SEVEN COUNTY INFRASTRUCTURE COALITION

UTAH NAVAJO WATER SETTLEMENT PLANNING

prepared by

Jones & DeMille Engineering

STUDY OVERVIEW

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1 INTRODUCTION

The Navajo Nation, particularly within Utah, has long faced challenges related to water access and infrastructure. These challenges are deeply intertwined with the region's remote geography, the complexity of tribal and state jurisdictions, and the historical underfunding of essential services. To address these pressing needs, the Seven County Infrastructure Coalition (SCIC) commissioned Jones & DeMille Engineering (JDE) to conduct a comprehensive engineering study to assess and identify critical water infrastructure needs across the Utah chapters of the Navajo Nation and to propose actionable solutions that align with the chapters' needs and priorities in relation to the Navajo Water Settlement with the State of Utah.

The Navajo Nation/State of Utah Water Rights Settlement Agreement includes provisions for the allocation and delivery of water from the Colorado River, ensuring that the Navajo Nation can utilize its water rights across both states.

The settlement allocates 81,500 acre-feet per year of water from the Colorado River to the Navajo Nation in Utah. This allocation is designed to support water delivery infrastructure projects that span both Arizona and Utah. The Utah Seventh Judicial District Court has adjudicated all Navajo Nation rights to the use of surface and underground water in Utah, fully incorporating the settlement agreement. This legal framework ensures that the Navajo Nation can manage and utilize its water resources effectively across Arizona and Utah.

By leveraging these provisions, the Navajo Nation can ensure that water delivery infrastructure supports communities in both states, enhancing access to clean water and promoting sustainable development for Tribal chapters.

1.1 Methodology

JDE adopted a multi-faceted approach to ensure the study was thorough and inclusive and aligned with the unique cultural and geographical context of the Navajo Nation. The study was designed to gather a broad spectrum of data, encompassing both technical assessments and community input, to form a holistic understanding of the water infrastructure needs.

1.1.1 Data Collection & Analysis

The first phase of the study involved extensive data collection to establish a baseline understanding of the current water infrastructure within the Navajo Nation's Utah chapters. This included a review of existing infrastructure, water quality reports, and previous studies conducted in the area. A list of these previous studies is included in the references section of this report. Each of the previous reports provided different helpful information in compiling this report. Geographic Information Systems (GIS) were employed to map existing water resources, distribution systems, homes without water connection, and potential areas of concern. This technical groundwork provided the foundation for identifying gaps and opportunities in the current infrastructure.

JDE gathered information from previous studies over the past 15 years and worked with the Navajo Tribal Utility Authority (NTUA) and Indian Health Services (IHS) to determine which projects may still be viable and what work had been completed since those studies.

1.1.2 Collaboration & Coordination

Recognizing the importance of local expertise and input, JDE prioritized collaboration with key stakeholders throughout the study area. Coordination was established with NTUA and IHS, both of which have deep-rooted knowledge and experience in managing water projects within the Navajo Nation. Regular meetings and consultations were held with representatives from these agencies to ensure that the study's findings were consistent with existing plans and initiatives. Meetings were also held with local chapter leaders, who provided valuable insights into the specific needs and challenges faced by their communities. JDE was able to tailor its recommendations to reflect the priorities of the residents and ensure that proposed solutions were culturally sensitive and practically viable.

1.1.3 Needs Assesment & Priorization

The needs assessment process involved synthesizing data from both technical analyses and stakeholder consultations. JDE developed a set of criteria to evaluate the urgency and feasibility of potential water projects. These criteria included factors such as population served, current water access levels, potential health impacts, and alignment with broader regional development goals. Each project was then prioritized based on its potential to improve water access and quality in the most efficient and impactful manner.

1.1.4 Community Engagement

Throughout the study, JDE placed a strong emphasis on coordination and engagement with Navajo Nation entities with jurisdiction over the water systems throughout the Utah chapters. Meetings were organized to present preliminary findings and gather feedback and discuss areas of concern. These meetings were crucial in ensuring that the study's recommendations were grounded in the lived experiences of the Navajo Nation's members. Feedback from these sessions was integrated into the final report, ensuring that the proposed projects were not only technically sound but also aligned with the community's aspirations and values.

1.1.5 Permit Requirements & Survey Considerations

1.1.5.1 Air

The Navajo Nation EPA's Minor Source Program became effective on September 19, 2024, requiring new construction applicants to coordinate early for current permitting. Construction activities can generate fugitive dust, a form of particulate matter (PM) that contributes to PM10 and PM2.5 emissions. If a proposed source's potential to emit a regulated pollutant is below the major source threshold but at or above the Minor Permit Threshold, it is subject to minor source permitting. If the potential to emit is below the Minor Permit Threshold, the source falls under a registration program. Sources emitting pollutants at or above the Minor Permit Threshold must obtain a site-specific or general permit, or request an exemption, with the permitting process potentially taking 90 days to a year.

1.1.5.2 Biological

Conducting biological surveys on Navajo Nation tribal lands necessitates a permit from the Navajo Nation Fish and Wildlife Department (NNDFW), and possibly other permits depending on the project's specifics and location. A Biological Survey Permit from the NNDFW is mandatory for all projects on tribal lands, and the Navajo Natural Heritage Program maintains a list of qualified contractors for this work. Projects involving homesites require navigating the Homesite Lease process, which includes a biological review by the NNDFW and the submission of a Homesite Biological Clearance Request Form. If no biological concerns are identified, the NNDFW issues a Biological Resource Compliance Form (BRCF). Project GIS files are cross-referenced with designated priority wildlife areas to facilitate early mitigation planning, guided by the Resources Committee's Biological Resource Land Clearance Policies and Procedures, which recognize six sensitivity levels for development. A Biological Evaluation (BE) is generally required for development outside of Community Development Areas, documenting potential impacts on biological resources, considering various impact types, providing accurate location information, and including data from the Navajo Natural Heritage Program.

1.1.5.3 Cultural

Projects involving archaeological investigations on Navajo Nation land require applicants and survey contractors to obtain valid Archaeological Resources Protection Act (ARPA) Permits from the Navajo Nation Historic Preservation Department (NNHPD) before any ground survey work begins. The NNHPD, as the Navajo Nation's cultural heritage regulatory body, consults with communities and provides guidance based on Navajo fundamental laws and historic preservation policies to protect Navajo traditions and culture. Since March 24, 1997, the Navajo Nation has an agreement with the National Park Service, recognizing the NNHPD Director as the Tribal Historic Preservation Officer (THPO),

assuming State Historic Preservation Officer functions for the Nation and its lands. Proposed construction projects typically require a Class III survey and report for the area of disturbance, ideally planned for spring or fall due to extreme heat or winter snow conditions.

1.1.5.4 Access, Lands/Realty

Initiating any action on tribal lands requires coordination with three primary entities: Tribal Access Authorization, the Navajo Nation General Land Development Department (GLDD), and the Bureau of Indian Affairs (BIA). Obtaining a Navajo Nation Tribal Access Authorization (TAA) involves submitting several documents, including a cover letter/ scope of work, permission to survey, a chapter resolution, grazing permittee consents, a legal land survey, a KMZ or KML file, and Navajo Nation Environmental Determination documents. The GLDD manages leasing and permitting for developmental activities across approximately 17 million acres of Navajo Trust and Fee Lands, overseeing telecommunications, easements, land withdrawals, mission site permits, and permissions for drilling and surveying. BIA Right-of-Way (ROW) applications must comply with NEPA, and currently, the BIA does not have categorical exclusions for proposed projects, with the processing of a complete ROW package taking 60 days or longer.

1.1.5.5 Water

Altering the bed or banks of a natural stream or any activity that could discharge pollutants into waters requires a Clean Water Act (CWA) Section 404 stream alteration permit from the US Army Corps of Engineers (USACE), which evaluates permits for construction activities in the nation's waters, including wetlands, even on Navajo Nation lands. While the Navajo Nation has its own Environmental Protection Agency (NNEPA), the USACE retains the authority for issuing Section 404 permits, though the NNEPA Water Quality Program (WQP) can issue necessary water quality certifications for these permits. The Army Corps of Engineers aims to process Section 404 permits for Navajo tribal lands within 120 days for individual permits and 60 days for general permits, although this timeline can be extended. To avoid Section 404 permitting, it's advised to stay above the Ordinary High-Water Mark and avoid wetlands near water bodies; otherwise, a wetland resource delineation report is needed. Construction disturbing one acre or more in Indian Country is subject to CWA Section 402 regulations, requiring a storm water discharge permit from EPA Region VIII (except for Navajo and Goshute Reservations, which fall under EPA Region IX), and necessitates the development of a Storm Water Pollution Prevention Plan (SWPPP) before submitting a Notice of Intent (NOI), with the EPA typically taking up to one year for a permit decision. Obtaining necessary Clean Water Act permits is a critical path item for any construction project on the Tribe and should be initiated around the 60% design stage.

1.1.6 Possible Funding Opportunities For Projects

The Bureau of Indian Affiars (BIA) would be responsible for Right-Of-Way Grants for projects. The flow chart below is provided by the agency to illustrate the process:

1.1.6.1 Permitting Council

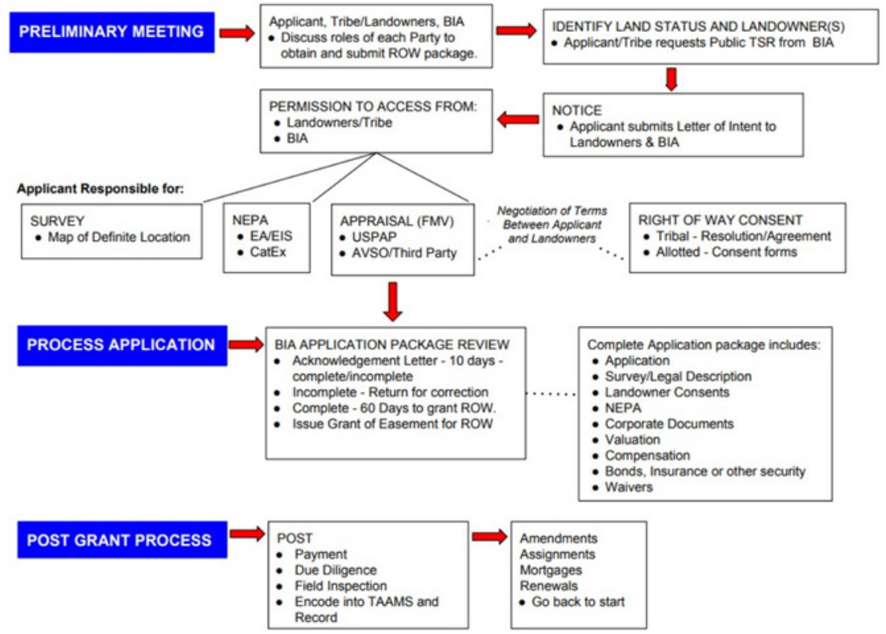
Environmental Review Improvement Fund Tribal Assistance Program (ERIF) associated with FAST-41 projects.

The new Environmental Review Improvement Fund Tribal Assistance Program (ERIF TAP) aims to build and support tribal capacity to enable them to meaningfully participate in the environmental review process for FAST-41 covered projects.

1.1.6.2 Environmental Protection Agency

WIIN Act Section 2104: Assistance for Small and Disadvantaged Communities Tribal Grant Program

The U.S. EPA Office of Ground Water and Drinking Water (OGWDW) has made available to tribes the Assistance for Small and Disadvantaged Communities Tribal Drinking Water Grant Program ("Grant Program"). The EPA has allocated funding to Regional offices based on the Drinking Water Infrastructure Grants – Tribal Set-Aside (DWIG–TSA) formula. The EPA will waive cost share requirements for the tribal grant program.



Drinking Water Infrastructure Grant – Tribal Set Aside Program (DWIG – TSA)

Provides funding to drinking water systems to finance infrastructure improvements. Community water systems and non-profit, non-community water systems that serve a tribal population are eligible to have projects funded, in whole or in part, with DWIG-TSA funds.

Water Infrastructure Finance and Innovation Act (WIFIA) Program

Provides long-term, low-cost supplemental loans for regionally and nationally significant water infrastructure projects. The WIFIA program was established by the Water Infrastructure Finance and Innovation Act of 2014. The minimum project size for small communities (with a population of 25,000 or less) is $5 million.

1.1.6.3 Bureau of Reclamation

WaterSMART Water and Energy Efficiency Grants (formerly Challenge Grants) Reclamation provides 50/50 cost share funding to irrigation and water districts, tribes, states and other entities with water or power delivery authority.

1.1.6.4 United States Department of Agriculture

USDA Rural Development:

Emergency Community Water Assistance Grants in Utah

This program helps eligible communities prepare, or recover from, an emergency that threatens the availability of safe, reliable drinking water.

Water & Waste Disposal Loan & Grant Program

This program provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas.

Water and Waste Facility Loans and Grants to Alleviate Health Risks on Tribal Lands

This program helps get safe, reliable drinking water and waste disposal services to low-income communities that face significant health risks.

1.1.6.5 State of Utah

Drinking Water State Revolving Fund (DWSRF)

The DWSRF provides low-interest loans and grants for drinking infrastructure and associated engineering and planning to public and non-profit water systems in Utah. Disadvantaged communities that meet hardship criteria can apply for a grant or principal forgiveness.

- Federal State Revolving Fund (SRF) Program: Drinking Water | Utah Department of Environmental Quality
- State Revolving Fund (SRF): Drinking Water | Utah Department of Environmental Quality

Tribal

The Navajo Revitalization Fund

The NRF was created to maximize the long-term benefit of oil and gas severance taxes derived from lands held in trust by the Federal Government for the Navajo Nation and its members living in Utah.

1.1.7 Conclusion

The engineering study conducted by JDE represents a significant step forward in addressing the water infrastructure challenges faced by the Utah chapters of the Navajo Nation. Through meticulous data analysis, close collaboration with key stakeholders, and active engagement with the local communities, the study has identified critical water project needs and proposed targeted solutions. The insights and recommendations generated by this study will serve as a foundational tool for the SCIC and the Navajo Nation in their ongoing efforts to improve water access and quality for the region's residents.

2 EXECUTIVE SUMMARY

The study was split into two units (western and eastern) for more detailed analysis. See the overall site map included in Appendix A to visualize the two units. The Western Unit includes analysis on connecting Mexican Hat and Halchita, refurbishing the water treatment plant, and a transmission line from Halchita to Oljato, as well as increasing source capacity in the Navajo Mountain area. The Eastern Unit includes four separate project alternatives to improve various water systems in that area. The Montezuma Creek, Aneth, Red Mesa, and Mexican Water areas were all included in this study. Cost estimates, exhibits, and submittals are included in the respective appendices for each study. Each project focuses on providing water to many residents who do not have access to clean water or improves the capacity of different systems to serve more individuals. Water quality was a primary concern for many of the long distribution lines and was analyzed closely to determine retreatment locations. The number of individuals that would benefit from each alternative was determined by proximity to the location of the alternative. This approach is not entirely inclusive of those who would benefit from the project but may live outside of the project alternative boundary.

Both studies are intended to provide insight into the existing systems, deficiencies, and provide recommendations on how to improve the water systems. This report is intended to provide a flexible avenue to create and add more alternatives to each Unit as the need arises. **Table 1** below provides each project alternative that has been analyzed as well as homes benefitted, and the cost estimate associated with those alternatives. The number of homes benefitting from each project was quantified by using a half-mile buffer around each alternative and counting the homes within that buffer. This approach is not all-inclusive, and therefore the number of homes could be higher than what is shown.

Table 1 - Benefit-Cost Table

Project Alternative	Cost	Number of Homes Benefitted
Mexican Hat to Halchita Interconnect	$7,672,000	91
San Juan River Water Treatment Plant (Halchita)	$10,211,000	91
Halchita to Oljato Pipeline	$22,217,000	159
Navajo Mountain Treatment Plant	$4,021,000	220
Montezuma Creek Distribution Improvements	$21,465,000	87
Aneth & Red Mesa Transmission Pipeline	$43,316,000	180
Montezuma Creek Water Treatment Plant	$7,181,000	105
Aneth, Red Mesa & Mexican Water Interconnect	$20,349,000	210

3 REFERENCES

1. Brown & Caldwell. (2010). *Navajo Utah Chapters Regional Water Plans and Analysis of the Existing Public Water System Upgrade*.

2. Brown & Caldwell. (2014) *Paiute Mesa Water Development Plan*

3. Navajo Nation Department of Water Resources. (2014) Navajo Nation/State of Utah Water Rights Settlement Projects: White Paper.

4. WHPacific & Carollo. (2016). *Cost Firming Investigation and Reports for Utah Navajo Water Project.*

APPENDIX A

WESTERN UNIT OF THE UTAH CHAPTERS OF THE NAVAJO NATION

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1 INTRODUCTION

This study analyzes the western unit of the Utah chapters of the Navajo Nation. Two areas were analyzed as part of this study: Halchita and Navajo Mountain.

Halchita's water system is currently supplied by water trucks hauling water to the tank site. Hauling water is costly and unreliable in the long term. A study of the culinary water system in the neighboring community of Mexican Hat was undertaken in 2019. Equivalent residential connection (ERC) values from that report and existing conditions of Mexican Hat's system were taken into consideration for this analysis. A hydraulic model was created for the proposed alternative of connecting the Halchita and Mexican Hat water systems. The model was used to evaluate the effect on the system's pressure in accordance with applicable Utah State rules, codes, and guidelines. Minimum sizing requirements have been determined using both Utah Administrative Code (UAC) R309-510 and actual water usage from Mexican Hat. Information from that report, including water usage, was interpolated and applied towards Halchita's water system due to the lack of water usage information. A similar growth rate was assumed for the Halchita water system.

Four projects were analyzed as part of this unit's study. Each project's respective cost estimate is summarized in **Table 1**.

Table 1 - Project Summary

Project Name	Description	Estimated Cost
Mexican Hat to Halchita Interconnect	Includes interconnect to Mexican Hat and pipeline improvements to tank site.	$7,692,000
San Juan River Treatment Plant (Halchita)	Includes newly refurbished treatment plant and pipeline improvements to tank site.	$10,211,000
Halchita to Oljato Pipeline	Dependent on the implementation of the San Juan River Treatment Plant. Pipeline to Oljato from Halchita.	$22,251,000
Navajo Mountain Treatment Plant	Beaver Spring treatment plant to increase source supply in Navajo Mountain.	$2,501,000

2 HALCHITA PROJECTS

2.1 Analysis/Design Criteria

Due to the lack of Peak Day usage, a statistical approach to the source production of Mexican Hat was conducted. Mexican Hat's water usage is seasonal, with most of the water being used from May to September. The monthly production of each well has been monitored and the data from the peak months was used to perform a statistical analysis. The standard deviation was found to be 0.61 acre-feet. One standard deviation from the mean provides 90% confidence that all water usage will be within that range. Using that standard deviation and adding it to the mean provides a peak monthly water usage of 2.36 acre-feet, which was used for analysis and design. This statistical approach is much more realistic for the flows observed in both Mexican Hat and what is anticipated in Halchita. Therefore, the statistical approach was used for modeling and sizing of the system. The state rule was analyzed but is not included in this report as a result. **Table 2** summarizes the flows used for both the state standard and the statistical approach outlined above.

Table 2 - Design Criteria

Design Approach	Peak Day Demand	Average Day Demand
State Standard R309-510	800 GPD	400 GPD
Actual Usage	400 GPD	200 GPD (2.36 ac-ft)

Figure 1 shows the production of both sources in Mexican Hat. This was assumed to correlate directly with water usage as it is monitored monthly it allowed for insight into peak usage months.

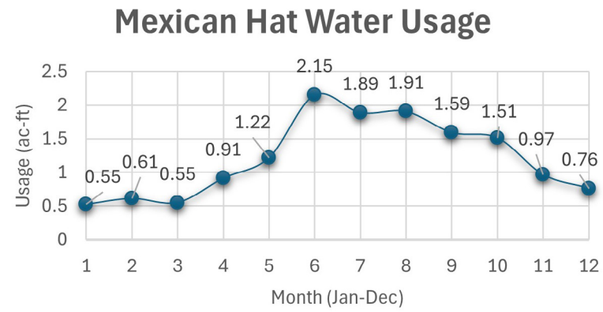

Figure 1 - Mexican Hat Water Usage

2.1.1 Water Modeling

The water model was created for the proposed improvement using InfoWater Pro 2025.1. GIS data was used to determine tank location and elevation, meter locations, and pipe diameters. The proposed line connecting the two systems is a 12-inch-diameter pipe. The flow for the PDD scenario was calculated to be approximately 0.14 gallons per minute (GPM) per ERC. Exhibits were created from this water model showing important information including pressures, water age and system layout. These exhibits are located in Appendix A.1.

2.1.2 Mexican Hat Existing Capacities

Three critical components of the existing system were analyzed for remaining ERC capacities using the statistical approach mentioned previously. The existing system would require upsizing if they were to connect to Halchita's water system. The source capacity is limited, connecting to Halchita's water system will require new sources of water be developed. Two additional wells are recommended to achieve the required amount of water for Halchita.

2.2 Mexican Hat to Halchita Interconnect

A simple solution for Halchita to obtain a regular water supply would consist of connecting the Halchita and Mexican Hat water systems and adding at least two new wells for the Mexican Hat system. To meet the increased demand associated with connecting to Halchita, two additional wells at least ½ a mile radius from the existing wells. Additionally, this project would consist of adding and replacing a pipeline from the north side of the San Juan River to the water storage tanks above Halchita. The pipeline would connect to the existing Mexican Hat system and would cross the river on the US-163 bridge. A booster pump and a chlorinator would be required at or near the water treatment plant to supply sufficient flow and maintain a healthy water age. The booster pump would need to provide 250 feet of head at a flow of 100 GPM. The chlorinator would keep the water age under 5 days in the Halchita water system. The operating point of this pump would be 100 GPM and 450 feet of head to reach the tanks. A pump submittal for the pump required is located in Appendix A.4. **Table 3** summarizes the source and treatment capacities that would need to be upgraded. Developing a new source and adding a skid to the reverse osmosis treatment building would be required to meet the demands.

Table 3 - Water Age Analysis

Hydraulic Element	Flow (GPM)	Existing ERC Capacity	ERC Capacity with Interconnect	State Rule ERC Capacity with Interconnect	Annual Flow (ac-ft)
Source (4 Year)	43.00	26.51	-71.49	-187.30	14.60
Treatment	75	141.50	43.50	-158.50	120.98
Storage	-	471	373	74	-

2.2.1 Well Sizing Requirements

Interconnecting Halchita and Mexican Hat would require drilling of at least two new wells to achieve the necessary flow. The minimum flow requirements for a source are determined by UAC R309-510-7, which states the source capacity shall be able to meet the anticipated peak day demand and supply the average yearly demand. To properly size the pump for the well, the peak day demand will be used.
Based on the design criteria shown in Table 2, the system will require approximately 0.28 GPM per connection. The total amount of proposed and existing connections (226 ERC) equates to approximately 63 GPM during the peak day demand. The new well and treatment system would need to provide approximately 40 GPM in addition to what the system is already capable of. Due to the lack of available groundwater, it is anticipated that two wells would be required to reach the additional 40 GPM.

2.2.2 Environmental Requirements

The Mexican Hat and Halchita interconnect would likely require a National Environmental Policy Act (NEPA) analysis, which is anticipated to be an Environmental Assessment (EA)-level analysis. A cultural resource inventory would be required along the pipeline corridor. In coordination with funding agencies and the Navajo Nation Department of Fish and Wildlife (NNDFW), a Biological Evaluation document would need to be prepared to address potential impacts to federally listed species; however, no adverse impacts to federally listed species are anticipated. However, the NNDFW and Navajo Natural Heritage Program (NNHP) may have additional special status species (animal and plant) that would need to be surveyed for after initial coordination efforts. No impacts to Waters of the U.S. are anticipated due to the lack of channel crossings along the pipeline alignment, and no Clean Water Act (CWA) Section 404 permitting requirements are anticipated; however, a CWA Section 401 Certification would likely be required. Coordination would be required with the funding agency, the Navajo Nation, and Bureau of Indian Affairs (BIA). During construction, a stormwater pollution prevention plan (SWPPP) would likely be required.

2.2.3 Cost Estimate

This project would require a minimum of two wells to be drilled, and additional treatment capacity. The proposed connection would also require chlorination, a booster pump, and pipe. Additional storage capacity should be evaluated before design. More design and analysis are required for each aspect of this alternative. This project is estimated to cost $7,692,000. Each of the above items are listed in the cost estimate in Appendix A.2 "Mexican Hat to Halchita Interconnect Cost Estimate".

2.3 San Juan River Treatment Plant (Halchita)

The San Juan River Treatment Plant project includes rehabilitation of the treatment plant south of Mexican Hat. This project also includes the replacement and upsizing of a corroded pipeline from the treatment plant to the existing tanks. This project would provide water to Halchita as a reliable source, while also allowing for growth and other connections in the future. The existing San Juan River treatment plant has not been in operation since the early 2000s and would require significant upgrades. The treatment plant failed to properly treat the wate when it was active, which led to it being taken offline. The treatment plant intake from the San Juan River is shown in Figure 2.

Figure 2 - San Juan River Treatment Plant Intake

The plant operated by pulling water out of the San Juan River, which is known for high turbidity and total suspended solids (TSS). The recommended improvements to this plant would include complete remodeling of the structure itself and site improvements. The recommended method of treatment would be reverse osmosis or ultra-filtration due to its ability to remove high levels of TSS and turbidity as well as any other pathogens. Extensive design would be required to ensure that proper levels of treatment are achieved. Due to the nearly 5-day water age in the system downstream of the treatment plant, it is recommended that a small chlorinator be installed to provide residual disinfection throughout the system. The treated water would then be transported via a pump station and 8-inch-diameter HDPE pipe to the existing storage tanks. The water age is not primarily a concern at 5 days; however, with fluctuating seasonal demands in Halchita, the actual water age could increase beyond 5 days, which could be a hazard.

The existing pipe condition was visually determined to be in poor condition. The pipe has been laid in a box and routed to the tanks. The pipe material was observed to be ductile iron that has been severely corroded and needs immediate replacement. Pipe conditions are shown in Figure 3. Ductile iron pipe is susceptible to corrosion over time, especially in unfavorable soil conditions. The pipe shown in the image below was uncovered and exposed to elements that cause corrosion to rapidly progress. When ductile iron is used it should be buried and proper cathodic protection measures should be taken to prevent pipe corrosion and prolong the life of the pipeline. HDPE is a much less susceptible material to corrosion and would be a favorable material in this application.

Figure 3 - Halchita Pipe Condition at Tanks

2.3.1 Cost Estimates

This alternative would include structural components to be addressed, a new treatment system to be designed and constructed, as well as a new pipeline. The total cost of this alternative is estimated to be $10,211,000. Each of these items are listed in the cost estimate in Appendix A.2 “Alternative 2A Cost Estimate.”

2.3.2 Environmental Requirements

The San Juan River Treatment Plant would likely require a NEPA analysis, which is anticipated to be an EA-level analysis. A cultural resource inventory would be required for any proposed new structures or site improvements, as well as for the pipeline alignment. In coordination with funding agencies and the NNDFW, a Biological Evaluation document would need to be prepared to address potential impacts to federally listed species; however, no adverse impacts to federally listed species are anticipated. However, Southern willow flycatcher habitat near the river may require noise and timing considerations from the Navajo Nation and/or the USFWS. The NNDFW and NNHP may have additional special status species (animal and plant) that would need to be surveyed for after initial coordination efforts. No impacts to Waters of the U.S. are anticipated due to the lack of channel crossings along the pipeline alignment, and no Clean Water Act (CWA) Section 404 permitting requirements are anticipated; however, a CWA Section 401 Certification would likely be required. Coordination would be required with the funding agency, the Navajo Nation, and Bureau of Indian Affairs (BIA). During construction, a stormwater pollution prevention plan (SWPPP) would likely be required.

2.4 Halchita to Oljato Pipeline

This project considers connecting Halchita’s water system to the Oljato water system. Approximately 24.8 miles of 8-inch pipeline with a booster pump and three pressure reducing valves would connect the Halchita system to the tanks from Oljato. The report explaining this potential project in detail can be found in Appendix A.3.

2.4.1 Water Quality and Age

Water age and quality is a concern with this length of transmission pipe; the longer water is in the pipe, the more bacterial growth will become a concern. Water age below 7 days is considered to be safe. The analysis summarized in **Table 4** shows the parameters that were considered in determining suitable pipeline sizes.

Table 4 - Water Age Analysis

Pipe Size (inches)	Downstream Demand (GPM)	Velocity (ft/s)	Headloss per Mile (ft)	Water Age @5 Miles (Days)	Water Age @10 Miles (Days)	Water Age @15 Miles (Days)	Water Age @20 Miles (Days)	Water Age @25 Miles (Days)
8	100	0.6	40.55	0.5	1.0	1.4	1.9	2.4
10	100	0.4	13.69	0.7	1.5	2.2	3.0	3.7
12	100	0.3	5.64	1.1	2.2	3.2	4.3	5.4
18	100	0.1	0.78	2.4	4.8	7.3	9.7	12.1
24	100	0.1	0.19	4.3	8.6	12.9	17.2	21.5

Connecting the two systems would allow for fill stations that would benefit individuals living outside of the limits of water systems, as well as provide more source capacity and pressure for Oljato, Halchita, and other nearby systems. This project would improve the source capacity for multiple systems and would also improve access to water through fill stations in remote areas.

2.4.2 Environmental Requirements

The Halchita to Oljato Pipeline would likely require preparation of an EA for review and approval from BIA. Cultural surveys would be required. Based on the length of pipeline and extent of associated disturbance, a BE would likely be required for approval from the NNDFW; biological surveys requested by NNDFW and or the NNHP may be required to complete the BE. Initial review of USFWS data suggests possible Mexican spotted owl (MSO) habitat in the project vicinity. Considerations for the species may require additional coordination and consultation efforts as well as project design features to minimize effects. The proposed pipeline alignment would cross at least one ephemeral channel; an aquatic resource delineation would be required if fill beyond the buried pipeline was needed. In that event, Clean Water Act Section 404 permitting with the U.S. Army Corps of Engineers and a Section 401 Certification with the Navajo Nation EPA would likely also be required, but no compensatory mitigation requirements are anticipated. A stormwater pollution prevention plan (SWPPP) would be required for construction as more than 1 acre would be disturbed by construction activities. Section 402 (stormwater permitting) is regulated on the Navajo Nation by Region IX of the Environmental Protection Agency (EPA); the NNEPA can certify 401 drinking water permits but EPA retains the jurisdiction for section 402 permitting.

2.4.3 Cost Estimate

This alternative would consist of a new treatment facility, nearly 25 miles of pipe, fill stations, and chlorination. Further analysis and design would be necessary before construction, this phase of this alternative is anticipated to cost $22,251,000. Each of these items are listed in the cost estimate in Appendix A.2 “Halchita to Oljato Pipeline Cost Estimate”.

3 NAVAJO MOUNTAIN TREATMENT PLANT

The Navajo Mountain Chapter is in south central Utah adjacent to the Arizona border and the San Juan River/Lake Powell. Historically, the chapter’s water source came from Beaver Springs located in the mountains just west of the community. The water system was maintained and operated by the Navajo Nation Water Resources. Due to a wildfire in 2006 and resulting contamination in the spring watershed, the water quality in the spring was no longer suitable for culinary water. In order to provide clean drinking water for Navajo Mountain residents, water was piped in from Inscription House, AZ and is now the chapter’s main culinary water source. Indian Health Services constructed the pipeline from Inscription House and added a new 200,000-gallon metal tank for storage. The Navajo Tribal Utility Authority (NTUA) currently operates and maintains the culinary water system.

It is recommended that the water from Beaver Springs be captured and treated to a culinary standard. To accomplish this, a new treatment facility and a dedicated culinary water tank would be required, along with potentially re-developing the well. This would allow Navajo Mountain to have redundancy in their source which is preferable in case of any emergency. Navajo Mountain could retain the overflow from these springs and utilize that water as secondary water, while having a steady redundant source of culinary water.

3.1 Cost Estimate

As part of this Navajo Mountain Treatment Plant project there would be a new dedicated culinary water tank, as well as a new treatment facility. This project is estimated to cost approximately $2,501,000.

3.1.1 Environmental Requirements

The Navajo Treatment Plant would likely require preparation of an EA for review and approval from BIA. Cultural surveys would be required. Based on the overall acreage needed for construction of the plant and associated water storage tanks, a BE would likely be required for approval from the NNDFW; biological surveys requested by NNDFW and or the NNHP may be required to complete the BE. Initial review of USFWS data suggests possible Mexican spotted owl (MSO) habitat in the project vicinity. Considerations for the species may require additional coordination and consultation efforts as well as project design features to minimize effects. A Section 401 Certification with the Navajo Nation EPA would be required. A stormwater pollution prevention plan (SWPPP) would be required for construction as more than 1 acre would be disturbed by construction activities. Section 402 (stormwater permitting) is regulated on the Navajo Nation by Region IX of the EPA; the NNEPA can certify 401 drinking water permits but EPA retains the jurisdiction for section 402 permitting.

4 CONCLUSION

The Mexican Hat to Halchita interconnect project provides a mutually beneficial solution for Halchita to receive a regular source of water, and for Mexican Hat to have a larger source of revenue. The treatment plant on the San Juan River south of Mexican Hat would provide a large quantity of water for Halchita to use and potentially add more connections to in the future. The pipeline to Oljato from Halchita would provide multiple opportunities for those in rural areas to have better access to clean water and provide Oljato with more source capacity. The Navajo Mountain Treatment plant project would allow for Navajo Mountain to have more source capacity as well as a redundancy in sources.