

May 15, 2017

**WATERSMART FY2017:  
SMALL-SCALE  
WATER EFFICIENCY  
PROJECT**

**SARONI CANAL  
WATER CONSERVATION PROJECT**

**FOAN: BOR-DO-17-F011**

**CFDA: 15.507**

**FEDERAL FUNDING REQUEST: \$71,796**

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## TECHNICAL PROPOSAL

### EXECUTIVE SUMMARY

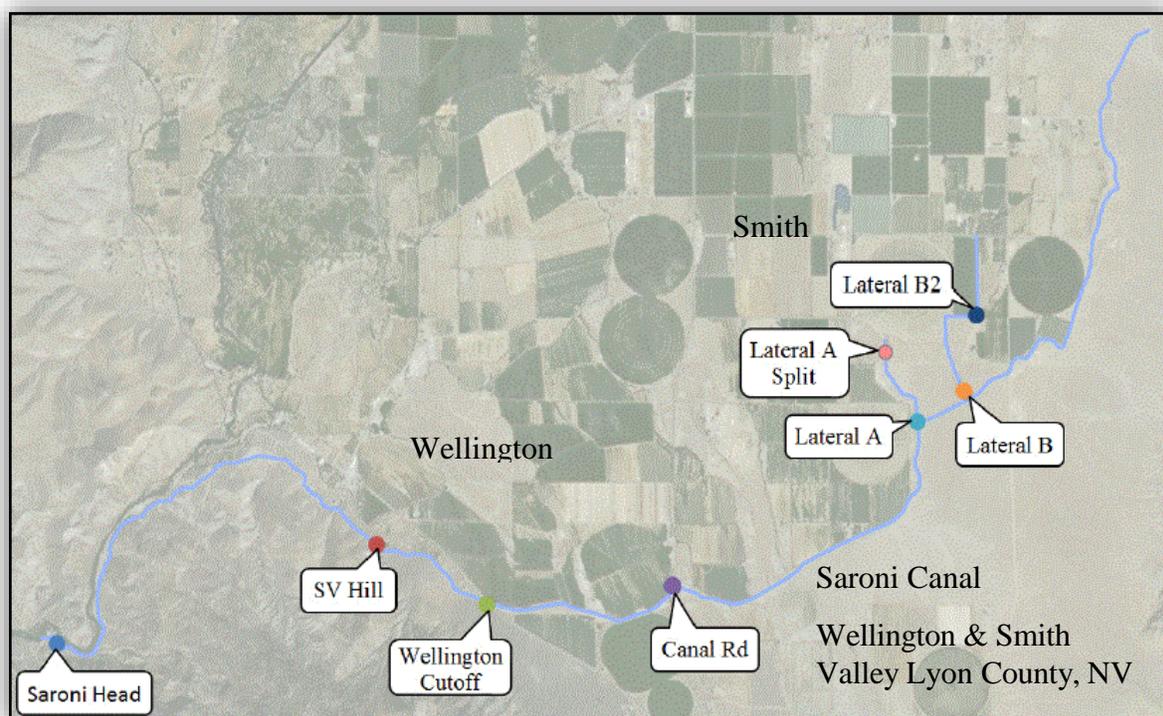
Walker River Irrigation District, located in Nevada's Walker River Basin, is requesting funding for a water conservation project under the FY2017 WaterSMART Small-Scale Water Efficiency Project. Walker River Irrigation District is requesting \$71,796 in federal funding that will be matched by \$74,727 of non-federal funds via monetary match and in-kind services. The proposed water conservation project has been titled as the 'Saroni Canal Water Conservation Project' (the Project). This Project is intended to minimize water loss and increase water efficiency and delivery along the Saroni Canal by converting a section of open canal to a piped section, installing dataloggers for continuous flow monitoring and tracking, and installing cross-section regulating structures. Upon completion, this Project will yield more accurate water delivery data, decreased water loss due to seepage, decreased likelihood for canal breach in project area, and improvement of instream conditions for endangered species. No part of the Saroni Canal Water Conservation Project will occur in or near a Federal facility. The Project will begin November 2017 and continue to progress with an estimated end date of Fall 2019.

### BACKGROUND DATA

The Walker River Irrigation District (WRID) was created in April 1919 under the Authority of the Nevada Irrigation District Act and functions primarily under Nevada Revised Statute 539; WRID is an independent irrigation district. WRID encompasses approximately 235,000 acres of which 80,000 are irrigated. WRID operates two storage reservoirs- Bridgeport Reservoir in Mono County, CA and Topaz Reservoir in Douglas County, NV and Mono County, CA. WRID operates and maintains extensive drainage systems in both Smith and Mason Valleys. The Saroni Canal (the Canal) is owned and operated by WRID, but is governed by a user elected board. The Canal begins at the top of Hoyer Canyon in Wellington, NV (Figure 1). The Canal waters are supplied from the West Walker River which is fed from Topaz Reservoir. The Canal has 3951.23 water righted acres along its entirety with 26 water right users, all of which were served during the 2016 irrigation season. The Canal users utilize 28 gates to direct irrigation water onto their farms and ranches; many of which are currently being operated by generational families. These farms and ranches depend on accurate and appropriate water delivery to aid in success. Success in the farming/ranching industry depends on the availability of water and efficiency in the use of water. The region continues to experience severe drought conditions, as reported by the U.S. Drought Monitor. During the 2016 irrigation season, 6,474.76 acre feet of water were requested to be delivered to users along the Canal. Monitoring during the irrigation season proved up to 45% water loss due to seepage & evaporation on multiple days; the average daily water loss was estimated at 30% per the Nevada State Engineer (NSE). Losses of any magnitude are detrimental to the accuracy of water delivery and efficiency of water use. With current litigations and current drought conditions, the demand for water downstream is expected

to increase. Accuracy of water delivery and efficiency of water use is detrimental to the ecosystem of the Walker River Basin and water conservation efforts are imperative to the symbiosis of the cultures within the Basin. Major agricultural crops along the Canal include grass, grain, alfalfa, as well as cattle, sheep, and horses. Many users have made on farm changes, including crop change, to adapt to the drought and decrease irrigation water availability from the reservoirs. The main Saroni Canal is approximately 8 miles of canal with two laterals that total approximately 2 miles combined. In 2014, WRID and Bureau of Reclamation (BOR) worked together in installing solar powered head gates and electronic equipment to modernize the operation of the Canal. Supervisory Control and Data Acquisition (SCADA) systems were installed to operate the head gates and to collect water measurements for data analysis. The WRID Water Gauge Improvement and the Desert Terminus Lakes projects are an example of a successful working relationship between WRID and BOR and demonstrates the ability of WRID to appropriately utilize federal funds and complete timely and accurate reports.

Figure 1



## PROJECT DESCRIPTION

A 16 September 2016 Draft Technical Memorandum from the Irrigation Training & Research Center (ITRC) of California Polytechnic State University identified a 30% water loss during a one month study between the Saroni Head and SV Hill sites of the Saroni Canal. A 13 January 2017 ITRC Draft Technical Memorandum identifies a 200-foot section of the Canal lined with Teranap liner as showing evidence of degradation due to age and

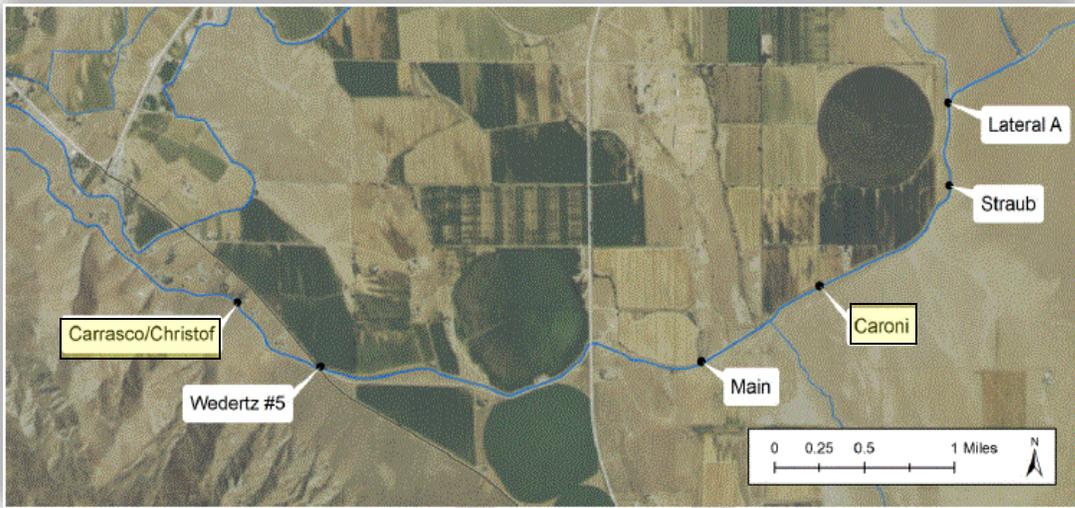
environmental factors (Figure 2). The 20-year liner was installed in 1997. Downhill from a tear in the liner, a leak is evident due to green vegetation. If the section of the Canal is not upgraded, a canal breach is very likely. There are homes below the hazard location, therefore, ITRC is recommending installation of 500-feet of 60- inch High-Density Polyethylene (HDPE) pipe to mitigate the hazard to ensure debris does not inhibit the flow of water through the pipe section, a trash rack is recommended in the ITRC Draft Technical Memorandum; WRID Staff will conduct the building and installation of the recommended trash rack. The installation of the (HDPE) pipe and steel trash rack is noted as Phase I of the Project. In accordance with Section 9504(a)(3)(B) of Public Law 111-11, WRID agrees 1.) not to use any associated water savings to increase the total irrigation acreage of the applicant; and 2.) not to otherwise increase the consumptive use of water in the operation of the applicant, as determined pursuant to the law of the State in which the applicant is located.

Figure 2



Phase II of the Saroni Canal Water Conservation Project is noted as the installation of cross-regulating structures. Currently, water users along the Canal move rocks, sheet piles, and other objects into the canal to raise water levels when they are receiving deliveries. The foreign debris not only causes structural issues, but results in inaccurate in-stream flow measurements. Per the recommendation of ITRC in its 16 September 2015 Draft Technical Memorandum, WRID will need to install six (6) cross regulator flow measurement devices at six suggested sites (Figure 3). WRID has identified the Carrasco/Christof and Main sites as being the highest priority of needing the regulating structures and the two sites are included for this proposal.

Figure 3



Installation of the two regulating structures and devices would mitigate both the debris piling and the inaccuracy of the in-stream flow measurements. With improving instream measurement accuracy, excess water may be available to return to the river system. The cross-regulating structures will be constructed as per the ITRC Design (the Design). The Design suggests the following key points be included in the cross-regulating structures:

1. The devices would consist of vertical concrete walls on each side of the canal with a footing across the Canal.
2. The devices will be installed at an angle across the Canal (rather than perpendicular) to provide added length, reduced water level fluctuations due to flow rate fluctuations (Figure 4).
3. The walls will have slots made to fit large pieces of dimensional lumber (i.e. 4x8s or 4x12s). The water level could be raised or lowered by adding or removing pieces of lumber.
4. A catwalk will run across the top of the Canal to allow access for adding and/or removing boards and/or measuring flow via a weir stick (Figure 5).

Figure 4

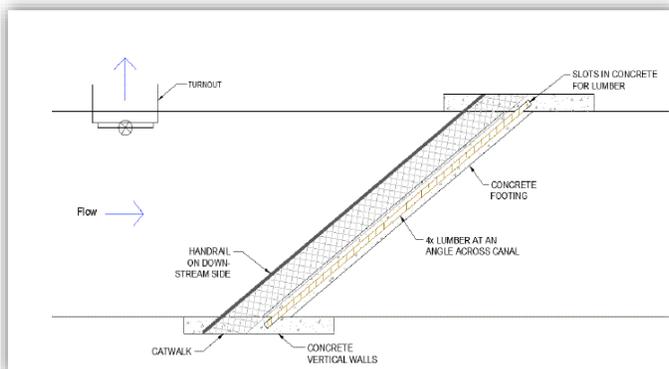
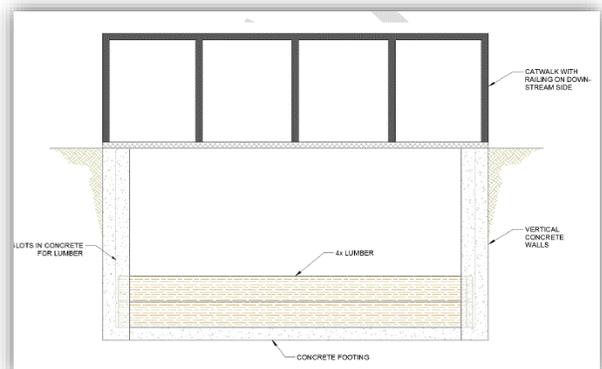


Figure 5



Phase III of the Saroni Canal Water Conservation Project is noted as the installation of instream data loggers. Six (6) Telog Data Loggers will be installed throughout the canal at key points. Data collected and analyzed will be crucial in determining instream flow changes and problematic areas within the Canal system. With the completion of Phase I and II of the Project, the major identified problematic areas will have been mitigated and the data collection may reveal other problem areas that were not detected due to the severity of other problem areas. Once Phase III is completed, WRID Staff will monitor and maintain the data loggers daily during irrigation seasons, and will collect data approximately thirty (30) times throughout the seasons. That data will be paired with SCADA data and appropriate corrective actions will be taken if needed to ensure sustained flows in the Canal. Currently, the Saroni Canal experiences fluctuation water flows with the Saroni Head to SV Hill section having the most fluctuation.

## EVALUATION CRITERIA

### PLANNING EFFORTS SUPPORTING THE PROJECT

1. Discussions and research are being conducted by WRID in effort of drafting a Walker Basin Water Conservation Plan in 2017. The obvious aspect of this project proposal, which conforms to all planning efforts currently under way, is that it works to conserve water. Secondly, the proposed project has a goal of increasing instream flows, benefiting federally listed species and downstream users. Shortfalls in the water supply, which have led to litigation, may be improved with the potential of increasing flow the Walker Lake.
2. With the threat to property and homes, the piping of a 700-foot section of the Saroni Canal is a top priority for WRID. ITRC staff has completed field studies of the potential devastation if the Canal were to breach in the hazard area. Another top priority of WRID's is the conservation of water. WRID, ITRC and the Saroni Canal Advisory Board have identified the problematic areas of the Canal which yield the highest water loss. Taking steps to mitigate the water loss is the first step in mitigating overall Canal loss.

### PROJECT BENEFITS

1. The Saroni Canal Water Conservation Project is expected to conserve water as well as improve water transport and delivery efficiency through the installation of HDPE pipe, cross-regulating structures, and instream data loggers. Water loss measurements during the past irrigation season reached as high as 45% loss on multiple days, but averaged 30% per the Nevada State Engineer. The total annual system loss from 1 April 2016 to 31 October 2016 is calculated at 1,942.43 acre-feet per year. Per ITRC Draft Technical Memorandums, 30% of the total water loss along the Saroni Canal is lost in the piping project area. Upon completion of Phase I of the Project, WRID estimates a total water savings of 582.73 acre-

feet per year. This annual savings is based on the calculation of Total Water Ordered in 2016 (af) multiplied by Daily Water Loss Percentage per NSE multiplied by Section Water Loss Percentage per ITRC.

Total Water Ordered in 2016 (af)	6474.76
Daily Water Loss Percentage per NSE	30%
Section Water Loss Percentage per ITRC	30%
Annual Total Projected Water Savings Phase I	582.73 acre-feet

2. Expected post-project Phase I annual average daily losses are estimated at maximum of 10% which is a 20% decrease from 2016 measurements. The entire Project annual average daily losses are expected to decrease to 20%; an estimated 712.22 acre-foot/year water savings. The estimated savings are based on facts that Phase I pipe installation will eliminate nearly all the evaporation, saturation, leakage, and absorption losses along the section identified as the major source of water loss. Phase II updating of cross- regulating structures will decrease the amount of debris in the Canal and will allow for more accurate water delivery and flow measurement. Phase III installation of instream data loggers will yield more accurate measurements and will aid in increasing return flow to the Walker River system. Taking the action to complete all Phases will ensure more water remains within the system and is available for irrigation use and/or instream flow; both of which improve the water supply reliability and availability.
3. The scope of positive impact will be seen throughout the project, but will ultimately yield results when the Post Performance Measures are completed. The overall water loss is expected to decrease approximately 20% from previous years. A positive impact will be felt by the homeowners whose property and homes were in jeopardy due to a leak below the canal in the proposed piping section.
4. Increased support for the Project results in increased collaboration for future water conservation projects. ITRC has collaborated with WRID and the Saroni Canal governing board to prioritize Canal improvements. Because of the ITRC, WRID, and Saroni Canal collaborations, other independent ditch companies within the Walker River Basin have expressed interest in discussing improvement projects to contribute to water conservation efforts. Tension and litigation within the Walker River Basin has been present for decades. With the continued drought and decrease water availability, tension builds. Diverse interest exists from the top of the Walker River’s two forks down to the terminal Walker Lake. Litigation has been an ongoing issue, primarily with surrounding tribes. The benefit of this Project is that no water rights will be affected and it has the potential to increase flows directed toward the tribes and Walker Lake. The possibility of future water conservation improvements by water users and ditch companies will be enhanced by this Project by setting an example of possible water saving improvements.

5. Walker River Basin thrives due to its agricultural economy. During the recent drought, water users were faced with the challenge of adapting their on-farm practices to accommodate the decreased availability of water. The economic benefits from increased instream flows would not only apply to the agricultural community, but will positively impact businesses along the Walker River who rely on recreational activity. With the expected loss reductions resulting in completion of the Saroni Canal Water Conservation Project, it is projected that excess water will now stay within the Walker River or will ultimately return to the river system. Any return flow or water left in the river system will benefit the efforts in preserving Walker Lake, a terminus lake at the end of the Walker River system. Benefits of increased return flows and allowing water to remain in the river system include improved stability and diversity to riparian and lacustrine habitats, as well as improved physical water quality composition for both fish and wildlife.

## PROJECT IMPLEMENTATION

1. Upon grant approval, compliance with all local, state, and federal mandates will be obtained. Prior to any ground-disturbing activity, National Environmental Policy Act (NEPA) representatives will be contacted. After all mandates and policies are adhered to, Phase I of the Project will commence as per an ITRC Draft Technical Memorandum dated 13 January 2017. Phase I is estimated to begin November 2017 and end January 2018. WRID staff will begin by clearing the debris and existing Teranap liner. Once existing obstacles are removed, staff will shape the canal and prepare for the pipe. Installation of the pipe will mark the halfway point of the Phase with concrete inlet/outlet installation, trash rack installation and burial of the pipe being the Phase I completion tasks. Phase II will begin in February as per an ITRC Draft Technical Memorandum dated 16 September 2015. Beginning tasks will include removal of existing rocks, sheet piles, and other debris currently being used to modify canal flows. Upon removal of all obstacles, framing and concrete installation for the cross-section regulating structures will commence. The tasks required for completion of Phase II will be building and installing the catwalk railing; this task is projected to be completed in March 2018. Phase III involves placement of Telog Data Loggers. Placement of the Data Loggers will begin in February 2018 and will be completed in March 2018. Post Project Performance Measures include data collection, analyzation, and reporting of canal water losses, flow rates, and potential problem areas. These measures will begin in April 2018 and will conclude in December 2019 with the results being reported. The final task of the Project will be completing closeout report; all reporting will be completed by the end of June 2019. The reports will comply with Reclamation requirements and will include all necessary data and observations of the Project.

Milestone	October 2017	January 2018	March 2018	December 2018	June 2019
Environmental/Cultural Review	X				
Phase I		X			
Phase II & Phase III			X		
Post Project Performance Measures				X	
Closeout Report					X

- As the proposal is planned for installation of piping, cross-regulating structures and instream data loggers within an irrigation canal, it is exempt from dredging permits from the Environmental Protection Act and the Army Corps of Engineers under the Clean Water Act. The canal, which is man-made, does occasionally transport surface water acquired from the West Walker River as permitted by users for irrigation purposes. No other permits/permissions are required for the Project.
- Walker River Irrigation District (WRID) works continually with the Irrigation Training & Research Center (ITRC) of California Polytechnic State University. ITRC Engineers provided a Draft Technical Memorandum dated 16 September 2015 which identifies all recommended improvement along the Saroni Canal. ITRC’s draft technical memorandum was compiled based on field studies performed, in person, by their Director and staff Engineers. All proposed improvements and projects are proposed based on their engineered specifications.
- No new policies or administrative actions will be created in effort to implement the project.

#### NEXUS TO RECLAMATION

- The proposed Project is connected to Reclamation project activities by contributing to the common goals such as conserving water, protecting agriculture, environmental and habitat interest.
- The waters of the Walker River Basin have been an integral part of life for many tribes including the Bridgeport Indian Colony, Washoe Tribe, Yerington Paiute Tribe and Walker River Paiute Tribe. Since the Project does not adversely affect the current flows, but potentially works to restore flows, it is a mutual benefit to other users such as the area tribes. The Federal Indian Trust Responsibility is a legally enforceable fiduciary obligation on the part of the United States, Reclamation included, to protect tribal resources, among other items. The Walker River Paiute Tribe has water rights along the Walker River and would benefit from increased flow, thus fulfilling a portion of the trust responsibility. Additionally, federal projects under Executive Order 13175, provided the opportunity for Tribal consultation which further helps Reclamation meet trust responsibility.

3. The applicant does not receive Reclamation project water.
4. The Project is not on Reclamation project land and does not involve Reclamation facilities.
5. The Project is in the same basin as other Reclamation projects such as the Walker Basin Restoration Program with the National Fish and Wildlife Foundation and the Walker Basin Project with the University of Nevada- Reno and Desert Research Institute.
6. Project results will include an increase in return flows due to more efficient use of water and decreased water losses along the Saroni Canal. The increase in return flows have the potential to increase the amount of water intended for Walker Lake.

#### ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

1. The piped pathway is planned entirely within the property of Walker River Irrigation District. Burial of the proposed piping and digging of a hillside drain may result in minimal airborne particulate matter. Surface material is primarily hillside vegetation.
2. No known occurrences of federally listed species have been documented in the project area, nor does the project area contain any critical habitat.
3. As the proposal is planned for installation of piping, cross-regulating structures, and instream data loggers within an irrigation canal, it is exempt from dredging permits from the Environmental Protection Act and the Army Corps of Engineers under the Clean Water Act. The canal, which is man-made, does occasionally transport surface water acquired from the West Walker River as permitted by users for irrigation purposes. Classification by the Fish and Wildlife Service along the canal is wetlands.
4. The proposed piped section of the Project was last improved in 1997 when a Teranap plastic liner was installed.
5. Phase I of the proposed Project will modify a 500-foot section of currently open, plastic lined canal with 500-feet of 60-inch High-Density Polyethylene (HDPE) pipe. Phase II of the proposed project will replace man-made diversion structures such as rocks, sheet piles, and other objects with engineer recommended cross-regulating structures. Phase III of the proposed Project will not modify or have a direct effect on any features of the irrigation system.
6. No historical or culturally sensitive properties lay within the project areas.
7. No known archaeological sites are present within the project areas.
8. The Project will not have a high or adverse effect on low income or minority populations.
9. Access will not be limited to any ceremonial grounds or sacred sites of Native Americans.
10. It is not anticipated that the Project will introduce or contribute to the spread of noxious or non-native invasive species known to occur within the area.

## FUNDING PLAN AND LETTERS OF COMMITMENT

1. A total of **\$74,727** is planned as the applicant contribution toward the Project.
2. Annual assessment fees are collected from water right holders within the Saroni Canal boundaries.
3. An Official Resolution accompanies this proposal.
4. No other funding or project partner contributions have been requested.

Funding Sources	Amount
Non-Federal Entities	
1. Saroni Canal Company	<b>\$74,727</b>
Non-Federal Subtotal	<b>\$74,727</b>
Other Federal Entities	
1. N/A	\$0
Other Federal Subtotal	\$0
Requested Reclamation Funding	<b>\$71,796</b>

## BUDGET PROPOSAL

Budget Item Description	Computation		Quantity	Total Cost
	Cost	Unit		
<b><i>PHASE I</i></b>				
<i>Salaries &amp; Wages</i>				
Administrative	\$17	Hour	25	\$ 425
Management	\$34	Hour	10	\$ 340
Site Crew	\$28	Hour	320	\$ 8,960
<i>Supplies &amp; Materials</i>				
Heavy Machinery Fuel	\$1,000	Week	3	\$ 3,000
HDPE Piping 60"	\$143	Foot	500	\$ 71,500
Concrete	\$115	Yard	10	\$ 1,150
Lumber, Rebar, Wire, Ties	\$2,000	Unit	1	\$ 2,000
Steel	\$1,900	Unit	1	\$ 1,900
Site Supplies	\$2,500	Unit	1	\$ 2,500
<i>Other</i>				
Environmental/Cultural Review	\$5,000	Review	1	\$ 5,000
<b><i>TOTAL PHASE I COSTS</i></b>				<b>\$ 96,775</b>
<b><i>PHASE II</i></b>				
<i>Salaries &amp; Wages</i>				
Administrative	\$17	Hour	4	\$ 68



# Walker River Irrigation District

Established in 1919

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## RESOLUTION NO. 3-17

### **RESOLUTION OF THE BOARD OF DIRECTORS OF THE WALKER RIVER IRRIGATION DISTRICT GRANTING THE GENERAL MANAGER THE AUTHORITY TO APPLY FOR A WATERSMART SMALL-SCALE WATER EFFICIENCY GRANT TO THE U.S. BUREAU OF RECLAMATION**

WHEREAS, the Walker River Irrigation District (“District”) is a Nevada irrigation district organized under Nevada’s Irrigation District Act, N.R.S. Chapter 539; and

WHEREAS, Local Improvement District No. 4 of the Walker River Irrigation District was formed in accordance with N.R.S. Chapter 539 on February 26, 1926, and is the owner of the Saroni Canal; and

WHEREAS, the Board of Directors of the District serves as the Board of Directors of Local Improvement District No. 4 with input from the Saroni Canal Advisory Board; and

WHEREAS, the U.S. Department of Interior’s WaterSMART (*Sustain and Manage America’s Resources for Tomorrow*) provides grant funding for the efficient use of water and integration of water and energy policies to support the sustainable use of all natural resources; and

WHEREAS, the grant program is administered by the U.S. Bureau of Reclamation; and

WHEREAS, the U.S. Bureau of Reclamation requires the grant applicant to designate, by resolution, an authorized representative for filing the grant application; and

WHEREAS, the Saroni Canal Advisory Board has requested the District to implement the Saroni Canal Water Conservation Project; and

WHEREAS, the District desires to apply to the U.S. Bureau of Reclamation for grant funding in an amount of \$71,796.00 to implement the Saroni Canal Water Conservation Project.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors, the governing body of the District and Local Improvement District No. 4 as follows:

- 1) That application be made to the U.S. Bureau of Reclamation to obtain a WaterSMART Water and Energy Efficiency Grant to receive a grant for the Saroni Canal Water Conservation Project.
- 2) The General Manager of the District is hereby authorized and directed to prepare the necessary data, conduct investigations, and file such application with the U.S.

Bureau of Reclamation and to execute any documents necessary to accept such grant once funded.

- 3) The General Manager of the District is further specially authorized to make the required assurances to the U.S. Bureau of Reclamation in accordance with the rules, regulations and policies of the U.S. Department of Interior Bureau of Reclamation WaterSMART Program.
- 4) That matching funds in support of the project, in the amount of no less than \$74,727.00 will be provided through Local Improvement District No. 4.
- 5) That, if the application is selected for an award, the District will work with the U.S. Bureau of Reclamation to meet established deadlines for entering into a grant funding agreement.
- 6) The Board of Directors has reviewed and supports the Application.
- 7) That a copy of this Resolution shall be submitted to the U.S. Bureau of Reclamation WaterSMART Program.

UPON MOTION DULY MADE AND SECONDED and approved by 5 in favor, 0 opposed, and 0 abstaining, the Board of Directors adopted the foregoing Resolution.

Dated this 8th day of May 2017.

Attest: Bridget A. Banta  
Secretary

[Signature]  
President