

Application for WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2023
Enterprise Watershed Improvement District
Enterprise Conservation Improvement Project

Prepared By:

Popo Agie Conservation District

District Manager: Kelsey Beck

pacd.beck@gmail.com

307-349-2063

and

Nikki Brinson

NB-Consulting LLC

nikki@nbconsulting.us

303-910-9528

Submitted To:

WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2023

Funding Opportunity No. R23AS00008

Bureau of Reclamation
Financial Assistance Operations
Section Attn: NOFO Team
P.O. Box 25007, MS 84-27133
Denver, CO 80225

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1.0 TECHNICAL PROPOSAL

1.1 Executive Summary

The Enterprise Watershed Improvement District, located in North-central Wyoming near the town of Lander, will construct 8,820 linear feet of pipe to conserve and use water more efficiently; mitigate potential conflicts in areas at a high risk of future water conflict; and accomplish other benefits that contribute to water supply sustainability in the abnormally dry part of Wyoming in the western United States. The District will replace the highly erodible earthen ditch, which experiences high seepage and evaporation loss, with a pipeline to increase water use efficiency and reliability through optimal flow rates, reduced seepage, and reduced operational losses. The project is a top priority for the District and is expected to result in annual water savings of 524 acre-feet, based on an average irrigation season of 120 days. The project should commence operations during fall 2023 and be completed by 2025.

Enterprise Ditch irrigators rely on snowmelt for both direct flow and to fill the Frye Lake storage. Enterprise typically begins direct flow diversions in mid-May depending on access to the ditch and diversion headgates. Current operations attempt to maintain the flow rate in the ditch at a consistent level, typically at the maximum capacity of the upper reaches of the ditch. Early season deliveries are typically dominated by delivery of direct flows, but as the snowpack dwindles, stored water is typically released to maintain the flow rate in the ditch near the maximum capacity. Storage water is typically delivered at the same rate as direct flow and, depending on the season, is exhausted by mid-Summer (July or August).

Maintenance and operation of the ditch is conducted by the Enterprise Board of Directors and the ditch riders employed by Enterprise. Larger projects are typically executed by contractors under contract to the Company, while ongoing maintenance and smaller projects are completed by the ditch riders, Board members, or volunteer shareholders.

1.2 Eligibility of Applicant

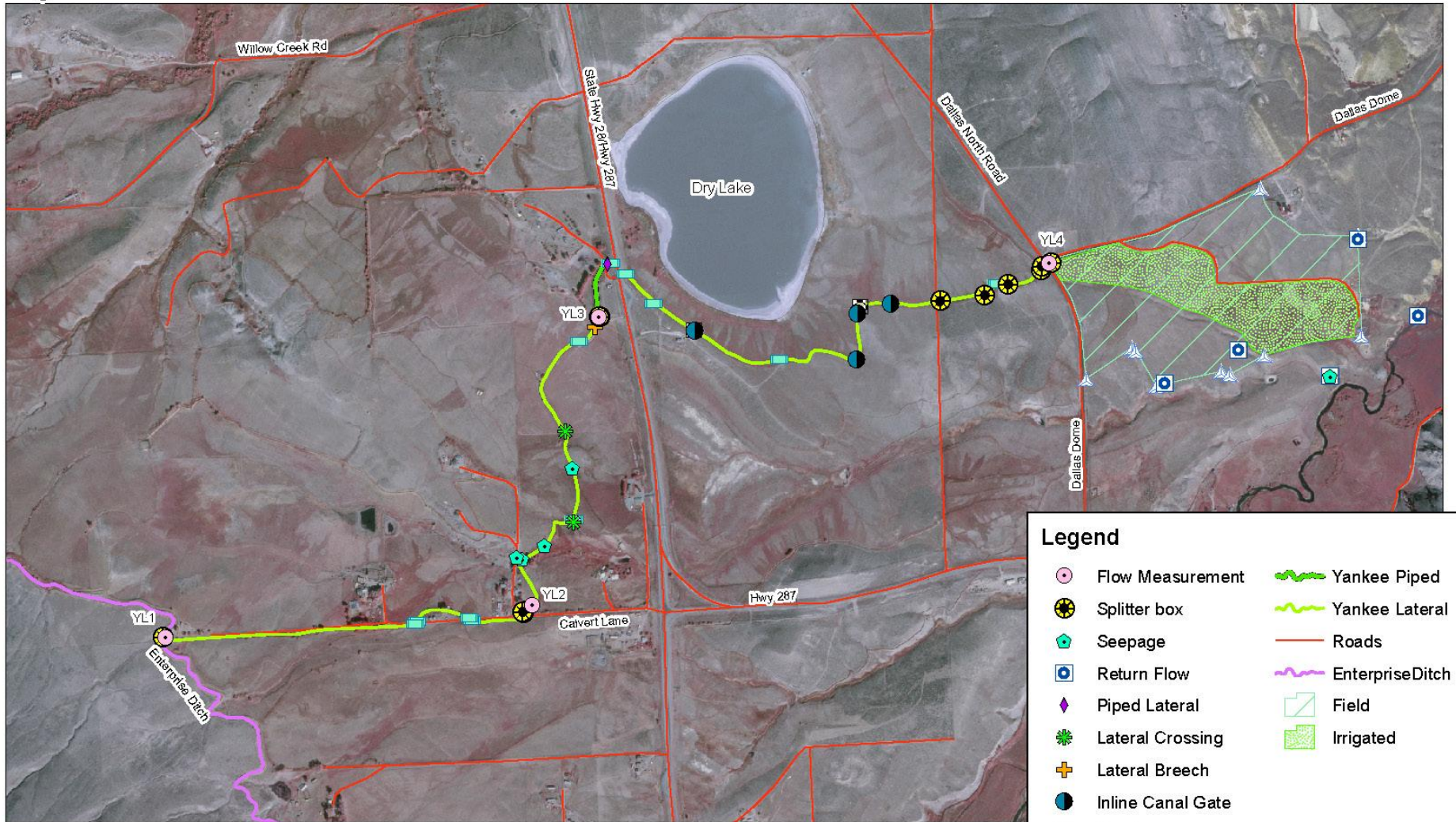
The Enterprise Watershed Improvement District (Enterprise or EWID) was formed in 2006 by a unanimous vote of the landowners within the district boundaries, generally defined as the service area of the Enterprise Irrigation and Power Company which was formed in 1901. EWID was formed to create an approved entity which can receive funding for studies or construction projects through the Wyoming Water Development Commission (WWDC). The previous Level II (Appendix B) study builds on the results and recommendations of the Level I Popo Agie Watershed study completed for the Popo Agie Conservation District (PACD) in 2003. On June 30, 2022 the EWID approved the study to Level III status.

Watershed Improvement Districts are created under the authority of Title 41, Chapter 8 of the Wyoming State Statutes, and are intended to “provide for the prevention and control of erosion, floodwater and sediment damages, for agricultural uses, and the storage, conservation development, utilization and disposal of water, and thereby to preserve and protect land and water resources, and protect and promote the health, safety and general welfare of the people of this state.” As provided in the statute, EWID is a subdistrict of the PACD and works closely with PACD in matters related to the organization, operations, and maintenance of the EWID. EWID is empowered to collect assessments from landowners within the District boundaries for the purchase of property or the construction, improvement, maintenance or operation of structures that are necessary for the performance of the authorized function of the EWID.

1.3 Project Location

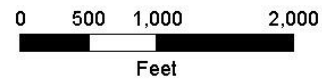
The project location is in the Popo Agie River Watershed, 9.4 miles southeast of the town of Lander, Wyoming. The project latitude is 42°43'42.73"N and longitude is 108°39'50.11"W.

The elevations in the Popo Agie River watershed range greatly. From about 5,000 feet (ft) above mean sea level (amsl) to over 13,000 ft amsl. Therefore, the climate varies within the basin with increasing precipitation and decreasing temperatures as elevations increase. Coinciding with the snowmelt in the watershed, the flows in the River typically increase in April and peak in early June. Flow in the River recedes through the summer months and returns to base flow conditions by about November.



Aqua Engineering, Inc.
Innovative Water Solutions

Riverside Technology, inc.
Water Resources Engineering and Consulting



Legend

	Flow Measurement		Yankee Piped
	Splitter box		Yankee Lateral
	Seepage		Roads
	Return Flow		Enterprise Ditch
	Piped Lateral		Field
	Lateral Crossing		Irrigated
	Lateral Breach		
	Inline Canal Gate		
	Headgates		
	Field Boundary Points		
	Culverts		

1.4 TECHNICAL PROJECT DESCRIPTION

The project is focused to deal with the seepage losses, and improvements on the delivery efficiency on laterals and farms to conserve and use water more efficiently and accomplish other benefits that contribute to water sustainability in the West. These efforts then contribute to the development of a canal and farm efficiency improvement strategy and concept design of canal improvements. Specifically, this project will result in quantifiable water savings, conserve and use water more efficiently; mitigate conflict risk in areas at a high risk of future water conflict; and accomplish other benefits that contribute to the sustainability of water in the Western United States.

The Yankee/Calvert Lane lateral is located near the downstream end of the South lateral. Water to be delivered to irrigators under this lateral is turned out of the South lateral at a concrete division structure. Water is then delivered to an earthen ditch and conveyed easterly to farms under the lateral. The total length of the lateral is approximately 2.5 miles from the turnout on the South lateral to the final division structure upstream of the Yankee farm. Flow measurements were made at several points along the lateral to determine seepage losses from the turnout to the delivery at the Yankee farm. Deliveries to other irrigators were accounted for in the determination of the efficiency of this lateral. The priority area extent is 1,862 acres and the proposed land treatment is 420 acres.

1.4.1 Climate

On average, Lander receives about 13 inches of precipitation per year measured at the Lander Airport. In 2019, Lander received 13.8 inches from January through September with generally higher than average precipitation in the spring months and lower than average precipitation in the summer months.

1.4.2 Hydrology

The water supply to the Enterprise system is dominated by snowpack and subsequent snowmelt in the Wind River Range. Typically, significant snow accumulation is generated during the winter months. The peak in flow typically occurs in June as rising temperatures during April and May cause an increase in the flow in the Roaring Fork, Sawmill Creek, and Crooked Creek tributaries which supply the Enterprise system. The Enterprise system is a trans-basin diversion, carrying water from its point of origin in the Middle Fork sub-watershed to irrigate lands on the Little Popo Agie River.

Typically, streamflows begin to recede in late June and July. Beginning in July, as snowmelt runoff has nearly ceased, Enterprise typically relies on water stored in Frye Lake for an increasing proportion of irrigation deliveries.

Snowpack accumulation supplies the majority of the water supply for the Enterprise system. Years with large snowpack or delayed melt significantly increase the length of the irrigation season under the Enterprise system, while years with low snowpack or high early season temperatures can limit the season length significantly. Frye Lake can typically fill during the winter months or early spring months, but high runoff during spring is typically bypassed by Enterprise due to the lack of conveyance capacity in the existing ditch and the lack of downstream storage. Rapid early season melting typically increases the amount of flow bypassed by Enterprise, while a longer snowmelt allows Enterprise to extend their direct flow season and delay use of supplemental irrigation water stored in Frye Lake.

1.4.3 Farming Practices under Enterprise

The irrigated farms under the Enterprise system grow pasture grasses, alfalfa, or alfalfa-grass mixes. These crops are typically sold for animal feed or used in on-farm winter feeding operations. Typically, grasses yield a substantial first cutting. Depending on irrigation supplies and summer precipitation, the second cutting is less productive. Additional cuttings are not standard. Irrigation practices under Enterprise are typically surface methods such as flood irrigation. Gated pipe is used extensively on-farm under the Enterprise system. Fields tend to be rolling and in some places, slopes can be quite steep. Farmers practice techniques such as intermediate terraces to allow for more controlled irrigation applications on the steeper slopes. The Enterprise system is typically water short, and excess runoff or surface tailwater return flows are not common on most farms where efficient irrigation practices are implemented. Excess water has been observed to runoff on farms with steeper slopes and between irrigation sets.

1.4.4 Technical Aspects of the Project

The Enterprise system inventory conducted in previous studies identified several critical structures which were in need of repair or near the end of their useful life. Canal reaches with especially high seepage or which are in poor condition have been identified and included in this project.

The lateral condition in the reach immediately downstream from the South lateral turnout is poor and characterized by heavy channel erosion and bank vegetation. In 2008, the Wyoming Water Development Office conducted a Level II Study (Appendix B) which identified the upstream reach of the lateral loses approximately 15 percent of the water conveyed through it

as a result of the earthen channel. Lower sections of this ditch were anticipated to lose no less than 50% of the water due to the erosion and heavy bank vegetation. Fourteen years later, with no ditch improvements, that number is expected to be higher.

The middle reach condition is generally poor. The lateral is overgrown in sections and is breached or flooding at several locations between Calvert Lane and Highway 287. In 2008 the Level II study identified the downstream reach of the lateral loses approximately 50% of its flow between Highway 287 and the delivery at the Yankee farm. This canal reach has a very flat gradient and leaks at several locations. Irrigation to the farm adjoining Dry Lake is conducted using openings in the earthen ditch. These openings are blocked when not being used for irrigation, but leaks were observed during these measurements.

1.5. EVALUATION CRITERIA

The evaluation criteria portion should be addressed in the technical proposal section of the application.

Evaluation Criteria: Scoring Summary	Points
A. Quantifiable Water Savings	28
B. Renewable Energy	20
C. Sustainability Benefits	20
D. Complementing On-Farm Irrigation Improvements	10
E. Planning and Implementation	8
F. Collaboration	6
G: Additional Non-Federal Funding	4
H: Nexus to Reclamation	4
Total	100

1.5.1 Quantifiable Water Savings

The estimated annual water savings would be 524 acre-feet based on the irrigation season of 120 days, beginning mid May and ending mid July or early August. This aligns with the water rights of this lateral being fulfilled if it were piped.

Water losses on this system result in continued erosion and seepage issues that negatively impact the conveyance and delivery of water. In addition undesirable species such as russian olive and invasive weeds further degrade the environmental conditions around the ditch. (Figure 1.5).



Figure 1.5. View of Yankee/Calvert Lane lateral canal on right side of road which experiences high seepage loss resulting in undesirable vegetation growth along the canal.

In 2008 a seepage loss analysis was conducted for this project (Table 1.5). If there is enough flow to supply water to the end of the ditch then return flows would end up in the Little Popo Agie river which flows into the Bureau of Reclamation Boysen Reservoir. No additional habitat for fish or animals are provided by the canal. Invasive species such as Russian olive have established along the canal which further erodes the canal and reduces water flow.

Table 1.5 Yankee/Calvert Lane Lateral Seepage Loss Summary (in 2008)

	Test section length (miles)	Test Date	Discharge Upstream (CFS)	Discharge Downstream (CFS)	Change in Flow (CFS)	Change in Flow per mile (CFS)
Yankee Lateral						
YL1 TO YL2	0.69	7/11/07	4.6	3.9	0.7	1.0
YL2 TO YL3	0.64	7/11/07	2.4	2.9	-0.5	-0.8
YL3 TO YL4	1.07	7/11/07	2.9	1.4	1.5	1.4

Note: Flow measurement was performed with portable long throated flumes and velocity meter

* Assumes same flow rate as tested. Varying flow rates will result in varying losses.

** Seepage loss is indicated by a positive number (+). Measured inflow or a "gain" is indicated by a negative number (-).

No average annual canal seepage losses have been determined, although the Level II (Appendix B) study captured seepage losses using portable long throated flumes and a velocity meter. Personal observations coupled with continued erosion and growing conflicts over access to water provide anecdotal information that these conditions have worsened in the past 14 years since the study was conducted.

The expected post-project seepage/leakage loss is 0%. The open earthen canal converted to a closed pipeline will result in 0% seepage and 100% water savings.

The Yankee/Calvert Lane lateral runs approximately 3.4 miles from the splitter box at the top of the lateral down to the Little Popo Agie River. This project proposes to convert 8,820 linear feet of open earthen ditch to a pipe which will result in water conservation and efficiency for farmers.

The Popo Agie Conservation District engineer will verify construction has been installed to specifications on the designs. In addition, PACD has equipment to conduct a seepage study after the installation of the project to verify flows and seepage reductions.

Appendix A includes the engineered project plans that provide a description of the proposal and materials to be constructed. Materials include 12" HDPE pipe, PIP PVC pipe (ranging from 8" to 15"), a coanda screen, a flow meter to measure flows, divided weir structure, divide plates, pond discharge inlet structure, turn out structures, and dual air vents.

Currently no irrigation flow measurements are taken on this lateral; however, NRCS and engineer designs have required a flow measurement device to monitor flows. This will result in water savings when improved measurement accuracy results in reduced spills and over-deliveries to irrigators.

1.5.2 Sustainability Benefits (20 points)

As with many water efficiency projects, this project seeks to improve water delivery and conservation efforts in order to support producers, wildlife, recreationists and other water users downstream to provide resiliency to an ever changing climate. As snowmelt is less reliable and ever increasing temperatures in an arid western state already pose challenges, ensuring stability from this small stream is a vital step in resiliency for this community and downstream water users. In addition, the stability provided in more accurate delivery will ensure resolutions in this water conflicted region.

Native species will benefit from habitat restoration and improved ecosystem function, habitat connectivity will be amplified, access to recreation areas will be expanded, and the local community will be engaged.

By reducing seepage losses, water is retained in the system and less water may need to be taken from Frye Lake, resulting in benefits to recreation, wildlife and fisheries. This project will result in more efficient management of the water supply and allow greater flexibility to water

managers, resulting in a more efficient use of water supplies. Improving water delivery will enable users better access to their water right and thus decrease the potential for water conflicts that occur when users do not receive their full water allotment.

1.5.3 Other Project Benefits

This project would support disadvantaged and underserved communities, E.O. 14008 and E.O. 13985. According to data from the United States Census Bureau, the State of Wyoming's median household income in the past 12 months is \$65,304.00. This project is located in Fremont County which has had a median household income in the past 12 months of \$54,291.00. That is only 83% percent of the statewide annual median household income for the State and therefore follows the classification (<100%) of a disadvantaged community under Section 1015 of the Cooperative Watershed Act.

This project will strengthen water supply sustainability and will thus increase drought resiliency benefits. Completing the project will also improve crop productivity and health. With additional NRCS assistance, crop and livestock producers will be able to improve irrigation water management and monitoring systems, reduce seepage loss, sediment transport, and gully or bank erosion in canals. The project is expected to result in an annual water savings of 524 acre-feet, which will be used primarily to increase the reliability of water supply from the Frye Lake to the Little Popo Agie river.

The improvements of removing the existing invasive species (ie Russian olives) will drastically improve natural grass and nearby areas to allow native wildlife habitats.

The Enterprise Ditch system is a transbasin diversion, meaning return flows do not return to the source water they were taken from. The source water for the Enterprise ditch system comes from the Middle Fork of the Popo Agie River which is overappropriated and depleted by late July. Piping the Enterprise ditch system will result in water savings that could result in more water available in the Middle Fork of the Popo Agie River, thus reducing water-related crises or conflict.

1.5.3 Complementing On-Farm Irrigation Improvements

The Enterprise Conservation Improvement Project will pursue assistance from landowners in a cost share program with NRCS under EQIP through the Regional Conservation Partnership Program. The attached letters of support from the local NRCS Field office in addition to landowner letters provide confirmation of some of the local and Federal support of this project.

1.5.4 Planning and Implementation: Readiness to Proceed

The project is ready to proceed in the fall of 2023, after the prime irrigation time for ditch users. The original, in-depth, Level II study in 2008 laid the foundation for the 2021 project plan that was developed. Estimates from contractors have been reviewed and partners are committed to project completion.

1.5.5 Collaboration

The Yankee/Calvert Lane Lateral project has widespread support. Provided with this application are letters of support from the City of Lander, The Nature Conservancy, Natural Resource Conservation Services (NRCS Riverton-Lander field office), The Healthy Rivers Initiative and local landowners. The community engagement and support around the benefits of all ditch users (along Enterprise) and recreationists at both Frye Lake and Boysen Reservoir is strong for this project.

This project is a stepping stone in the process of improving water conservation projects throughout the PACD and EWID, and impacts Boysen Reservoir. This project is one of several listed in the Enterprise ditch study, and is serving as the catalyst to get other outdated systems improved, to mitigate climate change impacts, specifically related to drought and reduce water-related conflicts.

1.5.6 Additional Non-Federal Funding

TOTAL NON-FEDERAL: \$452,376.00 = 59.9% Non Federal Funding
TOTAL PROJECT COST: \$755,540.00

1.5.7 Nexus to Reclamation

The return flows of the Enterprise Ditch (and thus the Yankee/Calvert Lane Lateral) flow into the Little Popo Agie River and downstream into the Bureau of Reclamation Boysen Reservoir.

1.6. PERFORMANCE MEASURES

This project will require an inflow meter (12" seameetrics irrigation magameter), and a proportional divided weir. In addition, the Popo Agie Conservation District engineer will verify construction has been installed to specifications on the designs and has equipment to conduct a seepage study after the installation of the project to verify flows and seepage reductions. This would occur above and below the project location.

Water on this system will be distributed equitably according to shares and allow for future system improvements and on farm efficiency projects to further enhance and mitigate climate change impacts and water user conflicts.

Appendix B, The Enterprise Conservation Program Level II Study, contains the pre-project baseline data for seepage loss and analysis (also listed on Table 1.5). Post project data will be collected again for comparison.

2.0 PROJECT BUDGET

2.1 Budget Proposal

2.1.1 Table 1. - Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non-Federal Entities	
1. Enterprise Watershed Improvement District	\$240,625.00
2. Landowners cost share match	\$211,751.00
Non-Federal Subtotal	\$452,376.00
REQUESTED RECLAMATION FUNDING	\$303,164.00

2.1.2 Table 2 - Total Project Cost Table

SOURCE	AMOUNT
Costs to be reimbursed with the requested Federal funding	\$303,164.00
Costs to be paid by the applicant	\$240,625.00
Value of third-party contributions	\$211,751.00
TOTAL PROJECT COST	\$755,540.00

2.2 Budget Narrative

Federal Narrative: \$303,076.00

Personnel: \$25,080.00 None

1. **Personnel:** Popo Agie Conservation District’s District Manager and Engineer will oversee \$25,000.00 for construction project supervision and management. This will include contracting for construction on the project and general project management and

oversight of that agreement. The average fee for an engineer is estimated at \$66.00/hour x estimated 380 hours of work.

Fringe Benefits: \$0.00 None (PACD will cover the fringe benefits of their employees)

Travel: \$0.00 None

Equipment: \$0.00 None

Supplies: \$0.00 None

Contractual \$9,900.00

1. **Contractor:** NB-Consulting LLC is contracted at \$9,900.00 to research, compile and compose grant management/reporting and accounting oversight/tracking for grant. NB-Consulting LLC will coordinate quarterly team meetings, perform project management for accounting, communication, outreach and assist with project evaluation. The contract is considered a micro purchase and the recipient considers the price to be reasonable. 2 CFR 200.68, 200.320.

Construction: \$240,624.00

1. Contractors Western Heritage and WURX LLC have provided project estimates (for costs in 2021 and 2022 respectively). The estimates cover the construction to furnish and install all pipe, equipment and appurtenances. The final contract will be awarded using competitive proposals and selections will be made based on the best value (qualifications and price). NOTE: The most recent estimate from WRUX LLC is attached for a total of \$693,000.00. Of that total amount, \$211,751.00 is expected to be covered by NRCS (and \$211,751.00 will be matched from landowners). \$240,625.00 is expected to be covered from the Enterprise Ditch Company. (Thus leaving the remaining \$240,624.00 to be requested from BOR in this proposal.)

TOTAL DIRECT: \$275,604.00

Indirect Charges: \$27,560.00

TOTAL FEDERAL REQUESTED: \$303,164.00

Non-Federal Narrative:

Personnel: \$0.00 None

Fringe Benefits: \$0.00 None

Travel: \$0.00 None

Equipment: \$0.00 None

Supplies: \$0.00 None

Contractual \$0.00 None

Construction:

1. Enterprise Watershed Improvement District will provide \$240,625.00 as direct money towards the construction contract.

2. Landowners will contribute \$211,751.00 in cost-share to their respective sections of the project.

TOTAL NON-FEDERAL: \$452,376.00

2.3 Funding Plan and Letters of Commitment

- Landowners along Calvert Lane Lateral Cost share \$211,751.00
- Enterprise Watershed Improvement District \$240,625.00
- BOR WaterSMART grant application \$303,164.00

3.0 ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

The proposed project already has engineering plans completed to NRCS standards and specifications. NRCS will conduct any federal environmental and cultural resource compliance requirements. Funding from NRCS EQIP is secured through the Regional Conservation Partnership Program which will expedite this project to completion.

NRCS standards and practices will be followed for any earth moving work on the canal with a goal to keep disturbances to a minimum. We are not aware of any species that are to be listed as Federal threatened or endangered in the area. The water delivery system was constructed in the early 1900s. The location of the project is not listed or eligible for listing on the National Registrar of Historic Places and there are no known archeological sites in the proposed project area. The proposed project will actually allow removal of noxious weeds (ie Russian olive) along the canal and will allow native vegetation to grow there.

4.0 REQUIRED PERMITS OR APPROVALS

Required permits or approvals will be obtained through NRCS.

5.0 LETTERS OF SUPPORT

Letters of support, partnership and participation are included.

6.0 CONFLICT OF INTEREST DISCLOSURE

State conflict of interest not applicable.

8.0 OFFICE RESOLUTION

The Popo Agie Conservation District Board of Supervisors.

9.0 UNIFORM AUDIT REPORTING STATEMENT

The Popo Agie Conservation District was not required to submit a Single Audit report for the most recently closed fiscal year ending December 2021.

10.0 CERTIFICATION REGARDING LOBBYING

Completed through grants.gov.