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# Engineer Update

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## Seven Oaks Dam marks a milestone

Article by Herb Nesmith  
Photo by Dr. Fred-Otto Egeler  
Los Angeles District

An era drew to a close for the U.S. Army Corps of Engineers on Jan. 7 with the dedication of the Seven Oaks Dam. The project is probably the last large-scale dam the Corps will build in the foreseeable future. The project, managed by Los Angeles District, is a key piece of the Santa Ana River Mainstem Flood Control Project that will provide dramatically greater flood protection to more than three million residents and 255,000 structures in the Los Angeles area.

"The project is going to protect the Southern California area from the most severe flood that could occur, which could damage three million homes, businesses, (and) properties," said Secretary of the Army Louis Caldera after the dedication. "It would cut our north-south freeways, (and) impact our entire nation. This is probably one of the last great dams that we'll build in the U.S. in the foreseeable future. There are no more on the drawing board."

"Today's ceremony is a celebration of many partnerships working toward a single goal — flood protection for residents of Orange, Riverside, and San Bernardino counties that reside along the Santa Ana River Mainstem," said Brig. Gen. Peter Madsen, South Pacific Division Commander. "Each of the counties stood up to the table, put their signatures on the line, and pledged to share in the costs of the \$1.4 billion project. They have put their stamp on this project and have been with us through every facet, and worked with us on every challenge."

The official groundbreaking for the dam was in January 1991, the embankment contract was awarded to Odebrecht Contractors of California in March 1994, and the structure reached its maximum elevation last June. More than 3.5 million hours of work went into construction, and the state Occupational Safety and Health Department (Cal-OSHA) recognized Odebrecht for its safety achievements in building the dam. On a national scale of 200,000 man-hours, one lost-time accident yields a score of 1.0. The national average for construction accidents is 12.3. The Corps' construction average is 1.07. Odebrecht's average at Seven Oaks was 0.7. This was the first-ever Cal-OSHA safety award to a private contractor.

### Huge numbers

Seven Oaks Dam extends across upper Santa Ana Canyon 13 miles east-northeast of San Bernardino, Calif., and 78 miles east of Los Angeles. Rising 550 feet from the floor of the canyon, it is the 12th highest in the nation. With its impermeable clay core and 38 million cubic yards of compacted earth and rockfill, it is the 10th largest in volume in the U.S., and 25th biggest in the world.

To build it, the contractor brought in five million cubic yards of impermeable clay to prevent water penetration. Figuring that each of the huge dumptrucks used on the job carried about 40 cubic yards per trip, that's about 120,000 truckloads.

For strength and stability, permeable rock and soil was added — 33 million cubic yards of it, enough to fill about 740,000 truckloads. To move that much, Odebrecht used giant trucks and almost five



The Seven Oaks Dam is a key piece of the Santa Ana River Mainstem Project which will protect three million people and 225,000 structures in the Los Angeles area.

miles of conveyor-belt systems to haul material from nearby areas.

The dam measures 2,200 feet wide at the base, narrowing to 40 feet at the top. The crest is more than 900 yards long. Behind it, a flood-control reservoir is capable of holding 145,600 acre-feet at the spillway crest. That's 47.5 billion gallons of water.

The spillway, 500 feet wide and 30 feet lower than dam's crest, will direct floodwaters down an adjacent canyon and back into the river channel downstream. Should the dam have to open its gates, the water would race through the outlet works in an 18-foot conduit at around 100 miles an hour for 1,656 feet before shooting into a downstream plunge pool to dissipate its energy.

### High stakes

Orange County with its large flood plain will benefit the most from the dam, but portions of San Bernardino and Riverside counties are now also protected from, at a minimum, the level of flood that has only a one percent chance of occurring in a given year. But the stakes are higher now than before World War II. In the river's flood plain there are now thousands of homes and businesses. Damage from a major flood could reach \$15 billion.

### Just one part

Seven Oaks Dam is a major work, but it is just one part of the Corps' Santa Ana River Mainstem Project. The river from its headwaters in the San Bernardino Mountains to its mouth at the Pacific

Ocean runs just 75 miles, but passes through nine heavily-urbanized cities with valuable residential and commercial development. In semi-arid southern California, where droughts are not uncommon, residents may not think much about a flood. In fact, though, the Santa Ana River poses the greatest flood threat west of the Mississippi River.

The 1938 flood was the region's worst in the 20th century. It overspread the entire northern half of Orange County. Nearly all bridges were destroyed, and there were damages to agricultural lands — lands that are now urbanized. Rapid growth in Southern California has decreased the effectiveness of the existing flood-control system, because areas that would once have absorbed rainfall runoff have been reduced by widespread development.

Today, without Seven Oaks, flooding could exceed the present capacity of the Corps' Prado Dam 35 miles downstream, breach levees, and spread over 110,000 acres. Transportation corridors would be heavily impacted, and traffic halted on six major freeways as well as railroad lines. Major public facilities would be inundated — hospitals, sanitation plants, hotels, shopping centers, universities and community colleges, sports arenas, and important economic venues such as Disneyland and Knotts Berry Farm.

The Santa Ana River Mainstem Flood Control Project is expected to relieve downstream homes and businesses from flood insurance. A decision whether to lift that requirement could be made by the Federal Emergency Management Agency in the next few months. The project is scheduled for completion by 2006 at an estimated cost of \$1.4 billion.



The Washington Aqueduct Division (left) and the mat-sinking unit of Vicksburg District showed impressive safety gains in the past year. (Photos from the Digital Visual Library)

# Safety program had good, bad news

By Bernard Tate  
Headquarters

There was good news and bad news last fiscal year in the U.S. Army Corps of Engineers' safety and occupational health program.

The good news is that the lost-time accident rate (number of lost-time accidents per 100 workers) continues a five-year downward trend, from 1.25 in fiscal year 1998 (FY98) to 1.07 in FY99. "The Corps' rate is about half of the Army's rate and we've pushed it down further every year," said Connie DeWitte, Chief of the Corps' Occupational Safety and Health Office. "Once again, it's in record-setting territory."

The contractor accident rate also continues to hold steady at about five times lower than the construction sector of private industry.

**Fatalities.** "What we're disappointed in is the fatalities," said DeWitte. "We had three accident fatalities to government employees last fiscal year, and we had nine contractor fatalities. Last year we had it down to *no* government fatalities and *two* contractor fatalities, so this is a backsliding. It's not outside our statistical range but, nevertheless, it's a red flag going up and, collectively, we need to address this problem."

"One of our projects this year is building a lesson-learned database using information from the causes of Corps fatalities in past years," said DeWitte. "A supervisor will be able to look at a pending operation to see the kinds of things that caused fatalities and other serious accidents in that type of operation."

There was other good news on the Corps' safety front last fiscal year.

"Water safety is a fairly good news story, I think," said DeWitte. "Although we had 192 drownings last year at our Corps projects, this is an improvement over 212 the year before. In 1995, '96, and '97 we were in the 150-170 range, and it popped up to 212 in FY98. That was a very warm summer, and our facilities were used a lot, for a longer period. But last year it was down to 192. Not as good as our lowest figures, but we are bringing it down."

"We're placing more responsibility on our Water Safety Committee members in the field, which is part



Safety Squirrel was one of the programs that helped reduce drownings at Corps lakes last year. (Photo courtesy of Mobile District)

of the National Water Safety Council," said Vickie Siebert, Safety and Occupational Health Manager at Headquarters. "That's a real win-win situation. They support Headquarters' safety work, and it gives seasoning to the field people who've never done safety policy or the other things Headquarters does. For example, John Punkiewicz in Rock Island District has helped us gather water accident information and compile the statistics. We really appreciate the help of people like John, and their commanders for understanding the importance of the water safety programs and letting their people work with us."

**Improvements.** "Something else I'm impressed with are some of the places that have had a lot of problems in the past really went after safety and have had some excellent results," said DeWitte.

The Washington Aqueduct Division recorded outstanding improvements in its safety record for the second straight year. In FY96 the Aqueduct had among the worst safety records in DoD, with 10.6 incidents per 100 workers. A recent Presidential initiative set goals for federal activities with poor safety records to improve their rates by 10 percent per year for the next five years. The Aqueduct has already achieved its 2004 goal, if it maintains its FY99 rate (2.42). As part of this effort, the Aqueduct hired a top occupational health professional to provide on-site safety and occupational health support.

The mat-sinking unit in Vicksburg District completed the sinking season with only two lost-time accidents in a five-month season, compared to 17 lost-time accidents last year. Improvement came from supervisor emphasis on safety, going to one 10-hour shift instead of two, fewer temporary workers, and no night work.

Memphis District has had consistently high accident rates. But last fiscal year, for the first time in recent history, they achieved a rate that moved them out of the "red" into a successful "green" rating in our Command Management Review. The district engineer held safety stand-downs to increase safety awareness, and the district also went to fewer temporary employees, and to one shift instead of two.

"I attribute our overall sustained improvement to sustained command emphasis on safety," said DeWitte. "Safety is part of the Command Management Review; we have active safety programs and we've continued closely tracking them; and we haven't let workers compensation go, even though resources have been challenged. Commanders had the choice to let the workers comp program go a little bit, or to resource it as we need to. Almost to a person they made the latter choice."

**Training.** More safety programs are coming on-line this fiscal year. For example, ergonomics training will be taught in the divisions by teams from the the U.S. Army Center for Health Promotion and Preventative Medicine.

"The training is specifically designed for the Corps and the kind of work we do," said DeWitte. "It will train people to go back to their projects and identify situations where the person and the equipment are not designed to go together, sort of an accident waiting to happen."

"Jacksonville District has the lead on safety training for emergency operations," said Siebert. "When our people are called out on emergency operations, whether it's in Kosovo or in Miami for a hurricane, they'll already be up-to-date on safety and health."

"We're also working heavily on integrating safety and health into program and project management, which will be one our big projects this fiscal year," said DeWitte.



Insights

# All those in favor, raise your hand

By Lt. Col. Tim Carlson  
Chaplain, U.S. Army Corps of Engineers

Hands are such an important symbol in our relationships.

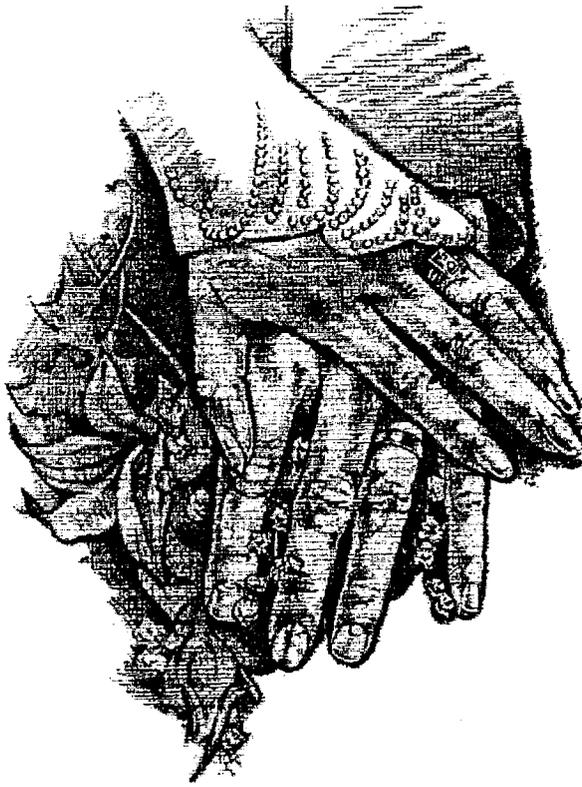
Do you recall the first time you took your lover's hand? A tingling and delight, almost beyond words, probably shot through you, leaving a sensation of pleasure and wonder.

I recall looking at my father's hands. They seemed so big and strong. The veins were prominent and his wedding ring accented the value of the fingers on his left hand.

Recently my wife and I took our college-age son to Dulles International Airport for his flight back to Chicago. For the first time since he left for school at Trinity International University, Kristian had come home for Thanksgiving. Our time with him had been very special.

Both my wife and I were still coming to terms with his growing up and leaving the nest. During the trip to the airport, and Judy handed Kristian photos of our family's life during the past 15 to 20 years. Judy's nickname is "Mor Mor," Norwegian for grandmother. Not too long into the photo reminiscence, our son said, "Mor Mor, take my hand."

That request lingers in my mind as I think of Valentine's Day. I've been the college route and so have many of you. We've traveled beyond the reach of a parent's hand, and now we, too, understand the



challenge and the pain of a life moving beyond our loving grasp. All the growing up, the study, the window washing jobs to fund his education, the many

times of needing a listening ear or a home-cooked meal were all gathered into his simple request as we traveled to the airport — "Mor Mor, take my hand."

Hands are an important spiritual symbol as well. From my tradition, John wrote of God's love, "I give them eternal life, and they shall never perish; no one shall snatch them out of my hand." When Peter tried to walk on the water to his Messiah, he lost his faith and began to sink. His Master rescued Peter by grabbing his hand. When Christ healed Dorcas, He took her hand to help her out of bed. Perhaps you recall reading similar references to hands from other religious traditions as well.

The experience of holding the hands of another represents peace and security. At this season of love, I invite us to value hands — the hands of your mate, the hands of your parents, the hands of your children and, not least of all, the mighty hands of God, in whatever way that you understand Him.

For many years, one of the leading insurance companies has used the symbol of hands to depict its customers' safety in their care. Hands truly are important in conveying love and comfort! So, I extend a Happy Valentine's Day to the Corps of Engineers, the best example I know of "good hands" people.

*(The views expressed in this article are those of the author and do not reflect the official policy or position of the U.S. Army Corps of Engineers, the Department of the Army, the Department of Defense, or the U.S. Government.)*

Commentary

## Quitting smoking is tough, worth it

By J. Leo Phillips  
Vicksburg District

There are still a few die-hard (literally, I'm afraid) folks out there who have not quit smoking. They need to quit, and I want to help without sounding "holier-than-thou."

I won't repeat all the reasons for quitting; they've been given adequate publicity. I doubt there is anyone left who needs convincing that they ought to quit. They just need help getting it done.

Yes, I smoked for about 25 years. For most of those years it was two packs a day -- Viceroy's. I could still smoke one 10 feet long. But now that I am approaching my sixth anniversary of quitting, I have too much invested to let go.

Quitting wasn't easy -- it's not for anyone who quits. I had several false starts. Mostly, those attempts were "tapering off." I would cut back to one pack a day for a week, half a pack for a week, and so on till I got to two cigarettes a day.

I had a lot of trouble getting past those last two. I must have tapered down four or five times. Then my smoking gradually increased, I got frustrated and started back full speed.

So I concluded that tapering off has a small chance of succeeding. The problem is the internal voice always arguing with you. It can come up with a thousand excuses why you should smoke. You have too many things on your mind right now, or someone yelled at you, or you need to celebrate (doesn't matter what), or your spouse is not sympathetic enough, or someone had the gall to ask you how quitting was coming. *Anything* becomes reason enough to smoke.

That's the basic fallacy of the taper-off method. You take so long getting to the "I don't smoke" mentality that your internal voice eventually wins. Also, the habit is readily available. You still have your cigarettes and lighter right in your pocket or purse. It's too easy to light up another one.

What about aids to quitting like nicotine gum, or those nicotine patches? For some folks the aids seem to help. The problem is the transition from the crutch to walking on your own. They have a similar problem in that your determination has to hold up for a long time to get to being a non-smoker.

There are other programs. You can go to a hypnotist, try acupuncture, or pay big bucks and attend seminars. The only real help to these deals is you have invested so much that your conscience might not let you backslide.

For my money, you'd do better to quit and give \$1,000 to your favorite charity. I have a friend who actually paid \$500 bucks each for him and his wife to attend a seminar. They quit smoking for about three months, then were right back at it full-steam.

I tried tapering several times, considered seminars, patches and whatever else there was available. I had relatives with good intentions constantly asking me when I was going to quit.

All this pressure, along with my own intellectual awareness that smoking made no positive contributions to my health and happiness, combined to bring me to the decision that I should just quit. I decided to bow up, get mad, and quit!

So I quit cold turkey. I had to psyche myself up. I told myself I would just take it a day at a time. I didn't worry about whether I would ever smoke again

or not. I took that first day by gritting my teeth and just not smoking.

The first day or two were slightly easier than days three and four. The craving peaked about day four and stayed at a high level for about the first two weeks. Also, after four days you have made enough progress that you build a little pride in the fact that you have made it that far.

But you still have to take it one day at a time. After two weeks the craving starts to ease. You begin to go for, maybe, 15 seconds without thinking about smoking. These periods of distraction grow with time. The real success point is when you can just not think about it.

But I suppose you never get to the point that you don't think about it at all. I quit on Feb. 17, 1994. In 1995, I still had a battle in my dreams. It got to the point in my dreams that I lost the battle and smoked! Then on subsequent nights, my dreams reminded me I had already smoked one, so it wasn't a big deal to smoke more. After a night of heavy dream-smoking, I felt like a failure until I shook the cobwebs enough to realize it wasn't real. I had to remind myself that I had not smoked.

So your internal voice works hard to get you to start back smoking. It uses all resources at its disposal, including your dreams.

I relate all this not to show what a wonderful person I am. But knowing what battles I fought might prepare you for the struggles you will have when you quit. Recognize it for the difficult challenge it is, set your mind to do it, then work hard at it.

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# Pentagon Renovation

## Biggest construction effort since 1941 showing results

By Tom Fontana  
Baltimore District

Not since crews began building the Pentagon in September 1941 could so much construction activity be seen at the nation's military headquarters. In fact, renovation crews are working in, around, or below all five sides of the Pentagon.

Along the South Terrace, work on the Corridor 2 pedestrian bridge nears completion. Pile-driving began in early August for the foundation of the second pedestrian bridge at Corridor 3. That bridge is expected to open when the first tenants move into renovated space in Wedge One late next year.

Last January, the last of 5,000 personnel relocated out of Wedge One, but the wedge is far from empty. Close to 300 workers involved in the reconstruction effort populate the area.

Just recently, the crews responsible for demolition and remediation inside the wedge completed the monumental task of removing 15 million pounds of debris, including three million pounds of asbestos. Similar amounts are expected to be found in the remaining four wedges.

Despite the prevalence of hazardous materials, the Wedge One team recycled close to 70 percent of all the debris removed, including millions of pounds of asphalt, aluminum, steel, and copper wire.

According to Dave Gabel, deputy project manager, all phases of work within Wedge One's million square feet of space continue at an aggressive pace.

"We've begun placing the new studwalls that will define the finished space and have insulated many areas," said Gabel. "We expect to begin moving tenants into renovated office space inside the wedge late this year, with the wedge becoming fully occupied by the spring of 2001."

### Remote Delivery Facility

Out at the Pentagon's Mall Terrace, a pile-driving operation continues on foundation work for a one-story, 250,000-square-foot Remote Delivery Facility (RDF). The RDF will significantly improve security by providing a secure consolidated location for receiving and screening the thousands of items shipped to the Pentagon each day.

"The RDF will enhance the security of the Pentagon by diverting more than 150 trucks and other commercial vehicles away from the building every business day," said John Jester, chief of Defense Protective Service, the agency responsible for securing the Pentagon. "During the past few years, terrorist events here in the U.S. and around the world attest to the security lapses that can occur when commercial vehicles are able to park below or adjacent to occupied buildings."



Work on the Corridor 2 pedestrian bridge is nearing completion. (Photo courtesy of Baltimore District)

### Basement, mezzanine

Back inside the Pentagon, one can hear the sounds of construction in the basement and mezzanine levels below the River Terrace. There, more than 1,100 personnel now walk through modern, bright corridors on their way to more than 450,000 square feet of renovated building space.

According to Kevin Powell, deputy project manager for Basement Seg-

ment 1, the renovation team has turned over 100 percent of the space here to Pentagon tenants.

"We're down to punch-list items in most areas," said Powell. "We're also progressing rapidly on a new Tri-Service Clinic in the Pentagon's former motor pool area."

Powell added that the Pentagon medical community can expect to begin moving into the new clinic early this year.

### More renovation work

A renovation team is now working on plans to improve traffic flow and security in an entrance area that accommodates 16,000 personnel each morning, as well as thousands more that use the same Metro stop as a transfer point. They expect to award a contract by July 2000.

Still more renovation work can be seen around the perimeter of the Pentagon as work continues on placing new utility lines. In some cases, this work involves the use of modern micro-tunneling technology, which employs a tunnel-boring machine guided by a laser beam. In one area near the Pentagon's heliport, excavation revealed a cement roadway believed to have been a runway from the old Hoover Airport, which once occupied a portion of the Pentagon site.

At a recent review of the Pentagon Renovation Program, Deputy Secretary of Defense Dr. John Hamre suggested a "back to basics" approach to the renovation effort. The paramount goal of the approach is to bring the Pentagon into compliance with modern building codes, which means replacing all of the major building systems and removing hazardous materials. Anything beyond those efforts will require close scrutiny as the Renovation Program endeavors to stay within its \$1.22 billion Congressional cap.

# Pittsburgh floats concrete

By Richard Dowling  
Pittsburgh District

Pittsburgh District kicked off the new fiscal year with a \$107 million gamble that could pay huge dividends in the district's worldwide engineering reputation. At issue is the selection of the successful contractor to use in-the-wet technology to build the new Braddock Dam on the Monongahela River, starting with two giant float-in concrete sections.

If successful, Pittsburgh District will be the first to have used the technique on the nation's inland waterway system. "If you want to be world-renowned, you've got to be willing to take some risks," said Col. David Ridenour, Pittsburgh District Engineer.

The district completed a selection process this summer that picked a joint venture of J. A. Jones Construction of Charlotte, N.C., and Traylor Brothers of Evansville, Ind., to build the new dam, part of the \$705 million Lower Monongahela Renovation Project. Crews from the joint venture are mobilizing for the estimated 40-month-long project. The workload is estimated at 700 man-years, or an average of more than 200 employees for a little



The Braddock Dam site is being prepared to receive the float-in concrete sections. (Photo courtesy of Pittsburgh District)

more than three years.

The unique aspect of the construction is that the firms will build the concrete sections off-site and float them into place for the new Braddock Dam just upriver of the current Mon River Dam 2. They will install the sections

without using large cofferdams and dewatering which are historically the universal practice in "dry" construction. This new in-the-wet technique offers potential savings of from \$5 mil-

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# Homestead AFB rebuilt after hurricane

Article by Tim Dugan  
Photo by Adrien Lamarre  
Mobile District

In August 1992, Hurricane Andrew hit Homestead Air Force Base, Fla., and forever changed its history. The storm damaged 75 percent of the base, prompting Department of Defense officials to close the active duty base and move military units and families.

But that was not the end of the story, and the U.S. Army Corps of Engineers played a big part in the outcome. Since then, the base has been divided, with about 75 percent turned over to the base closure agency, and the remainder serving as an Air Reserve Station (ARS).

Between 1992-99, the Corps had a large workload at Homestead ARS, mostly from a \$60 million special congressional appropriation for base upgrades, demolition, and repairs after the hurricane, said construction representative Harry Cronin, formerly of the Homestead Project Office.

**Steady program.** "Homestead has had a lot of work in the last couple years," said Jim Scheer, acting area engineer in the Florida Area Office. "The work continues at Homestead. It's not a big program, but it's a small, steady program. Right now it's just a reserve station; there are a few tenant units."

The 482nd Tactical Fighter Squadron (Reserves) operates the base and has one squadron of F-16s. Florida Air National Guard units fly F-15s. "They are virtually active duty units," Scheer said. "There's a big active group there."

"The Reserves do a lot of interservice training, such as with the Navy, the Canadians, and the British," said Cronin, who retired earlier this year. "But the base is a lot smaller since the hurricane." The Reserves have about 25 percent of the original base.

**Renovation.** As of mid-August, Homestead had \$6.6 million in design and \$5.35 million in construction. Design projects included the Fire Training Facility and the Renovation of Visiting Airmen Quarters (VAQ) Building 478 project. Four former barracks are being renovated. Building 476 is the Billeting Office and Visiting Officers Quarters. The other three buildings will be used for VAQ.

The \$2.8 million Renovate VAQ Building 477 project was completed earlier, and the \$3.2 million Renovate Building 475 project was completed in January. Construction requires about a year-and-a-half for each building.

Design called for gutting the barracks to the concrete frame and reconstructing totally new VAQs with exterior walkways instead of the center corridor configuration in the old barracks. All the rest have been demolished or turned over to the county.

Construction of the \$0.42 million Miscellaneous Fuel Systems Repairs began in July and has been completed five months ahead of schedule.

At the Fuel Farm, the Corps reno-



The \$4.5 million Entry Area project at Homestead Air Reserve Station included brick walls along the front entrance.

ated a jet fuel storage tank, for \$0.76 million. "We're bringing it up to American Petroleum Institution standards," said Cronin. "It's a 300,000-barrel tank. There are two more that will probably be renovated. We had to put in a new bottom and a new stabilizing roof. We also rehabed all their pumping stations."

The new \$2.8 million FAA Control Tower will handle military and civilian air traffic control, and the Survival Equipment Facility was completed in June 1998 for just under \$1 million. "They clean, rehab, and test parachutes," Cronin said. "They have a parachute drying facility, and they pack survival kits."

The \$60 million appropriation has almost been expended. About 50 percent of the structures are rehabs and the rest are new buildings, Cronin

said. The original base housing (1,400 units), 75 percent destroyed in the hurricane, was demolished by contract.

**Squadron area.** The appropriation included the \$21.3 million Package 1, 482nd Tactical Fighter Squadron Area, a 10-building project finished last April — Squadron Operations, a Base Operations Facility Complex, Base Supply/Warehouse/Traffic Management Offices, a Hazardous Materials/Pharmacy Facility, a Liquid Oxygen Facility, a Composite Maintenance Facility, a Mobility Processing Facility, Aerospace Ground Equipment, Base Civil Engineering, and the Aircraft Combat Maneuvering Instrumentation POD Shop.

"It was design-build," Cronin said. "They wanted to see if a design-build concept would work on a multiple build-

ing project."

After Andrew, one of the original contracts was \$2.5 million for Protection and Waterproofing of Various Buildings. Numerous contracts were let for demolition of damaged and destroyed buildings. "There were very few buildings on base that didn't have some damage," Cronin said.

The \$800,000 exterior work on the Base Headquarters (Building 360) Rehab was completed in 1994. The \$1.2 million interior work was finished last November. The \$3.6 million Infrastructure Improvements project was completed in April 1998.

The Base Security Police Building and Medical Training Facility were part of the \$4.5 million Package 5 Entry Area project. It included two guard buildings and a brick wall entrance.

The \$8 million Contaminated Soil project was finished in 1994. It cleaned up solvents, paints, fuels, aircraft fabrication, and aircraft wash rack areas. The total environmental cleanup of the base cost \$16 million and included removing all underground oil/water separators and fuel storage tanks.

**Important role.** Homestead is now a much smaller installation, but the Air Reserve Station still serves an important role in military defense. Cronin said he's proud of the work that the Corps does to support the Reserves at Homestead Air Reserve Station.

"It's important work," Cronin said. "They play a rather large role in our air defense system."

## Concrete

Continued from previous page

lion to \$15 million dollars overall and can cut as much as a year off the time needed to build the dam. In addition, eliminating cofferdams and other support structures reduces the amount of construction debris that must later be disposed of.

The \$107.4 million proposal from Jones/Traylor was one of six initial proposals considered by the district. An evaluation process called "best value" compared the work to be done along with numerous factors, including price, but lowest net cost was not the primary deciding factor.

"In simple terms, the best value trade-off is a negotiated procurement that allows award to an offeror other than the low bidder," said Dr. Les Dixon, District Deputy for Project Management. "In contracting terms, the best-value trade-off method establishes a requirement for offerors to submit both price and non-price proposals for evaluation against a well-defined set of standards and evaluation criteria. On the Braddock Dam construction contract, we set the price and non-price criteria as approximately equal."

The work itself will begin with building a two-level casting basin at the Leetsdale Industrial Park, on the Ohio River, about 29 miles downriver from

Braddock, where the companies will cast the dam segments.

According to Hank Edwardo, project manager for the Lower Mon work, two segments will be cast, each roughly the size of a football field, or 300 feet by 100 feet and 21 feet high. These concrete shells will have hollow voids, making them buoyant so they can be floated onto the Ohio and Mon rivers, moved by towboats to the dam site.

Meanwhile, the river bottom will have excess mud and silt removed and 77 drilled shafts and pilings installed. There will be sheet pile cutoff walls installed underwater to keep sediment from refilling the dredged area.

When the shells are prepared for placement, cables and towboats will inch them into their exact locations and the voids will be filled with water so they settle onto the pilings. Edwardo explained that this is a most critical maneuver and must be controlled to tight specifications, and in the most ideal water and weather conditions, which will occur late this year.

Once the dam segments are in place, a special type of concrete called Tremie will be pumped into the hollow chambers, replacing the ballast water, and the sections between and below the dam segments will be filled with a concrete grout. Also, tailrace pieces will be attached, and the process of building the

lift gates and other structures above the water level will begin, using the floated in sections as a foundation. The dam will be tied in to the extended lock walls of the Mon 2 facility, and the old fixed-crest dam will be substantially removed.

Work is scheduled to be completed by October 2002. Overall, the Lower Mon work will involve this new dam at Braddock, a new lock chamber at Charleroi, and the complete removal of Lock and Dam 3 at West Elizabeth. The three facilities are among the oldest and most deteriorated in the nation's inland waterway system and have been bottlenecks to commercial shipping. The \$705 million construction cost will be paid 50-50 by the federal government and the shipping industry through the Inland Waterways Trust Fund.

Across the district, the decision to go with the innovative in-the-wet technology is seen as a calculated risk that could pay off big dividends in enhancing the professional expertise and reputation of the district workforce. In-the-wet technology has never been used in the nation's inland waterway system, although it is the accepted way to build oil platforms at sea. Potential inland uses include bridge piers and other dam replacements, especially where currents can be controlled.



## Focus on Mississippi Valley Division

Memphis, New Orleans, Rock Island, St. Louis, St. Paul, Vicksburg

# Division spans nation, top to bottom

By Pam Clark  
Mississippi Valley Division

Mississippi Valley Division (MVD) is the only one that spans the nation from border-to-border, from Canada to the Gulf of Mexico.

The mission of the U.S. Army Corps of Engineers in the Mississippi Valley is accomplished by two distinct, complementary organizations — the Mississippi River Commission (MRC) and Mississippi Valley Division. Both are headquartered in Vicksburg, Miss., and commanded by Maj. Gen. Phillip Anderson.

### Mississippi River Commission

The Mississippi River Commission was established by presidential appointment on June 28, 1879. It was given the mission to develop a plan that would "correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River, improve and give safety and ease to navigation thereof, prevent destructive floods, promote and facilitate commerce, trade, and the postal service."

Its members were to consist of three officers from the Corps (one serving as president); one member from the U.S. Coast and Geodetic Survey; and three civilians, two of whom must be civil engineers. Since its creation, the Mississippi River Commission has retained this unique composition.

For nearly a half century the Mississippi River Commission functioned



The Mississippi River Commission is headquartered in this classic 19th century building in Vicksburg, Miss. The Mississippi Valley Division commander is also the head of the commission. (Photo courtesy of Mississippi Valley Division)

as an executive body reporting directly to the Secretary of War. But the disastrous 1927 flood changed the commission's mission. The consequent 1928 Flood Control Act created the Mississippi River and Tributaries (MR&T) project, a comprehensive, complex plan for improving the river and portions of its tributaries between Cape Girardeau, Mo., and Head of Passes.

The act designated the Mississippi River Commission to serve as advisory body. Its president was responsible for implementing the plan and

for reporting to the Chief of Engineers.

The MRC's general duties include making recommendations on policy and work programs, studying and reporting on the need for modifications or additions to the Mississippi River and Tributaries project, conducting public hearings, and making inspection trips.

The Mississippi River Commission's headquarters, originally located at St. Louis, Mo., moved to Vicksburg, Miss., in 1929. Since that time, the MRC president also has served as division engineer of MVD.

### Mississippi Valley Division

MVD conducts the Corps' water resources development and environmental programs not encompassed by the MRC mission. MVD has six districts that span the Mississippi River's corridor from Canada to the Gulf of Mexico. These six districts are located in St. Paul, Minn.; Rock Island, Ill.; St. Louis, Mo.; Memphis, Tenn.; Vicksburg, Miss.; and New Orleans, La. They conduct the programs and activities overseen by both the Mississippi River Commission and Mississippi Valley Division.

MVD's boundaries cover portions of 12 states, 60 congressional districts, and encompass 370,000 square miles. It is represented by 24 percent of the U.S. Senate, and 13 percent of the House of Representatives.

The mission of the dual headquarters and its districts is to develop and maintain flood control systems, navigation improvements, channel stabilization measures. In addition, they also undertake projects that preserve, restore, and enhance environmental resources.

Meeting these public needs and expectations requires conducting engineering studies; preparing designs and specifications; building, operating, and maintaining facilities and installations; acquiring, managing, and disposing of real property; and administering various laws and regulations. In addition, it means mobilizing support during natural disasters and other emergencies.



Whether they are providing recreation opportunities at Rough River Lake, or locking a towboat and barges through Peoria Lock and Dam, Mississippi Valley Division employees are involved in activities that affect people in the heartland of America every day. (Photos from Digital Visual Library)

# Memphis District saves 'Lover's Leap'

Article and Photo  
By Brenda Beasley  
Memphis District

Memphis District provides flood control, navigation, environmental stewardship, emergency operations, other authorized civil works, and work for others to benefit a 25,000-square-mile area that includes portions of six states, 355 miles of the Mississippi River, and more than 100 flood control districts. The district's ambition is to be the region's premier engineering organization — the team of choice, customer-driven and focused on performance and continual improvement.

The Magnolia Bluff project is a typical example of the district's service to the region.

## Magnolia Bluff

It was the local "Lover's Leap," the best place in town to get a beautiful view of the Mississippi River, visit late in the afternoon and watch the sun sink below the horizon. Then, after years of constant erosion, Lover's Leap took the leap itself. Magnolia Bluff at Hickman, Ky., began to crumble and plunge 180 feet into the river bottoms below. Ground and surface water had mixed with the bluff's silty soil, and caused the hillside to simply fall off.

The persistent erosion threatened adjacent residences, civic buildings and two 500,000-gallon city water tanks. Part of one city street had already toppled down the slope, and the remainder, along with other streets, was in jeopardy of following it into the river bottoms.

In March 1996, Memphis District signed a project cooperation agreement with the city to stabilize the runaway bluff. Now, after two summers of extreme heat, and a winter shutdown due to weather, the job



is almost complete. Using a revolutionary new soil nailing and anchoring process, engineers and civic leaders hope Magnolia Bluff is here to stay.

The figures on material used for the unique stabilization process are impressive — 1,711 soil nails; 10,600 square yards of six-inch-thick shotcrete facing (a mixture of concrete that is blown in place by air); 7,700 tons of stone; 37,000 cubic yards of lightweight fill; and five rows of gabions (stair-stepped stone layers held in a cage by steel fencing).

"It's one of the few jobs of this size and type of construction in the country," said Gary Moody of the district's

Caruthersville Area Office, the chief construction representative on the job.

To stabilize the bluff, contractors worked from the top toward the bottom, one horizontal section at a time. Workers excavated down six feet at a time with a 45-degree angle on the upper bluff, and seven feet down each section on the lower bluff. A concrete beam (called a reaction beam) and soil anchors will support the load that will be put on the bluff by rebuding its corner.

The last soil anchor was tensioned Aug. 11. Reconstruction of the corner portion of the bluff should be completed this month. Then, the only remaining work items will be finish-dressing, sodding, installing a permanent fence, and some final erosion repair. Once this work is done, the city plans to re-



A Caterpillar long-reach excavator dresses the stone and lightweight fill to grade as workers in the background install a final row of gabions at Magnolia Bluff.

build the street, and the residents of Hickman will once again be able to safely enjoy their spectacular view of the river from Magnolia Bluff.

# St. Paul has diverse range of missions

Article by Maj. Lonnie Mansell  
Photo by Gerald Cohen  
St. Paul District

St. Paul District contains the headwaters of the Mississippi River and covers 139,000 square miles of a five-state area, including portions of Minnesota, Wisconsin, North Dakota, South Dakota, and Iowa. As the northernmost district of the Mississippi Valley Division, the district manages a diverse mix of missions aimed at providing customers with the best products and services available.

Col. Kenneth Kasprisin took command last July and is leading the district through the challenges faced in the dawn of a new century.

The history of St. Paul District extends back to the 1860s when Maj. Gouveneur Warren, the first district engineer, received the original mission of determining how to stabilize the flow of the Mississippi River from St. Paul, Minn., to Prairie du Chien, Wis., to support the transportation industry.

Through the late 1800s and early 1900s, a series of reservoirs were built in the Headwaters Region to help regulate flow.

In 1917, construction of Lock and

Dam 1 was completed and the district's mission to support navigation evolved toward its present-day duties. In the 1930s, Congress authorized the Nine-Foot Channel Project, and in that era 13 of the district's locks and dams on the Mississippi River were built. The district gradually added recreation to the navigation and flood control missions when its first recreation facilities site was established in 1964.

Today, St. Paul District continues to work in six primary mission areas — navigation, flood control, environmental protection, disaster response, regulatory, and recreation. St. Paul District's budget for fiscal year 2000 exceeds \$114 million throughout these six mission areas.

## Navigation —

The district maintains 285 miles of nine-foot channel for commercial navigation on the Mississippi River and short segments of three tributaries. The district's dredging program is relatively modest, usually less than

one million cubic yards per year, but is challenging environmentally because the Mississippi River has been designated as a National Wildlife Refuge throughout most of St. Paul District.

On-going major maintenance and rehabilitation of the lock and dam system involves modernization of 10 of the district's older locks. Lock and

Dam 1 is currently dewatered for maintenance, and there are two projects at Lock and Dam 3 to upgrade dam embankments and to reduce the lock outdraft.

**Flood control** — St. Paul District is proud of its record in this area. District boundaries contain four drain-

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A crane barge and other heavy equipment gathers at the north end of Lock and Dam 1, which has been dewatered for rehabilitation and repair.

## Focus on Mississippi Valley Division



The dredge *Jadwin* (above) and the mat-sinking unit are just two examples of the work Vicksburg District does on the Mississippi River. (Photos courtesy of Vicksburg District)



# Corps is 2nd oldest business in town

By Michael Logue  
Vicksburg District

Vicksburg District, one of the U.S. Army Corps of Engineers' largest civil works districts in both size and activities, is the second oldest business in Vicksburg, Miss., dating back to 1873. The district moved into its new headquarters in 1996, the first permanent quarters in the history of this premier engineering organization.

The 68,000-square-mile Vicksburg District encompasses seven major river basins, including 278 miles of the Mississippi River's main stem, in Arkansas, Louisiana, and Mississippi. The district is also responsible for about 800 miles of commercially navigable streams and rivers including the Ouachita-Black system, the Pearl, the Red, and Yazoo rivers.

In recent years, the district's workload has averaged more than \$200 million annually for projects including navigation, flood control, environmental restoration, work for other agencies, and more. To handle the workload and geographic area, the district maintains two area offices — one in Vidalia, La., and one in Greenwood, Miss.

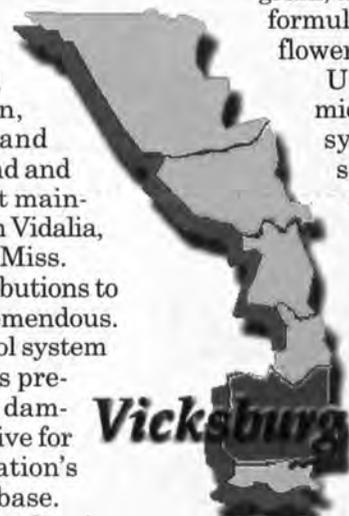
Vicksburg District's contributions to the Mid-South have been tremendous. A comprehensive flood control system on the Mississippi River has prevented nearly \$50 billion in damages and makes life productive for an important part of our nation's agricultural and industrial base.

Besides these projects, the district manages important national environmental issues on projects like the Mis-

issippi River levee enlargement program, the Yazoo backwater reformulation, and the Big Sunflower maintenance project.

U. S. and world economies are fed by navigation systems on the Mississippi, Red, Ouachita, and Pearl rivers. The district maintains a nine-foot navigation channel on 278 miles of the Mississippi River, which carries more than 500 million tons of cargo annually to the world's busiest shipping corridor, Baton Rouge to New Orleans.

Navigation program features include the 75-year-old refitted workhorse



## St. Paul

Continued from page seven

age basins, one the Mississippi River and the other three flowing into Canada. St. Paul is the only district interacting with the International Joint Commission for water resource management issues.

During the 1997 flood, flood control and flood damage reduction projects built under district missions prevented an estimated \$215 million in damages. Also, district flood control projects in Rochester and St. Paul earned the Award of Excellence in 1996 and 1998 in the Chief of Engineers' Biennial Design Competition. The district operates 16 reservoirs in Minnesota, North Dakota, and Wisconsin, primarily for flood control, but also for water supply, recreation, and fish and wildlife resources.

**Environmental protection** — Most of St. Paul District's environmental protection work includes habi-

tat restoration, erosion reduction, and riverbank stabilization. Much of this work is done under the Upper Mississippi River Environmental Management Program authorized by Congress in 1986 and reauthorized last year.

Projects under this program include island building to restore habitat or to control sedimentation in backwaters, dredging backwaters, building water control structures, dikes, and shoreline protection.

**Disaster response** — The district is prepared to respond to various disasters to assist federal, state, and local governments in saving lives and preventing significant damages. Flood response is the major task for the district.

St. Paul District also maintains one of the Planning & Response Teams (PRTs) for housing to provide damage inspection and assessment, and has a

secondary mission to provide drinking water if needed.

**Regulatory** — Minnesota has the second largest number of wetlands in the nation, surpassed only by Alaska. The district's regulatory responsibilities include reviewing permit applications for all of Minnesota and Wisconsin with more than 30,000 lakes, 60,000 miles of river shoreline, and 14 million acres of wetland.

**Recreation** — St. Paul District operates and maintains 11 campgrounds and 44 day-use areas in 19 project sites located at six headwaters reservoirs, eight flood control projects, and along the Mississippi River. By the joining the National Recreation Reservation System last year, district campgrounds may see an increase in usage for the fiscal year 2000 camping season.

(Maj. Lonnie Mansell is the Deputy Commander of St. Paul District.)

dredge *Jadwin* and the world's most successful and unique revetment placement system, the mat-sinking unit.

With one of the largest recreation programs in the country, the district hosts nearly 30 million visitors annually, returning more than \$1 billion in economic benefits to the local communities, and operates and maintains \$2.3 billion in real property and lands.

Current important projects include raising the Mississippi River levees, stabilizing the historic bluffs at Natchez, completing the \$2 billion Red River Waterway, and reforestation of one of the largest blocks of hardwood forest in the world.

Vicksburg District is a center of expertise for many engineering and environmental capabilities. Its proximity to the Engineer Research and Development Center enhances its ability to respond to the most challenging missions. Its success in developing small business and minority partnerships leads the Army.

Proud of its role as a good neighbor, the district participates in the Adopt-A-Highway program and is an adoptive parent for Vicksburg High School under the Adopt-a-School program. Its Combined Federal Campaign effort for 1999 surpassed the goal by 20 percent, and their Salvation Army Angel Tree program at Christmas holds the record for corporate giving.

The district's statistics include:

- Seven drainage basins in Mississippi, Arkansas and Louisiana.
- Nine lakes with 1,709 miles of shoreline.
- 12 locks and dams on the Pearl, Red, and Ouachita rivers.
- 1,808 miles of levees, including 468 along the Mississippi.
- 478 flood control structures.
- 21 pumping plants.
- 1,252 miles of navigable channel.
- 135 recreation areas with 3,215 camp sites and 2,028 picnic sites.
- Three hydropower projects.

## Focus on Mississippi Valley Division

# St. Louis reaches from ground to sky

By Terrie Hatfield  
St. Louis District

Mississippi Valley Division (MVD) is responsible for navigation support and flood control on the largest inland waterway system in the country. Each district along the Mississippi River from Lake Itaska in St. Paul, Minn., to the Gulf of Mexico at New Orleans, La., contribute significantly to the economy, environment, and overall well-being of citizens within its borders.

Each district is responsible for navigation support, flood control and environmental restoration on the Mississippi River, but each has a unique character and capabilities. For example, St. Louis District has several non-engineering, non-traditional engineering, and scientific endeavors.

### Archaeology

The district is home to the Corp's Mandatory Center of Expertise for the Curation and Management of Archaeological Collections (MCX-CMAC). The mandatory center of expertise was established in 1994 by the Director of Civil Works to address archaeological curation (preservation and study) and Native American Graves Protection and Repatriation Act (NAGPRA) issues for the Corps on a national scale. MCX-CMAC also works for other federal agencies on a cost-reimbursable basis, and has provided a diverse range of curation and NAGPRA-related services.

District expertise includes more than 30 specialists in archaeology and related fields, including archaeologists, physical anthropologists, archivists, a conservator, a cultural anthropologist, and a biologist. The director of the mandatory center of expertise is Dr. Michael Trimble, a nationally recognized expert in archaeological curation.

District archaeologists also conduct identification and preservation activities on Corps-managed lands in the district boundaries — one of the most archaeologically sensitive areas of the nation.

For example, the site at Cahokia, Ill., is North America's largest prehistoric ceremonial site and temple mound center and dates from about 900 AD to 1400 AD. The largest mound at this site, called Monks' Mound, covers almost 14 acres, about the same area as the pyramid of Cheops in Egypt.

In addition, Dr. Terry Norris, St. Louis District archaeologist, is one of the country's authorities on the French Colonial history of the middle



The dredge *Potter* discovered this partially intact mastodon skull in St. Louis District near where the Mississippi River meets the Ohio River. (Photo courtesy of St. Louis District)

Mississippi River Valley. Norris was highly instrumental in bringing national attention to the historical significance of Ste. Genevieve, Mo., one of the oldest European settlements west of the Mississippi River, and helped save its French colonial architectural treasures when they were threatened by the Great Midwest Flood in 1993.

### Mastodon

The crew of the dredge *Potter* recently called Norris to the Mississippi River near the confluence of the Ohio River, convinced they had made a significant archaeological find while dredging in very low water. The crew had uncovered

a partially intact mastodon skull that had been surprisingly well preserved for thousands of years under the ever-changing Mississippi River bottom.

The mastodon, an extinct species of elephant, roamed North America between 10,000 and 3.75 million years ago. Scientists believe that mature mastodons weighed from four to six tons and stood up to 10 feet tall, slightly smaller than modern day African elephants.

The skull will be displayed permanently at the National Great Rivers Museum at Melvin Price Locks and Dam, near the district's Rivers Project at Alton, Ill.

### Underwater explosives

Dr. Tom Keevin, ecologist, and Dr. Greg Hempen, geophysical engineer, collaborated in 1990 during the demolition of Locks and Dam 26 to evaluate the environmental impact of underwater explosions, and develop techniques to mitigate adverse impacts to aquatic biological systems and species. They tested a bubble curtain to determine its effectiveness in reducing underwater explosive pressures during demolition. The curtain worked well and received a Chief of Engineers Design and Environmental Honor Award.

These studies, funded by the Department of Defense (DoD) through the LEGACY Program, will culminate in a book and computer program to support to DoD facilities in assessing the environmental effects of underwater explosives and mitigation methods. Results will assist in preparing environmental compliance documents and in developing mitigation strategies.

This research has many practical applications. To date, St. Louis District has assisted other Corps districts, the Navy, the Coast Guard, Canada, Argentina, and federal and state natural resource agencies in assessing the effects of underwater explosive use or developing mitigation strategies. This unique level of expertise is currently not available in the private sector.

### Photogrammetry and hydrographic mapping

The district's Geospatial Engineering Branch contains the Technical Center of Expertise (TCX) for Photogrammetric Mapping which provides high quality, cost effective solutions and products to customers within and

outside the Corps. The center provides technical and contractual expertise in photogrammetry (making maps through the use of photos). The center has in-house expertise to design, negotiate, and manage photogrammetric mapping projects.

This work is accomplished by civil engineers, cartographers, geographers, a geodesist, a physical scientist, and a variety of technicians.

Current clients include the Corps' Topographic Engineering Center, and Cold Regions Research Laboratory, many Corps districts, U.S. Army Integrated Training and Range Management, National Imagery and Mapping Agency, the National Oceanographic and Atmospheric Administration, and the U.S. Geological Survey.

The TCX has two state-of-the-art survey vessels outfitted with the latest in underwater acoustic hydrographic survey systems. They are the most advanced survey systems currently in use by the Corps.

### Tailwind

The Cable News Network (CNN) aired a segment alleging that in September 1970, U.S. Special forces were inserted into Laos to locate and kill U.S. military personnel defecting to the other side. The story claimed that during the mission (code-named Operation Tailwind), the Green Berets assaulted an enemy base camp and killed the U.S. defectors, as well as enemy troops, women, and children.

The telecast also alleged that the Air Force dropped nerve gas munitions before the attack and during the extraction of Special Forces personnel. Immediately after the telecast, *Time* magazine published a similar story written by CNN staff.

In 1998, the Office of the Program Manager for Chemical Demilitarization, Non-Stockpile Chemical Material, tasked the district's Ordnance & Technical Services Branch to research the availability of the chemical munitions and munition dispensers allegedly used during Operation Tailwind.

The research team conducted a comprehensive audit trail of all pertinent munitions dispensers from manufacture and filling through final disposition. The team determined the types and quantities of chemical warfare material, especially cluster bombs and GB and VX nerve agents, that were shipped to and from the theatre of operations.

Findings produced by the research team played an important role in helping the Department of Defense disprove the allegations and conclude that Operation Tailwind did not target American defectors, did not employ nerve agents, and was conducted in accordance with the Laws of War, Rules of Engagement, and U.S. policies in force at that time.



## Focus on Mississippi Valley Division

# District's programs make a difference

By Mark Kane  
Rock Island District

In concrete, metal, mud, or water, Rock Island District's rehabilitation and environmental management programs are working wonders for transportation and wildlife in America's heartland. All indications are these programs will continue to grow.

### Rehabilitation

Each year millions of tons of commerce are barged up and down the Mississippi and Illinois river system, causing continual wear and tear. Consequently, the locks are in need of repairs and modernization to reduce or eliminate breakdowns, barge delays, and loss of revenue. To address these problems, the district began a major rehabilitation program nearly 25 years ago to replace deteriorating concrete, lock gates, and mechanical and electrical equipment.

The district began rehabilitating the Illinois Waterway locks and dams in the 1970s and completed final rehabilitation in 1995 when four locks were closed simultaneously for repairs. Rock Island District has been working on the Mississippi River locks and dams since the 1980s and recently completed major rehabilitation of Locks and Dams 13 and 15. The district is now rehabilitating Lock and Dam 14, which will be complete this fiscal year.

The work on Lock and Dam 14 began in 1996, and consists of two stages. Stage I will replace the lock machinery and overall site electrical systems. The Stage I contract was awarded Dec. 9, 1996 for \$12 million. Stage I was completed last May. The lock was closed and dewatered December 1997 through February 1998 during the normal winter closure, and reopened to traffic on March 6, 1998.

Stage II will rehabilitate the navigation dam. Major work includes replacing tainter gate chains, repair of roller gate chains, and replacing deteriorated concrete on the dam piers. Stage II is scheduled for completion next August. The completion date for Lock and Dam 14 is May 2001.

The Lock and Dam 12 rehabilitation is a new start for this fiscal year. Significant work includes resurfacing concrete in the lock chamber and dam piers, replacing operating machinery and the electrical system, installing a bubbler system in the lock chamber, replacing the roller and tainter gate chain hoisting equipment, and dam scour protection. The project started last October and is scheduled to be complete by December 2003.

### Navigational study

Although rehabilitating locks and dams is important, it is equally important to explore innovative ways to



A red-tailed hawk is released during the dedication of the Princeton Wildlife Management Area. (Photo courtesy of Rock Island District)

meet future navigational and environmental needs. The district's Upper Mississippi River-Illinois Waterway (UMR-IWW) System Navigation Study is a seven-year \$55.6 million project to investigate navigation improvements on these river systems from now to 2050.

The study area includes 854 miles of the UMR, with 29 locks and dams, between Minneapolis-St. Paul and the mouth of the Ohio River; and 348 miles of the IWW, with eight locks and dams, that connect Chicago and the Great Lakes with the Mississippi River.

The river systems' principle problem is delays to commercial navigation traffic due to limited lockage capacity and increasing traffic. Reconnaissance studies identified several locks with some of the country's highest average delays to commercial tows. Built in the 1930s, the navigation system was designed to accommodate 600-foot tows. Today, with tows routinely reaching 1,200 feet, double-lockages are the norm, which takes more time and results in higher costs to shippers and consumers. There is potential for growing traffic delays on the river system in the next 50 years.

The feasibility phase of the study began in April 1993, and is scheduled for completion next December. While Rock Island District leads the study efforts, St. Louis, St. Paul, and New Orleans districts play a significant role in completing this phase. The study team is formulating, evaluating, and comparing alternative plans to address the needs of the river systems in the 21<sup>st</sup> century. Those needs are not only commercial navigation; the team is spending nearly \$24 million to study the environment and the impact of in-

creased navigation.

The feasibility measures under study include 1,200-foot lock chambers, extending the existing guidewalls to 1,200-feet with powered keels, and mooring facilities. These hypothetical measures are combined at different lock locations to give an array of alternative plans. The plans will be evaluated for completeness, effectiveness, efficiency, acceptability, and cost.

To assist coordination of study efforts with state, local, and special interest groups, five committees (Governors' Liaison, Navigation Environmental, Engineering, Economics, and Public Involvement) were established in the first year of the study. Information on the study is available at (800) 872-8822 and at [http://www.mvr.usace.army.mil/pdw/nav\\_study.htm](http://www.mvr.usace.army.mil/pdw/nav_study.htm).

### Environmental management

Although successful river navigation is key to transporting cargo, the district does not compromise on the environment. On Nov. 12, a red-tailed hawk was released during the dedication of the Princeton Wildlife Management Area (PWMA) in Scott County, Iowa. The wildlife area is an important environmental enhancement project that restored wildlife feeding habitat in this backwater of the UMR.

The PWMA is part of the Upper Mississippi River System Environmental Management Program, a joint effort between the Corps, the Iowa Department of Natural Resources, and other state and federal agencies to improve the backwaters of waterways for productive resting, feeding, and winter-

ing wildlife habitat. Rock Island District manages the program, and the work is done by Rock Island, St. Paul, and St. Louis districts.

In 1986, Congress affirmed its commitment to the environment with the Upper Mississippi River Management Act. They noted, "To ensure the coordinated development and enhancement of the Upper Mississippi River system, it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system."

The multi-million dollar Environmental Management Program was established to plan and design environmental projects to restore fish and wildlife habitats in backwaters and side channels of the Upper Mississippi and Illinois rivers. It is the single most important effort to ensure the viability of the river system.

The program has three segments to address the rivers' environmental needs — wildlife habitat rehabilitation and enhancement, long-term resource monitoring, and a computerized inventory and analysis system.

Accomplishments to date include completing 24 habitat restoration projects which restored more than 28,000 acres of riverine and floodplain habitats. Another 40,000 acres will be restored by 14 current projects. Twelve more projects in various stages of design will add another 29,000 acres.

An important program feature involves monitoring the river system. Six field stations staffed by state biologists conduct this monitoring, which is managed by the Corps and implemented by the U.S. Geological Survey.

The environmental program includes collecting data for research to understand the dynamics of large floodplain rivers and successful multi-purpose resource management. Additionally, it includes developing extensive digital databases, mapping products, and establishing an information clearinghouse so that river data and information can be universally accessed.

The most recent enhancement project, the PWMA, significantly improves an environment important to wetland species, waterfowl, and other migratory birds. This portion of the refuge is part of the Upper Mississippi River Flyway, a major migration route.

Three shallow-water ponding areas and marshlands were built for the wildlife area. The excavated material was used to restore the existing perimeter levee and to build a low cross-dike. The dike divided the area into two cells that can be independently managed. A 36-inch gateway and three stop-log structures were built and the existing 16,000 gallon-per-minute pump relocated to the cross-dike to improve water-level management. Nut-producing trees were planted to provide food resources and habitat diversity.

# District works to tame Ol' Man River

By Al Naomi and Jack Fredine  
New Orleans District

The Corps' work in New Orleans dates back to 1803 when an Army engineer went to the city to study its defenses. Early work in the area was military, but soon expanded to include navigation and flood control, which have been New Orleans District's primary missions ever since. Today the district builds on these responsibilities with its commitment to environmental engineering. The district's civil works budget for fiscal year 2000 totals \$414 million, plus \$47 million for a multi-agency program to protect and restore Louisiana's wetlands. New Orleans District has the largest civil works budget in the Corps.

Wetland restoration is a vital part of the district's work. For 6,000 years, the Mississippi River moved back and forth across southern Louisiana, forming several deltas. Each spring the river overflowed, providing fresh water, nutrients, and sediments to the coastal wetlands. These actions created thousands of square miles of coastal marshes, cypress swamps, and bottomland hardwood forests.

The Louisiana coastal wetlands are among the most productive in the world. They support a \$1 billion seafood industry, a \$220 million sport hunting industry, a \$14 million alligator industry, and fur, crawfish, and timber industries.

This productive ecosystem attracted early settlers to Louisiana; they also discovered their homes and businesses were subject to annual floods. Efforts to counter the flooding involved building ring levees around individual homes or communities. Plantation owners built levees on their property along the river. Eventually, these levees expanded until today the Mississippi River is lined by either high natural banks or floodwalls and levees for 1,000 miles from Cairo, Ill. to the Gulf of Mexico. There is also an elaborate system of spillways and floodways to control extreme flooding threats.

While this complex system protects against the damage of annual river overflows, the impact on coastal wetlands has been devastating. The flood protection system eliminated the annual overflows, allowing saline Gulf waters to invade the freshwater wetlands. The saline water killed freshwater vegetation and has been a major factor in the loss of coastal wetlands. Other factors have also caused the loss of wetlands, including sea level rise, erosion damage from storms, land subsidence, draining wetlands for agricultural and residential use, and building pipeline and navigation canals.

Louisiana's wetlands are disappearing at the rate of about 25 square miles a year. This century, Louisiana's coastal wetland losses have exceeded 940 square miles and, if nothing is done, another 1,000 square miles will be lost by 2040.

The scope of these losses was not recognized until relatively recently. The U.S. Fish and Wildlife Service (USF&WS) first inventoried the wetlands in 1953 and found dramatic decreases in wetland acreage. In 1954, Congress asked the Chief of Engineers for recommendations to modify the Mississippi River and Tributaries (MR&T) Project to address the problem.



Railroad tracks must be temporarily relocated for the Davis Pond Freshwater Diversion project. (Photo courtesy of New Orleans District)

In 1959, the USF&WS sent a report to New Orleans District recommending that the Corps "...reduce the salt water intrusion by reintroduction of fresh water from the Mississippi River..."

In 1962, the Chief of Engineers submitted a comprehensive review to Congress including the USF&WS's 1959 report. In 1965, Congress passed the 1965 River and Harbors Act, which included the review. More than 10 years had passed since the first wetlands inventory, and it took 20 more years to start construction.

## Caernarvon Freshwater Diversion Structure

The first large federal project to address coastal wetlands loss is the Caernarvon Freshwater Diversion Structure 15 miles below New Orleans. The structure was built by the Corps, and cost-shared with the Louisiana Department of Natural Resources (LDNR). Total cost was \$25.9 million, \$19.4 million from the federal government and \$6.5 million from the state.

The Caernarvon Freshwater Diversion Structure consists of five box culverts built into the Mississippi River mainline levee. Flow is controlled by five vertical lift gates. Up to 8,000 cubic feet per second (cfs) can be diverted into the Breton Sound Basin.

The Louisiana Department of Natural Resources, in cooperation with a federal and state interagency advisory committee, oversees the operation of the structure. Maximum diversions normally occur in December, January, and February; lesser amounts are diverted in other months. The quantity of fresh water diverted depends on the need to supplement

rainfall in order to maintain the necessary salinity ranges.

Since operation began in 1991, freshwater marsh plants have increased dramatically. It is estimated that more than 16,000 acres of coastal wetlands will be preserved by the Caernarvon Freshwater Diversion Structure in a 50-year period.

## Davis Pond Freshwater Diversion

In 1996, the Corps began building the second major freshwater diversion project on a cost-shared basis with the LDNR. The Davis Pond Freshwater Diversion, 22 miles upstream from New Orleans, will be able to divert up to 10,650 cfs of fresh water into the Barataria Basin when completed in early 2001. The structure will have four box culverts built into the mainline Mississippi River levee. The project area covers 10,084 acres.

Three construction contracts have been completed, including two contracts for 19 miles of guide levee, and a contract for a 570 cfs pumping station to handle drainage by the project.

Three other contracts are underway for this project. The first is for construction of the diversion structure and to temporarily relocate Louisiana Highway 18, and three tracks of the Union Pacific Railroad. The second contract is to build a bridge for U. S. Highway 90 over the outflow channel. The third contract is to build a bridge over the outfall canal for the Burlington Northern-Santa Fe Railroad.

Two more contracts need to be awarded and completed before diversions can take place, one for a small levee in the southern portion of the ponding area and the other for the last segment of the outfall channel.

The total first cost of the Davis Pond Freshwater Diversion is \$106 million, with the Corps paying 75 percent and the LDNR responsible for the balance. As with Caernarvon, Davis Pond will be operated by the LDNR, in coordination with a multi-agency advisory committee.

The completed Davis Pond project will reduce salt-water intrusion, reestablish favorable salinities in the area, and enhance the growth of marsh vegetation. It is anticipated the project will increase commercial fishing benefits by \$15 million per year. More than 33,000 acres of wetlands will be saved, and more than 777,000 acres positively impacted.

These projects alone cannot stop the loss of wetlands in the Mississippi River delta. Even so, they will have a positive impact on the coastal environment and help enhance the productivity of these areas.

## Other projects

Other projects also address the loss of wetlands. The Coastal Wetlands Planning, Protection and Restoration Act project is multi-agency effort headed by the Corps to build specific coastal restoration projects. These projects include restoring natural processes like natural flow of sediment and fresh water, restoring hydrologic conditions, shoreline protection, barrier island reconstruction, vegetative plantings, and marsh creation. To date, 32 projects have been completed.

The Louisiana Coastal Area Ecosystem Restoration study is just beginning. When complete, it should provide a blueprint for long-range, large-scale ecosystem restoration strategies.

New  
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Focus on Mississippi Valley Division

Memphis, New Orleans, Rock Island, St. Louis, St. Paul, Vicksburg

# Projects making difference in Korea

By Gloria Stanley  
Far East District



New barracks are under construction at Camp Humphreys in Korea. (Photo courtesy of Far East District)

Far East District (FED) provides installation support for U.S. Forces Korea, including the Eighth U.S. Army, and the Area I Support Activity of the 19<sup>th</sup> Theater Army Area Command. The district's construction contract awards for major military construction Army (MCA) alone increased from nearly \$72 million in fiscal year 1998 (FY98) to \$183 million in FY99.

Nearly \$70 million is forecast for MCA construction awards and nearly \$136 million for the host nation program (what South Korea reimburses the Corps) during FY00. The barracks upgrade program, a new program for FED, will mean \$45 million more in construction contract awards during FY00. To put it another way, FED's total construction contract awards, forecast for FY00, is \$329 million.

"There's *so much* construction going on here," said Col. Chuck Cardinal, Commander of the Area I Support Activity. "It's heartwarming to visit the sites. Far East District always has quality assurance representatives; the sites are always clean. You have a sense of *correctness* when you visit a FED project."

**Quality equals readiness.** Cardinal is responsible for 42 posts, camps, and stations in the northern part of the Republic of Korea (about half of the 81 U.S. Army installations in Korea), including the largest U.S. camp, the Camp Casey and Camp Hovey area with 7,300 acres and 11,000 people. Four Directors of Public Works (DPWs) report to Cardinal. The 42 installations are spread out among the 2nd Infantry Division, which is their largest tenant and, as such, is an organization which FED gives a lot of installation support.

Nothing, according to Cardinal, makes a soldier feel better than seeing people with the energy and resources to give him or her a new barracks, a new motor pool, or a new training facility.

"Anything FED builds is by-and-large permanent, so you get a sense of commitment," Cardinal said. "We tell everybody that quality of life and readiness are synonymous, so we're a lot more ready because of FED's commitment to excellence."

**Never said no.** One strength of the Corps is its ability to expand to meet the workload, according to Col. C.A. Moldenhauer, Eighth U.S. Army Engineer. What stands out for Moldenhauer during his two years in Korea is that the Corps was with him during the flooding in 1998 and '99 while he was the "center of gravity" for all the money coming in for the recovery — and FED never said no.

Moldenhauer, who left Korea in January for an assignment at Fort Leonard Wood, Mo., had about 350 people involved in DPW work. He said the DPWs are understaffed and overworked and the Corps' Installation Support Office (ISO) was a big help. The ISO is another tool in the toolbox. TeleEngineering is another tool that is accessible without having to

pay travel expenses.

"I used to believe the Corps cost too much," Moldenhauer said. "Now I know the quality product is worth it. I think the Army is moving toward where the Corps has been for a long time. If you read the tea leaves of privatization of housing and business practices, the Corps is positioned very well."

After the flood of 1998, Corps hydrologists went to Korea to look at the situation and reported that a lot of fixes were pretty simple. Cardinal and Col. David Rehbein, Far East District Commander, were committed to rebuilding Area I. To do that, the new construction had to be protected, so the most important thing was infrastructure work. The hydrologists told them what to do and the DPWs and FED put together job order contracts, firm fixed price contracts, and major military construction work and integrated them into a plan that fixed the infrastructure.

"I guess the most gratifying thing for us here in Area I was that almost a year to the day after the '98 flooding we had another squall of rain," Cardinal said. "About 35 inches of rain fell in about three-and-a-half days, about the same intensity of the '98 rain, but this time it flowed through the Camp Casey area without any damage because we had done what the Corps told us to do."

**Fusion cell.** Three DPWs were seriously involved in the recovery effort, along with FED's Uijongbu Project Office and the Tongduchon Resident Office. FED also provided a representative to a specially formed fusion cell. The fusion cell made sure there was rapid visibility of all that was going on, and that the Corps' projects were synched with the other DPW Construction Command Korea (CCK) projects.

"The cell provided a transparency of what was going on in Area I, and *so much* was going on," Cardinal said. There were 632 top projects.

MILCON and OMA conversion work was originally projected at \$150 million, but it turned out to be only \$115 million. Cardinal attributed the savings to contracts written correctly, designs done correctly, and the economic situation in Korea allowing the Corps to competitively bid the contracts.

"We identified all the infrastructure problems which we hadn't had the resources to attack," Cardinal said. "For example, nobody had ever dredged the creeks. There were *trees* growing in the creeks because nobody had ever had any wherewithal to figure out they didn't belong there."

"The flooding was a whole lot of clouds with some silver lining," Cardinal said. "It accelerated the pace of military construction in Area I, but it hasn't gotten us where we need to be."

Cardinal said that Area I was neglected for a long time. About half the Army personnel in Korea live

there, but it didn't get the attention it deserved. During the last five or six years that has changed and the focus is on military construction, especially barracks. The major population centers in the area (Camps Casey, Red Cloud, and Stanley) have gotten a lot of attention with new barracks construction. However, there is still work to do in major camps such as motor pools and administration facilities, which are still housed in Quonset huts sitting next to brand-new construction.

"Also, a lot of the camps haven't had *any* MILCON focus, and if these camps are to be enduring camps (and many of them are), we have to get those barracks, motor pools, and dining facilities up to standard," said Cardinal. "There are so many camps up here, I don't think FED will have to look for work."

"We still have soldiers living in Quonset huts who go to different buildings to shower," Cardinal added. "That's not the way America expects us to treat its sons and daughters serving overseas. That's something we still have to wrestle with."

**Relevance.** "I had been here just three weeks when the flooding hit in '98, so the Corps was relevant to the *nth* degree as soon as we began to figure out what we needed to recover and rebuild," Cardinal said. "There isn't a more relevant organization in the Army right now as far as I'm concerned."

One of the most important things the Corps brings is knowledge of the local construction business in Korea. "To supervise and construct, you have to be on the ground in-country," Moldenhauer said. "You can't do that from Washington, D.C."

Also, Moldenhauer has noticed the Corps' increasing relevance to the rest of the Army. The first time was in Europe, getting ready to go to Bosnia when the Corps asked how it could help.

"I think that's true here, too, when the Corps tries to help us find solutions for everyday things like explosive safety quantity distance arcs on our installations," Moldenhauer said.

These arcs would indicate something dangerous, how big it is, and what it affects. With 81 installations and an arc probably somewhere on each installation, walking all the arcs to tell the Republic of Korea government they have people in dangerous areas is a monumental task which the Corps can help. Moldenhauer said the Corps is willing to help up-front and work out expense later.

Until he came to Korea, Cardinal said he didn't really appreciate how many resources the Corps could bring from various districts to solve problems.

"I know Brig. Gen. Randal Castro (Commander of Pacific Ocean Division) has said 'This is a team of teams.' We feel we are part of the Corps team, and that FED is part of our team," said Cardinal. "You have one very satisfied happy customer here."

# Omaha mops up Montana mine waste

## Arsenic and lead part of challenge at High Ore Creek

By Liam Bickford  
Omaha District

Cleaning up a century's worth of accumulated toxic material and rerouting two streams in a little more than a year seemed like a formidable challenge. But Omaha District's success in tackling such projects has opened new doorways to future opportunity.

Working with the Bureau of Land Management (BLM), Montana, and local authorities, the district began work last September on the High Ore Creek project near Basin, Mont. Like an already completed U.S. Army Corps of Engineers project at Indian Creek, near Townsend, Mont., it involved removing contaminated mine tailings and waste rock piles, and restoring and redirecting streambeds to their original channels.

### Door to opportunity

Although not mammoth in project scope, the execution of such projects just may serve as a door to (and for) the Corps. Restoration of Abandoned Mine Sites (RAMS) have an estimated \$33 to \$72 billion workload in identification, remediation, and restoration of non-coal abandoned mines in the West. The Corps' new strategic positioning is aimed at becoming the nation's RAMS engineering team of choice for federal and state agencies, says Larry Woscyna, Omaha District Director of Business Development.

"Meeting the clients' needs is a priority that pays," Woscyna said. "Our focus on client service shows other agencies that the Corps is available and ready to serve our clients needs, whatever they are. As a service provider we want to see repeat opportunities to work for and with clients."

The High Ore Creek watershed contains 26 abandoned or inactive mine sites. It took hundreds of miners and mill workers nearly 90 years to accumulate the huge piles of mine tailings that lined High Ore Creek just northeast of the tiny town of Basin. The area is strongly affected by periodic cycles of recurring mining activity and economic depressions due to the collapse of mining. This history has raised public awareness and involvement in issues concerning environmental degradation from mine sites.

First mined in 1880, the majority of its production occurred between 1883 and 1893. When the ore ran out, miners left behind a ghost town filled with memories of high-rolling days, and many tons of tailings laden with arsenic, lead, and zinc.

### Orange water

For years, the creek ran orange as it made its way down through the tailings. (The little bit of water that still flows just below the mine site retains some of that color.) Tests performed by the state showed that fish couldn't survive 72 hours in water from the tailings. Sampling done by the Montana Bureau of Mines and Geology confirmed extremely high concentrations of arsenic, lead, and zinc in both the creek water and stream sediment, and in tailings alongside the stream.

Somewhere close to \$2 million and 300 days will go into the clean-up effort, making High Ore Creek safe once again and alleviating longstanding concerns about water quality.

### New and future partner

Of vital significance was that the High Ore Creek project involved a new customer — BLM.



A view downstream shows how geotextile fabric is used to redirect a stream to its original banks. (Photo by Mike Browne, Bureau of Land Management)

"Taking on a major new client can be a tough task in the best of times," said Woscyna. "We have taken matters in hand, focusing on adaptability and dedication as the keys to success and jumping in where few would dare to tread."

Sure enough, the Corps team faced a myriad of hurdles as the project unfolded.

"To begin with, it was difficult to sell BLM on the Corps," said Woscyna. "BLM was a major new client and a lot of work went into developing the relationship and building BLM's level of comfort."

For Omaha District to achieve its goal of not just satisfying but delighting customers, some long-established practices gave way to new and different methods of doing business. For example, the Corps had to manage two contracts during construction phase — an Engineering Construction Inspection Service contract for BLM oversight, plus one with a local contractor to do the work.

The long history of mining issues in Montana has also led to long-standing relationships between the state and BLM, as well as local contractors. The overall development of separate and autonomous reclamation agencies with their own projects, agendas and methods naturally complicates matters.

### Cooperation essential

The original project goals were to encourage local contractor involvement. Interagency cooperation was the essential ingredient to using the talent available in the experienced pool of small local contractors.

"BLM has its own way of doing things and wanted to be heavily involved on construction oversight," Woscyna said. "Both BLM and the Corps had clear goals, but we lacked a clear process for interaction on this type of project. An adjustment of business

practices was clearly called for if everybody was to understand and accept their respective roles. But we molded successfully to both BLM and Montana state standards."

"I see no reason why we can't continue to do what we're doing in Montana with the Corps and BLM in other Western States," says Mike Browne, coordinator of Abandoned Mining Lands (AML) in BLM's Butte office. "It just takes the right people with the right knowledge to make this stuff happen."

Browne has a lot of good things to say about his experiences working with the Corps.

"My priority has always been to spend the money on reclamation work that improves the water quality from AML sites as much as possible," said Browne. "The problem is that we get money to do AML reclamation, but have never been given any guidance on how to accomplish the work. This is where the Corps has stepped in and helped us, and I can't thank them enough. We have been successful in Western Montana because of the Corps' assistance, and I will continue to work with the Corps to accomplish AML reclamation."

Woscyna says abandoned mine reclamation will produce a significant positive impact on the nation's water supply, particularly in mountainous regions.

Browne agrees. "There's a lot of interest in abandoned mining lands and the reclamation of sites similar to the ones we are currently working on with the Corps of Engineers."

Browne would like to see opportunities to expand existing Corps programs to other states and actively recommends the Corps to other client agencies, such as U.S. Fish & Wildlife.

Woscyna likes this type of reaction. "We want to see satisfied and enthusiastic clients that are glad to share their experiences with the other agencies. We're a water resources agency. Our future success depends on how we bend to adapt to our clients' needs."

# Retirement opens world of interests

By Christina Plunkett  
Jacksonville District

A lot of people wonder what they will do when they retire. They ask, "How will I ever fill the time?" They needn't worry, if Wilbert Samuel "Sam" Eisenberg is any indication.

Eisenberg, who is now 70, "retired" as Jacksonville District's former Assistant Chief of Design Branch in December 1984 after 33 years with the U.S. Army Corps of Engineers. But actually he just took his talents, interests, and professional skills into the world to help others. His desire to share his passion for teaching, engineering, hydrology, gardening, construction, and design show through his leadership and involvement in a host of organizations.

**Volunteer.** Eisenberg joined the board of directors for HABIJAX, a local chapter of Habitat for Humanity, shortly after it formed in Jacksonville in 1989. Since then he has helped design, build, and landscape hundreds of homes for needy families. The group currently builds up to 200 homes per year.

Eisenberg still remembers the first HABIJAX home he and his wife, Neena, helped restore on Jacksonville's south side. "It was exciting for us both, but I can say that after 10 years, the work continues to be just as rewarding, especially when you see the looks on the soon-to-be homeowners faces," Eisenberg said. Today, Eisenberg is a member of HABIJAX's building committee where he is a consultant on drainage problems and landscaping.

Eisenberg was a vice-president of the Riverside Park Apartments board of directors for eight years. He became involved in planning and designing the 90-unit complex for the economically disadvantaged several years before he retired. When the project was complete, he continued as the maintenance engineer for the complex and other similar projects in Florida as an employee of a management firm.

As a United Methodist Volunteer in Missions at Avondale Methodist Church, Eisenberg has used his technical skills for planning, design, and hands-on missionary work. He and Neena have helped build churches and classrooms in Barahona in the Dominican Republic, and Maricabo in Venezuela.

"It was amazing to see how creative and inventive the children were in such extreme poverty," said Eisenberg. The children built their own toys — kites from palm tree fronds and plastic shopping bags, or skateboards from a truck bearing mounted on a board. "Seeing the children with their makeshift skateboards brought back memories of growing up during the Depression when we made most of our toys also. If we could somehow get them all here, with their inquisitive, creative minds, they could be the engineers of the future."

Riverside Avondale Preservation (RAP) is a grassroots organization formed to protect that area, and Eisenberg has been involved since its inception. For 20 years, he has helped RAP deal with zoning issues and construction and design work in his neighborhood, and he served as RAP president in 1984. Riverside/Avondale has now been designated a historic district.

**Disaster work.** Eisenberg uses his Corps damage assessment skills to aid the Red Cross after disasters. He and Neena began their Red Cross work in 1989 when Hurricane Hugo ravaged the Caribbean. Eisenberg ran the Red Cross assessment operations in Neguabo, Puerto Rico for almost a month. He is currently the Damage Assessment Chairman for the Northeast Florida Chapter and is a certified Red Cross instructor for emergency disaster relief. Recently, he recruited a team of 17 American Society of Civil Engineer (ASCE) volunteers and trained them in damage assessment. They assessed damage in eight Florida counties after Hurricane Floyd.



Sam Eisenberg confers with a "Paint the Town" volunteer. (Photo courtesy of Jacksonville District)

As a member of the ASCE's Jacksonville Branch since 1951, Eisenberg has led their Science and Engineering Fair Committee for five years. For three of those years the group received the Outstanding Committee Award. He has also judged regional, state, and international fairs that encourage youth to choose engineering and science careers.

"Nothing compares to the look in a young person's eyes when you praise their project and show them how it relates to professional civil engineering," Eisenberg said. "There are many great young minds out there."

Eisenberg also guided qualified young people to seek civil engineering careers through his involvement in the Southeastern Consortium for Minorities in Engineering (SECME). As the Corps' liaison, Eisenberg worked with the Duval County School Board to introduce and develop programs in four local high schools. SECME helps promote engineering in various ways. Recently, Eisenberg assisted in developing a video titled "Who Needs Engineering? You Do" to show at the four high schools and throughout the community.

**Gardener.** Eisenberg is also a life-long gardener. In 1994 he took his experience and was trained as a Duval County master gardener. He has been planting gardens at elementary schools and daycare centers, and landscaping senior citizens' homes ever since. As the Jacksonville Housing Partnership Landscape Coordinator, Eisenberg draws up the individual landscape plans and, for the past five years, he has helped with the actual planting for about 60 homes during the annual "Paint the Town" event.

"It's rewarding to help bring older homes back to life through painting, repairing, and planting," Eisenberg said. "Many neighborhoods have been neglected for years, but Mayor Delaney's Target Neighborhood Program sparked new life and growth throughout our city."

For almost 50 years, Eisenberg has been known around his Riverside neighborhood for his flowers and vegetables. Strolling through his lot, one finds herbs, vegetables, even guavas, and a trellis speckled with red and green grapes. There are more than 70 varieties of plants in his yard.

"Neena and I love to experiment to see if different types of plants can be cultivated here," Eisenberg said. "I love to collect plants when I'm doing volunteer gardening so when I place a new plant, it reminds me of the person and area I got it from."

One of Neena's favorite spots is the butterfly gar-

den. "The red and yellow Mexican milkweed keep the monarch butterflies happy, while such plants as the pentas and the firespike attract all kinds of butterflies and hummingbirds," said Neena.

**Awards.** Not surprising, the awards Eisenberg has received for his volunteer work reads like a list of local volunteer organizations. This year, Eisenberg was selected Engineer of the Year by the Florida Section of the ASCE. Other awards since his retirement include Jax Cares Citizen Volunteer of the Quarter for May 1999 and November 1998; James F. Shivler, Jr. Professional Engineer Award for Outstanding Service to the Engineering Profession; Master Gardner of the Year by the Jacksonville Agricultural Department in 1998; 1997 Engineer of the Year for Northeast Florida at the National Engineer Week celebration in February 1997; Outstanding Volunteer Urban Gardening Program in March 1990; and Engineer of the Year from the Jacksonville Branch of ASCE for 1997.

Eisenberg doesn't waste time fixating on his accomplishments, but instead looks forward to more action. He credits his sales-oriented parents for his "go get 'em" attitude. He jokingly says, "What I lack in knowledge, I make up for in hustle."

**Travel.** And hustle he does whether volunteering or vacationing. As world travelers, the Eisenbergs have taken six cruises, including Alaska, the Mediterranean, a North Sea trip from England to Russia, a Florida-to-California trip via the Panama Canal, and two Caribbean tours.

"It was amazing to visit Olympia where the original Olympics were held in Greece," said Eisenberg. Neena found walking the streets of Pompeii near Naples and seeing the grooves made by Roman chariots an incredible experience, having studied this in her childhood.

"I most enjoy learning and teaching and make it a goal to learn something new every day so I can, in turn, share it with others," Eisenberg said. He sees life as a continual growth experience, which is why he gets such pleasure from watching both plants and students grow. "My mother always had something meaningful to do each day and she lived to be in her 90s. I hope to continue her legacy."

"Having a meaningful life can be found by surrounding yourself with interesting people and fully investing your talents to help others," summed up Eisenberg. "Just the pleasure of being able to get out and accomplish things is what keeps us all young."

# — Around the Corps —

## WRDA workers honored

Secretary of the Army Louis Caldera recently recognized 12 people from Headquarters for developing the Water Resources Development Act of 1999.

"Because of your tireless efforts, legislation is now in place authorizing the activities of the Civil Works Program of the Army Corps of Engineers," Caldera said in the Pentagon ceremony.

He noted that the 1998 version of the bill fell victim to congressional debate. "After a lot of hard work crafting and redrafting various legislative provisions, a lot of negotiations, a lot of hearings and testimony, you found solutions acceptable to the many diverse interests of Congress and the administration."

The Corps awardees were Raleigh Leef, Larry Prather, Janice Rasgus, Richard Worthington, Steve Cone, LetMon Lee, Zoltan Montvai, Gary Campbell, John Anderson, Milton Rider, William Schmitz, and Susan Bond.

## University partnerships

Mobile District recently initiated two major efforts to partner with universities.

A district team hosted 13 educators and students from six universities in an orientation about the Tenn-Tom Waterway. The event included briefings, discussions, and locking through the Stennis Lock and Dam on the motor vessel *Tenn-Tom*. The group also toured the Tom Bevill Visitor Center and Lock and Dam, the snagboat *Montgomery*, Pickensville Campground, Town Creek Campground, and the Dwayne Hayes Campground and Day Use Area.

District Engineer Col. David Norwood signed a partnering agreement with Tuskegee University's College of Agricultural, Environmental, and Natural Sciences. The goals are to prepare students majoring in natural resources and related sciences for jobs in the career field, inform them about the Corps, and assist Tuskegee University in educating them.

## Conservation award

On Sept. 17, Jean Sellar, Chicago District biologist, received the 1999 Cyrus Mark Conservation Award from the Nature Conservancy, Illinois Chapter. The award recognizes contributions to the pres-

ervation of biodiversity in Illinois.

Sellar made a number of contributions to conservation. She led efforts for a wetland delineation and inventorying at Gensburg-Markham Prairie, which placed a large area in protected status and halted construction of a truck stop. She helped forge a \$7 million agreement with Material Services Corporation for conservation work in the lower Des Plaines Valley. She has also been critical to the conservancy's work at Bluff Spring Fen, where they are rebuilding curves in a segment of Poplar Creek.

## Defeating Tailwind

On Dec. 8, five members of St. Louis District's Ordnance & Technical Services Branch received a Commander's Award for Civilian Service for helping DoD disprove allegations that the U.S. dropped nerve agent on U.S. military defectors during Vietnam. The awardees were Michael Dace, Thomas Murrell, George Sloan, Elinor Reinerman, and Kirk James.

CNN aired a story titled "Valley of Death" alleging that in 1970 Special Forces soldiers were inserted into Laos to kill defectors. The story claimed that the Air Force dropped nerve gas during Operation Tailwind.

In 1998, the Office of the Program Manager for Chemical Demilitarization, Non-Stockpile Chemical Material, tasked the Ordnance & Technical Services Branch to assist research into the allegations. They conducted an audit trail of all pertinent munitions dispensers from manufacture and filling through disposition. They also determined the types and quantities of chemical warfare material shipped to and from the theatre of operations.

The research team's findings helped DoD prove that Operation Tailwind did not target American defectors or use nerve agents, and was conducted in accordance with the Laws of War, Rules of Engagement, and U.S. policies at that time.

## Lifetime Achievement Award

Dr. Ed Middleton, Jacksonville District's Engineering Division chief, received the Bentley Systems Incorporated Lifetime Achievement Award, presented for his work in advancing information technology and his impact on the engineering industry.

## 225 Years Engineer fought yellow fever

*(This is the second in a series of true stories from the history of the U.S. Army Corps of Engineers to commemorate the Corps' 225<sup>th</sup> year. All material is from the History Office publication, "Historical Vignettes - Volume 2" EP 871-1-1.)*

A number of soldiers and civilians in the U.S. Army Corps of Engineers have died in the line of duty. Lt. Eugene Woodruff died fighting an invisible enemy.

In 1873, Capt. Charles Howell, district engineer at New Orleans, assigned his deputy, Woodruff, to the Red River of Louisiana to supervise a project to clear the river of the great log raft. The "raft" was a dense logjam that formed a formidable obstruction to river navigation.

In September of that year Woodruff left his workboats and crew on the Red River to visit Shreveport, La., to recruit a survey party. When he arrived, Woodruff found Shreveport in the grip of a yellow fever epidemic. Fearing that he might carry the disease back to his men if he returned to camp, Woodruff elected to remain in Shreveport and tend to the sick.

Volunteering his services to the Howard Association, a Louisiana disaster relief charity, Woodruff traveled from house to house in his carriage, delivering food, medicine, and good cheer to the sick and dying. Woodruff himself contracted the disease and died in Shreveport on Sept. 30.

Howell wrote, "He died because he was too brave to abandon his post even in the face of fearful pestilence, and too humane to let his fellow beings perish without give all the aid in his power to save them. His name should be cherished, not only by his many personal friends, but by the Army, as one who loved purely, labored faithfully, and died in the path of duty..."

Howell then assigned the task of clearing the great log raft to Assistant Engineer George Woodruff, the lieutenant's brother. On Nov. 27, 1873, the engineers broke through the logjam, finally clearing the Red River for navigation.

# Group rescued from sinking houseboat

Liam Bickford  
Omaha District

Three U.S. Army Corps of Engineers employees at Fort Peck Lake recently rescued a group of people. Thomas Hendricks and five others were passengers on a houseboat that foundered in high waves and capsized in the lake.

"Needless to say, it was an experience I'll not soon forget," said Hendricks. "On the other hand, it tends to reinforce the value of life and how quickly things can change."

A Mayday (from *m'aidez*, French for "help me.") call reported that the houseboat *Amnesia* had foundered in rough water and was sinking. Corps employees Cody Wilson, Ray Buchheit, and Anna Pieper boarded the rescue launch *Eagle* and proceeded to the *Amnesia*'s last reported position to assist.

Passengers from the *Amnesia* had abandoned the houseboat for smaller watercraft. Arriving on the scene, the



The rescue launch *Eagle*, which was used during the rescue at Fort Peck Lake. (Photo courtesy of Omaha District)

three rescuers found the *Amnesia* continuing to take on water and nearly one-fourth submerged. Wind and wave conditions continued to threaten the

passengers in the small boats.

Wilson, Buchheit, and Pieper picked up the passengers and transported them back to safety at the Fort

Peck Marina.

"We were adrift and hoping someone would come to our aid," said Hendricks. "It was certainly heartwarming to see the Corps workers approaching to render assistance."

"Fort Peck Lake has erratic high winds that change suddenly," said Wayne Barr, Safety Officer. "The lake is much larger than people realize. When the wind picks up, you get extremely high waves. That houseboat had taken on water and it was going down."

"The quick response of these employees prevented what could have been a tragic event," said Darin McMurry, Park Manager. "As a result of their response, no lives were lost."

Hendricks commends and thanks Wilson, Pieper, and Buchheit. "They set about their task in a very organized, professional, and humble manner. They're a credit to our federal employee service."



Maj. Christopher Brooks was the Corps' first-ever Air Force Staff Weather Officer, and supported Headquarters with meteorological information like this hurricane tracking map. (Photo by F.T. Eyre)



Brooks worked in the USACE Operations Center at Headquarters. (Photo by F.T. Eyre)

# Corps gets Air Force weather support

Hurricanes, tornadoes, flood control, cold regions research, river navigation...

The weather is a major factor in Corps of Engineers operations, so the Corps made weather information a permanent staff position.

This month, Maj.(P) Christopher Brooks, the Corps' first-ever Air Force Staff Weather Officer, will complete his assignment after 18 months in the USACE Operations Center (UOC) at Headquarters. From his arrival in August 1998, Brooks has supported the Corps with dedicated weather support from worldwide Air Force Weather assets and capabilities.

Ever since the split between the Army and the Army Air Corps in 1947, when the Air Force was created, all military meteorological support to the Army has been provided by Air Force weather personnel. But it wasn't until 1998 that efforts to assign a weather officer to the Corps finally bore fruit.

"I was very excited when I learned of the position with the Corps of Engineers," Brooks said. "I was completing a four-year tour as faculty member and cadet squadron commander at the Air Force Academy in Colorado Springs, and I wanted to find a challenging job in the weather career field again. I felt my background was ideal for the job, and I really worked hard to get the assignment."

**Ideal background.** Brooks' background included three years of undergraduate civil engineering and hydrology courses before completing his degree in physical geography and climatology. His first duty assignment was with the Army at Fort Bragg, N.C., where he served as assistant staff weather officer for the XVIII Airborne Corps. Following that, he had a series of more standard assignments for Air Force weather personnel — chief weather forecaster at the Headquarters of the Tactical Air Command (now Air Combat Command) at Langley Air Force Base, Va., graduate school at the Naval Postgraduate School in Monterey, Calif.; and a two-year stint in charge of the satellite imagery shop at the Joint Typhoon Warning Center in Guam.

"With my educational background in engineering and meteorology, and my operational experience with the Army and tropical weather, I thought I would be a pretty good fit at Corps Headquarters. It's turned out to be even better than I imagined. I've been very comfortable working with the great Army folks, as well as the civilian work force. The people I've worked with have been the best part of the job."

But coming to Corps Headquarters as its first Air Force weather officer (and possibly the only Air Force member assigned to the Corps) had its challenges.

"We had to start from square one, from defining



Maj. Mark Kaster (right) will replace Brooks this month as the Air Force Staff Weather Officer in Headquarters. (Photo by F.T. Eyre)

the job title and duty description to clarifying my operational chain of command, and even resolving where my desk would be. I was also trying to see how I could help the Corps with its weather needs; and I couldn't do that very well until I understood the Corps and its spectrum of missions."

Brooks' learning process got off to a fast start with a visit to St. Paul District and the annual Mississippi Valley Division Water Control Conference in 1998. "I was amazed to learn that water flow in the Mississippi River was essentially controlled along most of its course. It was incredibly enlightening to meet the engineers throughout MVD and hear the issues they were dealing with. It also provided an opportunity to better understand the close relationship between National Weather Service River Forecast Centers and the hydrologists and hydraulic engineers in Corps Water Contol."

The 1998 hurricane season also geared up in Brooks' first days with the Corps. UOC activation for Hurricanes Bonnie, Earl, and Georges let him use his experience in operational weather to help the Corps understand hurricane structure and forecasting.

**Projects.** "It was great being back in the middle of real-world weather," said Brooks. "I felt good being able to explain basic processes involved in tropical systems like hurricanes, and to help the emergency managers and command section make informed choices based on the best weather information possible. It really helped me feel like part of the Corps, and I believe the folks in the UOC saw the value in having an experienced weather officer on their team."

Several weather projects have kept Brooks busy during his assignment to Headquarters. "I've seen

the immediate need for a good, comprehensive weather web site on the Corps' intranet automated information system, ENGLink Interactive," he said. "That's the ideal place for one-stop shopping for weather and hydrology data at the Headquarters level. I've been working hard on work file transfer issues from firewalled military weather sites. My goal is to enable Corps users to have access to all-source weather and hydrology data throughout our divisions and districts without having to exercise password protocols except to get into ENGLink. It can be done, but the background coordination and design has taken longer than I hoped."

Other initiatives include generation of Air Force point weather warning support to Army sites similar to that now offered to many Army posts. "And ultimately, we in Air Force Weather would like to use our precipitation forecast models to tie in with Corps models for river flow in overseas areas, similar to what the National Weather Service does here in the U.S. Such an arrangement could preclude the surprises of a Sava River event from occurring again, and would be an important element of force protection during military operations."

But like many people in the Corps, Brooks has discovered that the demands of day-to-day Corps operations affects his work on long-term projects.

"The Kosovo events associated with Operation Allied Force, and the Oklahoma tornado recovery, really slowed my progress on some of these projects. But we'll keep working on improving access to needed weather data. It's difficult for one person to accomplish all he or she sees a need to do."

**New assignment.** Brooks has been selected to command the 18<sup>th</sup> Weather Squadron at Fort Bragg, his third Army support weather assignment. "There's something special about working Army weather issues," Brooks said. "The Army has always appreciated the work we do, and the Corps is no exception. I'll miss working with the great people in the UOC and in Earl Eiker's Hydraulics and Hydrology Branch, but I'll always feel like I'm part of the Corps family. You're never too far from the Engineer's castle."

Brooks' replacement will be Maj. Mark Kaster, currently the executive officer for Brig. Gen. Fred Lewis, Air Force Director of Weather in the Pentagon. Kaster is no stranger to Army weather support; he served in Germany with Army units and is familiar with the Sava River flood in Bosnia in 1996.

(Maj. Christopher Brooks, the former Air Force Staff Weather Officer at Headquarters, wrote this article.)