



News Brief

U.S. Army Corps of Engineers, Omaha District

July 2012 - Vol. 16, Issue 1



Fort Peck Dam turns 75

The Omaha District of the U.S. Army Corps of Engineers celebrates this engineering marvel as it reaches a major milestone in serving the people of the Missouri River Basin.

- » All systems go: Restoring flood risk mitigation.
- » How Omaha District is redefining geotechnical investigations.
- » Green buildings sprout at District project sites.
- » Building tranquility for both humans and birds.



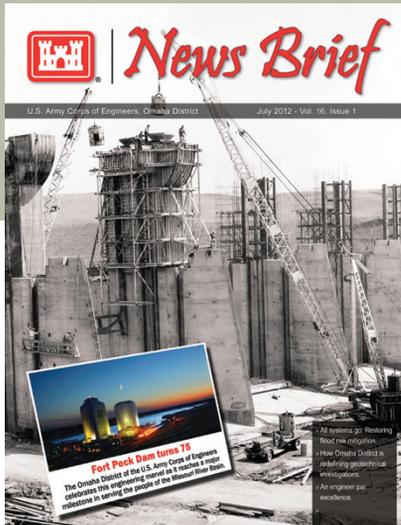
News Brief

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News Brief is a quarterly publication produced by the Public Affairs Office for the U.S. Army Corps of Engineers, Omaha District, in accordance with AR 360-1. This publication is produced for the Omaha District workforce and external audiences including other Corps' districts and stakeholders within the Omaha District's area of responsibility. Content is aimed at highlighting what, why and how the district fulfills its mission.

This publication is available on the district's public website (www.nwo.usace.army.mil) and has a limited print circulation of approximately 500 with distribution in district offices and via U.S. Mail. Content is prepared in accordance with the Associated Press Stylebook and the News Brief Style Guide. Contributions are welcomed and highly encouraged. However, the editor reserves the right to make editorial changes to any submitted material as deemed necessary.

The views and opinions expressed are those of the writers and not necessarily those of the U.S. Army Corps of Engineers, the U.S. Army or the U.S. Department of Defense.



On the cover:

Crews construct the spillway gates for Fort Peck Dam. Work on the dam began in 1933 and ran through 1940. More than 7,000 people signed up for jobs in the first two years to construct the project. The inset picture is at sunset on the night of the 75th anniversary (photo by Harry Weddington, NWO).

In this issue. . .

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- 6 **Fixing the breaches** - *The U.S. Army Corps of Engineers pushed hard to restore five levee breaches from the Flood of 2011 during a short, five-month window that preceded the next runoff season.*
- 8 **Marvel of engineering and manpower** - *At the time of its closure in 1937, Fort Peck Dam already was considered by those who constructed it a monument in perseverance. Some 75 years later, it still is.*
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- 15 **Pushing for more than gold or silver** - *The energy efficiency accolades continue to stream in for the Omaha District, this time with projects in Minot, N.D., as well as Fort Carson, Colo.*
- 16 **Top engineer award goes to hydro branch chief** - *Time and again, John Remus and his team proved their mettle during the Flood of 2011. His efforts were recognized with the top engineering award in the Corps.*



In this image from August 2011, Lt. Col. Mark Martinez, then chief of engineers for the Combined Joint Interagency Task Force 435, conducts a site survey in the village of Seh Du-Kahn with elders and representatives from the State Department and area energy providers to look for ways to improve the region's water and power supply systems. (Photo by Senior Chief Petty Officer Tom Jones, U.S. Navy)

New deputy commander reports to Omaha District

From Colombia and Guatemala to Iraq and Afghanistan, Lt. Col. Mark Martinez has served in both austere and combat conditions. Martinez assumed the role of Deputy District Commander on May 1.

His previous assignment saw him as the Chief Engineer for the Combined Joint Interagency Task Force 435 in Kabul, Afghanistan, where he oversaw the planning and development and construction of more than \$240 million of

critical Rule-of-Law and Detention Facility construction projects. Prior to that, he was the Counter-Improvised Explosive Device (IED) Branch Chief at the Collective Training Directorate, Fort Leavenworth.

Martinez served as the Battalion S3 (Operations) for the Brigade Special Troops Battalion, 4th Infantry Brigade Combat Team, 1st Infantry Division from 2007 to 2008 during the surge in Operation Iraqi Freedom in the Rashid District, Baghdad, Iraq.

Message from the commander

As my assignment as Omaha District Commander comes to a close, I want to say how profoundly and positively this experience has impacted me. I am extremely proud and deeply moved by what you have all done together in Omaha. I want to thank you for being the Nation's builders. I have worked with a magnificent group of outstanding people who have built a proud legacy featuring an historical, unparalleled litany of successful achievements, and thousands of meaningful accomplishments.

I hope you will take just a minute to reflect on how you have made our nation and our world a better place. Think about what you have built for your fellow citizens across this nation... water resource projects, military construction projects, environmental remediation solutions and special projects throughout the land.

Last year at this time the theme was WE STAND READY. Today, the theme is IT'S NOT BUSINESS AS USUAL in the Omaha District. What a year we had in 2011 and what a year we are having in 2012, as we scramble to repair flood damages even as we execute our biggest program ever. It takes a special group of people to do the things you do and to do them as well as you do them.

What a great honor it has been for me – to serve in the Omaha District, and to serve the Army Corps of Engineers. We can reflect for a moment on the District's distinguished history that goes back more than 78 years. We have a record of community-building and nation-building that is something to be respected and we can all take pride in it. Globally, our accomplishments not only result in magnificent structures and service, but they form a huge vault of knowledge storing methods and information from which the world has learned, developed and vastly improved.

We have had a hand in shaping this nation's history and destiny for 237 years.

And now that I have reflected for a few minutes it is – as always – time again to train our focus on the future. Face forward. The past is behind us, and we may use it as a proud launching pad, but our mission is to build tomorrow today.

As significantly and rapidly as the world is changing, we must all realize the people who stand beside us in the workplace today stand in a critical, key position to have a vital and positive impact on our world.

The Omaha District has always had noble work that required innovation, dedication and determination. And, it has earned the reputation for getting it done right.

The amount of work we have today eclipses what went before... \$1.3 billion in work spread across a thousand projects. We step outside our traditional borders and work all across the country... even around the world. And where there were once nearly 1,800 of us, now there are some 1,200.

So it is fitting that we take stock for a minute and recognize you who have given your efforts to this cause. I salute your families as well, for providing support to great men and women who work so hard to make America everything it can be.

The road ahead is challenging, but we have a workforce with proven track record and positive attitude. So I say onward and Essayons – LET US TRY.

I am extremely proud to have served as your commander.



Robert J. Ruch
Colonel
Omaha District Commander

A handwritten signature in black ink that reads 'Robert J. Ruch'.

Robert J. Ruch
Colonel, EN
Commanding

BENEATH THE Layers OF DIRT

Photos and Story by **KEVIN WINGERT**
Public Affairs Specialist

In a grassy field adjacent to an earthen levee, a group of three young men uncoil a long yellow wire with metal clasps every few feet. At each of these clasps, they secure a roughly foot-long metal probe that is pushed by hand into the soil.

The wires wind their way into a black box attached to large batteries. With each blip, whir and whine from that unassuming structure, these men are saving the federal government and the American public hundreds of thousands of dollars, potentially millions.

They are deploying a multiple electrode resistivity unit – MER, for short – to create a map of changes in the soil beneath them. Each probe either sends or receives electrical impulses across the alignment. The computer within the box records the resistance, or relative ease of transmission of the electricity.

“This is the quintessential widescreen assessment tool,” says Matt Glover, a geophysicist for the Omaha District of the U.S. Army Corps of Engineers. “It can pinpoint locations that we normally would have the potential to miss, and it can maximize the efficiency of our drilling process.”

A team can cover between 1,500 and 3,000 feet a day, providing a wealth of information to engineers who design setback levee alignments, including important indicators of how a levee may perform over time. If the foundation has large areas of sand, that may increase the chance of seepage when

the levee is loaded with water. If there’s too much clay beneath a foundation, the levee may settle, lowering its height.

It’s the first step in a process developed for the U.S. Army Corps of Engineers by engineers from the Omaha District and contractors from Terracon, a national geotechnical, environmental, CMET and facilities consulting firm headquartered in Olathe, Kan.

“For the purposes of defining ‘where is the problem, what is the problem,’ this process is more effective and efficient to determine what the critical situation is,” says Joe Waxse, a senior Terracon consultant with more than 32 years in the geophysical sciences field.

Waxse would use his experience, forged in far-flung locations like Saudi Arabia, Africa and Indonesia, to help formulate the basic process with Don Moses, a civil engineer in Omaha District’s geotechnical engineering and sciences branch.

“The technologies are actually pretty old, it’s just recent advancements in digital data processing and how we applied them to make sure we get good information that was new,” Moses says.

Dave Ray, the branch’s chief, would champion the fledgling process in its early days in levee construction post Hurricane Katrina in Louisiana. He would lead the push to refine and modify the process into its current form used to address the daunting repair needs for levees in the Missouri River Basin following the Flood of 2011.

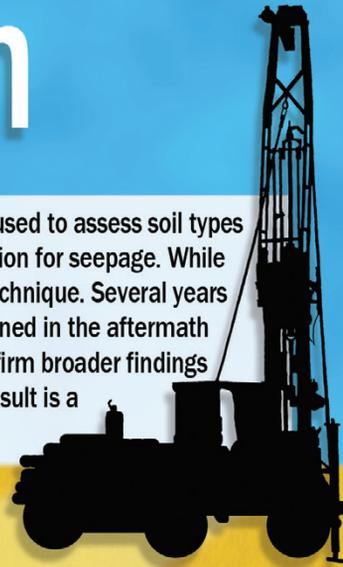
“Twenty years ago, the geotechnical investigation process would be a lot more methodical – you might concentrate on only areas that were damaged,” Ray says. “Whereas today,



A stake marks a potential alignment for a setback levee as a rig performs Cone Penetrometer Testing in a corn field adjacent to a levee that suffered substantial erosion during the Flood of 2011. The area had previously been scanned using Multiple Electrode Resistivity testing.

GEOTECHNICAL INVESTIGATIONS A new approach

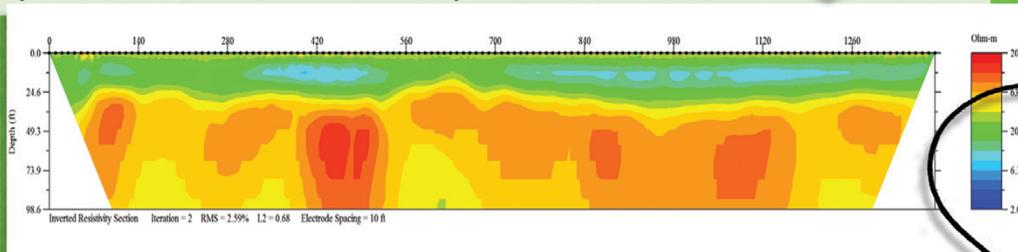
Under the old paradigm, traditional drill boring was the first and last technique used to assess soil types beneath a levee and whether conditions indicated a need for an engineering solution for seepage. While borings provide exacting information, drilling is an expensive, slow and invasive technique. Several years ago, the Omaha District rolled out a new process that has been expanded and refined in the aftermath of the Flood of 2011. In it, drilling is the last step to give a physical sample to confirm broader findings found by cone penetrometer testing and multiple electrode resistivity tests. The result is a highly efficient and cost effective method of engineering levees and setbacks.



Cone penetrometer testing pushes a small conical probe into the ground and uses a variety of pressure related tests to help further refine the understanding of the soils present below the surface of a field, a berm or a levee, itself. CPTs are significantly less destructive than traditional drilling and can yield substantial information. Between the CPTs and MERs, geophysicists can better assess whether the soils present can handle the weight of a levee or if engineers have to design for seepage.



Multiple electrode resistivity testing forms the backbone of a robust geotechnical investigation. Using a series of electrodes to emit and receive electrical impulses along a line, geophysicists can see the electrical resistance of the soils beneath the ground along a continuous, wide area. Changes in resistance indicate changes in material. Combined with data from CPT testing, geophysicists can produce a map of sorts where reds and oranges areas typically denote sand and blues indicate clay bodies. This gives Corps engineers substantially more information about an entire levee system than older methods.



Graphic illustration by Kevin Wingert, NWO

we're looking at levees as a holistic system, rather than just concentrating on the most obvious problems. By looking at them holistically, we saw damage that likely would have been missed and are able to investigate larger areas more efficiently."

With the MER data in hand, engineers superimpose data on the maps of known performance issues on the levees recorded by flood fighters using an Android-based mobile information collection application on cell phones. Between those two data sets, cone penetrometer testing – CPT – pushes are scheduled to verify the MER data and further refine data near areas of concern. That redundancy is a needed feature as MER is not an engineer's silver bullet.

"We know and learned that there are real limitations to the MER data when taken alone," Ray says, noting that the water table or buried materials like metal or plastic can interact with the test. "It takes a team effort by the geophysicist and the geologist and levee engineer to take a look at the data and interpret it."

Following the CPTs, drill borings collect physical samples at specific sites and depths instead of drilling at general intervals with continuous sampling – an expensive and time consuming process.

"In the old days, what we used to do was every 1,000 feet go out and drill a boring sample. And you based all your analysis and design on that one point of information every 1,000 feet," says John Bertino, the chief of engineering division for Omaha District.

While the intervals for drilling – be it 500 feet or 2,000 – would be set by a mixture of ground observations and U.S. Geological Service soil maps, the fact remained that the exact composition of the earth beneath a levee or along a proposed alignment between two drill points were nagging question marks for engineers.

"Now, we can get an actual picture of what the foundation looks like with the MER and CPTs," Bertino said. "You can really make some educated decisions based on that data. This process reduces our risk – the risk that we might miss some of the variability in the foundation."

One example stems from the work done post Katrina. A MER scan clearly showed something in a levee that required additional investigation. Subsequent borings revealed buried trees and other organic material in the levee foundation.

For Ray, part of the value of the process is obvious.

"We're able to map things a lot more closely and accurately with these methods," he says, giving an example where a levee might need only a few relief wells or a trench drain as opposed to an entire relief well field. "Instead of just assuming the worst scenario and the highest dollar fix for everything, we're able to hone in on the type of fix needed at a particular point that might be a little more economic and easier to build. You've saved the government and taxpayers a considerable amount of money because you're not overdesigning a repair."

The levee repairs in the Missouri River Basin are a prime example of this. Many levee systems are thirty or more miles in length. Applying blanket solutions across an area would be cost prohibitive and likely wasteful.

But it works both ways. Occasionally, damage or problematic areas are uncovered by the process. Left unchecked and not repaired, those features could potentially lead to significant issues

or failure in a future flood fight.

"We did adjust our preliminary designs based upon the data from our geotechnical investigations," Moses says. "Where we thought we needed to widen one levee to deal with under seepage issues, the MER and CPT data showed us that repair wasn't needed across the entire segment. It also showed us that some additional work beyond our planned repair was needed in certain areas."

For Waxse, the original work done in Louisiana compounded with efforts in the Missouri River Basin confirms the value of a process that is still gaining acceptance in the engineering world:

"It all boils down to the comfort level that you have a good picture of what's there, and your engineering judgment is therefore better, allowing you to reduce both costs and risks."



Matt Glover, a geophysicist with the Omaha District of the U.S. Army Corps of Engineers, checks a GPS unit reference while conducting Multiple Electrode Resistivity testing in a field.

DROPPING A FEW TONS OF Rock

*The tugboat **Motorvessel Missouri** positions several barges with 300 tons of rock for installation along a revetment near Blair, Neb., on July 2. The work is part of a larger effort to restore the Missouri River channel following damages from the Flood of 2011.*

To accomplish the channelization, a variety of dikes and revetments are used. Dikes are a hard-point rock structure that extends into the river to help train and slow the flow of water. Revetments are rock-armor or riprap along stretches of shore where the angle of the river's flow is pointed toward the shoreline. The armor prevents erosion and degradation of the river bank at that point.

Contractors and the Omaha District of the U.S. Army Corps of Engineers will place roughly 250,000 tons of rock between Sioux City, Iowa, and Rulo, Neb.

The work should be completed by September of 2014.



A MONUMENTAL TASK

Five breaches • Five months • 2.7 million cubic yards of material

Timeline on Missouri River Levee Units L-550, L-575

2011

May – Unprecedented, torrential rains in the upper basin set off a systemic flood

June through July – Continued record runoff from snowpack and regional weather events continues the need for high releases from its six mainstem dams

June 13 – Full breach of L-575 (middle) occurs near Hamburg, Iowa; sponsor subsequently notches levee (lower) to reduce pressure of floodwaters and stabilize the levee

June 24 – Full breach of L-550 (upper) occurs just south of Watson, Mo.; sponsor subsequently notches levee (lower) to reduce pressure of floodwaters and stabilize the levee

June 30 – Full breach of L-575 (upper) occurs near Percival, Iowa

July 29 – The Corps releases a drawdown schedule to reduce releases from the mainstem dams

Sept. 6 – Damage survey reports conducted on all five breaches of L-550, L-575

Oct. 17 – Flood of 2011 declared over

Oct. 25 – Contracts awarded on L-550, L-575

Nov. 9 – Construction starts on upper breach of L-550

Dec. 7 – Construction starts on upper breach of L-575

Dec. 8 – Construction starts on middle breach of L-575

Dec. 24 – Construction starts on lower breach of L-550

2012

Jan. 19 – Breach closed at upper L-550

Jan. 26 – Construction starts on lower breach of L-575

Jan. 28 – Breach closed at middle L-575

Feb. 1 – Breach closed at upper L-575

Feb. 24 – Breach closed at lower L-550

Feb. 28 – Breach closed at lower L-575

Photos and Story by **KEVIN WINGERT**
Public Affairs Specialist

Rockport. Hamburg. Council Bluffs.
Names on a map.

In the summer of 2011, though, they were so much more: Communities fighting a rising tide of water that threatened to wash away everything. In some places, levees held and a crisis was averted. In other places, the levees failed and lives were disrupted.

But throughout the Missouri River Basin, there were many flood control structures stressed or broken that held little chance of functioning properly even as the 2012 runoff season approached. Tensions in these and similar towns and cities ran high.

Now those communities can take comfort in knowing that much of the flood risk reduction in the basin has been restored. The five breaches along Missouri River Levee Units L-575 and L-550 are closed. Several critically damaged segments of levee from Omaha and Council Bluffs south to just below the Missouri state line are restored and ready to handle high water if the mild winter worsens.

March 1 is the typical start of the runoff season for the year, when the first significant amounts of water from melting plains snowpack enters the Missouri River. It is a date fraught with meaning for businesses, residents, farmers and advocacy groups like Responsible River Management.

“We sat down with the people of the Basin – we sat down with Responsible River Management and the sponsors, and we put this March 1 date on the calendar,” said Col. Bob Ruch, the commander of the Omaha District of the U.S. Army Corps of Engineers. “And working with them, we’ve met that date.”



Tractors pass atop the growing crown of a setback for the lower breach at Missouri River Levee Unit L-575 near Hamburg, Iowa, in this photo taken Feb. 24. Contractors on the repair projects frequently employed local and area farmers in construction.

Between L-575 near Percival and Hamburg, Iowa, and L-550 near Watson and Rockport, Mo., contractors placed 2.7 million cubic yards of material in 86 calendar days. That's an average of 31,000 cubic yards of material a day.

"Without getting these breaches closed, absolutely nothing can move forward – our commerce or getting back in our houses, getting our lifestyle back," said Leo Ettleman, the chairman of Responsible River Management. "Going on, moving forward – it all starts with getting the levees back."

Col. Ruch praised the efforts of groups like Responsible River Management as well as local sponsors who worked with the Omaha District, helping on real estate issues and providing crucial input into the local needs.

For their part, Ettleman said farmers and Responsible River Management appreciated taking an active part in the process of levee restoration.

"Having them listen to our concerns, they've been very receptive to our concerns and taken that to heart," he said. "And they're reached out to us just as we reached out to them. So it's worked out well."

The work of restoring flood control structures in the Public Law 84-99 program along the Missouri River Basin to their pre-flood status will continue through the remainder of the year.

Ongoing repairs are addressing areas of concern with underseepage or scouring and erosion.

The initial construction in the early months of 2012 represented fixes designed to repair damages deemed the highest risk to life safety. The Corps focused its energy and resources on repairs that could be completed in a tight timeframe. Those efforts were aided by decidedly mild weather.

"God's blessed us with some great weather this winter to do construction. Otherwise, we really would have had a bigger challenge than we did to meet this March 1 date," Col. Ruch said. "We've been very fortunate. I don't think we've lost three days to weather this winter. And that's not normal for this time of year."

To implement the massive contracting actions required throughout the basin and provide the necessary safety and quality oversight on these projects, Col. Ruch formed a special execution cell, the Omaha District Systems Restoration Team.

"We brought all the program managers, project managers into one section," Col. Ruch said. "This is really a \$500 million effort up and down the river. That's a large program for any organization to run. So we brought in the right overhead to make sure that all the things are sequenced correctly and that we don't miss anything."

To man such an effort, the district had to look beyond its borders.

"We received engineers and support from seven different districts in the U.S. Army Corps of Engineers, stretching from Alaska to New England to Kansas City and to the mouth of the Missouri River at St. Louis," said Bret Budd, the chief of the Omaha District Systems Restoration Team.



By the numbers

FILLING THE BREACHES AT L-550, L-575

- 5** – Number of critical breach repairs
- 6** – Number of local construction subcontractors located within 20 miles of the breach sites
- 35** – Number of local operators/laborers employed by Weston directly
- 62** – Estimated number of local operators employed by the local subcontractors
- 86** – Number of calendar days spent placing material along the setback levees and near the breach sites
- 163** – Maximum pieces of equipment working at any one time at all sites together
- 220** – Maximum number of personnel at any one time including operators, laborers, professional staff, geotech/survey personnel
- 320** – Number of maps with various data produced to assist engineers in design process, including for the breach sites at L-550 and L-575
- 31,000** – Number of cubic yards of material placed per day at the various breach sites
- 2,700,000** – Number of cubic yards of material used in the critical repairs at L-550, L-575



75th Annive

Fort Peck Dam: tested and true

By **KEVIN QUINN**
Public Affairs Specialist

"The sheer magnitude of this dam ...and this day... are in perfect symmetry. And the spirit of human accomplishment – which resulted in the construction of Fort Peck Dam – is a story that should be known by all Americans."

So rang the resonant, staccato tones of Omaha District Commander Col. Robert Ruch, as he spoke to a crowd of 330 people gathered on a windy Montana day to celebrate the 75th anniversary of Fort Peck Dam.

Col. Ruch, one of two keynote speakers taking part in the ceremony, asked the audience to raise a hand if they worked on the dam in the 1933-1940 time frame – three hands went up. Even more went up when he asked if anyone had lived in the town or famed boomtowns.

"The operation and maintenance of this dam for the last 75 years is an awesome responsibility and it has been executed to perfection," said Ruch. "Please stand or wave if you worked on the dam at any time."

Another 60 or so waved their hands.

Ruch went on to thank the staff at Fort Peck for putting in the great effort to make the 2-day event special.



rsary



“Your heartfelt efforts are a tribute to this great dam and to yourselves as well. You have enriched us all,” said Ruch. “Today we stand here on hallowed ground – we stand on a functioning giant – an incredible feat of engineering ...we stand on a launching pad for superior civil works throughout the nation... so many of the smart, savvy and hardnosed people who built this dam spread across the country to share their skills and knowledge in subsequent years.

“And, alas, we stand here today upon the unmarked graves of those who died and were buried here in the Slide of 1938.”

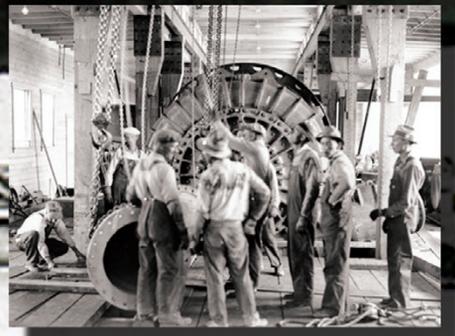
In planning for the day, the Fort Peck staff focused on honoring all 61 people who died during the construction of the

dam. They were able to name 59 of them, and each name was read aloud later in the ceremony. Their names will be carved into boulders placed at the “lookout” on the east end of the dam, near a similar boulder bearing the names of the eight people who died in the slide of 1938.

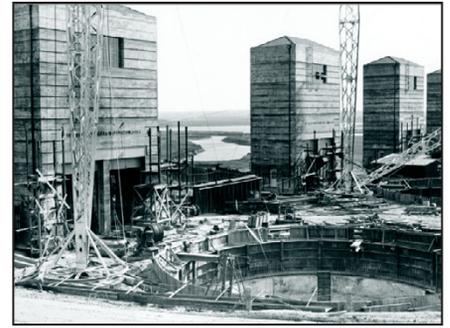
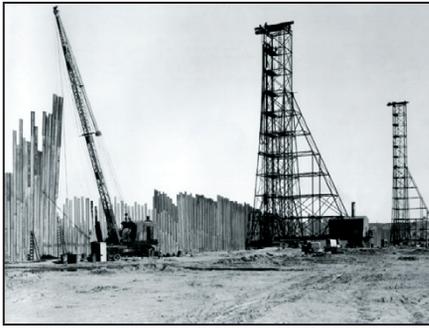
Ruch spoke of a “rough and tumble era” featuring the harshest of conditions. “Still it was a time of incredible discovery and triumphant accomplishment,” he said.

“One can sense the desperation of the times as workers gathered and struggled through the Great Depression... the willingness of those men and women to toil under the

Continued on Page 12



Continued on Page 9



A short course in a **big dam**'s history

By **KEVIN QUINN**
Public Affairs Specialist

The largest dam in the world; that was what Fort Peck was destined to be when it was on the drawing table in 1933. At nearly four miles long, 250 feet high and more than 3/4 mile wide at the base, it was the biggest, by far. When only a fifth complete, it was already the largest dam in the world.

The concept of the Fort Peck Dam was conceived as a whisper of an idea in 1866. For the next 67 years, the region surrounding the northeast Montana settlement called Durfee and Peck suffered numerous crippling flood events and slashing “ice gorge” attacks, which tore stockades and dwellings asunder.

By 1932, politicians, local business owners and home owners were serious about getting a massive dam in place on the upper Missouri River to protect them from the ravages of flooding and to boost the economy. Four years of The Great Depression had bled Montanans – as it had all Americans. Then came the life-saving clarion call from the White House.

The Fort Peck Dam Project was authorized in late 1933 by President Franklin Delano Roosevelt, who hoped it would serve the dual purpose of providing jobs for a Depression-plagued workforce and providing flood protection on the Missouri River, which had been a major problem since the 1860s.

When the idea to build an earth fill dam across the great valley was shared with Glasgow Mayor Leo B. Coleman, he surveyed the site and said “My God, man...that would cost a million dollars.” In the dollars of the day, it actually cost \$158 million for the dam, spillway, hydropower facilities and real estate transactions.

Later to become part of the famed Pick-Sloan Plan, which includes the six U.S. Army Corps of Engineers managed dams on the upper Missouri River basin, Fort Peck was not

By the numbers

- 125 million cubic yards of fill material
- 34 million pounds of steel in the cut off wall
- 53 million pounds of steel in the spillway
- 4 million cubic yards of gravel
- 4,900 feet – the width of the base
- 50 feet – the width of the top of the dam
- 250 feet – the distance separating the base from the top of the dam
- 1,600 miles of shoreline along the reservoir
- 134 miles – the length of the reservoir
- 18.7 million acre-feet of water in the reservoir
- \$12.1 billion – amount of flood damage reduction to date
- \$2.4 million – annual economic benefit from tourism to the project

thought of by its creators in the same way it is thought of today. In those days it was considered a project of salvation which breathed new life into a populace desperate for work. They could not see, nor did they care, that one day it would be seen as a memorial to human skill, stamina and the ability to overcome hopelessness.

Engineers were tasked with building the world’s largest dam in a remote location with no roads, no power, and no housing, where temperature extremes of 110 degrees F to -60 degrees F were not uncommon. It became the single largest project of the New Deal, employing 10,560 at the peak of construction, nearly doubling the work force at Hoover Dam and topping Grand Coulee Dam by more than 2,500 workers.

One of the most formidable obstacles faced by the workforce is described by Major Clark Kittrell, who arrived at Fort Peck in 1933 and served as District Engineer from 1937 to 1940. He wrote “no engineering job of this magnitude had ever been attempted with so short a time for planning.”



Indeed, the work on the dam began a mere ten days after its authorization. By the time closure of the dam was made in June 1937 so many hardships had been conquered that some who worked on the dam consider it first and foremost a monument to perseverance.

Building the world's largest dam in such a remote location created many challenges and led to many seemingly unusual decisions. One of the first was to build the dam by hydraulic fill; using hydraulic fill to build a dam this size had never before been attempted. Hydraulic fill meant dredges. The dredges would be built onsite, resulting in the creation of a shipyard and the Fort Peck Navy.

Delivery time for large diesel motors the size needed for the massive dredges was two years, and the availability of fuel was inconsistent. This led to another major decision – the dredges would be powered by electricity. A 154,000 kVA power line, 288 miles long, was constructed from Rainbow Falls to Fort Peck to power the dredges and the rest of the construction.

An entire town would be built to house the workers. Roads and a railroad would be constructed to haul materials and people. At the same time, clearing operations were going on at the dam site, where more than 4 million cubic yards of material would be removed.

On June 24, 1937, the culmination of the past three and half years' worth of decisions, planning and millions of hours of hard work came to fruition with the closing of the dam. Thousands of details, big and small, had to be carefully coordinated to be ready for this event.

At 4:20 a.m., the dike separating the river from the tunnel intake portals was blown up and water began flowing into the tunnels. Train car after train car dumped gravel and boulders into the river below the Missouri River Bridge, placing some 20,000 cubic yards in the river in one day. The Missouri River was cut off.

A congratulatory letter was sent from the Chief of Engineers, Major General Markham, describing the closure as “a unique, delicate and highly successful engineering achievement.”

Although closure took place in mid-1937, the dam was not finished until 1940. The four-mile-long dam was considered the engineering feat of its time.

At the time of construction it was the largest dam in the world.

Seventy-five years later it remains the world's largest hydraulically filled dam and is now the eighth largest dam in the world.

Major milestones in Fort Peck construction

1933

- Oct. 14:** Project approved by President Roosevelt under public works program
- Oct. 23:** First day of work on project
- Dec. 18:** First earth moved on project

1934

- April 5:** Town buildings and services started
- May:** Work begins on diversion tunnels
- June 19:** Work to strip base of dam begins
- Oct. 13:** First dredge starts work and first material placed in the dam
- Nov. 15:** Spillway excavation started
- Nov. 19:** Stripping of base of dam completed 1935
- May 13:** Construction begins on spillway gate structure
- Nov. 25:** Cutoff wall completed at spillway top

1936

- June:** Construction begins on lower spillway cutoff wall

1937

- May 10:** First gate placed in spillway
- June 23:** Tunnels completed
- June 24:** Closure of dam made and river diverted through tunnels
- Aug. 10:** Concrete-lined channel of spillway completed
- Aug. 24:** Last spillway gate set in place
- Nov. 9:** Spillway gate structure completed

1938

- Sept. 22:** The Slide occurs; 8 men killed

1940

- August:** Construction of first power plant begins
- November:** Topping out of dam with fill earth completed

“Today we stand here on hallowed ground... an incredible feat of engineering... we stand on a launching pad for superior civil works throughout the nation” - Col. Robert Ruch



Continued from Page 9

harshest of conditions, and apply their strong work ethic. That is why the Fort Peck Dam is a monument in itself and a reminder of a special spirit that defines what America is all about.”

Ruch also quoted President Franklin D. Roosevelt, who spoke at Fort Peck Dam in 1934 and 1937.

“...We have given useful work to millions of unemployed citizens; we have brought water to dry places, and we’ve increased and cheapened the use of electricity ...due to projects like Fort Peck, the nation has understood that we are building for future generations of our children and our grandchildren, ... the money spent is an investment which will come back a thousandfold in the coming years.”

Ruch pointed out that Fort Peck Dam alone has prevented nearly \$11 billion in flood damages.

“Add in hydroelectric benefits and recreation dollars and water supply benefits and you have one of the best investments ever made,” he said. “Last year gave the truest picture of the greatness of what those workers started 80 years ago... Indeed the Missouri River Flood of 2011 – which hurled the greatest challenge of all time at Fort Peck Dam... proved the point better than any words ever could.

“The old heavyweight – THE LEGEND – didn’t flinch. Just like the dam’s creators, both living and dead...the Flood of 2011 gave the truest illustration yet of the greatness of this monument to engineering.”

Ruch closed with another quote, this from President Teddy Roosevelt’s famous “Citizenship in a Republic” speech from 1910:

“The credit belongs to the man who is actually in the arena, whose face is marred by dust and sweat and blood; who strives valiantly; who errs, who comes short again and again, because there is no effort without error and shortcoming; but who does actually strive to do the deeds; who knows great enthusiasms, the great devotions; who spends himself in a worthy cause; who at best knows, in the end, the triumph of high achievement, and who at worst – if he fails – at least fails while daring greatly, so that his place shall never be with those cold and timid souls who know neither victory nor defeat.”



AT LEFT - Col. Robert Ruch delivers the keynote address at the 75th anniversary for the closing of Fort Peck Dam on June 23 to a crowd of more than 300 people. **ABOVE** - Bison graze in an open field near the iconic powerhouses of the project. **BELOW** - A stone monument stands at the top of the earthen dam structure above the powerhouses. The stone lists the name of eight workers who died during "The Slide" that occurred on Sept. 22, 1938. In all, some 61 workers would die during the construction of the dam from 1933 to 1940.

“Let us quietly – and with great pride and dignity – think of how their contributions reverberated throughout the nation,” said Ruch.

“The ghosts of the men and women who built Fort Peck stand among us today. And they are proud...”

Visitors flocked into the Fort Peck Interpretive Center, before and after the ceremony, and also toured the Administration building and had a picnic at Kiwanis Park.

A large crowd also filled up the old Fort Peck Theater for a special showing of the Montana PBS documentary, “Fort Peck Dam.”

Two theatrical performances of “All Shook Up” were also presented in commemoration of the 75th Anniversary.

Project Engineer John Daggett was pleased with the event.

“The anniversary went very well,” he said. “We had a lot of compliments from people who attended. It was really great to see some of the people who worked on the dam construction at the dedication.

“There are not many left.”

Pride was a constant theme of the weekend.

“They certainly did it right 75 years ago,” said Daggett. “Fort Peck workers really take a lot of pride in working at the project and providing great service to the Army Corps of Engineers and the nation.”





Project allows return of the wild things

Plus, brings a nice escape for the hectic lives of city dwellers

By **MAGGIE OLDHAM**
Public Affairs Chief

A steady stream of traffic zips along busy West Maple Road near 120th Street in northwest Omaha. Many commuters focused on getting to their destination may be unaware that a suburban oasis lies only a few hundred feet away, behind a thick grove of trees.

The Heron Haven wetland sanctuary provides habitat for a wide range of species and serves as a corridor linkage for migratory birds. In June, the Omaha District, in partnership with the Papio-Missouri River Natural Resources District, completed the restoration of seven acres of historic oxbow wetlands in Heron Haven along the Big Papillion Creek to

address the loss of native wetland plant communities and wildlife habitat.

Over time, the wetland ecosystem became degraded due to urbanization of the surrounding area and the spread of invasive species such as reed canary grass and cattail plants.

“This project has been a long process that has involved a diverse range of stakeholders in the Omaha community,” said Jeff Greenwald, Omaha District project manager. “The Friends of Heron Haven, a non-profit group that manages the site has been very supportive of the project since it was conceptualized in 2002. The improved wetland area will continue to provide a source of recreation and environmental education for Omaha residents.”

The Corps completed a feasibility study under Section 206 of the Water

Resources Development Act of 1996 to identify options and recommended an implementation plan in 2010. Prudent Technologies, Inc. was awarded the construction contract in 2011.

The project involved dredging accumulated sediments and organic matter to re-establish wetland depth diversity, and planting native vegetation such as green bulrush, lilies, sedges, arrowhead and spikerush. The total costs for the project was roughly \$1.2 million.

Students from local schools and universities also use Heron Haven as a resource for ecological studies and surveys of native plant and animals. “The site is a popular place for the general public to view wildlife, hike and photograph nature,” said Greenwald.



The 91st Missile Wing Procedures Training Operations Facility building was recently awarded a gold rating from the U.S. Green Building Council. It is estimated that the building will realize 55 percent less in energy costs than a similar structure built only seven years ago. (U.S. Air Force photo, Senior Airman Desiree Esposito)

Going for more than the gold

LEED certifications continue to mount for District at Carson, now Minot

By **EILEEN WILLIAMSON**
Public Affairs Specialist

It's not the Olympics, but if it were, the Omaha District would have quite a display case as it continues to add to its collection of LEED certified projects.

In April, the 4th Infantry Division's Brigade and Battalion Headquarters at Fort Carson, Colo., received the installation's first U.S. Green Building Council Leadership in Energy and Environmental Design platinum certification and the 91st Missile Wing Procedures Training Operations Facility at Minot Air Force Base, N.D., became the installation's first LEED gold certified facility.

Constructing LEED facilities is nothing new for the Omaha District. Since 2008, the district has built and certified 22 facilities at the silver level and achieved 31 gold LEED certifications at Fort Carson alone. To earn LEED certification, facilities must meet rigorous criteria for energy and water conservation, using recycled-content construction materials, low-water use landscaping and alleviating traffic congestion by promoting walking and bicycling.

At Fort Carson, earning platinum certification meant incorporating cutting-edge lighting control designed to reduce energy consumption by approximately 22 percent. Other features include low-flow water fixtures; a solar hot water system, partially heated by roof-mounted solar panels; and a 2.7-acre, onsite solar array, which supplies approximately 62 percent of the 138,000-square foot building's electrical power needs.

Sustainable features such as an abundance of windows to provide views and natural light for task lighting, air quality friendly paints and carpets to eliminate off-gassing smells and advanced "smart" systems that control lighting

when there are no occupants or when natural lighting provides adequate lighting levels are types of features that are now incorporated into the designs of LEED targeted construction projects throughout the district.

At Minot, the 91st MW Operations building incorporates many of these sustainable features with energy costs projected to be 55 percent less than they would be for a similar building built just seven years prior. Efficient toilets and sinks are designed to reduce water usage in the building by 49 percent. And during the construction phase, 92 percent of construction waste was diverted from landfills through reusing or recycling building materials.

Brian Nohr, Omaha District Sustainability Coordinator, said the Army and Air Force will be increasing energy reduction for new construction by setting higher minimum requirements.

Nohr said the Air Force's current minimum requirements are for silver certification and a 30 percent reduction on energy usage. The added water and energy reduction for the 91st MW Operations facility made it possible for the team to achieve gold certification.

"This program is really making the military build better quality facilities, and it's also making us clean up after ourselves," said Nohr.

For Fort Carson, the next step is focusing facilities toward 'net zero' where facilities produce the energy they use through passive and renewable energy features.

To achieve net zero water objectives, the Corps is exploring gray water technologies to enable reusing a building's waste water for landscape irrigation.

Susan C. Galentine (Fort Carson DPW Public Affairs) and **Maj. Shane Balken**, USAF (Minot AFB Public Affairs) contributed to this article.

Hydro branch chief snags Engineer of the Year

By **KEVIN QUINN**
Public Affairs Specialist

The greatest strength John Remus may possess is the recognition of his own limitations.

That is why the recently awarded USACE Engineer of the Year is slow to take credit for this significant accomplishment.

“The award is nice, and I am very honored to receive it, but in all truth it is a team accomplishment. Everything I’ve ever accomplished has been because I’ve gotten help from others. For the Flood of 2011, for example, an opportunity to serve presented itself, and we worked hard and did well,” says Remus, Chief of the Omaha District’s Hydrologic Engineering Branch.

A 27-year veteran of the Corps, Remus oversees engineering and scientific support to the district’s water resources mission, to include design of flood control, channel stabilization, environmental restoration and navigation projects throughout the upper Missouri River basin. Hydrologic Engineering Branch is also responsible for the day-to-day operations of 26 tributary projects, and provides data collection and data base management support to Northwestern Division for the operation of the six mainstem Missouri River projects. During his career, Remus has served as a river engineer, a project manager, a Section Chief, and Branch Chief.

The award nomination for Remus cites numerous notable accomplishments, the most obvious being his work during the historic Missouri River Flood of 2011. But other significant accomplishments factored in, including reach-back work for Afghanistan projects and a myriad of planning studies as well.

Katie Schenk, Chief of Operations Division, says she “cannot think of anyone who knows more about the Missouri River than John Remus. He has worked all aspects of the river and has the knowledge to pull together past and present events that are essential to shape the future of the river.”

Omaha District Commander, Col. Robert Ruch, picks up on that wisdom theme when he says “I came to depend on him as much as anyone during the flood of 2011. He was there 24 hours a day and he knew so much.”

An impact player, Remus lived his early life in humble but solid surroundings. He grew up in the North Platte, Neb. area, played three sports and three instruments in the marching band. His parents exhibited “great values,” he says. “I understood that excellence and hard work were their own rewards, and if you do good things, good things happen.”

“I believe it’s my duty to be as honest as I can be with coworkers and supervisors. Honesty adds value to the organization.”



John Remus
Chief, Hydrologic Engineering

His heroes were the Oakland Raider’s roguish, carousing quarterback Kenny Stabler and his math teacher Mr. Herrin. “Mr. Herrin saw something in me. He set me up for success in college and later in life.” He credits retired Corps supervisor Wayne Dorough with being the “best supervisor I could have had. He gave me freedom and support, and allowed me to grow.”

Remus hasn’t forgotten the formula. “As a manager today, I try to keep that in mind. I try not to be a shackle.”

He dutifully but painfully answers personal questions about who he is and how he has come to this point, with two Commander Awards for Civilian Service, one Achievement Award for Civilian Service and now the USACE Engineer of the Year honor.

Asked to list what he views as his three greatest personal characteristics, Remus lists honesty first and optimism third, sandwiched around the ability to recognize one’s limitations. (He opines his faults are too numerous to mention. “I am stubborn. My wife Pat would list that as a flaw.”)

“I believe it’s my duty to be as honest as I can be with co-workers and supervisors. Honesty adds value to the organization.”

As for working with teammates, his philosophy is this: “I tend to think people want to and like to do great work. I trust folks.” Which ties back to his “people want to do well” theory.

So he lets them.

“John Remus is as fine a professional engineer as you will meet within the entire USACE organization,” says Randy Behm, chief of the Omaha District’s Flood Plain Management. “He is thoughtful and considerate of his employees and customers and always willing to listen to all sides of an issue before passing judgment. He provides



John Remus, the chief of the Hydrologic Engineering Branch for the Omaha District of the U.S. Army Corps of Engineers, points out features of the Missouri River as it flows past the damaged remnants of the Pierre Causeway in early November 2011 near the communities of Pierre and Fort Pierre, South Dakota. Remus, the USACE Engineer of the Year, played a pivotal role in helping communities throughout the Missouri River Basin prepare for the high flows. Also pictured, from left, are Jody Farhat, Eric Stasch, Kevin Grode and Capt. Dan Larson. (Photo by Monique Farmer, NWO)

his section chiefs and their employees room to conduct their business and is always there to bounce ideas off of.”

Behm says that in addition to Remus being a well-rounded engineer and supervisor, he also has a wealth of knowledge and opinions on almost any subject matter. “And, if you do not see eye to eye with him on a specific matter, he will always consider your perspective before deciding on a path forward,” says Behm.

For Kellie Bergman, Chief of Water Control and Water Quality Section, Remus goes beyond his job to invest in those who work for him.

“John has the rare combination of technical expertise and people skills that allows him to make difficult engineering decisions for the Missouri River basin while strengthening relationships with both internal and external stakeholders. He is a solid role model for young engineers in the Omaha District,” Bergman says. “John consistently removes obstacles so that his employees can do their jobs better and faster. This not only results in high quality products but also high morale among his staff.”

Ruch saw first hand how that investment paid off.

“One thing that impressed me was even though John’s crew had never experienced a flood near the scale and duration as of 2011, he had his staff ready to deal with the greatest disaster in district history. That is the sign of a leader,” Ruch says.

Schenk says Remus’ longtime emphasis on mentoring is rock solid. “John does a great job mentoring new staff. He recognizes the value of bringing in students and training them to be our future.

“He is active in the engineering mentoring of middle school and high school students during the Society of America Military Engineers sponsored events. Even when things are extremely busy at work, he finds time to mentor.”

Remus’ focus on education and mentoring began in central Nebraska.

He earned a Bachelor of Science in Civil Engineering in 1982 and a Masters of Science in Engineering in 1985, both from the University of Nebraska. He is a registered professional engineer in the State of Nebraska.

“True, but funny, story about John,” says Ruch. “When we were having daily news conferences for 4-5 months during the worst part of the flood, the media would come at me with a lot of questions. I was mostly sure of my answers, but occasionally I found myself looking across the table to John Remus – like getting an approval from your college professor – to see if he was nodding or shaking his head. If he nodded, I knew I got it right. If not, I figured I could have come up with a better answer.”

The professor is in—but it’s his team doing all the great stuff.



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- Performed post flood assessments
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"During 2011, Omaha District's Engineering Division employees worked extremely long hours to execute their assigned mission, spearhead flood fight efforts and provide support to other Divisions... Their hard work was critical to ensuring the public's safety..."



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