

Water & Power for the American Public

SUMMER 2025



RECLAMATION

magazine

A BIG DEAL at DAVIS DAM

A time of change - a future with purpose
Immersive experience at Hoover Dam
Reclamation-wide photo contest
Delivering hope in New Mexico
DOI's first spray drone

News from the Department of the Interior's Bureau of Reclamation



RECLAMATION

magazine

Summer 2025

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Department of the Interior Mission Statement

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, Native Hawaiians, and affiliated Island Communities.



Reclamation Mission Statement

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Cover photo: Davis Dam rotor lift by Chris Clark
Background photo: North Dakota storm by Michelle Boehm

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Welcome to the inaugural issue of Reclamation Magazine

A time of change & a future with purpose

Commissioner David Palumbo

Dear Reclamation Team,

We are living through a time of profound change — across government, across our agency, and across the communities we serve. Yet through it all, one thing remains constant: the dedication and ingenuity of the people who make up the Bureau of Reclamation. You are the strength behind our mission, and this magazine is a tribute to your work, your stories, and your enduring spirit of professional excellence.

As we marked Reclamation's 123rd anniversary this June 17, we celebrated more than a legacy — we celebrated a living mission. From delivering water and power to millions across the West to stewarding vital natural resources amid drought, climate uncertainty, water supply and demand imbalances, and infrastructure challenges, your work ensures the resilience of communities and economies alike.

The Colorado River Basin, among many basins across the West, illustrates the urgency and importance of what we do. Supporting 40 million people and vast ecosystems, it faces historic stress. Its future depends on our shared ability to innovate, collaborate, and adapt — values that have long defined Reclamation's culture. Likewise, hydropower — part of Reclamation since its founding — continues to supply reliable energy needs across the West, reinforcing our relevance and impact.



Secretary Burgum at Hoover Dam.



Commissioner Palumbo at Gila River Indian Community Project.

At this pivotal moment, we are also implementing workforce changes. Some shared services have transitioned to department-level management, a shift that brings understandable uncertainty amid change. Yet, it also renews Reclamation's spirit and focus on collaboration and partnerships through sharing our mission with others throughout the federal workforce. These services, while no longer housed directly within Reclamation's workforce, remain essential. We will continue to rely on them and continue to build strong relationships and coalitions.

The Reclamation Leadership Team is committed to supporting every employee through these transitions. Your contributions are vital, and open communication will guide our path forward. Leadership does not expect one person to carry the weight of ten — but we do believe in the collective strength of shared knowledge, collaboration, flexibility, and innovation. Cross-training, skill building, and the embrace of new tools will be key as we adapt and take advantage of new opportunities to serve as they arise.

I extend my deepest gratitude for your resilience, patience, and professionalism. Your unwavering focus on our mission — to deliver water and power to the American West — grounds us and propels us forward.

Together, we will navigate this moment of change driven by purpose, guided by values, and powered by the incredible people of Reclamation. This magazine celebrates that journey... who we are, and where we are going. It is a reflection of our strength, agility, and unity.

With gratitude and respect,
David M. Palumbo
Acting Commissioner
Bureau of Reclamation



First annual Reclamation-wide photo contest

Submit your best qualifying image through Friday, October 3

The first annual Reclamation-wide photo contest is now open for entries! Your photos will help us showcase the natural beauty, team members, wildlife, infrastructure, and worksites across Reclamation.

All Reclamation employees are encouraged to submit their best qualifying photo through Friday, October 3 for a chance to be featured in Reclamation social media posts, posters, brochures, and other print and digital products. All Reclamation employees will be encouraged to vote to choose the winners.

TO ENTER: Just email your photo to: dasher@usbr.gov.

IMAGES: Each employee may enter one photo. Please provide the highest resolution image you have. Basic editing is fine, as long as it does not affect the authenticity of the image.

REQUIRED INFO: Please name your photo file with your name and a short description. (Example: Darryl Asher - Yellowtail Dam from the visitor center.jpg.) You may include additional information in your entry email.

SUBJECT: All photos must be taken on Reclamation lands or facilities or during Reclamation events. This includes worksites, infrastructure, and recreation areas.

DEADLINE: Photos are due by COB Friday, October 3.

WINNERS: Winners will be announced in the winter issue of RECLAMATION magazine. Prizes are to be determined, but mostly consist of bragging rights.

QUESTIONS: Contact Darryl Asher at dasher@usbr.gov or (406) 247-7608.



Project feature is known as dragon's teeth

Targeting seismic risks at Conconully Dam

By Erika Lopez



Did you know that the Bureau of Reclamation's Dam Safety Office oversees 57 high-hazard potential dams in the Pacific Northwest? Each of these dams is rigorously monitored under our Safety of Dams program, established in response to the Teton Dam failure in 1976. This program is dedicated to evaluating and implementing actions to address safety concerns, with the goal of making sure our dams do not pose unacceptable risks to people, property, and the environment.

As part of Reclamation's ongoing commitment to safety, engineers conduct dam safety studies to identify potential corrective actions, incorporating public input into the decision-making process. At Conconully Dam in Washington, engineers are working on reducing seismically driven deformation and cracking by utilizing seismic models to assess how the dam would perform during an earthquake. This assessment will be included in a draft environmental assessment, which the public will be invited to comment on beginning in June.

The proposed modifications are crucial for public safety and the long-term functionality of the facility. Reclamation continuously monitors it to ensure the safety of downstream residents and the ongoing operation of irrigation projects. The proposed project aims to implement cost-effective measures to reduce long-term performance risks, maintain water deliveries for irrigators and endangered species, and continue providing recreational benefits and habitat for fish and wildlife.

The dam was built between 1907 and 1910 using a method called hydraulic fill. At the time, this approach was considered a faster and more affordable way to build dams. Engineers now know the puddled-core embankment is susceptible to liquefaction, which could increase the risk of failure during significant seismic events.



Conconully Dam, Reservoir and spillway

National Dam Safety Awareness Day is May 31
Dams manage flood risk, provide clean and renewable energy through hydropower, irrigate farmland, and create recreational opportunities. National Dam Safety Awareness Day serves to raise awareness about the significance of dam safety and the measures in place to ensure the integrity of these vital structures.

To learn more about how our dams are monitored and Reclamation's Safety of Dams program that is recognized worldwide, please visit:
<https://www.usbr.gov/pn/about/dams/sod.html>

Early construction



October 7, 1907

Workers mix concrete for lining the high line canal, Pogue Flat



November 8, 1907

People lived in this camp while working on the Okanogan Project and Conconully Dam



October 11, 1909

Workers used a team of horses to move construction material. Here they are dumping material through a trapdoor above the shoveling platform



Department of the Interior's FIRST SPRAY DRONE

Story by Elizabeth Smith - MB&ART Public Affairs

Photos by Stephen Kroeker - MB&ART GIS

First class of carded Reclamation pilots (from left to right): Lawrence Osbourne, natural resource specialist; Steve Kroeker, Region GIS Coordinator; Meyer Jay, UAS Program Manager; Jacob Frein, engineering technician; Miles Morgan, civil engineer.



MB&ART Region obtains spray drone

Controlling invasive weeds around Reclamation infrastructure has long meant hours of manual labor, often in dangerous terrain. Slippery riprap, steep slopes, and unexpected wildlife are just part of the job. But that job now has a precision-powered alternative.

Enter the Hylío AG-230 – Reclamation's first spray drone.

Thanks to the efforts of Steve Kroeker, Missouri Basin Region GIS Coordinator, and his team, the regional drone program is now a reality. Kroeker collaborated with Environmental and Cultural Resources Chief Jason Gibbons and Planning and Lands Resources Supervisor Seth Joramo to identify a smarter, safer alternative to traditional spraying methods.

"I've worked with various branches of the government over the years and understand the effort, labor, safety, and cost of manually caring for property," said Kroeker.

Kroeker saw potential in the AG-230 – a drone equipped with radar, autonomous flight, and precision spraying capabilities. With an eight-gallon tank and AI-assisted navigation, it can maintain a consistent spray height over rugged terrain, offering increased efficiency during narrow application windows.

Gibbons supported Kroeker's vision, especially after seeing the limitations of existing methods. "We managed to spray



(Continued from previous page)

about 20 acres in an hour, including time spent landing, changing batteries, and refilling the tanks. It's a game-changer," Kroeker said.

To acquire the spray drone, Kroeker worked with the Office of Aviation Services to meet acquisition and operational standards. OAS fleet manager Stephen Stroud emphasized the importance of selecting a drone that could serve not just one project, but potentially a broader mission.

"It's important that the facility is capable of supporting an entire fleet of aircraft and not just a small-scale operation," said Stroud.

Once a compliant model was selected, the team inspected the manufacturer, vetted its production and maintenance capabilities, and moved into live testing with the United States Department of Agriculture research engineers in Texas. The results confirmed the drone's potential for wide-scale Reclamation use.

In April, the drone was transferred to the Nebraska-Kansas Area Office in McCook, Nebraska, where it will be deployed for the 2025 spraying season. Four certified UAS pilots across the Missouri Basin Region – including staff from the Nebraska-Kansas and Dakotas Area Offices – now make up Reclamation's first official spray drone pilot team.

The drone is set to begin operations on dams and facilities across Nebraska, the Dakotas, and potentially Montana. Reclamation expects this shift to significantly reduce labor hours and injury risk while increasing coverage and efficiency.

“We managed to spray about 20 acres in an hour, including the time spent landing, changing batteries, and refilling the tanks. It's a game-changer.”

The next step for the team is obtaining a Nebraska applicator's license, with requirements varying slightly by state. In Nebraska, for example, Miles Morgan, a civil engineer with Nebraska-Kansas Area Office, must complete classes through the Nebraska Department of Agriculture (i.e. General Standards, Agricultural Pest Control, Right-of-Way Pest Control, Aerial Pest Control), and obtain an FAA Class 3 Medical Certificate – a medical clearance confirming a pilot meets the health standards to safely operate an aircraft. In Kansas, Sam Wagoner, an engineering technician in Kansas, also with NKAO, will complete similar certifications to support spray operations at Lovewell Dam near Webber, Kansas.

To operate the spray drone, all pilots must also hold an FAA Remote Pilot Certificate under Part 107, complete the Department of the Interior's A-450 UAS Basic Remote Pilot Course, and finish A-454 Hylío AG-230 Type-Specific Training, which focuses on the safe and effective use of the drone.

Morgan, a civil engineer in the McCook, Nebraska, water operations group, looks forward to the drone streamlining the spraying process on dams for his maintenance team. "Overall, I'd say safety is a big part of it," he said. "From my own experience walking the upstream riprap while surveying, it can be pretty nerve-racking – let alone doing it while carrying a heavy spray tank on your back."

The bottom line

The spray drone marks a major step forward in vegetation management – bringing modern technology to meet the needs of the field. With each successful mission, Reclamation is paving the way for safer, smarter, and more sustainable operations.



The spray drone team in Boise, Idaho, conducting spray pattern testing with the Hylío drone.



In Lake Somerville, Texas, a pilot demonstrates how the Hylío drone folds down to fit in the bed of a pickup truck.



Steve Kroeker stands behind the drone in Lake Somerville, Texas, demonstrating the Hylío's 10-foot wingspan.

Drone technology helps detect roof issue at Reclamation headquarters

-Steve Kroeker

Reclamation's Missouri Basin Region continues to find innovative ways to accomplish its mission by employing cutting-edge technologies. A recent example involved the use of drone-mounted thermal imaging to investigate a possible leak at the Region Headquarters in Billings, Montana.

After a rainstorm led to wet carpeting in an office, the source of the leak proved difficult to pinpoint. One of Reclamation's drone pilots took initiative and deployed a quadcopter drone equipped with thermal and color cameras to inspect the roof of the building. The imagery collected provided a clear answer.

Though initially uncertain whether the roof would show signs of an issue, the pilot's thermal scan identified an area of potential water infiltration under the roof membrane – something that was not visible in standard color images. Radiometric thermal imagery, which captures temperature data in each pixel, revealed a cooler patch originating at a seam in the membrane.

The area with water under it changes temperature at a different rate than the dry parts of the roof because the trapped water acts as a heat sink. That means it appears cooler during the day and warmer at night.

While the suspected leak in the office was ultimately traced to a drainpipe inside the wall, the drone imagery still proved valuable.

The pilot forwarded the data and imagery onto the property management officer, and building manager. Ultimately, a drain on the roof had lost a seal, which allowed for the leak and the repair was made.

This instance is just one example of how Reclamation is leveraging drone technology to save time, reduce costs, and enhance safety for employees. As drone tools and methods continue to improve, they're opening new opportunities to accomplish tasks more efficiently – and sometimes in ways that weren't possible before.



DELIVERING HOPE

Navajo-Gallup Water Supply Project celebrates steps towards completion

By Jenny Erickson, UCB Public Affairs | Photos by Jenny Erickson and Pablo Mena

Photo: Jenny Erickson

Spanning 7,800 square miles and carrying an estimated cost of \$2.2 billion, the Navajo-Gallup Water Supply Project stands as the Bureau of Reclamation's largest dollar project designed and built by the agency. Since the initial groundbreaking in June 2012, the project has made steady and meaningful progress. Last month, this progress was marked with a Navajo blessing ceremony and groundbreaking event for the San Juan Lateral Water Treatment Plant—one of the project's most critical components.

The ceremony not only celebrated the start of construction on the largest feature of the project but also honored the enduring partnership between the Navajo Nation and Reclamation. Once complete, the water treatment plant will play a central role in delivering clean, dependable water to the Navajo Nation and the City of Gallup.

The Navajo-Gallup Water Supply Project is a major infrastructure project that once completed, will convey a reliable municipal and industrial water supply from the San Juan River to the eastern section of the Navajo Nation, southwestern portion of the Jicarilla Apache Nation, and the City of Gallup, New Mexico via about 300 miles of pipeline, 19 pumping plants, and two water treatment plants. The Project is designed to provide a long-term sustainable water supply to meet the future population needs of approximately 250,000 people in these communities over a 40-year time horizon.

"Today marks a historic milestone for the Navajo-Gallup Water Supply Project as we break ground on the San Juan Lateral Water Treatment Plant that will deliver vital drinking water for the Navajo people and the City of Gallup," said Reclamation Acting Commissioner David Palumbo. "This monumental infrastructure initiative is not just about pipes and pumps; it is about the lifeblood for those we serve across the American West—water."

The event started with a Navajo blessing ceremony, a tradition of the Navajo faith which asks permission to disturb the earth and for a blessing for the project before ground is broken. In addition to honoring the ground with leadership songs and other traditions to bring harmony and good fortune to the new construction, the ceremony also invited attendees to participate in the blessing and recognized the collaboration of the organizations who are working to bring water to these communities.

Many of the day's participants talked about the years of effort that have gone into the project, and how the Navajo people have waited so long to have a water supply in their communities.

"As I always like to say to our Navajo grandchildren, our time is now. I think we waited long enough; we waited too long. We have hauled water for too long," said Navajo Nation Speaker Crystalne Curley during the event.



A view of Pumping Plant 3 in progress, showing the four air chambers within the building. (Photo: Pablo Mena)



Pipeline construction on the San Juan Lateral near Pumping Plant 3, showing the 42-inch discharge pipeline that will connect to Reach 4C. (Photo: Pablo Mena)

"I still haul 500 gallons of water weekly to the back of my home in Fishpoint. The imagery of a truck hauling water, some of our children still draw that, water in the blue barrels and in plastic water bottles because that is how they envision water. It will be good to see when that is a water faucet or a garden."

Navajo Nation President Dr. Buu Nygren also spoke at the event about opportunity, promise and a new chapter as this project brings hope to the story of the Navajo Nation.

"This project brings massive economic opportunity. Hundreds of jobs - engineers, pipe fitters, concrete crews, operators and welders; local contractors, Navajo vendors and suppliers will benefit from this long-term engagement in building this project," said President Nygren.



"This project will inject millions of dollars into the regional economy and much of it will stay local. That means food on the table, paychecks in pockets, shoes on little feet and pride in providing for our loved ones."

Last fall, Jacobs was awarded a **\$267 million** design and build contract for the San Juan Lateral Water Treatment Plant. Funding for the project is split between two major sources: the Indian Water Rights Settlement Completion Fund, supported by the Infrastructure Investment and Jobs Act, and the Reclamation Water Settlement Fund, established under the Northwestern New Mexico Rural Water Projects Act.

The water treatment plant's initial capacity is treatment of up to 18.8 million gallons of water per day to Safe Drinking Water Act standards, with the capability to treat up to 37.6 million gallons per day at full build-out. The contract also includes the commissioning and computer control integration of the entire San Juan Lateral system, and 12 months of operations and maintenance necessary to fully test the water treatment plant while making the initial water deliveries.

Project Progress

The completion deadline for the Navajo-Gallup Water Supply Project was extended last fall to Dec. 31, 2029, through an agreement between the Navajo Nation, state of New Mexico acting through the New Mexico Interstate Stream Commission, and the United States through the Secretary of the Interior, collectively referred to as the Settlement Parties to the Navajo Nation's Water Right Settlement on the San Juan River Basin in New Mexico. Progress is continuing at a steady pace throughout the vast project area.

"We appreciate the collaboration of the settlement parties, as well as the City of Gallup and the Jicarilla Apache Nation, to extend the completion deadline of this vital project so we can ensure safe, reliable, and affordable drinking water for the future of this project and Navajo and Gallup communities."

Construction Engineer/ Manager Bart Deming

Manager Bart Deming. "We appreciate the collaboration of the settlement parties, as well as the City of Gallup and the Jicarilla Apache Nation, to extend the completion deadline of this vital project so we can ensure safe, reliable, and affordable drinking water for the future of this project and Navajo and Gallup communities."

Reclamation is currently modifying the existing San Juan River intake structure near Fruitland, New Mexico, and will construct a new pumping plant to move water to Frank Chee Willetto Reservoir, approximately 5 miles north of the intake. The water will be stored in the reservoir prior to conveyance to the San Juan Lateral Water Treatment Plant, where it will be treated and pumped to communities in the western part of Navajo Nation in New Mexico and to the cities of Gallup, New Mexico and Window Rock, Arizona.

The San Juan Lateral—the larger of the two water transmission systems of the Navajo-Gallup Water Supply Project—is now over 60% complete, with major components actively under construction. Pumping Plants 4 and 7 are now at operational readiness, while Plants 2 and 3 are about 75% complete.



Navajo Nation President Buu Nygren addresses the audience during the ground-breaking ceremony and spoke of the opportunity and hope the project brings to Navajo communities. (Photo: Jenny Erickson)

The Navajo Code Talkers Lateral is nearly finished, with pipeline installation wrapping up near the New Mexico-Arizona border this month. On Reach 4A/4B, about 18 of 19 miles of pipeline have been laid, and crews are installing key mechanical components, including air valves, thrust blocks, and a large 42-inch diameter horizontal directional drill installation.

A recent milestone includes the successful use of a tunnel boring machine to install a protective pipe beneath high-voltage APS power lines.

"Reclamation initially considered using the former PNM pumping plant near the retired San Juan Generating Station but opted to build a new facility due to safety, efficiency, and cost concerns," said Deming. "Reclamation's Technical Service Center built a physical model of the intake system to conduct extensive research on the new facility and simulate various river flows and sediment conditions. Now final design and testing are nearly complete, with construction slated to begin next year for the major intake channel modifications to support the new plant and protect endangered species, including new control gates, a concrete fish barrier, and a reconfigured return channel."

The overall Navajo-Gallup Water Supply Project is now 70% complete with initial water deliveries from the San Jaun Lateral slated for late 2028 and final project completion by the end of 2029.



Navajo medicine man Richard Anderson awaits the arrival of invited guests for the blessing ceremony to begin. During the ceremony, he and guests honored the ground with leadership songs and other traditions to bring harmony and good fortune to the new construction. (Photo: Jenny Erickson)

This project represents a significant collective effort—a true partnership between the Navajo Nation, the State of New Mexico, and the Department of the Interior. Each speaker at the groundbreaking event reminded us that this project is more than just building infrastructure, the goal is to shape a future where every person has access to safe and reliable water.

"[This project] means our people having what every American should expect: Clean reliable water at home," said President Nygren.

"It will do more than just deliver water, it will deliver hope."



Dam maintenance: a **BIG** deal

*Davis Dam and Powerplant crew place
306 ton rotor back into service*

Story by: Connie Castle
Photos by: Chris Clark



A historic undertaking

Nestled in the breathtaking Pyramid Canyon along the Colorado River, Davis Dam plays a vital role in managing water resources and generating power for the Southwest. The semi-outdoor power plant, with its five Francis-type turbines each boasting 62,200 horsepower, stands as a testament to engineering prowess and dedication. With its earth and rock fill construction, Davis Dam stands 1,600 feet long and rises about 140 feet above the riverbed.

This spring, the dam's team undertook an impressive feat: lifting a 306-ton rotor from the machine shop, where it had undergone a year-long overhaul, and placing it back into service.

The lift

On a beautiful, windless day crews meticulously maneuvered the rotor back into its original position inside D3. The logistics of this operation were complex, requiring precision and teamwork.

Constructed between 1942 and 1952, the dam features a remarkable 325-ton outdoor gantry crane, which lifted the rotor across the powerhouse roof, a distance that required careful planning and execution. After the rotor overhaul and several months of rewinding the stator, the crew was ready to complete the installation, ensuring everything was in place for optimal performance.

Deputy Regional Director Christi Davis-Kernan expressed her pride in the team, stating, "I am truly proud of the dedicated team at Davis Dam. Many of our crew members weren't here during the last rewind in 1980, but they came together with passion and commitment, meticulously documenting every step and training the next generation. Their hard work and teamwork embody the spirit of our mission."

"I am truly proud of the dedicated team at Davis Dam. ... Their hard work and teamwork embody the spirit of our mission."

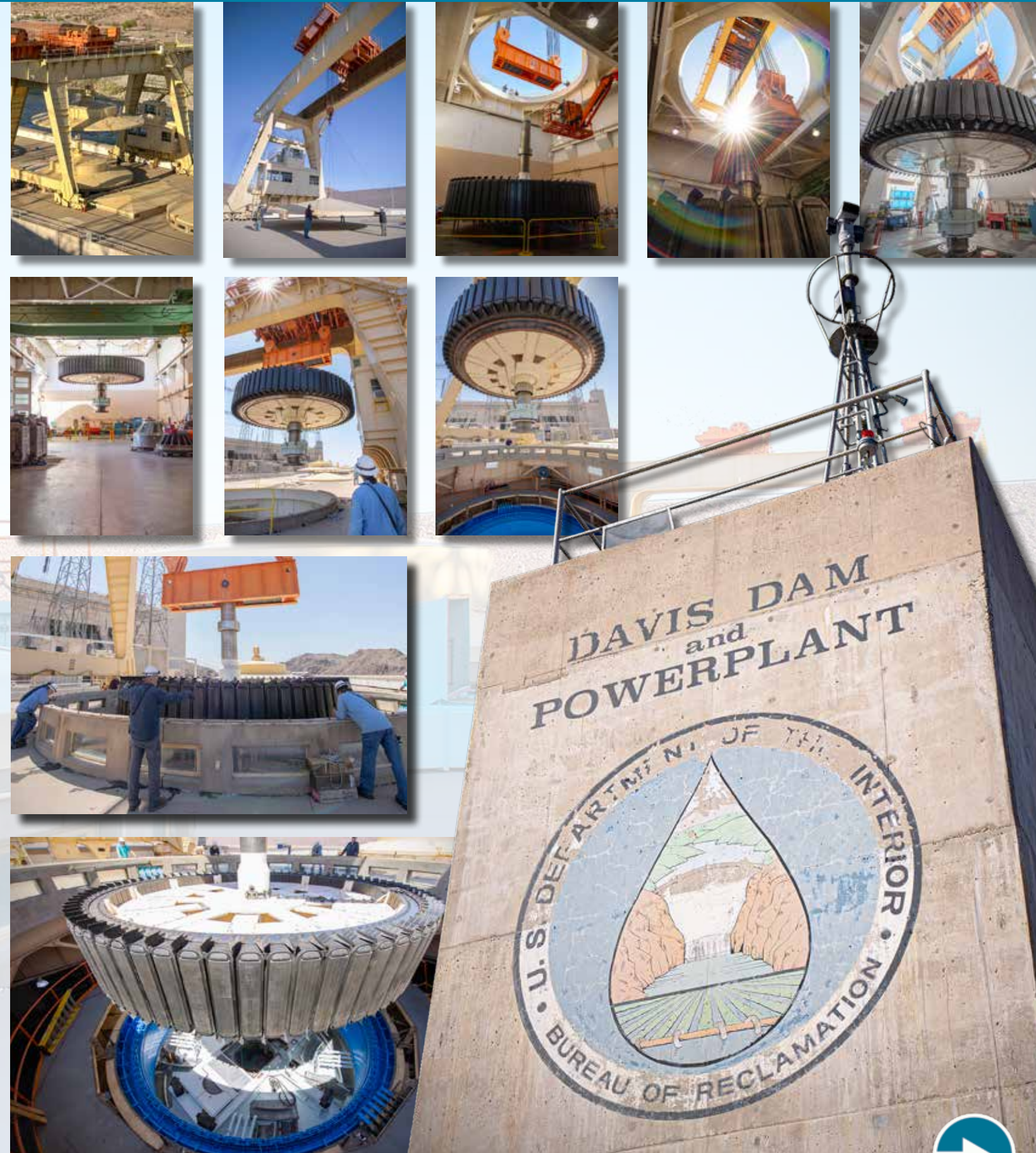
Overcoming challenges

The rotor's installation involved significant technical expertise. The upper bearing bracket was carefully installed, and the rotor was raised using jacks to allow for the installation of the thrust bearing and runner.

The generator shaft was then coupled to the intermediate shaft, ensuring everything was precisely aligned. Any deviations from plumb were corrected to guarantee the rotor was properly set in place.

"I commend our crew for their dedication and diligence in working through and overcoming all the setbacks."

Acting Davis Dam Manager Steven Russ praised the crew for their resilience. "I commend our crew for their dedication and diligence in working through and overcoming all the setbacks. We have celebrated many milestones, tackling each task one at a time. I am truly proud of the team for forging ahead and achieving this together."



The significance of Davis Dam and Powerplant

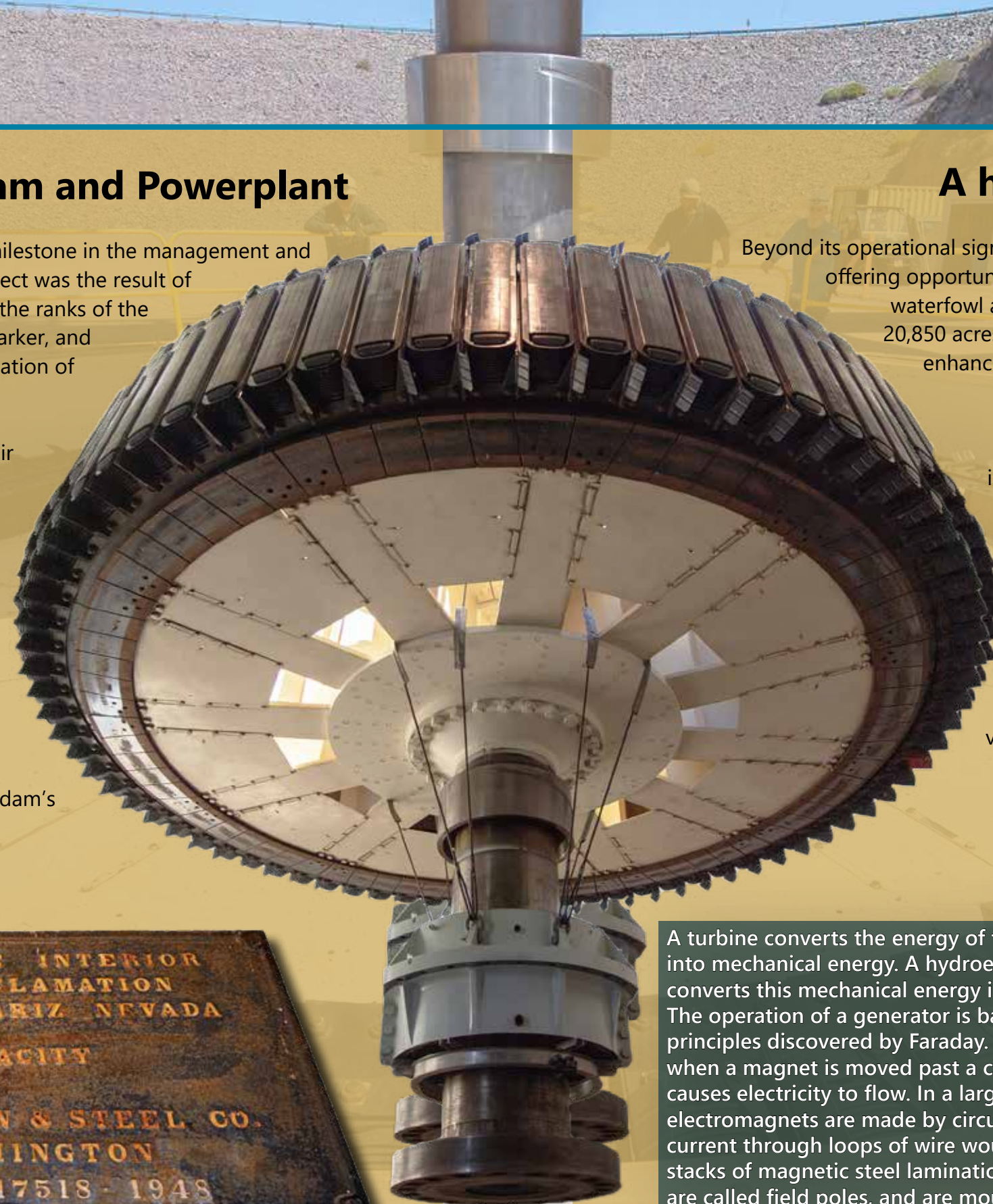
Davis Dam, completed in 1953, marked a significant milestone in the management and utilization of the lower Colorado River's flow. This project was the result of nearly 50 years of planning and development, joining the ranks of the other great Lower Colorado River dams like Hoover, Parker, and Imperial. Together, these structures optimize the regulation of the river, ensuring a reliable water supply for millions.

Davis Dam not only serves as a critical storage reservoir downstream from Hoover Dam but also plays a key role in power generation. The dam's operations help meet the requirements set forth in the treaty between the United States and Mexico, ensuring a balanced allocation of resources.

The powerplant, equipped with five 62,200 horsepower turbines and vertical-shaft generators, continues to be a vital contributor to the electrical energy needs of the Southwest. As the crew at Davis Dam embraces the challenges of modernization and maintenance, they remain committed to ensuring the dam's legacy endures for future generations.



Commemorative plaque found at Davis Dam.



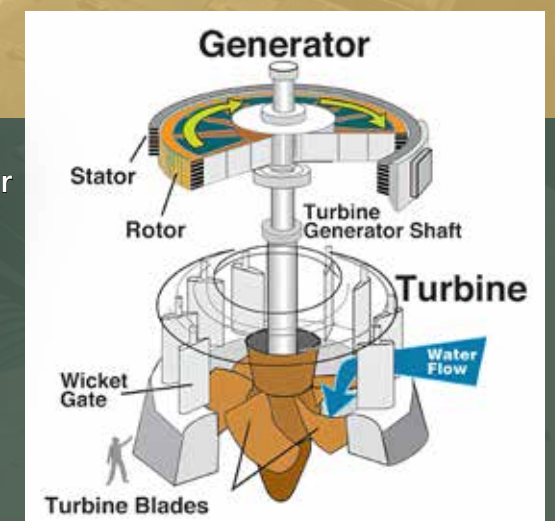
A hub of recreation and wildlife

Beyond its operational significance, Davis Dam is a haven for recreational activities, offering opportunities for boating and fishing while providing a refuge for waterfowl along a major flyway. The reservoir covers approximately 20,850 acres and stretches nearly four miles wide at its widest point, enhancing the natural beauty of the area while serving essential environmental functions.

Named Lake Mohave, it is home to a variety of fish, including striped bass, largemouth bass, and smallmouth bass, as well as the razorback sucker and bonytail chub. The spillway below the dam is a popular birding spot, with a variety of waterfowl, shorebirds, and riparian birds frequenting the area. The dam's presence has created a broader range of habitats that attract diverse bird species.

Lake Mohave and its surrounding areas also support a variety of desert mammals, including bighorn sheep, wild burros, and others.

A turbine converts the energy of flowing water into mechanical energy. A hydroelectric generator converts this mechanical energy into electricity. The operation of a generator is based on the principles discovered by Faraday. He found that when a magnet is moved past a conductor, it causes electricity to flow. In a large generator, electromagnets are made by circulating direct current through loops of wire wound around stacks of magnetic steel laminations. These are called field poles, and are mounted on the perimeter of the rotor. The rotor is attached to the turbine shaft, and rotates at a fixed speed. When the rotor turns, it causes the field poles (the electromagnets) to move past the conductors mounted in the stator. This, in turn, causes electricity to flow and a voltage to develop at the generator output terminals.



Safeguarding the future

Inside the B.F. Sisk Safety of Dams and Reservoir Expansion Projects

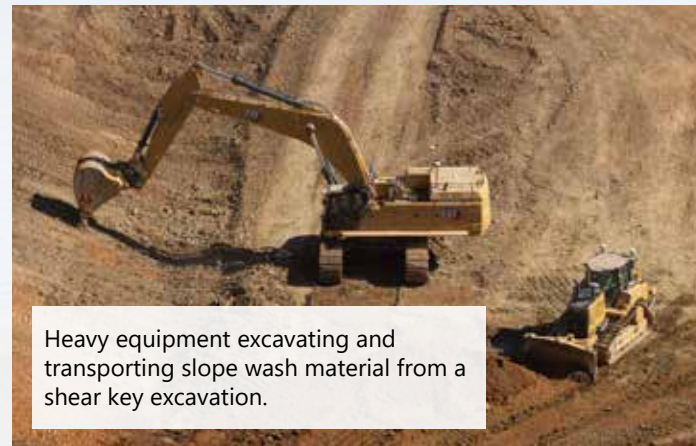
By Mary Lee Garrison-Knecht and Gary Pitzer, California Great Basin | Photos by Aric Coppola

As drought patterns increase in the American West, water security has become one of the defining challenges of our era. In California, where every drop matters and earthquakes are a fact of life, an ambitious engineering endeavor is underway to fortify a key piece of water infrastructure—even when Mother Nature decides to shake things up: the B.F. Sisk Dam.

Nestled in the arid foothills of California's San Joaquin Valley, B.F. Sisk Dam holds back San Luis Reservoir, a vital link in the storage and conveyance systems of the Central Valley Project and State Water Project. With a storage capacity of more than 2 million acre-feet, the reservoir is the largest off-stream storage facility in the nation, providing water for prime farmland, wildlife refuges, and millions of Californians.

This is a once-in-a-generation investment in critical infrastructure.

Now, it's undergoing a transformation—not just to strengthen its structure, but to add storage capacity in an area that is critical to California's water supply security. One part is a safety retrofit designed to withstand a major earthquake, Reclamation's largest dam safety project under the 1978 Safety of Dams Act. The other is a strategic expansion to coincide with the dam safety work that will increase the reservoir's capacity by 130,000 acre-feet—enough to supply around 300,000 California households for a year.



Heavy equipment excavating and transporting slope wash material from a shear key excavation.

Implementing Reclamation's largest Safety of Dams project

Originally completed in 1967, the 3.5-mile-long earthen B.F. Sisk Dam was a marvel of its time, but updated seismic studies have shown that if a major earthquake struck along the nearby Ortigalita Fault, the dam and downstream communities could be at risk.

Enter the Safety of Dams Modification Project, a \$1.1 billion effort to reinforce the dam. The project includes constructing shear keys, stability berms, an internal filtration and drainage system, and raising the dam crest 10-feet to provide additional freeboard. The work involves moving over 20 million cubic yards of earth and rock—one of the largest embankment modification projects ever undertaken in the U.S.

The seismic retrofit is designed for a relatively infrequent earthquake, but the project is given



View of the Basalt Hill Quarry located south and west of the dam where riprap and rockfill materials are produced.

relatively frequent reminders of the urgency in the form of earthquakes such as one last fall that had an epicenter 60 miles west of the dam.

Visits to the dam over the past two years featured a beehive of activity including excavators digging out low-strength soils, haul trucks, and compactors placing a variety of engineered earthen materials, along with the construction team monitoring work and performing tests to construct shear keys and stability berms.

Crews recently constructed shear keys within the dam foundation at three locations along its 3.5-mile-length. This was done by removing "slope wash," a less dense and low-strength material that comes from erosion of the coastal range and making the base of the dam stronger.

"It's not a very well-compacted, stable foundation," said Reclamation Supervisory Field Engineer, Sean Frische. "It has a lot of clay in it so when it gets wet it stays wet. We are taking that out and replacing it with rock fill that is a lot heavier and will give it a more stable foundation."

The first phase of the project, which was substantially complete in October 2024, involved constructing shear keys and stability berms at three locations where the low strength slope wash material was identified. The scale of the work was impressive, with crews digging out approximately 450 thousand cubic yards of weak foundation soil and placing 2.3 million cubic yards of engineered earthen material at all three locations.

The contract for Phase 2 is expected to be awarded in June 2025, with work starting soon after. The second phase will construct a large stability berm along the central portion of the dam that requires placing approximately 15 million cubic yards of earthen material. The last phase includes a dam raise of 10 feet for safety, the idea being that even with a full reservoir, the dam will not overtop in the aftermath of a seismic event.

"We want to make sure that in a shaking event, if the material were to subside, we have enough freeboard, the difference between the top of the water to the top of the dam, that if it does fall, it still maintains a higher elevation." Frische said.

"This is a once-in-a-generation investment in critical infrastructure," said California-Great Basin Acting Regional Director Adam Nickels. "We're not only strengthening the dam to protect lives and property, but we're building resilience into California's water system."

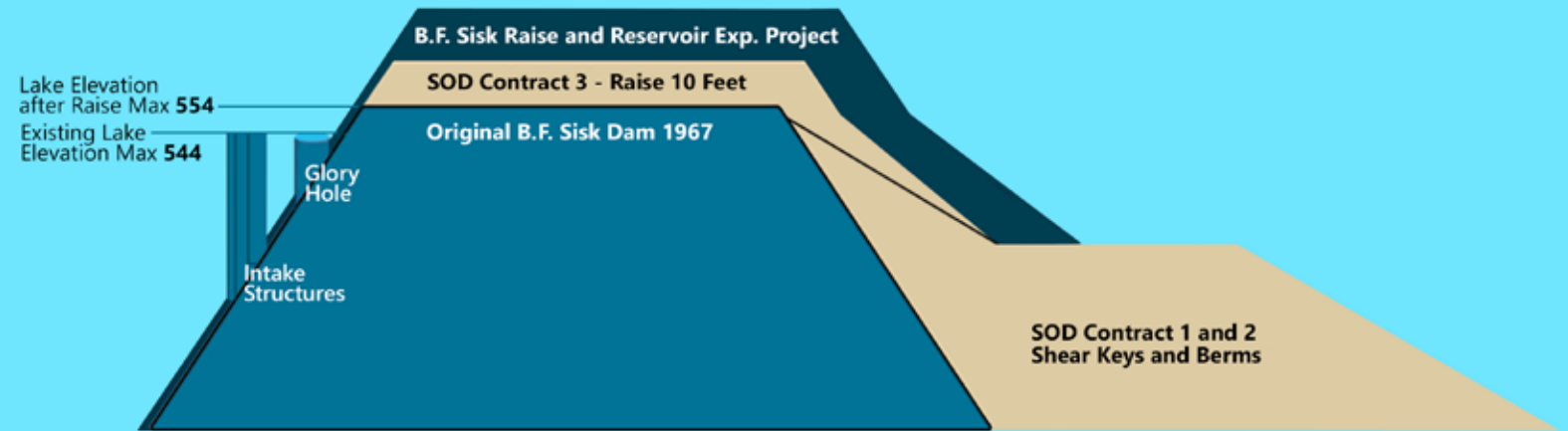


Reclamation's own Sean Frische (supervisory field engineer) providing construction oversight and support.

Making room for more

While safety is paramount, Reclamation is partnering with the San Luis & Delta-Mendota Water Authority to leverage the opportunity to expand San Luis Reservoir's storage capacity in parallel with the Safety of Dams Project. Under the B.F. Sisk Dam Raise and Reservoir Project, the dam crest would be increased by an additional 10 feet, increasing storage by 130,000 acre-feet. The project will create additional water supply for two million people, over one million acres of farmland and 135,000 acres of Pacific Flyway wetlands and critical wildlife habitat.





The increased storage will help mitigate some of the volatility in California's water supply. In wet years, it allows more water to be captured and stored; in dry years, it offers an additional buffer against shortages. It also alleviates the so-called "low point problem," where water levels drop too low for continued delivery, especially during hot summers.

"San Luis Reservoir has served as the hub of California's water system south of the Sacramento San Joaquin Bay-Delta since its completion in 1967," said San Luis & Delta-Mendota Water Authority Board Chair Cannon Michael. "The ability to capture more water in the years it is available,

in mid-2028. Then the solicitation and construction award will follow. The design team includes Bureau of Reclamation and San Luis & Delta-Mendota Water Authority.

Safely elevating water reliability for future generations

As the construction at B.F. Sisk Dam achieves key milestones—with full completion expected in the early 2030s—it is being watched closely by water managers across the West. It may well serve as a blueprint for how to adapt legacy infrastructure to meet 21st-century challenges.

"The projects represent some real strategic planning on Reclamation's part, said Nickels. "It's about rethinking how we manage water in a changing world—with smarter storage, integrated safety, and a long view."

Reclamation has long been known for turning engineering dreams into reality. With the B.F. Sisk Dam Projects, it's showing that a secure, sustainable water future still flows from the bedrock of vision and bold planning.



Heavy equipment used to excavate and remove slope wash materials.

particularly given California's changing climate, is a critical component of a more secure future for the communities, farms and wildlife dependent on the Central Valley Project for their water supply." The signing of the Record of Decision and Notice of Determination is the first approval of a major water storage project in California since 2011.

Plans to raise the dam crest 20 feet are currently in the design stage, which is estimated to be completed

Hoover Dam's new immersive exhibit

By Connie Castle

The wait is finally over! Hoover Dam's Visitor Center has undergone a remarkable transformation, unveiling an immersive exhibit experience that is nothing short of awe-inspiring. There was a soft opening May 26, followed by a celebratory ribbon-cutting ceremony on June 17, representing a historic moment for this iconic landmark. Fully operational and open to the public, the excitement around this project's completion is palpable.

"This is an exciting project that educates the public on the fascinating history of Hoover Dam and the dedication of everyone involved in its construction," said David Palumbo, Reclamation's Acting Commissioner. "This is an engaging narrative brought to life through the voices of workers and their families, and I commend all who have worked so hard to bring this upgraded visitor experience to completion."

The exhibits are designed to offer a multi-sensory experience that captivates visitors of all ages. From the moment you walk through the passageway, you'll be

This is an exciting project that educates the public on the fascinating history of Hoover Dam.

met with visual displays, tactile experiences, and auditory elements that bring the past to life. Imagine

feeling the vibrations of jackhammers embedded in the canyon floor, or handling shovels that connect you to the hard-working laborers who shaped this monumental structure. You might even find yourself walking through a 'Rag Town' shack, experiencing the stories of families relocated to new homes in Boulder City.

One of the most stunning features of the exhibit is a 17-foot model that reveals the intricate inner workings of the dam, exposing components that remain hidden within the canyon walls, including intake towers and other crucial elements. The exhibit has something for every visitor, whether you want to start the A1 commercial generator or trigger the sounds of a dynamite plunger explosion in the passageway. You'll be immersed in a world where history meets hands-on learning, allowing you to join the crew that built Hoover Dam during the Great Depression.



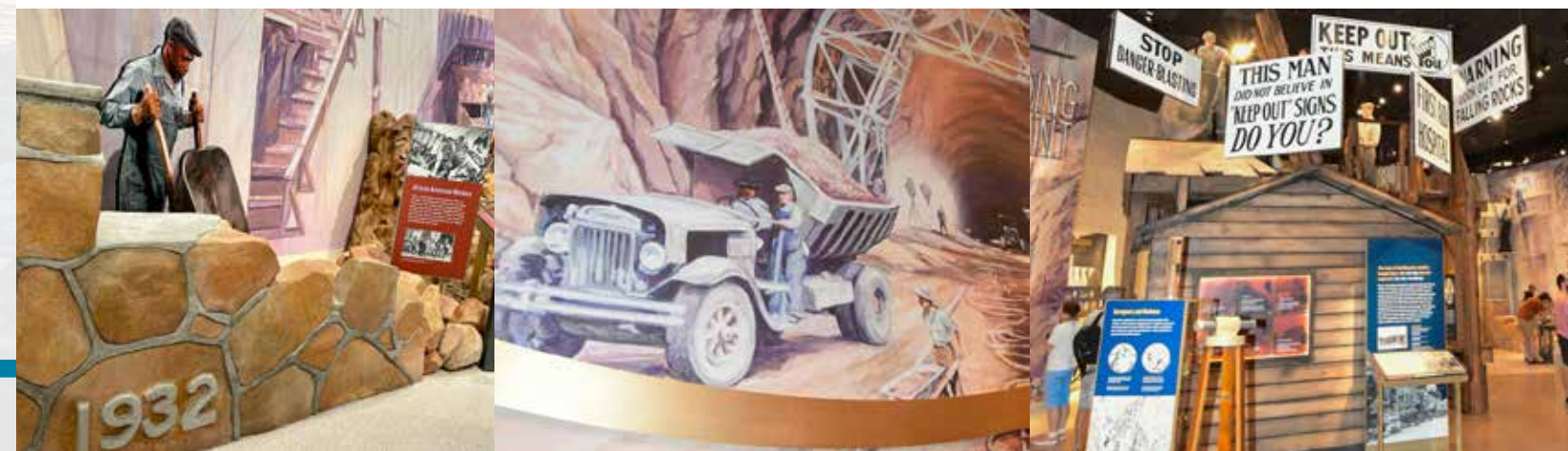
Nevada Congresswoman Dina Titus, Civil Engineer Eddie Lopez, Acting Commissioner David Palumbo, Facility Manager Terri Saumier, and Boulder City Mayor Joe Hardy. Photo: Stephanie Hunsaker

Acting Regional Director Genevieve Johnson also shared, "I am immensely proud of the work we have achieved with our partners to create this remarkable new exhibit space. It is designed to be educational and fun for everyone, providing an authentic account of a day in the life of the people who built Hoover Dam during the Great Depression. Together, they created one of the most iconic landmarks in the world. As the Acting Regional Director, I am honored to witness the hard work and dedication that continues today in fulfilling Reclamation's mission to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public."

Hoover Dam operates on a self-funding model, relying on revenue from hydropower and tourism. Unlike most other federal parks and visitor centers, Hoover Dam does not receive funding under the Federal Lands Recreation Enhancement Act, making its ability to sustain operations even more impressive.

Hoover Dam Facilities Manager Terri Saumier said, "This project would not have been possible without the \$15 million in funding from the Southern Nevada Public Lands Management Act. Hoover Dam is now able to continue its legacy of innovation and education."

From the dynamic sounds of dynamite explosions to the powerful roar of a seven-story generator, there's no better time to visit and immerse yourself in the stories that make Hoover Dam a national treasure. The Bureau of Reclamation warmly invites you to join us on this thrilling adventure, where history meets innovation in an experience like no other!



TAKE YOUR KIDS TO WORK DAY

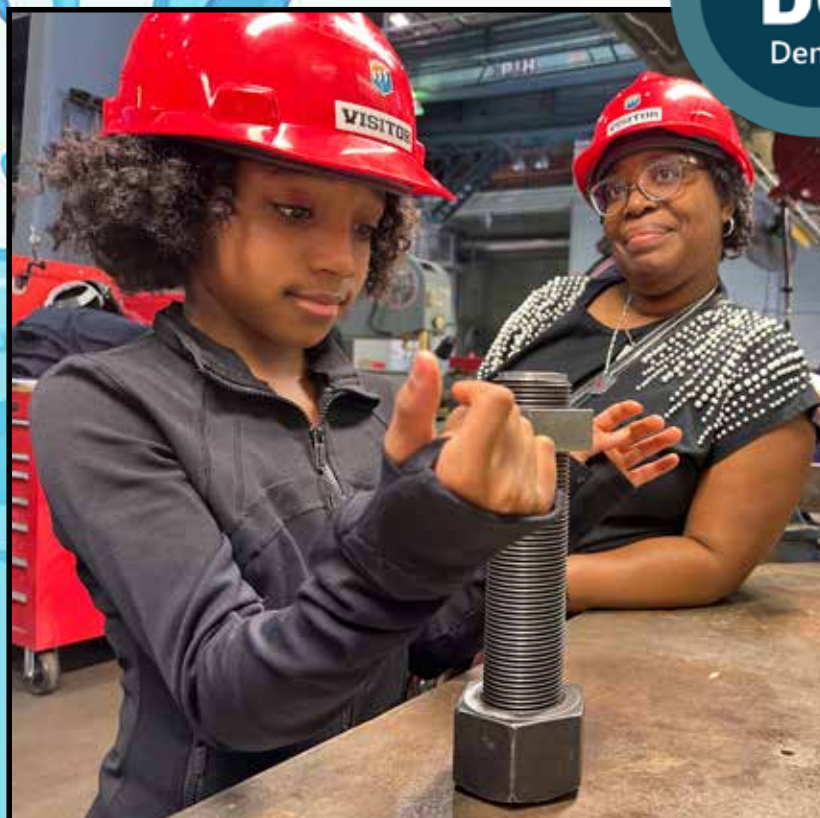
Across the Bureau of Reclamation, employees welcomed the next generation into the heart of its mission during National Bring Your Kids to Work Day on April 24. From Washington, D.C., to the Denver Federal Center, to the iconic Hoover Dam in the Lower Colorado Basin, children received a firsthand look at how Reclamation helps shape communities and power the West.

At the Denver Federal Center, the day kicked off with behind-the-scenes tours and interactive learning stations designed to showcase the agency's broad impact—from water operations and hydropower to

By Jennifer Chance & Connie Castle



Washington
DC
Denver





environmental stewardship and public safety. Kids explored Reclamation's diverse career paths through hands-on STEM activities and met with agency leaders who shared stories of innovation, service, and the real-world impact of Reclamation's work. "Days like this remind us of the importance of inspiring future generations," said Robert Manning, Reclamation's director of communications. "It's an opportunity to show our families the impact of our work and to encourage the next wave of public servants and problem-solvers."

excavators—giving them a feel for the tools that shape and maintain Reclamation's facilities. A demonstration by the dam's K-9 unit provided a practical lesson in safety and security, while kids also tried their hands at operating fire hoses and explored the machine shop to observe maintenance processes firsthand.

INSPIRING THE NEXT GENERATION

Meanwhile, under bright Nevada skies, the Lower Colorado Basin Region hosted its own event at Hoover Dam, centered around the theme "For a New Generation." Families gathered early as employees prepared for a full day of exploration. Guided tours took participants inside and around the dam, offering a close-up look at the massive infrastructure that keeps water and power flowing across the Southwest. One of the highlights at Hoover Dam was the opportunity for children to climb into the operator's seat of heavy machinery—including bulldozers and

Employees at both locations took time to explain their roles, share their passion for engineering and science, and answer curious questions from young visitors. These immersive experiences were designed to spark interest in STEM careers and public service, planting seeds for future hydrologists, engineers, and environmental scientists.

Reclamation extends its sincere thanks to the employees who made the day such a success across all regions. Their enthusiasm and dedication ensured a meaningful, memorable experience—one that showcased the agency's mission and helped inspire the public servants, innovators, and problem-solvers of tomorrow.



Problem solving and innovation at Reclamation's *TECHNICAL SERVICE CENTER*

By Jade Soddell, Nate E. Myers, and Jennifer Bounty, TSC

Created more than 30 years ago in Denver, Reclamation's Technical Service Center delivers top-notch science and engineering services for the bureau's most challenging projects. Regardless of the complexity, TSC employees work diligently to provide innovative solutions to their client's unique problems.

The passion and dedication of the individual TSC staff members to Reclamation's mission, and the projects they support, is the real key to success. Below are two examples of staff-led innovations and their commitment to advancing best practices around the globe to harness water resources and power generation.

A cost-effective controller to improve safe and reliable powerplant operations

The TSC's Control Systems Testing and Analysis Team, led by Kyle Clair, travels to Reclamation power facilities to perform commissioning and testing of electronic



Kyle Clair received the Department of the Interior's 2025 Superior Service Award for his outstanding contribution to the advancement of power generation control systems.



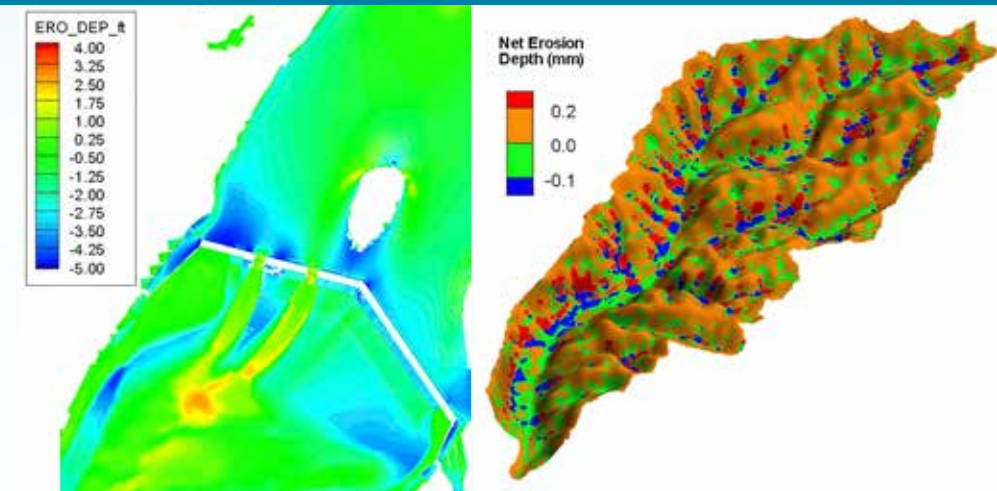
The Boise Diversion digital-speed governor controller upgrade.

speed governor and excitation systems. Upgrading outdated systems is costly; new systems do not always provide the necessary reliability for the power grid, and recently implemented power reliability standards have resulted in burdens for our facilities.

Clair, tapping into his nearly 20 years of civil service and his extensive abilities and technical knowledge, envisioned implementing a new excitation/speed governor controller that could improve the overall reliability of Reclamation's fleet while reducing the travel and staff time required to perform the work. He designed a new cost-effective controller to address issues with currently obsolete equipment—which even our smallest facilities could implement without breaking the bank.

In addition to improved reliability, the new controllers could also perform routine testing associated with regulatory requirements.

From the initial conception, Clair dedicated more than 10 years to fully design, prototype, test, and implement the design at Reclamation's power facilities. Developed from the ground up, the new controller includes a hardware and software design that allows for seamless integration into existing powerplant systems. In 2024, it was extensively tested prior to the commissioning of the Boise Diversion Powerplant speed governor system and the Fontenelle Powerplant excitation system. This groundbreaking, in-house developed solution is saving Reclamation substantial time and money while paving the way for greater innovation and efficiency in acquiring North American Electric Reliability Corporation compliance test data. This marks a significant advancement in our quality control over the control systems installed at our powerplants, allowing for more effective testing and maintenance. Kyle received the Superior Service Award in 2025 for delivering an exceptional product that he and his team developed.



Examples of SRH-2D model application. Left image - Optimizing sluiceway design and gate operation to minimize sediment deposition and diversion sediment loads at Isleta Dam, Rio Grande (ERO = erosion; DEP = deposition). Right image - Estimating sediment delivery and routing in Goodwin Creek Watershed.

Sedimentation and River Hydraulics Group improves modeling

Dr. Yong Lai, from TSC's Sedimentation and River Hydraulics Group, is a recipient of many accolades for his achievements in hydraulic engineering. A 22-year Reclamation employee, Dr. Lai is also the lead developer for a specialty public-domain software model that has been crucial to hundreds of Reclamation's projects and now has more than 3,000 users worldwide.

Called Sediment and River Hydraulics Two-Dimensional (SRH-2D), its features include bank erosion; pressurized flows in culverts, gates, and under bridges; post-wildfire sediment loads; and mercury transport. SRH-2D model development success has resulted from a partnership between Reclamation, United States Federal Highways Administration, and the Taiwan Water Resources Agency to collaboratively solve real-world water resource problems.

Dr. Lai's innovative thinking advanced the state of practice from a place where 2D models were inaccessible to most engineers—expensive, difficult, and taking too much computational power—to a place where more detailed local hydraulics for various river designs could be adapted in real-time for new projects and challenges in critical areas such as river mechanics, sediment transport, fish passage, water quality, watershed management, and coastal engineering.

Dr. Lai works in collaboration with Dr. Ben Abban and Dr. Victor Huang to develop and apply code for a wide range of engineering projects focused on reservoir sedimentation, river engineering, and dam infrastructure sustainability.

For more information about the SRH model, please visit <https://www.usbr.gov/tsc/techreferences/computer%20software/compsoft.html>

The Technical Service Center's role within Reclamation

The TSC tackles a broad and diverse range of engineering and scientific challenges to enhance water resources and power generation. Organized into specialized divisions including:

- Civil Engineering
- Water, Environmental and Ecosystems
- Geotechnical Services
- Electrical and Mechanical Engineering
- Engineering and Laboratory Services

The TSC excels at innovative design, technical studies, and advanced laboratory testing. The TSC invites you to meet some of the talented individuals and view capabilities at www.usbr.gov/tsc.



Dr. Lai investigates the effects of exposed, highly erosive "badlands" in Guam and the application of the SRH-2D model to predict current and future sediment loads at the Ugum Water Treatment Plant, which serves most of Southern Guam.

TSC
Technical
Service Center

78 years ago...

On June 25, 1947 this waterwheel made by Newport News Shipbuilding and Drydock Co. of Newport, Virginia arrived at Grand Coulee Dam on Washington's Columbia River.

