WaterSMART

Pick Anderson Modernization Project

Henry Miller RD No. 2131
Dos Palos, California
(West side of the San Joaquin Valley)

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D(1) – EXECUTIVE SUMMARY

- Date: July 27, 2022

- Applicant Name: Henry Miller Reclamation District No. 2131
  11704 W. Henry Miller Ave.
  City: Dos Palos
  County of Merced
  State: California

- Proposal Name: Pick Anderson Modernization Project

Project Summary:
Henry Miller Reclamation District No. 2131 (HMRD) is a Category A applicant in Funding Group III, for the WaterSMART Grant: Water and Energy Efficiency Grant for Fiscal Year 2023, No. R23AS00008. The Pick Anderson (PA) Modernization Project encompasses the northern end of HRMD's surface water conveyance system. The project includes modernizing two existing spill structures, the creation of one Long-Crested Weir (LCW), lining of 5,560 feet of earthen canals with geomembrane and cement, and a new SCADA Control Pump Station. Three new SCADA sites will be installed on the PA conveyance system for remote spill and flow monitoring and automated pumping control to maintain a consistent water level on the North Bypass Ditch. The two existing spill structures will be modernized to ITRC automatic flap gate structures with flow meters. Through better measurement and SCADA automation the project will indirectly benefit 2,200 acres of farmland. This project also will reduce energy and fuel consumption by reducing the hours of operation of several deep wells and low lift pumps along the mentioned canal system. This reduction in deep well pumping will also result in water quality improvements since the water developed by these deep wells is of higher salinity levels. This project will contribute to regional water quality and drainage goals in the San Joaquin River. The PA system was identified as a necessary location for automation and modernization based on the potential water management improvements and estimated water savings. HMRD conducted a district wide seepage study to prioritize canals modernization and lining projects. The PA Modernization Project is expected to result in an annual water savings in the following categories, 187 acre-feet (AF) of surface water savings due to canal seepage, 275 AF of deep well ground water pumping reductions and 2,700 AF of operational spill reduction.

D(2) – BACKGROUND DATA

D.2.1. Area Description

HMRD is an agricultural District. The Pick Anderson Modernization Project impacts 2,200 acres of farmland (See Attachment 1).

D.2.2. Geographic location

State: California
County: Merced
Direction from nearest town:
From the intersection of Hwy 165 and Hwy 152 in the town of Los Banos, go east 2.3 miles on Hwy 152. Turn north on Turner Island Road. Go north 3 miles, to Henry Miller Avenue. The headquarters of HMRD is located on the NE corner of Turner Island Road and Henry Miller Avenue.

D.2.3. Annual Water Supply

The following are approximate values:

- Total diversion from the Delta – Mendota Canal (DMC) = 165,000 AF
- Uncontrolled inflows from upslope neighbors = 33,000 AF
- Private well pumping = 3,300 AF
- District well pumping = 4,300 AF

	2022		2021		2020		2019		2018		2017		2016	
Total net acres in SLCC	40252	100%	40220	100%	40433	100%	40476	100%	40686	100%	40476	100%	40439	100%
Submitted crop report	40252	100%	40220	100%	40336	100%	40476	100%	40686	100%	40449	100%	40439	100%
Double Crops	1641	4%	7700	19%	3673	9%	6248	16%	1540	4%	2457	6%	2183	5%
	41893		47920		44009		46524		42226		42906		42622	
COTTON	11752	28.1%	8252	17.2%	10828	24.6%	14366	30.9%	12308	29.7%	13945	32.5%	12619	29.6%
ALFALFA	3187	7.6%	4212	8.8%	4675	10.6%	4471	9.6%	4433	10.7%	5534	12.9%	6296	14.8%
TOMATOES	9894	23.6%	10994	22.9%	7281	16.5%	9106	19.6%	11300	27.3%	9370	21.8%	9915	23.3%
CORN	2114	5.0%	2502	5.2%	2202	5.0%	2425	5.2%	2276	5.5%	1796	4.2%	1875	4.4%
WINTER CROPS	1914	4.6%	6700	14.0%	6376	14.5%	5328	11.5%	2274	5.5%	2486	5.8%	2239	5.3%
WETLAND VEGETATION	1894	4.5%	1894	4.0%	1895	4.3%	1745	3.8%	1918	4.6%	1918	4.5%	1444	3.4%
PASTURE	894	2.1%	839	1.8%	769	1.7%	1095	2.4%	858	2.1%	876	2.0%	1130	2.7%
PISTACHIOS	596	1.4%	531	1.1%	533	1.2%	533	1.1%	527	1.3%	475	1.1%	475	1.1%
ALMONDS	2907	6.9%	2608	5.4%	2078	4.7%	1491	3.2%	1033	2.5%	690	1.6%	206	0.5%
SAFFLOWER	88	0.2%	0	0.0%	5	0.0%	5	0.0%	5	0.0%	76	0.2%	278	0.7%
IDLE	3155	7.5%	4202	8.8%	3711	8.4%	2465	5.3%	2007	4.8%	2084	4.9%	3637	8.5%
		92%		89%		92%		92%		94%		91%		94%

D.2.4. Describe Water Supply

Source: Please see D.2.3 above.

Water Rights: San Luis Canal Company (SLCC) obtains its water supply through an Exchange Contract with the USBR. The Exchange Contract allows the Company to receive its water through the Delta-Mendota Canal. Henry Miller Reclamation District 2131 was formed in FY2000. It works in conjunction with SLCC to deliver the irrigation water and provide drainage to the company costumers. The vast majority of the delivery facilities are now either owned by HMRD or have a permanent easement. Henry Miller Reclamation District No. 2131 is in charge of operating and maintaining the canals and drains.

As a member of the San Joaquin River Exchange Contractors, SLCC has an annual right of 163,600 AF in a “normal” year, and 123,000 during critical years. The actual deliveries to farmers average 122,000 AF per year. HMRD also “wheels” 26,000 AF of water to US Fish and Wildlife, California Fish & Wildlife 8,600 AF, and to Grasslands RCD 9,100 AF.

Current water uses: All agricultural
Number of water users: 171

D.2.5. Water Supply System

The system is completely gravity canals, with a few recirculation pumps. It is comprised of a network of unlined canals and drains constructed over 100 years ago.

The District previously installed 2 buffer reservoirs with a SCADA system to monitor the pumps and gates. Many of the check structures are flashboards, although the District has installed 65 LCWs and 20 ITRC flap gates in the last fourteen years. The District has a SCADA system that serves the canal operations department to monitor and control the delivery and quality of irrigation water. Flow measurement to individual turnouts is measured with canal meter gates and flow meters at drip pumping stations. All surface drainage flows that exit the District go to the San Joaquin River. HMRD does make deliveries to wildlife refuges.

The District has the following physical characteristics:

Miles of main canals: 59
Miles of lateral canals: 98
Miles of surface drain ditches: 113

SLCC has submitted a Water Conservation plan to the USBR through the Exchange Contractors.

D.2.7. Past working relationships with the Bureau of Reclamation.

Includes previous grants and agreements:

Grant No. 04FG210012
Carlucci Low Lift Pumping Station Upgrade.
Finished December 31, 2005

Grant No. 05FGG210011
Upgrade Telemetry System with Acoustic Doppler flow meters in Drains.
Finished December 31, 2006.

Grant No. 07FG200023
Flow Rate and Water Quality Monitoring Sites Upgrade.
Finished December 2009.

Grant No. 08FG200107
System Optimization Review
In Progress. Date to be finished June 2010.

Grant No08FG200049
Retrofitting existing check structures into Long Crested Weirs
Finished March 2010.

Grant No08FG200056
Retrofitting existing check structures into Flow Control Structures
Finished February 2009.

Grant No R10AP20120
Temple Santa Rita Canal Modernization

Finished September 2012.

Grant No R11AP20111
Arroyo Canal Modernization
Finished September 2013.

Grant No R12AP20034
Lower Arroyo Canal Modernization
Finished December 2014.

Grant No R13AP20049
Island Canal System Modernization Project
Finished June 2019.

Grant No R18AP00048 – Environmental Compliance, Engineering and Design for the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project
Started August 2018. In progress.

Grant No BORDO20F006 – WaterSMART SWEP Grant for Community Ditch Lining Project
Awarded June 2020. Declined by HMRD June 2020.

San Luis Canal Company (SLCC) encompasses the entire 47,500 acres and holds the water right with the USBR. HMRD No. 2131, a public agency, was formed in FY2000 to serve as the entity that delivers the water to farmers within SLCC. All the deliveries and drainage facilities are owned by HMRD, yet the water right is and will remain with SLCC. Therefore, the contractual relationship as it relates to water supply is between SLCC and the USBR, but the conservation measures associated with this project would be through HMRD who delivers the water. SLCC is a member of the San Joaquin River Exchange Contractors Water Authority, whose members receive their water from the USBR via the Delta – Mendota Canal. The four member Exchange Contractor Authority has also submitted a Water Conservation Plan to the USBR.

D(3) – PROJECT LOCATION

The Pick Anderson Bypass Drain is located within Merced County, California. It is approximately 9 miles northeast of Los Banos. The project latitude is 37° 7'52.38"N and longitude is 120°40'56.26"W (See Attachment 2).

D(4) – TECHNICAL PROJECT DESCRIPTION

D.4.1. Detail of Pick Anderson Modernization Project

The Pick Anderson canal system is the continuation of the Temple Santa Rita Canal which conveys the water from the San Joaquin River through the Arroyo Canal. HMRD's conveyance system operates through a combination of upstream water level control and flow control. Two

existing spillways will be modernized with automatic ITRC flap gates to monitor the canal level and report spill in cubic feet per second (CFS). In order to maintain consistent water level in the Pick Anderson Bypass Drain a new LCW will be constructed. The LCW will include 75 feet of reinforced concrete underlined with filter blankets and HDPE sheets. Upstream of the proposed LCW exists the PA Pump Station. The PA Pump Station lifts surface water from the PA Bypass Drain into the North Bypass Lift Ditch and downstream laterals. The PA Pump Station will be modernized with three 30 CFS pumps with variable frequency drives (VFD); two 6 inch stilling wells to house sensors for water quality and level control; upgraded electric services for the new pumps and a new permanent control building to house the VFD controllers and SCADA equipment. The SCADA system will control the pumps based on the water level in the North Bypass Lift Ditch, which the pumps discharge into. The lining of the Middle Ditch and River Ditch will consist of placing Huesker Canal 3 geomembrane. The geomembrane will then have shotcrete lined over the top, to further prevent seepage losses, intrusion of non-native invasive species, and punctures. In total the project will include lining approximately 5,560 feet of earthen ditches. Based on the District's seepage study, the lining of the Middle and River Ditch will equal a savings of approximately 187 AF per year. The facilities are not federal facilities.

D.4.2. Project Schedule

The project is estimated to be completed in three years. Design is estimated to be completed in Spring of 2023. Construction would begin during the 2024 or 2025 maintenance season**.** The maintenance season is approximately November to February of the following year. Based on similar projects completed in the District during the maintenance season, the Pick Anderson Modification project will be completed within 3 years.

E(1) – TECHNICAL PROPOSAL: EVALUATION CRITERIA –

E.1.1. Evaluation Criterion A – Quantifiable Water Savings & Project Benefits

HMRD conducted a district wide seepage study which confirmed the PA service area as one of priority for HMRD. The Middle Ditch, (Ponds 1 and 2), is estimated to lose 104 AF annually to seepage. The seepage data for the first pond of the River Ditch is estimated to be 83 AF a year. The combined savings from lining the two canals will equal 187 AF annually (See Attachment 3). These losses enter the groundwater table, which is impaired in this area, and create a saline sink making it unsuitable for future use. The District will complete seepage measurements in the project area at completion of this project to quantify the actual water savings. HMRD will also use both historical usage and delivery records from the project area as additional means of quantification. Modernization to the PA will allow the system to respond to unexpected variation in inflows from the upstream Temple Santa Rita Canal system, while maintaining constant flows to local turnouts. These types of improvements will automatically balance incoming and outgoing flows, which will greatly enhance flexibility and enable operators to reduce spill. The project will simplify operations and reduce unwanted operational spill and seepage while improving service to water users, reducing man hours, and reduce driving in this area which affects both water and air quality. It should also be noted in 2017 HMRD installed a solar farm to serve the District and offset the fossil fuel footprint of the District's pumping operations. The solar farm

offsets a large portion of the District's energy usage and supplies solar power generation to 87 HMRD owned energy meters. This project is estimated to save 67,000 kWh per year based on pump test efficiencies from the old pumps to the new pumps.

Beyond a substantial reduction in diversions and deep well pumping, this project will bring beneficial outcomes for regional water quality issues in the San Joaquin River. Implementation of ITRC flap gates for automated upstream water level control will eliminate the manpower needed to manually operate flash board structures. Long Crested Weirs in place of adjustable flash board structures allow for greater flow fluctuation while maintaining consistent water level. Consistent water surface elevation is crucial to provide a constant flow to the irrigated field through the turnout.
The District continues to expand and implement SCADA to remotely monitor deliveries, water quality and intercept spills for improved efficiency. During previous years unnecessary canal spill in the PA was measured and totalized approximately 3,000 AF. We estimate that this spill can be reduced by 90% based on similar modernization project savings. The project will save approximately 2,700 AF of surface water annually that is lost to operational spill. In addition, we anticipate reducing the deep well pumping in the PA, (550 AF annual average over the last five years), by 50% providing 275 AF in savings. The combination of canal lining, operational efficiencies, and reduction in deep well pumping total approximately 3,000 AF of water saved annually.

E.1.2.2. Evaluation Criterion B – Planning Efforts Supporting the Project
The District developed a Strategic Planning document which was approved by the Board of Directors in 2019. This document outlined the primary concerns and issues facing San Luis Canal Company and Henry Miller Reclamation District. One of the primary concerns identified in the Strategic Plan states, "…continue efforts to improve water use efficiency along with a flexible and reliable water supply…". Seepage and groundwater are addressed in policy issue 5 within the document. Modernization is addressed in policy issue 7 which states the need for "additional long crested weirs, and concrete lining". Therefore, the implementation of the PA Modernization Project is consistent with the District's strategy of improving infrastructure to increase water efficiency.

The District has developed a district wide seepage study program in collaboration with Irrigation Training and Research Center (ITRC) at Cal Poly San Luis Obispo. The test involves studying seepage within fixed intervals along HMRD's conveyance system. Attachment 3 includes a district map showing the results of the seepage tests conducted within the PA. The test results are compiled into an excel spreadsheet so that analysis can be performed. The analysis develops a priority system for canal lining, based on AF savings compared to canal section length and width. The Middle Ditch and River Ditch were identified as a high priority project given its high AF savings compared to section length. It should be noted that 1,500 feet of the Middle Ditch has already been lined in 2019.

E.1.5. Evaluation Criterion C – Planning and Implementation
The project will be implemented over a 3-year time span. The project is estimated to finish the design phase in spring 2023. During this time the project will be fully designed and surveyed. The project will be advertised through the public bid procedure in October. After a three-week

bid window, the bids will be reviewed by HMRD staff, and a contract will be awarded. The construction will take place during the 2023 – 2024 maintenance season, which will be from December to February. The construction is anticipated to take up to 3-years for completion. Construction would begin during December 2023 or January 2025.

The schedule is summarized in the table below.

	June 2023	Sep 2023	Oct 2023	Dec 2023 – Feb 2026
Design & Survey				
Notice to Bidders				
Construction				

E.1.8. Evaluation Criterion D – Nexus to Reclamation

San Luis Canal Company (SLCC) obtains its water supply through an Exchange Contract with the USBR. The Exchange Contract allows the Company to receive its water through the Delta-Mendota Canal. HMRD is situated in a "hot spot" in the San Joaquin Valley that is impacted by many issues where Reclamation is actively involved such as:

- Restoring flows in the San Joaquin River for salmon runs.
- Maintaining salinity standards in the San Joaquin River.
- Disposal of selenium-laden water.
- Disposal of silt into the San Joaquin River
- Reduced pumping from the Delta
- Climate change and the anticipated water shortages throughout the state.

Water use efficiency is one of HMRD's highest priorities.

E.1.5. Evaluation Criterion E – Department of the Interior and Bureau of Reclamation Priorities

The District continues to complete canal lining projects throughout the conveyance system in efforts to reduce seepage, erosion, evaporation, increase channel capacity, and delivery efficiency.

The District has a Water Conservation Program to help the landowners and farmers to apply for grants and low interest loans to improve the on-farm irrigation efficiencies. Due to the program since 2004 48% of irrigated lands in the District have been converted from surface irrigation to drip. Several of these farmers received funds through the NRCS EQIP program to convert to drip irrigation, therefore the importance to provide a flexible and reliable delivery of irrigation water to all the farmers throughout the District. HMRD through SLCC is a member of the San Joaquin River Exchange Contractors. The Exchange Contractors are already involved in water marketing and are well aware of the need to shift conserved water to areas that need it. Specifically, water that is conserved in HMRD can reduce diversion needs from the Delta-Mendota Canal. There are currently pumping restrictions from the Delta, and many users south of the Delta need more water. Water conservation in HMRD will not only benefit the water quality in the San Joaquin River, but it will provide water for potential transfers south of the Delta. This project is also consistent with the DOI's goal of modernizing infrastructure. As the needs of the District change overtime, the infrastructure must change accordingly. The Pick Anderson system has needed modernization for some time. The opportunity to partner with USBR in order to achieve greater

water efficiency, also provides an opening to improve infrastructure to match the demands of District.

G – PROJECT BUDGET

D.2.2.5. (1) Funding Plan and Letters of Commitment

The project identifies direct, environmental, cultural compliance, and engineering/design costs. Henry Miller Reclamation District will provide the $1,488,078 required contribution to the cost share through actual cash during the 2023-2026 fiscal year budget. Revenue to cover capital project cost is generated from water sales, acreage assessments, and water transfers.
HMRD annually approves a capital budget to cover these types of projects. HMRD completed the initial project engineering and design in fiscal year 2021-2022. A copy of the 2021-2022 board adopted capital projects budget can be found in Attachment 4.

D.2.2.5. (2) Budget Proposal

Table 1. Total Project Cost Table

SOURCE	Amount
Cost to be reimbursed with the requested Federal funding	$ 1,488,078
Cost to be paid by applicant	$ 1,488,078
TOTAL PROJECT COST	$2,976,155

Table 2. – Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	Total Cost
	$/Unit	Quantity		
Salaries and Wages				
Senior Engineer / Project Manager – S. Quarnstrom	42	40	Hrs.	$1,680
Associate Engineer – S. Stephens	35	40	Hrs.	$1,400
Fringe Benefits				
Full time employees	%			
Senior Engineer / Project Manager – S. Quarnstrom	38.49%	$1,680	Hrs.	$646.63
Associate Engineer – S. Stephens	37.07%	$1,400	Hrs.	$518.98
BUDGET ITEM DESCRIPTION	**COMPUTATION**		**Quantity Type**	**Total Cost**
	$/Unit	**Quantity**		
Contractual/Construction				
Environmental and Regulatory Compliance				
Permits / CEQA	$50,000	1	Lump Sum (LS)	$50,000
Pick Anderson Pump Station				

Demolition of existing facilities	$25,000	1	LS	$25,000
Furnish and Install (F&I) Reinforced concrete	$3,000	61	Cubic Yards (CY)	$183,000
F&I Miscellaneous metal	$9	6850	Pounds	$61,650
F&I Control Building	$87,000	1	LS	$87,000
F&I 30" Steel Discharge Pipe	$81,000	1	Each	$81,000
F&I 24" Steel Discharge Pipe	$57,000	2	Each	$114,000
Site Grading	$25,000	1	LS	$25,000
F&I 6" PVC stilling well	$2,300	2	Each	$4,600
F&I Electrical Equipment & Controls	$416,000	1	LS	$416,000
Pick Anderson Pumps and Motors				
F&I 30 cfs pump head, column and motor	$62,000	3	Each	$186,000
Furnish 30 cfs pump bowl	$28,000	3	Each	$84,000
Pick Anderson Electrical Service Upgrade				
Upgrade existing PG&E electrical service	$44,000	1	LS	$44,000
Turner Island Long-Crested Weir				
Demolition of existing facilities	$2,000	1	LS	$2,000
F&I Reinforced concrete	$2,500	43	CY	$107,500
F&I Miscellaneous metal	$9	380	Pounds	$3,420
36"Wx48"H Fabricated Metal Gate	$5,000	3	Each	$15,000
Weep Holes, Filter Blanket & HDPE Sheets	$7,000	1	LS	$7,000
Canal Cleaning	$8,000	1	LS	$8,000
Middle Ditch Spillway				
Demolition of existing facilities	$2,500	1	LS	$2,500
F&I Reinforced concrete	$9,000	2	CY	$18,000
F&I Miscellaneous metal	$9	100	Pounds	$900
River Ditch Spillway				
Demolition of existing facilities	$2,500	1	LS	$2,500
F&I Reinforced concrete	$9,000	2	CY	$18,000
F&I Miscellaneous metal	$9	100	Pounds	$900
Install 24" DR25 PVC pipe	$130	34	Linear Feet	$4,420
Geomembrane and Concrete Lining				
Engineering Fees	$30,000	1	LS	$30,000
Middle Ditch	$192	1,335	LF	$256,320
River Ditch	$192	4,225	LF	$811,200
SCADA				
SCADA Programming	$70,000	1	LS	$70,000
SCADA Integration	$253,000	1	LS	$253,000

TOTAL ESTIMATED PROJECT COSTS	$2,976,155

D.2.2.5. (3) Budget Narrative

The cost estimates used for the budget proposal are based on engineering estimates, actual quotes and bid processes administered on similar modernization and lining projects.

Salaries and Wages
The Project Manager is the District's Senior Engineer: Sean Quarnstrom
The District's Associate Engineer, Stephanie Stephens will assist in cost estimate development, permit applications, construction contracting, and some construction inspections.

Construction / Contracting
The District will contract the services of an outside contractor for the structural improvements, Construction drawings will be prepared by the District's chosen engineering firm. The final drawings will show the calculated square footage of concrete and materials used. The cost figures used are derived from costs the District is paying now on similar construction projects.

Indirect Costs
N/A.
No Indirect cost will be considered in this project.

The Total Estimated Project Cost has been calculated as $2,976,155.

D.2.2. Letters of Support

Please see Attachment 5.

D.2.2.8. Official Resolution

HMRD will provide an official Board Resolution of support at a later date.

H – ENVIRONMENTAL AND CULTURAL RESOUCE CONSIDERATIONS

Henry Miller Reclamation District follows all federal and state requirements with regards to environmental permits. The proposed project is considered a modernization project since the project involves upgrading facilities. The surrounding environment will not be impacted outside of the current footprint of the canal and structures. The work will entail fortifying the existing canal banks as needed, modernizing existing structures, installing a Long-Crested Weir, installing ITRC flap gates, a SCADA pump station, and new SCADA monitoring sites. The

disturbed area, or the footprint, will remain the same as pre-project conditions. Proper dust control methods will be implemented during construction.
We are aware of some threatened or endangered species within our service area; however, we are not aware of any within the project footprint. As stated above, this maintenance project is similar to other maintenance projects carried out within the District every year. As the system was built over one hundred years ago, maintenance projects are performed routinely. This project does not affect Indian or tribal lands, furthermore there are not tribal lands within the project area. With the introduction of the geomembrane and concrete lining we are reducing the possibility of non-native invasive species to propagate within the canal. The reduction of non-native invasive species reduces the District's maintenance cost and limits the strain of weeds on the District's growers.