NAVAJO-GALLUP WATER SUPPLY PROJECT NEWSLETTER

Spring 2025

COMMUNITY MEETINGS

Project Construction Committee (PCC)
Location: Reclamation Technical Service Center
6th and Kipling, Bldg 67
Denver, CO 80225-0007
Apr. 24, 2025
9 a.m. - 12 p.m.
To participate virtually, please contact jacree@usbr.gov
Ph. 505-324-5504

GET IN TOUCH

Questions/Comments:
Becky Begay
Navajo Outreach Coordinator
Ph. 505-408-8516
bbegay@usbr.gov

Contact us:
Bureau of Reclamation
Four Corners Construction Office
Ph. 505-324-5000
1235 La Plata Highway
Farmington, NM 87401

LOTS OF BOLTS

Last issue we asked you to guess the number of bolts that went into building the 1.5-million gallon water storage tank located at the Bahastahl Pumping Plant #7 in Coyote Canyon. The answer: Over **29,000** bolts!

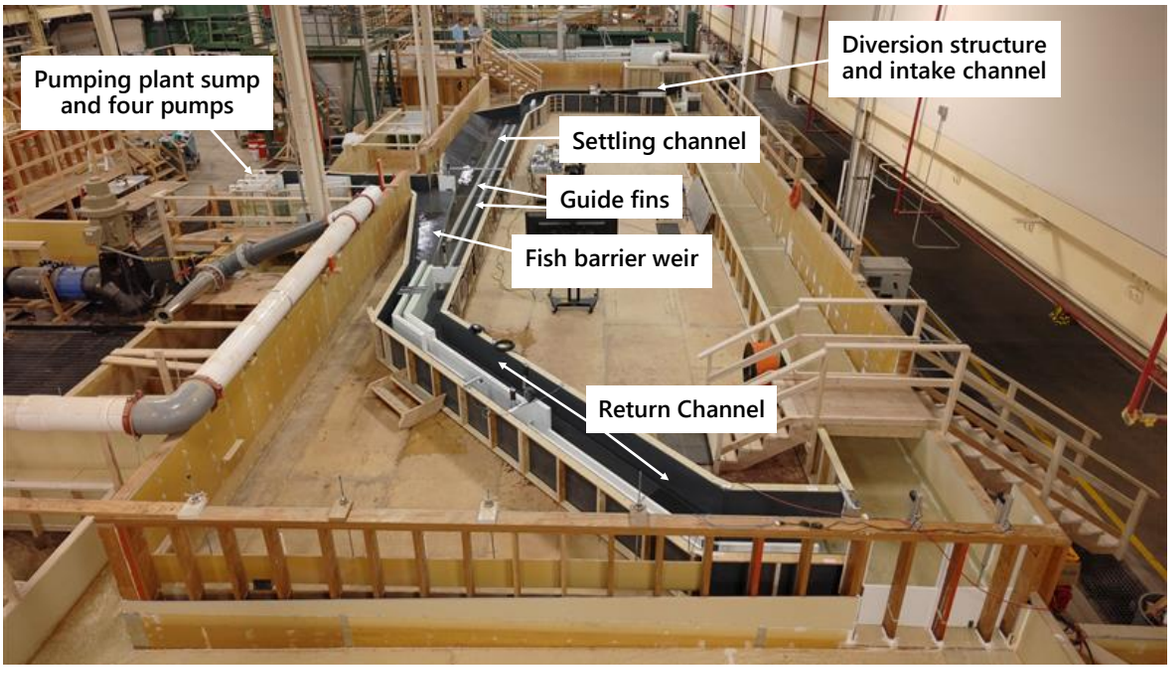
From model to reality: Designing and testing Reach 1 improvements

By Shannon Hatch
FCCO Project Management Specialist

As part of the Navajo-Gallup Water Supply Project, the Bureau of Reclamation will modify the existing San Juan River intake structure near Fruitland, New Mexico and 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.

Initially, Reclamation planned to revitalize an existing pumping plant, previously used by Public Service Company of New Mexico (PNM) when the San Juan (Power) Generating Station was operational. However, after identifying issues with the PNM plant– such as inefficiencies, safety concerns, design constraints, and minimal to no cost savings compared to a new plant – Reclamation chose to design and build a new



An overview of the scaled down model of the intake structure at Reclamation's Technical Service Center located in Denver. Reclamation photo.

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Reach 1 improvements cont.

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plant instead.
To accommodate the new plant, and to meet environmental requirements for protecting endangered fish in the river, the intake channel leading up to the plant will be significantly modified. Changes include adding control gates, installing a fish barrier weir (i.e. concrete wall), and reconfiguring the return channel. These modifications, while necessary and beneficial, can present operational challenges, which is why Reclamation has done extensive research through computer and laboratory modeling to better understand potential challenges.

Ensuring Success Through Testing and Modeling

In late 2024, experts at Reclamation's Hydraulics Laboratory at Reclamation's Technical Service Center (TSC), built a scaled down model of the intake structure to study how variations in river flow affects pumping plant operations. They tested river conditions ranging from 500 (typical of average river flow between October and March) to 4,700 (average spring runoff and occasionally observed during late summer monsoon rainfall events) cubic feet per second (cfs) and compared results with previous computer models. The model is also being used to analyze sediment movement and buildup in the system to assist the design team and inform the future operators.

Reclamation had a complex set of problems to solve due to the existing infrastructure and variable river flows. The hydraulics for this project are very complex and require both computational and physical models to confirm we can provide adequate flow.
The physical model includes key features like the concrete diversion dam, settling channel, fish barrier weir, return channel, and pumping plant sump. It also features the four pumps which will be used in the pumping plant, each of which can be independently operated, allowing for an in-depth testing.

What have we learned from the testing the model?

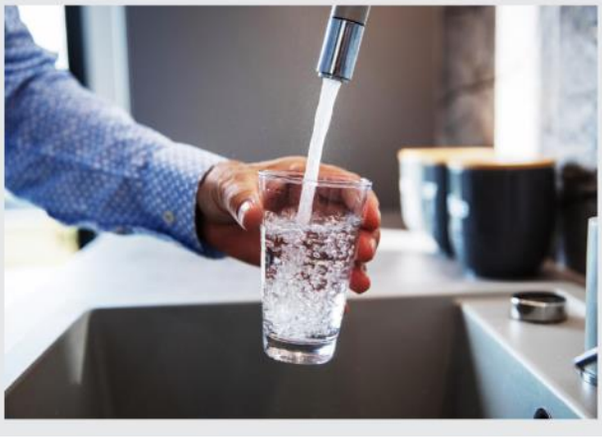
Hydraulic modeling has shown us how the system functions under different river flow conditions, helping to identify potential issues. Engineers also tested key features like the fish barrier weir and control gates, making adjustments to improve accuracy.
Sediment modeling revealed how sediment moves and settles in the system, highlighting possible impacts on the system's performance. These findings are shaping new sediment management strategies to ensure the plant operates efficiently for years to come.

"Reclamation tackled a complex set of challenges in designing the intake and pumping plant, working within the constraints of existing infrastructure," said TSC Structural Engineer Brandon Bowman. "Using both physical and computational modeling, they confirmed the design's reliability and hydraulic efficiency."

Looking Forward

Extensive physical modeling has confirmed that the intake and pumping plant design is strong and reliable, with no major issues found. Testing and modeling has assisted the design team with designing and refining the computerized control system, otherwise known as SCADA, that will be used by the future operators for controlling river diversions and pumping up to Frank Chee Willetto Reservoir. This validation boosts confidence in the upcoming construction and ensures smooth operations and maintenance. With this assurance, the project is on track for success, providing communities with a dependable water supply for years to come.

The Project Construction Committee plans to tour and take part in observation and testing of the model in late April. Groundbreaking for the new pumping plant is slated for 2026, north of the existing intake.



Learn more about drinking water standards and regulations by visiting the links below:

Safe Drinking Water on Tribal Lands

National Primary Drinking Water Regulations

Construction Update

By Hilda Castillo-Smith and Paul Bergstrom, FCCO Engineers

The Pumping Plant buildings are located on the Navajo Nation north of Sheep Springs Chapter

The Navajo-Gallup Water Supply Project is now 70% complete. The San Juan Lateral portion is estimated to be over 60% complete and is progressing towards completion with four pumping plants and two water transmission pipelines currently under construction.
The Tooh Haltsooi (Pumping Plant 4) and Bahastl'ah (Pumping Plant 7) are essentially complete with both plants being run through their final tests to ensure they are ready for water deliveries and finishing touches being added.

Construction at Tse Da'azkani (Pumping Plant 2) and To Alts'iisi (Pumping Plant 3) is approximately 75% complete as of March. The exterior walls and the metal building system are up and currently crews are working in manifold pipe inside the plants and setting up pedestals for the pumps. The electrical subcontractor is installing all conduit and cables, while another crew is installing the heating, ventilation, and air-conditioning system. The wall and dome panels have been installed on the water tank, and that crew will resume work once we have warmer weather this spring.

The Navajo Code Talkers Lateral, on the north side of Highway 264 between Yah-Ta-Hey and Window Rock, is close to completion and the final sections of pipe have been installed just a few miles east of the New Mexico-Arizona state line. Installing gravel around Black Hat Tank and McKinley Tank is underway, and final paint is being applied on the manway lids, bollards, and associated structures. Reach 4A/4B runs north along Hwy 491 beginning at Pumping Plant 3 and then northeast to Pumping Plant 2 east of Table Mesa before continuing north to the San Juan Lateral Water Treatment Plant at Highway N36. Pipe crews have been working hard installing the pipe and making great progress. To date, approximately 18 of 19 miles of pipe have been installed. A mechanical crew is working in the installation of air valves and related system parts and a subcontractor is working in thrust blocks for the pipe to prevent them from moving when water pressure is applied once water starts flowing through the San Juan Lateral. A tunnel boring machine was used to cut a tunnel under the high-voltage APS power lines and carrier pipe has been installed.

Faces of NGWSP - Meet Andrew Robertson

Yá'át'ééh, shee Andrew Robertson yinishé. Bilagaanaa nishlí, bilagaana dashishchíín, bilagaana da shichei, bilagaana da shináálí. I started working with Eastern Navajo chapters while working for a non-profit in 2000 and continued assisting chapters with their water needs after taking a job with Souder, Miller & Associates (SMA) in 2002. I currently serve as senior vice president at SMA and consulting engineer to the Navajo Nation Department of Water Resources.

The highlight of my career has been the opportunity to work directly with the people in Eastern Navajo chapters who receive water from the Navajo Gallup Water Supply Project. The eight chapters of the Cutter Lateral service area formed the Cutter Lateral Chapters Workgroup in 2006 (3 years before PL 11-111 was signed), which has been meeting quarterly ever since. Over the years, we've added the Beacon Bisti N-9 (BBN9) chapters and the 371 regional chapters to the group, which now includes 21 chapters who aspire to receive safe, sustainable San Juan River water for every family in their communities.

It's been an amazing journey. I've spent nights sleeping in pump stations (when we had to run water to fill pipelines but didn't have SCADA running yet to turn off the pumps in case of emergency), pounded tee posts in the snow, and been fed juice and cookies by gracious chapter members while line staking in the summer heat.

The best part of this job over the past 19 years has been the friendships and working relationships formed with community members, chapter leaders, and respected colleagues in Reclamation, Navajo Division of Water Resources, Indian Health Services, Bureau of Indian Affairs, Bureau of Land Management, the State of New Mexico, DePauli, and the many other partners who are making the NGWSP a success.

Groundbreaking and Blessing Ceremony held for Beacon Bisti Lateral

By: Navajo Nation Office of the President and Vice President, Chris Coon, Souder, Miller & Associates, and Johnny Johnson, Tse'ii'ah Chapter President

On Oct. 25, communities from Coyote Canyon to Crownpoint and Lake Valley gathered at the site of the Beacon Bisti Lateral in Coyote Canyon for a traditional Navajo blessing ceremony and groundbreaking event hosted by the eight Navajo Chapters who have worked together since 2012 to expedite this project to bring a reliable and potable source of water to their communities.

When completed by the Navajo Engineering and Construction Authority (NECA), the water project known as Beacon Bisti Navajo Route 9 Lateral (BBN9 Lateral) as part of the larger Navajo-Gallup Water Supply Project will use 46-miles of pipeline to bring clean water to about 6,800 Diné residents who live in Coyote Canyon, Tse'ii'ah, Nahodishgish, Crownpoint, Little Water, Becenti, White Rock and Lake Valley.

Haataalii (medicine man) Richard Anderson performed the Navajo Blessing during the ceremony in recognition of the Chapter's many years of working together to make this possible. He said community voices are important in leadership and that the new pipeline had been ceremonially honored with leadership songs, white cornmeal, and corn pollen.

"This ceremony is a tradition of our faith. When we do this, we are basically asking permission to disturb the earth and asking for a blessing for the project before we break ground," said Johnny Johnson, president of the Eastern Navajo Agency Council and president of the Tse'ii'achi Chapter. "This ceremony reflected the coming together of our Navajo communities involved with advancing this project for the past 12 years."

Representatives from the Navajo Nation and Reclamation kick-off construction on the Beacon Bisti N9 Lateral of the NGWSP during a blessing and groundbreaking ceremony held at Bahastahl Pumping Plant #7. Reclamation photo.

Navajo Nation President Buu President Nygren said the project would not have been possible without the dedication of past leadership. Thanks to support from community consent and contractors Souder Miller, NECA, Navajo Tribal Utility Authority and the U.S. Indian Health Service, the 46-mile pipeline project will soon be a reality.

"It is an exciting time for chapters to receive these new water infrastructure projects," Nygren said. "These communities now have the potential to grow and develop in line with sustainable models."

President Nygren also said that the work of the Navajo Department of Water Resources to secure water rights and bring water to Navajo communities is already transforming lives.

"I encourage all of the Navajo people to participate in the chapters' planning efforts to maximize access to water," said Nygren.

Connecting every Chapter to a clean and reliable water supply is a goal for many involved with the NGWSP. Souder, Miller & Associates, who is the design and construction engineering consultant for the Navajo Department of Water Resources, partnered with the Navajo Nation to help complete portions of the NGWSP and distribution lines that will bring clean water to Navajo communities.

"We want to make sure all of the Chapters get connected to the larger Navajo Gallup Water Supply Project," said Souder, Miller & Associates Tribal Consultant, Andrew Robertson. "The goal is to expand service areas to include all eight BBN9 Lateral chapters without an overall project cost increase."

At the ceremony near Pumping Plant 7 in Coyote Canyon, the Bureau of Reclamation's NGWSP Construction Engineer Bart Deming acknowledged the significance of the project.

"Water is life," Deming said. "It is vital to everything that we do. It is long overdue for the Navajo people to have clean, reliable, sustainable drinking water."

Pumping Power: How water gets where it needs to go

By Moncef Tihami
FCCO Engineering Division Manager

A pumping plant is a facility designed to move fluids, in this case, water, using pumps, valves, pipes, storage tanks, air chambers, sensors and control mechanisms. The Navajo-Gallup Water Supply Project will have at least 19 pumping plants when completed. Some pumping plants move raw water from Cutter Reservoir to the Cutter Lateral Water Treatment Plant, as well as from the San Juan River to Frank Chee Willetto Reservoir and to the San Juan Lateral Water Treatment Plant. Other pumping plants will push drinking water from the water treatment plants along the transmission pipelines and subsequently into community public water systems and ultimately homes. Most pumping plants will be operated remotely using a computerized system, otherwise known as Supervisory Control and Data Acquisition (SCADA).

To successfully and efficiently pump the water to its destination, pumps must be properly sized depending on the flow needed and total dynamic head (TDH) of the pipeline. Below are the basic criteria involved with designing and operating a pumping plant:

Aerial view of San Juan Lateral Pumping Plant 4. Photo by project contractor Archer Western

San Juan Lateral Pumping Plant 4—Pump Room Interior. (Vertical turbine pumps on the left and discharge manifold on the right.) Photo by project contractor Archer Western

WATER TALK
Additional terms that are critical to the operation of pumping plants

Flow: The amount of water to be pumped; usually expressed in gallons per minute (gpm) or cubic feet per second (cfs) and sometimes in millions of gallons per day (mgd). It is calculated based on the population served.

Static Head: The pressure created by the water elevation difference between where the water is and/or needs to be pumped from, to where it needs to be pumped; usually expressed in feet (ft).

Dynamic Head: The total amount of friction in the piping system that acts as resistance that the pumps must push against to move the water through to the correct elevation.

Total Dynamic Head (TDH): this is the combination of static head plus dynamic head.

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Pumping power cont.

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The air chamber room at San Juan Lateral Pumping Plant 4 Photo by Ed Tsosie

Air Chamber: An air chamber in a pumping plant is a device that reduces water flow pulsation in pipes, similar to the sound known as water hammer, which you might hear in the pipes in your home after turning off a faucet. Air chambers help control pressure surges that can be dangerously high and subsequently protect the entire pumping plant infrastructure (pipes, pumps, valves, building, etc…) in case of the sudden starting or stopping of water flow in a pipe.

Example of SCADA System. Stock Photo

SCADA: Stands for Supervisory Control and Data Acquisition. SCADA is a computerized system that gathers and analyzes real-time data using sensors and other devices to monitor and control equipment in facilities such as pumping plants, by starting/stopping pumps or opening/closing valves when critical water tank levels or pressures in the system are reached. SCADA systems are used in many industries, including power, water, manufacturing, and transportation.

The motor control center at San Juan Lateral Pumping Plant 4. Photo by Eugene Tanner

MCC: Stands for motor control center. This is an electrical assembly that centralizes the control and protection of multiple electric motors in a facility, typically consisting of enclosed sections or cabinets, where each section manages individual motors within a system. It essentially acting as a single point to start, stop, and monitor motor operations within the facility.