WATERSMART WATER AND ENERGY EFFICIENCY GRANTS FOR FY 2022
FUNDING OPPORTUNITY ANNOUNCEMENT NO. R22AS00023

RIVERSIDE CANAL
CONCRETE LINING PROJECT: PHASE IV

TOTAL PROJECT COST: $2,002,417
USBR GRANT REQUEST: $1,000,000

Applicant
El Paso County Water Improvement District No. 1
13247 Alameda Avenue, Clint, Texas 79836

Project Manager
Jesus Reyes, General Manager
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I EXECUTIVE SUMMARY

Applicant Information

Date:	October 29, 2021
Applicant Name:	El Paso County Water Improvement District No. 1
City, County, State:	Clint, El Paso County, Texas
Applicant Category:	Category A
Project Name:	Riverside Canal Concrete Lining Project: Phase IV
Project Manager:	Jesus Reyes, General manager
Telephone:	915-872-4000
E-mail:	jreyes@epcwid1.org
Project Funding Request:	The total project cost is $2,048,785 and EPCWID1 is requesting $1,000,000 in federal funds.

Project Summary

The El Paso County Water Improvement District (EPCWID1), located in El Paso County, Texas, will concrete line 7,700 feet of the Riverside Canal using shotcrete reinforced by prefabricated steel rebar panel formwork. The project engineering design was completed with funding from the Texas Water Development Board (TWDB) and the project is prioritized in the 2022 Texas State Water Plan. The project has a life expectancy of 50 years and is expected to result in annual water savings of 1,145 acre-feet with a return-on-conservation investment of $35.79 per acre-foot of water. As water demand is met by a more efficient system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest. Additional benefits will also be achieved as part of the project, including advancing sediment control efforts, stabilizing the canal banks on which the U.S.-Mexico Border Fence was constructed, and facilitating access and use of the banks for U.S. Customs and Border Protection operations.

This proposal is being submitted as a Funding Group II project under the category Water Conservation Projects: Canal Lining/Piping.

Estimated Completion Schedule

The construction of the project will take thirty-six months (or less) from the date of funding authorization, which is assumed to be in August of 2022. Concrete lining work will need to take place outside of the irrigation season (typically March 15 to October 15) and is expected to be completed by July of 2025. The project will be accomplished within the three-year allowance.

Federal Facility

The Riverside Canal is not located in a federal facility.

II PROJECT LOCATION

The Riverside Canal Concrete Lining Project: Phase IV is located in the City of San Elizario, El Paso County, Texas, adjacent to the U.S.-Mexico border. The project linear length begins at latitude *31°33'03.3"N* and longitude *106°15'28.9"W (31.550925, -106.258026)* and ends at latitude *31°32'25.7"N* and longitude *106°14'05.6"W (31.540474, -106.234892*).

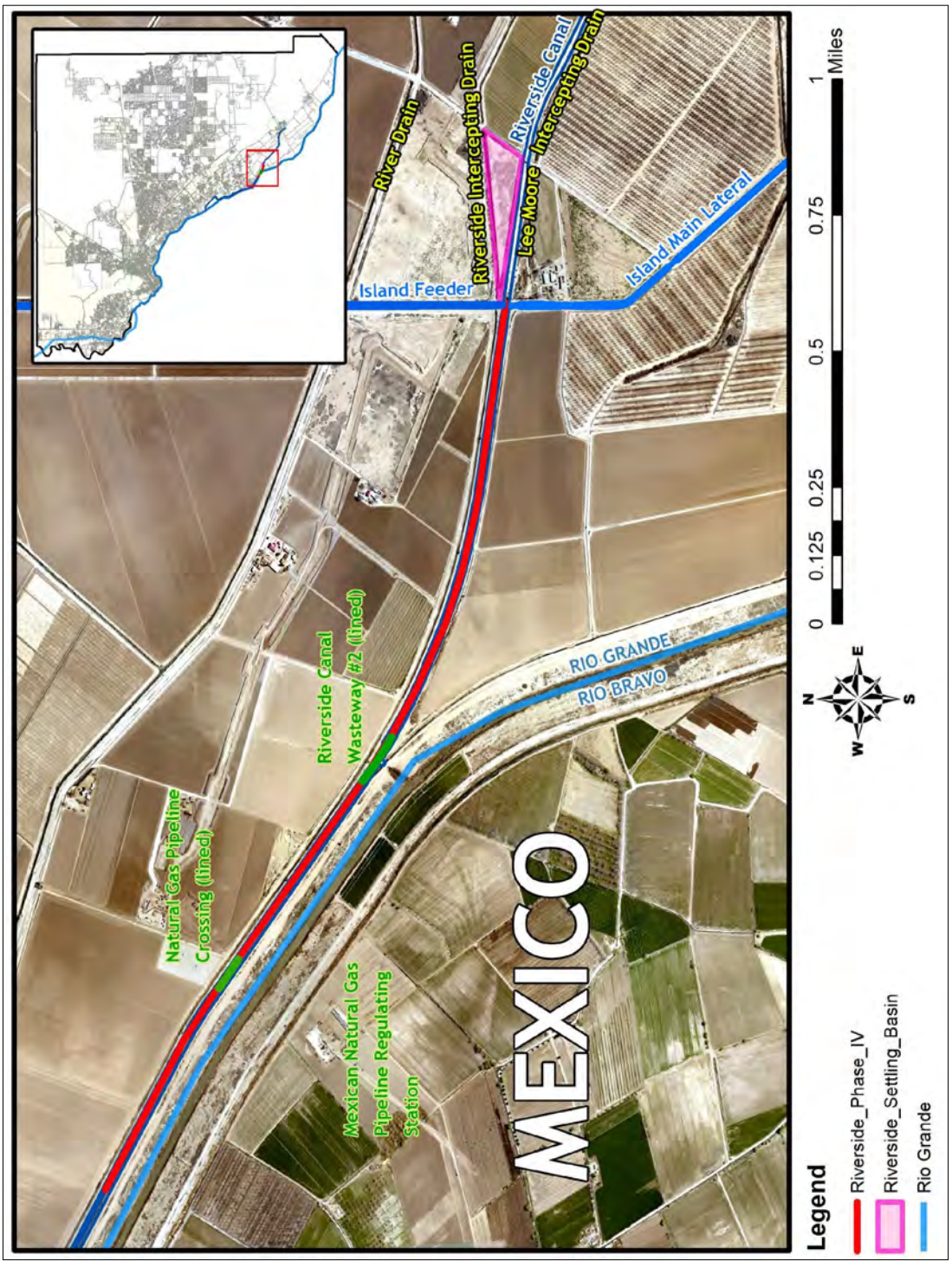


Figure 1. Project Location Map

III TECHNICAL PROJECT DESCRIPTION

Provide a more comprehensive description of the technical aspects of your project, including work to be accomplished and the approach to complete the work

Project Tasks and Milestones

The Riverside Canal is a 17.2-mile-long irrigation water conveyance channel with an original design capacity of 900 cubic feet per second. The measured average (5-year) cumulative water volume conveyed in a full allocation year at the Franklin Canal is approximately 111,062 acre-feet. Water losses at the Riverside Canal are lost primarily by seepage. The proposed project will conserve water currently lost to seepage by concrete lining a 7,700-foot section of earthen canal. EPCWID1 has completed similar concrete lining work for more than 4 miles of the Riverside Canal, of which 2.8 miles were completed in partnership with Reclamation (Agreements R09AC62396; R18AP00193; R20AP00056). Engineering specifications for the proposed project are available in Appendix D.

Task 1: Environmental and Regulatory Compliance

The purpose of this task is to perform environmental review and cultural compliance work necessary to complete the concrete lining project. Work includes but is not limited to:

1.1 Working with Reclamation to meet federal environmental and regulatory compliance requirements, including National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance

1.2 Working with the Texas Historical Commission (SHPO) to meet historical and cultural compliance requirements

1.3 Developing a Stormwater Pollution Prevention Plan (SWPPP) and submitting a TxR150000 General Permit request with the Texas Commission on Environmental Quality (TCEQ)

1.4 Reviewing findings from environmental, cultural, and historical compliance work and developing any additional documents and modifications necessary to adhere to federal, state, and local laws, regulations, and codes

Expected Deliverables: [1] Categorical Exclusion (CEC), [2] SHPO Determination Notice

Task 2: Fleet Mobilization

EPCWID1 owns all the equipment that will be used for project construction. Fleet mobilization involves documenting equipment work hours, designating and transporting construction equipment to the project site, assigning personnel to equipment, and performing regular equipment maintenance.

Task 3: Begin Construction

The purpose of this task is to perform all necessary concrete lining construction work, which includes but is not limited to:

3.1 Bidding and purchasing of materials in compliance with 2 CFR 200

3.2 Performing earth work, including excavation, dirt hauling, soil compaction, grading, and alignment

Expected Deliverables: [1] geotechnical soil density test and [2] concrete test data, construction records for [3] hourly equipment use and [4] labor and fringe costs, and [5] purchase and procurement records

Task 4: Concrete Lining Construction (50%)
The purpose of this task is to perform all necessary concrete lining construction work, which includes but is not limited to:
4.1 Bidding and purchasing of materials in compliance with 2 CFR 200
4.2 Performing earth work, including excavation, dirt hauling, soil compaction, grading, and alignment
4.3 Performing field engineering work, including construction surveying, geotechnical construction testing, and quality assurance and quality control monitoring
4.4 Installing geofabric liner, steel formwork, expansion joints, spraying and curing shotcrete, and performing final grading

Expected Deliverables: [1] geotechnical soil density test and [2] concrete test data, construction records for [3] hourly equipment use and [4] labor and fringe costs, and [5] purchase and procurement records

Task 5: Concrete Lining Construction (100%)
The purpose of this task is to perform all necessary concrete lining construction work, which includes but is not limited to:
5.1 Bidding and purchasing of materials in compliance with 2 CFR 200
5.2 Performing earth work, including excavation, dirt hauling, soil compaction, grading, and alignment
5.3 Performing field engineering work, including construction surveying, geotechnical construction testing, and quality assurance and quality control monitoring
5.4 Installing geofabric liner, steel formwork, expansion joints, spraying and curing shotcrete, and performing final grading
5.5 Fleet demobilization

Expected Deliverables: [1] geotechnical soil density test and [2] concrete test data, construction records for [3] hourly equipment use and [4] labor and fringe costs, and [5] purchase and procurement records

Task 6: Reporting and Grant Administration (August 2022 – April 2025)
The purpose of this task is to perform grant administration, periodic reporting, and technical assistance work necessary to complete the project. Work includes but is not limited to:
5.1 Developing SF-425 Federal Financial Reports on a semi-annual basis and a final financial performance report as specified in Section F.3.1. of the FY2022 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation
5.2 Developing Interim Performance Reports as specified in Section F.3.2. of the FY2022 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation
5.3 Performing a post-construction inflow-outflow test
5.4 Developing a Final Performance Report as specified in Section F.3.3. of the FY2022 WaterSMART WEEG FOA and/or as required by a resulting award contract from Reclamation
Expected Deliverables: [1] inflow-outflow test data, [2] interim reports, [3] final report

Specifications for Reinforced Concrete for Shotcrete Application
Concrete batching and delivery meet requirements and specifications in ASTM C94 and ACI304R. The concrete will be applied in the field as 4000psi shotcrete and sprayed pneumatically with a 4–5-inch thickness. Full shotcrete material content specifications are available for reference in Section IV.A.e. found later in this document.

Specifications for Prefabricated Steel Rebar Panel Framework
Prefabricated steel rebar panel formwork will be tested for compliance with ASTM A1064 and A1064M-15. Using prefabricated steel rebar panel framework is a time-saving measure used in several concrete lining projects at the Riverside Canal and other major canals. Instead of contracting or assigning staff to tie steel rebar for concrete reinforcement on-site, steel panel sheets are fabricated in accordance with designed canal cross-section specifications and hauled to the site. Specifically, side steel panel sheets are fabricated with the correct slope and cut to accommodate changes in elevation needed for efficient gravity flow. Floor steel panel sheets are fabricated using longer lengths to stabilize the frames. Side and floor steel panel sheets are secured using separate bend sheets. After initial earthwork and canal shaping, steel panel sheets are placed and tied over geofabric liner.

Once concrete lined, the Riverside Canal will have a 46-foot cross-section and 1:1.5 bank slopes. Engineering specifications are included in Appendix D. Construction work involves the movement, hauling, and compaction of roughly 616,000 cubic yards of earthen canal bank, placing approximately 415,800 square feet of geofabric liner beneath tied prefabricated steel rebar panel framework, and sealing 7,700 feet of canal surface with a 4-5-inch layer of shotcrete. Construction will be completed in two phases, with 50% completion expected by March of 2024 and 100% completion expected by March of 2025. Construction must be completed outside of the irrigation season during the 6-month period between October and March of any given year. The irrigation season may start late and end early as a result of drought, increasing the number of days that can be used for construction. The dry, mild winter weather in El Paso County is usually not a prohibitive factor.

All construction work will be performed by trained EPCWID1 staff using EPCWID1-owned equipment. Figure 2 below illustrates the shotcrete lining process used by the EPCWID1 as part of Agreement No. R18AP00193 with Reclamation. The cross-section engineering specifications and environmental compliance work for the Riverside Canal were developed as part of a grant award from the Texas Water Development Board in 2018 and meet state and federal-level standards.

A Stormwater Pollution Prevention Plan (SWP3) will be prepared and a Notice of Intent will be filed with the Texas Commission on Environmental Quality (TCEQ) using the State of Texas Environmental Electronic Reporting System (STEERS). Although the Section 106 Review process with the Texas Historical Commission (SHPO) has not been finalized, engineering design and mitigation steps have been identified in order to secure a determination of No Adverse Effect. An Environmental Summary is available for reference in Appendix E.

Because the Riverside Canal Concrete Lining Project: Phase IV is located adjacent to the U.S.-Mexico Border Fence and the Rio Grande, EPCWID1 will coordinate with U.S. Customs and

Border Protection (CBP) and the U.S. Section of the International Boundary and Water Commission (USIBWC) to ensure safe operations and construction. CBP input was requested as part of the project engineering design. One incorporated request was expanding the southern bank allowing safe passage of CBP equipment and vehicles on the U.S. side of the Border Fence. As shown in this proposal's cover page and other images available throughout the document, the southern bank is currently not accessible by vehicles (see Figure 2).

Figure 2. Riverside Canal Concrete Lining Construction (2021)

IV EVALUATION CRITERIA

A. Evaluation Criterion A: Quantifiable Water Savings (28 Points)

1) Describe the amount of estimated water savings. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project.*

Approximately 1,145 acre-feet of water per irrigation year (February 15 to October 15) will be conserved as a result of the proposed project.

2) Describe current losses: *Please explain where the water that will be conserved is currently going and how it will be used.*

Water conserved by the proposed project is primarily lost to seepage. Conserved water will be used to address water reliability concerns in the region: as water demand is met by a more efficient system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

a. Explain where current losses are going.

Water conserved by the proposed project is primarily lost to seepage.

b. If known, please explain how current losses are being used.

There are no shallow groundwater wells in this area that can be used to recover seeped water. As such, current water losses are not being used.

c. Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?

There are no fish or animal habitats near the proposed project site.

3) Describe the support / documentation of estimated water savings: *Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.*

In 2020, as part of the Riverside Canal Concrete Lining Project: Phase II (Agreement No. R18AP00193 with Reclamation), EPCWID1 contracted Sheng Engineering PLLC to perform a seepage test on a representative canal section. Water savings estimates and supporting calculations are available for reference in Appendix C (Sheng 2020).

4) Please address the following questions according to the type of infrastructure improvement you are proposing for funding.

(1) Canal Lining / Piping: *Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:*

a. How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

Average annual water savings were determined based on a seepage test performed by Sheng Engineering PPLC in 2020. Seepage rate measurements are available for reference in Appendix C (Sheng 2020 – Section 3.2). Specifically, the report determined that concrete lining a section of the Riverside Canal will lead to potential water savings of up to 844 acre-feet per mile per

year. Water savings estimates for the Riverside Canal Concrete Lining Project: Phase IV are calculated using the following equation:

7700 ft (1.4583 miles) * 844 acre-feet per mile per year = 1,230.8331 acre-feet per year
1,230 acre-feet per year (current losses) – 85 acre-feet per year (post-lining losses)
= 1,145 acre-feet per year

b. How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.

EPCWID1 contracted Sheng Engineering PPLC in 2020 to perform a seepage test on a representative section of the Riverside Canal. The ponding test was conducted based on procedures as documented in United States Department of the Interior, Bureau of Reclamation (1968)'s bulletin "Measuring Seepage in Irrigation Canals by the Ponding Method." Please refer to Appendix C (Sheng 2020) for additional details.

c. What are the expected post-project seepage/leakage losses and how were these estimates determined?

Initial post-project seepage losses are expected to be minimal (5% or less). Multiple studies (USBR 1968; Comer et al. 1996) have determined that the permeability of concrete lining changes with increasing service time due to aging of the lining materials, maintenance, and damage by plant roots or animals. The use of steel reinforcement and geofabric liner underneath concrete in conjunction with geotechnical best practices (e.g., soil compaction) is expected to extend the life of the concrete lining and reduce post-project seepage losses.

As part of the Riverside Canal Concrete Lining: Phase II (Agreement No. R18AP00193 with Reclamation), EPCWID1 performed inflow-outflow observations using four telemetry sites at a 3-mile section of the Riverside Canal. These sites are located in canal sections that are concrete lined. Estimated transit losses were determined by comparing calibrated meter readings from one site to another site. From this activity, transit flow losses were observed to be generally below 0.1 cubic feet per second (cfs) per mile after controlling for diversions from irrigation turnouts. EPCWID1 reported in Agreement No. R18AP00193 that the estimated average post-project seepage losses are 0.08 cfs per mile and the following formula was used to determine post-project seepage losses for the proposed project:

0.08 cfs/mile = ~0.159 acre-feet/mile/day → 0.159 * 365 (year) = 58.04 acre feet/mile/year

58.04 * 7700 ft (1.4583 miles) = 84.9397

d. What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

Current Annual Transit Loss:
7700 ft (1.4583 miles) * 844 acre-feet per mile per year = 1,230.8331 acre-feet per year

Future Annual Transit Loss:
1,230 acre-feet per year (current losses) – 85 acre-feet per year (post-lining losses) = 1,145 acre-feet per year

e. How will actual canal loss seepage reductions be verified?

EPCWID1 will perform an inflow-outflow test to verify estimated canal loss seepage and transit loss reductions and transit loss. EPCWID1 will provide annual maintenance to the concrete lining in an effort to reduce permeability.

f. Include a detailed description of the materials being used.

The proposed concrete lining construction provides a durable canal surface with excellent hydraulic properties that is stable and easier to maintain than earth-lined canals. The concrete will be applied in the field as 4000psi shotcrete. Grade 60 U.S. Certified Steel (AISC) (ASTM A1064 and A1064M-15) reinforcement contributes to the strength and life expectancy of the concrete. Nonwoven geotextile composed of polypropylene fibers that meet specifications listed in AASHTO M288-15 Class 3 is installed below the shotcrete. These materials can be seen on site in Figures 3 and 4 below.

Bid Specifications for Reinforced Concrete for Shotcrete Application
(Used in USBR Agreements No. R18AP00193, R18AP00261, R19AP00228, R20AP00056)

Concrete batching and delivery shall meet requirements and specifications ASTM C94 and ACI304R as applicable, and the following specifications:
a. Application: Pumpable mix for shotcrete application of 2 or more inches of canal pavement
b. Cement: 7 sack minimum Type I/II low alkali cement content per cubic yard
c. Fly Ash: Class F fly ash content of 20% to 30% per cubic yard
d. Specified Strength: 4,000 PSI at 28 days
e. Fiber: 3 lbs per yard of 3/4” fibrillated polypropylene fiber
f. Superplasticizer: 1 to 2%
g. Application: Pumpable mix for shotcrete application to include super plasticizer
h. Air Entrainment: 6% air plus or minus 1.5%
i. Slump: Maximum of 5 inch and determined at the time of pour

Figure 3. Riverside Canal Steel Panels and Lined Bank (2021)

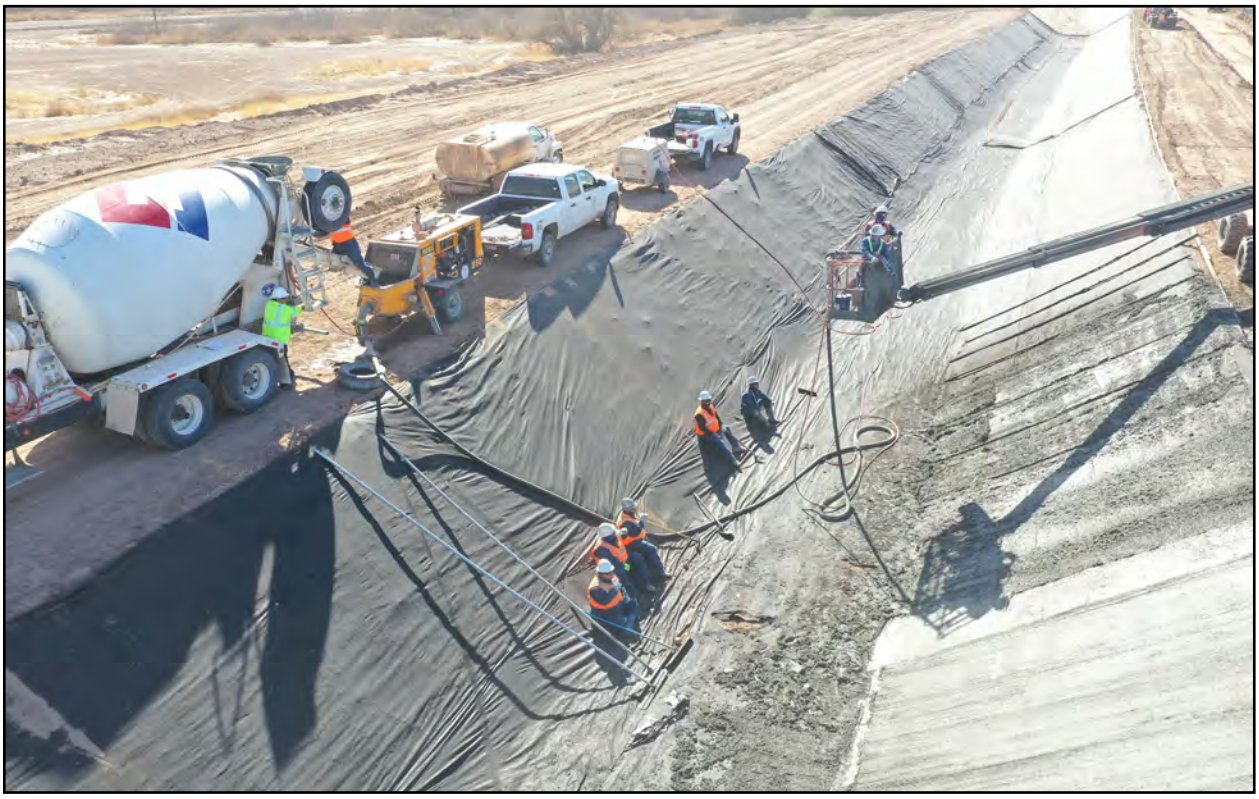


Figure 4. Riverside Canal Geofabric Liner (2021)

B. Evaluation Criterion B: Renewable Energy (20 Points)

The Project does not include a renewable energy component.

C. Evaluation Criterion C: Sustainability Benefits (20 Points)

Enhancing drought resiliency. *Please provide information on how the project will enhance drought resilience by benefitting the water supply and ecosystem, including the following:*

- *Does the project seek to improve ecological resiliency to climate change?*

The El Paso region has an arid climate and receives an average annual rainfall of about 8 inches with net evaporation exceeding 70 inches. The region faces unique water challenges characterized by an agricultural system that is a century old, prolonged drought conditions, a growing population and a growing sister city in Mexico with shared groundwater and surface water supplies, interstate and international treaties, and interstate litigation that may impact EPCWID1's water supply from the Rio Grande Project.

The proposed concrete lining of the Riverside Canal will occur at an area that has been significantly disturbed by the previous construction and expansion of the U.S.-Mexico Border Fence. Historically, the Riverside Canal ran parallel and adjacent to the Rio Grande levees and was in direct contact with riparian wildlife and vegetation (see Figure 5 below). The Rio Grande Canalization Project led by the U.S. Section of the International Boundary and Water Commission (IBWC 2015) further reduced riparian habitat. As such, in the El Paso region, ecological resiliency largely means ensuring water supplies are more resilient against climate change and continue to be available for designated habitat areas, including wetlands.

Figure 5. Border Fence Divides the Riverside Canal and Rio Grande (2020)

The Riverside Canal is used to deliver allocated Rio Grande Project water to the 372-acre Rio Bosque Wetlands Park. The Riverside Canal Concrete Lining Project: Phase IV is more than three miles downstream from the Rio Bosque Wetlands Park and, in accordance with an Environmental Assessment performed by Reclamation (2009) and Finding of No Significant Impact (2009), concrete lining construction will not adversely impact the park.

Water conserved as part of the Riverside Canal Concrete Lining Project will directly benefit all water users, including the Rio Bosque Wetlands Park. As water use demand is met by a more efficient conveyance system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water to the Bosque in drought years when unmet water demands are highest.

- *Will water remain in the system for longer periods of time? If so, provide details on current/future durations and any expected resulting benefits.*

This question does not apply to the project.

- *Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a listed species, or a species of particular recreational or economic importance? Please describe the relationship of the species to the water supply, and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).*

Water conserved as part of the project will indirectly benefit species. Rio Grande Project water conserved by the project will benefit all users, including the Rio Bosque Wetlands Park. The Rio Bosque Wetlands Park receives Rio Grande Project water by allocation. There is a record of sightings at the Rio Bosque Wetlands Park listed in the Texas Natural Diversity Database (TXNDD) for the Western burrowing owl (*Athene cunicularia hypugaea*), which is a federally endangered species.

- *Please describe any other ecosystem benefits as a direct result of the project.*

This question does not apply to the project.

- *Will the project directly result in more efficient management of the water supply? Will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?*

Water conserved as part of the Riverside Canal Concrete Lining Project will directly benefit all water users, including environmental, municipal, agricultural, and industrial water users. As water use demand is met by a more efficient conveyance system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

Addressing a specific water and/or energy sustainability concern(s). *Will the project address a specific sustainability concern? Please address the following:*

- *Explain and provide detail of the specific issue(s) in the area that is impacting water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.*

The El Paso region has an arid climate and receives an average annual rainfall of about 8 inches with net evaporation exceeding 70 inches. The region faces unique water challenges characterized by an agricultural system that is a century old, prolonged drought conditions, limited and dwindling supplies of water, a growing population and a growing sister city in Mexico with shared groundwater and surface water supplies, interstate and international treaties, and interstate litigation that may impact EPCWID1's water supply from the Rio Grande Project.

Source of Water Supply and District Water Use

EPCWID1 obtains water by annual allocation from the United States Bureau of Reclamation's Rio Grande Project. EPCWID1's diversion right of water during a full allocation year during the primary irrigation season is 376,860 acre-feet. Rio Grande Project water is released from storage in Elephant Butte Reservoir and regulated through Caballo Reservoir. The methodology for determining diversions for EPCWID1, Elephant Butte Irrigation District (EBID) in New Mexico, and the Republic of Mexico is described in the Operating Agreement and Operating Manual that the two districts and Reclamation negotiated and approved in 2008. The Operating Agreement is currently in litigation (*Texas v New Mexico and Colorado*).

EPCWID1 provides water from the Rio Grande for 69,010 acres of water rights lands divided into more than 30,000 water user accounts. Irrigation users include approximately 325 large farms and 4,500 irrigated tracts of five acres or less. Irrigated crops include cotton, alfalfa, pecan trees, sorghum, chilies, wheat, onions, corn, vegetables, pasture grass, and family gardens.

The City of El Paso currently has water rights for approximately 70,000 acre-feet per year from Rio Grande Project Water in contracts with EPCWID1. Rio Grande Project water is used to meet approximately 50% of municipal demand for a population of over 800,000. EPCWID1 delivers water for municipal use to the City of El Paso at the W.E. Robertson/Umbenhauer Water Treatment Plant located in downtown El Paso and at the Jonathan W. Rogers Water Treatment Plant located in the El Paso Lower Valley. The amount of water attainable by the City of El Paso is subject to availability and is dependent on the EPCWID1's total diversion rights and prior appropriations.

Water Conveyance Losses

The number one potential shortfall for EPCWID1 is water losses due to seepage. A report from the United States Geological Survey (USGS) investigated cumulative seepage losses along a 64-mile reach of the Rio Grande from below Leasburg Dam in Leasburg, New Mexico to above the American Dam in El Paso, Texas (USGS 2015). This report determined that the cumulative seepage losses in 2015 (a drought year) were approximately 12,524 acre-feet per year and are a result of seepage in the Rio Grande streambed, evaporation from the water surface, and transpiration by vegetation along the river banks. Measured seepage losses are higher during wet

years, and these and additional losses further upstream starting from Elephant Butte Reservoir must also be accounted as part of the EPCWID1's water delivery operations and drought planning.

Because EPCWID1 has a limited ability to address water losses upstream, the District continuously invests in projects within its jurisdiction that increase efficiency and reduce losses. EPCWID1's ability to develop water conservation projects is partially dependent on revenues derived from water orders sourced by EPCWID1's annual allocation of Rio Grande Project water. In drought years, EPCWID1 revenues decrease. When possible, EPCWID1 partners with the Texas Water Development Board, the U.S. Bureau of Reclamation, the U.S. Section of the International Boundary and Water Commission (IBWC), and other local entities to cost-share many of its water conservation and drought mitigation projects.

Water conservation estimates and implementation strategies for El Paso County listed in the 2017 Texas State Water Plan determined that approximately 50,000 acre-feet of water per year can be saved by concrete lining select, cost-effective sections of the EPCWID1's canals. According to a Texas A&M University report sponsored by the Texas Water Development Board (TWDB), there are very limited opportunities for water conservation in Far West Texas irrigated agriculture outside of making improvements to EPCWID1's conveyance system (Michelsen et al. 2009). The reasons for this can be summarized by: the most cost-effective best management practices in irrigation have already been implemented and associated water savings realized, there are limitations to gravity flow used by the irrigation system, sediment and salinity levels limit the use of pressure piping and drip-irrigation systems, and water conservation implementation costs for a number of practices exceed the agricultural value and benefits of any water saved.

The proposed concrete lining of the Riverside Canal is among the most important projects for EPCWID1 to continue providing the water necessary to sustain agriculture and provide water to the City of El Paso for municipal use under its contracts with EPCWID1. As water demand is met by a more efficient system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

Projected Increases in Municipal Water Demand

The 2017 Texas State Water Plan estimates that the total water demand in El Paso County is 406,422 acre-feet of water per year. By 2070, water demand is expected to increase to 476,929 acre-feet of water per year. The population in El Paso County is expected to nearly double to over 1.5 million by 2070. Irrigation currently accounts for over 60% of water use in El Paso County, and a significant portion of future municipal water needs are projected to be supplied using increasing amounts of water previously allocated for irrigation. Municipal water demand projections in the 2017 Texas State Water Plan are based on current and projected future per capita consumption and are therefore susceptible to any variations in actual population increases.

One such variation is the continued expansion of Fort Bliss as a result of the U.S. Army's Base Realignment and Closure (BRAC) program, which from 2005 to 2011 brought 24,000 additional military personnel and over 20,000 dependents (Fort Bliss Garrison 2011). Increasing the

military value of Fort Bliss is one of the top economic development priorities for the City of El Paso, opening the possibility of future increases in military personnel (City of El Paso 2012). Fort Bliss received approximately 26% of its water supply from the City of El Paso in 2017 (Gonzalez 2017) and additional water can be supplied via emergency interconnections by El Paso Water Utilities in the event that the Fort Bliss Water Supply Corporation water systems are incapable of providing sufficient supply (FBWSC 2017).

Another variable that is not entirely accounted for in water supply and use projections is the increasing water demand in Ciudad Juarez, Mexico, which is located across the Rio Grande from the City of El Paso. The City of El Paso shares the Hueco Bolson aquifer with Ciudad Juarez, which is used to meet anywhere from 28-61% of municipal and industrial water needs in El Paso, depending on the availability of Rio Grande Project water. Historical groundwater overdraft in El Paso and Ciudad Juarez has caused large groundwater drawdowns, deterioration of groundwater quality, and land subsidence in the Hueco Bolson, although some shared measures have been taken to control the groundwater use (Sheng 2013).

Ciudad Juarez is currently 100% dependent on groundwater to satisfy all of its municipal and industrial water demands, according to the *Junta Municipal de Agua y Saneamiento de Juárez* (JMAS), Ciudad Juarez's municipal water utility. In 2014, 144,213 acre-feet of water were pumped from the Hueco Bolson aquifer, following a 15-year trend of average annual increases in pumping of 1,289 acre-feet since 2000 (FWTWPG 2016). In 2018, water use in Ciudad Juarez was approximately 162,142 acre-feet and 30 additional wells were brought online to meet peak summer demand (JMAS 2019). The population of Ciudad Juarez is estimated at over 1.4 million (CONAPO 2012). Water demand projections published by JMAS recommend a series of projects necessary to meet demand for a population of 1.7 million by 2030 (JMAS 2013).

According to their 2012-2030 Master Plan (JMAS 2013), JMAS expects to begin constructing two surface water treatment plants for potable use in 2020 and 2025 to treat up to 38,375 acre-feet of Rio Grande Project water per year (delayed due to COVID-19). This project is expected to be partially funded by the North American Development Bank (NADBANK), a binational financial institution established by the governments of the United States and Mexico to provide financing to support the development and implementation of infrastructure projects along the U.S.-Mexico border. Meeting Ciudad Juarez' growing water demand via the construction of the two surface water treatment plants will depend on the United States' ability to meet treaty-obligated deliveries to Mexico. As such, significant collaboration and conservation investments are needed in both nations to address current and future challenges facing the region's limited water supplies.

To address water reliability concerns, El Paso Water Utilities (EPWU) has adopted multiple water source diversification strategies, including desalination, advanced purification, and long-distance importation of water from outside El Paso County. Reports by EPWU (Gonzalez 2017, Balliew 2019) compared drinking water quality treatment costs per acre-feet, determining that treatment costs for surface river water are the second least expensive option at $300 per acre-foot, while costs for desalination are $508 per acre-foot, costs for advanced purification are $1,370 per acre foot, and costs for long-distance importation are $2,840 per acre foot (see figure 6 below). Because surface water is one of the few renewable water resources available to the El

Paso region, both EPWU and EPCWID1 developed planning (via the 2022 Texas State Water Plan), engineering, environmental, and permitting work necessary to deliver Rio Grande Project water for the first time to the Upper Valley Water Treatment Plant. Two projects that advanced this effort were funded by Reclamation as part of the 2019 WaterSMART Water and Energy Efficiency Grants Program (R19AP00150) and 2019 Water Conservation Field Services Program (R20AP00046).

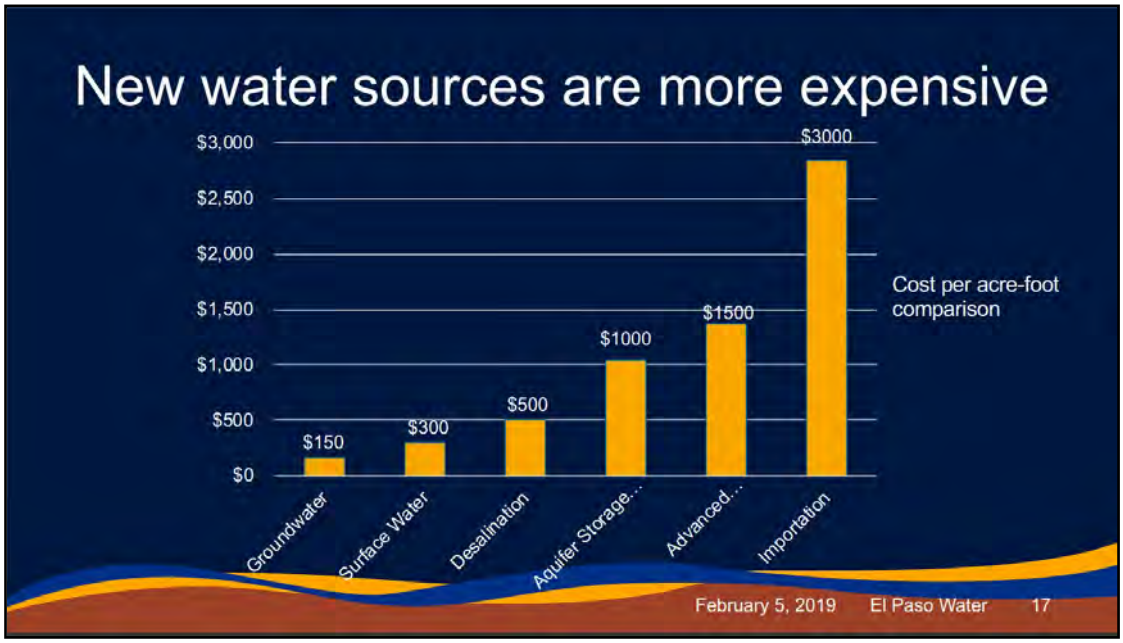


Figure 6. Cost per Acre-foot Comparison by El Paso Water (Balliew 2019)

Irrigation Water Demand Exceeds Surface Water Supply

Whereas municipal water use is priced in such a way that it allows EPWU to invest in large-scale water source diversification, there are limited, cost-effective projects available for agricultural water users outside of conservation. According to the 2017 Texas State Water Plan, there are approximately 53,202 acre-feet of annual unmet water needs for irrigation in El Paso County during drought-of-record conditions (see Figure 7 below). The growing imbalance between supply and demand is expected to lead to greater reliance on non-renewable groundwater resources used by farmers in the El Paso region.

Only a portion of the agricultural land in El Paso County has access to private irrigation wells of which a majority of the wells produce water with total dissolved solids (TDS) of greater than 1,000 mg/l (many in excess of 2,500 mg/l) with significant sodium content (see Figure 6 below). The high salt content limits the amount of groundwater that can be used to grow irrigated crops. Consequently, many farmers rely on blending surface water from the Rio Grande with groundwater to meet their water quality needs or use surface water exclusively. During years of drought, many agricultural operations are fallowed or deficit irrigated.

EPCWID1 currently operates and maintains 60 active shallow groundwater well sites that are used to provide supplemental irrigation water during drought. Recovered groundwater is used to supplement Rio Grande Project water during drought periods with an average system-wide capacity of 8,500 acre-feet of groundwater per month. The cost of pumping and delivering

supplemental groundwater costs is approximately $45 per acre-foot, which is significantly more expensive than surface water costs. As such, widespread groundwater use considered inadequate to meet irrigation water deficits.

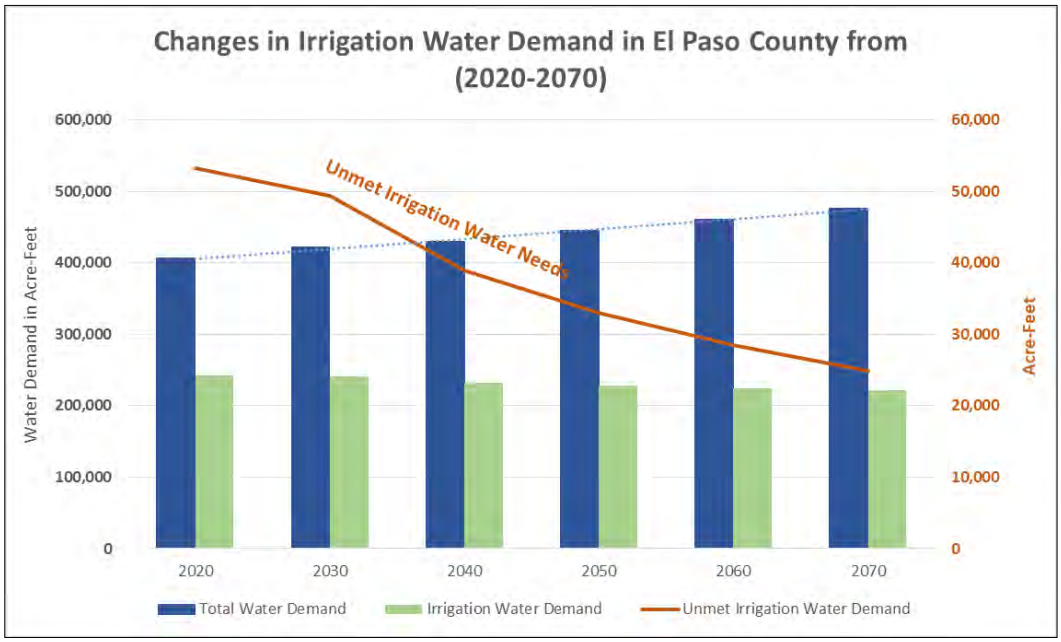


Figure 7. Changes in Irrigation Water Demand in El Paso County (FWTWPG 2016)

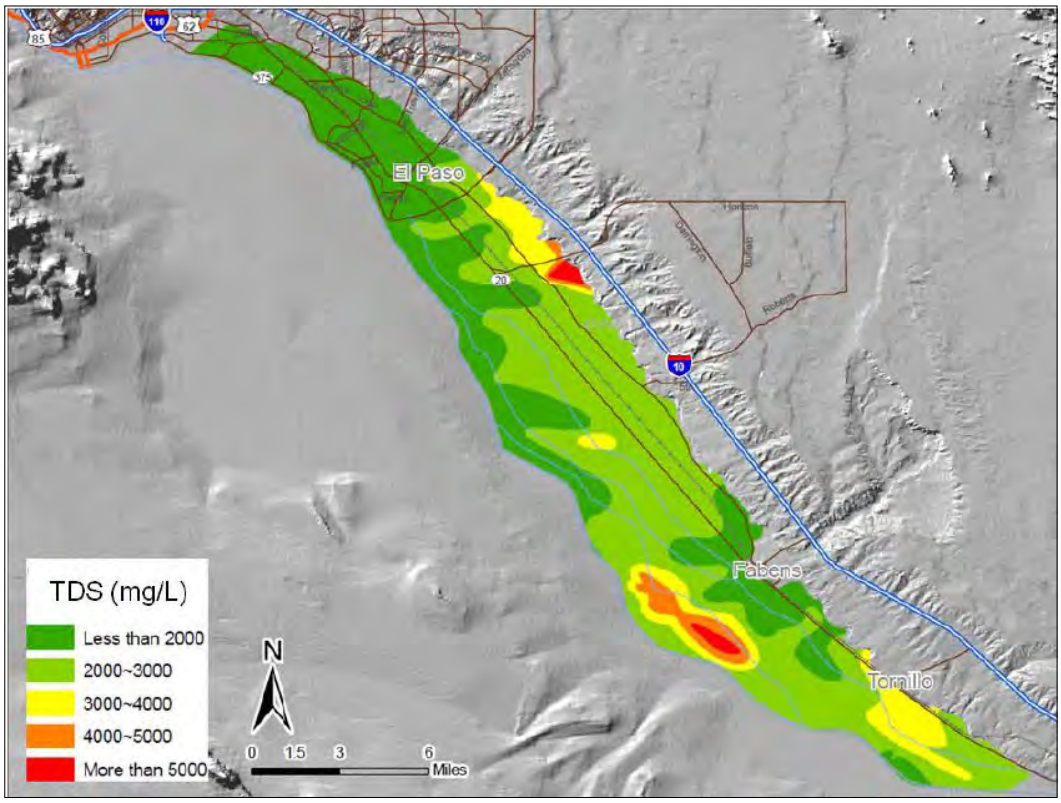


Figure 8. TDS in the Rio Grande Alluvial Aquifer (CH2MHILL 2011)

Prolonged Drought and Current Near Drought-of-Record Conditions

Surface water users in the El Paso region are currently experiencing near record-of-drought conditions. The westernmost part of Texas, as well the headwaters of the Rio Grande in Colorado and New Mexico from which the EPCWID1's water supply originates, have been in drought for much of the past two decades, with only 2005, 2008, 2016, 2017, and 2019 experiencing average or above-average spring runoff into Elephant Butte Reservoir (see Figure 8 below). In 2018, Elephant Butte Reservoir reached near record-low levels at about 3% capacity, with just 58,240 acre-feet of water in storage as of September (total conservation capacity is 1,973,358 acre-feet). Water levels at Elephant Butte Reservoir in 2021 are similar to 2018 (see Figure 10 below).

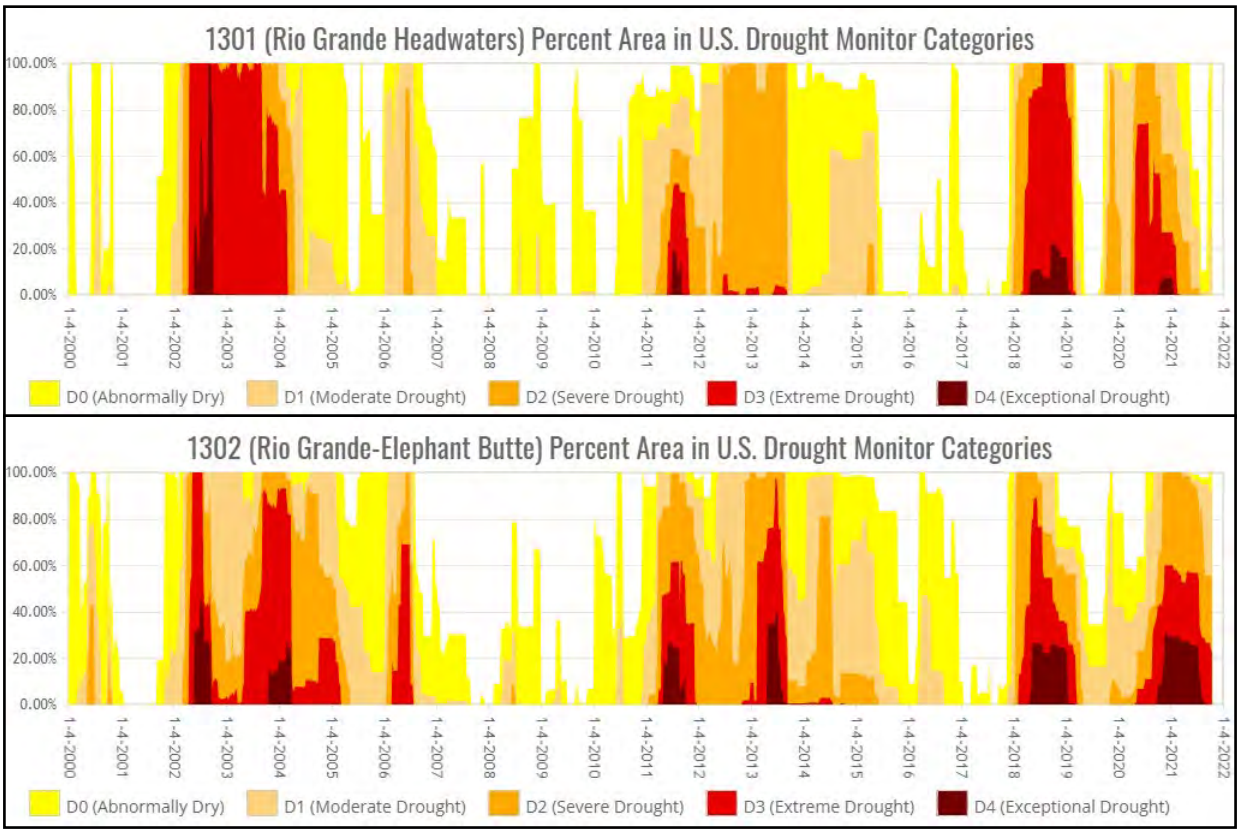


Figure 9. U.S. Drought Monitor Intensity for the Rio Grande from 2000-2021

Storage levels in Elephant Butte Reservoir in 2018 were also similar to drought conditions in 2013 (see Figure 11). 2013 was the shortest irrigation season in El Paso (less than six weeks) and supplied the least amount of water in the almost 100-year history of the Rio Grande Project. Storage levels in Elephant Butte Reservoir have only been at or below the 2013 and 2018 levels three times: during the drought-of-record from 1951-1957, in 1963-1964, and in 1971-1972.

To meet municipal water demands in 2013, the City of El Paso drilled new groundwater wells and operated its desalination plant at maximum capacity with per acre-foot costs that are higher than surface water treatment (EPWU 2014). These new near drought-of-record conditions prompted changes to water availability and supply projections modeled by the Texas Water Development Board (TWDB) for the 2022 Texas State Water Plan. Based on these changes, the

projected timeline, schedule, and urgency for developing water conservation projects has been accelerated.

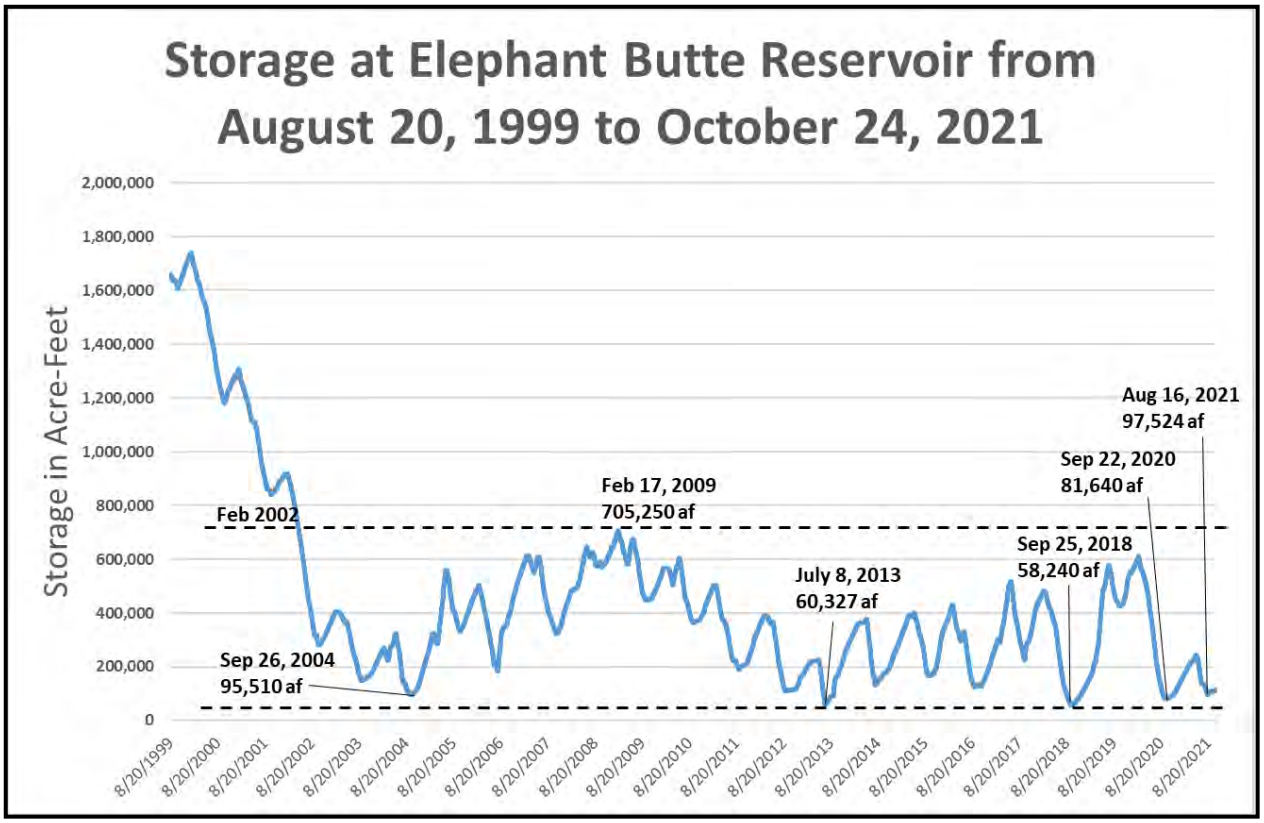


Figure 10. Storage and Level Thresholds at Elephant Butte Reservoir from 1999 - 2021

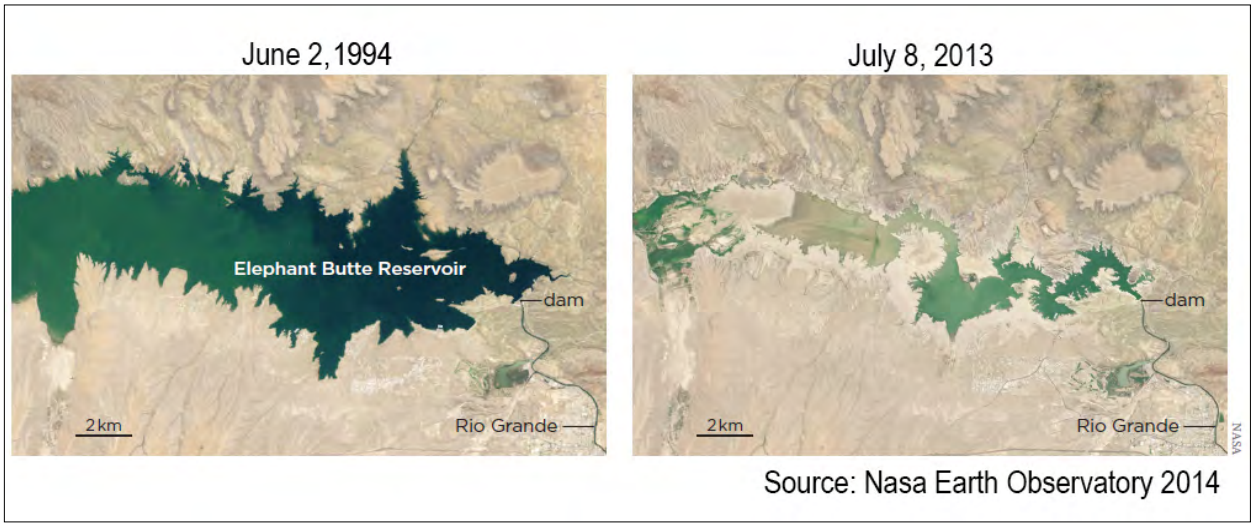


Figure 11. Images of Elephant Butte Reservoir in 1994 and 2014

By all measures, the El Paso region is currently experiencing drought. The headwaters and the lower Rio Grande Basin south of Elephant Butte Reservoir are experiencing abnormal to

moderate drought conditions as of October 12, 2021(see Figure 12). Drought is expected to continue per estimates in the August 20 U.S. Seasonal Drought Outlook (see Figure 11).

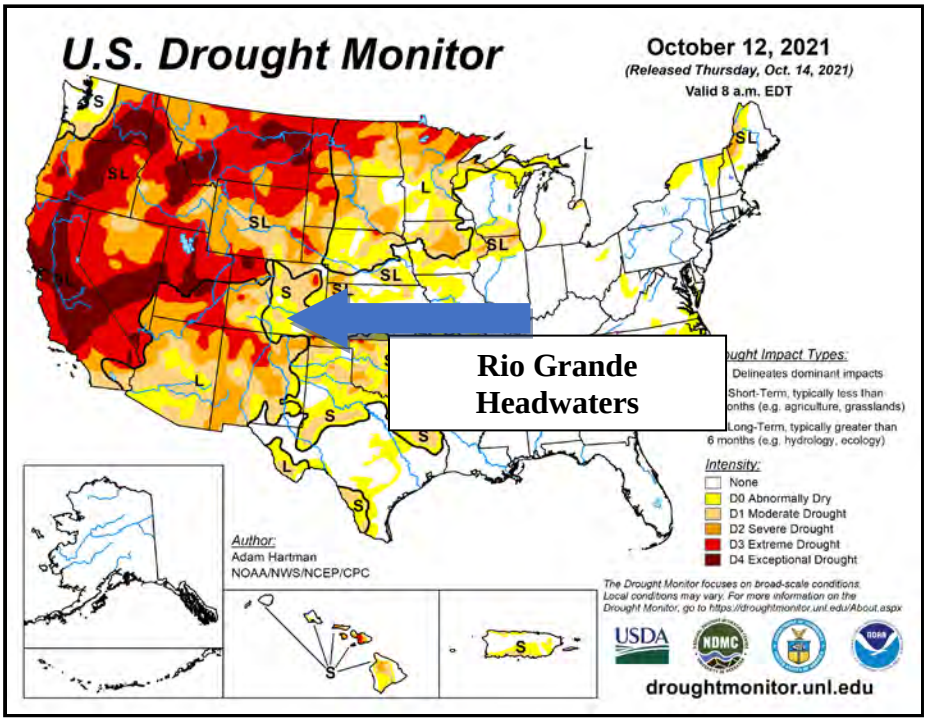


Figure 12. U.S. Drought Monitor and Rio Grande Headwaters

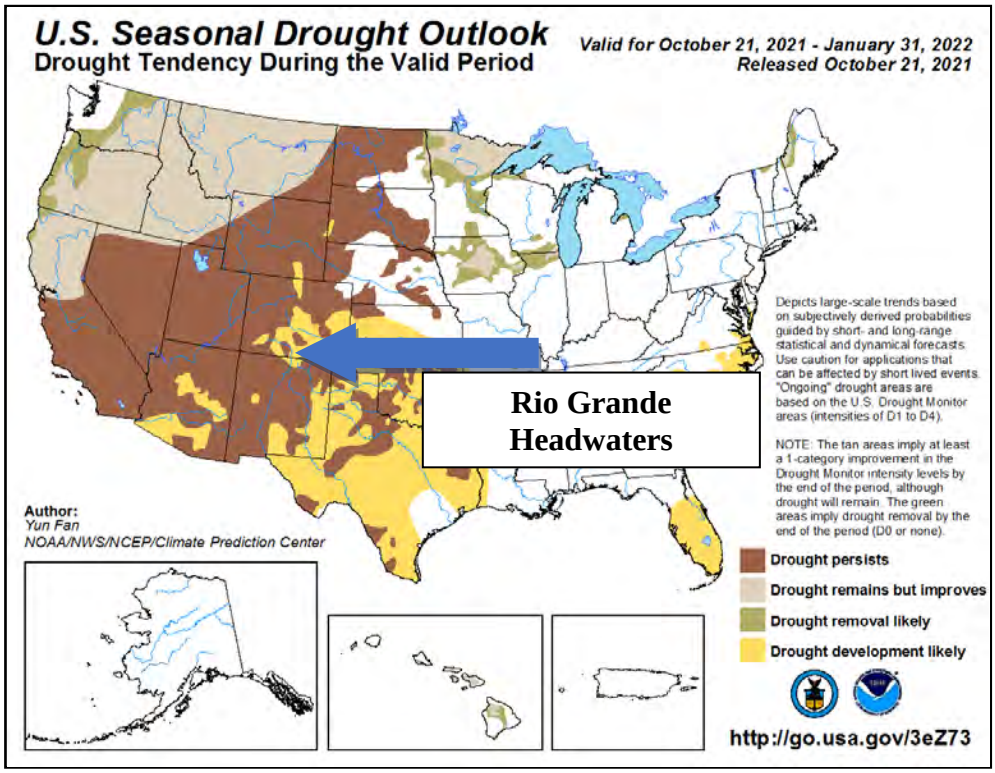


Figure 13. U.S. Drought Monitor and Rio Grande Headwaters

The Impact of Drought on the Local Economy

Beneficial use and conservation of water is critical to the El Paso economy. A TWDB study on the socioeconomic impacts of projected water shortages in El Paso County determined that, if unmet, water shortages would have a negative economic impact of $3.45 billion by 2070 and include almost 25,000 jobs lost (TWDB 2015). The economic impact of unmet irrigation water demands directly contributes to the slowing or reversal of job growth in areas where the economy benefits from agricultural revenues. Estimates from Texas A&M University determined that $150 million in agricultural sales were lost due to irrigation water reductions from drought conditions in 2011-2015 (TAMU 2015). All of the Upper Rio Grande Basin has received drought designations by the USDA, including El Paso County (see Figure 14).

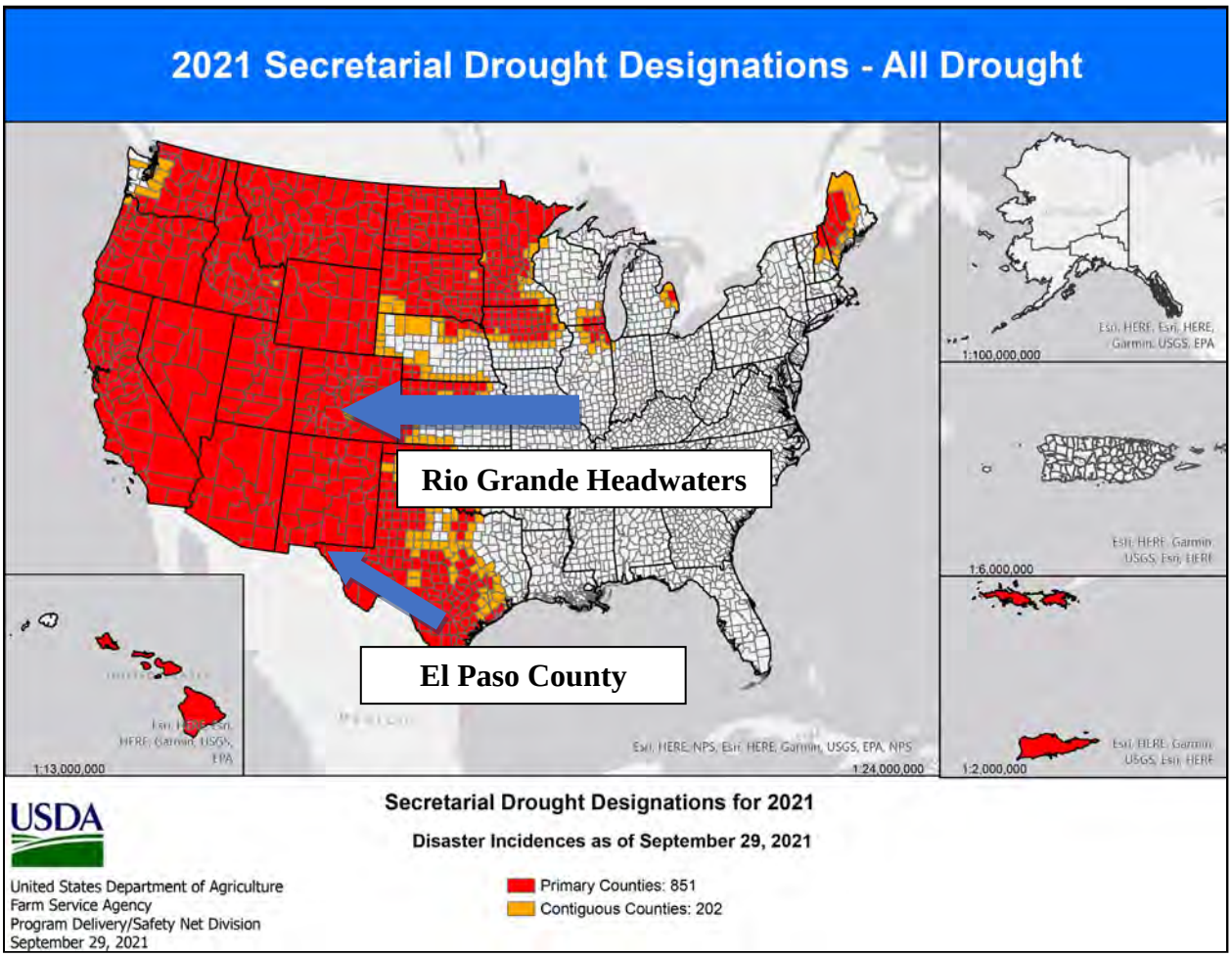


Figure 14. 2020 Secretarial Drought Designations as of September 29, 2021

Economic activity in other sectors can also be impacted by water shortages. According to the 2014 Southern New Mexico and El Paso Joint Land Use Study (JLUS 2015), water source diversification efforts have allowed Fort Bliss to augment its water supplies by purchasing water and developing emergency interconnections with the City of El Paso, thereby positively impacting the military value of the base. 1 in 5 jobs in the El Paso region are linked to military

installations. The Texas Comptroller estimates that Fort Bliss contributed $24.1 billion to the Texas economy in 2015 (Texas Comptroller 2016).

Projected Reductions in Snowpack, Snow Water Equivalence, and Overall Water Supply
In order to sustain the local agricultural economy, growing water demand, and growing population, water users in the Rio Grande watershed will need to continue making investments in water conservation to adapt to projected reductions in surface water supply.

A *Review of Observed and Projected Climate Changes* (2013) by the U.S. Bureau of Reclamation noted that projected reductions in snowpack, declines in snow water equivalence, and advanced snowmelt resulting from increased temperatures will lead to a 10% to 30% reduction of water flow in the Rio Grande in the next 50 to 70 years. The usable, manageable water supply is projected to decline in the Upper Rio Grande, where supplies over the course of the 21st century are projected to decrease by about one-fourth in the Colorado portion of the basin and by about one-third in the New Mexico portion (USBR 2016). The Rio Grande at El Paso observed flows for 2001 through 2010 that were about 23% lower than the period from 1941 through 2000 (Chavarria & Gutzler 2018). Assessed annual and monthly changes in streamflow volume and surface climate variables near the headwaters of the Rio Grande River suggest that snow water equivalent has decreased by approximately 25% from 1958 – 2015 in part due to temperature increases, although small increases in precipitation have reduced the impact of declining snowpack on streamflow (Chavarria & Gutzler 2018). Reservoir evaporation at Elephant Butte Reservoir, the reservoir with the highest evaporative losses in the Upper Rio Grande Basin, is projected to increase by up to 10 percent as a result of projected increases in temperature. Decreasing runoff and streamflow also threaten Mexican irrigation, food production, and Treaty-obligated deliveries to the Rio Grande (USBR 2016).

- *Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.*

This question does not apply to the project.

- *Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?*

Conserving water via concrete lining irrigation canals is among the most cost-effective water management strategies available in the El Paso region (Michelsen et al. 2009). As irrigation water demand is met by a more efficient system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

- *Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*

Water conserved as a result of the proposed project will continue to use Rio Grande Project storage (Elephant Butte and Caballo Reservoirs) and conveyance systems (Rio Grande and EPCWID1 irrigation system). The conserved water will be used to offset the Hueco Bolson Aquifer for municipal and agricultural use in accordance with available Rio Grande Project allocations.

The City of El Paso draws groundwater from the Hueco Bolson Aquifer to meet 28-61 of municipal and industrial water demand. When a full allocation is available, EPCWID1 delivers Rio Grande Project water to the City of El Paso to meet approximately 50% of this demand. I.e., as more Rio Grande Project water is conserved and accumulated at Elephant Butte and Caballo Reservoirs, the City of El Paso can better project available water supplies and effectively reduce groundwater pumping.

Conserved water resulting from the Riverside Canal Concrete Lining Project: Phase IV will also reduce agricultural groundwater use. According to the 2017 Texas State Water Plan, there are approximately 53,202 acre-feet of annual unmet water needs for irrigation in El Paso County during drought-of-record conditions. The growing imbalance between supply and demand is expected to lead to greater reliance on non-renewable groundwater resources used by farmers in the El Paso region. The amount of groundwater used by farmers is inversely proportional to available Rio Grande Project water. As such, EPCWID1's water conservation and efficiency projects ultimately benefit the region by making more Rio Grande Project water available which will offset groundwater use.

- *Provide a description of the mechanism that will be used, if necessary, to put the conserved water to the intended use.*

Water conserved as a result of the proposed project will continue to use Rio Grande Project storage (Elephant Butte and Caballo Reservoirs) and conveyance systems (Rio Grande and EPCWID1 irrigation system).

- *Indicate the quantity of conserved water that will be used for the intended purpose(s).*

All water (approximately 1,145 acre-feet per irrigation year) conserved as a result of the project will be stored or used as needed to address water reliability concerns within EPCWID1 boundaries.

Other project benefits. *Please provide a detailed explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:*

(1) Combating the Climate Crisis: Presidential Executive Order 14008: Tackling the Climate Crisis at Home and Abroad. *Please describe how the project will address climate change, including the following:*

a. Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.

The Riverside Canal Concrete Lining Project: Phase IV will lead to significant reductions in water lost due to seepage and evapotranspiration. The concrete lined canal will reduce the conveyed water surface area by approximately 1.58 acres (reduced cross section from 66 feet average to 54 feet). Increasing temperatures generally also increase evaporation rates. As such, concrete lining large sections of EPCWID1's 100+ year old irrigation system is a form of future-proofing the system's conveyance capacity in preparation for a hotter, drier future climate.

b. Does this proposed project strengthen water supply sustainability to increase resilience to climate change?

In alignment with findings from the 2021 Far West Texas Water Plan and 2022 Texas State Water Plan, agricultural water supply sustainability in El Paso will require concrete lining more than 80 miles of canals and laterals to achieve more than 25,000 acre-feet in water savings at an estimated cost of $157 million (Water Management Strategy E-37). Via improved conveyance and seepage reductions, the Riverside Canal Concrete Lining Project: Phase IV will make EPCWID1's irrigation system more resilient to climate change. Additional details on Water Management Strategy E-37 and regional sustainability strategies can be referenced below:

2021 Far West Texas Regional Water Plan (Page 11-18)
http://westtexaswaterplanning.org/wp-content/uploads/2020/11/2021-Far-West-Texas-Water-Plan.pdf

2022 Texas State Water Plan (Interactive)
https://2022.texasstatewaterplan.org/project/1777

c. Will the proposed project establish and use a renewable energy source?

This question does not apply to the project.

d. Will the project result in lower greenhouse gas emissions?

This question does not apply to the project.

(2) Disadvantaged or Underserve Communities: *E.O. 14008 and E.O. 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including the following:*

a. Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to, public health and safety

through water quality improvements, new water supplies, new renewable energy sources, or economic growth opportunities.

Municipal water users in El Paso County rely on the Mesilla Bolson and Hueco Bolson Aquifers to meet demand. High levels of naturally-occurring arsenic are present in the Mesilla Bolson Aquifer. Communities along the Texas-New Mexico border including the Town of Anthony, Texas, the Village of Vinton, Texas, and multiple Census Designated Places (Canutillo, Westway) rely on water purchased from the City of El Paso to meet water quality standards.

In 2006, the Environmental Protection Agency (EPA) reduced the maximum amount of arsenic allowable in U.S. Drinking water from 50 parts per billion (ppb) to 10 ppb. In order to comply with that standard with regards to the Mesilla Bolson Aquifer, where El Paso obtains 19% of its water, El Paso Water Utilities designed and constructed the $77 million Upper Valley Water Treatment Plant.

The Record of Decision for the El Paso-Las Cruces Regional Sustainable Water Project, a planning initiative led by the Texas-New Mexico Water Commission with the U.S. Section of the International Boundary and Water Commission and El Paso Water Utilities as lead agencies (Reinert et al. 2001), selected a Preferred Alternative that called for treating up to 80 million gallons per day (MGD) (89,611 acre-feet of water per year) of Rio Grande Project Water by 2030.

Although the Upper Valley Water Treatment Plant does not currently treat surface water, El Paso Water Utilities already receives Rio Grande Project water at two other treatment plants which rely on interconnections. El Paso Water Utilities and EPCWID1 are developing a strategy to decrease reliance on non-renewable groundwater resources in the Mesilla Bolson Aquifer and allow Rio Grande Project water to be used by El Paso Water Utilities to meet federal regulations. Additional information on this joint strategy is available for reference under Water Management Strategy E-22 in the 2022 Texas State Water Plan (Interactive) at https://2022.texasstatewaterplan.org/project/4090 and the 2021 Far West Texas Regional Water Plan (Page 5-16) http://westtexaswaterplanning.org/wp-content/uploads/2020/11/2021-Far-West-Texas-Water-Plan.pdf.

All Rio Grande Project water conserved will directly benefit communities in El Paso County, which meet the disadvantaged community definitions outlined in Section 1015 of the Cooperative Watershed Act (see next section). As water demand is met by a more efficient system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water to El Paso Water Utilities in drought years when unmet water demands are highest

b. If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act (defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State), or the applicable state criteria for determining disadvantaged status.

The proposed project will improve water reliability in an area impacted by prolonged drought conditions. According to the *October 2021 StatsAmerica Distress Criteria Statistical Report* by the U.S. Economic Development Administration (EDA), El Paso County is considered economically disadvantaged. The pre-COVID-19 Median Household Income (MHI) (2019 ACS 1-Year Estimates) is $48,903, which is at 76.4% of the Texas MHI ($64,034). The poverty rate stands at 18.8% compared to 13.6% in Texas. Based on MHI, the proposed project will provide benefits to multiple communities that meet the definition of "disadvantages community" per Section 1015 of the Cooperative Watershed Act.

Table 1. Distress Criteria Statistical Report in October 2021 for El Paso County, Texas

24 Month Unemployment	Threshold Calculation	BEA PCPI	Threshold Calculation	ACS 5-year PCMI	Threshold Calculation
7.11	0.55	$37,715	66.8	$21,683	63.6

c. If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

EPCWID1 regularly works with agricultural producers considered historically underserved in water conservation and efficiency projects. The Riverside Canal Concrete Lining Project: Phase IV is expected to benefit historically underserved farmers. The majority of producers in El Paso fall under the US Department of Agriculture (USDA) definition of historically underserved farmers and ranchers as defined by the Agricultural Improvement Act of 2018 (2018 Farm Bill). According to the data from the 2017 Census of Agriculture for El Paso County, 444 out of 656 (67.7%) farms and 79,424 out of 142,675 (55.7%) are operated by a Hispanic producer. 166 out of 1,062 (25.3%) farms are operated by veterans. 185 out of 656 (28.2%) farms are operated by new and beginning producers.

(3) Tribal Benefits: *The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal Tribal trust responsibilities. Please address the following, if applicable:*

a. Does the proposed project directly serve and/or benefit a Tribe? Will the project increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?

Water conserved as a result of the proposed project will benefit all Rio Grande Project water users served by EPCWID1, including the Ysleta del Sur Pueblo, a federally recognized tribe. EPCWID1 delivers water to the Ysleta del Sur Pueblo Reservation for agriculture and for two of the Ysleta del Sur Pueblo's most important ceremonial processions: *St. Anthony of Padua Feast Day* and *Dia de Los Santos Reyes*. The Ysleta del Sur Pueblo owns 379.2 acres of land with active irrigation water rights.

EPCWID1 consulted with the Ysleta del Sur Pueblo multiple times starting on September 19, 2019 to discuss the multiple phases and scheduling of the Riverside Canal Concrete Lining

Project. To this end, the Ysleta del Sur Pueblo issued a statement of no opposition which can be referenced in Appendix A.

b. Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?

As water use demand is met by a more efficient conveyance system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water to the Ysleta del Sur Pueblo in drought years when unmet water demands are highest.

(4) Other Benefits: *Will the project address water and/or energy sustainability in other ways not described above? For example:*

a. Will the project assist States and water users in complying with interstate compacts?

Texas v New Mexico Supreme Court Litigation Regarding the Rio Grande Compact
The proposed project will contribute water via conservation and efficiency improvements to delivery operations for Rio Grande Project water users. The methodology for determining diversions and allocations established in the 2008 Operating Agreement between the District, Elephant Butte Irrigation District, and Reclamation is currently in litigation (*State of Texas v State of New Mexico and State of Colorado, No. 22O141 Original in the United States Supreme Court and Intervention by the United States*). Decreasing and streamflow threaten Mexican irrigation, food production, and treaty-obligated deliveries to Mexico via the Rio Grande (USBR 2016).

b. Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?

Water conserved as a result of the proposed project will benefit the agriculture, municipal, and environmental water users, including:

- An average of 49,000 acres of agricultural lands
- Approximately 50% of municipal water demand for a population of over 800,000 in El Paso County
- 372 acres of designated wetlands with active irrigation water rights that are also used for recreation and eco-tourism (Rio Bosque Wetlands Park)
- 379.2 acres of tribal land with active irrigation water rights (Ysleta del Sur Pueblo)

The successful construction of the Riverside Canal Concrete Lining Project: Phase IV will also stabilize the canal banks on which the U.S.-Mexico Border Fence was constructed and facilitate access and use of the banks for U.S. Customs and Border Protection operations.

Sections of the U.S.-Mexico Border Wall are constructed on the banks of the Riverside Canal. Figure 16 below illustrates the typical, unimproved placement of the U.S.-Mexico Border Fence with respect to the Riverside Canal. As they are, the canal banks cannot be traversed by vehicles

and maintenance is difficult. The proposed project will improve the continued reliability of the canal system, stabilize infrastructure build on the canal banks, and enhance the flexibility of U.S. Customs and Border Protection (CBP) to operate along the Riverside Canal. CBP already uses the banks of canals to access areas along the U.S.-Mexico border that are blocked off due to existing infrastructure and natural features. The proposed project would narrow the cross-sectional width of the Riverside Canal, increasing the size of the banks where CBP could operate motor vehicles, reinforce existing infrastructure, and carry out other activities.

EPCWID1 reviewed the project with the CBP Officer in Charge of the Ysleta Station and the Officer in Charge of the Clint Station in 2019 in an effort to accommodate access and use requests. Accommodations recommended by CBP included wider and more stable access roads for CBP and emergency response vehicles and the ability to access the channel for rescue operations (via ingress and egress points normally used for sediment cleanup). Additionally, concrete lining will reduce vegetation growth, which will also reduce CBP's maintenance costs to clear vegetation growing on the bank of the Riverside Canal on which the U.S.-Mexico Border Fence was constructed.

EPCWID1 has a history of collaboration with CBP and has previously completed shared-infrastructure improvements along the U.S.-Mexico border and at ports of entry. EPCWID1 worked with CBP during the lining of 6,040 feet of the Riverside Canal located immediately upstream from the proposed project length and is also adjacent to the U.S.-Mexico Border Wall (Agreements R18AP00193 and R20AP00056 with Reclamation). Figure 15 below shows a washout that occurred during the month of April 2020 that is a direct result of interactions between Border Fence support structures and flowing water on unlined sections of the Riverside Canal. The proposed Riverside Canal Concrete Lining Project: Phase IV would address structural support deficiencies between the Border Fence and the Riverside Canal.

Figure 15. Washout At the U.S.-Mexico Border Fence and Riverside Canal (2020)

Figure 16. Typical Unlined Section of the Riverside Canal and Border Fence

c. Will the project benefit a larger initiative to address sustainability?

Water Management Strategy E-37

Conserving water via concrete lining irrigation canals is among the most cost-effective water management strategies available in the El Paso region (Michelsen et al. 2009). The Riverside Canal Concrete Lining Project: Phase IV is a key component of Water Management Strategy (WMS) E-37 in the 2021 Far West Texas Water Plan and 2022 Texas State Water Plan. WMS E-37 is a strategy to ensure the sustainability of agricultural water supplies in El Paso during prolonged and near drought-of-record conditions. Water stakeholders in El Paso must invest aggressively to ensure that Rio Grande Project water can be managed sustainably amidst a changing climate, increased water demand, and continuing conflicts. WMS E-37 will require concrete lining more than 80 miles of canals and laterals to achieve more than 25,000 acre-feet in water savings at an estimated cost of $157 million. Improved conveyance and seepage reductions are necessary for sustainability.

Improvements to Riverside Canal Wasteway II and Check Structure

In 2019, the U.S. Section of the International Boundary and Water Commission (USIBWC) provided $226,936 in funds matched by EPCWID1 labor and equipment to reconstruct the Riverside Canal Wasteway II and Check structures. The Riverside Canal Concrete Lining Project: Phase IV includes concrete lining located work immediately upstream and downstream from these structures. The wasting structure was reconstructed for flood mitigation and to meet future levee certification requirements. Concrete lining the proposed section of the Riverside Canal is necessary to meet the full objectives of the joint project with the USIBWC.

Figure 17. Reconstruction of Riverside Canal Wasteway II and Check Structures

Riverside Canal Sediment Control Basin

EPCWID1 will construct a settling basin immediately downstream from the proposed project length using a 6.04-acre site located between the Riverside Canal and the Riverside Intercepting Drain. As one of the downstream-most Rio Grande Project water users, EPCWID1's canal system receives significant sediment loads. Ongoing sediment delivery from tributary arroyos located south of Elephant Butte and Caballo Reservoirs result in sediment plugs, increased water-surface elevations, and reductions in channel and drain return efficiencies. To mitigate the effects of sediment on water delivery and flood control, the United States Section of the International Boundary and Water Commission (USIBWC) embarked in the Rio Grande Canalization Project (RGCP) and in 2015 completed a channel maintenance alternatives and sediment transport study that determined an average annual inflow of 400,000 cubic yards of sediment between Caballo Reservoir and American Dam (IBWC 2015). In 2019, the USIBWC contracted the removal of approximately 1,188,000 cubic yards of sediment from the Rio Grande (IBWC 2020).

The USIBWC sediment removal work occurs north of the American Dam and American Canal, where EPCWID1 receives its water supply from the Rio Grande. Two Implementation Watersheds (Vado Arroyo and Picacho Drain) located upstream of the American Dam are listed in the 2020 USDA NRCS National Water Quality Initiative (NWQI) Watersheds and Source Water Protection Areas for high sediment runoff into the Rio Grande (USDA NRCS 2019). EPCWID1 already supports the operations of a sediment basin near American Dam. Sediment is carried approximately 8 miles from the heading of the Riverside Canal to the proposed project length. The creation of a settling basin is necessary to manage sediment, and the selected site is ideal for this purpose.

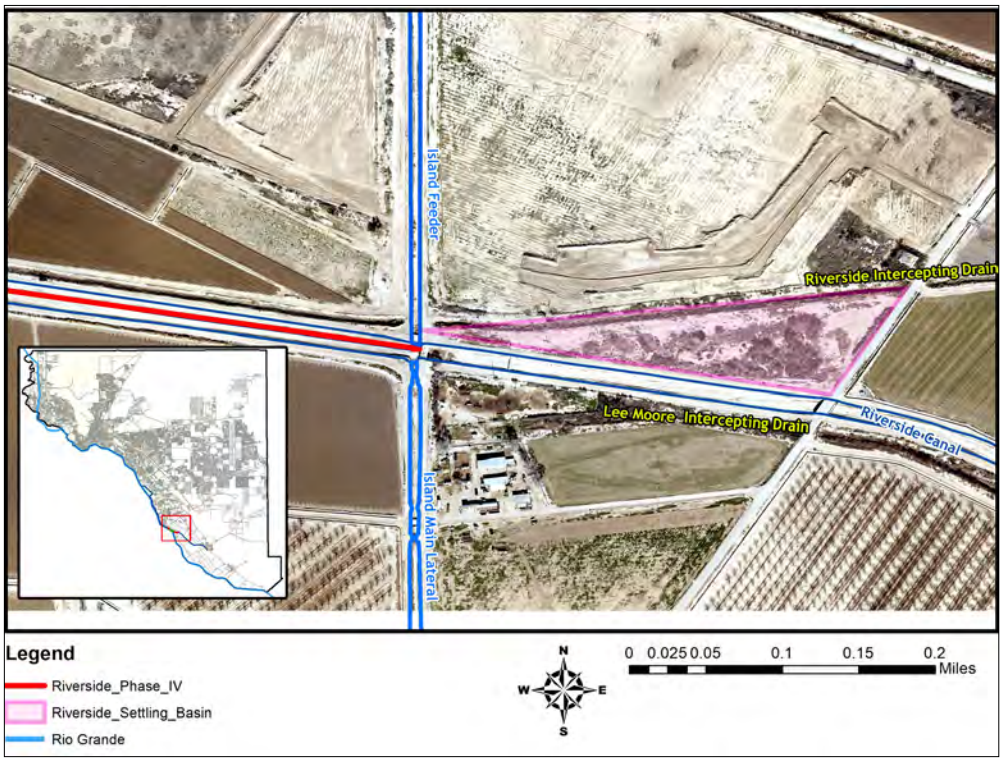


Figure 18. Future Site of Riverside Canal Settling Basin

d. Will the project help to prevent water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?

The El Paso region faces unique water challenges characterized by an agricultural system that is a century old, prolonged drought conditions, dwindling and limited water supplies, a growing population and a growing sister city in Mexico with shared groundwater and surface water supplies, interstate and international treaties, and interstate litigation that may impact the EPCWID1's water supply from the Rio Grande. EPCWID1 is located in an area considered to be of "Substantial Potential for Conflict" as defined in the U.S. Bureau of Reclamation's Technical Memorandum 86-68251-11-01 (2011). As previously stated, EPCWID1 is involved in the Texas v New Mexico and Colorado Supreme Court litigation regarding the Rio Grande Compact. At the center of this litigation are conditions established by the 2008 Operating Agreement which were negotiated by the District, Elephant Butte Irrigation District in New Mexico, and Reclamation.

The proposed project will increase the efficiency of EPCWID1's distribution system and conserve water. The 2008 Operating Agreement introduced the option for EPCWID1 to carry over a maximum of 232,915 feet, equivalent to 60% of EPCWID1's full yearly allocation. This is a significant conservation incentive, and as irrigation water demand is met by a more efficient system, EPCWID1 can better manage its allocation of Rio Grande Project water and allow more storage in Elephant Butte and Caballo Reservoirs to accumulate and provide critical water in drought years when unmet water demands are highest.

D. Evaluation Criterion D: Complementing On-Farm Irrigation Improvements (10 Points)

If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:

Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.

- *Provide a detailed description of the on-farm efficiency improvements.*

EPCWID1 has a history of collaboration with the Natural Resources Conservation Service (NRCS) program and periodically hosts local work group management meetings at the District offices. The Environmental Quality Incentives Program (EQIP) 2020 El Paso District Priorities include practices that can enhance water availability and efficient irrigation systems.

Cropland Priority 1	**Excess/Insufficient Water - Inefficient use of irrigation water**
Irrigated Cropland Priority 1	**Excess/Insufficient Water - Inefficient use of irrigation water**

The proposed project advances NRCS priorities by conserving water and improving efficiency. In addition to conserving water, the proposed project will reduce sediment levels and decrease maintenance costs for agricultural acreage that receives water via the Riverside Canal. Previous concrete lining projects performed by EPCWID1 facilitated NRCS EQIP-eligible improvements such as the installation of turnout flow meters, the concrete lining of private irrigation ditches, and installing low-cost, on-farm soil moisture sensors.

Figure 19 below illustrates part of the agricultural operations of the Ysleta del Sur Pueblo, a federally-recognized tribe. The photo shows an irrigation ditch where Rio Grande Project water diverted from the Riverside Canal is blended with groundwater from a well. A high tunnel and other structures at this site were constructed using NRCS EQIP funding (USDA NRCS 2015a; USDA NRCS 2015b; USDA NRCS 2015c).

Figure 19. Agricultural Operations of YDSP as seen from Riverside Intercepting Drain

- *Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?*

On May 11, 2021, EPCWID1 informed the office of the local NRCS District Conservationist of the Riverside Canal Concrete Lining Project: Phase IV. NRCS partners with the El Paso-Hudspeth Soil and Water Conservation District (SWCD) to provide technical and financial assistance to local farmers for the implementation of on-farm efficiency projects. The SWCD contacted agricultural producers that receive water via the Riverside Canal of the proposed concrete lining construction and USDA and Reclamation's partnership.

As previously stated, lining projects performed by EPCWID1 facilitated NRCS EQIP-eligible improvements such as the installation of turnout flow meters, the concrete lining of private irrigation ditches, and installing low-cost, on-farm soil moisture sensors. These types of improvements may not be currently feasible due to sediment levels at the Riverside Canal, as sediment can affect the accuracy of meter sensors and cause rapid wear and tear.

- *If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.*

Due to prolonged drought conditions and COVID-19 restrictions, EPCWID1 was not successful in obtaining documentation from any upcoming NRCS EQIP projects impacted by the Riverside Canal Concrete Lining Project: Phase IV. According to the USDA NRCS El Paso Office, the demand for NRCS EQIP projects is linked to drought and available Rio Grande Project water supplies. Farmer production and revenues decrease as drought forces farmers to fallow or deficit irrigate their agricultural acreage. This makes water conservation investments that are partially funded by EQIP less viable compared to non-drought periods.

- *Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*

No letters of intent were secured primarily due to local COVID-19 restrictions.

Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.

- Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how?

As previously stated, lining projects performed by EPCWID1 facilitated NRCS EQIP-eligible improvements such as the installation of turnout flow meters, the concrete lining of private irrigation ditches, and installing low-cost, on-farm soil moisture sensors. These types of improvements may not be currently feasible due to sediment levels at the Riverside Canal, as sediment can affect the accuracy of meter sensors and cause rapid wear and tear.

- Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?

The proposed project advances NRCS priorities by conserving water and improving efficiency. In addition to conserving water, the proposed project will reduce sediment levels and decrease maintenance costs for agricultural acreage that receives water via the Riverside Canal.

Describe the on-farm water conservation or water use efficiency benefits that are expected to result from any on-farm work.

- Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.

No water savings data is available at this time.

Please provide a map of your water service area boundaries. If your project is selected for funding under this funding opportunity, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.

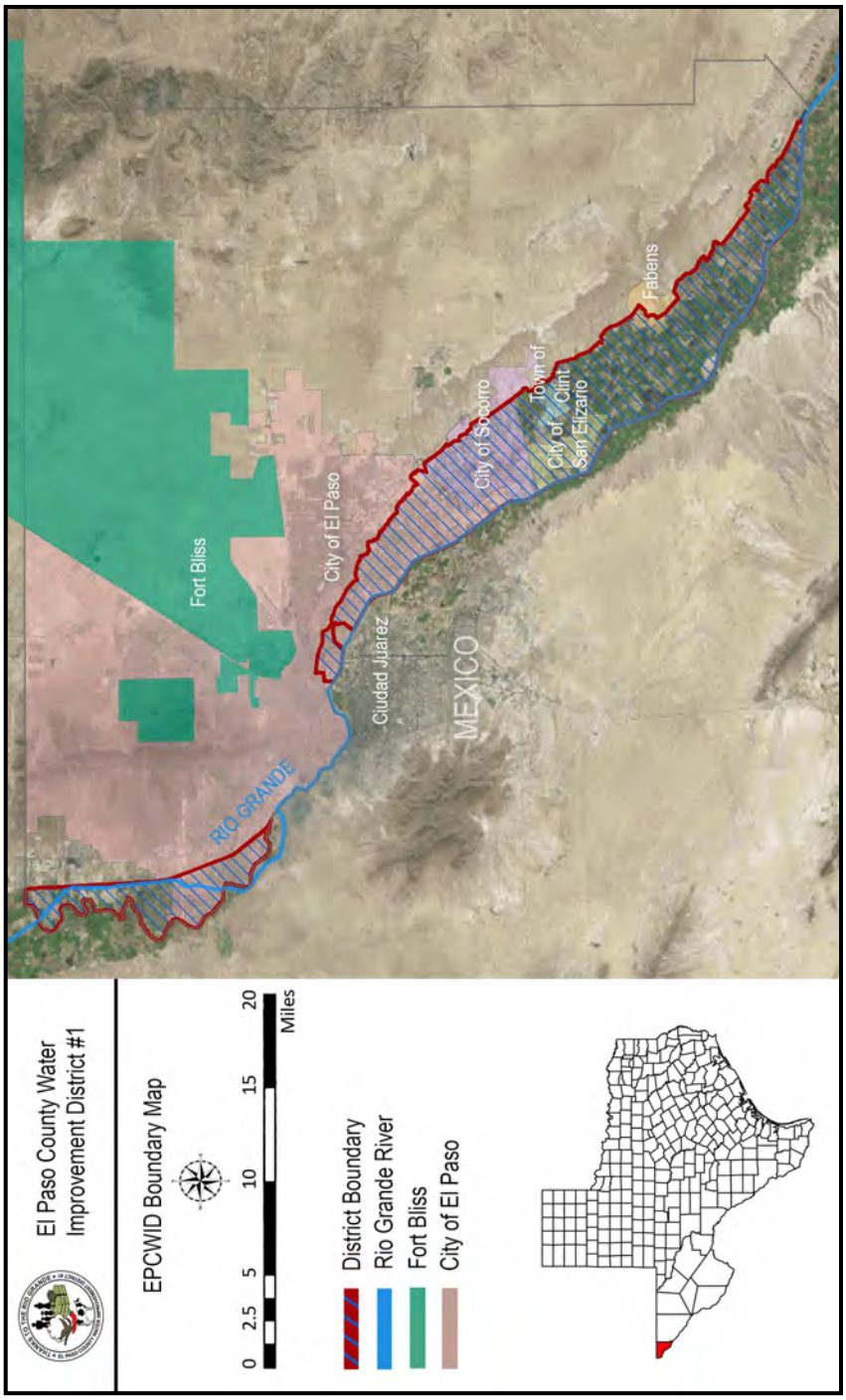


Figure 20. EPCWID1 Jurisdictional Boundaries Map

E. Evaluation Criterion E: Planning and Implementation (8 Points)

Subcriterion E.1. Project Planning
Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study?

Please self-certify or provide copies of these plans where appropriate to verify that such a plan is in place. Including a specific excerpt or a link to the planning document may also be considered where appropriate.

The District Board of Directors approved an update to the District's Water Conservation Plan (WCP) in 2019 and the WCP is available for reference at https://www.epcwid1.org. The WCP incorporates findings from an internal System Optimization Review (SOR) and prioritizes conservation and efficiency projects.

Provide the following information regarding project planning:

(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan, or other planning efforts done to determine the priority of this project in relation to other potential projects.

2022 Texas State Water Plan and 2021 Far West Texas Water Plan

The Riverside Canal Concrete Lining Project is listed under Water Management Strategy (WMS) E-37 in the 2022 Texas State Water Plan. The State Water Plan is developed at the state level by the Texas Water Development Board (TWDB) with input from local water users and historical water use data. Improvements in EPCWID1's delivery system in WMS E-37 are estimated to conserve an aggregated 25,000 acre-feet of water per year. The proposed project is also included as part of a Recommended Water Management Strategy in the state-approved 2021 Region E Far West Texas Water Plan, which is developed by the Far West Texas Water Planning Group (FWTWPG). Projects prioritized in these water plans are eligible for state funding from the TWDB. A Letter of Support from the Texas Water Development Board with additional details is included in Appendix A.

2021 Far West Texas Regional Water Plan (Page 11-18)
http://westtexaswaterplanning.org/wp-content/uploads/2020/11/2021-Far-West-Texas-Water-Plan.pdf

2022 Texas State Water Plan (Interactive)
https://2022.texasstatewaterplan.org/project/1777

2019 EPCWID1 Water Conservation Plan
The proposed lining of the Riverside Canal is a planned conservation and efficiency improvement included in the EPCWID1's Water Conservation Plan (WCP). EPCWID1 has partnered with the Texas Water Development Board, the U.S. Bureau of Reclamation, the International Boundary and Water Commission (IBWC) and other local entities to cost-share

many of its water conservation and drought mitigation projects. Select projects are listed in Table 2:

Table 2. Select Water Conservation Projects Prioritized in Internal SOR

Project	Date Start	Date End	Estimated Costs ($)	*ac-ft/yr	Status
Riverside Canal Lining Phase IA	2014	2016	$612,000	758	Completed
Riverside Canal Lining Phase II	2019	2021	$2,302,500	2,639	Completed
Riverside Canal Lining Phase IB	2015	2016	$550,000	621	Completed
Riverside Canal Lining Phase III	2020	2023	$2,039,504	1,770	In Progress
Riverside Canal Lining Phase IV	**2023**	**2025**	**$2,002,417**	**1,145**	**Funding Req.**
Riverside Canal Lining Phases V-VI	2025	2028	$10,600,000	4,842	Engineering
Franklin Canal Lining Phase I	2017	2020	$5,223,316	874	Completed
Franklin Canal Lining Phase II	2022	2025	$4,002,417	568	Funding Req.
Franklin Feeder Lining Project Phase 2	2019	2021	$1,113,360	376	In Progress
La Union East Canal Lining	2019	2022	$925,298	231	In Progress
Telemetry / Well Meter / GIS Upgrades	2018	2021	$275,000	120	In Progress

*Water conservation estimates may vary by year, use, allocation, and water supply availability

(2) Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).

The project was selected based on its water conservation potential, expected return on conservation investment, and overall contribution to WMS E-37. Concrete lining the Riverside Canal will complete one of the projects listed in EPCWID1's 2019 Water Conservation Plan and advance Water Management Strategy E-37 in the 2022 Texas State Water Plan.

The method for determining the project return on conservation investment is calculated via:

*Total project cost / (annual water savings * life expectancy) = return on conservation investment*
$2,048,785 / (1,145 acre-feet per year * 50 years) = $35.7866 → $35.79

(3) If applicable, provide a detailed description of how a project is addressing an adaptation strategy specifically identified in a completed WaterSMART Basin Study or Water Management Options Pilot (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes).

The Riverside Canal Concrete Lining Project: Phase IV is aligned with priorities outlined in Reclamation's Rio Grande Basin SECURE Water Act Section 9503(c) Report to Congress, which states: "For the next steps in the Rio Grande Basin, Reclamation has projects in progress to increase water conservation and efficiency…including addressing aging infrastructure."

(USBR 2021, p. 39). Canal concrete lining is one of the most effective strategies available to the El Paso region necessary to mitigate the current and future impacts of water shortages resulting from drought.

Subcriterion E.2. Readiness to Proceed
Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.

- *Identify and provide a summary description of the major tasks necessary to complete the project.*

Task 1: Complete Environmental and Cultural Compliance
Environmental and regulatory compliance work is expected to begin in August of 2022. It is expected that completing a Categorical Exclusion Checklist will be sufficient to meet environmental compliance requirements. EPCWID1 will work with the Texas Historical Commission to ensure cultural and historical compliance requirements are met. EPCWID1 will complete Clean Water Act (CWA) compliance, which includes developing a Stormwater Pollution Prevention Plan (SWPPP) and submitting a TXR150000 General Permit request with the Texas Commission on Environmental Quality (TCEQ). Additional information about cultural and historical resource compliance necessary for the proposed project is available in Section VII Environmental and Cultural Compliance.

Task 2: Fleet Mobilization
EPCWID1 owns all the equipment that will be used for project construction. Fleet mobilization involves documenting equipment work hours, designating and transporting construction equipment to the project site, assigning personnel to equipment, and performing regular equipment maintenance. EPCWID1 will mobilize and demobilize equipment as needed during the three-year construction period.

Task 3: Begin Construction
All construction work will begin at the end of the irrigation season, which is normally from October 15 to April 15. It is expected that initial earthwork and canal shaping will begin on October of 2022. EPCWID1 will monitor market conditions to procure the best prices possible for shotcrete and steel panel formwork.

Task 4: Concrete Lining Construction (50%)
The second phase of construction will begin on October 2023 and end in March 2024. This schedule assumes a 6-month construction period between irrigation seasons. EPCWID1 will procure materials necessary to complete the project in full and expects to complete 3,350 feet of concrete lining.

Task 5: Concrete Lining Construction (100%)
The second phase of construction will begin on October 2024 and end in May 2025. This schedule assumes an 8-month construction period between irrigation seasons. EPCWID1 expects

to complete 3,350 feet of concrete lining and complete final earthwork and compaction. Equipment will be demobilized at the end of construction.

Task 6: Grant Administration and Project Closing
Grant administration and reporting will begin as soon as EPCWID1 receives notice of a funding award from Reclamation. EPCWID1 has experience in developing and implementing grant award funding and project contracts with Reclamation and expects to complete this process by August of 2022 or earlier. Periodic and final reporting work will be performed throughout the project and all reporting will be completed by June of 2025 or earlier. EPCWID1 will also host multiple site visits from Reclamation staff.

EPCWID1 will perform a post-construction inflow-outflow analysis using existing telemetry at Riverside Wasteway II and the Riverside Canal at the Island Main Lateral heading. This step is necessary to measure proposed project performance measures and was used as part of the Riverside Canal Concrete Lining: Phase II (Agreement No. R18AP00193 with Reclamation).

A final report will be produced that meets specifications outlined in an agreement with Reclamation. EPCWID1 has developed and submitted Final Reports for multiple agreements with Reclamation and staff is familiar with Reclamation's grant and project closing procedures.

- *Describe any permits that will be required, along with the process for obtaining such permits.*

The project activities will be confined to EPCWID1's right-of-way and property. No other permits or approvals will be necessary for the project as proposed.

- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*

Survey, engineering design, and preliminary environmental work was completed as part of a grant-awarded project by the Texas Water Development Board (TWDB) 2018 Agricultural Water Conservation Grant program. A letter of support from the TWDB is included in Appendix B with additional details. Engineering drawings and specifications for the proposed project are available in Appendix D. An Environmental Summary is available in Appendix E.

- *Describe any new policies or administrative actions required to implement the project.*

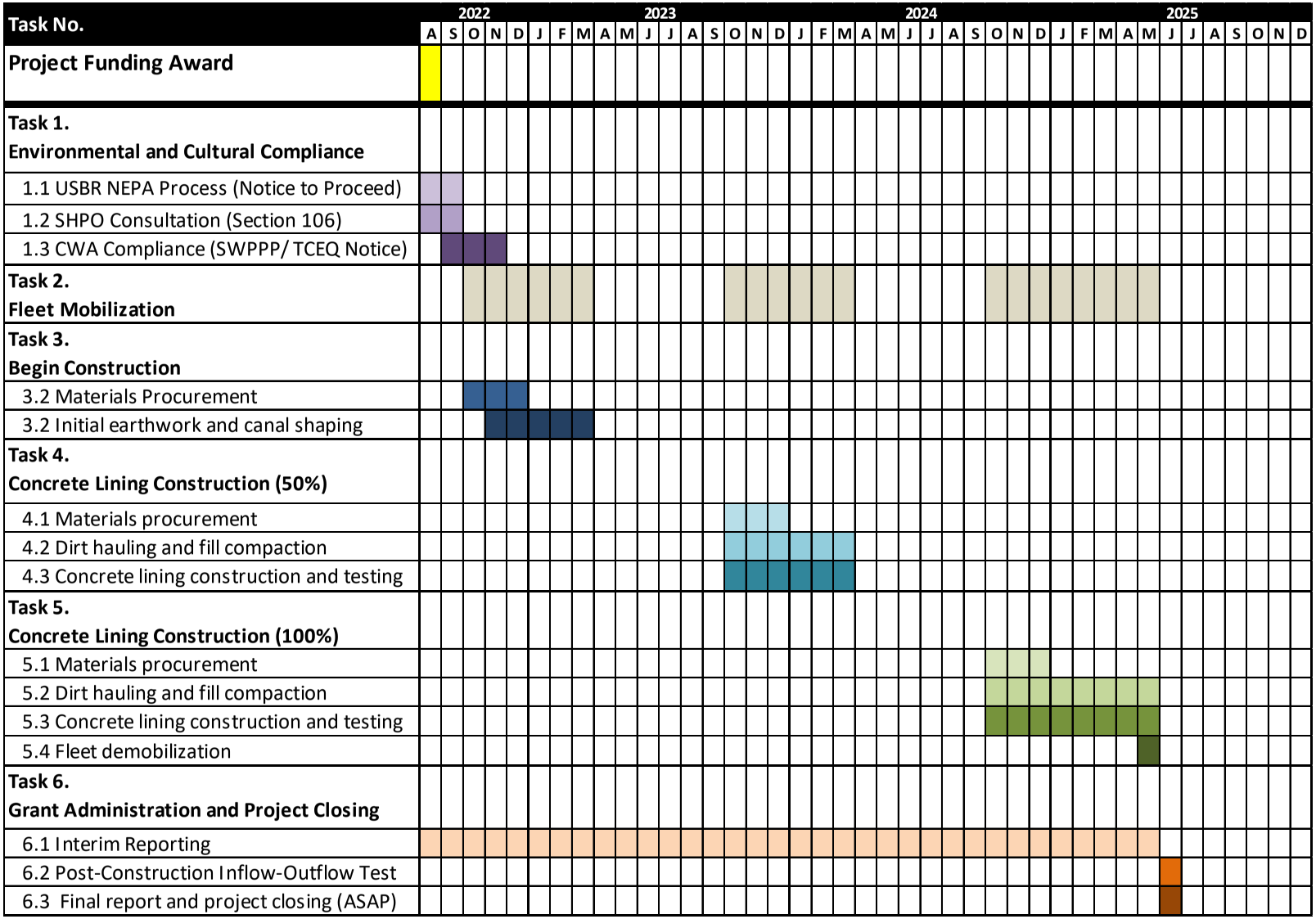
No new policies or administrative actions are required to implement the proposed project.

- *Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.*

Table 3. Estimated Project Task Schedule

Task	Estimated Start Date	Estimated End Date
1. Environmental and Regulatory Compliance	**Aug 2022**	**Nov 2022**
1.1 Categorical Exclusion Checklist (USBR)	Aug 2022	Sept 2022
1.2 Cultural Compliance (Section 106)	Aug 2022	Sept 2022
1.3 Clean Water Act Compliance (SWPPP / TCEQ Notice)	Sep 2022	Nov 2022
2. Fleet Mobilization	**Oct 2022**	**Dec 2022**
3. Begin Construction	**Oct 2022**	**Mar 2023**
3.1 Materials procurement	Oct 2022	Dec 2022
3.2 Initial earthwork, canal shaping, and dirt hauling	Nov 2022	Mar 2023
4. Concrete Lining Construction (50%)	**Oct 2023**	**Mar 2024**
4.1 Materials procurement	Oct 2023	Dec 2023
4.2 Dirt hauling and fill compaction	Oct 2023	Mar 2024
4.3 Concrete lining construction and testing	Oct 2023	Mar 2024
5. Concrete Lining Construction (100%)	**Oct 2024**	**May 2025**
5.1 Materials procurement	Oct 2024	Dec 2024
5.2 Dirt hauling and fill compaction	Oct 2024	May 2025
5.3 Concrete lining construction and testing	Oct 2024	May 2025
5.4 Fleet demobilization	May 2025	May 2025
6. Grant Administration and Project Closing	**Aug 2022**	**July 2025**
6.1 Performance and Financial (SF-425) Interim Reporting	Aug 2022	July 2025
6.2 Post-Construction Inflow-Outflow Test	June 2025	June 2025
6.3 Final report and project closing (ASAP)	June 2025	July 2025

Table 4. Estimated Project Timeline



F. Evaluation Criterion F: Collaboration (6 Points)

Please describe how the project promotes and encourages collaboration. Consider the following:

- *Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?*

The following stakeholders issued statements of support for the Riverside Canal Concrete Lining Project (by phase):

Table 5. Supporting Stakeholders for the Riverside Canal Concrete Lining Project

Phase	Stakeholder	Description
Phase II	Far West Texas Water Planning Group	Developed Water Management Strategy E-37 in the 2022 Texas State Water Plan in support of the project (WMS-E45 in previous state water plan).
Phase II	Congressman Beto O'Rourke (USTX-016)	No longer in office.
Phase II	Congressman Will Hurd (USTX-023)	No longer in office.
Phase III	Texas Water Development Board	Funded engineering design.
Phase III	Congresswoman Veronica Escobar (USTX-016)	General endorsement
Phase III	City of Socorro, Texas	General endorsement
Phase III	Congressman Will Hurd (USTX-023)	No longer in office.
Phase IV	Texas Water Development Board	Funded engineering design.
Phase IV	Congressman Tony Gonzales (USTX-023)	General endorsement (pending)

- *What is the significance of the collaboration / support?*

EPCWID1 generally does not request repeat statements of support for project phases. However, the continued involvement of the Texas Water Development Board (TWDB) and members of congress has been essential in ensuring the success of the project. The TWDB funded the project engineering design as part of their Agricultural Water Conservation Grants program in 2018. The final design met both state and federal environmental and engineering standards (see Appendices D and E). Members of congress facilitated conversations with U.S. Customs and Border Protection (CBP) to ensure that concrete lining work met the needs of both EPCWID1, CBP operations, and future modifications to the U.S.-Mexico Border Fence.

- *Will this project increase the possibility/likelihood of future water conservation improvements by other water users?*

Water conservation improvements by other water users are being developed concurrently with the different phases of the Riverside Canal Concrete Lining Project. For example, the U.S. Section of the International Boundary and Water Commission (USIBWC) invested funds to reconstruction Riverside Canal Wasteway II and Check Structure for both flood mitigation (primary) and water conservation (avoiding leakage). The Texas Water Development Board (TWDB) funded the engineering design that allowed changes to the specifications of the waste structure to reduce sediment buildup and eliminate spills (see letter of support in Appendix A). This was beyond what the USIBWC originally intended but conceded due to its synergistic benefits. The proposed Riverside Canal Concrete Lining Project: Phase IV will line sections upstream and downstream from the Wasteway II structure.

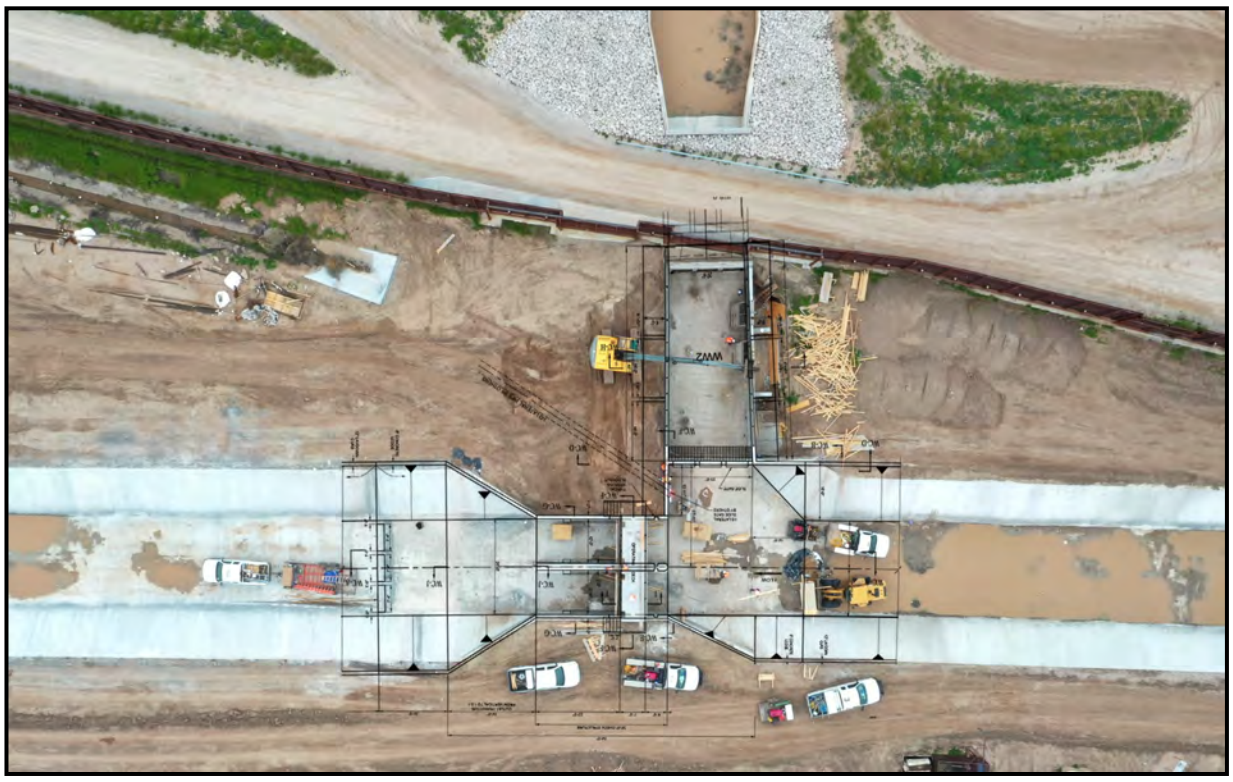


Figure 21. Riverside Canal Wasteway II and Check Structure Design and Construction

- *Please attach any relevant supporting documents.*

Please refer to statements of support included in Appendix A.

G. Evaluation Criterion G: Additional Non-Federal Funding (4 Points)

Non-Federal Funding	$1,048,785	=	51 %
Federal Funding	$1,000,000	=	49 %
Total Project Cost	$2,048,785		100 %

H. Evaluation Criterion H: Nexus to Reclamation (4 Points)

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider the following:

- *Does the applicant have a water service, repayment, or O&M contract with Reclamation?*

EPCWID1 obtains water by annual allocation from the United States Bureau of Reclamation's Rio Grande Project.

- *Will the proposed work benefit a Reclamation project area or activity?*

The proposed project lies within the Rio Grande Basin and is part of Reclamation's Rio Grande Project.

- *Is the applicant a Tribe?*

EPCWID1 is not a tribe. Water conserved as a result of the proposed project will benefit all Rio Grande Project water served by EPCWID1, including the Ysleta del Sur Pueblo, a federally recognized tribe. EPCWID1 delivers water to the Ysleta del Sur Pueblo Reservation for agriculture and for two of the Ysleta del Sur Pueblo's most important ceremonial processions: *St. Anthony of Padua Feast Day* and *Dia de Los Santos Reyes*.

V PERFORMANCE MEASURES

EPCWID1 proposes performance measures that are similar to Phase II and Phase III of the Riverside Canal Concrete Lining Project (R18AP00193 and R20AP00056, respectively).

Period of Performance

A. EPCWID1 will complete construction from August 2022 to June 2025 (35 months)

Scope of Work and Administration

A. EPCWID1 will concrete line 7,700 feet of the Riverside Canal
B. EPCWID1 will ensure all environmental and cultural compliance requirements are met
C. EPCWID1 will ensure the project follows requirements in 2 CFR Part 200
D. EPCWID1 will ensure the project complies with applicable local, state, and federal laws
E. EPCWID1 will submit semi-annual performance and financial reports
F. EPCWID1 will work with designated USBR staff that will oversee the project

Water Savings

Project improvements are expected to result in annual water savings of 1,145 acre-feet.

A. EPCWID1 will perform a post-construction inflow-outflow test to verify water savings

> *Estimated water lost to seepage – post-construction losses = total annual water savings*
> **1,230 af/y – 85 af/y = 1,145 acre-feet per year**
> **EPCWID1 will perform an inflow-outflow test using existing telemetry installations to verify estimated post-construction seepage losses.**

B. EPCWID1 will monitor concrete lining construction to identify any faults and cracks where additional water losses can occur
C. EPCWID1 will include all findings as part of the project Final Report

VI PROJECT BUDGET

A. Funding Plan and Letters of Commitment

How will you make your contribution to the cost-share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant.

EPCWID1 has sufficient revenues to provide a 51.19% cost share for the project. EPCWID1's funding commitment was established via Resolution from the District Board of Directors and is available for reference in Appendix B.

The proposed project includes budgeted costs that are representative of actual construction costs for concrete lining projects and are similar in scope to the proposed project (R18AP00193 and R20AP00056). Specifically, unit rates and quantities used in multiple contracts with Reclamation are used as a basis for cost estimates. EPCWID1 staff is familiar with the budget revision and justification process that is part of an award contract with Reclamation and the subsequent reporting requirements necessary for cost reimbursement and the closing of the contract.

Describe any donations or in-kind costs incurred before the anticipated project start date that you seek to include as project costs.

There are no donations or in-kind costs incurred before the project start date that are included as part of the proposed budget.

B. Budget Proposal

Table 6. Total Project Cost Table

FUNDING SOURCES	AMOUNT
Cost to be reimbursed with the requested Federal funding	$ 1,000,000
Cost to be paid by the applicant (EPCWID#1)	$ 1,048,785
Value of third party contributions	-
TOTAL PROJECT COSTS	**$ 2,048,785**

Table 7. Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION			Quantity Type	EPCWID1 Funding	Reclamation Funding	TOTAL COST
	$/unit		Qty				
Salaries and Wages							
Maintenance Manager	$59.60	/hour	200	Labor	$ 11,919	$ -	$ 11,919
Maintenance Supervisor	$30.44	/hour	1800	Labor	$ 54,786	$ -	$ 54,786
Maintenance Supervisor	$28.12	/hour	1800	Labor	$ 50,614	$ -	$ 50,614
Equipment Operator I / Labor	$13.39	/hour	900	Labor	$ 12,051	$ -	$ 12,051
Equipment Operator I / Labor	$14.35	/hour	900	Labor	$ 12,913	$ -	$ 12,913
Equipment Operator I / Labor	$14.35	/hour	900	Labor	$ 12,913	$ -	$ 12,913
Equipment Operator I / Labor	$14.21	/hour	900	Labor	$ 12,793	$ -	$ 12,793
Equipment Operator I / Labor	$14.65	/hour	900	Labor	$ 13,182	$ -	$ 13,182
Equipment Operator I / Labor	$14.84	/hour	900	Labor	$ 13,358	$ -	$ 13,358
Equipment Operator I / Labor	$14.87	/hour	900	Labor	$ 13,386	$ -	$ 13,386
Equipment Operator II	$18.65	/hour	900	Labor	$ 16,788	$ -	$ 16,788
Equipment Operator II	$22.53	/hour	900	Labor	$ 20,273	$ -	$ 20,273
Equipment Operator II	$23.64	/hour	900	Labor	$ 21,275	$ -	$ 21,275
Equipment Operator III	$20.88	/hour	900	Labor	$ 18,790	$ -	$ 18,790
Equipment Operator III (2)	$24.83	/hour	900	Labor	$ 22,350	$ -	$ 22,350
Welder	$23.76	/hour	300	Labor	$ 7,129	$ -	$ 7,129
						Subtotal	**$ 314,520**
Fringe Benefits (Actual Rates 2021)							
Maintenance Manager	$16.20	/hour	200	Labor	$ 3,240	$ -	$ 3,240
Maintenance Supervisor	$6.03	/hour	1800	Labor	$ 10,860	$ -	$ 10,860
Maintenance Supervisor	$5.45	/hour	1800	Labor	$ 9,803	$ -	$ 9,803
Equipment Operator I / Labor	$7.87	/hour	900	Labor	$ 7,086	$ -	$ 7,086
Equipment Operator I / Labor	$3.94	/hour	900	Labor	$ 3,546	$ -	$ 3,546
Equipment Operator I / Labor	$3.94	/hour	900	Labor	$ 3,546	$ -	$ 3,546
Equipment Operator I / Labor	$3.95	/hour	900	Labor	$ 3,555	$ -	$ 3,555
Equipment Operator I / Labor	$4.21	/hour	900	Labor	$ 3,789	$ -	$ 3,789
Equipment Operator I / Labor	$4.29	/hour	900	Labor	$ 3,861	$ -	$ 3,861
Equipment Operator I / Labor	$4.31	/hour	900	Labor	$ 3,879	$ -	$ 3,879
Equipment Operator II	$4.16	/hour	900	Labor	$ 3,748	$ -	$ 3,748
Equipment Operator II	$5.13	/hour	900	Labor	$ 4,619	$ -	$ 4,619
Equipment Operator II	$5.15	/hour	900	Labor	$ 4,633	$ -	$ 4,633
Equipment Operator III	$6.62	/hour	900	Labor	$ 5,957	$ -	$ 5,957
Equipment Operator III (2)	$5.54	/hour	900	Labor	$ 4,987	$ -	$ 4,987
Welder	$6.95	/hour	300	Labor	$ 2,086	$ -	$ 2,086
						Subtotal	**$ 79,195**

BUDGET ITEM DESCRIPTION	COMPUTATION			Quantity	EPCWID1	Reclamation	TOTAL
	$/unit		Qty	Type	Funding	Funding	COST
Equipment (Rates from 2018 US-ACE USACE EP1110-1-8 District VI Expense Schedule)							
Pickup (5)	$18.16	/hour	3200	Equipment	$ 58,112	$ -	$ 58,112
Dump Truck (4) (12/15 CY)	$28.73	/hour	1200	Equipment	$ 34,476	$ -	$ 34,476
Dump Truck (6) (6 CY)	$22.74	/hour	1200	Equipment	$ 27,288	$ -	$ 27,288
Excavator 1	$44.51	/hour	650	Equipment	$ 28,932	$ -	$ 28,932
Excavator 2	$44.51	/hour	650	Equipment	$ 28,932	$ -	$ 28,932
Excavator 3	$53.91	/hour	650	Equipment	$ 35,042	$ -	$ 35,042
Excavator 4	$53.91	/hour	650	Equipment	$ 35,042	$ -	$ 35,042
Welding Rig (2)	$4.82	/hour	900	Equipment	$ 4,338	$ -	$ 4,338
Dozer	$37.95	/hour	500	Equipment	$ 18,975	$ -	$ 18,975
Grader	$48.77	/hour	500	Equipment	$ 24,385	$ -	$ 24,385
Sheeps Foot Roller	$65.20	/hour	500	Equipment	$ 32,600	$ -	$ 32,600
Water Truck (2)	$41.43	/hour	1200	Equipment	$ 49,716	$ -	$ 49,716
Rubber Tire Excavator	$50.36	/hour	500	Equipment	$ 25,180	$ -	$ 25,180
Steel Roller Compactor	$43.23	/hour	500	Equipment	$ 21,615	$ -	$ 21,615
Loader	$36.72	/hour	500	Equipment	$ 18,360	$ -	$ 18,360
Shotcrete Machine (2)	$20.66	/hour	900	Equipment	$ 18,594	$ -	$ 18,594
Compressor (2)	$9.69	/hour	900	Equipment	$ 8,721	$ -	$ 8,721
Telescopic Boom 1	$78.31	/hour	500	Equipment	$ 39,155	$ -	$ 39,155
Telescopic Boom 2	$45.53	/hour	800	Equipment	$ 36,424	$ -	$ 36,424
						Subtotal	**$ 545,885**
Supplies and Materials							
Concrete 4000 psi	$115.00	/cy	5661	cubic yards	$ 53,285	$ 597,730	$ 651,015
Curing Compound	$6.20	/gal	2264	gallons	$ -	$ 14,037	$ 14,037
Steel Panel Formwork	$45.68	/lf	7700	linear feet	$ -	$ 351,736	$ 351,736
GeoFabric	$0.08	/sf	354200	square feet	$ -	$ 28,336	$ 28,336
Waddle Pins	$0.31	/ea	23100	each	$ -	$ 7,161	$ 7,161
						Subtotal	**$ 1,052,285**
Contractual Engineering / Construction							
Field Engineering	$200.00	/hr	70	Hours	$ 14,000	$ -	$ 14,000
Construction Services Geotechnical and Lab	$450.00	Test	50	Tests	$ 22,500	$ -	$ 22,500
Construction Services Geotechnical Density	$50.00	Test	100	Tests	$ 5,000	$ -	$ 5,000
QA/QC Monitoring	$120.00	/hr	120	Hours	$ 14,400	$ -	$ 14,400
						Subtotal	**$ 55,900**
Other							
NEPA CEC (USBR)	$25.00	/hr	40	Other	$ -	$ 1,000	$ 1,000
						Subtotal	**$ 1,000**
TOTAL ESTIMATED PROJECT COSTS					**$ 1,048,785**	**$ 1,000,000**	**$ 2,048,785**

C. Budget Narrative

Salaries and Wages (in-kind)
The following District personnel will be involved in this project. The perspective roles and value of their in-kind services is described as follows:

Pete Rodriguez is the District Maintenance Manager and has successfully led the construction of dozens of EPCWID1 canal concrete lining projects, including projects funded by Reclamation. Mr. Rodriguez will be responsible for the oversight of all construction work personnel, project management tasks, planning and coordination, quality control, and cost and equipment use reporting. It is expected that Mr. Rodriguez will contribute 200 salaried hours to the project at a rate of $59.60.

Maintenance Supervisors are responsible for project supervision, quality control, safety, operating of equipment, other labor contributions to construction work, and generating cost and use data necessary for reporting. The Maintenance Supervisor (1) will contribute 1800 hours to the project at a rate of $30.44. The Maintenance Supervisor (2) will contribute 1800 hours to the project at a rate of $28.12. Maintenance Supervisors are salaried and have ample experience with concrete lining construction, including for projects funded by Reclamation.

Equipment Operators I / Ditchriders are responsible for the operation of construction equipment (light) and various manual labor tasks necessary for the completion of concrete lining construction. Equipment Operators I are generally deployed as a team and have similar start and end work periods. EPCWID1 employees classified as Equipment Operators I are not salaried, their hourly wages are in full compliance with the Davis-Bacon Act and local prevailing wages, and will be paid for any overtime.

The Equipment Operators II are responsible for the operation of construction equipment (medium and heavy) and various manual labor tasks necessary for the completion of concrete lining construction. EPCWID1 employees classified as Equipment Operators II are not salaried, their hourly wages are in full compliance with the Davis-Bacon Act and local prevailing wages, and will be paid for any overtime. Equipment Operators II have experience with concrete lining construction, including projects funded by Reclamation.

The Equipment Operators III are responsible for the operation of construction equipment (medium and heavy) and various manual labor tasks necessary for the completion of Task 2: Concrete Lining Construction. EPCWID1 employees classified as Equipment Operators III are not salaried, their hourly wages are in full compliance with the Davis-Bacon Act and local prevailing wages, and will be paid for any overtime. Equipment Operators III have ample experience with concrete lining construction, including projects funded by Reclamation.

The Welder will be responsible for metalwork necessary for the completion of concrete lining construction. This includes cutting steel panel framework on-site and other rebar reinforcement. The Welder is paid hourly, will be paid for any overtime, and the wages paid are in full compliance with the Davis-Bacon Act and local prevailing wages. The Welder will contribute 800 hours to the project at a rate of $23.76.

Fringe Benefits (in-kind)
The in-kind fringe benefits EPCWID1personnel involved in this project were computed on a "Fringe" basis and were derived by subtracting the hourly salary rate for designated EPCWID1 personnel from the loaded value per hour. EPCWID1 average fringe benefit rate is 28%. Actual fringe benefit costs per employee will be determined pursuant to an award contract with Reclamation.

Certification of Labor Rates
The labor rates of identified personnel included herein are representative of the actual labor rates of personnel bearing the same title. Additional verification per employee assigned to the project is available as needed pursuant to an award contract with Reclamation.

Travel
No travel costs are included in the proposed budget.

Equipment
EPCWID1 owns all of the equipment that will be used in the proposed project. EPCWID1 is proposing to use equipment hourly usage time estimates that are based on similar concrete lining projects, including Agreements No. R18AP100193, R18AP00261, R19AP00150, R20AP00046, and R20AP00155 with Reclamation. The proposed usage cost rates are based on costs outlined by the United States Army Corps of Engineers (USACE) Construction Equipment Ownership and Operating Expense Schedule (EP1110-1-8) for District VI, which includes the State of Texas. There have been no updates to EP1110-1-8 since 2018. Equipment cost rates used in the aforementioned contracts with Reclamation can be referenced in Table 8.

Table 8. Proposed Equipment Rates (EP1110-1-8, Most Recently Published in 2018)

EP1110-1-8 Equipment (2018)	Category Number	EP1110-1-8 ID No	Page No.	Horsepower/ Specification	District Vehicle	Year	EP11101-1-8 Rates (average hr)	DEPR	FCCM	Ownership Rate (DEPR+FCCM)	Age Mult	Adjusted Ownership Rate	(Final) Adjusted Hourly
Pickup (x5)	T50	T50XX004	231	4x4, 1/2 ton, gas pickup	F-350 / 2500 HD	Varies	$21.71	$3.34	$0.45	$3.79	1	$3.79	**$21.71**
Dump Truck 1	T50	T50XX032	232	10-13 CY Dump	2017 PETERBILT 348 T-10 (12/15 YD Dump)	2017	$30.52	$7.03	$1.18	$8.21	1.02	$8.37	**$30.68**
Dump Truck 2	T50	T50XX032	232	10-13 CY Dump	2017 PETERBILT 348 T11 (12/15 YD Dump)	2017	$30.52	$7.03	$1.18	$8.21	1.02	$8.37	**$30.68**
Dump Truck 3	T50	T50XX032	232	10-13 CY Dump	2001 FREIGHLINER T6 (12/15 YD Dump)	2001	$30.52	$7.03	$1.18	$8.21	0.66	$5.42	**$27.73**
Dump Truck 4	T50	T50XX032	232	10-13 CY Dump	2001 STERLING T7 (12/15 TD Dump)	2001	$30.52	$7.03	$1.18	$8.21	0.66	$5.42	**$27.73**
Dump Truck 5	T40	T40OX002	222	8 CY Dump Option	2008 FORD F750 6YD DUMP TRUCK T9	2008	$1.99	$1.11	$0.12	$1.23	0.84	$1.03	**$1.79**
	T50	T50XX026	232	32,000 GVW Truck			$21.31	$4.75	$0.82	$5.57	0.87	$4.85	**$20.59**
Dump Truck 6	T40	T40OX002	222	8 CY Dump Option	2008 FORD F750 6YD DUMP TRUCK T8	2008	$1.99	$1.11	$0.12	$1.23	0.84	$1.03	**$1.79**
	T50	T50XX026	232	30,000 GVW Truck			$21.31	$4.75	$0.82	$5.57	0.87	$4.85	**$20.59**
Dump Truck 7	T40	T40OX002	222	8 CY Dump Option	2007 FORD F750 6YD DUMP TRUCK T2	2007	$1.99	$1.11	$0.12	$1.23	0.81	$1.00	**$1.76**
	T50	T50XX026	232	30,000 GVW Truck			$21.31	$4.75	$0.82	$5.57	0.87	$4.85	**$20.59**
Dump Truck 8	T40	T40OX002	222	8 CY Dump Option	2006 F750 6YD DUMP TRUCK T-1	2006	$1.99	$1.11	$0.12	$1.23	0.79	$0.97	**$1.73**
	T50	T50XX026	232	30,000 GVW Truck			$21.31	$4.75	$0.82	$5.57	0.72	$4.01	**$19.75**
Dump Truck 9	T40	T40OX002	222	8 CY Dump Option	1997 GMC 6YD DUMP TRUCK T-5	1997	$1.99	$1.11	$0.12	$1.23	0.66	$0.81	**$1.57**
	T50	T50XX026	232	30,000 GVW Truck			$21.31	$4.75	$0.82	$5.57	0.72	$4.01	**$19.75**
Dump Truck 10	T40	T40OX002	222	8 CY Dump Option	1995 GMC 6YD DUMP T-4	1995	$1.99	$1.11	$0.12	$1.23	0.66	$0.81	**$1.57**
	T50	T50XX026	232	30,000 GVW Truck			$21.31	$4.75	$0.82	$5.57	0.72	$4.01	**$19.75**
Excavator 1	H25	H25CA022	120	153 HP / 1.56 CY bucket	EC210BLR-1 VOLVO EXCAVATOR (159 HP, 1.5yd bucket, long-stick)	2008	$44.97	$14.84	$3.12	$17.96	0.87	$15.63	**$42.64**
Excavator 2	H25	H25CA022	120	153 HP / 1.56 CY bucket	EC210BLR-2 VOLVO EXCAVATOR (159 HP, 1.5yd bucket, long-stick)	2008	$44.97	$14.84	$3.12	$17.96	0.87	$15.63	**$42.64**
Excavator 3	H25	H25CA041	119	Cat 320DL	320DL-EXC CATERPILLAR E-9 (148 HP, .80 CY, long-stick)	2008	$51.17	$17.78	$3.73	$21.51	0.87	$18.71	**$48.37**
Excavator 4	H25	H25CA041	119	Cat 320DL	320DL-EXC CATERPILLAR E-10 (148 HP, .80 CY, long-stick)	2008	$51.17	$17.78	$3.73	$21.51	0.87	$18.71	**$48.37**
Excavator 5	H25	H25CA041	119	128 HP, .80 CY bucket	320A -EXC CATERPILLAR E-7 (138 HP, 1 CY, long-stick)	2008	$51.17	$17.78	$3.73	$21.51	0.87	$18.71	**$48.37**
Welding Rig (x2)	W35	W35XX022	243	(250 amp)	Utility Truck + Ranger 250 GTX (250 amp)	2012	$5.81	$0.59	$0.09	$0.68	0.93	$0.63	**$5.76**
Dozer	T15	T15JD007	213	JD 650K / 101 HP	JOHN DEERE 700K XLT DOZER (97 HP)	2017	$37.44	$10.88	$2.13	$13.01	1.02	$13.27	**$37.70**
Grader	G15	G15JD010	103	JD 770G	2009 JD 770D MOTOR GRADER G-6 (160 HP)	2009	$58.20	$15.78	$1.96	$17.74	0.78	$13.84	**$54.30**
Sheeps Foot Roller	R45	R45CA010	188	145 HP / D-off	CAT CP563 ROLLER RL-2 (145 HP)	2007	$71.27	$22.84	$3.00	$25.84	0.78	$20.16	**$65.59**
Water Truck	T50	T50XX026	232	32,000 GVW Truck	2007 Freightliner	2007	$21.31	$4.75	$0.82	$5.57	0.77	$4.29	**$20.03**
	T40	T40RS003	224	4,000 gal tank	4000 gal Water Tank Add-on	2007	$9.60	$4.88	$0.59	$5.47	0.79	$4.32	**$8.45**
Water Truck	T50	T50XX026	232	32,000 GVW Truck	1995 GMC W2	1995	$21.31	$4.75	$0.82	$5.57	0.72	$4.01	**$19.75**
	T40	T40RS002	224	3,000 gal tank	3000 gal Water Tank Add-on	1995	$7.60	$4.11	$0.22	$4.33	0.61	$2.64	**$5.91**
Rubber Tire Excavator	H30	H30CA001	134	141 HP, .69 CY bucket	EW170B VOLVO EXCAVATOR (145 HP 3/4 bucket)	2001	$53.04	$23.89	$3.51	$27.40	0.63	$17.26	**$42.90**
Steel Roller Compactor	R50	R50WG001	192	132 HP, 83" wide, 21.1 ton	DYNAPAC CA2500 D ROLLER RL-1 (130 HP, 83" wide, 13 ton)	2015	$55.35	$13.69	$18.08	$2.70	0.97	$2.62	**$55.27**
Loader	L40	L40CA019	147	CAT 924H	924H CAT LOADER L1 (128 HP, 2 YD bucket)	2010	$34.23	$12.16	$2.07	$14.23	0.85	$12.10	**$32.10**
Shotcrete Machine (x2)	P45	P45AF010	172	60 HP / 50 CY/HR	SHOTCRETE PUMP REED B50 (50 CY/HR, 110 HP)	2013	$22.26	$7.75	$0.93	$8.68	0.97	$8.42	**$22.00**
Compressor (x2)	A15	A15DP001	25	Doosan P185	DOOSAN AIR COMPRESSOR P185 AC2 (185 CFM 49 HP)	2013	$9.81	$1.59	$0.26	$1.85	0.96	$1.78	**$9.74**
Telescopic Boom 1	P40	P40TE022	168	Genie S105 / 500 lbs / 110 ft	GENIE S-120 2002 LF1 (126 ft telescopic boom, 750 lbs, 78 hp)	2002	$78.66	$38.28	$4.36	$42.64	0.73	$31.13	**$67.15**
Telescopic Boom 2	P40	P40TE021	168	500 lbs / 64 ft	JLG 600S SKYPOWER 2008 LF2 (66 ft boom, 750 lbs 78 hp)	2008	$43.47	$20.28	$2.38	$22.66	0.89	$20.17	**$40.98**

Materials and Supplies
The proposed costs and itemization for materials and supplies are representative of costs and quantities from comparable concrete lining construction projects recently completed by EPCWID1, some of which were performed in collaboration with Reclamation. EPCWID1will purchase the needed construction materials and supplies by publicly soliciting sealed bids following competitive procurement laws outlined in the Texas Water Code, EPCWID1 purchasing policies, and applicable federal regulations. Historical bid and pricing information is available upon request for the development of an agreement with Reclamation.

Shotcrete
The quantity of shotcrete needed for the project was estimated at 5,661 cubic yards. This estimate is consistent with the quantity of shotcrete used in previous concrete lining projects at the Riverside Canal. The following calculations were used to estimate the amount of shotcrete needed for the project:

Project length (feet) * Cross-section (feet) * Thickness (inches)/12/27
(7,700 * 46 * 5)/12/27 = 5,466 cubic yards

Additional shotcrete is needed for the construction of buffers at the beginning and end of the lining work, transitions and reinforcement at crossings, footings, and additional shotcrete needed to straighten the channel (variance is approximately 0.25 to 0.75 inches). The amount of additional shotcrete needed is estimated at 3.56% of the shotcrete used for the base amount needed concrete lining and is calculated using the following:

Base shotcrete (cy) * 0.0356
5,466 cubic yards * 0.0356 = 195 cy

Curing Compound
Approximately 1 gallon of curing compound is needed for every 2.5 cubic yards of shotcrete used in the project and was estimated via the following:

cy shotcrete used / 2.5 = gallons per cubic yard of shotcrete
5,661 / 2.5 = 2,264 gallons

Geofrabric liner
The following calculations were used to estimate the amount of geofabric liner:

Project Length (feet) * Cross Section (feet) = Surface Area (square feet)
7,700 * 46 = 354,200 sf

Steel Panel Formwork
Steel panel formwork is fabricated according to the canal specifications and rates vary depending on the size of sheets for the canal bottom, sides, and bends. Prefabricated steel panel framework is purchased in linear feet based on engineering design specifications and is then cut and installed EPCWID1 staff at the job site. The estimated costs are based on purchases in 2020 for

Phase II of the Riverside Canal Concrete Lining Project. It is the experience of EPCWID1 that the price of steel varies on market conditions.

Waddle Pins
Waddle pins are used to secure the geofabric liner to soil. The proposed budget estimates 3 waddle pins per linear foot of concrete lining.

Project Length (feet) * 3 = Total Waddle Pins Needed
7,700 * 3 = 23,100

Contractual
Contracted engineering services for on-site engineering, construction monitoring, quality control, and reporting are necessary for the completion of the proposed project. Procurement and solicitation methods are performed in accordance to state and professional engineering solicitation practices. EPCWID1 uses a qualifications-based method for the selection of a qualified and experienced engineering firm. Budgeted costs are representative of costs from concrete lining projects similar to the proposed project.

Rates included for geotechnical lab concrete testing and soil density testing are consistent with bid responses received in for Contract No. R18AP100193 and R20AP00046 with Reclamation. The rates are also similar to costs for cylinder and field density tests for the El Paso market listed in RS Means, a construction industry costs database used by EPCWID1 to estimate construction costs.

Environmental and Regulatory Compliance Costs
The proposed costs for environmental and regulatory compliance costs are representative of costs from similar concrete lining projects. It is estimated that completing a Categorical Exclusion Checklist (CEC) is sufficient to meet environmental and cultural compliance requirements. Costs for any additional environmental activities will be determined pursuant to an award contract with Reclamation.

Indirect Costs
Indirect costs are not included as part of the project. All costs associated with the project are accounted for separately by EPCWID1.

Total Amount of Project Costs
The total cost of the project is $2,048,785. The Bureau of Reclamation requested share is $1,000,000. The non-federal cost-share is $1,048,785 as in-kind contributions from EPCWID1 and cash from EPCWID1 and third-parties.

VII ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

Will the proposed project impact the surrounding environment? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

Post-construction environmental impacts will be positive. There will be a reduction in wind-borne dust from the earth-lined channel, which will be concrete-lined over a 7,700-foot reach adjacent to urban development. District maintenance activities will be reduced by approximately 80%, thereby reducing dust generation, equipment noise and fuel consumption. A project Environmental Summary is available for reference in Appendix E.

Special attention will be given to the following items during the construction phase:

- Dust abatement
- Noise impacts
- No clearing will be done except clearing brush within right-of-way of the District
- Mechanical compaction of the earth to prevent any damage to adjacent property from earth movement

Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

There are no anticipated impacts to threatened and endangered species by the proposed project.

Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" if so, please describe and estimate any impacts the proposed project may have.

There are no surface waters inside the project boundaries that fall under CWA jurisdiction.

When was the water delivery system constructed?

Major canals and drains in the water delivery system were constructed under the Rio Grande Reclamation Project from 1915 to 1925. The Riverside Canal was originally constructed in 1917 by Reclamation.

Will the proposed project result in any modification of or effects to individual features of an irrigation system? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

Irrigation system features such as headings and turnouts are continuously modified as part of maintenance operations. No adverse impacts to individual features of the irrigation system are anticipated as part of the proposed project.

Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?

The El Paso County Water Improvement District Number One (EPCWID1) is listed in the National Register of Historic Places (NRHP) under National Register Information System ID 97000885. There are no anticipated adverse effects of features listed in the National Register of

Historic Places as a result of the proposed project. EPCWID1 has an agreement with the Texas Historical Commission (SHPO) in regards to which facilities within the District can be concrete lined or placed underground. The proposed project is allowed under this agreement and there are no anticipated adverse effects to historical assets. A copy of the agreement is available from EPCWID1.

Are there any known archeological sites in the proposed project area?
There are no known archeological sites in the proposed project area.

Will the proposed project have a disproportionally high and adverse effect on low income or minority population?
The proposed project would not have a negative impact on minority populations or low-income communities.

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?
There are no anticipated limits to access and ceremonial use of Indian sacred sites or adverse impact tribal lands.

Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?
There are no anticipated contributions to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

VIII REQUIRED PERMITS OR APPROVALS

The project activities will be confined to existing District right-of-way. No conflicts with existing utilities or facilities requiring third-party approval are anticipated. A Storm Water Pollution Protection Plan (WPPP) will be prepared and filed with the Texas Commission on Environmental Quality (TCEQ). It is not expected that any other permits or approvals will be necessary for the project as proposed.

IX UNIQUE ENTITY IDENTIFIER AND SAM

System for Award Management (SAM) Registration
The El Paso County Water Improvement District No. 1 maintains an active SAM registration and all information is up to date.

EIN Number: 74-1505167

Department of Treasury Automated Standard Application for Payments (ASAP)
The District is currently enrolled in ASAP and is ready to engage in active financial assistance agreements with Reclamation. EPCWID1 is currently administering grant awards from Reclamation using ASAP.

DUNS Number: 128044773