaving untouched political appointments made at the higher bureaucratic levels. According to Donald F. Kettl, author of the report, “employee cutbacks were made with little thought to how they might help—or hurt—agency performance.”⁴³ In its haste to cut spending, Congress mandated huge personnel cutbacks in federal agencies, but, according to the report, gave little consideration to performance—a major part of NPR. For the plan to succeed, the report argued, NPR must actually strengthen government capabilities instead of weakening them.⁴⁴

Throughout 1994 and 1995, the Corps of Engineers continued to develop restructuring initiatives. A Corps-wide Restructuring Task Force chaired by General Genetti was charged with developing strategies. The plan incorporated the “roles matrix” guidelines set forth in late 1994 under the auspices of Acting Secretary Zirschky. The roles matrix better identified the functions of the assistant secretary’s office, headquarters, divisions, and districts. It also incorporated a sweeping early retirement program and a Voluntary Separation Incentive Program to help the Corps meet its personnel reduction mandates.⁴⁵ To make Corps employees fully aware of coming cutbacks, both General Williams and Acting Assistant Secretary Zirschky traveled to field offices in mid-1995. In May, Williams addressed district employees on a theme that Tulsa was healthy in all major Corps mission areas. In June, Zirschky outlined the cutbacks and changes that would soon take place in civil works. In addition to a reduced federal

³⁶ *Nor’wester* (Aug. 1994).

³⁷ *Ibid.*

³⁸ Bernard W. Tate, “Meeting Explains HQUSACE Cuts,” *Engineer Update* Vol. 18, No. 1 (Jan. 1994).

³⁹ Memorandum from John M. Zirschky, Acting ASA-CW, subj: Corps reorganization, 15 March 1994, LAD PAO files.

⁴⁰ Memorandum for Commanders from LTG Williams, subj: Directorate of Civil Works Restructuring, 7 April 1994, Los Angeles District Historical files.

⁴¹ Bernard W. Tate, “Dr. John H. Zirschky, Acting ASA (CW), discusses future,” *Engineer Update* (June 1994), 8-9.

⁴² Memorandum for Commanders from MG Stanley G. Genega, subj: USACE Restructuring, 15 Feb. 1995, Los Angeles District historical files.

⁴³ *The Washington Post* (22 Aug. 1994).

⁴⁴ *Ibid.*

⁴⁵ *Ibid.*; “West Approves Civil Works Roles Matrix,” *Engineer Update* (Nov. 1994).



In 1993 Tulsa District moved its entire operations to the new Corps offices 8 miles east of downtown Tulsa. For the first time, Tulsa District's staff was all under a single roof.

contribution to most water resources projects, the assistant secretary stated, "the budget cuts are real... using 1992 levels, it's about a 31 percent cut ... discretionary spending has to be cut about a third."⁴⁶

As restructuring proceeded, the mandated personnel cuts took their toll on Corps field offices. Divisions were hardest hit, with full-time employees reduced to an average of about 100. Districts also felt the impact of Reductions in Force (RIFs). Tulsa District's employee workforce fell from a peak of about 1,200 employees at the beginning of the 1990s to 900 by 1997.

The District Move

In December 1991, with the Corps of Engineers in the throes of proposed reorganization, the General Services Administration began construction of a new federal building for the Tulsa District located at 1645 South 101st East Avenue in Tulsa at the northwest corner of Interstate 44 and U.S. Highway 169. The decision to move was based on several factors that were part of the district's history. Since its establishment in 1939, the district

had operated out of several locations in Tulsa. In 1968, most of the staff moved into the Federal Building (Boulder Building) in downtown Tulsa. By the 1970s, personnel were working in three locations including the Bank of Oklahoma Tower more than four blocks away from the Federal Building. In 1981, personnel working in offices on the 20th floor of that building moved to a new three-story building on 3rd Street and Houston Avenue. The General Services Administration (GSA) procured the building and leased it to the Corps.⁴⁷ This move involved relocating several divisions back to the Federal Building-- including the district library--and involved more than 200 employees. The Houston Avenue building was six blocks from the Federal Building.⁴⁸ In 1987, the district moved its Geotechnical and Reports and Military Planning Branches, and the Planning, Personnel, Real Estate, and Operations Divisions to three floors of the newly constructed Williams Towers across the street from the Federal Building. At the same time, the district relinquished the Houston Avenue building.⁴⁹ Although moving to the Williams Tower was an improvement, the

⁴⁷ TD News Release, 16 Dec. 1981.

⁴⁸ Ibid.

⁴⁹ Patton, *Fifty Years Remembered*, pp. 27-28.

⁴⁶ *Tulsa District Record* Vol. 17, No. 7 (July 1995).

district still operated under the difficulty of having its main staff in more than one location. About 60 percent of the district's employees worked in the Federal Building; 35 percent worked in the Williams Towers; and an additional 5 percent worked in two other locations.⁵⁰

As the district looked to consolidating its staff under one roof, another federal organization advanced the action. The federal courts, expanding and in need of additional downtown space, began looking toward the Tulsa District's headquarters in the mid-1980s. Although the Boulder Building had been district headquarters since 1968, it was originally Tulsa's post office and courthouse. Now the federal courts wanted the building for their use. In 1986, District Engineer Frank Tilton informed GSA of the situation and the district's desire to consolidate.⁵¹ GSA evaluated more than 70 possible sites before obtaining 13 formal solicitations. After reviewing a variety of factors—including parking availability, proximity to freeways and airports, land acquisition costs, and construction costs -- GSA determined the best location proposal to be about eight miles east of downtown at the interchange of two principal freeways: Interstate 44 (Skelly Bypass) and U.S. Highway 169 (Mingo Valley Expressway). In July 1991, the new District Commander Colonel Lee Smith confirmed that this site, controlled by the Dominion Leasing Corporation, was selected for the new district headquarters.⁵²

In November 1991, the same month that the plan to close the Tulsa District was dropped, Colonel Smith forwarded a request to Corps Headquarters for 579 new workstations. In December, Dominion Leasing broke ground for the building designed by architect Kevin Craig of Oklahoma City.⁵³ By the fall of 1992, the structure was about 45 percent complete. Design features of the five-story, 150,000-square-foot main building included a combination of pre-cast and poured-in-place concrete framing and masonry veneer. Most of the work areas were open space with extensive telecommunication and electrical connections. The

open spaces allowed easy expansion and contraction of workstations as needed in various divisions. Parking spaces surrounding the main building and auxiliary building numbered over 600. The main building also included a second floor full-service snack bar and men's and women's locker rooms.⁵⁴

As completion of the building neared, the district formed a relocation planning team with representatives from each division and office to expedite the move. Adequate planning and cooperation resulted in a smooth transition to the new headquarters.

A ribbon cutting ceremony was held on July 21 when Tulsa District Commander Colonel Otis Williams and Southwestern Division Commander Colonel Paul King dedicated the new building. A crowd of nearly 800 people witnessed the building dedication followed by an open house, tree-planting ceremony, retiree reception, and guided tours of the new building.⁵⁵ After 64 years of operation, the Tulsa District headquarters staff was finally consolidated under one roof.

Conclusion

From 1971 to 1997, the U.S. Army Corps of Engineers and the Tulsa District experienced rapid transformations in all mission and non-mission responsibilities. The period began with pivotal environmental legislation and concluded with a gradual but steady reorganization of the Corps. Eleven district engineers led the Tulsa civilian workforce through these transitions and made their mark in a variety of ways. Colonel Vernon W. Pinkey (March 1968-July 1971) presided over the hectic last construction phases and completion of the \$2.6 billion McClellan- Kerr waterway, and commanded a civil works-only district with the largest budget in the Corps.⁵⁶ Pinkey was succeeded by Colonel William E. Read (August 1971-November 1972), whose short tenure saw the first complete operation of the waterway and construction on eleven major water resources

⁵⁰ These percentages exclude resident office and project office staff. Ross Adkins, "State of the District: ACOE," (speech transcript), 20 Oct. 1992, TD historical files.

⁵¹ Col. Otis Williams, "State of the New District Home," (speech transcript) 2 Oct. 1992, TD historical files.

⁵² Ibid.; *Tulsa District Record* Vol. 13, No. 3 (June/July 1991).

⁵³ *Tulsa District Record* Vol. 14, No. 3 (April/May 1992).

⁵⁴ Williams, "State of the New District Home."

⁵⁵ "Celebrating and Dedicating a New Home," *Tulsa District Record* Vol. 15, No. 5, (August 1993), p. 3.

⁵⁶ See Patton, *Fifty Years Remembered*, p. 129.

projects.⁵⁷ From November 1972 until July 1975, Colonel John G. Driskill was Tulsa District Engineer. He was followed by Colonel Anthony A. Smith (July 1975-July 1978) and Colonel Robert G. Bening (July 1978-August 1980). Under their command, the district completed major reservoirs, including DeQueen, Gilliam, Dierks, Hugo, Waurika, Birch, Optima, and Kaw. Their tenures also saw a vast expansion of the Tulsa District recreation, regulatory, and emergency management programs.⁵⁸

Colonel James J. Harmon (September 1980-August 1983) was district engineer when Tulsa regained military construction responsibilities in 1981. Harmon oversaw the establishment of new divisions and offices to meet the demands of military construction in Oklahoma, Arkansas, and west Texas during the Reagan defense buildup.⁵⁹ Under the command of Colonel Franklin T. Tilton (August 1983-August 1986), the district consolidated its military construction activities in Oklahoma and northwest Texas and significantly expanded its environmental restoration work at Department of Defense and other sites. Tilton also presided over the rapid emergency repair of fire-damaged Building 3001 at Tinker Air Force Base in 1984 and 1985 and the declaration of Tulsa as a Model District in the Corps.⁶⁰ Colonel Frank M. Patete (August 1986-July 1989) commanded the district as the Corps implemented the provisions of the Water Resources Development Act of 1986 and he presided over the difficulties of the Great Flood of 1986 and the litigation with the city of Edmond over recreation costs at Arcadia Lake. Under Patete's command, the district combined its Engineering and Construction Divisions and set the pace in the Corps for implementation of project management.⁶¹

⁵⁷ Periodic Letter, Col. William E. Read to Maj. Gen. H.R. Parfait, SWD, 5 May 1972, subj: District operations, TD Archives, Box 1917, 5/11.

⁵⁸ 60 TD News Releases, 30 Oct. 1972, 26 Mar., 10 Nov. 1975; Tulsa District Information Bulletin Vol. XII, No. 11 (Nov. 1972); Patton, *Fifty Years Remembered*, p. 168.

⁵⁹ Periodic Letters, Col. James J. Harmon to Maj. Gen. Hugh G. Robinson, SWD, 10 Jan., 19 July 1983, subj: District Status, TD Archives, Box 1917, 5/11; Settle, "Years of Challenge," chapter XII.

⁶⁰ TD News Release, 25 July 1983; Periodic Letters, Col. Franklin T. Tilton to Maj. Gen. Hugh G. Robinson, SWD, 18 Jan. 1984, 15 July 1985, subj: District Status, TD Archives, Box 1917, 5/11.

⁶¹ *Tulsa District Record* Vol. VIII, No. 5 (July/Aug. 1986). See also Chapters 3 and 4 of this manuscript.

The beginning of the 1990s saw Colonel F. Lee Smith, Jr. (July 1989-July 1992) in command of the district during turbulent times.⁶² When the announcement came that Tulsa District would close in May 1991, Smith compiled statistics and presented them to the BRAC commission. "I saw a BRAC commission looking at each other saying Tulsa – where's Tulsa?" Smith briefed district employees in December 1991. "I guarantee you this," he continued, "the BRAC commission knows where Tulsa is now!"⁶³ Groundbreaking for the new district headquarters took place in December 1991. During the tour of duty of Colonel Otis Williams (July 1992-July 1995), Tulsa District personnel moved to their new location in east Tulsa and were all housed in the same location for the first time. It was Williams' task to implement a new efficiency program called Total Army Quality (TAQ) in the district. In June 1995, the district won the Army Communities of Excellence Award.⁶⁴ Colonel Timothy Sanford took command in July 1995. In 1996, Sanford authorized the district website at the address: <http://www.swt.usace.army.mil>. The district's website would be rapidly expanded and refined over the coming months. The potential of the World Wide Web as an information, communications, and emergency management tool was only beginning to be realized by the late 1990s. At the end of 1997, Tulsa District had 977 employees.⁶⁵

The Corps of Engineers of the late 1990s was an organization in transition. Much of the tradition forged during the Big Dam Era and World War II continued, but fiscal, environmental, and social changes had their inevitable impact. Water quality, recreation, regulation, and emergency management diversified responsibilities but the traditional missions of flood control and navigation remained as integral components of civil works. Environmental constraints and public involvement complicated planning, and the passage of WRDA-86 mandated new approaches in dealing with local sponsors. Military construction demanded efficient

⁶² *Tulsa District Record* Vol. 11, No. 4 (Aug. 1989).

⁶³ Col. F. Lee Smith, "Holiday Briefing," (Speech Transcript), 17 Dec. 1991, TD Historical files.

⁶⁴ *Tulsa District Record* Vol. 15, No. 3 (March 1993).

⁶⁵ *Ibid.*, Vol. 17, No. 8 (Aug 1995), and Vol. 19, No. 8 (Aug. 1996).

application of new technology for installations, and the Corps of Engineers strove to satisfy its Army, Air Force, and Work for Others customers. When federal budget constraints prompted a reorganization of the Corps, a decade of upheaval occurred.

The Tulsa District experienced each of these transitions. Responding to the changing world of civil works, the district employed an increasing number of non-engineers particularly in planning and engineering. Cultural resources management laws required the district to account for the impact of its projects through extensive archeological inquiries. The district, therefore, employed and contracted several archeologists and anthropologists to perform these tasks. By the late 1990s, the district's workforce included unprecedented numbers of non-engineers and percentages of women and minorities. With the changing civil works needs and the resumption of military construction, Tulsa District altered its divisional structure and added an environmental restoration component. By the 1990s, the district had three main components of about equal workload: civil works, military construction, and environmental restoration.

The benefits of the McClellan-Kerr waterway were significant and facilitated the economic diversity of eastern Oklahoma. Waterborne commerce increased gradually but steadily during the waterway's first 25 years. However, other benefits, such as water supply, water quality, flood control, and especially recreation, far exceeded even the most optimistic estimates during the planning of the waterway. The district's other reservoirs and flood control projects overwhelmingly exceeded their costs as assets to the region. Other parts of the broad umbrella of civil works, including the regulatory program, emergency management, and recreation, remained vital components of the district.

Military construction returned to Tulsa in the early 1980s, and the district quickly established its reputation with Department of Defense customers. Providing timely and high quality products to the large military installations in its area of operations, the Tulsa District military construction program soon took its place beside civil works. The entrepreneurial approach of the district has kept

the military construction workload stable and expanding into the late 1990s.

The district's Hazardous, Toxic, and Radiological Waste program accelerated rapidly in the 1980s with the resumption of military construction. By 1989, the district had become the Design District for Southwestern Division, serving Oklahoma, Arkansas, Texas, New Mexico, and Louisiana. Environmental restoration work included the Army and Air Force Installation Restoration program, the Formerly Used Defense Sites program, and a robust Work for Others program for the Department of Energy and the Environmental Protection Agency.

The crucible of the 1990s changed the Corps of Engineers and its field operating agencies. Tulsa District responded to the changes by diversifying its workload, taking on new tasks, and solidifying its traditional functions. Such a diversity of workload served Tulsa District well in the uncertain times of the late 1990s.

Commanders 1971-1997



*Colonel John G. Driskill
1972 - 1975*



*Colonel Anthony A. Smith
1975 - 1978*



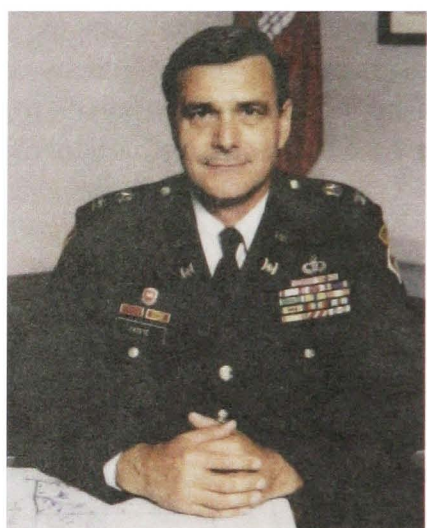
*Colonel Robert G. Bening
1978 - 1980*



*Colonel James J. Harmon
1980 - 1983*



*Colonel Franklin T. Tilton
1983 - 1986*



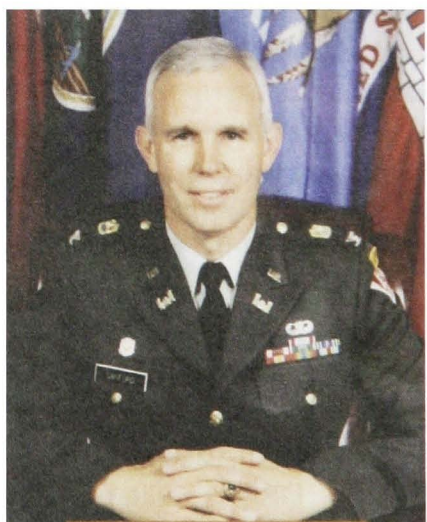
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1986 - 1989*



*Colonel Lee Smith
1989 - 1992*



*Colonel Otis Williams
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