BUREAU OF RECLAMATION

Carlsbad Irrigation District

Prioritized Small-Scale Main Canal Lining

Applicant Contact:
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Eddy County, New Mexico

WaterSMART Small-Scale Water Efficiency Projects For Fiscal Year 2024 and Fiscal Year 2025

Notice of Funding Opportunity No. R24AS00059
CFDA Number: 15.507

Contents

Executive Summary

Application Date: January 15, 2024
Applicant Name: Carlsbad Irrigation District
City, County, State: Carlsbad, Eddy County, New Mexico
Project Manager: Coley Burgess
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Requested Reclamation Funding: $91,818; Total Project Cost: $183,636

The Carlsbad Irrigation District (CID), located in southeast New Mexico, will improve overall canal efficiencies by lining a portion of its Main Canal with a precoated polyurea liner. Lining a priority area of CID's Main Canal will result in significant and quantifiable water conservation and increased surface water supply available to both CID's farmers and Reclamation which will also help prevent Pecos River intermittency during critically dry years. Lining 2,000 ft of CID's Main Canal will result in an estimated 1,945 acre-feet conserved annually. By improving water conservation within its canal system CID is increasing the reliability of its water supply and taking the opportunity to support Critical Habitat for Pecos Bluntnose Shiner and the Interior Least Tern. This project can be accomplished within one maintenance season following the 2025 water delivery season within CID property and have no disturbance to Federal lands.

Project Location

Carlsbad Irrigation District is located in Eddy County, New Mexico approximately 25 miles from the Texas border in the southeastern portion of New Mexico.

The project location will take place on CID's Main Canal which begins just north of the city of Carlsbad and spans 28 miles south to the city of Malaga. The upstream beginning of the Main Canal is found at latitude 32°29'24.49"N, and longitude 104°15'9.61"W (WGS84). This project more specifically takes place near the heading of "Lateral 26.5" found at Latitude 32°15'6.63"N and Longitude 104°7'40"W. Figures 1 and 2 below illustrate the location of the CID Main Canal and the location of the canal to be lined by this project.

The upper reaches of the Pecos River watershed begin north of Santa Fe, NM. The Pecos River Watershed is in a semi-arid region, with the southern end of the Pecos River in New Mexico being the most arid portion.

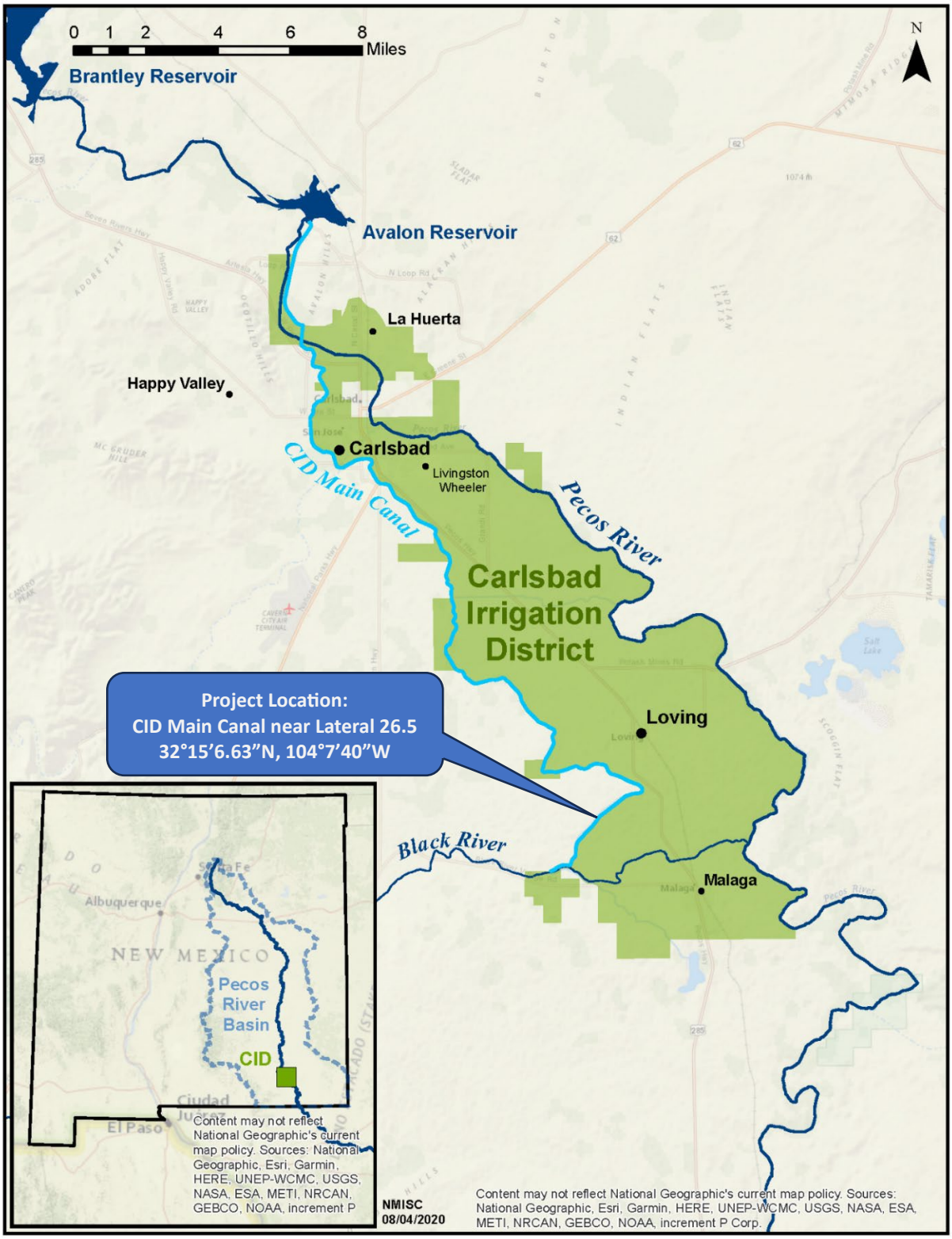

Figure 1. Map of Carlsbad Irrigation District, showing the Pecos River, CID Main Canal, Brantley Dam, and Avalon Dam (NMISC).

Technical Project Description

Carlsbad Irrigation District will achieve water conservation by lining a priority portion of CID's Main Canal. This project will implement a proven canal lining material and technology. Converting a portion of a poorly lined canal with a pre-coated polyurea liner CID will significantly improve the Main Canal. CID's Main Canal is an existing Carlsbad Project conveyance delivery infrastructure that is undergoing renovation with Rubicon automation infrastructure. Due to the nature of Rubicon's automated design, the Main Canal will see less fluctuation, increased stored volume within the canal, and consistently higher water levels. While this is great for canal operations and delivery improvements, this has the potential to increase canal seepage which makes canal lining a high priority for CID's aging infrastructure.

CID has identified priority locations for canal lining and water conservation opportunities and ranked them based on water loss. Priorities for lining are effectively locations within CID's Main Canal which have the greatest seepage and inefficiency. This project will install 2,000 feet of liner to eliminate seepage in the second highest priority area. Figure 2 below illustrates the locations of these priority reaches and labels the reach for this project as Priority 2.

CID has experience in the design, procurement, and installation of canal liner to reduce seepage and improve the efficiency of the canal system. CID has also found canal lining to be beneficial for the protection of the canal system from utility crossings beneath the canal because maintenance, including mowing and digging of vegetation is eliminated in the bottom of the canal. Figures 3 and 4 below show a successful application of liner within CID's Main Canal paid for by a licensed pipeline crossing.

The priority reaches shown below are ranked for lining based on seepage loss and delivery difficulties, with the lining of the initial stretches of the CID Main Canal being the most important (but a larger scope than this project can entail) and the second highest being this stretch of Main Canal near Lateral 26.5.

The 2,000 feet of the Main Canal prioritized for this small-scale project near Lateral 26.5 is known for excessive seepage, quite possibly due to sink holes and karst topography. Prioritization of reaches for lining are ranked by loss monitored in nearby drainage diches and seeped conditions outside of the canal footprint. Saltcedar are also prevalent in these areas indicating an undesirable leakage from the canal that needs to be addressed. Sinkholes have been discovered in this area in recent memory. Karst topography refers to natural landscape that is largely the result of chemical weathering by water, resulting in caves, sinkholes, cliffs, and steep-sided hills called towers. These features form when water picks up carbon dioxide from the atmosphere and ground to form carbonic acid. Water lost to sinkholes and karst topography is no longer useful for CID's farmers nor habitat of aquatic species. Lining this reach of the Main Canal benefits all downstream users and will result in an increased likelihood that water will be available for CID to assist Reclamation with preventing intermittency of the Pecos River during critically dry conditions.

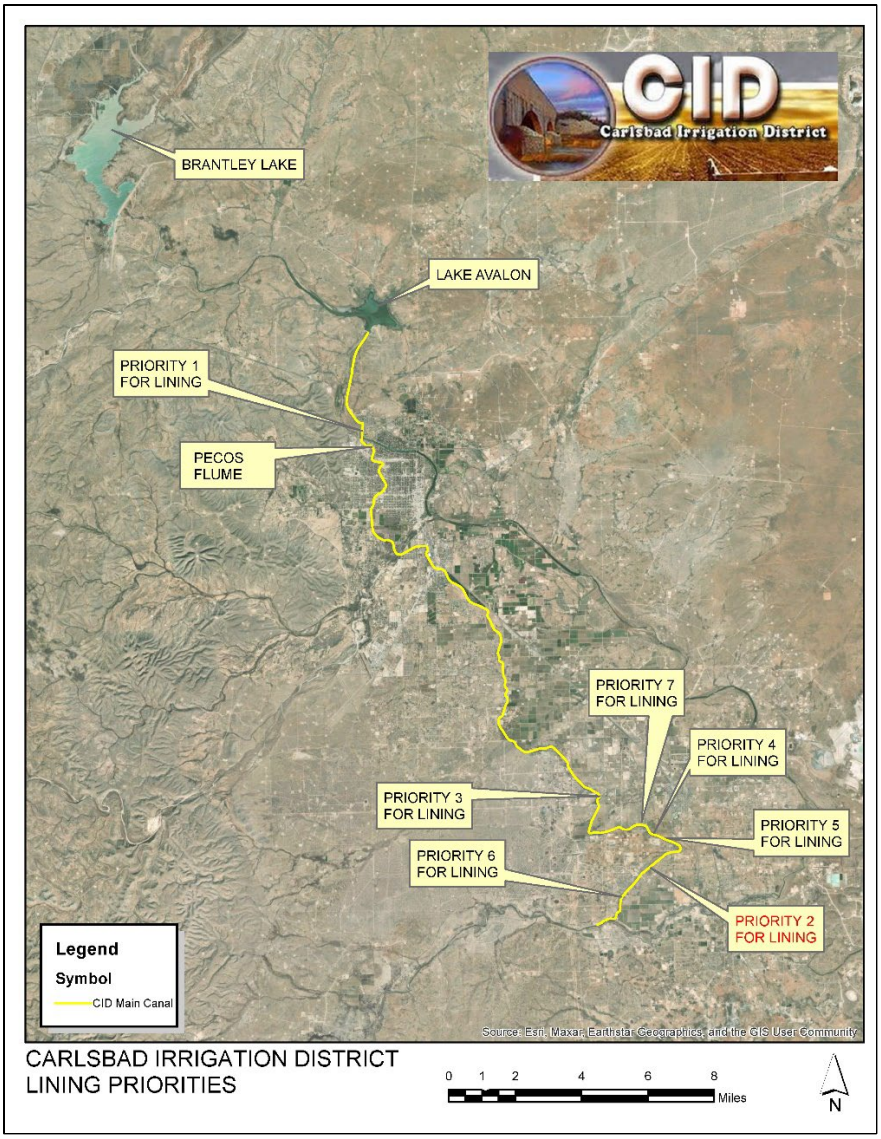

Figure 2. Map of CID Lining Priorities

This prioritized portions of the CID Main Canal, as shown in Figure 2 above, will be lined with a single layer of impermeable liner such as AssetGuard's "Groundguard" modified polyurea liner. AssetGuard's Groundguard liner is an example material which provides an impermeable layer and when installed and maintained correctly eliminates seepage for the portion of the canal lined.

Based on AssetGuard's product specifications Groundguard maintains impermeability and puncture resistance under exposure to harsh UV and weather extremes, resulting in a long lifespan with minimal maintenance requirements. Only a single layer of the liner is required instead of multiple layers of HDPE. The selected product will have 60mil thickness and a permanently attached geotextile for resistance to puncture by the underlying canal.

Figure 3. Photo of AssetGuard's Groundguard liner installed in CID's Main Canal.

Installation of the selected liner begins with minor earthwork reshaping the canal including removing large rocks, vegetation, debris, any sharp objects, and smoothing of the canal slopes. This portion of the installation will be accomplished by CID personnel and CID owned or rented wheeled backhoe and tracked excavators. Following reshaping of the canal a small trench is dug along the top of slope of the canal to allow the liner to be keyed into the top of the canal bank, maximizing the available freeboard of the canal. Locations with less than adequate freeboard can be addressed at this time.

The liner is rolled into the canal in transverse or longitudinal swaths and aligned to provide complete coverage.

The liner is trimmed and attached to perimeter structures such as lateral head gates, farm turnouts, headwalls, abutments, and check gates. The joints, end of overlap of the top layer, and connection with perimeter structures are then sealed with a proprietary polyurea spray on bonding and sealing agent similar to the liner. Installation of the liner and sealant will be completed by the material supplier's contracted labor with specialized experience. Connection to existing perimeter structures can be assisted by CID employees directed by the contractor.

Following backfill and compaction of the keyway trench at the canal's top of slope, the connection between the canal liner and unlined canal at the beginning and ends of lined portion of the canal is addressed with another keyway of the liner into the earthen banks of the canal and simple placement of concrete fill the void and weight the liner to prevent the flow of water underneath the liner. Figure 4 shows the connection of the liner to an existing lined lateral.

Figure 4. Photo of liner attached to existing concrete in the vicinity of Lateral 26.5.

Evaluation Criteria

Evaluation Criterion A: Project Benefits

Benefits to the Category A Applicant's Water Delivery System:

- Will the project result in more efficient management of the water supply?

Lining a portion of CID's Main Canal will result in a reduction of seepage to improve the delivery efficiency of the limited water supply. Reducing seepage of the water that is released from storage reservoirs and diverted to CID's Main Canal results in more of that water reaching the ditches and fields of CID's farmers. This increased water reaching the farmer's field is by definition more efficient management of the limited water supply.

The selected reach for lining by this project is the second highest priority of CID's operational analysis. The eight prioritized reaches account for at least 50% of the Main Canal's seepage. Lining the reach selected for this project will result in elimination of at least one eighth of the prioritized seepage reaches. Table 1 below shows that 1,945 ac-ft/year can be conserved by lining the portion of the canal planned by this project and that this reduction of seepage will result in nearly one additional acre-inch per acre of water being delivered to CID's farmers.

Table 1. Calculations of Water Conservation

Var		Unit	Desciption	Source
A	3.697	ac-ft/acre	Full allotment to CID farmers	Adjudicated water right
B	25,055	acres	CID water righted acreage	Adjudicated water right
C	35%	Percent	Total Loss	Estimated, historical, USGS Data
D	142,505	ac-ft/year	Full diverted water supply	B*A/(1-C)
E	4,500	ac-Ft/yr	Spillage/human error	USGS data
F	10%	percent	Evaporative losses	Estimated, anecdotal
G	31,126	ac-ft/year	Canal Seepage	D-(A*B)-(D*F)-E

H	22%	percent	Portion of Diversion lost to seepage	G/D
I	157,448	feet	Total Length of Main Canal	Mapped
J	2,000	feet	Linear feet to be lined	Project Plan
K	1.27%	percent	Canal to be lined	Project Plan
L	50%	percent	Seepage attributed to priority reaches	Estimated, anecdotal
M	1/8	fraction	One of eight priority reaches	Project Plan
N	1,945	ac-ft/yr	Seepage reduction-Conserved per year	G*L*M
O	6.25%	percent	Seepage reduction	G/N
P	1.37%	percent	Percent of full water supply	N/D
Q	0.9	ac-in/acre	Increased supply per acre	N/B
R	$ 183,636	USD	Project Cost	Budget
S	$ 94.40	$/ac-ft	USD per annual ac-ft conserved	Q/N

Project effectiveness will be determined based on existing USGS flow measurement and by calculation of delivered water compared to diverted water and compared to historical efficiency which in turn result in the quantification of reduced delivery improvements. Calculated diversion of water into the CID Main Canal is annually compared to delivered volumes and will continue to be the basis for calculation of canal and system efficiency. Water spilled beyond the canal system, an important factor in system efficiency, and will continue to be metered by the USGS.

- Where any conserved water as a result of the project will go and how it will be used?

Increased canal efficiency will result in increased surface water supply to CID's farmers and increased economic benefit. It is estimated that 50% of the Main Canal seepage can be eliminated by lining the proposed 8 reaches of the CID Main Canal and that this priority reach can be attributed to at least $1/8^{th}$ of this 50%. Table 1 above shows that 1,945 ac-ft/year can be conserved by reducing canal seepage by 6.25% resulting in additional water being delivered to CID's farmers.

By improving water conservation within its canal system CID is leveraging the opportunity to support Critical Habitat for Pecos Bluntnose Shiner and the Interior Least Tern. Minimizing intermittency and drying of critical habitat for listed and endangered species is important to CID in cooperation with Reclamation. Increased surface water supply due to conservation increases the likelihood that the water supply will reach the threshold of 3.679 acre-feet per acre resulting in water being left in upstream reservoirs. Since 2000, only 8 years have reached this threshold. By increasing the likelihood that water supply will exceed this threshold, additional water would have been left in upstream reservoirs available for Reclamation to lease for in-stream flows above Brantley Dam.

- Are customers not currently getting their full water right at certain times of year?

The Southwest US, New Mexico, and CID have seen increasing water scarcity and prolonged drought due to climate change. Since 2000, CID's farmers have received an average of 72% of their annual allotment. During this 24 year period, CID's farmers have received a full allotment of 3.697 feet only eight years, and in 2012 received less than one acre foot per acre, less than 25% of the annual allotment. Since a significant portion of the losses are fixed, independent of flow rate, the conveyance efficiency gets lower in short supply years, and has generally been at or below 35% in recent years. Short supply years compounded by higher relative losses makes drought particularly painful in CID, and this has been much of the motivation for this project.

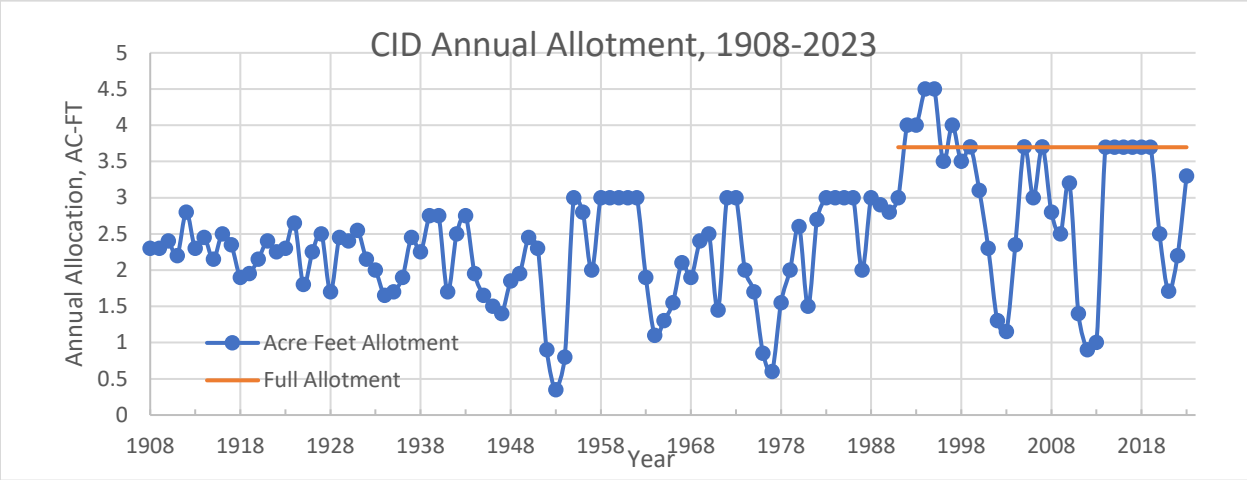

Figure 5. Graph of CID annual allotment, 1908-2023

- Does this project have the potential to prevent lawsuits or water calls?

CID has a storied past of water conflicts. The "Pecos River Basin Study - New Mexico, Evaluation of Future Water Supply and Demand for Irrigated Agriculture in the Pecos Basin" written by the Bureau of Reclamation and New Mexico Office of the State Engineer - Interstate Stream Commission (Bureau of Reclamation and Interstate Stream Commission, 2021) well documents history and competing demands for the Pecos River Basin. Improving conservation, of which canal seepage and operations improvements are the few that CID can influence, helps reduce water conflicts across the Pecos River watershed.

Improving the canal system helps adapt to variable and persistent drought and therefore reduces conflict due to years with inadequate water supply. Improved water supply stability helps reduces threats of legal action against CID, the State of New Mexico, and Reclamation that could arise from farmers and the state of Texas not receiving Pecos River Compact required water.

- What are the consequences of not making the improvement?

By not making system improvements, including reducing seepage, CID grows more less resilient to variability in water supply and more vulnerable to the effects of climate change. Not making system improvements is foolish and could result in a further loss of agriculture in the US.

Current losses leave the surface water system to the unknown geologic system beneath the Carlsbad area. Carlsbad is known for its Caverns and the sinkholes and other issues throughout the area result in seepage leaving the usable system to a mostly unusable system. Canal seepage may even be worsening the conditions of the groundwater system.

- Are customer water restrictions currently required?

Water restrictions are inherent in an irrigation system dependent on a variable water supply. If water supply is less than a full allotment, CID's farmers must make cutbacks in their irrigation or irrigated acreage, which results in less yield and lost opportunities. In years like 2012 where CID delivered less than one acre-foot per acre, cutbacks resulted in fewer acres farmed and fallowed land having no economic productivity which detriments not only farmers, but also the economics of the surrounding area.

- Other significant concerns that support the need for the project.

By improving water conservation within its canal system CID is taking the opportunity to support Critical Habitat for Pecos Bluntnose Shiner and the Interior Least Tern. Minimizing intermittency and drying of critical habitat for listed and endangered species is important to CID in cooperation with the Bureau of Reclamation.

Broader Benefits

- Will the project improve broader water supply reliability at sub-basin or basin scale?

This project improves the water supply at a sub-basin scale by improving the water supply to CID's farmers. This project also improves water supply at a basin scale by allowing for water to be left upstream during full allotment years. Water left upstream allows for support of Critical Habitat for Pecos Bluntnose Shiner and Interior Least Tern. Minimizing intermittency and drying of critical habitat for listed and endangered species is important to CID in cooperation with the Bureau of Reclamation.

- Will the proposed project increase collaboration and information sharing among water managers in the region?

This and other conservation projects currently being installed result in increased flow data and ability to account for conservation. This results in collaboration and information with those interested in CID's management of it's limited water and further conservation. By installing in a limited area as this project will do will allow for specific accountability of the decreased losses.

- Is the project in an area that is experiencing, or recently experienced, drought or water scarcity? Will the project help address drought conditions at the sub-basin or basin scale?

As the climate warms, precipitation falls less as snow and more as rain, and more of the snow that does build up melts during the winter (rather than during the typical spring snowmelt period). That decreases snowpack (the amount of snow that accumulates over the winter to melt in the spring). Since the 1950s, snowpack has been decreasing in New Mexico.

As demonstrated by the US Drought Monitor graphical report for New Mexico (Figure 6 below), CID is engulfed in Drought Monitor Intensity: D4 Exception Drought. While much of the

watershed is “only” D2-Severe Drought, the state and Southwestern US are in prolonged drought.

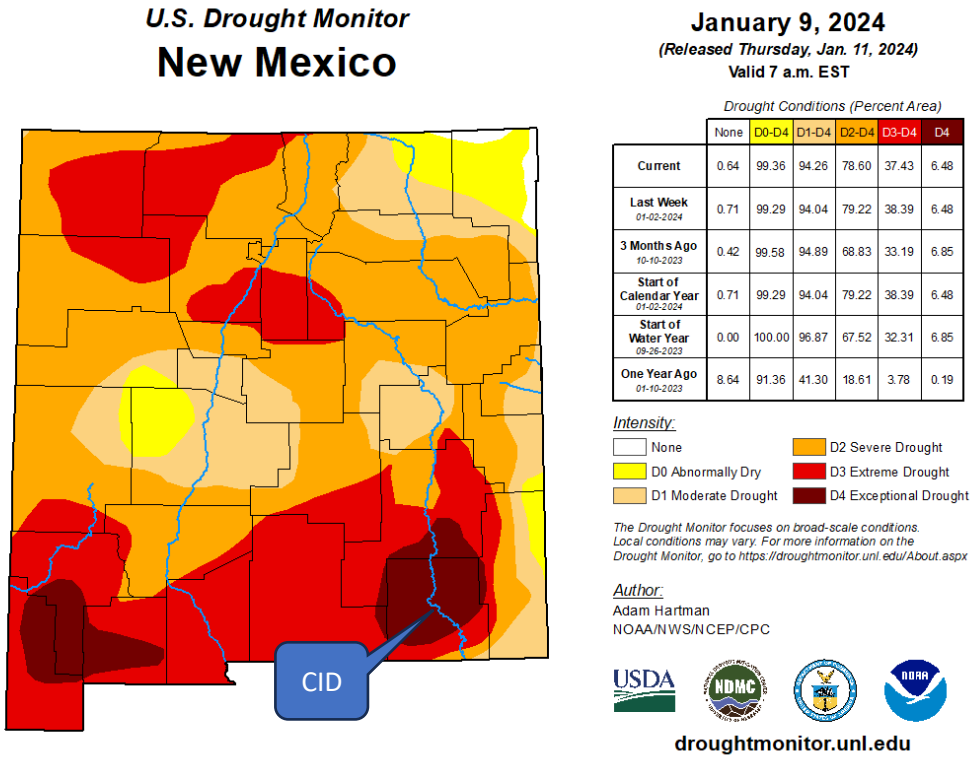

Figure 6. US Drought Monitor-New Mexico, obtained from: https://droughtmonitor.unl.edu/data/png/current/current_nm_trd.png

- Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state listed species, or a species of particular recreational, or economic importance)?

The most obvious result of this project is to improve efficiency of water released and diverted for agriculture but there are multiple, less obvious benefits. By reducing canal seepage, CID’s water supply is more resilient to climate change and in turn enables water availability for support of habitat.

Increased surface water supply due to conservation increases the likelihood that the water supply will reach the threshold of 3.679 acre-feet per acre resulting in water being left in upstream reservoirs. Since 2000, only 8 years have reached this threshold. By increasing the likelihood that water supply will exceed this threshold, additional water would have been left in upstream reservoirs available for Reclamation to lease for in-stream flows above Brantley Dam.

Reclamation’s Budget Justifications and Performance Information, Fiscal Year 2021, Upper Colorado Basin, Carlsbad Project, UCB-19, documents that Reclamation spends nearly 1.5 million dollars annually in support of Fish and Wildlife Management and Development as part of

oversight of the Carlsbad Project. It is the intention of this project to support these goals and requirement of Reclamation and in turn hopefully reduce the Federal cost of compliance.

This project will increase the likelihood of a full per-acre allotment to CID's farmers, reduce the challenges that seepage poses to delivering water to the lower end of the canal, and increase the likelihood of water being available for Reclamation fish habitat efforts.

- Will the proposed project positively impacts/benefit various sectors and economies within the applicable geographic area?

Lining a portion of CID's Main Canal has multiple benefits and positive impacts. The economic impacts of a more reliable water supply to CID's agricultural producers has positive impacts to the connected industries such as farm labor, farm machinery suppliers, suppliers of fertilizer, and custom harvesters. Avoiding years of very low supply helps to avoid years where the agriculture industry cannot sustain economic viability. In addition to the benefits to the agricultural producers and connected industries, the potential for this project to help CID have supply greater than a full delivery supply of 3.697 ac-ft/acre increases the potential for benefits to the environment (as explained above) and similarly recreation and tourism. When water is stored upstream for future supply, the storage reservoirs (lakes) benefit with greater surface area, improved recreation, and increased tourism. CID also requires that pipelines for the surrounding oil and gas industry to cross its canal during the maintenance/non-irrigation season. With this portion of the canal being lined, CID can allow pipelines to directionally drill across the canal during the water season safely, which helps encourage other economic drivers in the applicable geographic area.

- Will the project complement work being done in coordination with NRCS in the area

Conservation projects which complement each other such as this canal lining and the ongoing canal automation project directly ongoing work that NRCS is contributing to across CID. NRCS has implemented on farm infrastructure improvements across CID and these ongoing efforts are complemented by this project.

Evaluation Criterion B: Planning Efforts Supporting the Project

Plan Description and Objectives: Is your project supported by a specific planning document or effort? If so, describe the existing plan. When was the plan developed? What is the purpose and objective of the plan?

Lining projects within CID and its Main Canal are documented as a supported project by the "Pecos River Basin Study - New Mexico, Evaluation of Future Water Supply and Demand for Irrigated Agriculture in the Pecos Basin" written in 2021. The document states that "Basin studies are collaboratively-developed technical assessments of future conditions and adaptation actions." This planning document can be found at:
https://www.usbr.gov/watersmart/bsp/docs/finalreport/Pecos/PRNMB-final-9-20-2021.pdf

Plan Development: Who developed the planning effort? What is the geographic scope of the plan? If the planning effort was not developed by the Category A applicant, describe the Category A applicant's involvement in developing the planning effort.

The Bureau of Reclamation, in partnership with the NM Office of the State Engineer Interstate Stream Commission and in collaboration with local stakeholders (including CID), completed this report. The geographic scope of the plan is the Pecos River Basin, of which CID is the largest surface water user. The plan includes many sections specific to CID and the interactions with the other water users associated with the Pecos River Basin. CID was an integral partner in the creation of this report and its modeling efforts. CID's perspective was more than considered, it is documented that CID was a collaborator.

Support for the Project: Describe to what extend the proposed project is supported by the identified plan. Consider:

- Is the project identified specifically by name and location in the planning effort?
- Is this type of project identified in the planning effort?
- Explain whether the proposed project implement a goal, objective, or address a need or problem identified in the existing planning effort?
- Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.

This study identified CID system lining as a potential action to conserve water within the system. Quoting a portion of that planning document: Section 12.2. Potential Future Actions and Analyses>12.2.1.2. Infrastructure>Improving conveyance efficiency: "Rehabilitating or replacing canals, check structures, and diversion structures could improve conveyance efficiency, making more water available for use by irrigators." In another portion pertaining directly to CID's aging infrastructure the plan states: "Lining the full canal would greatly reduce conveyance losses and permit the correction of several sections of the canal that pool water."

The 2000 ft reach of CID's Main Canal to be lined by this project was not mentioned specifically, but there were no specific portions of the canal identified individually. Canal lining projects were included within this document as one of many considered opportunities to address a known need for improvement.

In a letter of support for a list of projects, including lining CID's Main Canal, dated March 15, 2023, Frank Scott, New Mexico Interstate Stream Commission Pecos Bureau Chief stated: "The NMISC also notes that the repair and lining of the Main Canal (including the flume) to reduce seepage was one of several such projects identified as suitable candidates for future funding by the Bureau of Reclamation's Pecos River Basin Study, which was released in September 2021 and was developed in collaboration with the NMISC. As part of this study, the NMISC and Reclamation spent a great deal of time consulting with the various water users in the basin to identify their critical infrastructure needs, such as the proposed project. Funding these projects will help continue and validate that work."

Evaluation Criterion C: Implementation and Results

Describe a detailed plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates).

- Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.
- Proposals with a budget and budget narrative that provide a reasonable explanation of project costs will be prioritized under this criterion.

The implementation plan for this project is relatively simple as it should be for a WaterSMART Small Scale Water Efficiency Project. Allowing time for Reclamation and CID to reach a funding agreement following selection, NEPA compliance documentation and consultation, final design work by the selected liner provider, and allowing time for the completion of CID's 2025 irrigation season, CID will be ready to pursue the following schedule with November 1st, 2025 as the anticipated beginning for implementation of the following plan.

Implementation and construction of this project will require about 3 weeks total following a dry-down period after the end of the irrigation season. Some of the canal shaping and preparation work can be done simultaneously during the two weeks following the irrigation season. Following dry-down, roughly one additional week will be required to prepare the canal using CID personnel and equipment and then two weeks will be required to install the liner by the liner's supplier and contractor. Due to the Thanksgiving Holiday on November 27th, that week has been omitted from the planned dates below.

- ✓ Expected end of CID's 2025 water delivery season: November 1st
- ✓ Expected start of preparation work: Monday November 17th
- ✓ Expected beginning of liner installation: Monday December 1st
- ✓ Expected completion of liner installation: Friday December 12th

2025 Season Ending 11/1/2025	Dry-down 2 weeks	Canal Prep 1 week	Liner Installation 2 weeks

- Describe any permits and agency approvals that will be required along with the process and timeframe for obtaining such permits or approvals.
- Identify and describe any engineering or design work performed specifically in support of the proposed project. What level of engineering design is the project currently? If additional design is required, describe the planned process and timeline for completing the design.

CID has contracted a handful of similar lining projects and has direct experience with the timeframe and permitted process. In summary, no further permitting is required for the installation of a lining within CID's Main Canal.

No additional time beyond the 12 months between the anticipated award date of October 31, 2024 stated in the Notice of this funding opportunity and CID's planned start date will be required for design, based on previous experience. CID has previously had the Main Canal surveyed and the liner supplier is well versed in the design of this simple liner. No significant changes to the canal will be required for the installation of the liner and the level of engineering design is minimal beyond previous efforts of surveying the canal.

- Does the applicant have access to the land or water source where the project is located? Has the applicant obtained any easements that are required for the project?
- Identify whether the applicant has contacted the local Reclamation office to discuss the potential environmental and cultural resource compliance requirements for the project and the associated costs. Has a line item been included in the budget for costs associated with compliance?

CID owns the land associated with the Main Canal including all rights and access to the land where the lining will be installed. No easements or land acquisition will be required. CID has previously discussed similar projects with the Bureau of Reclamation and expects relatively simple Categorical Exclusion NEPA compliance documentation. No line item has been included for preparation of NEPA or other compliance documentation, it is expected to be a simple cooperative process by CID and Bureau of Reclamation.

Evaluation Criterion D: Nexus to Reclamation

Describe the nexus between the proposed project and a Reclamation project or activity, including: Is the proposed project connected to a Reclamation project or activity? If so, how? Please consider the following:

- Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?
- If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?
- Will the proposed work benefit a Reclamation Project area or activity?

Carlsbad Irrigation District is a Category A applicant. As an irrigation district, contractor of Reclamation, and local political entity. CID is a legislatively authorized political subdivision of the State of New Mexico. The district operates under New Mexico statutes §73-10-1 through §73-10-47, Irrigation District Cooperating with United States under Reclamation Laws; Formation and Management, and §73-11-1 through §73-11-55 Irrigation Districts Cooperating with United States under Reclamation Laws; Fiscal Affairs; Local Improvements and Special Powers. CID is governed by a board of elected members drawn from the district's constituents.

The original Carlsbad Project was authorized by the Secretary of the Interior on November 28, 1905, with the formal purchase taking place December 18, 1905. Subsequently, a number of federally constructed features superimposed on the private irrigation works, the most notable of these include Avalon Dam (1907) and Avalon Dam cylinder gates (1911) and the Pecos River Flume (1903). Sumner Dam was authorized for construction by the President on November 6, 1935, under the Emergency Relief Appropriations Act of 1935. Section 7 of the Flood Control Act of August 11, 1939, declared Sumner Dam and Lake Sumner were to be used first for irrigation, then for flood control, river regulation, and other beneficial uses.

Brantley Dam and Reservoir of the Brantley Project was authorized on October 20, 1972, by Public Law 92-514, for the purposes of irrigation, flood control, fish and wildlife, recreation benefits, and to provide protection for Avalon Dam and as a replacement of McMillan Dam which was determined to be unsafe. McMillan Dam was breached in 1991.

The transfer from federal to local control occurred on October 1, 1949, beginning a new chapter in the irrigation system's operation. However, title to the property remained in federal control. Pursuant to an Act of Congress in 2001, CID acquired all the land rights covering the distribution and drainage system from the U.S. This transfer did not include the system's dams and reservoirs. CID is the fee owner of lands and easements that cover both Laterals and Canals. Today, Reclamation is responsible for the operation, maintenance, and oversight of the Carlsbad Project reservoirs. However, the CID, diverts and delivers irrigation water to its members. By contract with the Reclamation, the CID operates and maintains Sumner, Brantley, and Avalon Dams.

Evaluation Criteria E: Presidential and Department of the Interior Priorities

Sub-criterion No. E1: Climate Change

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

• Does this proposed project strengthen water supply sustainability to increase resilience to climate change? Does the proposed project contribute to climate change resiliency in other ways not described above?

The purpose of CID's canal lining project is to increase resilience to the impacts of climate change, drought, and increase the reliability of the water supply for CID's agricultural producers and habitat for threatened and endangered species. This project provides for significant and quantifiable reduction in losses of the limited water supply available to CID. By eliminating seepage and losses to sinkholes in priority portions of CID's Main Canal CID will be able to weather more extreme variations in water supply and in turn provide increased potential for being able to cooperate with Reclamation to address the drying of the Pecos River, which is also caused by climate change.

A safe, American grown, food and fiber supply supported by CID's water supply and the stretching of the limited water supply to address the impacts of climate change help combat local effects of the climate crisis.

Sub-criterion No. E2: Disadvantaged or Underserved Communities

• If applicable, describe how the project benefits those disadvantaged or underserved communities identified using the tool.

Portions of the CID service area and Eddy County are identified as disadvantaged communities. These areas are considered disadvantaged because they meet more than 1 burden threshold and the associated socioeconomic threshold according to the White House Council on Environmental Quality's interactive Climate and Economic Justice Screening Tool. This project contributes resiliency to the "Expected agricultural loss rate" by increasing the reliability of the irrigation water supply. This project also provides economic growth opportunities for disadvantaged communities, specifically farm labor and the industries connected with agriculture.

References:

Bureau of Reclamation and Interstate Stream Commission. (2021) Pecos River Basin Study - New Mexico, Evaluation of Future Water Supply and Demand for Irrigated Agriculture in the Pecos Basin. Department of Interior and New Mexico Office of the State Engineer.
https://www.usbr.gov/watersmart/bsp/docs/finalreport/Pecos/PRNMB-final-9-20-2021.pdf

Project Budget

Funding Plan and Letters of Commitment

CID's plan for funding includes a guaranteed minimum 50% of the total project cost from budgeted expenditures of savings for capital improvements. Each year CID's Board of Directors establishes a budget which includes system improvement projects. CID's annual budget, savings, and funding available for this project comes from annual assessment of CID's member's water righter acreage and permit fees. CID's Board of Directors has committed to a minimum of 50% cost share throughout this project if funding is awarded.

A resolution signed at a CID Board meeting is not available by the deadline of this funding opportunity. An official Resolution signed by the offices of CID's Board of Directors will be provided as directed within 30 days of submission of this application. CID's cost share funding is currently available as savings and will be available each year at the time of funding in forms of labor, equipment, and purchasing of materials.

Budget Proposal

Table 2. Summary of Non-Federal and Federal funding

Funding Sources	Amount
Non-Federal entities	
1.Carlsbad Irrigation District canal preparation (in-kind)	$5,536*
2.Carlsbad Irrigation District cash contribution	$86,282
Non-Federal subtotal	**$91,818**
REQUESTED Reclamation funding	**$91,818**

Total cost of installed liner, other than preparation of the canal is expected to be $178,100. Of this, $91,818 is requested to be reimbursed by Federal funding. The remaining costs totaling $86,282 will be provided as cash investment by CID. Preparation of the canal is expected to require $5,536 of labor, equipment, and management from CID personnel and equipment.

Table 3. Total Project Cost Table

Source	Amount
Costs to be reimbursed with the requested Federal funding	$91,818
Costs to be paid by the applicant	$91,818
Value of third-party contributions	$0
TOTAL project cost	**$183,636**

Budget Narrative

The budget narrative provides an explanation for the items used to develop the project budget proposal shown in Table 3 above.

Personnel

Coley Burgess, CID District manager, will provide overall project management. Joe Navarette will provide daily supervision of CID employees completing the sandblasting. Four District employees will make up the sandblasting and prep crew and 2 heavy equipment operators for keyway trenching and backfill. It is estimated it will take two weeks to complete the surface preparation. CID will have an administrative assistant responsible for providing project-related administrative support and providing grant reporting assistance. Additionally, CID will have accounting staff responsible for tracking costs and maintaining financial records to administer project finances, including making all payments for contracted services and collecting monies from the Reclamation as required for meeting project cash-flow requirements. All labor rates included in this budget proposal are the actual labor rate of the personnel.

Task 1: Equipment Operator	20	hr, Year 1	$37	/hr	$ 740
Task 2: Manual labor, including sandblasting	50	hr, Year 1	$37	/hr	$1,850
Total		**(all Y1)**			**$2,590**

Fringe Benefits

All CID employees are provided health insurance, employee retirement contribution match, vacation, and sick leave. An average of the cost to provide these benefits to CID employees was determined to be $8 an hour.

Travel

CID will not be charging any travel expenses to the project.

Equipment

No equipment will be purchased to complete the proposed project.

Supplies

Sand blasting media	$8.00	/ea	x	2	ea=	$16
Total						**$16**

Required expendable supplies are limited to sand blasting media.

Construction – Equipment Use

Sandblaster	$ 60.00	/hr	x	5 hrs=	$	300
Air compressor	$ 60.00	/hr	x	5 hrs=	$	300
CAT 120 Grader	$ 85.00	/hr	x	20 hrs=	$	1,700
Heavy Duty Pickup	$ 25.00	/hr	x	10 hrs=	$	250
Light Duty Pickup	$ 19.00	/hr	x	20 hrs=	$	380
Total					**$**	**2,930**

CID will owns all of the necessary equipment and machinery to prepare the Main Canal for installation of liner. The hourly rates are the rates established by ownership rates developed by CID. Estimated number of project hours for each machine were extrapolated using actual numbers and data from similar sized projects the District has completed in the past. The rates for the trucks and excavator include fuel.

Construction – Contractual services

Lining supplier/installer	$178,100
Total	**$178,100**

In order to determine the estimated cost of the turn-key installation of 2,000 feet of canal lining in the budget proposal for this project, CID relied upon a recent quote from a supplier for this specific project. This supplier/installer has completed similar projects recently using Assetguard Groundguard liner which were paid for by others but contracted by CID. Experience with these projects resulted in confirming that the quoted cost for lining 2000ft of the Main Canal near Lateral 26.5 is a reasonable and reliable cost estimate. CID herein has budgeted $178,099 for a contractor to complete the process of installing 2000 linear feet liner of at this location. CID will bid the materials and construction of the project to several prequalified companies. The contractual costs shown are estimates for the contractor to provide and install the liner. Generally, the low bidder will be selected following a determination of acceptable specifications and qualifications.

Indirect Costs

No indirect costs are associated with the proposed project.

Proposed Total Costs

Refer to Table 2 above for a summary of non-federal and federal funding sources.

Environmental and Cultural Resources Compliance

CID's canal lining project priorities are located exclusively within canal rights-of-way owned, operated, and maintained by CID. Therefore, no easements and no federal, state or local permitting will be required for the proposed project.

It is requested that Reclamation assist with the environmental compliance documentation including Endangered Species Act compliance.

NOFO Section H.1 Questions:

- Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

CID's canal lining project priorities are located exclusively within canal rights-of-way owned, operated, and maintained by CID. No animal habitat will be impacted. Impacts to air and water quality due to the construction of the canal lining, which as described above are only reshaping of the canal (normal maintenance) and installation of the liner, will be mitigated by standard Surface Water Pollution Prevention Best Management Practices (BMPs). BMPs including wetting the surface soil to minimize dust transport and installing a berm within the canal downstream of construction activities will minimize potential impacts to water quality. Avoiding earth moving activities on windy days will help prevent air quality impacts from construction activities.

- 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?

CID is not aware of any threatened or endangered species nor critical habitat within the footprint of project construction activities, which are limited to CID's Main Canal which is constantly operated and maintained.

- 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, describe and estimate any impacts the proposed project may have.

CID is not aware of any wetlands or other surface waters inside the footprint of construction activities.

- When was the water delivery system constructed?

Early construction of the Carlsbad Project began in 1887 and continued into the turn of the century, this included a majority of the canals, laterals, drains and CID's main diversion dam (Avalon). Sumner Dam (formerly Alamogordo Dam) was authorized for construction by the President in 1935 and was completed in 1937. In 1967, the CID entered into the R&B Program with the Reclamation for concrete lining of some 90 miles of canals and laterals. Brantley Dam and Reservoir was authorized by Congress on October 20, 1972, and construction finally began in 1984 and was largely finished by 1989.

- Will the proposed project result in any modification of, or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? 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.
The Main Canal was originally constructed in the early 1900s. Portions of the Main Canal was concrete lined in 1968.

- Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

CID represents the evolution of American reclamation technology. Avalon and McMillan Dams exemplified the rockfill composite design popular at the turn of the century and were among the first in the U.S. with an earth fill facing. Avalon's cylinder gates, first used in 1911, represent a technological application which would be used in subsequent dams across the West, including Hoover Dam. CID displays not only the transition from nineteenth to twentieth century technology, but also the evolution of private irrigation efforts into public-sponsored reclamation, and the creation of water districts.
Many features of the Project are listed on the National Registrar of Historic Places, most notably the Pecos River Flume and Avalon Dam. The CID was designated a National Historic Landmark in 1975.
-Historic American Engineering Record: HAER NM-4
-National Register of Historic Places NRHP Number: 66000476

- 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 disproportionately high and adverse effect on low income or minority populations?

The proposed project will not have a disproportionately high and adverse effect on low income or minority populations. Any effect to low income or minority populations will be positive due to resilience to climate change.

- Will the proposed project limit access to, and ceremonial use of, Indian sacred sites or result in other impacts on Tribal lands?

The proposed project will not limit access to and ceremonial use of Indian sacred sites or result in other impacts on 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?

The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

Required Permits or Approvals

The proposed project is located exclusively within maintained canal rights-of-way owned and operated by CID. Therefore, no easements and no federal, state or local permitting will be

required for the proposed project. Many features of the Project are listed on the National Registrar of Historic Places, most notably the Pecos River Flume and Avalon Dam. The CID was designated a National Historic Landmark in 1975.
-Historic American Engineering Record: HAER NM-4
-National Register of Historic Places NRHP Number: 66000476

Overlap or Duplication of Effort Statement

This project and application does not have any overlap with any active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel. This project and proposal submitted for consideration does not in any way duplicate any proposal or project that has been, or will be, submitted for funding consideration to any other potential funding source—whether it be Federal or non-Federal.

Conflict of Interest Disclosure Statement

CID, its Directors, nor management have any Conflict of Interest under, or with respect to, Federal financial assistance agreements.

CID has internal controls that include procedures to identify, disclose, and mitigate or eliminate identified conflicts of interest. CID will notify the Financial Assistance Officer in writing of any conflicts of interest that may arise during the life of the award, including those that have been reported by subrecipients.

Uniform Audit Reporting Statement

CID did not meet the threshold of local governments expending $750,000 USD or more in Federal award funds in the applicant's most recently closed fiscal year and was not required to submit a Single Audit report. If this threshold is met CID will submit a Single Audit report for that year through the Federal Audit Clearinghouse's Internet Data Entry System as required.

Certification Regarding Lobbying

CID certifies, and documents as to such on the SF424 form, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

Official Resolution

CID's Board of Directors has committed to a minimum of 50% cost share throughout this project if funding is awarded. If selected, CID will provide an official resolution adopted by CID's Board of Directors, signed by its officers as directed within 30 days of selection of this application. The provided resolution will include:

- The identity of the official with legal authority to enter into an agreement
- The Board of Directors, governing body, or appropriate official who has reviewed and supports the application submitted
- That CID will work with Reclamation to meet established deadlines for entering into a grant or cooperative agreement

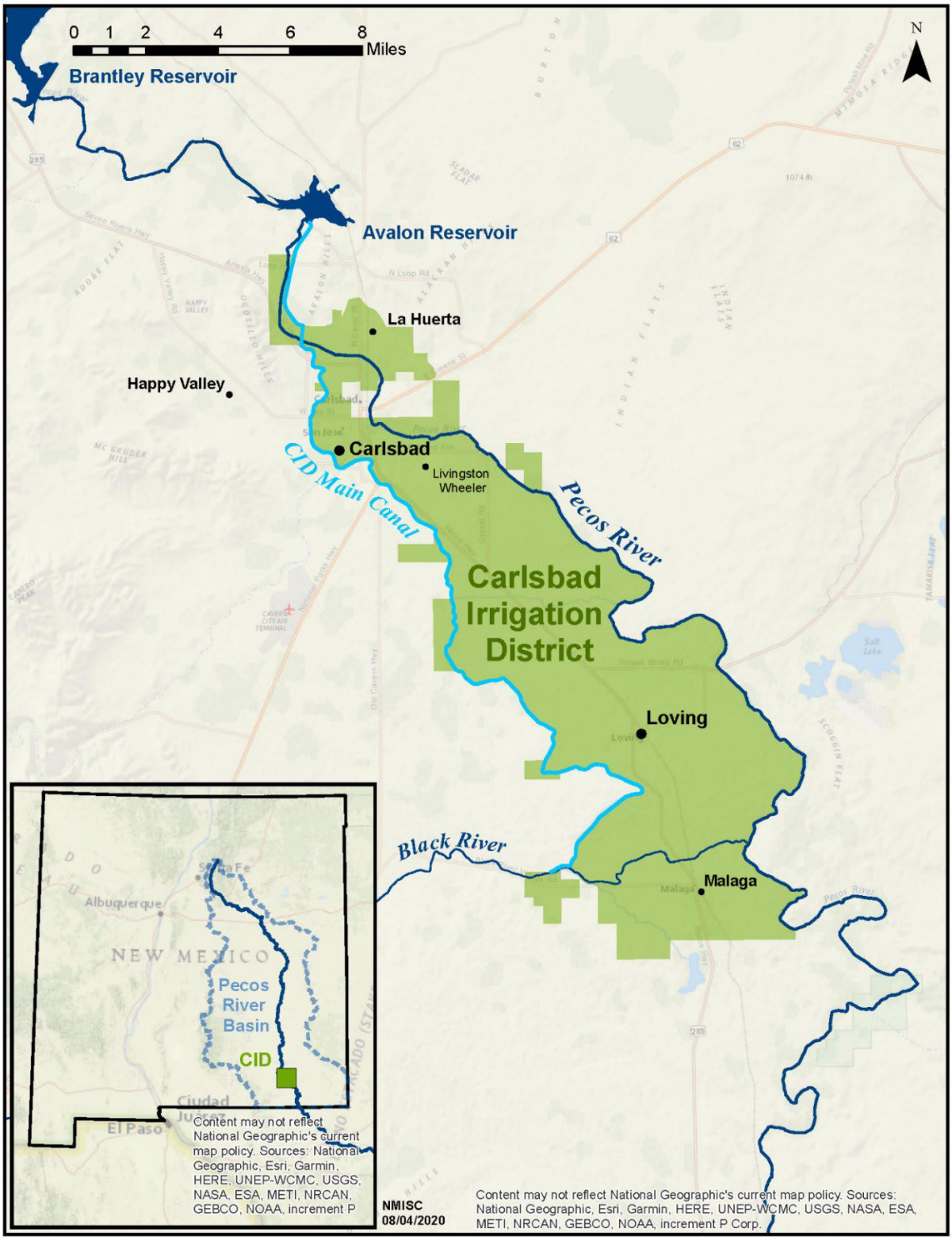

Figure 1. Map of Carlsbad Irrigation District, showing the Pecos River, CID Main Canal, Brantley Dam, and Avalon Dam (NMISC).

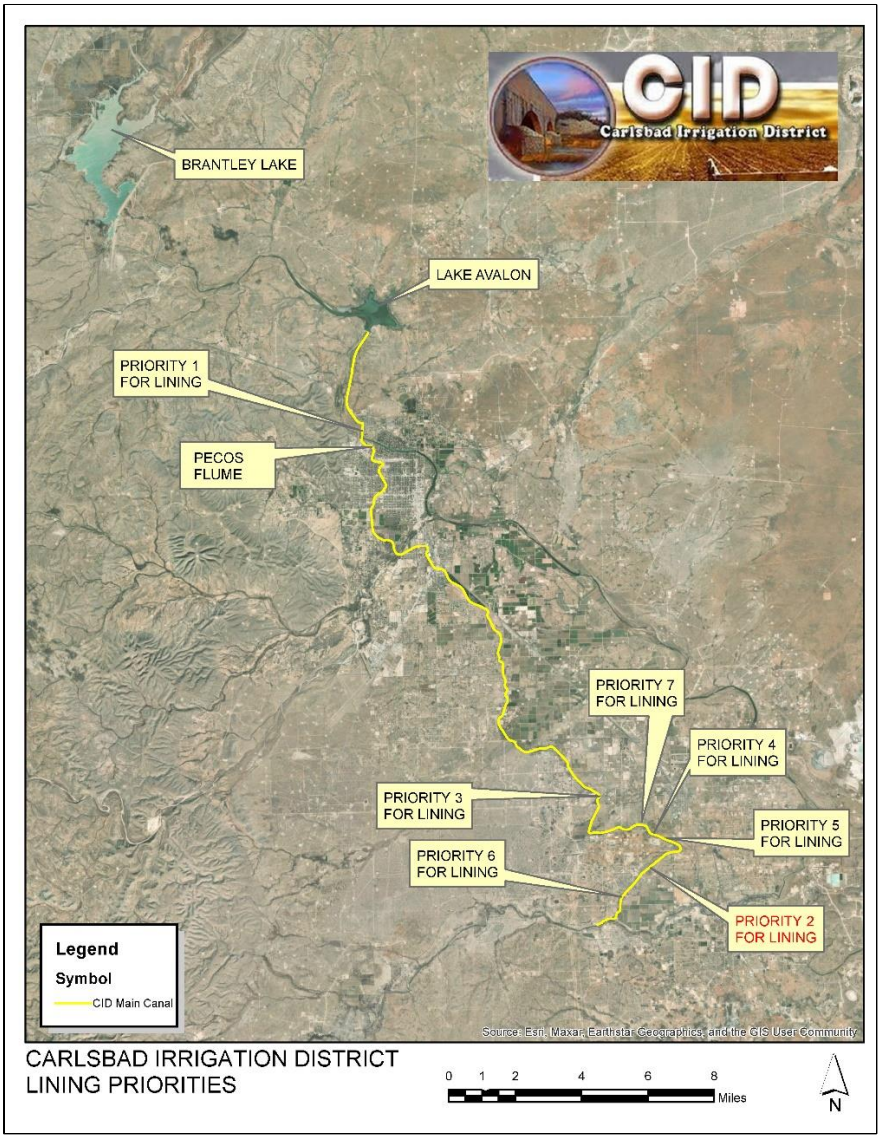

Figure 2. Map of CID Lining Priorities. Priority 2 is the subject area affected by this lining project.