EPA United States Environmental Protection Agency

USDA U.S. DEPARTMENT OF AGRICULTURE

Options for Wastewater and Drinking Water Solutions

in Santo Domingo Pueblo, New Mexico

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Closing America's Wastewater Access Gap Community Initiative

Contents

Santo Domingo Pueblo's Options for Wastewater and Drinking Water Solutions

Santo Domingo Pueblo is a historic Pueblo community located between Santa Fe and Albuquerque, New Mexico. For hundreds of years, members of this community have practiced a traditional way of life, including producing pottery and other crafts and living in long-standing adobe homes. Today, Santo Domingo Pueblo faces inadequate wastewater and drinking water conditions that negatively affect public health and limit economic growth. By addressing its infrastructure needs, the Pueblo can preserve its cultural traditions while modernizing to achieve growth and economic prosperity.

The Pueblo recently focused on the construction of new housing and the repair and upgrade of existing infrastructure to support community health initiatives. For wastewater and drinking water infrastructure updates, the Pueblo worked to secure over $30 million in funding. As part of the Closing America's Wastewater Access Gap Pilot Initiative, Santo Domingo Pueblo will work with state and federal partners to address sanitation and drinking water needs so the community can thrive into the future.

Cover photos: Santo Domingo's mission-style church (middle), photo provided by Santo Domingo Pueblo; advanced sequencing batch reactor (bottom), photo by AWT Technologies, Inc.

Closing America's Wastewater Access Gap Community Initiative Pilot: EPA/USDA-RD Partnership

Introduction

The U.S. Environmental Protection Agency (EPA) and the U.S. Department of Agriculture Rural Development (USDA-RD) partnered with six states and three Tribes (two federally recognized and one state-recognized) on the Closing America's Wastewater Access Gap Community Initiative. As a pilot program, this initiative was the first of its kind for EPA and USDA-RD. This initiative provides technical assistance to support capacity to improve wastewater management for the 11 participating communities. EPA and USDA have grant and loan programs to help pay for wastewater system improvements. Recent increases in federal funding offer an opportunity for communities to invest in septic upgrades, connect to nearby treatment systems, or build new sewer and wastewater treatment systems that meet their needs.

EPA offers a range of Water Technical Assistance (WaterTA) for communities to identify water challenges and solutions, build capacity, and develop application materials to access water infrastructure funding. EPA collaborates with states, Tribes, territories, community partners, and other stakeholders to implement WaterTA efforts. The result: more communities apply for federal funding to have quality water infrastructure and reliable water services. Communities can learn more about EPA WaterTA and how to indicate interest in receiving assistance by visiting EPA's WaterTA website.[1]

USDA offers a wide range of water and wastewater assistance for rural communities to obtain the technical assistance and financing necessary to develop drinking water and waste disposal systems. USDA's Water and Waste Disposal Technical Assistance and Training Grants program helps qualified, private nonprofits provide technical assistance and training to identify and evaluate solutions to water and waste problems. It also helps applicants prepare applications for water and waste disposal loans and grants, and it helps associations improve the operation and maintenance (O&M) of water and waste facilities in eligible rural areas with populations of 10,000 or fewer. Communities can learn more about USDA Water and Waste Disposal Technical Assistance and Training Grants and how to indicate interest in receiving assistance by visiting USDA's website.[2]

Purpose

EPA and USDA-RD worked with the pilot program team—Santo Domingo Pueblo's Tribal administrator; the Indian Health Service (IHS); the Pueblo's hired engineer, Molzen Corbin; the Pueblo's hired consultant, High Water Mark LLC; and a technical assistance provider, Southwest Environmental Finance Center (SW EFC)—to develop solutions for Santo Domingo Pueblo's wastewater and drinking water issues. This document, *Options for Wastewater and Drinking Water Solutions for Santo Domingo Pueblo*, outlines potential solutions to address the needs for improved wastewater treatment and drinking water transmission in Santo Domingo Pueblo. Residents and Pueblo leadership can use this information to evaluate funding opportunities through federal and state programs and determine how to best proceed.

1 www.epa.gov/waterta

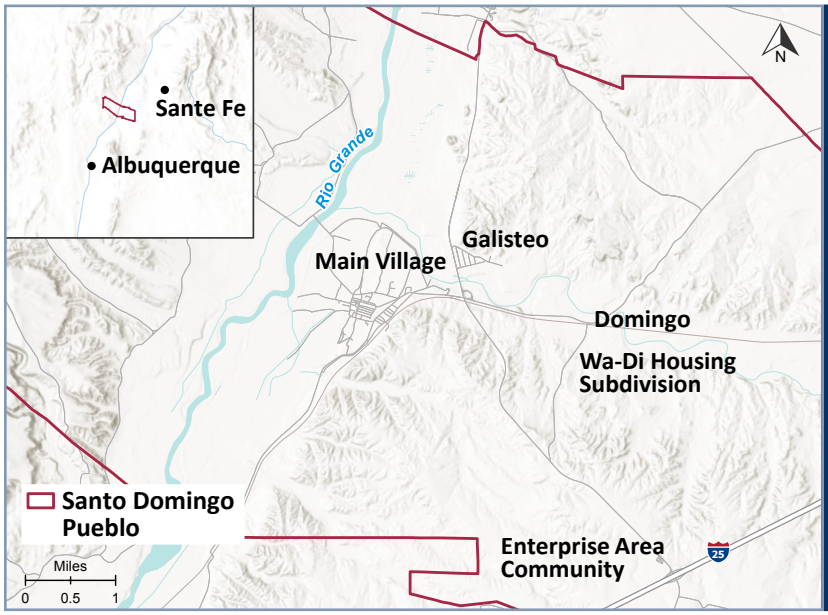
2 http://www.rd.usda.gov/programs-services/water-environmental-programs/water-waste-disposal-technical-assistance-training-grants

Over the past year, the pilot program team has:

1. **Conducted a community wastewater assessment.** The pilot program team reviewed existing information on wastewater systems in Santo Domingo Pueblo and proposed improvements. This review included a site visit and independent modeling of the proposed wastewater treatment plant improvements.
2. **Reviewed wastewater and drinking water solutions.** The team reviewed the wastewater and drinking water solutions and Preliminary Engineering Reports (PERs) already drafted by the Pueblo. The team initially focused on USDA funding applications for the wastewater treatment and conveyance system, then revisited the funding application to IHS for renewal and replacement of the Main Village sewer system.
3. **Helped communities find and apply for funding opportunities.** This document outlines federal funding sources and how to apply for funding. It also shows how to pay for construction and long-term costs. The Pueblo has already been awarded several grants, including some federal funds.
4. **Evaluated impacts on rates and affordability for homeowners.** To install and operate the selected system, Santo Domingo Pueblo will have to develop a plan to pay for construction and ongoing costs. These costs could include management, operations, maintenance, and any potential construction loan repayments. This document offers ideas to get started, such as programs with low-income rate assistance and non-rate revenue programs that other utilities have used.

Santo Domingo Pueblo, New Mexico

Santo Domingo Pueblo, also known as Kewa Pueblo, is a federally recognized Tribal government located in Sandoval County, New Mexico, between Albuquerque and Santa Fe along the Interstate 25 (I-25) corridor, as shown in Figure 1. For thousands of years, Indigenous People have resided on this land. Santo Domingo Pueblo is one of 19 traditional Pueblos in the state.



Santo Domingo Pueblo Utilities Fast Facts

- **Customer base: 823 households, 26 Enterprise Zone connections**
- **Median annual household income: $36,932**
- **Residential monthly bill for drinking water, wastewater, and solid waste: $40**
- **Drinking water use per day: 220,000 gallons**
- **Tribal utility staff: 11**

Figure 1. Overview of Santo Domingo Pueblo's main housing areas.

The Pueblo collects its own census data. Table 1 presents enrollment numbers (on- and off-reservation) for the last 10 years.

Table 1. Santo Domingo Pueblo Enrollment Numbers

Year	Enrollment On-Reservation	Enrollment Off-Reservation
2013	3,363	4,943
2014	3,409	4,995
2015	3,460	5,086
2016	3,477	5,059
2017	3,520	5,228
2018	3,526	5,260
2019	3,574	6,322
2020	3,583	5,337
2021	3,554	5,308
2022	3,563	5,311
2023	3,570	5,303

The Pueblo consists of four main sections: the Main Village; the Domingo Area, which includes the Wa-Di housing subdivision; the Galisteo Housing Area; and the Enterprise Area.

The Main (Traditional) Village homes have small lots with adobe houses. These houses tend to be one- to two-room dwellings, and many of the homes are inhabited by large, multi-generational families. The homes in Wa-Di and Galisteo are recent, new home construction projects.

Research shows American Indian households across the country are 19 times more likely to face inadequate sanitation issues than white households.[3] Many federally recognized Tribes, such as Santo Domingo Pueblo, have aging or inadequate centralized wastewater infrastructure.

3 Tanana, H., Combs, J., & Hoss, A. (2021). Water Is Life: Law, Systemic Racism, and Water Security in Indian Country. *Health Security*, 19(S1) S-78–S-82. https://doi.org/10.1089/hs.2021.0034

> *To reacquaint Tribal members that have left our Pueblo due to limited and inadequate housing and poor water and wastewater infrastructure, the leadership of Santo Domingo Pueblo, in partnership with our federal and state agencies, is focused on building the needed housing, water and wastewater infrastructure that addresses current and future health concerns in our community and supports creating a vibrant, self-sustaining economic future allowing more members to return to the Pueblo and honor traditional customs.*
>
> — Governor Esquipula Tenorio Sr.

The assessment for this project and the PER provided by the Pueblo revealed the following concerns about the current wastewater infrastructure for Santo Domingo Pueblo (Figure 2):

- The Main Village sewer system and lagoon system is aging, and the lagoon is prone to overflowing due to inadequate disposal infrastructure. There is a spray irrigation field offsite from the lagoon, but the pump to the field is not functional. The current disposal from the lagoon is an evaporation pond next to the lagoons. The Main Village sewer system was built with vitrified clay pipe (VCP) in the 1960s. Much of the piping system has cracks, root intrusion, inverse slopes, or other defects. Some of the system will need to be physically replaced, while other sections will require pipelining due to the lack of space for pipe replacement.
- The Galisteo lagoon system is often hydraulically overloaded, and flow must often be pumped to the Main Village lagoon system.
- The Wa-Di Housing Area is served by a community septic tank and leach field that has failed, likely due to fats, oils, and grease clogging up the system, requiring frequent pumping.
- The Enterprise Area is served by multiple systems, which include the following:
  - Cedar Tree Community septic tank and leach field.
  - Santo Domingo High School septic tank and leach field.
  - Gas station/travel center lagoon system.
  - Kewa Safety Complex septic tank and leach field.
  - Santo Domingo Health Center membrane bioreactor (MBR) package plant and leach field.
  - Santo Domingo Early Childhood Learning Center MBR plant and leach field.

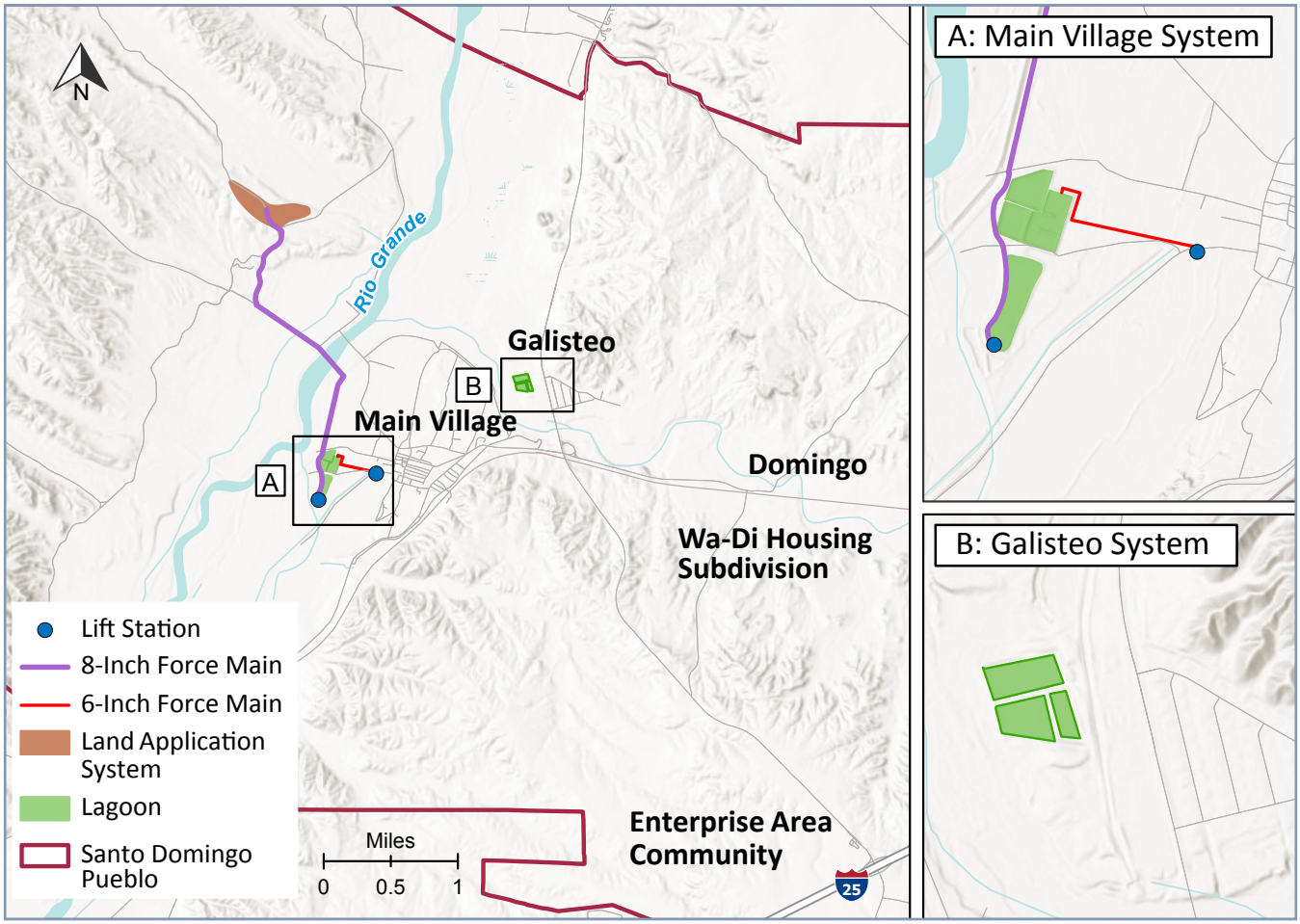


Figure 2. Santo Domingo Pueblo's current wastewater treatment system.

The drinking water transmission system from the Pueblo's wells to the Main Village and other housing areas is undersized and lacks redundancy. Due to the inadequate pipe size and lack of hydraulic controls, the transmission line often breaks due to high flow rates and pressure variation. When the water line breaks, sediment and impurities can enter the drinking water distribution system, compromising the quality of water delivered to residents of the Pueblo. This can cause an elevated risk of bacteria in tap water and discolored or brown tap water. Pueblo members residing within the Main Village rely on bottled water for drinking and cooking, and the public school has had closures due to water quality. The Pueblo has already completed a PER and selected an alternative to increase hydraulic capacity in this system to meet clean drinking water and adequate fire flow needs.

The Potential of Infrastructure Investment

Upgrading drinking water and wastewater infrastructure will allow Santo Domingo Pueblo to address long-term community health concerns and provide a foundation for a financially independent economy that builds on native traditions and works toward future goals. An additional $65 million is necessary to address all the Pueblo's infrastructure needs. Over the next 5 years, the Pueblo will have several moving pieces to keep the current utility system in operation, upgrade existing infrastructure, and build new infrastructure. This document is meant to support the Pueblo in competitive funding applications so the community can develop an upgraded, reliable drinking water and wastewater system.

Community Engagement Feedback

Santo Domingo Pueblo, EPA, USDA-RD, and SW EFC held community meetings in May and July 2023. The Council, Governor, and Lieutenant Governor of the Pueblo and all Tribal leadership supported the need to modernize the wastewater and drinking water infrastructure systems.

The Pueblo leaders indicated that improvements are critical to support the Pueblo's economic independence in a way that honors their traditional heritage. They want to provide more housing for members who want to move back to the Pueblo to live in their traditional culture. They also want to address potential public health issues, such as wastewater exfiltrating from the aging sewer system and contaminated drinking water caused by water main breaks.

The Pueblo leadership also recognizes the opportunity to engage with their community during this time to address issues affecting the current wastewater system, such as the disposal of fats, oils, and grease, and leaky water fixtures. The Pueblo will develop outreach materials to ensure that messaging resonates with Pueblo members and fits preferred communication methods (e.g., monthly newsletters and verbal communication in the native language). Outreach and education efforts tailored to the community are more likely to succeed.

> *Creating a safe drinking water system and adequate wastewater system are paramount to Santo Domingo Pueblo reaching our full potential. This will allow us to provide a safe, healthy environment for our community and to provide a brighter future for our people through sustainable economic development.*
>
> — Governor Esquipula Tenorio Sr.

Wastewater Treatment and Drinking Water Options for Santo Domingo Pueblo

Santo Domingo Pueblo has already spent considerable effort evaluating wastewater management options to address its current challenges and future needs. The Pueblo evaluated alternatives to modernize the wastewater treatment system, selected a preferred alternative, developed a plan to repair and upgrade the aging VCP sewer system in the Main Village, and developed a plan to replace the sewer trunk line in the Main Village. Santo Domingo Pueblo still needs to address deficiencies in its drinking water distribution system. The main transmission line is not large enough for the community's needs, which has led to water line breaks that disrupt drinking water flow and result in insufficient fire protection due to a lack of flow capacity. A summary of needs and alternatives selected for each of these systems is discussed in the next section. The Pueblo is continuing its design work and updating costs on alternatives selected prior to the Closing America's Wastewater Access Gap Community Initiative. Costs and cost estimates are provided when available.

Modernization of the Wastewater Treatment System

An October 2022 PER by Molzen Corbin Consulting Engineers evaluated alternatives for modernizing the Pueblo's current treatment system, which consists of two lagoon systems (one for the Main Village and one for the Galisteo Housing Area) and the decentralized treatment systems in the Wa-Di Housing Area and Enterprise Area. The PER considered the following alternatives:

- **Alternative 1.** Build one new treatment plant and four lift stations with land application discharge on Pueblo land to serve the entire Pueblo and include capacity for economic development and new housing. The current Main Village lagoon system would be maintained for flow equalization needs, but the rest of the system would be removed from service. ***This alternative was selected.***
  - Prior to the initiative, Pueblo leadership selected this alternative because it met existing demands and near-term future growth needs as well as long-term future goals. A solid waste transfer station and a utility administration building are included in this alternative.
  - The current estimated cost of this alternative is $31.2 million.
- **Alternative 2.** Expand the existing Main Village lagoon system to serve the entire Pueblo; remove the rest of the system from service.
  - The Pueblo did not select this alternative due to its impact on sacred lands and inability to expand in the future to meet economic development needs.
- **Alternative 3.** Build a new wastewater treatment plant near the Main Village with a surface water discharge to the Rio Grande River that would require a federal discharge permit.
  - The Pueblo did not select this alternative because of concerns about potential future changes to regulations that would lead to unexpected costs.

Renewal of the Main Village Trunk Sewer Line

As of September 2023, the Main Village sewer trunk line renewal project is nearly complete. The objective was to replace the older 6-inch and 8-inch VCP with new pipe. The project cost approximately $5 million and was funded through multiple sources, including the New Mexico Tribal Infrastructure Fund, New Mexico Capital Outlay, and a grant from the U.S. Economic Development Administration (EDA).

Renewal of the Main Village Sewer System

The sewer system in the Main Village is mostly VCP. According to the Main Village Sewer Rehabilitation and Extension PER, approximately 92 percent of the system has defects, such as cracks, root intrusion, offset joints, and/or broken pipe. Renewing the system could include replacing, repairing, and/or lining the pipes based on the existing conditions of the pipe segments. Special care will be needed during construction to protect the historic adobe homes and navigate small clearances between structures.

- **Alternative 1.** Install pipe liner in the existing system. Upgrade the existing sewers by replacing pipes with inadequate slopes, broken pipes, bellies, or offset joints with new polyvinyl chloride (PVC) pipe and using resin-impregnated fabric tube (i.e., cured-in-place pipe or CIPP) liner inside the rest of the existing sewer system.
- **Alternative 2.** Replace Main Village sewers. Replace all VCP with PVC, coat manholes for corrosion protection, and replace service laterals. ***This alternative was selected.***
  - The current cost estimate for this alternative is $17.5 million.
- **Alternative 3.** Phase implementation of Alternative 1 into two phases based on the current condition of the pipeline, with Priority 1 pipe segments being lined or replaced first and Priority 2 pipe segments being lined in a second phase.
- **Alternative 4.** No action. Leave the existing system as is and make no improvements.

The Pueblo is revisiting this PER to address IHS comments to receive funding through the Sanitation Deficiency System (SDS). The Pueblo may be able to work collaboratively with IHS and USDA to fund the total project.

Renewal of the Drinking Water Transmission System

This project would increase the capacity of the transmission system to reduce internal pressure in the piping system, thereby reducing the number of pipe breaks. With the additional flow capacity in the water transmission system, the Pueblo will be able to increase fire flow capacity and improve community safety. While inadequate fire flow capacity is not considered a deficiency by IHS or USDA for funding through their programs, it can narrow potential funding opportunities.

- **Alternative 1.** No action. Current conditions would be maintained, which include compromised drinking water services and inadequate fire flow capacity in the water distribution system that put the Pueblo at risk, forcing utility managers to address failures as they arise.
- **Alternative 2.** Replace the current water transmission system with large pipe sizes to provide the necessary hydraulic capacity and storage volume to address fire flow and backup needs. ***This alternative was selected.***
  - The current cost estimate for this alternative is $15.8 million, with four phases:
    - **Phase 1.** Upsize approximately 4 miles of water transmission line from I-25 to near the Main Village, implement Galisteo tank flow control, and install two new water tanks near Wa-Di or Domingo.
    - **Phase 2.** Install two new water tanks, upsize approximately 3,000 linear feet of distribution water main to the Main Village, install a new 500 gallon-per-minute well near I-25, and modify the existing wellhouse.

    - » **Phase 3.** Upsize approximately 2.2 miles of transmission water line.
    - » **Phase 4.** Install a new water tank near I-25.
- **Alternative 3.** Construct a new well near I-25 and construct a separate transmission line with additional capacity and storage to augment the current line.

Timing of Projects

Pueblo leadership provided the following timeline for projects to meet the Pueblo's needs.

Years 1–3

- Design and construct the wastewater treatment plant and conveyance system.
- Design and construct Phase 1 of the water transmission system.

Years 3–5

- Construct the Main Village sewer system renewal program.
- Design and construct Phases 2–4 of the water transmission system.

Santo Domingo's mission-style church, photo by Davidhc9, licensed under CC BY-SA 3.0.

Funding Opportunities

The Bipartisan Infrastructure Law provides funding to IHS to support deficient infrastructure in American Indian and Alaska Native communities. It also provides funding to the Clean Water State Revolving Fund (CWSRF) for loans and grants to small, rural, and Tribal communities. This funding can be leveraged with USDA-RD funds to address inadequate water and wastewater systems.

There are multiple potential funding sources for Santo Domingo Pueblo, including the CWSRF, USDA-RD, and the IHS SDS program for funding water, wastewater, and solid waste facilities.

Current Funding Secured by Santo Domingo Pueblo

Santo Domingo Pueblo has successfully secured nearly $30 million in funding for its wastewater infrastructure through the following sources:

- Commitment of Santo Domingo Pueblo's American Rescue Plan Act (ARPA).
- Coronavirus Aid, Relief, and Economic Security (CARES):
  - This funding was used to extend sewer to residences, conduct the CCTV sewer inspection, and evaluate connecting Domingo to the Main Village.
- New Mexico Tribal Infrastructure Fund.
- New Mexico Capital Outlay.
- Economic Development Administration grants.
- Congressionally directed spending appropriations.
- IHS.

Overview of USDA's Rural Development Water and Environmental Programs: Water and Waste Disposal Loans and Grants

- Through Rural Utilities Service Water and Environmental Programs and Native American Set Aside for Infrastructure Projects, Tribal communities can obtain the technical assistance and financing necessary to develop drinking water and waste disposal systems.
- The Native American Set Aside program can be up to 100 percent grant (306d) funding, based on eligibility. This program supports Tribal communities nationwide.
- USDA funding is typically through long-term low-interest loans with some grant funding available to communities that qualify. The grant amount is based on median household income (MHI) and community population. Santo Domingo Pueblo would be considered for other USDA-RD programs that provide a higher level of grant funding.
- Financial audits are required for USDA-RD loans and grants in years when more than $750,000 of federal funds are expended. USDA-RD loans and grants also require a commitment from the Pueblo for revenue collection during the life of the loan.
- For communities receiving loans, the loan term can be up to 40 years based on the expected life of the system. The interest rate is below market rates and adjusted quarterly.

- USDA-RD accepts applications year-round on a rolling basis through RD Apply.[4]
- More information is available on USDA's website.[5]

Overview of IHS Funding Program

IHS uses the SDS to evaluate and prioritize funding needs of American Indian and Alaskan Native communities within the United States. SDS was created under Public Law 86-121 as an inventory of projects to address existing sanitation deficiencies in these communities. It features standards and procedures for identifying deficiencies and developing and prioritizing projects. All IHS Areas are required to report their sanitation deficiencies uniformly across all projects according to SDS guidelines. IHS funding for projects comes from federal appropriations and does not have a loan component. Key aspects of the SDS system include:

- Only current deficiencies can be addressed.
- Communities can work with IHS staff to address future needs while addressing existing deficiencies, but there are limitations. For example, water infrastructure for new subdivisions must be coordinated with the construction of any new homes or buildings. Timing of construction must be coordinated through IHS staff.
- IHS uses SDS to determine eligible and ineligible costs associated with projects. Water infrastructure that serves buildings funded through the U.S. Department of Housing and Urban Development or other federal sources are not generally eligible for funding.
- The SDS prioritizes existing deficiencies, so projects that can demonstrate significant deficiencies are more likely to rank higher.
- IHS funding typically follows this process:
  - The Tribe submits their priority list of the top four projects in June with appropriate scores to denote priority:
    - Priority 1: 16 points
    - Priority 2: 12 points
    - Priority 3: 8 points
    - Priority 4: 4 points
  - Each listing is given a tier level. For the purpose of listing projects in SDS, three tiers of project planning and cost estimation have been established.
  - IHS staff assigns scores to projects based on multiple factors, including:
    - Health impact
    - Project deficiency level
    - Adequate pervious surface
    - Capital cost
    - Local Tribal priority
    - O&M capability
    - Contributions
    - Other considerations
  - Projects are prioritized for funding based on their overall score.

4 https://www.rd.usda.gov/programs-services/rd-apply

5 https://www.rd.usda.gov/programs-services/water-environmental-programs

- A project must be certified as "Ready to Fund" by the Area Sanitation Facilities Construction (SFC) Director. Based on the 2019 SDS manual, Ready to Fund projects are deemed ready to proceed when the information submitted in SDS allows a peer reviewer to fully understand the project's scope and impacts. SDS projects that are certified by the Area SFC Director as Ready to Fund have the following:
  - A well-defined scope.
  - A detailed cost estimate.
  - A plan to address foreseeable risks to construction, operation, and maintenance, including a plan to pay for O&M for the proposed infrastructure.
  - Sufficient completed planning and design work (appropriately documented) such that plans and specifications can be created without delay once the project is funded.
- Once federal appropriations are made, which can take up to a year, the highest-ranking projects for the fiscal year (FY) are funded based on availability of funds.
- Tribal Priority Projects included in the FY 2024 Project List were submitted to IHS in June 2023 for use in planning the 2024 budget. Once federal appropriations are made, IHS will review the SDS priority list to determine how many priority projects can be funded in the FY 2024 budget year.
- Once funding for a project is confirmed, the Project Proposal, Project Summary, and Memorandum of Agreement are signed. Then, the funding is made available to the Tribe. The Project Summary(ies) should be signed by the end of the fiscal year, which is September 30. The Memorandum(a) of Agreement should be signed by the end of the calendar year or December 31.
- The Environmental Information Document (EID) must be completed for the National Environmental Policy Act (NEPA) before funds can be spent.
- Typically, a project is completed within 5 years of funding allocated for the project.
- More information on SDS can be found on the IHS website.[6]

Overview of the Clean Water Indian Set-Aside (CWISA) Program Administered by EPA Region 6, with Support from IHS

- The CWISA program provides funding to Indian Tribes and Alaska Native Villages for wastewater infrastructure. The CWISA program is administered in cooperation with IHS.
- To be considered for CWISA program funding, Tribes must identify their wastewater needs to the IHS SDS. EPA is required to use IHS SDS priority lists to identify and select projects for CWISA program funding.
- CWISA funding is available for infrastructure such as central sewer and treatment systems and the repair or replacement of onsite wastewater treatment systems.
- CWISA funds are available to provide services to facilities with existing deficiencies, including potentially IHS-ineligible businesses and homes such as those constructed with Santo Domingo Tribal Housing Authority funds and under the management of the Santo Domingo Tribal Housing Authority.
- Use of CWISA grant funds often requires extra lead time for a project to be listed in the IHS SDS.
- Funding for the drinking water transmission system may also be available through the Drinking Water Indian Set-Aside (DWISA) program, which has some of the same requirements as the CWISA program.

6 https://www.ihs.gov/dsfc/resources/

- The SW EFC can assist with State Revolving Fund (SRF) funding applications.
- More information can be found on the EPA websites for clean water funding[7] and drinking water funding.[8]

Overview of the CWSRF Program Administered by the New Mexico Environment Department (NMED)

- The New Mexico CWSRF is a low-interest loan program intended to finance public infrastructure improvements, including planning projects.
- Subsidy is possible for eligible communities in the form of grants. Eligibility is based on NMED's affordability criteria, which include:
  - Per capita income 80 percent or less of the national average.
  - Population under 20,000 for a municipality and under 200,000 for a county.
  - Unemployment higher than the national average.
- Applications are accepted throughout the year.
- The loan term is up to 30 years, and the interest rate is 0 percent or 0.01 percent.
- The amount of subsidy and loan is not determined until after an application is submitted.
- The applications are scored using criteria based on the proposed project's water quality improvement to either surface water or groundwater, sustainability, and readiness to proceed. Project scoring information and ranking are posted on the quarterly priority list on the NMED website.[9]
- Funding for the drinking water transmission system is also available through the New Mexico Drinking Water State Revolving Fund (DWSRF). The program is similar to the CWSRF program. Information can be found on the NMED website.[9]
- The SW EFC can assist with applications to the SRF programs.

Aligning Funding and Project Needs

Pueblo leadership has committed to addressing its wastewater infrastructure needs. By aligning the remaining project needs to the available funding systems, the Pueblo should be able to fully fund the needed investment in their drinking water and wastewater system in the next 5 years. Table 2 represents potential ways to align the funding sources.

7 https://www.epa.gov/small-and-rural-wastewater-systems/clean-water-indian-set-aside-program

8 https://www.epa.gov/tribaldrinkingwater/drinking-water-infrastructure-grants-tribal-set-aside-program

9 https://www.env.nm.gov/funding-opportunities/

Table 2. Funding for Wastewater and Drinking Water Infrastructure Needs

Infrastructure System Needs	Funding Sources
Wastewater treatment plant • Estimated cost: ~$31.2 million	• Pueblo ARPA funding • Tribal Infrastructure Fund • New Mexico Capital Outlay • Congressionally directed spending appropriation • USDA funding application (potential)
Wastewater conveyance system • Wa-Di lift station and force main • Galisteo lift station and force main • Main Village lift station and force main • Estimated cost: ~$16.2 million	• Tribal Infrastructure Funds • Pueblo ARPA funding • USDA funding application (potential)
Main Village trunk system renewal • Estimated cost: ~$5 million	• Tribal Infrastructure Funds • New Mexico Capital Outlay • EDA grant
Main Village sewer system renewal • Estimated cost: ~$17.5 million	• IHS (potential) • USDA-RD (potential) • CWSRF (potential)
Drinking water transmission system • Estimated cost: ~$15 million	• IHS (potential) • USDA-RD (potential) • DWSRF (potential)

Benefits of Investing in Adequate Wastewater and Drinking Water Infrastructure

Public and Community Health Improvement

Exposure to sewage can have negative health impacts and spread diseases such as salmonellosis, shigellosis, cholera, giardiasis, amoebiasis, hepatitis A, viral enteritis, and other diarrheal diseases.[10] There are many different types of microbes in wastewater, which makes it challenging to determine specific causes of illness. Detecting and identifying microbes in wastewater takes time and resources.[11] However, it is well known that exposure to untreated waste negatively affects residents' health and well-being. Addressing failed wastewater conveyance and treatment systems is essential to preserving public health for Santo Domingo Pueblo.

10 World Health Organization. (2006). *WHO guidelines for the safe use of wastewater, excreta and greywater* (Vol. 2). https://www.who.int/publications/i/item/9241546832

11 Kaushal, S., & Singh, J. S. (2017). Wastewater impact on human health and microorganism-mediated remediation and treatment through technologies. In J. Singh & G. Seneviratne (Eds.), *Agro-environmental sustainability*. Springer. https://doi.org/10.1007/978-3-319-49727-3_12

In 2010 and 2014, extreme rain events in the Pueblo caused flooding and damage to traditional adobe housing, including saturation of natural roofs and damage to foundations and walls (Figure 3). The Pueblo has worked with the Federal Emergency Management Agency (FEMA) since then to remediate the black mold that formed due to saturation of natural building materials. However, some residents still experience respiratory impacts potentially related to the floods and overall substandard housing conditions. The Pueblo continues to work with federal and state agencies to address impacts on the adobe housing in the Main Village. The adobe dwellings, many of which are more than 100 years old, represent important traditional heritage for the Santo Domingo Pueblo and other southwestern Pueblos.

Figure 3. Adobe dwelling affected by water damage.

Adobe dwellings present unique challenges for maintenance and repair or rehabilitation as compared with frame-built housing. Adobe-constructed homes have specific ventilation requirements and often have central design elements that incorporate a fireplace. Many of the homes in the village were not originally built with plumbing, kitchens, or bathrooms. In the 1950s, front rooms were added to the homes, attached to the original adobe structure. It is unclear how modern plumbing and new moisture sources affect the structures when core elements of the building are changed, such as when asphalt or rubber roofs, stucco cement, or flooring finishes are added. Failing or inadequate interior plumbing can also be a major contributor to water damage and mold growth. Modern sewer systems have vent pipes and p-traps to ensure dangerous or odorous gases do not enter the home. It is unknown what, if any, impacts these have on the ventilation patterns of traditional adobe structures and how they affect mold growth. Proper p-traps also prevent cockroaches, which can and do live in municipal sewer systems, from entering a home from a sewer system. Recent video inspections of the Main Village sewer system have revealed cracked clay piping. It is unclear if leaking pipes and exfiltration have an impact on mold in adobe housing. The Main Village sewer system is made up of aging VCP, and many parts need repair or replacement. Parts of the sewer system have an inverse slope that affects the flow of raw wastewater and include disintegrating clay pipe and tree roots or other blockages. These conditions can allow raw wastewater to back up or exfiltrate from the sewer system, preventing it from reaching the wastewater treatment plant.

The Galisteo and Wa-Di wastewater treatment systems are failing. The Pueblo is pumping out the septic tanks at the Wa-Di housing area and is also pumping wastewater from the smaller Galisteo lagoon system to the Main Village lagoon system to keep wastewater systems operational. The Main Village lagoons are overloaded with temporary discharge of effluent to a percolation pond because the land application system is not operable. To protect public health, Pueblo members need a properly functioning centralized wastewater treatment system. Further inspection and analysis of the decentralized wastewater treatment systems may help simplify operations and reduce costs, such as wastewater hauling fees, while the new centralized wastewater treatment system is being constructed.

Because the new wastewater treatment system and plant will not be completed for 3 to 6 years, the Pueblo may want to repair the land application discharge system for the Main Village lagoon to make it functional for the short term. This could reduce hauling costs for effluent disposal, increase the capacity of the Main Village lagoons, and reduce any potential risks or damage to the lagoon system. This suggestion is not a permanent fix and is only meant to address any short-term public health risks to the community and the environment.

The proposed wastewater treatment project will allow the Pueblo to possibly reuse the effluent of the treatment plant for irrigation or other non-potable uses, depending on the effluent quality attained by the treatment. As the Pueblo considers other drinking water improvement and sustainability initiatives, such as attracting industrial customers or developing community spaces with landscaping, the use of effluent for non-drinking water purposes such as irrigation or industrial processes can help the Pueblo strengthen its resilience to future droughts or impacts to the groundwater system.

Economic Impact of Wastewater Infrastructure Investment

The primary purpose of the proposed wastewater system is to address the current sanitation conditions in Santo Domingo Pueblo. The investment in new infrastructure will provide a strong foundation for the community through improved wastewater treatment and public health protection for existing residents. The Santo Domingo Pueblo leadership team is focused on building infrastructure that will support economic growth without compromising their traditional heritage and customs. The Tribe has plans for new housing, industrial areas, and a potential solar farm. A modern wastewater conveyance and treatment system is critical to support that growth.

Impact of Economic Growth on Monthly Rates

As Tribal members relocate to the Pueblo and the population expands, there will be a need to construct new homes and improve water infrastructure to support those homes. Currently, the Tribe is building wastewater treatment capacity for additional customers. In typical communities, new development would pay an impact fee or capacity fee at the time of construction to recoup the cost of infrastructure to provide wastewater service. Most federal funding programs assume some type of economic contribution from new development as part of their funding package. Home and land ownership on the Pueblo can vary between the Tribe, the Santo Domingo Tribal Housing Authority, and private ownership, but the Tribal Utility Authority does not charge a capacity fee to the Tribe or the Housing Authority. Tribal leadership will need to consider financial measures that support construction of new infrastructure. As the Tribe confirms future operating budgets and economic growth plans, a rate study would be helpful to determine the revenue needs of the water and wastewater system.

Sustaining the Investment Through Operations and Maintenance

Potential Approaches for O&M

The Tribal Utility Authority has primary responsibility for O&M of the water and wastewater infrastructure. Based on the PER's recommendation for the wastewater treatment plant and modeling by the pilot team, four staff members will be needed for the new wastewater treatment plant. The PER does not differentiate between position responsibilities of staff members. The modeling conducted by the pilot team indicates that two operators, one maintenance worker, and one laboratory staff member will be needed. The Pueblo can streamline future operations through the following measures:

- Requiring staff training and certification to operate the water and wastewater treatment systems. The SW EFC may be able to help with developing training programs.
- Including appropriate technology for efficient operations, including an up-to-date telemetry system for the treatment plant and lift stations.
- Providing appropriate monitoring and process control software and a Supervisory Control and Data Acquisition (SCADA) system for remote system monitoring and operation.

- Developing Standard Operating Procedures for the new infrastructure in accordance with the manufacturers' recommendations.
- Developing asset management plans for each piece of infrastructure to optimize maintenance and renewal of components such as pumps, motors, and aeration equipment for optimal life. Asset management plans can assist with future budgeting projections. The SW EFC can assist the Pueblo in creating these plans.
- Evaluating non-rate revenue opportunities, such as leasing space on water storage infrastructure to cellular providers.
- Incorporating solar panels and renewable energy production to support operations as appropriate.

Paying for O&M and the Affordability Challenge

Across the United States, utilities use sewer bills to pay for management, operations, maintenance, and loan repayments for wastewater systems. Santo Domingo Pueblo will need to keep rates affordable for low-income customers but high enough to collect funds to operate and maintain the system. This challenge is a key obstacle for utilities across the United States. Traditional approaches for evaluating the affordability of a combined water and sewer bill have limitations. Many metrics assume the services are affordable if the combined bill is less than 4 percent of MHI.

Wastewater-only projects are considered "affordable" if the sewer bill is 2 percent of MHI or less. However, using MHI as an indicator can make it challenging to understand the community's affordability needs, as low-income residents struggle more with paying utility bills than higher-income residents do. This analysis incorporates both household income quintile upper limits from the U.S. Census Bureau and MHI into the affordability analysis to better reflect the impact for low-income residents. Even with assistance from federal and state funding programs, all options will have a high financial impact on the lowest-income residents of Santo Domingo Pueblo.

Currently, the Tribe charges a flat fee of $40 per month to residential units for drinking water, wastewater, and solid waste services. The Tribe supports most utility operation expenses through subsidizing these programs, and plans to continue to do so, due to the importance of these services for community members. However, the Tribe intends for utility operations to become self-sustainable in the future. The customers in the Enterprise Area are billed monthly, and the total expected monthly revenue from customers in the Enterprise Zone is approximately $9,700.

The annual O&M costs of the new wastewater plant and conveyance system are expected to range from $800,000 to $1.2 million. The Tribal Utilities Authority 2022 O&M budget was approximately $1.5 million for drinking water, wastewater, and solid waste. It is not known how much money and staff time the Tribe can save by discontinuing the failed wastewater systems at Wa-Di and Galisteo and reducing maintenance at the Main Village lagoon. A projected budget for the new system is needed to calculate projected rate impacts. USDA funding contracts require a separate budget for the wastewater system and revenue generation commitments prior to funding.

The Tribal leaders have indicated that they want their utility system to be a true enterprise fund and sustain itself with rates from utility services. This goal will take time and focus to achieve and should be woven into the Tribe's economic growth plans.

The Pueblo does not currently require utility bill payment and has a collection rate of approximately 22 percent of expected revenue. The Tribal leadership discussed a wastewater ordinance that would require households to pay their utility bills. For customers that are unable or unwilling pay their utility bills, alternative methods of debt collection such as connecting households to payment assistance programs and having them make smaller payments to catch up over time can be used. Having a wastewater ordinance that requires payment of utility bills will help the Pueblo develop an adequate and reliable source of revenue to pay for O&M for a new wastewater system.

Addressing the Affordability Challenge

The Pueblo has multiple options for providing clean water and wastewater service to all members of the community. The Pueblo has made a commitment to the community by supporting utility operations as a Tribal program. As the Tribe works to modernize its systems and create a self-sustaining enterprise utility fund, the Tribal Utility Authority will need to work with Tribal elders and leadership to implement necessary rate increases while providing rate assistance to low-income households.

The affordability analysis completed as part of this initiative uses MHI and quintile income brackets from the U.S. Census Bureau. The quintile income brackets represent 20 percent increments of household income levels. Table 3 shows what a monthly bill would be for both wastewater (assuming a 2 percent bill) and drinking water (assuming a 4 percent bill) for household incomes for the lowest three quintiles and MHI. The upper two income brackets were not evaluated since they would not be the target audience for affordability programs.

Table 3. Income Levels Based on U.S. Census Bureau Information and Projected Monthly Bills for Water and Wastewater Service as a Percentage of Income

Income Bracket	Household Income	Wastewater-Only Monthly Bill: 2%	Water and Wastewater Monthly Bill: 4%
Lowest: 0%–20%	$14,475	$24	$48
Second: 20%–40%	$34,250	$57	$114
Third: 40%–60%	$55,250	$92	$184
MHI	$36,932	$62	$123

Current analysis indicates that the Pueblo can raise water utility rates for all income levels except the lowest income households and still meet affordability standards. Rate assistance for lowest-income households will be needed as the Pueblo modernizes its systems.

Key Takeaways on Affordability:

The current utility rates have a medium to high financial impact on the lowest-income residents of Santo Domingo Pueblo. ***Rate assistance programs may be necessary for some households in Santo Domingo Pueblo.***

The costs of operating and maintaining the new wastewater system will be higher than the cost of the current system. The Pueblo appears to have capacity to raise its flat fee for residential units (currently $40 per month) and still maintain affordable service to the community with rate assistance programs for the lowest-income households.

Tribal leadership is encouraged to adopt a wastewater ordinance that requires payment of utility bills to develop a reliable, adequate revenue source for future operations. The Tribe can provide rate subsidy for those households that meet criteria for assistance.

Loan repayments for the construction of a wastewater treatment plant will have a high financial impact on residents of Santo Domingo Pueblo. Santo Domingo Pueblo will need to work with the funding agencies to ***maximize the amount of grants*** for construction of the new system.

Economic growth can lead to more affordable utility services. ***Utility rates and goals should be factored into economic growth plans.***

Partners and Roles

The path to clean water is not an easy one. Many partners in this pilot program will continue to support the Pueblo along this journey (Figure 4), including:

- **U.S. Department of Agriculture Rural Development (USDA-RD):** Lead agency (with EPA) providing jointly leveraged technical assistance resources in this pilot program. Funding partner.
- **U.S. Environmental Protection Agency (EPA) Headquarters and Region 6:** Lead agency (with USDA) providing jointly leveraged technical assistance resources in this pilot program. Region 6 is available to answer questions on the SRF Indian Set-Aside funding program.
- **Indian Health Service (IHS):** Funding partner.
- **Southwest Environmental Finance Center (SW EFC):** Association providing technical assistance specializing in community engagement, education, and outreach.
- **Molzen Corbin:** Engineering firm hired by Santo Domingo Pueblo.
- **High Water Mark:** Environmental consulting company specializing in water resources that can assist the Pueblo with funding applications and analysis.

Figure 4. Partners to Santo Domingo Pueblo.

Technical Assistance and Support for Santo Domingo Pueblo Moving Forward

Both EPA and USDA-RD fund technical assistance programs that support small, rural, and disadvantaged communities to help them navigate the CWSRF, DWSRF, and USDA-RD funding programs. The ultimate goals of the technical assistance (WaterTA) programs are to help communities identify water challenges and solutions, build capacity to address those needs, and develop application materials to access water infrastructure funding. Technical assistance providers can help Santo Domingo Pueblo understand the funding available through CWSRF, IHS, and USDA-RD programs, as well as deadlines and application requirements. **EPA WaterTA and USDA-RD TA can also assist with preparing and submitting funding applications.** These providers can offer advice as communities consider infrastructure options, financing, and rate structures. Their connections with EPA and USDA-RD can help communities successfully complete projects and programs. Other technical assistance support for Santo Domingo Pueblo can include:

- **Developing a wastewater rate program to build a local "affordability assistance" and asset management program.** Santo Domingo Pueblo could establish a rate program where new, commercial, or industrial customers contribute to an affordability assistance program for low-income residents. EPA's network of Environmental Finance Centers and the Rural Community Assistance Corporation (RCAC) have technical assistance providers that specialize in these types of rate programs.
- **Supporting workforce development and staff training.** Santo Domingo Tribal Public Utility Authority will need to hire new operations staff or train existing staff for a new system. The technical assistance providers have staff training programs available. Santo Domingo Pueblo staff are encouraged to reach out to SW EFC or

EPA Region 6 about training needs. Requests for assistance from SW EFC can be made via email[12] or on their website.[13]

- **Educating residents on the needs and benefits of modernized water and wastewater systems.** The successful completion of Santo Domingo Pueblo's new wastewater treatment plant and collection system will rely on the continued support of utility customers. Technical assistance providers can provide guidance and outreach to educate residents about the long-term needs and benefits of a new wastewater treatment plant and collection system. Technical assistance providers can also help with engagement and education on topics such as "What Not to Flush"; "Management of Fats, Oils, and Greases"; and the importance of repairing leaking water fixtures, reducing water use, and other water conservation mechanisms. Educational materials are available for residents.
- **Assisting with federal funding applications.** The SW EFC can assist the Pueblo with applications to the SRF programs, including to the State of New Mexico SRF and the Indian Set-Aside program administered by EPA Region 6. RCAC is familiar with USDA-RD funding programs and can assist with those applications.

Road Map for Implementation

Santo Domingo Pueblo's Tribal administration and Tribal Utility Authority leadership are organizing resources to make one of their largest investments in infrastructure for Santo Domingo Pueblo. Developing wastewater infrastructure takes time. The leadership team has indicated that it plans to address the wastewater treatment plant, conveyance system, and Phase 1 of the water transmission system improvements in the first 3 years. The Main Village sewer system renewal and water transmission system improvements Phases 2–4 will take place in years 3–5. This is an ambitious amount of work that will be transformative to the Pueblo. The following section provides a general guide and timeline (Figure 5) for the Pueblo as they undertake this project.

Immediate Next Steps Ongoing Through 2024

The Pueblo has lined up funding for the majority of the wastewater treatment plant and Wa-Di lift station projects. The Pueblo is planning on investing approximately $19 million of its ARPA funds in the wastewater treatment plant and Wa-Di lift station and force main. This funding needs to be encumbered or obligated by December 31, 2024, and spent by December 31, 2026. The Tribal Utility Authority leadership indicated that it will use Construction Manager at Risk (CMAR) project delivery for the wastewater treatment plant. This involves procuring the project contractor or construction manager at 30 percent design (high-level design, cost estimate, and permitting strategy) and allows for the contractor to be involved in the project's design elements. The CMAR contractor provides a guaranteed maximum price (GMP) for construction of the wastewater plant at 90 percent design. To obligate the construction funds by the end of 2024, 90 percent design will need to be completed in late 2024. Therefore, the CMAR procurement process and design activities should begin immediately.

The Pueblo is expected to apply for USDA-RD funding in 2024 for the following components of the wastewater treatment plant and conveyance system:

- The entrance works and primary lift station to the wastewater treatment plant.
- The chlorine contact chamber and dewatering building, which will facilitate beneficial reuse of effluent from the treatment plant.
- The Galisteo lift station and force main.
- The Main Village lift station and force main.

12 swefc@unm.edu

13 https://swefc.unm.edu/home/about-us/contact-us/

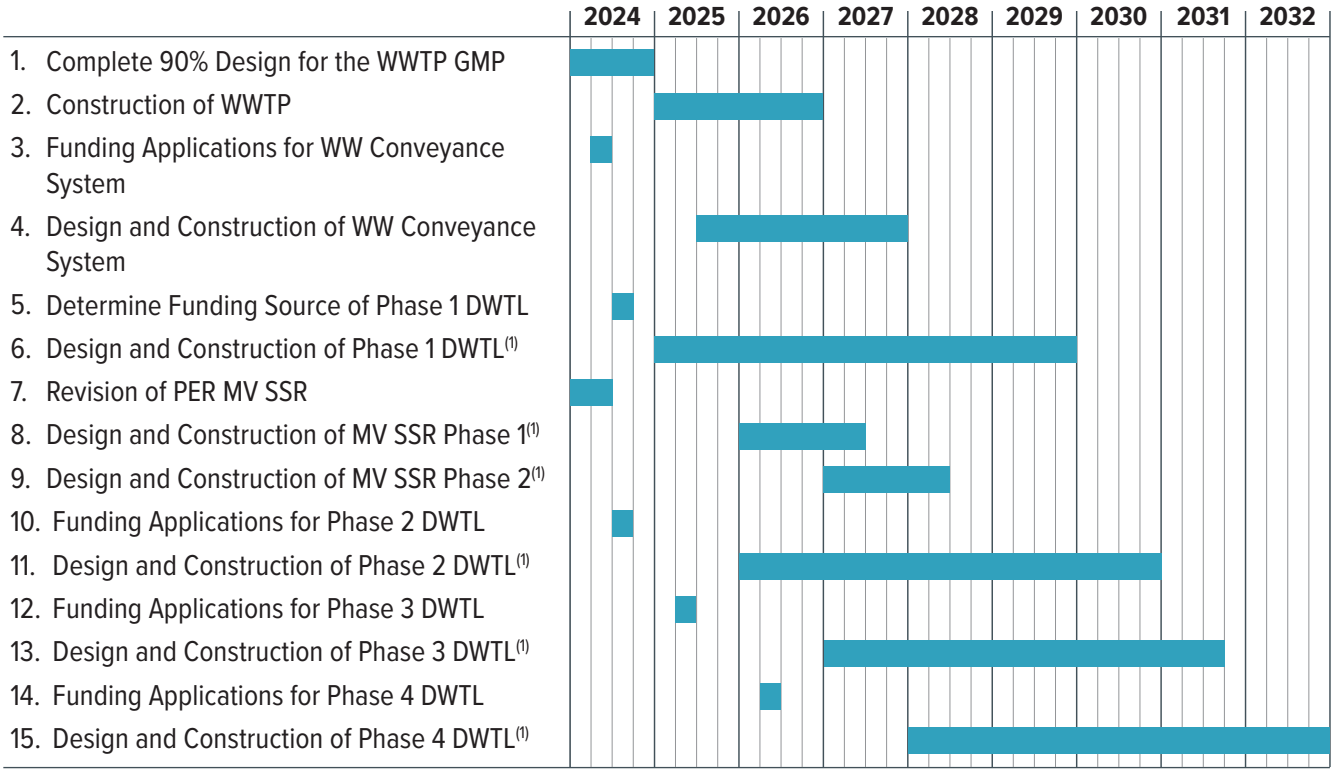
The current PERs and EIDs will need to be modified for these applications to meet USDA guidelines. If funding applications with USDA are successful, the Pueblo will receive a "letter of conditions" for the funding that will include 1) revenue requirements for the Pueblo to apply toward the wastewater system's O&M needs and 2) asset management plan requirements to proactively manage the infrastructure.

USDA funding, if secured, should fully fund the wastewater treatment plant and conveyance system.

Funding Approach for the Main Village Sewer System Renewal and Drinking Water Transmission System Improvements

To prepare for the Main Village sewer system renewal, the Pueblo can work with IHS to revise the current PER, which outlines phasing of the project and incorporates sewer system replacement and lining based on site conditions within the Pueblo. To be considered for the FY 2025 funding cycle, the PER will need to be revised by June 2024. The Tribe can prioritize the Main Village sewer system project and drinking water transmission system improvements for potential funding through the IHS SDS funding system.

The Pueblo will need to consider how to fund parts of the drinking water transmission system that address issues outside of the IHS SDS system (for example, providing sufficient fire flow or infrastructure to support new housing, such as the Domingo tanks). These parts of the project are not eligible for IHS funding but may be eligible for other funding sources such as USDA-RD loan/grant funding.



(1) Design and construction schedules shown depend on successful funding applications.

Abbreviations:
DWTL = Drinking Water Transmission Line
MV SSR = Main Village Sewer System Renewal
PER = Preliminary Engineering Report
WW Conveyance = Wastewater Conveyance
WWTP = Wastewater Treatment Plant

Figure 5. Potential timeline for wastewater and drinking water improvements.

Concluding Thoughts

The leadership of Santo Domingo Pueblo has a vision to address deficiencies in the Pueblo's drinking water and wastewater systems. Their plan will address current health risks to the community and develop the capacity to build a stronger economic future. This is an ambitious undertaking by the Pueblo and will require additional O&M. The Tribal leadership has shown a steadfast commitment to address the wastewater and drinking water needs of the community. Multiple funding sources will be needed for the Tribe, as no single funding source can address all infrastructure needs. The Tribal administration and Tribal Utility Authority leadership will need clear communication with each funding agency to ensure success.

Definitions

Adobe. A type of clay used as a building material, typically in the form of sun-dried bricks. One of the oldest building materials. Adobe structures are well insulated and particularly suitable for the extreme desert temperatures of the southwestern United States.

Force main. Pipeline that conveys wastewater in areas where the pipes are either too low to rely on gravity or encounter a barrier of some sort.

Lagoon. Earthen-bound pond-like bodies of water or basins designed to receive, hold, and treat wastewater for a predetermined period. If necessary, they are lined with material, such as clay or an artificial liner, to prevent leaks to the groundwater below. Can be anaerobic (without oxygen), aerobic (including oxygen), or facultative, which is a combination of the two oxygenic conditions.

Lift station (pump station). Moves wastewater from lower to higher elevation, particularly where the elevation of the source is not sufficient for gravity flow and/or when the use of gravity conveyance will result in excessive excavation depths and high sewer construction costs.

Trunk line. Main sewer line within the collection system.

Vitrified clay pipe. Pipe made from a blend of clay and shale that has been subjected to high temperature to achieve vitrification, which results in a hard, inert ceramic.

Wastewater treatment plant. Facility that receives and treats municipal and/or industrial wastewater.

> *To create a self-sustaining Indian Nation that will be less dependent on the federal government, building partnerships with our federal and state agencies are the key to success in addressing the Pueblo's water infrastructure needs. The ability to work collaboratively and synergistically will allow this community to address one of the most basic needs: clean, adequate water.*
>
> — Governor Esquipula Tenorio Sr.

Limitations

Any systems and associated cost estimates discussed in this draft analysis are preliminary and not intended to serve in lieu of a Preliminary Engineering Report prepared by a professional engineer licensed in the relevant jurisdiction.

Alternatives have been developed at a high level with desktop tools and have not been informed with survey data or field reconnaissance work. Further field evaluation is needed to verify these alternatives in subsequent work following this assessment and solutions plan.

Treatment and dispersal systems designed by licensed design professionals are based on soil evaluations, flood elevation evaluations and variances, permitted discharge limit determinations, and unforeseen factors that cannot be determined without onsite field surveys and evaluations beyond the scope of this draft assessment.