U.S. Army Corps of Engineers

Tulsa District Project Update

Flooding Rains Put Corps Projects to the Test

It's Either Feast or Famine (Flood or Drought)

During the summer of 2007, Tulsa District's 33 lakes with flood storage capacity quickly went from drought conditions to near the top of their flood pools.

For nearly two years, the lack of rainfall in Kansas, Texas and Oklahoma reduced the conservation pools to nearly record lows in all of our lakes. It took only 30 days for all that to change.

Rainfall, up to 18 inches in Oklahoma and as much as 40 to 45 inches in southern Kansas in the month of June, quickly saturated the ground. It rained a record 20 of the 30 days in June. The runoff immediately headed downhill to streams and rivers, much of it eventually finding its way into District lakes.

Normally storms will occur in the basin of one or two of our reservoirs. This time it seemed Mother Nature was trying to make up for the drought in one huge storm covering all of our drainage basins.

At one point, all but three of the reservoirs in the rain-drenched area of southeast Kansas, Oklahoma and along the border between Oklahoma and Texas were near-

Continued ... page 4

Ross Adkins
Public Affairs Office

High water at Hugo Lake, Oklahoma, reflects the signs at the Rattan Landing Public Use Area. The high water resulted in closed campgrounds and facilities. Nearly all of Tulsa District's 33 lakes were impacted by the wide-spread storms of June and July.

Fall River Lake, Kansas, (below) makes a spectacular scene as excess water is released through the spillway.

Col. Anthony Funkhouser
Commander Tulsa District

Col. Anthony C. Funkhouser was born in Keyser, West Virginia. He was commissioned as a Second Lieutenant in the United States Army Corps of Engineers in 1985 from the United States Military Academy at West Point, New York with a Bachelor of Science degree in Civil Engineering. He holds a Master of Science degree in Engineering Management from the University of Missouri-Rolla; a Military Art and Science from the United States Army Command and General Staff College and a Master of Strategic Studies from the United States Army War College. His military education includes the Engineer Officer Basic and Advanced Courses, the Combined Arms and Staff Service School, the United States Army Command and General Staff College, the Advanced Military Studies Program and the United States Army War College.

Col. Funkhouser's assignments include service as: Platoon Leader, Executive Officer and Battalion Logistics Officer in the 317th Engineer Battalion (Corps) in Eschborn, Germany; Assistant S3 and Assistant Brigade Engineer in the 17th Engineer Battalion, 2nd Armored Division at Fort Hood, Texas; Assistant Division Engineer, 1st Cavalry Division (Desert Shield/Desert Storm), Commander of D Company and B Company, 8th Engineer Battalion, 1st Cavalry Division; Small Group Instructor for the Engineer Officer Advanced Course at Fort Leonard Wood, Missouri; Observer/Controller at the National Training Center at Fort Irwin, California; Regimental Engineer, 11th Armored Cavalry Regiment at Fort Irwin, California; Executive Assistant to the Commanding General, III Corps and Fort Hood, Texas; Battalion Executive Officer, 91st Engineer Battalion and Engineer Brigade Executive Officer, 1st Cavalry Division; Chief of Doctrine, U.S. Army Engineer School, Fort Leonard Wood, Missouri; Commander, 5th Engineer Battalion (Corps)(Operation Iraqi Freedom I); and Chief of Staff, United States Army Engineer School, Fort Leonard Wood, Missouri.

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A Change of Command Ceremony was held on June 29 and Col. Anthony Funkhouser assumed command of the Tulsa District.

Corps of Engineers

Missions

The mission of the United States Army Corps of Engineers, the world's preeminent public engineering agency, is to provide quality, responsive engineering services to the nation and its armed forces. The Corps plans, designs, builds and operates water resources projects; designs and manages military facility construction for the Army and Air Force at home and abroad; provides design and construction management support for other Defense and Federal agencies; cleans hazardous areas across the nation through the Formerly Used Defense Sites program and the Formerly Utilized Sites Remedial Action Program; and conducts state-of-the-art engineering research and design at its Engineer Research and Development Center.

Over its 230 year history, the Corps of Engineers mission has evolved. What began as a military engineering mission for the nation in the 18th Century adapted into a major peacetime mission in the 19th Century. The Corps helped develop a vast water resource infrastructure, initiated development of the first national parks, and linked navigable waterways together to move commerce across states.

In the 20th Century, the Corps' civil mission changed again with the adoption of more water resources development and management duties, including flood control, hydropower, recreation, water supply, shore protection, and disaster relief. More recently, environmental protection and restoration missions were entrusted to the Corps.

As society's requirements and values have changed, the Corps programs have changed to reflect new national priorities.

U.S. Army Corps of Engineers ®

Historical Perspective by Tulsa's Former Commander

Col. Miroslav Kurka
Former Commander, Tulsa District

This column is my last for the Tulsa District Project Update; on June 29, 2007, I turned over command of the Tulsa District to Col. Tony Funkhouser and deployed to Afghanistan where I am commanding the Afghanistan Engineer District. Although I love history, I am generally a person who looks ahead, not back. Nevertheless, it is useful to periodically take stock of where we are and to measure ourselves against our goals, and I'd like to take a few paragraphs here to do just that.

Tulsa District faces challenges that are complicated and not easily defined; it is part of living in the 21st Century superconnected, complex world while fighting a Global War on Terror. Three years ago, we initiated a strategic planning process to prepare the District for the future. We correctly foresaw a volatile, uncertain, complex and ambiguous environment (VUCA) in which most work was regional and outside the District's boundaries, where we faced limited budgets, and where the Corps faced increasing pressure to deliver facilities and services better, faster, less expensively, and greener.

To cope with this environment, we envisioned a District that leverages the resources of its superb workforce, the regional business team and private industry to deliver excellence in construction and services. We also predicted that our future success would rely on interdependence with other Districts to execute projects and studies better, faster, less expensively, greener and safer, and on fostering an expeditionary mindset among our world-class workforce. A key component of our strategy was to use our blossoming Tulsa/Little Rock partnership to develop the tactics, techniques and procedures for sharing work with other Districts thereby enhancing interdependence, affordability, workforce opportunities, and technical expertise.

As I assess the District today, I can honestly state that we've been very successful with this strategy – far beyond even my expectations.

In June 2004, when I took command, Tulsa District had approximately 750 employees and our annual program was approximately $290 million. As I ended my command, we had 624 people executing a program of $350 million. This significant increase in productivity is a result of our leveraging of our own superb workforce, the regional business team and private industry. More significant than even this productivity increase is the change in the nature of the work we are doing. Whereas in 2004, with the exception of environmental work, our program was generally confined to our geographical boundaries, we now routinely do engineering, real estate, planning, and contracting as well as environmental work throughout the region and nation. We are truly becoming an expeditionary workforce, whose services are routinely solicited by many.

What is truly remarkable is the fact that we achieved this success despite a very difficult environment. Over the past three years, we have weathered a fiscally austere period caused by budget uncertainties and anemic Operations and Maintenance budgets. We also faced many other challenges including: a drought, extended hurricane relief missions, numerous questions from the public and stakeholders about our actions, the Chief Financial Officer audit, two Southwestern Division Command Staff Visits, rapidly escalating construction costs, and uncertainty caused by numerous changes to contracting, Army military construction, and the personnel, logistics, and information management systems. We completed the last three years without a Reduction In Force, without a cut in services to the public, all the while maintaining excellent affordability. Not only that, we excelled in most areas, and our excellent performance, lean organization, and high quality/low cost repu-

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> **HOOAH !!!**
> **An Army motto meaning anything but no or can't.**
>
> **Col. Miroslav Kurka**

Col. Funkhouser ... from page 2

Col. Funkhouser's awards and decorations include the Bronze Star Medal with "V" Device, Meritorious Service Medal with five oak leaf clusters, Army Commendation Medal with five oak leaf clusters, the Army Achievement Medal with five oak leaf clusters, the Marine Corps Expeditionary Medal, the National Defense Service Medal, the Southwest Asia Service Medal, the Terrorism Expeditionary and Service Medals, the Military Outstanding Volunteer Medal, the Saudi Arabian and Kuwaiti Liberation Medals and the Combat Action Badge. He has also been awarded the Bronze DeFleury and the Order of Saint Barbara Medallions and is a licensed Professional Engineer in the State of Virginia.

Col. Funkhouser (left) at the Copan Lake witnessing flood control operations of the Tulsa District.

Copan Lake water releases through the spillway.

Kaw Lake, on July 3, raised to within inches of the top of the flood control gates.

Flooding Rains Put Corps Projects to the Test ...

from page 1

ing the top of their flood control pools. At the same time, uncontrolled runoff below reservoirs was filling rivers and streams causing them to overflow their banks.

In Coffeyville, Kansas, where hydrologists had predicted a 500 year flood event to reach 83,000 cubic feet per second flows, this storm had flows exceeding 150,000 cubic feet per second, topping levees and causing extensive flood damages.

Not knowing how extensive the rains would be, our hydrologists reduced or stopped releases from our lakes in order to avoid or reduce flooding downstream in the uncontrolled areas.

As the rains continued in torrential amounts over all of the river basins, very aggressive efforts were made by the Corps of Engineers to capture flows that would have created devastating flooding in areas below these dams and at the same time, not exceed the amount of storage in the flood pools. At one point, there was about 10 million acre-feet of water captured in the flood control pools of our reservoirs. This nearly doubled the 13 million acre-feet of water normally stored in our reservoirs. (That's about 10 million football fields filled with one foot of water.)

One example was Keystone Lake a few miles upstream from the city of Tulsa.

There were recorded flows of nearly 300,000 cubic feet per second coming into the reservoir. Engineers controlled releases from the dam to no more than 80,000 cubic feet per second, well within the banks of the Arkansas River through Tulsa. This effort was repeated at nearly all of the Corps operated lakes.

These efforts paid off. While the flood control pool at Keystone filled to within inches of the top of the gates at the dam, we did not have to make releases that would have caused flooding downstream.

Depending on where it rains, some of the runoff takes days before it reaches the lake. On the other hand, releases from Keystone will take about 8 hours to reach Tulsa and about 28 to 30 to reach Muskogee.

Col. Funkhouser took command of the Tulsa District on Friday, June 29. The following day, Saturday, he received a briefing on the extent of the

Peak Rainfall Amounts During June 2007

Copan OK (meso)	18.45
Dewar OK	18.17
Burbank OK (meso)	17.68
Mannford OK	16.47
Hominy OK	15.95
Pawnee OK	14.65
Ralston OK	13.82
Okmulgee OK (meso)	12.69
Bartlesville OK	12.21
Haskell OK (meso)	11.96
Miami OK (meso)	11.62
Claremore OK (meso)	11.56
Okemah OK	11.45
Clayton_14WNW	11.25
Pryor OK (meso)	11.21
Bixby OK (meso)	11.02
Vinita OK (meso)	10.41
Nowata OK (meso)	10.38
Porter OK (meso)	10.30
Wynona OK (meso)	10.25
Jenks OK	10.21

MESO - Multi-Community Environmental Storm Observatory

Flooding Rains Put Corps Projects to the Test ... from page 4

storm and its impact on Corps operated flood damage reduction reservoirs; he immediately scheduled visits to the flood areas and affected reservoirs beginning Sunday, July 1st. During his visits at Waurika Lake; Lake Texoma; Bartlesville, Oklahoma; Coffeyville, Kansas; Miami, Oklahoma; Eufaula, Oklahoma; and Keystone Lake; he met with local and state officials as well as congressional staffs and members offering assistance from the Corps.

During the entire time of the storms, the District maintained constant dialog with officials and shared information through the much visited Tulsa District website.

By July 8th, it seemed the worst was over as downstream flooding abated and hydrologists from the Corps began to see high lake levels stabilize or start to recede.

The good news is that our flood damage reduction reservoirs performed exactly as they are supposed to. They captured and held back very high flows from these record-setting storms. This either prevented flooding or kept it to a minimum. Most of the flooding that did occur was from uncontrolled runoff in areas where there are no flood reduction reservoirs.

There was, of course, a huge impact on the parks, recreation areas and marinas, most of which are located in flood control pools of these lakes.

Another problem of so many lakes being so full is the speed at which the flood pools can be evacuated in preparation for the next round of storms.

In order to avoid downstream flooding on the rivers, all reservoirs must evacuate the pools of collected runoff at a much slower rate. It is estimated that it will take six weeks to return the reservoirs to their normal levels. Then it will take weeks, if not months, to clean up the debris left by receding water and to check damages to toilets, water systems and electrical systems at recreation sites. Ground under park roads will also have to be dry enough to withstand traffic.

"Safety of our visitors is of primary importance. We will not open parks and recreation areas until it is safe to do so," said Billy Banks, chief of Tulsa District's Operations Division.

Lake Texoma's uncontrolled spillway is seldom used, but in July 2007, the lake reached the 640.0 elevation crest of the uncontrolled spillway. Shown above, the water level is just shy of flowing over. Sightseers came to witness the event which has only happened twice since the dam was completed in 1944.

It is estimated that it will take $40.5 million to repair damages and return lakes and recreational facilities to usable condition.

Since their creation, Tulsa District's reservoirs and personnel have prevented almost $5 billion dollars in flood damages.

Col. Kurka ... from page 3

tation have set the District up for outstanding future success.

This enviable position is totally due to our hard working, dedicated, tenacious, innovative, and exceptionally competent workforce, and to our great partners in government and industry.

As I depart, I am thrilled that Tulsa is getting a great new commander. Col. Tony Funkhouser is a wonderful leader and a true professional who epitomizes the U.S. Army Soldier's Creed. He is a combat veteran of Operation Iraqi Freedom and a heck of a nice person who is also a very quick study.

As I turn over command of this great District, I am thankful to the District and to our many partners and stakeholders for the terrific hospitality and support given to me and my family during the past three years. Any success I have had has been the direct result of God's help and the District's stupendous efforts.

I've challenged the District to continue to strive and thrive in this VUCA environment. They are daily making great contributions to our Army and our country. Many are answering the call of service overseas in Iraq and Afghanistan, and I look forward to seeing more than a few friendly faces our great Tulsa District in Afghanistan during my year-long assignment there. God bless all of you; God bless our Army; and God Bless the United States of America.

HOOAH!!!
(An Army motto meaning anything but no or can't.)

Surprise Find at the Great Salt Plains National Wildlife Refuge

Status of CAIS Vial Investigation at Salt Plains National Wildlife Refuge

Dan Plugge
Tulsa District
Formerly Used Defense Site
Program Manager

The Salt Plains National Wildlife Refuge in north central Oklahoma closed the public Crystal Digging Area earlier this year after the discovery of several unidentified glass vials by a Boy Scout digging for selenite crystals. The vials were identified as K951/K952 Chemical Agent Identification Sets (CAIS), which contain small quantities of various dilute chemical agents used for chemical warfare training. The Army's 22nd Chemical Battalion responded to the emergency situation and recovered approximately 134 intact vials and several remnants of incendiary devices. It is assumed that an unsuccessful attempt was made to destroy the vials at the time of disposal, which would have been during the World War II timeframe when the land was leased by the War Department for use as a bombing and gunnery range.

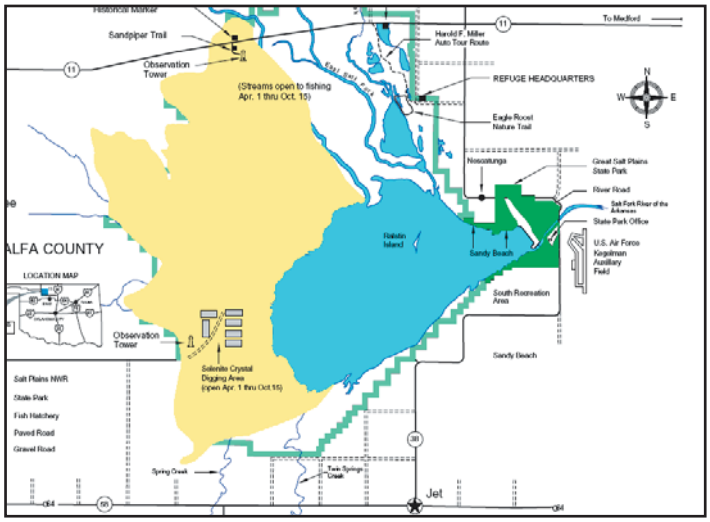
The number of recovered vials continued to increase during the Army's emergency response; therefore, the Army chose to suspend emergency operations and continue the response efforts under the Formerly Used Defense Site (FUDS) Military Munitions Response Program (MMRP).

The MMRP was established to provide response actions (i.e., the identification, investigation, and remedial actions, or a combination of removal and remedial actions) to address Munitions and Explosives of Concern (MEC) or Munitions Constituents (MC).

After the discovery of the CAIS vials, the Tulsa District, partnered with the Corps' Engineer Research Development Center - Geotechnical and Structures Laboratory in Vicksburg, Mississippi, to conduct geophysical mapping of the disposal pit area to determine the size of the pit and determine the viability of finding glass CAIS vials in the subsurface.

Several detection systems were used during this effort including a Geonics Electromagnetic 61 MKII, a Geonics EM38B Conductivity Meter, a pulseEKKO 1000 ground-penetrating radar, and a Geometrics G858 Magnetometer.

Analysis of the data indicated that, due to the high water table and high conductivity of the salt environment, neither the conductivity meter nor the ground-penetrating radar systems worked effectively enough to warrant mapping the



Great Salt Plains Lake, Oklahoma, and the National Wildlife Refuge area are part of a formerly used bombing range.

Some of the 130 CAIS vials found buried at the Crystal Digging Area.

CAIS Vials and Containers (historical photo)

300-acre Crystal Digging Area with either of the instruments.

The U.S. Army Engineering Support Center in Huntsville, Alabama, has contracted Parsons Infrastructure and Technology Group, Inc., to perform a Time Critical Removal Action to remove and dispose of all remaining MEC and CAIS vials in and around the identified disposal site. The removal action began in August 2007. The effort will include sampling and analyses of the soil and groundwater in the vicinity of the disposal area to ensure that the vial's contents were not released to the environment.

The U.S. Geological Survey has also been tasked to conduct geophysical mapping of the 300-acre Crystal Digging Area beginning in August 2007 to identify the location of any metallic items beneath the surface.

Because the glass CAIS vials could not be identified by ground-penetrating radar or conductivity-type geophysical instruments, electromagnetic and magnetometer type instruments will be used to find metallic objects in the subsurface. The evaluation for metal objects follows the assumption that other disposal sites for World War II era CAIS vials also used metallic incendiary devices similar to those found at this site.

The information derived through geophysical analysis will be combined with a historical aerial photo interpretation to develop plans for a subsurface investigation during a Remedial Investigation which is planned for execution in 2008.

Geonics MEM 61 MKII

Security fencing and the pulseEKKO ground-penetrating radar stands out on the salt plain selenite Crystal Digging Area at the National Wildlife Refuge.

The combination of these efforts should help determine if the identified CAIS vial disposal pit was an isolated event or the result of a more widespread disposal effort, which will, in turn, assist the U.S. Fish and Wildlife Service determine whether the Crystal Digging Area should be reopened for public access to resume crystal digging activities.

Geometrics G858 Magnetometer

Tulsa District's

Emergency Response

Calendar year 2007 will be remembered as the year the Tulsa District established a record level of Emergency Operations Center activations.

In 2007, Tulsa District emergency responders assisted the citizens of Kansas, Oklahoma, and Texas along with Federal Emergency Management Agency (FEMA) Regions VI and VII. This assistance came from the Corps of Engineers flood fight assistance programs and from the Emergency Support Function #3 (ESF-3) Public Works and Engineering assistance we provide the country under the National Response Plan (NRP).

The refrains of "Auld Lang Syne" had barely faded away when the January Ice Storm impacted a significant portion of eastern and south central Oklahoma plunging thousands of residents into darkness and cold. To make matters worse, the subfreezing temperatures persisted for nearly two weeks.

An Emergency Power Mission was assigned to the Corps by FEMA Region VI late on a Sunday evening. By the middle of the week, a team of Tulsa District Emergency Power Planning and Response Team (PRT) members, 249th Engineering Battalion "Prime Power" soldiers, and contract forces led by IAP Worldwide Services were underway installing what would ultimately number 62 generators at a variety of impacted critical public facilities. FEMA agreed to loan generators to the McAlester Army Ammunition Plant allowing them to meet critical Global War on Terrorism munitions shipments. By the end of the month, power had been restored and the mission was completed.

In May, a tornado devastated the community of Greensburg, Kansas. This series of storm events also dropped flooding rains across much of the Missouri River and its tributaries in Nebraska, Iowa, Kansas, and Missouri. With Kansas City District heavily involved in flood fighting along the Missouri River, Tulsa District accepted the execution of six different FEMA Region VII-issued ESF-3 mission assignments to assist the residents of Kansas. Most of this work has been completed, but we continue to assist Kiowa County, the State of Kansas, and FEMA by executing the closure of a construction and debris reduction site and landfill used for debris removal operations in the Greensburg area.

Mother Nature was not finished. During the latter part of May and most of June, a stalled series of weather fronts across the states of Kansas, Oklahoma, and Texas brought continued, even torrential, rains. The rain culminated over the period from June 29 – July 1 with some areas of southeast Kansas receiving 20+ inches in less than 24 hours. Much of this rain fell below our flood control projects in uncontrolled areas of the river basins in Kansas. Levees protecting the communities of Coffeyville and Osawatomie, Kansas, which were built to protect to a 100-year flood event, were overtopped. The community of Fredonia, Kansas, experienced a record flood level that was five feet higher than any previously

Continued ... page 9

Halstead, Kansas, Levee is a Success

There is a success story from Halstead, Kansas. Their levee and flood walls, which were Federally constructed by the Tulsa District, held back the flooding in that area.

The real-life flood test happened during the May 26th flooding that impacted central Kansas. During that period, the town was shut off from the world for a couple of days but the water stayed out.

Water Safety Program

"Your safety, Our concern"

Mary Beth Hudson
Public Affairs Office

"Your safety, our concern" was a motto set to action throughout Tulsa District heading into the Memorial Day weekend. From Council Grove, Kansas, to Pat Mayse, Texas, employees and partners worked to highlight the importance of water safety and educate children and their parents.

From one-on-one interactions between a ranger and a child to joint press conferences in Tulsa and Oklahoma City, the District was continuously blanketed in the days leading up to the traditional start of the recreation season.

"Corps employees and our partners teamed together proactively to get the water safety message to the public," said Billy Banks, chief of Operations Division. Partners included Safe Kids Coalition, Oklahoma Highway Patrol, U.S. Coast Guard Auxiliary, Bass Pro Shops, Life Flight, local first responders, and many media outlets. "We had a very successful Memorial Day weekend with thousands of people visiting our lakes and no reported drownings," Banks reported.

The focus now shifts to the next holiday. The subject remains the same: Your safety, our concern.

Park Ranger Travis Miller, Keystone Lake, visits with children at Frost Head Start in Tulsa, Oklahoma. Most of the four and five-year-old children in the class did not know what a life vest was before rangers visited that day.

Emergency Response ... from page 8

recorded flood stage along Fall River. For the first time in our District's 68-year history, nearly every one of our 38 lake projects received flood runoff which raised their lake elevations into, and in many cases above, the top of the flood control pool. While that was occurring, there was also flooding occurring in the uncontrolled river basins below our projects. This meant we were extremely limited in the amounts of flood water we could release from our projects. Many of our releases were made only when it was apparent that inflows were going to continue to the point where, if we did not initiate releases, we would be threatened with the failure and loss of the dam. These were painful, but necessary, decisions. Decisions that were especially hard for Bartlesville, Oklahoma, downstream of Hulah and Copan Lakes; Waurika, Oklahoma, downsteam of Waurika Lake; and Coyville and Altoona, Kansas, downstream of Toronto Lake.

The communities downstream of Keystone Lake were also nervous over releases from Keystone Lake having to be increased above the Arkansas River channel capacities.

However, as the rains upstream subsided, we were able to maintain releases from Keystone below the channel capacity.

High flood pool elevations severely hampered the recreational benefits that area residents and businesses typically enjoy from these lakes.

Navigation along the McClellan-Kerr Arkansas River Navigation System was shut down for nearly 5 weeks due to river flows in the system being above 150,000 cubic feet per second (cfs) (1 cfs is equal to 450 gallons per minute).

Tulsa District was issued another seven ESF-3 mission assignments from FEMA Region VII to assist the impacted citizens in southeastern region of the State of Kansas. This work will be ongoing through the fall of this year.

Additionally, under the Corps of Engineers "Flood Control and Coastal Emergency Program Rehabilitation, and Inspection Program," we will be performing repairs to the levees and channels in Great Bend, Wichita, and Coffeyville, Kansas, that were damaged by these flooding storm events.

Arkansas City Aquatic Ecosystem Restoration

Section 206, Water Resources Development Act of 1996, as amended

Feasibility Study

The city of Arkansas City is located at the confluence of the Arkansas and Walnut Rivers in southeast Kansas, Cowley County, approximately 122 miles northwest of Tulsa, Oklahoma.

The proposed restoration site is located within the historic floodplain of the Walnut River. The recommended plan would improve various types of wildlife habitat over a total of 122 acres. Borrow pits would be modified to be productive fish habitat. Constructed wetlands would provide habitat to numerous types of wildlife as well as improve water quality. Species diversity and carrying capacity would be restored to bottomland hardwood stands and prairie grasslands in the project area.

Fiscal year 2007 efforts are focused on completion of feasibility study efforts that will detail the most cost-effective plan to restore this historic floodplain.

Arkansas River Corridor

Section 22, Water Resources Development Act of 1974, Public Law 93-251 (Planning Assistance to States Program)

Study

The Arkansas River is a valuable water resource that provides opportunities for redevelopment to promote economic development, ecosystem restoration, and other initiatives that would improve the quality of life for many citizens living in the Tulsa metropolitan area as well as visitors to the region.

In 2005, we completed a comprehensive Master Plan that sought to integrate economic development with ecosystem restoration. This plan identifies specific features and locations based on extensive public outreach efforts and technical analysis of the feasibility of the community's vision.

Tulsa County is the cost-share sponsor providing non-Federal funding and coordinating with stakeholders as we move through Phase III. In this phase, we will formulate ecosystem restoration features, model potential weir designs, and conduct comprehensive natural and cultural resources investigations. Primary products from this phase include: an ecosystem restoration plan, recommendation for holistic approach to weir operation as well as design recommendations and baseline ecosystem data. Two low-water dams have been identified as major components of the comprehensive ecosystem restoration plan. They are necessary as hydropower production at Keystone Dam has negatively impacted this riverine ecosystem. Tulsa District will work with the Tennessee Valley Authority to model impacts of various dam designs on the aquatic ecosystem and public safety.

This project has generated great excitement within Tulsa County as well as the region. Other municipalities are closely watching the successes of our partnerships with both public and private stakeholders. Tulsa District is committed to providing support to the Tulsa Community as they seek to integrate economic development with ecosystem restoration.

Augusta Levee Local Flood Protection Project

Section 205 of the Flood Control Act of 1948, as amended (Continuing Authority - Flood Control)

Pre-Construction Engineering & Design

Augusta is about 19 miles east of Wichita, Kansas. The Whitewater River runs through Augusta to its confluence with the Walnut River.

The original levee was constructed in the 1920s and '30s through private and public sponsorship and was incorporated into the Federal Levee Inspection Program in the 1940s.

The November 1998 flood damages were caused primarily by the Whitewater River breaching of the city's levee system at several locations along the west side of Augusta. The recommended plan is to raise and extend the existing levee to provide a 500-year level of flood protection.

Fiscal year 2007 efforts are focused on completion of construction plans and specifications. We anticipate execution of the Project Cooperation Agreement in August 2007 and award of the construction effort in the summer of 2008.

Bartlesville Water Supply

Section 22, Water Resources Development Act of 1974

Study

On May 15, 2006, Mayor Julie Daniels and Col. Kurka (former Commander of the Tulsa District) signed the cost-share agreement for this study. The agreement was amended in January 2007 to allow the Oklahoma Water Resources Board to provide the cash portion of the non-Federal cost share. It is a 50% Federally funded study that will use the latest technology to project water supply needs for the next 50 years. Once that data is clearly established, the study team will analyze alternatives such as: the cost of storage and conveyance from Kaw Lake and the impacts for reallocating from the flood pool on Hulah and/or Copan Lakes. Cost estimates will be an integral part of this study.

Primary stakeholders in this study are the city of Bartlesville, the Oklahoma Water Resources Board, the Nature Conservancy, and rural water districts.

Another closely related project is the Hulah/Copan Reallocation Study. This study was signed by the Tulsa District Commander on April

26, 2007, and has been sent to Corps Headquarters for review/approval. Water supply contracts totaling just over 12 million gallons per day accompanied the report to Corps Headquarters.

Big Lake Habitat Restoration, Oklahoma

Section 1135(b) of the Water Resources Development Act of 1986, as amended (Continuing Authority -- Habitat Restoration)

Feasibility Study

Big Lake is a locally-owned lake located along the Verdigris River in Rogers County, Oklahoma, about 10 miles northeast of Tulsa and approximately 15 miles downstream of Oologah Lake. Due to the McClellan-Kerr Navigation System channel and the impoundment of Oologah Lake, over 700 acres of forested wetlands are no longer subject to annual flooding.

The recommended plan would improve various types of wildlife habitat for 700 acres of bottomland hardwood forest, restore 100 acres of bottomland hardwood wetlands and an oxbow lake, and simulate natural flooding to the area.

In December 2006, environmental compliance efforts were completed for the study, and the final report was approved by Corps higher authority. This project is on hold until funding is made available to initiate construction efforts.

Blackwell Lake Clearing and Snagging

Section 208 of the 1954 Flood Control Act, as amended by the 1974 Water Resources Development Act.

Project Design Analysis Underway

Blackwell Lake is located in Kay County, Oklahoma, near Braman, and is a primary recreational feature in that part of Oklahoma.

Due to the ice storm of 2001, a heavy load of logs and other debris have accumulated upstream of the Lake Blackwell Dam and spillway. The log jam is blocking access to the gate controls of the dam structure and has completely overwhelmed the normal maintenance capacity of the Lake Blackwell Trust Authority. The log jam has also significantly increased the flooding risks of the residential community immediately upstream (approximately 200 homes).

The recommended plan of improvement is to remove the log jam and properly dispose of the accumulated material.

Fiscal year 2007 activities are focused on completing the project design report activities. Contingent upon funding, construction efforts could be initiated.

Candy Lake Land Sale

Water Resources Development Act of 1999

Land Sale

Candy Lake was deauthorized by publication in the Federal Register in December 1996. Water Resources Development Act 1999 authorized the Corps to sell Candy Lake project land at fair market value to the previous landowners or their descendants. The Corps contracted with General Services Administration to conduct a land appraisal and identify former landowners or their descendants and complete the Environmental Assessment.

In 2005, we completed the Environmental Assessment and initial coordination with the State Historic Preservation Officer. Offers to purchase were sent to appropriate parties.

Title transfers for the first 11 Candy Lake tracts were signed by the Assistant Secretary of the Army for Civil Works and sent back to the District in June 2006. Deeds were filed in Osage County on June 14 to complete these sales. Funding from these initial sales were used to complete the cultural resource investigation. The cultural resource report is currently being coordinated with the State Historic Preservation Officer. Title transfers for those remaining tracts are scheduled for fiscal year 2007.

Parcels for which bids were not received from former owners or their descendants were offered to the Bureau of Indian Affairs; however, they did not express an interest to accept ownership. These tracts are going through further screening by the General Services Administration. If they are not picked up by another Federal agency, they will be identified for disposal as surplus property.

Canton Lake, Oklahoma, Dam Safety Project

Canton Lake, Oklahoma (Dam Safety)

Flood Control Act approved June 28, 1938 (Public Law 761); Flood Control Act approved July 24, 1946 (Public Law 526) (irrigation storage); Flood Control Act approved June 30, 1948 (Public Law 858); and the Water Resources Development Act of 1990 (Public Law 101-640) (water supply storage)

Under Construction

This is a multi-phase dam safety project with the first phase consisting of a Spillway Stabilization Construction Project in which 64 anchors were installed into the spillway to correct stability deficiencies. The first phase contract was awarded to Nicholson Construction Company for $4,525,000 on November 17, 2005 and was completed on October 22, 2006.

The next phase of the project, which will occur in fiscal year 2007, consists of relocating Highway 58A, relocating existing utilities and the development of plans and specifications for the channel excavation which is planned to occur in fiscal year 2008.

Cowskin Creek, Local Flood Protection Project, Wichita, Kansas

Section 205 of the Flood Control Act of 1948, as amended (Continuing Authority - Flood Control)

Pre-Construction Engineering & Design

The Cowskin Creek Basin is located in the western part of Wichita, Kansas. This basin has sustained significant recurring flooding problems directly impacting residential areas. The November 1998 flood resulted in significant damage to about 200 homes and many businesses, some of which were damaged beyond 50% of their value.

The recommended plan of improvement would include channelization of a portion of Cowskin Creek with construction of an overbank area to convey the high flows during a flood event.

On June 22, 2007, the Project Cooperation Agreement between the Corps of Engineers and the city of Wichita, Kansas, was executed. Contract Plans and Specifications are complete. Award of the contract for construction is expected to occur in August 2007. Construction should take approximately 18 months to complete.

Crow Creek Aquatic Ecosystem Restoration

Section 206 of the Water Resouces Devemopment Act of 1996, as amended (Continuing Authority -- Aquatic Ecosystem Restoration)

Planning

Crow Creek is located in a mixed residential and commercial area of central Tulsa, Oklahoma. This ecosystem restoration project will focus on riparian corridor habitat restoration and wetland creation.

Project features could include outdoor classrooms and multi-purpose maintenance trails that would provide public access for nature-related recreation.

Fiscal year 2006 efforts were focused upon completion of the preliminary assessment which was provided to the sponsor in August 2006.

This project has been placed on hold until additional funds are made available to complete the detailed feasibility report.

East Tulsa County, Haikey Creek Watershed, Oklahoma

Section 205 of the Flood Control Act of 1948, as amended (Continuing Authority -- Flood Control) Feasibility

Study

The Haikey Creek watershed is approximately 9 miles long and a maximum of 8 miles wide, originating in Broken Arrow, Oklahoma, flowing generally southward within east Tulsa County through portions of the cities of Tulsa and Bixby. The drainage area contains approximately 37 square miles and is largely urbanized.

The city of Bixby requested assistance to reduce flooding and improve riparian habitat in the lower reach of Haikey Creek.

Potential improvements could consist of channelization of Haikey Creek and/or construction of a levee approximately 2-5 feet high.

Fiscal year 2007 efforts are focused on completion of feasibility study efforts which will recommend the most cost-effective plan of improvement.

Grand (Neosho) River Wetlands and Bottomland Hardwoods Ecosystem Restoration, Oklahoma

Section 206 of Water Resouces Devemopment Act of 1996, as amended (Continuing Authority -- Aquatic Ecosystem Restoration)

Planning

This ecosystem restoration project will focus on wetland bottomland hardwood habitat restoration and would extend along the Neosho River upstream of Miami, Oklahoma.

Project features could include outdoor classrooms and multi-purpose maintenance trails that provide public access for nature related recreation.

In December 2006, The Natural Resources Conservation Service at Stillwater completed a preliminary assessment report detailing possible improvements that could be accomplished.

Fiscal year 2007 activities focused on completion of the Preliminary Assessment Report. On May 29, 2007, the draft Preliminary Assessment Report was submitted to Corps higher authority for review and approval.

Grand Lake Comprehensive Study

Section 449 of the Water Resources Development Act of 2000

Study

Grand Lake became operational in 1941 and its purposes include hydroelectric power (operated by the Grand River Dam Authority - GRDA) and flood control (directed by the Corps). Grand Lake is located in the Grand (Neosho) River Basin (a sub-basin of the Arkansas River Basin) and is an integral component of a system flood control operation consisting of 11 principal reservoir projects in the Arkansas River Basin. The system operation of the 11 principal reservoirs also benefits the McClellan-Kerr Arkansas River Navigation System.

Grand Lake was designed and constructed by the GRDA, an agency of the State of Oklahoma, and initially had a single purpose of hydropower production. In order to include Grand Lake as part of a comprehensive multi-purpose plan for the Arkansas River, the Flood Control Act of 1941 authorized the Corps to manage the flood control features. The flood control pool limits were established from elevation 745.0 to 755.0. Flood flowage easements were acquired up to elevation 750.0 by the State of Oklahoma. Other Federal agencies acquired flood flowage easements from elevation 750.0 to 760.0. The flowage easements are now held by the Corps.

In response to public concerns, Congress established Section 560 of the Water Resources Development Act of 1996 which authorized the Corps to conduct a study that considered the combined operating purposes of flood control and hydropower. The September 1998 Grand Lake, Oklahoma, Real Estate Adequacy Study report documents that areas were found around the lake where, using current criteria and based on current lake operations, additional flowage easements would be recommended if Grand Lake was a “new” Corps project.

The most recent legislation, Section 449 of the Water

Resouces Devemopment Act of 2000, directed the Corps to further evaluate the backwater effects specifically due to flood control operations on land around Grand Lake.

Activities in fiscal year 2005 included development of a working draft Project Management Plan for potential near-term activities and coordination with Ottawa County Commissioners, GRDA, and Congressional interests.

Fiscal year 2006 funds were used to complete a letter report in May 2006. Following a review by our Headquarters Offices, the report will be reviewed by the Assistant Secretary of the Army for Civil Works (ASA-CW). If the ASA-CW determines that Federal actions have been a significant cause of backwater effects, feasibility study activities would be initiated at full Federal expense in accordance with Section 449 language.

Potential future feasibility phase activities would be dependent on annual Congressional funding. The purpose of the feasibility study would be to identify cost-effective solutions to the flooding problems consistent with current Federal policies. Categories of alternatives to consider include structural measures (such as levees), nonstructural measures (such as flood proofing and buyouts of flood prone structures), changes in the system operation, and combinations of measures.

A strategic activity to address minor flood events is the flood control pool releases consistent with the current system operating plan. While there is only limited and preliminary data at this time to confirm the effectiveness, it is likely that this approach reduces flooding related to the more frequent (minor/moderate) flood events. It is important to note, however, that large flood events, like those frequent in the late 1980s and 1990s, overwhelm available flood storages, significantly limit the ability to transfer flood waters to downstream lakes quickly, and cause significant flooding with or without operational modifications.

Grand/Neosho Ecosystem Restoration Study

Section 208, Flood Control Act of 1956

Study

The study area consists of the 12,500 square-mile Grand/Neosho River Basin in northeastern Oklahoma and southeastern Kansas. Flooding around Grand Lake, sedimentation problems in John Redmond Reservoir, and the 1,800 square miles of uncontrolled drainage areas have increased the need for a basin-wide study to address flooding and floodplain management problems and opportunities and ecosystem improvements associated with aquatic habitats, wetlands, and watershed corridors.

A feasibility cost-share agreement was executed with the Kansas Water Office on September 2006 for the John Redmond Reservoir Study. This interim study will focus on the ecosystem degradation that has occurred in John Redmond Reservoir. This degradation is largely a result of sedimentation and nutrient loading. Other local issues such as the log jam and an assessment of dredging as an alternative are included in the multiyear study.

Marion Reservoir could be the second of several interim studies to be conducted under the Grand/Neosho Watershed authority. Funds would be used to execute agreement and initiate study. Dependent upon funding received; efforts in fiscal year 2007 could focus on modeling, formulation of alternatives and collaboration efforts.

The John Redmond study is the first of several interim studies to be conducted under the Grand/Neosho authority. Funds are being used to execute feasibility cost-share agreement and initiate study. Depending on funding received, efforts in fiscal year 2007 will primarily be focused on data gathering and modeling, formulation of alternatives and collaboration efforts.

Hulah/Copan Reallocation Study

Study

The Hulah/Copan Reallocation report was signed by the District Commander and sent to Corps Headquarters on April 26, 2006. The District expects about a year for the review and approval to occur. This report and its accompanying contracts identify an additional 6 million gallons per day (mgd) for the city of Bartlesville. One mgd will be contracted from existing storage but this study identified an additional 5 mgd to be reallocated to water supply from water quality.

Severe drought conditions in 2001-2002 caused Hulah Lake to lose a considerable portion (over 80%) of its conservation pool. Bartlesville ceased using Hulah Lake for water supply on April 18, 2002 and, on an emergency, temporary basis, began withdrawing water from Caney River made available from Copan Lake water quality storage releases.

The study examined several alternatives to maintain consistent water supply for Bartlesville and surrounding communities through 2035. The report recommends reallocating water from water quality storage to water supply storage. Implementation of this action will cause no adverse impacts to biological or cultural resources. The hydrology analysis indicates that there would be no affect on downstream flooding. Because this is less than 15% of the total usable storage, the reallocation may be approved by the Chief of Engineers.

Joe Creek Ecosystem Restoration Project, Tulsa, Oklahoma

Section 1135, Water Resouces Devemopment Act of 1986 (Continuing Authority - - Habitat Restoration)

Feasibility Study

Joe Creek is a tributary to the Arkansas River at Tulsa, Oklahoma. The Joe Creek Local Protection Project was constructed under the authority of Section 205 of the 1948 Flood Control Act. A majority of the improved channel is concrete lined.

The proposed project will focus on improvements to the riparian stream corridor habitat that was impaired when the original flood control project was constructed.

In December 2006, a draft formulation report was submitted to the sponsor, the city of Tulsa, for their review and approval.

Fiscal year 2007 activities are focused on completion of the detailed feasibility study efforts.

Lawton Wastewater Infrastructure

Section 219(f)(40), Water Resources Development Act of 1992 as amended

Pre-Construction Engineering & Design

The project consists of constructing wastewater infrastructure for the city of Lawton, Oklahoma. Lawton is located approximately 100 miles southwest of Oklahoma City in Comanche County, Oklahoma.

The city is conducting a 20-year, three-phase $63 million sewer rehabilitation program in response to a consent order from the Oklahoma Department of Environmental Quality. The program involves total replacement of sewer pipelines and upgrading of other components. The services provided by the city's infrastructure include off-base housing for the Army at Fort Sill. The Corps participation in the overall project will be approximately $2.5 million.

The city will provide the construction plans and specifications and the Corps will conduct all contracting and construction administration services as well as publication of the Environmental Assessment.

In fiscal year 2007, the Environmental Assessment was completed and the Project Cooperation Agreement (PCA) was drafted.

In fiscal year 2008, with the approval of the PCA, the sponsor can begin acquisition of real estate. If the PCA is approved in a timely manner and if there are no major real estate acquisition issues, a construction contract could be underway in fiscal year 2010.

McClellan-Kerr Arkansas River Navigation System (MKARNS), Arkansas & Oklahoma, 12-Foot Navigation Channel

Section 136, Energy and Water Development Appropriations Act, fiscal year 2004 (Public Law 108-137)

Under Construction

The McClellan-Kerr Arkansas River Navigation System is approximately 445 miles in length and consists of 18 locks and dams providing 9-foot depth inland navigation from the Mississippi River to Catoosa, Oklahoma. In 2005, the system carried 12.9 million tons of various materials to include petroleum products, wheat, chemicals, and steel.

This project would deepen the navigation channel to a minimum depth of 12 feet thereby increasing the efficiency of the system. Deepening of the channel will be performed by a combination of techniques including altering the flow management, constructing dikes and jetties and dredging the channel. This project also includes a significant environmental component to include creation of bottomland hardwood forests and high quality wetlands as well as other environmental enhancements.

This project has a projected cost estimate of $165.5 million and is jointly managed by both Little Rock and Tulsa Districts. To date, $7.0 million was provided through a fiscal year 2005 congressional add to complete the feasibility study and the Environmental Impact Statement as well as to start dredging activities and construction of dikes and jetties.

During fiscal year 2006, dredging commenced and was completed at mile 348 in Pool 15 in Oklahoma as well as commencing construction of training structures in Pools 2 and 7 in Arkansas. Construction of a Least Tern Island with rock protection was also accomplished in conjunction with the dredging activities in Pool 15. Design of river structures was accomplished for Pools 2, 7 and 5. Mitigation activities including aquatic and terrestrial surveys were performed in both Oklahoma and Arkansas. A five-year project plan was also developed for the project that includes an integrated project breakdown of activities and associated costs that has been vetted through the navigation stakeholders.

This project is not included in the fiscal year 2007 budget, though fiscal year 2006 carryover funds will be used to place stone structures to improve self scour in Arkansas, and the continuation of design of upland dredge disposal sites, and real estate efforts in Oklahoma. Once available funds are exhausted, no further work will be done on the deepening.

North Canadian River Aquatic Ecosystem Restoration Project, Oklahoma

Under Construction

The project is essentially complete and consists of the reestablishment of an aquatic wetland ecosystem corridor along the North Canadian (Oklahoma) River between Western Avenue and May Avenue in Oklahoma City. The restoration was accomplished by constructing about 26.5 acres of wetlands and related water control structures to manage the wetlands. The low-water dam near Western Avenue was constructed by Oklahoma City and creates a backwater pool with about 145 acres of open water aquatic habitat and provides a reliable source of water for the adja-

Dredging the McClellan-Kerr Arkansas River Navigation System is an ongoing maintenance need to keep the channel open. The ongoing deeping project will allow shippers to increase the loads hauled. The greater capacity of the channel the greater system efficiency.

cent wetlands. Approximately 54 acres of bottomland hardwood and riparian trees along with native grasses were planted along both sides of the river to reestablish a contiguous riparian corridor. An irrigation system was installed to water the plantings.

Included in the project are two multipurpose maintenance trails consisting of a 12-foot-wide asphalt trail and a 6-foot-wide concrete trail.

Additional planning activities in 2007 will address future adaptive management measures, consistent with Federal criteria, to assure project compatibility with Oklahoma City's comprehensive plan for the Oklahoma River corridor.

Oklahoma Comprehensive Water Plan

Study

We are providing technical planning assistance to help the Oklahoma Water Resources Board update the Oklahoma Comprehensive Water Plan (OCWP).

Initial assistance is being provided through the Planning Assistance to States program and the on-going Southeast Oklahoma General Investigations study.

The study will include the development of a programmatic work plan for the Technical Studies component of the OCWP while taking into consideration the interaction of the Policy Development component of the OCWP. Since southeast Oklahoma will play a critical role in contributing the water resources required for Oklahoma's future sustainable development, the Southeast Oklahoma General Investigations study will be fully integrated with the development of the OCWP. The Corps' potential assistance in the implementation of the Technical Studies component of the OCWP will be determined at a later date.

The first phase of the OCWP update will focus on development of water demand projections by county and region throughout forecast year 2060 as well as a comprehensive inventory and analysis of the state's water supplies.

Coinciding with this effort will be the initiation of an extensive public participation program. Forty-two public meetings will be held throughout the state to create a transparent and open planning process that will lead to feasible and defensible policy for Oklahoma's future.

Phase two of the updated Water Plan will identify local and regional problems and opportunities related to the use of water for public supply, agricultural, industrial, recreational, and environmental uses. This particular segment of the planning process, involving close partnerships with both municipal and rural water system representatives, will identify infrastructure needs, management options, and other measures to maximize the efficiency of Oklahoma's public water suppliers.

The third phase of the state water planning process involves the implementation of planning initiatives and tools derived from the issues, problems and needs identified during phase two. The Oklahoma Water Resources Board will draw upon the expertise of Oklahoma's foremost water experts from various water use sectors, local, state and Federal governments, and universities to develop policy recommendations for consideration by the state legislature.

Oologah Lake Watershed Feasibility Study, Oklahoma and Kansas

Section 206, Flood Control Act 1958; Resolution adopted on May 25, 1960 by the House Committee on Public Works

Study

The Verdigris River Basin drainage area is approximately 4,300 square miles and is located in southeastern Kansas and northeastern Oklahoma. This basin is impounded to form Oologah Lake.

The study will address impacts of upstream development on aquatic and terrestrial habitat within the basin. Upstream development has also adversely affected the water quality at Oologah Lake which is a water supply source for the city of Tulsa.

In July 2006, we conducted a feasibility scoping meeting with Corps Headquarters. In early June 2006, the District distributed the extensive "read ahead" package for the headquarters team. The Kansas Water Office has expressed an interest in the study and the District is meeting with them to further discuss the option of Kansas Water Office becoming a cost-share sponsor.

In 2007, funds are being used to continue the study. The District is working closely with the cost-sharing partner, local stakeholders and the Kansas Water Office to address issues in the upper reaches of the watershed.

Sand Creek Ecosystem Restoration Project, Newton, Kansas

Section 1135 of the Water Resouces Devemopment Act 1986, as amended (Continuing Authority - Habitat Restoration)

Pre-Construction Engineering & Design

The Sand Creek Ecosystem Restoration Project focuses on improvements along Sand Creek within the city limits of Newton, Kansas. The Sand Creek Local Flood Protection Project was completed by the Corps of Engineers in April 1967.

The proposed project will focus on improvements to the riparian stream corridor habitat that was impaired when the original flood control project was constructed. Fiscal year 2007 efforts are focused on completion of contract plans and specifications. We anticipate initiating construction efforts in the first quarter of fiscal year 2008.

Spavinaw Lake Watershed Feasibility Study

Section 208, Flood Control Act of 1965 (Public Law 89-298)

Study

Spavinaw Creek, and its downstream impoundments - Eucha and Spavinaw Lakes, is severely impacted by nutrient loading and excessive algae growth as a result of agricultural practices in Arkansas and Oklahoma. Degradation of water quality has led to taste and odor problems, increased treatment costs, and the lakes' decreased recreational and aesthetic value. Together, Spavinaw and Eucha Lakes provide 47% of the water supply for the Tulsa metropolitan

area. The Tulsa Metropolitan Utility Authority entered into the feasibility cost-share agreement in June 2004.

Because of extensive ecosystem restoration work being done by the poultry industry in the watershed, this study is focused on in-lake solutions. In fiscal year 2005, we completed alternative formulation and began analysis.

In August 2006, the Tulsa team prepared the package for a feasibility scoping meeting. That meeting with Corps Headquarters was held in March 2007. In 2008, the team will complete alternative analysis including engineering and environmental analyses.

Tar Creek and Spring Creek Watershed Management Plan Development

Complete

The Tar Creek Grant for $3.5 million was awarded by the Corps of Engineers to the Oklahoma Department of Environmental Quality on June 12, 2007. The grant will be used for demolition of homes purchased by the State of Oklahoma in the communities of Picher, Cardin, and Hockerville in the Tar Creek area.

The State of Oklahoma has begun relocating citizens because of subsidence potential identified in a January 2006 Subsidence Report prepared by the Corps of Engineers. The grant allows use of the funds over the next two years with two one-year extensions possible. The relocation is anticipated to cost $50 million in Federal funds for a voluntary buyout of approximately 600 homes in the Tar Creek area.

U.S. Highway 83 Bridge, Erosion Control Project, Garden City, Kansas

Section 14 of the 1946 Flood Control Act, as amended (Continuing Authority - Emergency Streambank Protection)

Completed

The U.S. Highway 83 Bridge Erosion Control Project is located in Garden City in western Kansas. Bank erosion associated with lateral migration of the Arkansas River is encroaching on the U.S. Highway 83 embankment and approaches to the bridge.

The value of the infrastructure at risk is approximately $5 million. The sponsor for this effort is the Kansas Department of Transportation.

Planning, engineering and design efforts were completed in 2005.

Construction efforts were initiated in September 2006 and completed in January 2007.

Photo of the "bullgear" taken during maintenance of the Webbers Falls powerplant in 1990.

Walnut River Basin Feasibility Study

Flood Control Act of 1965, approved October 27, 1965; Public Law 89-295, HD 232, 89th Congress, 1st Session

Study

The Walnut River Basin covers about 2,000 square miles in southeastern Kansas. The Walnut River combines with the Arkansas River at Arkansas City, which flows across the Kansas-Oklahoma state line within about 10 miles of Arkansas City. The city of Wichita is located immediately west of the basin.

The U.S. Fish and Wildlife Service (USFWS) estimate that Kansas has lost almost 50% of its wetlands since the 1980s, with the vast majority of the losses since 1950. The loss of these wetlands means urban and rural runoff previously "filtered naturally" before entering a watercourse now enters the stream directly. The result of past and continuing losses is both a reduction in area and ecological system viability due to fragmentation. Some of the measurable losses include wildlife density, reductions in animal and plant species, and significant reductions in water quality. At the request of the local sponsors, the feasibility effort is focused on a 230-square-mile watershed impounded by El Dorado Lake. The sponsors are the Kansas Water Office, Kansas Water Authority, and the city of El Dorado.

Study efforts include addressing opportunities to reduce sedimentation in El Dorado Lake and to meet the watershed total daily maximum load (TMDL) issues of sediment and eutrophication for the purpose of preserving existing water supply storage and to restore riparian and aquatic habitat and ecosystem function in the lake and upstream watershed.

About a dozen state and Federal environmental agencies are participating as team members in the feasibility study. The feasibility study is identifying ecosystem resources, evaluating the system qualities, determining past losses and current needs, and evaluating potential restoration and preservation measures. Justified collections of measures found to be warranted and acceptable to the sponsor and the Federal government will be recommended for implementation. In part, this plan will allow monitoring of implemented restoration measures, which will provide opportunities to revise and improve the application of standard best management practices for this basin application. The feasibility cost-sharing agreement was executed in November 2001.

The plan for completing the feasibility study in fiscal year 2007 includes formulation of watershed management oppor-

tunities, reservoir shoreline restoration, and a larger scale reservoir revitalization plan. A draft report is scheduled for submission in September 2007.

Webbers Falls Powerhouse Major Rehabilitation, Oklahoma

River & Harbor Act, approved July 24, 1946; Project Document HD 758, 79th Congress, 2d Session

O&M

The run-of-river power plant contains three 23,000 kilowatt (kW) inclined-axis Kaplan-type generating units with a total rated generating capacity of 60,000 kW. These turbines are the first tube turbines of this magnitude ever built and placed in operation. As a result, the design did not consider all of the factors that would be specific to the operation of slant-axis turbines, consequently the project has been plagued with mechanical reliability problems during its operation. Currently one turbine is non-operational; the two remaining units will continue to fail regularly until they can no longer generate power. The major rehab project will replace all three turbines resulting in $1.32 million of net benefits per month to the nation. In addition to rehabbing the turbines, the cranes will be rehabbed, the generators will be rewound and turbine governors will be upgraded which will increase the capacity of the plant by 8.5%.

The Webbers Falls Powerhouse Rehabilitation project current cost is $65.2 million. In February 2001, the Corps of Engineers' Hydroelectric Design Center recommended that the Ozark and Webbers Falls turbine replacements be combined into one contract for a savings to the government and power customers of over $5 million. The Webbers Falls Turbine Replacement contract was subsequently included in the Ozark contract as an option and awarded May 3, 2005. This option expires in 2008.

Fiscal year 2007 activities include the design and award of the turbine and generator bay bridge cranes as well as awarding the first turbine runner contract using customer funds.

Wister Lake Watershed Study

Resolution adopted January 28, 1955 by the Senate Committee on Public Works

Study

Wister Lake is an important water supply resource and provides important aquatic and terrestrial habitat for wildlife as well as recreational opportunities for citizens of Oklahoma and Arkansas. However, excessive sedimentation, turbidity and nutrient loading are impacting the aquatic ecosystem and water supply at Wister Lake. Wind and wave action combined with shoreline erosion and nutrient inputs contribute to habitat loss and degradation in the lake.

In 2006, we prepared the extensive package for the feasibility scoping meeting with Corps Headquarters and conducted preliminary alternative analysis.

In 2007, the District continued with its studies of in-lake alternatives to address aquatic ecosystem issues in the lake. These studies include environmental, hydrologic and engineering studies. In 2008, the District intends to complete a feasibility scoping meeting with Corps Headquarters and complete the alternative analysis.

Skiatook Public/Private Partnership Celebration

CrossTimbers' Lighthouse.

June 11, 2007, the city of Skiatook and the Skiatook Economic Development Authority hosted a dinner to celebrate the public/private partnership of the CrossTimbers Resort located on Skiatook Lake, Oklahoma. Stephanie Upton, Executive Director of the Skiatook Chamber of Commerce (left) presented Col. Kurka (right) with a Certificate of Appreciation. Ron Howell, commercial developer of the resort, is center. Col. Kurka was also presented with a "Key to the City" of Skiatook in recognition of Tulsa District's work on CrossTimbers development.

Bowie County Levee

Energy and Water Development Appropriation Act of 2001 and 2002

Pre-Construction Engineering & Design

The Bowie County Levee is located near Texarkana, Texas, in Bowie County, Texas. The existing levee is 8.8 miles long and was built in 1913. The locally preferred plan, known as Alternative B, is the plan which will be constructed. This plan consists of restoring 6.0 miles of existing levee, constructing 4.0 miles of new levee, and constructing 1.4 miles of channel to divert Barkman Creek flows to the Red River.

In fiscal year 2007, the extensive archaeological survey and report were completed, the Project Documentation Report was updated, and plans and specifications were approved.

Traditionally, the responsibility for relocations has fallen onto the sponsor. In this case, the sponsor has requested that the financial responsibility for relocations be assigned to the government. In order for this to happen, legislation is necessary. This legislation, or the lack of it, has a direct bearing on the provisions of the Project Cooperation Agreement (PCA). Therefore, drafting of the PCA will not begin until the fiscal year 2008 legislation is passed and the status of this issue is known.

The schedule, which still contains many variables, shows construction scheduled to begin in fiscal year 2010 and end an estimated two years later.

Kemp Lake Reallocation Study

Water Resources Development Act of 1986

Study

Lake Kemp is located on the Wichita River at river mile 126.7 in Baylor County, Texas. Lake Kemp was originally constructed in 1924 by the Wichita County Water Improvement District #1. The lake was constructed for the primary purposes of irrigation, water supply, and related uses.

The project is operated and maintained by the Wichita County Water Improvement District #2 and the city of Wichita Falls, Texas.

During the design and reconstruction of Lake Kemp, sedimentation was a key consideration. Design Memorandum No. 1 recommended raising the conservation pool after 40 years of operation to recover conservation storage lost to sedimentation. The latest sedimentation survey performed at Lake Kemp was in 1973, and it indicated an expected high level of sedimentation. In recent years, during drought conditions, the upper portions of Lake Kemp appear severely impacted by sedimentation.

The study is being conducted with the Texas Water Development Board in conjunction with the Wichita County Water Improvement District #2 and the city of Wichita Falls. The District is using $115,000 to initiate preliminary studies in 2007.

Mangum Geotechnical Study

Section 22 of the 1974 Water Resources Development Act

Study

Phase VI of the Mangum Lake Geotechnical study will focus primarily on cost estimates for the preferred dam alignment. We will also drill one bore hole and develop a piezometer at the site. A draft cost-share agreement has been sent to the Oklahoma Water Resources Board.

The recently completed Phase V study was comprised of a geotechnical investigation and stream loss study of the proposed dam site near Mangum, Oklahoma. The Oklahoma Water Resources Board was the cost-share partner.

Foundation conditions at the proposed Mangum Dam site, 2 miles southwest of Mangum on the Salt Fork of the Red River, appear to be favorable. Complex geology and karstic conditions impose limits on elevation, size and capacity of Mangum Reservoir. While the proposed dam site was proven feasible, the elevation would be 1550 feet (mean sea level) rather than the preferred 1560 feet. The difference in elevation reduces the acre-feet of storage by half.

Further study could be focused on additional characterization of foundation conditions, hydrogeology and water loss.

Red River Basin Chloride Control Project

This project was authorized for construction by the Flood Control Act of 1966, approved November 7, 1966, Public Law 89-789, SD 110; as modified by the Flood Control Act approved December 31, 1970, Public Law 91-611; and as amended by the Water Resources Development Acts of 1974 and 1976. The Water Resources Development Act of 1986, Public Law 99-662, amended the above authorization to separate the overall project into the Arkansas River Basin and the Red River Basin and authorized the Red River Basin for construction subject to a favorable report by a review panel on the performance of Area VIII.

Under Construction

The Red River Chloride Control Project is authorized to identify and implement measures to reduce naturally occurring brine emissions into several sub basins within the Red River Basin in northern Texas and southern Oklahoma. The project's primary purpose is to improve water quality for municipal, industrial, and agricultural uses along the Red River within Oklahoma, Texas, Arkansas and Louisiana.

Portions of the Wichita River Basin Chloride Control element, located in northwest Texas, have been constructed and have been in operation since 1987. Features completed and in operation include two low-flow collection dams, a pump station and diversion pipeline to the Truscott Brine Disposal Reservoir.

Recently, the State of Oklahoma expressed renewed

interest in the Area VI element of the Red River project. Area VI is located on the Elm Fork of the North Fork of the Red River in Harmon County, Oklahoma.

Fiscal year 2007 efforts are focused on completion of contract plans and specifications at Area VII in Texas and continued reevaluation efforts for Area VI within the Elm Fork Basin in Oklahoma. In addition, detailed baseline environmental monitoring activities are continuing.

Southeast Oklahoma Water Resource Study

1983 Supplemental Appropriation Act (PL 98-63)

Study

The Oklahoma Water Resources Board is the sponsor and they have requested that the study scope be updated to be consistent with the development of the Oklahoma Comprehensive Water Plan (OCWP). A programmatic work plan for the OCWP is scheduled to be completed in the first quarter of fiscal year 2008.

The cumulative effects of land use changes in the Kiamichi River Basin and other tributaries of the Red River have resulted in a loss of habitat for a number of aquatic species that are critical to the functioning of the riverine ecosystem. The Corps of Engineers was authorized to investigate water resource related problems in the study area which encompasses 29 counties in southeast Oklahoma, including the Kiamichi River Basin and other tributaries of the Red River.

The reconnaissance study found a Federal interest in ecosystem restoration in the Kiamichi River Basin. That study recommended proceeding to a cost-shared feasibility study with the Oklahoma Water Resources Board as the local sponsor.

The reconnaissance report was certified in January 2001. The feasibility cost-sharing agreement was signed with the local sponsor, the Oklahoma Water Resources Board on July 10, 2001.

This is a complex, 11-year feasibility study that will be conducted in 5 phases. Phase 1 involves rough estimates of the water available in the Kiamichi River and Little River Basins for environmental restoration after other water needs have been met.

The next phase of this study will consist of an infrastructure assessment and water use impacts on this important natural resource.

Texoma Reallocation Study

Water Resources Development Act of 1986

Study

The Water Resources Development Act of 1986 authorized the Secretary to reallocate 300,000 acre-feet of storage from hydropower to water supply storage at Lake Texoma. The law specified that 150,000 acre-feet of storage would go to Texas and Oklahoma with 50,000 acre-feet of the Texas total going to the Greater Texoma Utility Authority. The North Texas Municipal Water District (NTMWD) has expressed an interest in the remaining Texas storage.

The final public review of the Environmental Assessment on the reallocation report ended in January 2006. Responses to comments were completed in early May and the final Environmental Assessment, reallocation report, and water supply agreements were sent to Corps Headquarters in June 2006.

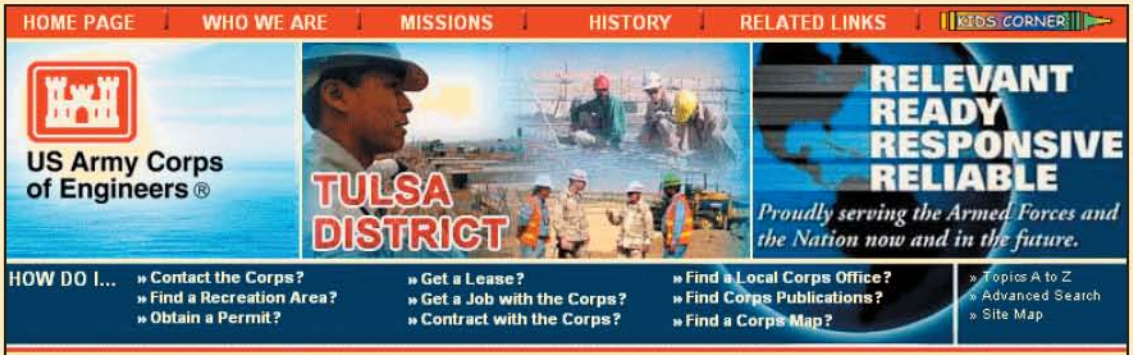
The final report recommends the reallocation of 300,000 acre-feet from hydropower to water supply. Water supply agreements for 105,000 acre-feet were sent with the report for review and approval.

Washita Feasibility Study

Red River and Tributaries above Denison Dam, Texas, Oklahoma, and New Mexico, House Resolution dated February 25, 1938; Senate Resolutions dated February 18, 1954 and June 19, 1962

Study

The Washita River is a tributary to the Red River in Oklahoma and flows into Lake Texoma. The reconnaissance study report is being updated to take into consideration the Oklahoma Comprehensive Water Plan goals and objectives. We anticipate the reconnaissance study will also identify a Federal interest for flood damage reduction and ecosystem restoration. The Oklahoma Water Resources Board is a potential sponsor for a future feasibility study. They are also interested in a study of golden algae. This algae can create a toxin which is deadly to fish. This toxin has the potential to have very serious impacts on the regional economy due to the striper fishery on Lake Texoma.



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Carter earns Customer Care award

Brad Carter of the Fort Sill Resident Office has been named Tulsa District's Customer Care Employee of the Quarter for the second quarter, FY 07. Carter is a civil engineer for Engineering and Construction Division. His duties include project oversight and technical services for operations and maintenance projects as well as military construction. According to the nomination, he has rendered them in a very professional and responsive manner. Brenda S ...

Corps seeks retirees for emergency response cadre

The Rehired Annuitant Program has been in existence within the Corps of Engineers for about two years. It permits federal civil service retirees (they do not have to be retired from the Corps) to return to work, on an intermittent basis, with no reduction in their federal retirement annuity. The Rehired Annuitant Cadre is part of the Homeland Security office at Headquarters and was organized primarily to provide a source of readily available help, on ...

New boating law in effect

Boat and PWC operators 12 years of age up to 16 years of age must complete an approved Boat Safety Course (6 hours) before operating on Oklahoma waters (some exemptions apply). Anyone 16 years of age or older must posses a photo ID when operating. To enroll in a free Boat Safety Course offered by the Oklahoma Highway Patrol or to learn more go to: WWW.OKBOATED.COM Most insurance companies will give a disc ...

Water Safety - Is for You and Your Family

Water Safety Media Kit
Tulsa District Water Safety Page
Corps National Water Safety Prog

News Released by Tulsa District

Aug 2 U.S. Army Corps of Engineers to conduct survey at Great Salt Plains - TULSA, Okla. -- The U.S. Army Corps of Engineers in Tulsa announced today that a week-long Time Critical Removal Action will begin Monday i ...

Engineer Update
(HQ Newsletter)

Pacesetter

Opens a PDF file

For updated project information, access our web site at:
http:\\www.swt.usace.army.mil
or call
1-918-669-7366