NORTH KERN WATER STORAGE DISTRICT

March 2019

Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements Project

North Kern Water Storage District

Project Location–Southern San Joaquin Valley, California

Application for WaterSMART Grants:
Water and Energy Efficiency Grants for Fiscal Year 2019
FOA No: BOR-DO-19-F004

Applicant: North Kern Water Storage District
33380 Cawelo Avenue
Bakersfield, CA 93308

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3.0 Technical Proposal

3.1 Executive Summary

Information for the applicant is as follows:

Date	March 19, 2019
Applicant Name	North Kern Water Storage District
City, County, State	Bakersfield, Kern, California
Project Name	Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements

Applicant Information	
Name	Ram Venkatesan
Title	District Engineer, North Kern Water Storage District
Telephone	(661) 393-2696
E-mail Address	Ram@northkernwsd.com

All Figures and Tables referred as part of the Technical Proposal are included as part of Section 3.5 Figures and Supporting Data.

The North Kern Water Storage District (North Kern or District), proposes to utilize their resources in a cost-shared project with the US Bureau of Reclamation (Reclamation) for the Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements (WDI) (Project), which includes concrete lining 2,200 linear feet of the Calloway Canal (Component – 1) and implementing on-farm Water Delivery Improvements (WDI, Component – 2). Both components are designed to conserve irrigation water, which is in line with the goals of Section C.3.1.1 of the Funding Opportunity Announcement (FOA).

As noted above, component - 1 of this project comprises of concrete lining 2,200 linear feet of the currently unlined Calloway Canal. This portion lies outside the service areas of the District and overlies a portion of the regional groundwater basin that is of diminished quality due to past industrial and petrochemical seepage. This component is a continuation of the recently completed 1.1-mile long canal lining effort. An essential goal identified by the District is improvements to the Calloway Canal. The lining will reduce the irrecoverable losses that result when high quality surface water seeps to poor quality groundwater, which cannot be recovered for later use without substantial treatment. Reducing these losses enhances the Districts' capability to deliver increased volumes of water from the Kern river to irrigators for existing demand. Improved delivery of surface water to irrigators will increase the ability of growers to implement on-farm irrigation efficiency enhancements, which will in turn result in further improvements in water use efficiency.

Component-2 was designed to create a more robust system of managing the groundwater pumped by the District. The WDI component includes:

i) Procuring and installing magnetic flowmeters (magmeters), water level sensors, and telemetry enhancements at forty-seven (47) District-owned production wells.

ii) Procuring and installing water level sensors and telemetry enhancements at four (4) District-owned monitoring wells.
iii) Procuring and installing telemetry enhancements at eighteen (14) Remote Terminal Unit (RTU) locations.
iv) Design, develop and implement a Programmable Logic Control (PLC) platform to integrate the site-specific telemetry enhancements with the Districts' existing Supervisory Control and Data Acquisition (SCADA) platform to facilitate remote monitoring of the District's water system facilities.

Implementing remote monitoring technology to its existing groundwater pumping network will District can efficiently track its pumping activities by obtaining real time access to well yield and depth to water at each site. The District is currently implementing WDI at 54 well sites and 14 RTU locations, with an anticipated completion date of October 2019. The proposed Project is a continuation of this effort. It is estimated that the water conserved and better managed through this Project would be used to effectively irrigate 52,000 acres of farmland in the District.

The Project is estimated to provide the following annual benefits, in acre-feet. Technical justifications for each of these values are given in Section 3.4.

Avg. Annual Water Supply	185,593 AF*
From Local Groundwater	163,580 AF
Est. Annual Water Saved	1,576 AF
Est. Annual Water Better Managed	24,833 AF
Enable on-farm water use efficiency and conservation improvements	52,000 Acres

* from NKWSD-AWMP 2014

Duration of Project implementation and estimated completion date: It is anticipated the canal lining can be completed within 24 months of the time grant funding is secured. The Project would start in October 2019 with construction being completed by June 2022.

Anticipated design and construction duration of no more than 36 months. Assuming funding is secured, construction is scheduled for completion by June 2022.

Project Funding: The District is requesting the following funding support from USBR, in order to implement the Project as described in this proposal. A budget and justification for the funding assessment are given in Section 4.0.

Funding Source	Funding Amount
Non-Federal Entities (District)	$1,633,029
Reclamation Funding	$1,500,000
Total Project Funding	$3,133,029

It is expected that this Project will proceed immediately upon notification grant funding and would be completed June 2022. The Project is not located on a Federal facility.

3.2 Background Data

The following section provides background regarding the District and information on general water management and water use considerations, not necessarily specific to the proposed Project but to provide context for the Project need.

Geographic Location

North Kern WSD, shown in Figure 1, is located in Kern County along the eastern side of California's southern San Joaquin Valley. The District lies between the City of Bakersfield on the South and the City of Delano on the north, and between Highway 99 on the east and the cities of Wasco and Shafter on the west. Figures 2 provides the facilities within the District. This figure also identifies the wells and RTUs that are to be instrumented as part of the proposed project, and the on-going WDI improvements that is partially funded by Reclamation. Figures 3, 4 and 5 all provide overviews of the location of the canal-lining Project within the North Kern service area.

The location of the proposed canal-lining program is shown in Figure 3. The previously completed 12,554 LF and 5,553 LF Canal lining projects (both awarded by Reclamation) are also identified in Figure 4.

Primary Water Supplies and Delivery System

The North Kern WSD, established in 1935, is a public agency, which supplies surface water from the Kern River and groundwater to primarily agricultural customers. About 52,000 acres of the 60,000 gross acres (87 percent) in the North Kern service area have been essentially fully developed to irrigated agriculture for over forty years; however, cropping patterns have varied over the years.

Average Annual Acre-Feet of Water Supply: While North Kern's principal source of surface water is the Kern River, the program for lining the Calloway Canal was developed collaboratively with neighboring CVP and SWP contractors as part of the Poso Creek Integrated Regional Water Management (IRWM) Plan and the Water 2025 System Optimization Review for the Poso Creek IRWM Plan Area.

North Kern has utilized Kern River water under a schedule of long-standing diversion rights, with this water being supplemented from time to time by water from Poso Creek, which traverses the northern portion of the District and contributes primarily through infiltration, to the underlying groundwater supply. While North Kern is not a CVP-Friant Unit contractor, the District has purchased and diverted "surplus" CVP-Friant water when available.

Historical water supplies to North Kern from the Kern River have ranged from less than 10,000 acre-feet per year to nearly 400,000 acre-feet per year. As a result of this highly variable water supply, North Kern has developed an extensive groundwater recharge and extraction program utilizing groundwater to regulate its water supplies by pumping an estimated average of 80,000 acre-feet of groundwater per year to meet the District total demand for irrigation water which is on the order of 180,000 acre-feet. North Kern has successfully operated this conjunctive management program for over 50 years.

The Canal Lining also benefits the Kern Sub basin and the SWP contractors within it. For example, Cawelo WD has a contract for 38,200 acre-feet of SWP water. Direct delivery of this water is now accomplished by conveyance from the California Aqueduct via the Cross Valley Canal to Pump Station A, where the water is delivered into North Kern's Beardsley Canal and eventually the Lerdo Canal at North Kern's southern boundary. Under agreement with North Kern, water is conveyed in the Lerdo Canal to Cawelo's Pump Station B and then lifted into the Cawelo system. The program for lining the Calloway Canal will shorten the pathway for delivering water from the California Aqueduct to Cawelo, reduce energy demands by avoiding the need to lift water along the Cross Valley Canal (CVC) and from the CVC to the Beardsley Canal at Pump Station A, and increase operational flexibility for both North Kern and Cawelo. North Kern growers will benefit from routing water through the Calloway Canal by giving them access to surface water that could be made available to North Kern through exchange of a portion of its Kern River supply for a portion of Cawelo's SWP water routed through the Calloway Canal.

In North Kern, surface water is delivered through approximately 130 miles of unlined canals heading at two diversion points on the Kern River, 20 miles of pipeline, and 20 miles of lined canal. The District's principal supply artery, and most important upstream point of diversion on the Kern River, is the Beardsley-Lerdo system. This system is entirely gravity flow and consists of the diversion structure or headworks on the Kern River, 9.5 miles of concrete-lined canal (the Beardsley Canal) between the headworks and the District's southern boundary, followed by an unlined canal section (the Lerdo Canal) that continue along North Kern's eastern or "high" side.

As much as 850 cfs has been conveyed through the Beardsley Canal and delivered to the District, which represents the practical maximum delivery in this system. The second point of diversion, 4.5 miles downstream, is the Calloway headworks, which services the relatively large, now unlined section of the Calloway Canal shown on Figure 2. This facility is also entirely gravity flow and extends for 10.4 miles before entering North Kern at Seventh Standard Road. The Calloway Canal is now used as a "wet year" facility and has a capacity of 1,000 cfs at its headworks. As described throughout this grant application, the central purpose of component-1 for lining a portion of the Calloway Canal is to enable the canal below the CVC-Calloway Intertie to serve as a conveyance during all years.

Typically, District-owned wells are used only during "dry" years when surface water supplies are inadequate. Groundwater is delivered to customers during dry years via a network of small, lined canals running parallel to the larger, unlined canals used for conveyance of surface water. The District owns and operates about 100 wells at locations shown in Figure 2. Approximately 200 privately owned wells in the Class 2 service area are used to meet irrigation demands in this part of the District.

Major crops and total acres served - The cropping pattern within North Kern's 52,000-acre water service area has changed significantly from row crops to permanent plantings over the past 25 years. Currently, about 75 percent of the District's irrigated lands are planted to permanent crops, primarily almonds, grapes and pistachios. Additional detailed information may be found in North Kern's 2015 Agricultural Water Management Plan, at http://www.water.ca.gov.

Hydropower or energy efficiency elements - The project does not propose to install or construct any hydropower systems. However, the reduction in groundwater pumping will save a total of 45,806 kWh/year.

Prior Working Relationships with USBR

Examples of North Kern's working relationships with the USBR include the following:

Various North Kern has entered into short-term (annual) contracts for the purchase of Section 215 water from the Friant Division of the CVP. All contracts were with Reclamation.

2002 North Kern entered into a long-term water banking agreement with Kern-Tulare Water District to regulate CVP supplies available to Kern-Tulare. This agreement was approved by Reclamation.

2002-2003 North Kern constructed a turnout from the Friant-Kern Canal, which provides for the diversion of water from the Friant-Kern Canal into North Kern's 8-1 Lateral and thence into North Kern's Calloway Canal. The design and rights-of-way were approved and permitted by Reclamation.

2004-2005 North Kern constructed four deep wells and installed piping on Friant-Kern Canal rights-of-way to route the discharge from these wells into the Friant-Kern Canal. The design and rights-of-way were approved and permitted by Reclamation.

Various North Kern has participated in a number of short-term water banking and exchange arrangements that involved CVP contractors and CVP water, including Shafter-Wasco Irrigation District, Delano-Earlimart Irrigation District, Madera Irrigation District, and Westlands Water District. These arrangements were approved by Reclamation.

2008-2013 Semitropic Water Storage District, acting as lead agency for the Poso Creek Regional Water Management Group, was awarded a Reclamation grant in the fall of 2008 to prepare a System Optimization Review for the region. North Kern is a member of that group. The focus of the SOR was to (1) prioritize the implementation of structural water management measures for the region based on their expected benefits to the region's water reliability, and (2) identify and resolve institutional constraints to exchanges between districts and enhance the use of District groundwater banking facilities that will help mitigate the projected loss of water reliability to the region. In this regards, the group has worked with

Reclamation to complete an Environmental Assessment to cover long-term banking and exchange activities among neighboring districts in the Poso Creek IRWM Plan Area. This work was a collaboration with Reclamation on the preparation of the EA; the SOR grant was administered by Reclamation.

2012 North Kern, collaborated with Cawelo WD, and received the 2012 CalFed Grant funding to concrete line Reach A of the Calloway Canal. The project was successfully constructed in 2015 and the Grant is entering the Post-Project Completion phase.

2013 North Kern parterned with Cawelo WD, and was awarded the 2013 CalFed Grant funding to concrete line Reach B of the Calloway Canal. The project was successfully constructed in 2015 and the Grant is entering the Post-Project Completion phase.

2014 North Kern, on a joint venture with Cawelo WD, received 2014 CalFed Grant funding to concrete line Reaches C1, C2, and D of the Calloway Canal. The project was successfully constructed in 2015 and the Grant is entering the Post-Project Completion phase.

2016 North Kern entered into a contract with the USBR for $1,000,000 to line 1,600 LF of currently unlined portion of the Calloway Canal. This component was completed in December 2018. The WDI component of this Project is expected to go for bid in April with construction expected to be completed by October 2019.

2017 North Kern entered into two contracts with the USBR; one for $1,000,000 and a second one for $300,000 to line portions of the currently unlined Calloway Canal. The component was completed in December 2018. The WDI component of this Project is expected to go for bid in April with construction expected to be completed by October 2019.

2018 North Kern was awarded a grant of $750,000 from USBR for their project titled 'Return Capacity Improvements for Regional Drought Resiliency'. The grant award contract document is currently being finalized.

2018 North Kern was awarded a grant of $75,000 from USBR to implement SCADA automation and ET improvements in the District. The grant award contract document is currently being finalized.

3.3 Project Description

Project Summary

Component -1 of the proposed Project consists of concrete lining approximately 2,200 LF of the currently unlined portion of Calloway Canal. Underlain by a portion of the regional groundwater basin that has marginal quality water, it is advantageous to limit the amount of seepage in this

canal portion. Figure 5 represents the Phenol concentration area that is located directly underneath the proposed Calloway Canal lining portion. Figure 3 provides an overview of the canal alignment. Construction would consist of trimming the existing canal profile to provide a trapezoidal prism with a 50-foot-wide bottom width, 3-to-1 side slopes, and a nominal depth of 8.5 feet. The canal section would be lined using 4-inch thick unreinforced concrete.

Component-2, titled as water delivery improvements consists of installing magnetic flowmeters (or magmeters) at 50 of the District owned production wells. Each magmeter will consist of a totalizer that is capable of measuring the volume of groundwater pumped through the wells. Component-2 further includes installing water level sensors in each of the 50 production wells and four additional monitoring wells to quantify the depth-to-water data. Additionally, the District proposes to implement telemetry upgrades at each of the production well site (50), each of the monitoring well site (four) and 14 Remote Terminal Unit (RTUs – used to measure canal levels) sites. Figure 2 includes all of the District's well and RTU sites and identifies the sites located as part of component -2. The final part of the water delivery improvements integrating these sites with District's Supervisory Control and Data Acquisition (SCADA) setup. The integration of telemetry system with the SCADA setup will enable the District to control well operation and access their groundwater pumping data remotely. Additionally, this also enables the growers to access the groundwater characteristics, and quantity of water delivered on a daily basis.

Tasks and Project Work

Several tasks are defined below to accomplish the Project Work and are organized to track Budget and Schedule items. The design of the lining of the Calloway Canal would be based on the previously concrete lined portion of the Calloway canal (completed in 2018) and under the guidance of GEI Consultants Inc. The design for WDI portion of the project would be based on the on-going WDI efforts implemented by the District on their wells and RTUs. If grant funding is awarded for this Project, a grant agreement is expected to be signed by October 2019. Construction bidding would take place in 2020 with construction scheduled for completion prior to 2022.

The following list of details the anticipated tasks associated with the Project work:

Task 1: Administration

Coordination of all Project activities, including budget, schedule, communication, and grant and cost-share administration. ***Expected Deliverables: Preparation of invoices and other deliverables, as required.***

Task 2: Grant Reporting

Report on project financial status on a semi-annual basis and prepare significant development reports and a Final Project Report. In addition, the Project will comply with any other reporting requirements specified in the potential grant agreement between North Kern and Reclamation. ***Expected Deliverables: Submission of semi-annual status reports, significant development reports, and a Final Project Report as specified in the potential grant agreement.***

Task 3: Design

Preliminary design of the Project features has been completed to approximately the 30-percent design level, including Project sizing and preliminary cost estimates based on previous construction experience and information received from manufacturers. Remaining work includes completion of design plans specific to the proposed canal lining and construction specifications for the water delivery improvements, as indicated on the Project Schedule. ***Expected Deliverables: Design documents will be prepared and approved at the 100-percent design level.***

Task 4: Environmental Documentation

In February 2006, North Kern completed an Initial Study (IS) for the 2006 System Operations Improvement Project, which included lining over a six-mile portion of the Calloway Canal. In January 2007, based on the IS, North Kern adopted a Negative Declaration for the 2006 System Operations Improvement Project.

For lining of the Calloway Canal, Reclamation completed four Environmental Assessments (EAs), including the *Cawelo Water District Calloway Canal Lining Project – Reach A* (12-08-MP in December 2012), *Cawelo Water District Calloway Canal Lining Project – Reach B* (EA-14-02-MP in July 2014), *Cawelo Water District and North kern Water Storage District Calloway Canal Lining Project – Reaches C1, C2, and D* (EA-15-01-MP in March 2015), *North kern Water Storage District Calloway Canal Lining and Water Delivery Improvements* (EA-17-23-MP in October 2017).

As part of the NEPA process, Reclamation will complete an Environmental Assessment (EA), which is expected to culminate in a Finding of No Significant Impact, and undergo consultations with the U.S. Fish and Wildlife Service (USFWS) and Office of Historic Preservation. ***Expected Deliverables: An Environmental Assessment, following Reclamation's NEPA guidelines; a biological assessment in compliance with federal Endangered Species Act; and a cultural resources report in compliance with the National Historic Preservation Act.***

Task 5: Permits/Approval

The Project is located exclusively within maintained rights-of-way owned and operated by North Kern WSD, therefore, completion of permitting and approvals for lining of the canal and implementation of water delivery improvements should be straightforward.

- Bids for construction will be solicited through a competitive bidding process based on final plans and specifications. The language in the standard specifications relating to permitting state "The Contractor is an independent contractor and shall, at his sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the work, obtain all necessary permits and licenses therefore..." This would include, but is not limited to, preparing and implementing a Stormwater Pollution Prevention Plan pursuant to the National Pollution Discharge Elimination System (Clean Water Act Section 402) and a Construction Notification and Dust Control Plan to the San Joaquin Valley Air Pollution Control District.
- A pre-construction survey of special-status species will be conducted by a qualified biologist immediately prior the start of construction.

- Pursuant to Section 17.28.040(B)(5) of the Kern County Code of Ordinances, the District is exempt from obtaining a grading permit. Likewise, pursuant to Section 17.66.020(C)(7) of the City of Bakersfield Municipal Code, the District is exempt from obtaining a grading permit. Accordingly, the District will not seek a County or City grading permit. .

Expected Deliverables: Complete necessary permitting and approval activities prior to any construction activities.

Task 6: Construction

Construction involves furnishing and installing of all Project works, primarily all works pertaining to the physical lining of the proposed portion of the Calloway Canal and procuring and installing the components of the WDI. A contract for this task will be awarded to the successful bidder. ***Expected Deliverables: (Reference Construction Management task below).***

Task 7: Construction Management

Construction Management involves everything from the advertisement for bids from qualified construction firms to filing a Notice of Completion for the Project works and preparation of "As-Builts" drawings. Construction management activities can generally be categorized as field inspection and contract administration, where the latter includes items such as the Notice to Proceed, pre-construction conference, correspondence with the Contractor, submittal review, progress payments, periodic meetings with the Contractor, Contract Change Orders, etc. ***Expected Deliverables: Multiple deliverables including a (1) abstract of bids received; (2) successful bid proposal; (3) construction progress pay estimates; (4) start-up and testing verification; (5) Notice of Completion; and (6) "As-Builts" drawings.***

The proposed Project will be implemented under the direction of North Kern WSD. GEI will provide design, construction management, administrative, reporting assistance, and coordination with local firms, as needed. Richard Diamond, North Kern's General Manager, will have responsibility for overall Project Management, while Ram Venkatesan, North Kern's Engineer (a California-licensed Civil Engineer), will provide the technical Project Management on behalf of North Kern and will work closely with the designated construction manager.

Project Schedule - Based on the above-described tasks, this schedule for this Project is shown in Figure 6. As such, construction contract documents will be provided by early 2018 for bidding purposes and completion of construction is anticipated by 2020 with all Project work being completed and a Final Project Report delivered by September 2022. For purposes of this Proposal, assuming the Project is approved for grant funding, the contract start date is anticipated to be October 1, 2019.

The Project is not expected to deviate from Reclamation's proposed schedule of a start date of October 1, 2019 and completion within the 36-month project duration.

Engineering Plans - Engineering design drawings and contract documents for bidding have already been prepared for segments of the Calloway Canal that received funding in previous years. For the WDI component, the District has already conducted the site survey and radio survey studies to identify the required infrastructure and components to implement this project. If grant funding were awarded for lining this portion, North Kern WSD would complete the design for this portion

based on the designs completed to date because the well sites have already been surveyed and the canal sections used in the completed designs are of the same dimensions as those of the proposed area.

3.4 Evaluation Criteria

The Technical Proposal addresses each benefit category and sub-category as presented in the FOA, addressing each question and point of interest directly.

3.4.4 Criteria A: Quantifiable Water Savings

Describe the amount of estimated water savings.
Describe current losses.
Describe the support/documentation of estimated water savings.

Please address the following questions according to the type of infrastructure improvement you are proposing for funding. See Appendix A: Benefit Quantification and Performance Measure Guidance for additional guidance on quantifying water savings.

1) ***Canal Lining/Piping:***
2) ***Municipal Metering:***

Quantifiable Water Savings - The amount of water conserved by lining the Calloway Canal and implementing WDI is estimated at **1,576 acre-feet per year**. The estimate is based on seepage losses representing irrecoverable average annual losses for historic use of the Calloway Canal, the increased water conveyance through the Calloway Canal post concrete lining and reduction in groundwater pumping by real-time monitoring through the implementation of the WDI system.

For canal lining, historical data was collected at various locations along the Calloway Canal and reported in the *North Kern Water Storage District Calloway Canal Diversion Summary* available from the annual *Kern River Report* prepared by the City of Bakersfield. The reports used in this analysis are from 1990 to 2010 and have been summarized in Table 1. The Diversion Summary demonstrates that the Calloway Canal has been predominantly used by the regional districts, including North Kern, during "wet" hydrologic years when excess surface water supplies were distributed around the region for groundwater recharge. By contrast, the canal has been sparingly used during dry periods, largely due to the high seepage losses associated with its current unlined condition.

To determine the average annual seepage losses two different flow measurement locations along the canal were compared: the Buck Owens Weir and the Olive Drive Weir, which includes the proposed location. The amount of water lost due to seepage was calculated as the difference in water measured at the two weir locations (assuming evaporative losses are negligible). As summarized in Table 4, the 6.2 mile canal length between the weirs lost on average 6,975 acre-feet annually (1,125 acre-feet per year per mile of canal). However, because the canal operated

for parts of the year, the average annual or monthly values are not reflective of daily seepage rates. Table 2 considers only the summer periods when the canal was typically operated for an entire month. During these periods, the average monthly loss was 1,994 acre-feet per month or 322 acre-feet per month per mile, a rate equivalent to an average daily seepage rate of 11 acre-feet per day per mile.

As noted in the Diversion Summary, Calloway Canal operations averaged 3.14 months per year (96 days per year). The length of the canal to be lined as part of this Project is roughly 2,200 feet. Therefore, the amount of water saved along this reach can be calculated as **433 AF/year** (11 acre-feet per day-mile x 0. 41 miles x 96 days per year) based solely on the historical use of these facilities. Table 1 also shows the average annual flow in this reach of the Calloway Canal is 31,458 acre-feet. Therefore, the percentage of the historical flow to be conserved by lining the proposed portion is about 1.37 percent (433 acre-feet water saved along reach / 31,458 acre-feet annual flow).

SWP water from the Cross Valley Canal has historically been delivered to Cawelo WD through North Kern's system by pumping water from the Cross Valley Canal to the Lerdo Canal, as shown in Figure 4. An intertie linking the CVC and the Calloway Canal was completed in 2014, which enables the water to be conveyed from the CVC to the Calloway Canal and then lifted to the Lerdo Canal at the Calloway Canal to Lerdo Canal Intertie. This new route allows the use of the Calloway Canal to Lerdo Canal Intertie 8-1 Lateral Pumping Plant, which is more efficient in terms of energy, and the delivery of water can be accomplished by exchange with North Kern, avoiding the pumping lift entirely. Because the new operational scheme will utilize the portion of the Calloway Canal proposed to be lined, this future use will result in conservation of water beyond the volume that would be conserved under the current mode of operation and would significantly enhance water management and flexibility of operation.

The volume of water conserved from future conveyance in the Calloway Canal was estimated by examining historical data for water conveyance along the current delivery route and assuming a similar quantity will be delivered through the "new" delivery route (shown in Figure 4). The average annual conveyance shown in Table 3 of 24,833 acre-feet reflects the average annual delivery to North Kern, Cawelo and the KCWA, that typically occurs over 3.1 months per year. Comparing these monthly operations (Table 3) with Calloway Canal historical monthly operations (Table 1) suggests that that the Calloway Canal could see an increased operation of around 2.4 months per year (72 days per year). As such, the amount of avoided seepage due to increased water use in canal would be approximately **325 AF/year** (11 acre-feet per day-mile x 0. 41 miles x 72 days), representing 1.31 percent of the expected deliveries (325 acre-feet water saved along reach / 24,833 acre-feet of increased annual flow). **In total, the Canal Lining will conserve 758 AF/year [325 AF/year plus 433 AF/year] of water.** The type of material used is going to be reinforced concrete.

North Kern's WDI will utilize magnetic flow meters (or magmeters) (AG-3000 or similar), PLC upgrades (Allen Bradley or similar), a state-of-the-art telemetry system, and water depth sensors (Ashcroft SL-17 or similar), transformer upgrades, and radio and antennae upgrades as a part of the WDI. Upon completion, this will revolutionize North Kern's method of manual monthly data

collection and estimation, which is cumbersome and inefficient, and replace it with an automated real-time data collection system by integrating this telemetry system with District's SCADA setup. The District will become highly proficient in well data management by having access to automated real-time monitoring of well pumping, which will enable the District to match its well production to meet irrigation demand. North Kern expects the implementation of this component will reduce the time and labor spent on manually controlling their wells. It is anticipated that the WDI upgrades will help reduce the District's groundwater pumping activities by 2.5% annually by reducing over-pumping and constantly monitoring pumping efficiency. A ten-year study with a remote monitoring system similar to the proposed WDI found that landowners will actively reduce their water consumption with access to previously unmonitored information by as much as 8.8 to 18 percent (Symonds and Hill, 2013). Therefore, anticipated reductions in applied water by 2.5 percent is more on the conservative side.

These upgrades will help North Kern achieve their goal of reducing 2.5 percent of its current applied water and groundwater pumping. With an array of revolutionary advantages to the growers and the District, Component-2 enhances the on-farm benefits of the entire Project.

The Water Delivery Improvements (WDI) will also contribute to water savings. The District anticipates that the accurate water volume measurements provided by the WDI will reduce groundwater pumping 2.5 percent by curtailing the over-application of water. This amounts to 4,090 AF/year of groundwater conserved (2.5% of their current groundwater utilization (163,580 AF/year)). According to DWR's California Data Exchange Centre (CDEC) the San-Joaquin Valley Wet Year Index, the frequency of a critically dry year (such as 2015) is 2 out of every 10 years. Considering that a critically dry year occurs once in five years, the average volume of water conserved by the WDI amounts to **818 AF/year** [4,090 AF/year x 2/10 years] and is expected to increase the groundwater table by about 4.2 feet over the life of the project (Figure 7).

Overall, the Project will conserve 1,576 AF/year of water.
[1,576 AF/year = 818 AF/year in WDI and 758 AF/year in Canal Lining].

Monitoring points are already in place to measure the Project's performance in reducing the **canal seepage loss**. Figure 4, shows the historical flow measurement points at the Buck Owens Weir, Olive Drive Weir, and at Seventh Standard Road. Records of monthly flow volumes will continue to be maintained at these locations. Measurements at each of these locations are based on sharp-crested weirs equipped with stage recorders and the discharge ratings at each location are periodically checked by stream gaging methods. Under Post-Project conditions, the reduction in seepage losses will be measured by comparing the Pre-Project average of 11 AF/day-mile with the average implied loss from taking the difference between monthly flow volumes measured at the Buck Owens and Olive Drive weirs and dividing that difference by the number of days of operation. It would be preferable to make the comparison on months where the Canal was in use all month to avoid issues with canal filling.

According to North Kern's Agricultural Water Management Plan (AWMP), 2015, the average volume of groundwater pumped in 2013 and 2014 is equal to 163,580 AF/year. This proposal to

line this 2,200 LF portion of the Calloway Canal is a component downstream of a larger effort in 2018 to line 5,553 LF.

The water delivery improvements underway in North Kern are to monitor the amount of groundwater pumped on a real-time basis, rather than the current bi-monthly basis where the total volume of water delivered to the individual user is determined by extrapolating the amount pumped in a day to a whole month. This current method is highly inefficient since it doesn't account for pump efficiency loss, leakage, and over pumping. Additionally, it is time consuming due to the amount of manual labor involved to calculate the values. Upon implementation of the WDI component, the District will be able to accurately calculate the groundwater pumped and electricity consumed on a real-time basis with the help of their SCADA setup. The installation of depth-to-water sensors will help monitor the groundwater levels (including pumping drawdowns) in line with the upcoming SGMA regulations. The canal level sensors will help transmit real-time canal level data to the District, thereby augmenting their canal operations and conveyance efficiency. Leakage can be identified by finding the difference between the amount of water pumped at the well head and the amount of water delivered to the user at the turnout. This real-time data monitoring will be compiled into annual reports to estimate the annual groundwater pumping reductions.

The District's goal in making improvements is to conserve groundwater though saving the canal seepage (11 AF/mile/day) by lining the canal and reduce its groundwater pumping by 2.5 percent in a critically dry year once the Water Delivery Improvements are completed that will complement the regional canal lining effort.

3.4.2 Criteria B: Water Supply Reliability

Please address how the project will increase water supply reliability. Proposals that will address more significant water supply shortfalls benefitting multiple sectors and multiple water users, will be prioritized. General water supply reliability benefits (e.g., proposals that will increase resiliency to drought) will also be considered. Please provide sufficient explanation of the project benefits and their significance. These benefits may include, but are not limited to, the following:

1) *Will the project address a specific water reliability concern?*

2) *Will the project make water available to achieve multiple benefits or to benefit multiple water users?*

3) *Does the project promote and encourage collaboration among parties in a way that helps increase the reliability of the water supply?*

4) *Will the project address water supply reliability in other ways not described above?*

North Kern Water Storage District is part of the Poso Creek IRWM group, which includes several

water districts in Kern County. This group was established with a primary purpose of achieving regional collaboration by identifying long-term goals to improve water sustainability within Kern County. The *Calloway Canal Lining* and *Water Delivery Improvements* Project has been identified as an important component in the Poso Creek IRWM Group Plan Update, 2014, to deliver surface supplies to the basin more efficiently, and improve operational flexibility and efficiency within the region (refer to section-7.0 for Letter of Support from Poso Creek IRWM Group).

The proposed canal-lining component is a regional water conveyance facility improvement that will allow state, federal, and previously banked water supplies to be delivered directly to North Kern WSD, Cawelo WD, and Shafter-Wasco ID, and to Kern-Tulare WD and Delano-Earlimart ID using exchange agreements. Both CEQA and NEPA documents have been completed to allow the districts to bank, exchange, and transfer water supplies over a 25-year period. Lining the Calloway Canal is integral to improving how water deliveries occur in the region. The WDI component aims at revolutionizing the management of the District's groundwater system and surface water conveyance. The state-of-the art telemetry system when integrated with existing SCADA will enable the District and the growers to monitor the groundwater pumped on a real-time basis. With an estimated annual reduction of 2.5% in groundwater pumping, this is a critical management step that is aimed at conserving groundwater pumping, which is in-line with the Bay Delta Conservation Plan and upcoming SGMA regulations.

Overall, the canal lining and WDI implies lesser dependence on groundwater. This is essential considering the lack of surface water supplies owing to the constraints on conveyance of contract supplies into the region and the occurrences of severe drought in the basin. This Project also improves the water conveyance within the region, thereby increasing regional collaboration by becoming locally self-sufficient. The direct delivery of state and federal water supplies to the above-mentioned Districts in Kern County, eliminates certain existing delivery routes, which are much less efficient and experience constraints.

Conserved water will go towards meeting existing agricultural demand within North Kern presently met by pumped groundwater, since surface supplies conveyed in the Calloway Canal will no longer seep into the groundwater in an area where the water quality of the recovered groundwater would not be suitable for irrigation without costly treatment (Figure 5 shows the contaminated area).

CVP Contractors are already contributing contract water to flows in the San Joaquin River. Lining the Calloway Canal provides a vital conveyance route for return or re-circulation of water and retirement of environmental water credits as part of the SJR Water Management Goal.

Relative to the CVP-Friant supplies, the San Joaquin River Restoration Program includes a *water management goal.* The goal is to reduce or avoid adverse water supply impacts to the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided by the restoration program. San Joaquin River restoration efforts envision a program whereby water flowing from the San Joaquin River into the Delta would be conveyed in the California Aqueduct and diverted into the Cross-Valley Canal for delivery to Friant Division contractors. Owing to mismatches in timing between supply and demand, regulation will be necessary to correct these imbalances. The Poso Creek Region includes three contractors, which

collectively account for about 25 percent of the Friant Division's Class 1 supply. Two of these entities have already entered into banking arrangements with North Kern WSD to regulate their contract water supplies and thereby mitigate adverse water supply impacts (refer Figure 6 and 7 for CVP and SWP water flow path into the District; and various water banking arrangements). This directly supports the Settlement Agreement through furtherance of the *water management goal.* With regard to the San Joaquin River, the relevant species is the federally threatened (spring run)/endangered (winter run) Chinook Salmon.

The proposed Project would indirectly benefit federally listed threatened or endangered species by improving the regulation of water supplies that have been rendered less reliable owing to the imposition of measures designed to protect threatened and endangered species. These measures include seasonal pumping restrictions in the Sacramento River-San Joaquin River Delta (Delta) and restoration of flows below Friant Dam on the San Joaquin River. The pumping restrictions reduce the amount and constrain the timing of deliveries of State Water Project and Central Valley Project (CVP) water pumped from the Delta and the deliveries of CVP-Friant Division supplies. The Poso Creek Region, to which North Kern and Cawelo belong to, includes districts with contracts for water from both of these sources.

The proposed Project contributes to accomplishment of the State's co-equal goals, as defined in the Amended Memorandum of Agreement Regarding Collaboration on Planning, Design and Environmental Compliance for the Delta Habitat Conservation and Conveyance Program in Connection with the California Bay Delta Conservation Plan (First Amendment MOA Collaboration BDCP, December 15, 2011). The implementation of co-equal goals is intended to provide reliable water supply for California while enhancing, protecting, restoring, and enhancing the Delta ecosystem and habitat (SB1, Steinberg- Section 85054). With the completion of the intertie between the Cross-Valley Canal and the Calloway Canal, any water diverted from the California Aqueduct for direct delivery to North Kern WSD or Cawelo WD would be conveyed through the reaches of the Calloway Canal, including this newly lined segment.

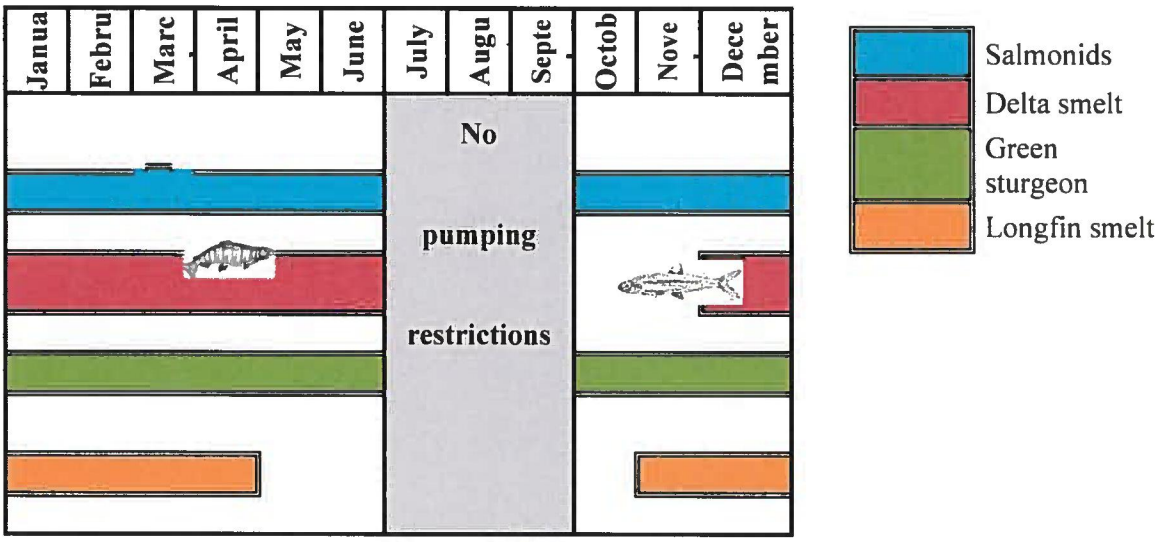
Lining the Calloway Canal will minimize seepage losses, which are particularly problematic because of the poor quality of the groundwater underlying the canal. Historical data prove the presence of petrochemical discharge present in the groundwater (Figure 5). The presence of Phenol makes the groundwater completely unusable without subject to secondary and tertiary treatment. Any measures which minimize seepage to poor quality groundwater and enable delivery of conserved surface water directly to water users improves the efficiency of water management in the region, reduces demand on the Delta and, supports the environmental objectives of the California Bay-Delta Conservation Plan and the San Joaquin River Restoration Program.

With regard to the Delta, relevant species include the following:

- Delta smelt (*Hypomesus transpacificus*) federally threatened;
- Longfin smelt (*Spirinchus thaleichthys*), San Francisco Bay-Delta distinct population segment (DPS), federal candidate;
- Green sturgeon (*Acipenser medirostris*), southern DPS, federally listed threatened;
- Steelhead (*Oncorhynchus mykiss iridium*), California Central Valley DPS, federally threatened;
- Chinook salmon (O. *tshawytscha*), winter-run, federally endangered; and

- Chinook salmon (O. *tshawytscha*), Sacramento River spring-run, federally threatened.

The diagram below, illustrates the pumping restrictions that are currently in force in the Delta in an effort to restore these fish species' populations.



By reducing seepage to marginal quality groundwater, reducing pumping demand on higher quality groundwater and helping support groundwater elevations underlying irrigated lands, the proposed Project has the ability to benefit local species. Kern County has more than two dozen threatened and endangered species. As demonstrated by the Kern Water Bank, actions that support local groundwater may assist in restoring wetland and upland habitat via in-lieu groundwater recharge. Species that may benefit include:

- San Joaquin kit fox (*Vulpes macrotis mutica*) (Picture to the right);
- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*); and
- San Joaquin wooly threads (*Monolopia congdonii*).

Lining the Calloway Canal will benefit the State of California and Reclamation since it adds a regional conveyance route to help manage recirculation water to meet the San Joaquin River Restoration, Water Management Goal.

The region has a concern of groundwater balance because groundwater use has occurred and is relied on over time due to environmental constraints on delivery of available, supplemental surface water supply to the region. In 2014, the State of California passed the Sustainable Groundwater Management Act (SGMA) which emphasizes a timeline for sustainable groundwater management. North Kern is participating in the Kern Groundwater Authority that is forming a Groundwater

Sustainability Agency (GSA) and is presently now formulating a Groundwater Sustainability Plan (GSP). The region has also recently experienced a multi-year drought.

The loss of water supply reliability (owing to climate change, and regulatory and judicial actions) was the fundamental regional concern identified in the Poso Creek IRWM Plan. The proposed Project will aid in addressing this concern by increasing the capacity to introduce high quality surface water into the region, to deliver this water to irrigation users, and to protect water quality by eliminating canal seepage in an area underlain by poor quality groundwater. As a result, more surface water will be brought into the region than under the no-Project condition and this increased volume of imported water will be available for delivery to irrigators with little water lost to seepage.

The Kern River is the main source of water to the District and significant source of supply to many other water agencies in Kern County. The severe drought over the last few years has severely stressed out the Kern River. The completion of this Project will help facilitate the long-term goal of Poso Creek IRWM Group interest to line the entire Calloway Canal, thereby preventing a significant amount of water from seepage losses and providing the ideal conveyance facility to bring in more surface water into the valley. This process will reduce the dependency on Kern River, by giving the District flexibility to time their diversions from the river. The WDI component will directly reduce the groundwater pumped by monitoring excessive pumping and identifying seepage losses. This not only aids in resolving the water crisis due to drought, but also provides a suitable natural habitat for local species. Kern County falls under a group of critically stressed basins. Therefore, the lining of the Calloway Canal and implementing Water Delivery Improvements alleviates the stress on groundwater by paving the way for more sustainable supply of surface water.

The Project will conserve groundwater in a basin that has a shared use with disadvantaged communities. The disadvantaged communities are represented in the Kern GSA and in the Poso Creek IRWM Plan.

3.4.3 Criteria C: Implementing Hydropower

If the proposed project includes construction or installation of a hydropower system, please address the following:

Describe the amount of energy capacity. *For projects that implement hydropower systems, state the estimated amount of capacity (in kilowatts) of the system. Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

Describe the amount of energy generated. *For projects that implement hydropower systems, state the estimated amount of energy that the system will generate (in kilowatt hours per year). Please provide sufficient detail supporting the stated estimate, including all calculations in support of the estimate.*

Describe any other benefits of the hydropower project. *Please describe and provide sufficient detail on any additional benefits expected to result from the hydropower project, including:*

- *Any expected reduction in the use of energy currently supplied through a Reclamation project*
- *Anticipated benefits to other sectors/entities. Expected water needs, if any, of the system*

The project does not propose to install or construct any hydropower systems. However, the reduction in groundwater pumping will save a total of 45,806 kWh/year

3.4.4 Criteria D: Complementing On-Farm Irrigation Improvements

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

- *Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.*
    - *Provide a detailed description of the on-farm efficiency improvements.*
    - *Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?*
    - *If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.*
    - *Applicants should provide letters of intent from farmers/ ranchers in the affected project areas.*

In 2015, NRCS announced the North Kern Water Improvement Project that provides funding through the Bay Delta Initiative for Northern Kern County. The District has a history encouraging direct coordination between the NRCS and growers. The District communicates regarding funding programs with local NRCS staff. As a result, growers within the District have frequently applied to the NRCS for funding of on-farm improvements. As of 2015, the District has received summary information from the NRCS indicating that 406 contracts with individual landowners within Kern County have been signed since 2010 for growers that have applied for EQIP funding, demonstrating a high level of cooperation between growers, districts in the County, and the NRCS. In 2015, the NWKRCD provided assistance to the NRCS to process 227 incoming EQIP applications, of which 105 were funded for a total of $7,366,105.

Although North Kern does not have a capital program to fund on-farm enhancements, the District coordinates with local NRCS staff working directly with growers who have applied to the NRCS for funding of on-farm improvements. Because the names of applicants to NRCS programs remain confidential until funding has been awarded, the District does not have advance knowledge of the number of growers within the District who have requested NRCS funding or of the location of lands where on-farm improvements may be located. The local NRCS staff collaborates with North Kern and local growers on on-farm improvements through the Bakersfield Service Center (USDA, NRCS, Bakersfield Service Center, 5000 California Ave., Bakersfield, CA). NRCS is currently in

discussion with North Kern to implement on-farm efficiencies per the 2016 and 2017 Agricultural Water Use Efficiency (AgWUE) awards.

In addition, North Kern growers have already converted much of the District to low volume irrigation systems such as drip and micro spray, the District provides some financial support the NRCS on-farm irrigation system evaluations using the Mobile Lab service operated by Brian Hockett of the North West Kern Resources Conservation District (NWKRCD). These evaluations enable growers to improve operation of their existing systems, improvements that both increase the efficiency of their on-farm water management and enhance their management of nutrients such as nitrogen. North Kern is in the NWKRCD service area and has funded irrigation system evaluations to growers for many years. NRCS funding could enable expansion of this Mobile Lab program.

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

The Calloway Canal is a principal surface water conveyance facility utilized within the District. Therefore, this proposed Project will benefit the entire crop acreage throughout the District. Moreover, this project to line a segment of the Calloway Canal is integrated with the District's improvements for water delivery (water conservation reduces both groundwater pumping volumes and pumping lifts). The WDI component will allow growers access to water measurement, weather, and depth to water measurements. The District and the growers will be able to improve drought water management that conserves groundwater. This Project will serve as an excellent example to the water community of the value of such conservation projects. As part of the regional planning process, the North Kern WSD has presented Project details and benefits to the other members of the Poso Creek IRWM group who have expressed interest in improving similar regional conveyance facilities that could further leverage the approach taken in this Project for assisting with on-farm improvements.

A primary on-farm benefit is the improved capacity to deliver surface water to irrigated lands that also rely on groundwater pumped from wells drawing from an aquifer immediately underlying the irrigation service area. The Calloway Canal allows for delivery of water directly to North Kern WSD, Cawelo WD, and Shafter-Wasco Irrigation District and by exchange to Kern Tulare Irrigation District and Delano Earlimart Irrigation District. Surface water deliveries to irrigators allow groundwater to be conserved. North Kern practices conjunctive use, as do the neighboring districts, which means surface water, when available, replaces pumping of groundwater to meet irrigation demand. If more surface water is available, less groundwater is pumped, resulting in less energy for the same total water use. As explained earlier in section 3.1, the potential benefits accruing to the Project due to reduced reliance on groundwater are directly associated with the 758 acre-feet of reduced seepage that will result from lining the proposed 2,200 feet and 818 acre-feet of reduced groundwater pumping from the WDI effort.

Having the data available for groundwater well operations allows landowners to actively monitor and set management guidelines for improving on-farm water uses. For instance, having data on

groundwater deliveries that complements data now available from the District on surface water deliveries allows growers to better predict and analyze their on-farm water usage, both in terms of volume and availability, allowing them to better schedule crop irrigations. Moreover, quantification of water deliveries may influence growers to install more efficient systems on fields that are shown to be receiving more water than the grower had previously believed, or to audit on-farm systems that are not performing at a level of efficiency typical of the type of system now in the field. A ten-year study with a remote monitoring system similar to the proposed WDI found that landowners will actively reduce their water consumption with access to previously unmonitored information by as much as 8.8 to 18 percent (Symonds and Hill, 2013). Therefore, the delivery measurement has the potential to provide a foundation for implementation of on-farm improvements that could result in significant reductions in groundwater deliveries. If implementation of on-farm measures such as irrigation scheduling and irrigation system audits were to attain reductions in applied water by 2.5 percent, on-farm water conservation due to measures made possible through the Project would equal 818 AF of pumped groundwater on an annual basis (4,090 AF on a dry year). Importantly, implementation of the WDI also has the potential to generate interest among other landowners wishing the same level of access to data provided to participants in this Project.

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

The proposed Project will enhance collection of energy use data from groundwater wells and provide the information needed to enable growers to better estimate flow to improve their on-farm irrigation and water management systems, as explained previously.

In Summary, the NRCS Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that provides financial and technical assistance to farmers and ranchers who face threats to soil, water, air, and related natural resources on their land. Growers apply directly to the NRCS for EQIP funding, and, since the applicants to the NRCS programs remain confidential until awarded funding, North Kern is generally not aware of the number of growers in the District who have applied for funding until the funding has been awarded. Nevertheless, the District strongly supports grower participation in EQIP as improved on-farm water use efficiency is the cornerstone for improved District and regional water management.

Expanded NRCS funding would benefit both growers and the District by 1) conserving water on irrigated cropland, and 2) reducing leaching of nutrients to groundwater by controlling deep percolation and improving nutrient management. The NWKRCD provides the water conservation field services necessary to attain these objectives through their on-farm irrigation system performance testing.

3.4.5 Criteria E: Department of Interior Priorities

Please address those priorities that are applicable to your project.

1) *Creating a conservation stewardship legacy second only to Teddy Roosevelt*
2) *Utilizing our natural resources*
3) *Restoring trust with local communities*
4) *Striking a regulatory balance*
5) *Modernizing our infrastructure*

Utilization of Natural Resources

Water is one of our greatest natural resources. In the western United States, it is a critical resource that requires extensive planning efforts to fully utilize supplies to meet beneficial uses. California's water supply is interconnected throughout the state. Better management practices and conservation of supplies provide benefits to all that rely on the shared supply.

Restoring Trust with Local Communities

Agriculture is a key component of the economy of the San Joaquin Valley. As the California's population has grown, the water supply within the state has been stressed. This places communities needs and interests for the use of water in competition with those of agriculture. The lining of the canal serves to provide additional surface supplies delivered to the farmer and relieves tension with municipal services. The implementation of WDI will enable the growers to access real-time pumping information and groundwater characteristics that will positively impact the grower's irrigation practices. Additionally, the groundwater monitoring practices included as part of this Project will provide valuable groundwater data to help other domestic communities (six within the District) and neighboring districts. This promotes regional cooperation amongst the District and its neighbors to effectively implement groundwater conservation and management practices.

Modernizing our Infrastructure

Much of the water infrastructure of the District was installed several decades ago. The Calloway Canal, for instance, was initially used only during wet periods to deliver high flows to spreading grounds as an unlined, earthen canal. Lining of the Calloway Canal provides a regional improvement for more efficient and flexible (timing) means of delivery of water supplies in dry, normal and wet hydrologic years. On the other hand, the District's wells were never augmented with any form of telemetry systems. The implementation of the WDI will revolutionize the district's well and canal level sites. The use of local private contractors to implement both components of the proposed Project is in line with points 5b and 5c of section E.1.5 of the FOA.

3.4.6 Criteria F: Implementation and Results

3.4.6.1. Subcriterion No. F.1: Project Planning

Engineering design drawings have been prepared for segments of the Calloway Canal and WDI components that have received funding in previous years, including final design drawings and

contract documents prepared for bidding. The previously prepared design and bid documents have canal sections of the same dimensions and well sites of similar design. If funded, North Kern will complete the design for the proposed area based on the designs that have already been completed.

North Kern WSD adopted, by Resolution of its governing Board of Directors, the Poso Creek IRWM Plan in July 2007 and the Plan Update of 2014. This plan was developed in collaboration with neighboring districts, the Poso Creek Regional Water Management Group, over a period of years in accordance with guidelines published by the State of California. Subsequently, a Reclamation-funded System Optimization Review (SOR) was conducted for this group[1].

Integrated Regional Water Management Plan - The Plan's Executive Summary lists the following as the first strategy to be employed to mitigate projected reductions in the Region's surface water supplies:

> "Maximize use of available surface water supplies through the use of existing absorptive capability by coordinating mismatches between supply and demand within the Region, i.e., matching supply that exceeds demand in one district with demand that exceeds supply in another district. This applies to both irrigation absorptive capability as well as spreading absorptive capability."

By expanding the flexibility of water management options available in the region, limiting seepage to impaired groundwater, and reducing groundwater pumping volumes and lifts, the proposed Project is entirely consistent with, and in furtherance of, this strategy.

System Optimization Review (SOR) - The focus of the SOR was to (1) prioritize the implementation of structural water management measures for the region based on their expected benefits to the region's water supply reliability, and (2) identify and resolve institutional constraints to exchange water between districts and enhance the use of District groundwater banking facilities that will help mitigate the projected loss of water reliability to the region. The study is complete, a memorandum was prepared in March 2010 regarding the Plan of Action resulting from the SOR, and a Final Report was submitted to Reclamation in early 2011. The Plan of Action identified lining of the Calloway Canal as one of the structural measures required to optimize management of water supplies to the region.

The Project will be implemented as shown on the schedule (Figure 6). The projected schedule shows that activity would begin around October 1, 2019, contract documents would be completed by early 2020, construction would extend to Summer 2022, and all Project work and reporting would be completed by September 2022.

3.4.6.2. Subcriterion No. F.2: Performance Measures

Historically, flow has been measured at various locations along the Calloway Canal (Canal) and the resulting flow volumes have been recorded and reported in annual Hydrographic Reports for the Kern River. The reports used in this analysis cover the 21-year period from 1990 through 2010. These data demonstrate that the Canal has been used historically only in "wet" years, which

[1] Semitropic Water Storage District acted as lead agency on the grant from Reclamation to help fund this work.

is due in part to the high seepage loss rates. To evaluate the average annual seepage losses, two different flow measurement locations along the Canal were compared; specifically, the Buck Owens Weir (previously named Standard Weir) and the Olive Drive Weir (previously named Laborde Weir). These are sharp-crested weirs equipped with stage recorders and the discharge ratings are periodically checked with stream gaging methods. Taking into account all deliveries and inflows, the difference in flow volume between these two points is the amount of canal seepage (excepting a relatively small amount attributable to evaporation).

As summarized in Table 1, Seepage Loss at Buck Owens Weir, the 6.-mile reach between the Buck Owens and the Olive Drive weirs, lost an average of 6,975 acre-feet per year over the 21-year period. Figure 4 shows the locations of the measuring points. Excluding the non-flow years and non-flow months, the average annual losses are about 12,200 acre-feet (AF) and the average monthly losses are about 1,017 AF (12,200 AFY/ 12 Mo). These numbers are higher and more closely reflect losses when water is flowing. However, during some of the months, the Canal was only operated for part of the month; therefore, averages are not truly reflective of daily losses. Considering only the summer months, when the Canal typically operated for the entire month (66 months over the study period, [ref. Table 2], the average loss is 1,994 AF or 322 AF per mile. Based on a 30-day month, the implied average loss per day per mile is 11 AF per day per mile).

As mentioned in Section 3.1, the completion of this Project will enable the District to direct 24,833 AF of SWP water in addition to the current conveyance of 31,458 AF of Kern River water. With an annual savings of 758 AF, this Project increases the efficiency of the canal by 0.83%.

Post completion of this Project, measurements will be taken at Buck Owens and Olive Drive Weirs to estimate the volumetric loss of water. In addition to these two, occasional stream gage measurements will be taken at locations between the Buck Owens Weir and Olive Drive weirs. In particular, these locations include segments of the Calloway Canal that were recently lined.

The implementation of WDI will integrate the telemetry sites to district's SCADA setup thereby enabling the District to monitor the performance of its water system facilities on a real time basis. As stated previously, North Kern uses a bi-monthly flow measurement system, their staff manually collect flow measurements from wells and project that data to calculate the groundwater pumped for the entire month. This manual collection process is highly laborious and potentially inaccurate method of calculating future demand and planning water supply. This manual method can result in reduced/excessive pumping, since the quantity needed to pump is mismatched with the irrigation demand. This irregularity in the quantity of groundwater pumped results in farmers not knowing if the actual amount of water needed to be applied will be available for delivery to the crop. With the access to real-time pumping data, the District can monitor the water pumped and delivered to effectively monitor and leakage, reduction in pumping efficiency, excessive drawdown, and electricity usage on a real-time basis. The District will generate monthly reports from their SCADA setup to monitor the performance improvements.

These data should be sufficient to measure the Project Performance.

3.4.6.3. Subcriterion No. F.3: Readiness to Proceed

Implementation plan - The overall schedule for the project has been shown as part of Figure 6, and the description of each task is included in section 3.3. The first step would be to complete the CEQA and NEPA compliance requirements for the Project area. The design work for this project will take place parallelly for both components of the project. Once the environmental documentation and design work is complete, the District will go out to bid for the construction phase of the Project. All necessary permits will be obtained prior to beginning of construction activities. The District plans on beginning the necessary environmental documentation on October 1st, 2019 (post award date) and expect to complete construction by June 2022, with estimated completion of all construction management and reporting activities by September 2022.

Permits – Apart from permits necessary as part of the CEQA and NEPA documentation, the District anticipates filing the ITP with MBHCP (refer section 4.3 for details). The NPDES SWPPP and PM-10 permits in addition to any other permit that may be necessary to be compliant with all environmental regulations established by the County, State and Federal authorities. All necessary permits will be evaluated and filed prior to beginning of construction.

Engineering design work - Engineering design drawings have been prepared for segments of the Calloway Canal and WDI components that have received funding in previous years (NK-611 Calloway canal lining project and NK-612 Water Delivery Improvements project), including final design drawings and contract documents prepared for bidding. The previously prepared design and bid documents have canal sections of the same dimensions and well sites of similar design. If funded, North Kern will complete the design for the proposed area based on the designs that have already been completed. Additionally, the District has already completed a detailed **Site survey report, Radio survey report, and SCADA setup evaluation** that identified the necessary infrastructure enhancements required to successfully implement the WDI component of this project. These surveys will save a significant amount of time in implementing the Project.

Environmental compliance efforts – Sections 3.3 and 4.3 discuss the environmental compliance in detail. The District has previously prepared EA-17-23-MP in consultation with the Reclamation for the previously lined canal lining project and the WDI project that is currently being implemented. The cost estimate was prepared by District's consultant based on the cost incurred to prepare EA-17-23-MP. The District anticipates working closely with Reclamation to prepare the environmental compliance document required to implement the proposed Project.

3.4.7 Criterion G: Nexus to Reclamation Project Activities

- *Is the proposed project connected to Reclamation project activities? If so, how? Please consider the following:*
  - *Does the applicant receive Reclamation project water?*
  - *Is the project on Reclamation project lands or involving Reclamation facilities?*
  - *Is the project in the same basin as a Reclamation project or activity?*
  - *Will the proposed work contribute water to a basin where a Reclamation project is located?*

- *Will the project benefit any tribes?*

Although North Kern is not a federal water contractor, they have already entered into water banking deals with federal water contractor neighbors such as Shafter-Wasco ID, Delano-Earlimart ID and Kern-Tulare WD. Reclamation's Friant-Kern Canal (FKC) flows through the District, this enables the District to bank water from the FKC on behalf of Kern-Tulare WD and Delano-Earlimart ID during the wet years, onto their spreading grounds. Figure 1 indicates the flow path of the FKC and the spreading grounds located in the District, to effectively bank Reclamation's water on behalf of the federal contractors. In another instance, Shafter-Wasco ID exchanges Reclamation's water with North Kern by drawing water into their district from the more conveniently located Calloway Canal. North Kern effectively utilizes its absorptive capacity to bank excess water during wet years for its federal contractor neighbors and delivers back to them during the dry years using canals such as the Calloway. This enables operational flexibility for all these districts in terms of effective utilization of their surface water sources and promotes regional co-operation towards making this basin self-sufficient.

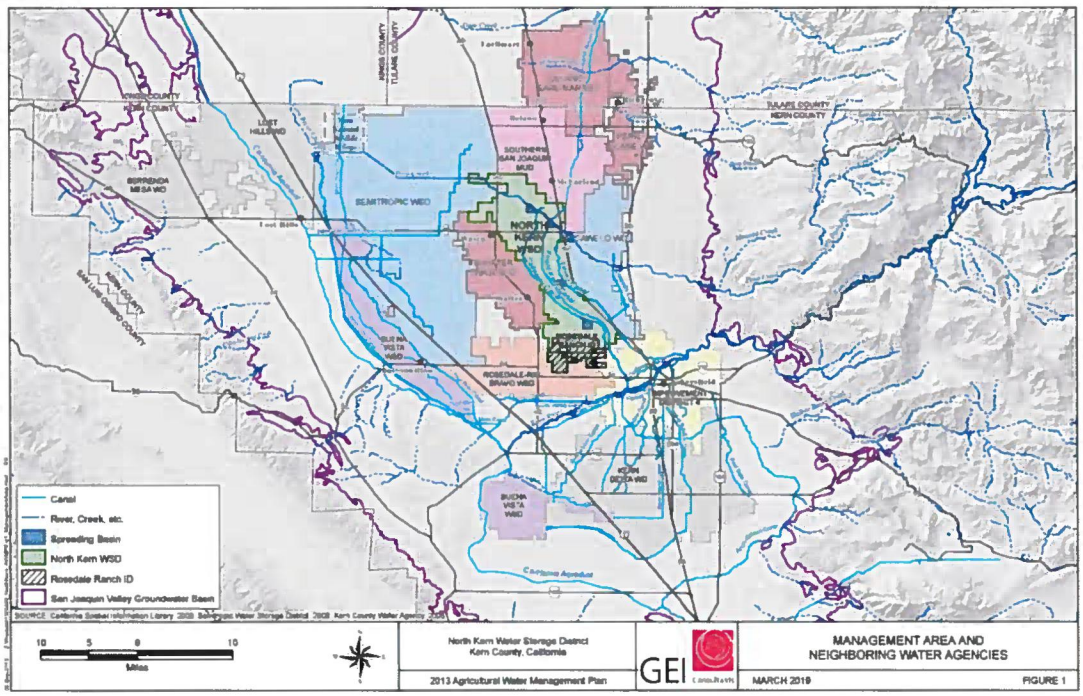
The proposed Project is located in the Tulare Lake Basin, which also includes Reclamation's Friant-Kern Canal. The Project lands do not involve any Reclamation facility; nor provide benefit to tribes.

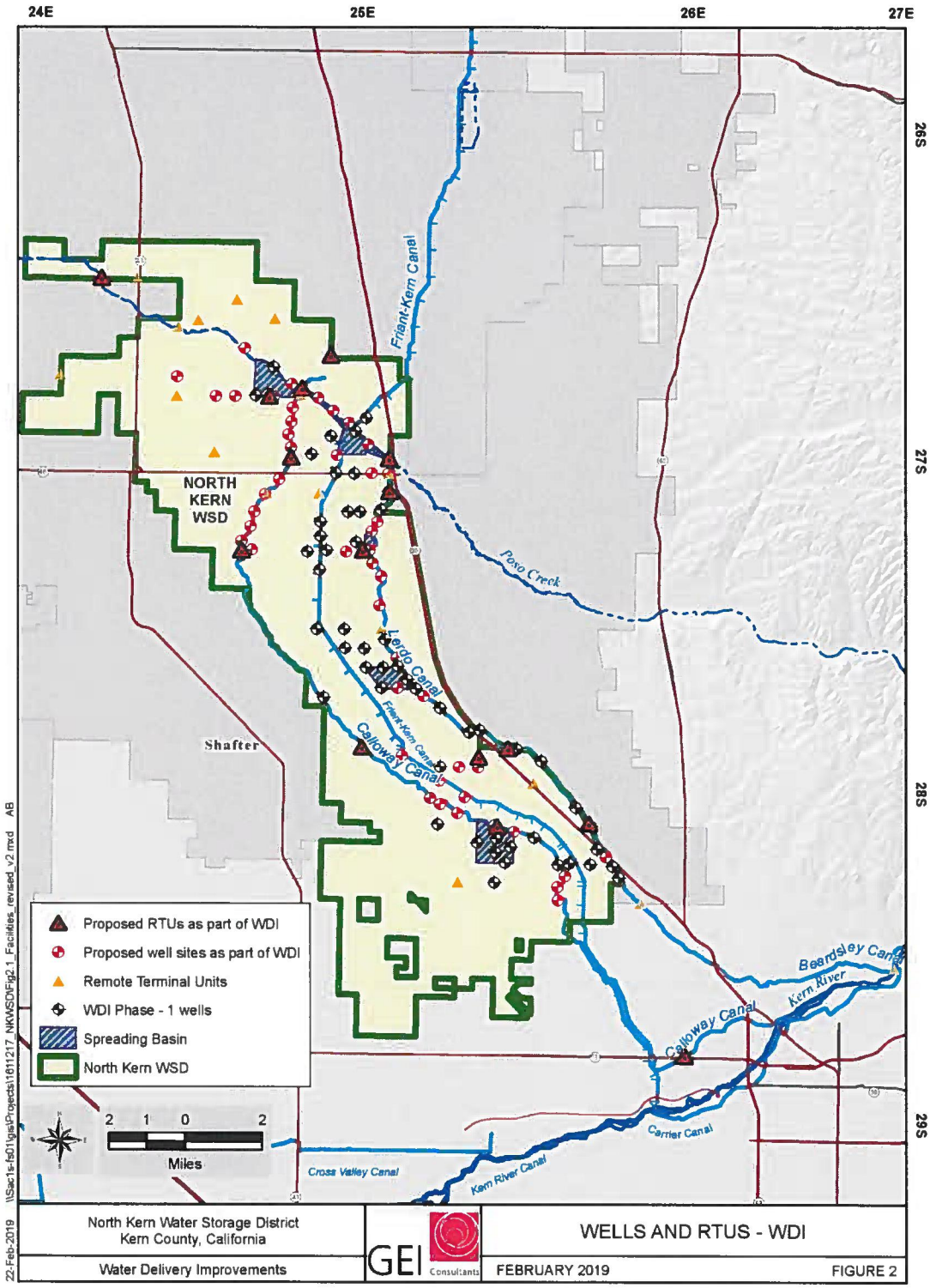
3.4.8 Criterion H: Additional Non-Federal Funding

The District has successfully aligned state funding and local funds to match the federal assistance. The District was successful in securing funding for the 1.1-mile long canal (of which, this Project is a part) through DWR's Agricultural Water Use Efficiency Grants. The District will maintain and operate the Calloway Canal with District funds once constructed.

Non-Federal Funding	=	$ 1,633,029	=	52.12%
Total Project Cost		$ 3,133,029		

3.5 Figures and Supporting Data

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NORTH KERN WSD
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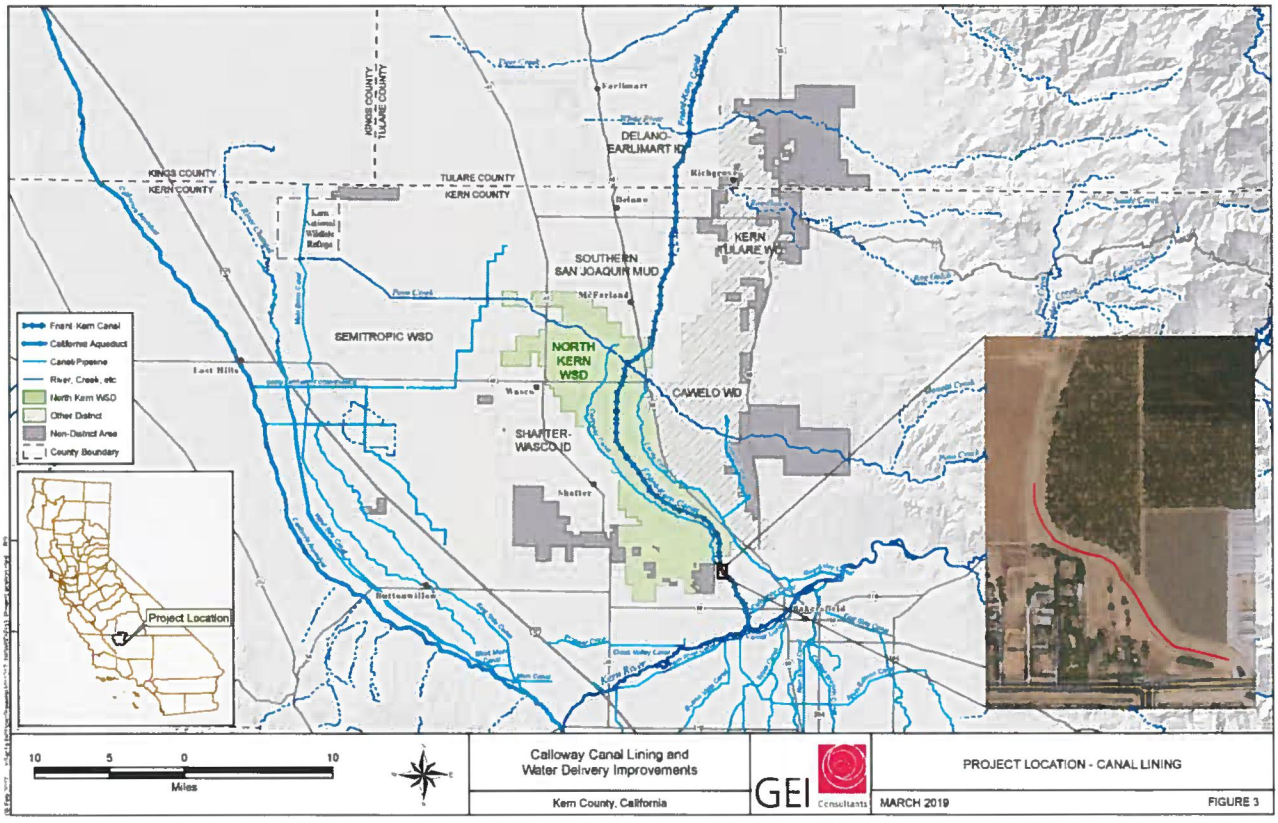
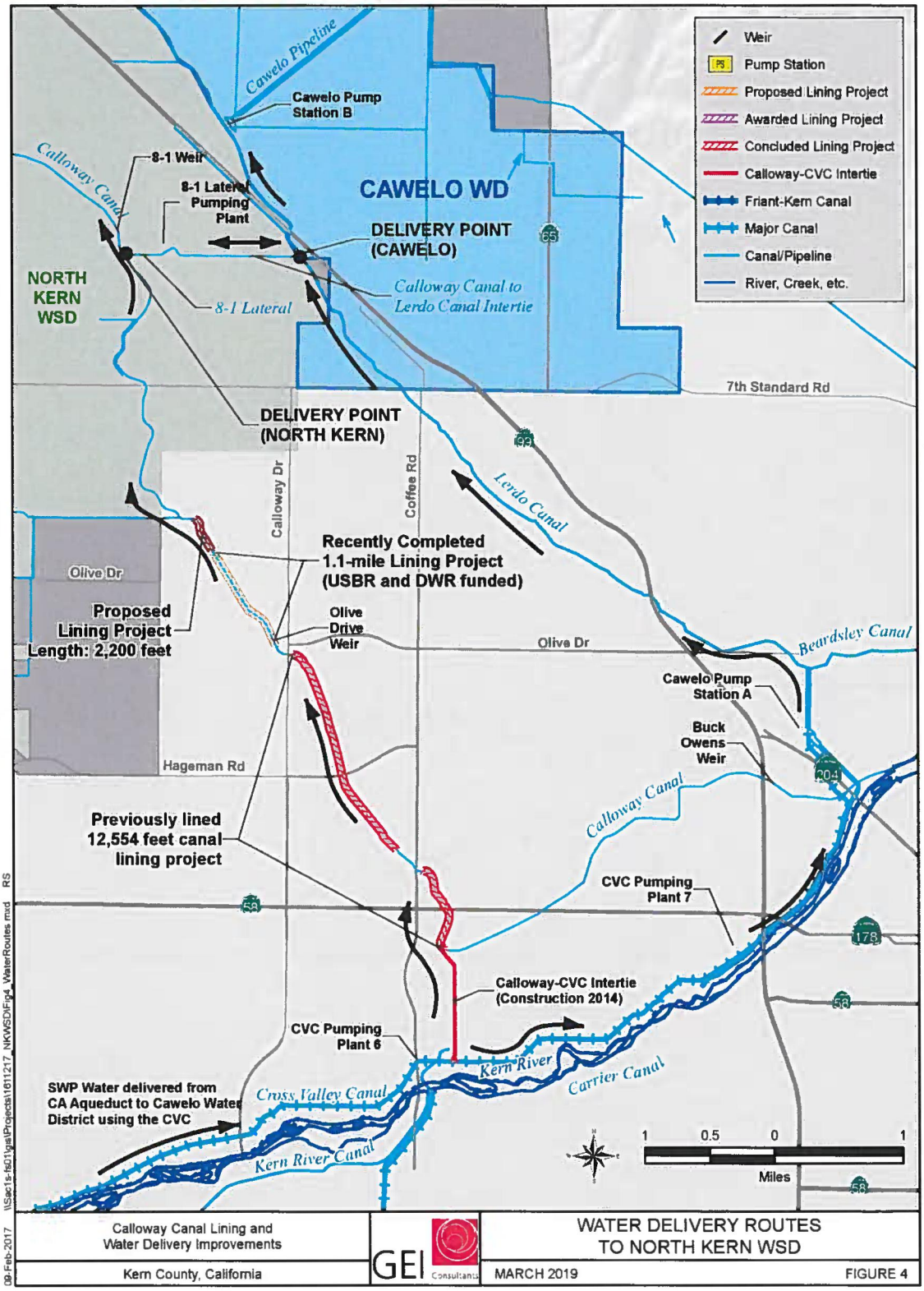
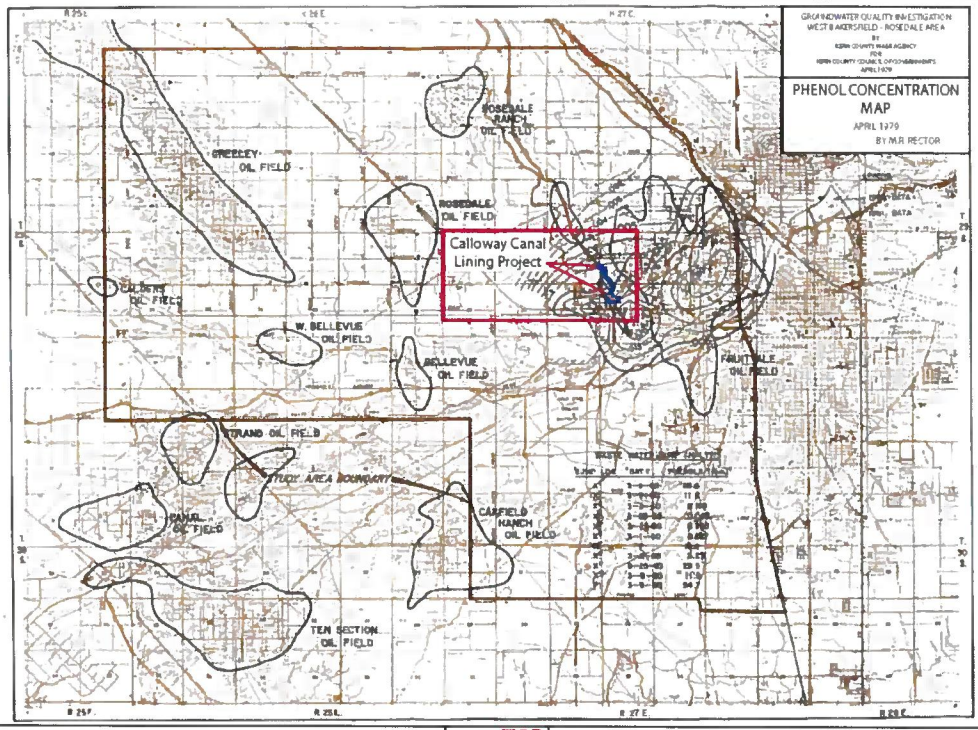
Lerdo Canal
Friant-Kern Canal
Calloway Canals
Beardsley Canal
Kern River
Calloway Canal
Carrier Canal
Cross Valley Canal
Kern River Canal
Proposed RTUs as part of WDI
Proposed well sites as part of WDI
Remote Terminal Units
WDI Phase - 1 wells
Spreading Basin
North Kern WSD
2 1 0 2
Miles
\\Sac1s-fs01\gis\Projects\1811217_NKWSD\Fig2.1_Facilities_revised_v2.mxd AB
22-Feb-2019
North Kern Water Storage District
Kern County, California
Water Delivery Improvements
GEI Consultants
WELLS AND RTUS - WDI
FEBRUARY 2019
FIGURE 2

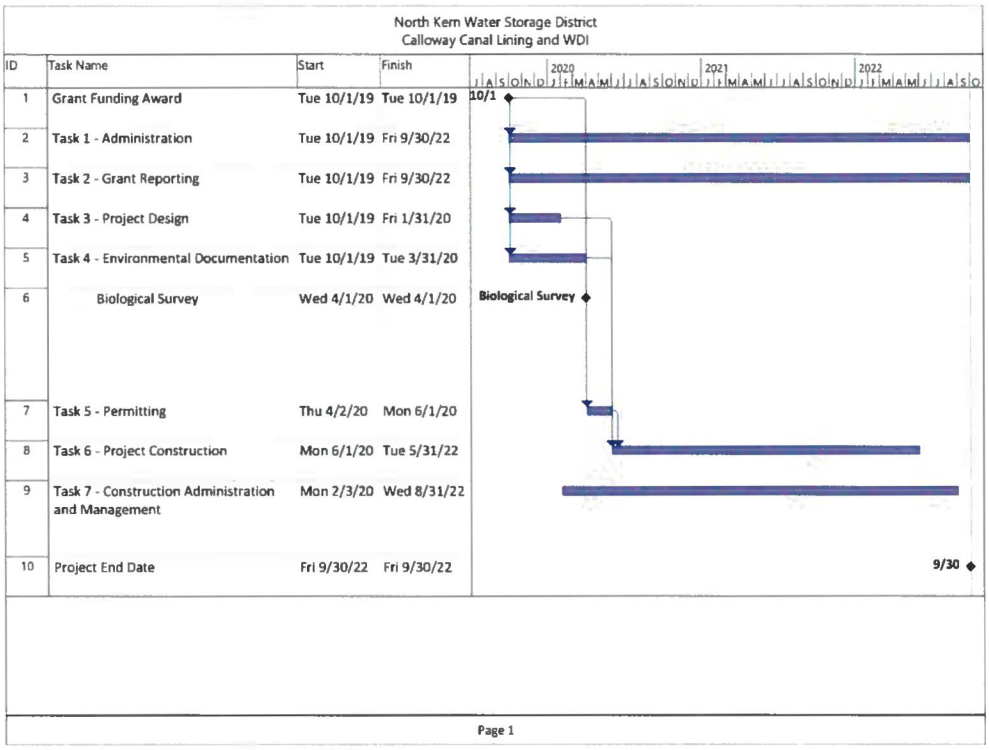

KINGS COUNTY
TULARE COUNTY
KERN COUNTY
DELANO-EARLIMART ID
SOUTHERN SAN JOAQUIN MUD
KERN TULARE WD
SEMITROPIC WSD
NORTH KERN WSD
CAWELO WD
SHAFTER-WASCO ID
Project Location
Friant Kern Canal
California Aqueduct
Canal-Pipeline
River, Creek, etc
North Kern WSD
Other District
Non-District Area
County Boundary
10 5 0 10
Miles
Calloway Canal Lining and Water Delivery Improvements
Kern County, California
GEI Consultants
PROJECT LOCATION - CANAL LINING
MARCH 2019
FIGURE 3


Weir
Pump Station
Proposed Lining Project
Awarded Lining Project
Concluded Lining Project
Calloway-CVC Intertie
Friant-Kern Canal
Major Canal
Canal/Pipeline
River, Creek, etc.
Cawelo Pipeline
Cawelo Pump Station B
Calloway Canal
8-1 Weir
8-1 Lateral Pumping Plant
CAWELO WD
DELIVERY POINT (CAWELO)
NORTH KERN WSD
8-1 Lateral
Calloway Canal to Lerdo Canal Intertie
7th Standard Rd
DELIVERY POINT (NORTH KERN)
Calloway Dr
Coffee Rd
Lerdo Canal
Recently Completed 1.1-mile Lining Project (USBR and DWR funded)
Olive Dr
Proposed Lining Project Length: 2,200 feet
Olive Drive Weir
Olive Dr
Beardsley Canal
Cawelo Pump Station A
Buck Owens Weir
Hageman Rd
Calloway Canal
Previously lined 12,554 feet canal lining project
CVC Pumping Plant 7
Calloway-CVC Intertie (Construction 2014)
CVC Pumping Plant 6
Kern River
Carrier Canal
SWP Water delivered from CA Aqueduct to Cawelo Water District using the CVC
Cross Valley Canal
Kern River Canal
1 0.5 0 1
Miles
Calloway Canal Lining and Water Delivery Improvements
Kern County, California
GEI Consultants
WATER DELIVERY ROUTES TO NORTH KERN WSD
MARCH 2019
FIGURE 4
09-Feb-2017 \\Sac1s-fs01\gis\Projects\1611217_NKWSD\Fig4_WaterRoutes.mxd RS



Calloway Canal Lining	GEI Consultants	Phenol Concentration Map
North Kern Water Storage District	MARCH 2019	Figure 5

Figure 6, Project Schedule



Energy Calculation (Figure - 7)

Annual Operational Electrical Energy Savings

Post-Project	Water hp	Q	TDH (ft)	OPE	Input hp	kWh/AF	AF	kWh	MWh	CO2e (MT)		Cost
Well Pumping	202	5	355.8	56.4%	358	645	165,155	106,592,447	106,592	45206	$	12,781,084

Pre-Project	Water hp	Q	TDH (ft)	OPE	Input hp	kWh/AF	AF	kWh	MWh	CO2e (MT)		Cost
Well Pumping	204	5	360	56.4%	362	653	166,731	108,882,756	108,883	46177	$	13,065,931
						Difference =	(1,576)	(2,290,309)	(2,290)	(971)	$	(274,837)

Assumptions

Average Pre-project pumping depth = 360
Average Post Project pumping depth = 356 adjusting for **4.2' rise in water table**
Average Pre project District pumping of 166,731 AFY
1576 AFY of reduced groundwater pumping
Emission Factor conversion from MWh to kgCO2e = 424.1
Ag Energy Rate Average = $0.12/kWh
Average energy saving/year= 45,806 kwh

Table 1 Calloway Canal Flow at Buck Owens Weir

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1990	-	-	-	-	-	-	-	-	-	-	-	-	0
1991	-	-	-	-	-	-	-	-	-	-	-	-	0
1992	-	-	-	-	-	-	-	-	-	-	-	-	0
1993	-	-	2,737	3,314	4,395	13,793	15,872	4,149	859	3,175	1,857	-	50,151
1994	-	-	-	-	-	-	-	-	-	-	-	-	0
1995	1,656	4,587	5,088	10,227	18,621	19,900	20,604	17,669	10,975	10,468	10,143	1,674	131,612
1996	1,370	1,638	766	792	12,948	11,700	12,355	7,857	1,222	1,065	-	-	51,713
1997	7,842	10,145	13,866	5,829	9,677	12,474	12,058	7,090	1,004	-	-	-	79,985
1998	5,461	5,011	5,827	5,940	8,279	18,434	22,526	20,013	10,584	1,764	-	-	103,839
1999	6,651	4,533	63	541	3,511	5,342	6,044	4,810	2,839	3,820	371	-	38,525
2000	-	476	1,081	-	-	-	-	-	-	168	20	4	1,749
2001	-	-	16	-	-	-	-	-	-	-	-	2,184	2,200
2002	1,486	-	-	-	-	-	-	-	-	-	36	44	1,566
2003	-	-	-	-	-	-	-	-	-	-	-	-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	0
2005	18	2,440	1,341	264	1,457	18,488	19,241	4,201	-	1,087	522	10,038	59,097
2006	12,113	-	559	1,656	22,387	29,151	26,337	5,687	327	-	-	-	98,217
2007	-	-	-	-	-	-	-	-	-	-	-	-	0
2008	-	-	-	-	-	-	-	-	-	-	-	-	0
2009	-	-	-	-	-	-	-	-	-	-	-	-	0
2010	-	-	4	454	12,174	10,488	14,104	-	-	-	-	4,744	41,968
Total	36,597	28,830	31,348	29,017	93,449	139,770	149,141	71,476	27,810	21,547	12,949	18,688	660,622
Average	1,743	1,373	1,493	1,382	4,450	6,656	7,102	3,404	1,324	1,026	617	890	31,458
Non-Zero Average	4,575	4,119	2,850	3,224	10,383	15,530	16,571	8,935	3,973	3,078	2,158	3,115	55,052

Source: Annual Hydrographic Reports for Kern River.

Table 2 - Seepage Loss between Buck Owens and Olive Drive Weirs (Full Flow Months)

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1990	-	-	-	-	-	-	-	-	-	-	-	-	0
1991	-	-	-	-	-	-	-	-	-	-	-	-	0
1992	-	-	-	-	-	-	-	-	-	-	-	-	0
1993	-	-	2,238	1,496	-	1,153	1,492	1,431		1,211		-	9,021
1994	-	-	-	-	-	-	-	-	-	-	-	-	0
1995	1,656	2,905	1,889	1,645	1,940	1,722	1,828	1,676	1,613	1,658	1,507		20,039
1996	-	-	-	-	2,021	1,560	1,598	1,710		1,305	-	-	8,194
1997	1,416	1,138	1,271	1,291	1,287	1,226		1,210				-	8,839
1998	1,862	1,244	1,269	-	1,287	1,601	1,271	1,037	1,214			-	10,785
1999	1,484	1,276	-		1,149	1,752	1,496	1,037	1,149	1,593		-	10,936
2000	-	-	1,081	-	-	-	-	-	-				1,081
2001	-	-		-	-	-	-	-	-	-	-	2,166	2,166
2002	1,363	-	-	-	-	-	-	-	-	-			1,363
2003	-	-	-	-	-	-	-	-	-	-		-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	0
2005		2,440	1,341		1,457	8,297	2,378	1,466	-	1,087		3,152	21,618
2006	2,152	-		1,656	3,979	3,675	3,423	2,747		-	-	-	17,632
2007	-	-	-	-	-	-	-	-	-	-	-	-	0
2008	-	-	-	-	-	-	-	-	-	-	-	-	0
2009	-	-	-	-	-	-	-	-	-	-	-	-	0
2010	-	-			7,611	4,913	5,045	-	-	-	-	2,376	19,945
Total	9,933	9,003	9,089	6,088	20,731	25,899	18,531	12,314	3,976	6,854	1,507	7,694	131,619

Source: *Modified from Table 1*

Total Months = 66
131,619 AF/ 66 Mo = 1,994 AF/Month

Table 3 Cross Valley Canal to Beardsley Canal though Cawelo Pump Station A
(values in acre-feet)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1976	0	657	1,567	2,452	3,951	6,925	8,867	7,030	1,643	0	629	1,914	35,635
1977	0	279	412	0	0	446	1,099	1,978	813	424	99	0	5,550
1978	0	0	67	0	0	0	248	4,759	1,627	0	0	0	6,701
1979	0	0	0	0	0	0	0	0	1,162	6,129	3,477	3,404	14,172
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	476	248	0	1,279	4,760	8,360	9,047	9,376	7,740	4,433	926	0	46,645
1982	0	56	1,406	0	0	0	0	0	0	0	0	0	1,462
1983	0	0	0	4	0	0	0	0	0	0	0	0	4
1984	10	0	0	0	0	0	0	0	0	0	0	0	10
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	12	4,117	5,015	3,818	4,348	5,090	0	0	0	0	0	0	22,400
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	607	1,572	30	0	2,209
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	6	0	0	0	0	0	0	0	0	0	0	0	6
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	1,549	6,006	9,445	9,362	8,957	8,253	8,053	9,574	3,400	0	64,599
2000	0	0	0	1,573	4,963	4,770	5,086	4,393	1,254	0	0	0	22,038
2001	0	0	0	0	0	1,250	924	454	2,277	0	0	0	4,905
2002	0	1,755	167	151	329	8,295	9,221	9,838	6,795	8,160	40	0	44,751
2003	0	0	772	107	0	1,603	0	0	0	0	627	0	3,108
2004	0	2,424	4,534	0	0	5,554	6,311	2,763	0	0	0	0	21,586
2005	472	1,531	5,950	9,199	0	0	0	0	0	0	0	0	17,152
2006	0	3,117	8,888	2,473	0	0	4,421	9,025	5,147	9,423	9,537	6,821	58,852
2007	1,615	0	0	0	4,381	4,092	1,099	151	0	0	0	0	11,338
2008	0	0	0	0	0	0	0	0	0	0	0	0	0
1976-2008	79	430	919	820	975	1,689	1,675	1,758	1,125	1,203	569	368	11,610
max. af	1,615	4,117	8,888	9,199	9,445	9,362	9,221	9,838	8,053	9,574	9,537	6,821	64,599
max. cfs	27	68	147	152	156	155	152	163	133	158	158	113	1,068
1998-2007	209	883	2,186	1,951	1,912	3,492	3,602	3,488	2,353	2,716	1,360	682	24,833

Table 4 Seepage Losses between Buck Owens and Olive Drive Weirs

(values in acre-feet)

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1990	-	-	-	-	-	-	-	-	-	-	-	-	0
1991	-	-	-	-	-	-	-	-	-	-	-	-	0
1992	-	-	-	-	-	-	-	-	-	-	-	-	0
1993	-	-	2,238	1,496	878	1,153	1,492	1,431	573	1,211	972	-	11,444
1994	-	-	-	-	-	-	-	-	-	-	-	-	0
1995	1,656	2,905	1,889	1,645	1,940	1,722	1,828	1,676	1,613	1,658	1,507	688	20,727
1996	926	678	587	710	2,021	1,560	1,598	1,710	778	1,305	-	-	11,873
1997	1,416	1,138	1,271	1,291	1,287	1,226	996	1,210	743	95	65	-	10,738
1998	1,862	1,244	1,269	986	1,287	1,601	1,271	1,037	1,214	914	560	-	13,245
1999	1,484	1,276	63	541	1,149	1,752	1,496	1,037	1,149	1,593	194	-	11,734
2000	-	476	1,081	-	-	-	-	-	-	168	20	4	1,749
2001	-	-	16	-	-	-	-	-	-	-	-	2,166	2,182
2002	1,363	-	-	-	-	-	-	-	-	-	36	44	1,443
2003	-	-	-	-	-	-	-	-	-	-	-	-	0
2004	-	-	-	-	-	-	-	-	-	-	-	-	0
2005	18	2,440	1,341	264	1,457	8,297	2,378	1,466	-	1,087	522	3,152	22,422
2006	2,152	-	559	1,656	3,979	3,675	3,423	2,747	327	-	-	-	18,518
2007	-	-	-	-	-	-	-	-	-	-	-	-	0
2008	-	-	-	-	-	-	-	-	-	-	-	-	0
2009	-	-	-	-	-	-	-	-	-	-	-	-	0
2010	-	-	4	454	7,611	4,913	5,045	-	-	-	-	2,376	20,403
Total	10,877	10,157	10,318	9,043	21,609	25,899	19,527	12,314	6,397	8,031	3,876	8,430	146,478
Average	518	484	491	431	1,029	1,233	930	586	305	382	185	401	6,975
Non-Zero Average	1,360	1,451	938	1,005	2,401	2,878	2,170	1,539	914	1,004	485	1,405	12,207
Maximum	2,152	2,905	2,238	1,656	7,611	8,297	5,045	2,747	1,613	1,658	1,507	3,152	22,422

Source: Annual Hydrographic Reports for Kern River.

4.0 Budget Proposal

4.1 Funding Plan

Describe how the non-Federal share of project costs will be obtained.

Please identify the sources of the non-Federal cost share contribution for the project, including:

- *Any monetary contributions by the applicant towards the cost-share requirement and source of funds (e.g., reserve account, tax revenue, and/or assessments)*
- *Any costs that will be contributed by the applicant*
- *Any third-party in-kind costs (i.e., goods and services provided by a third party*
- *Any cash requested or received from other non-Federal entities.*
- *Any pending funding requests (i.e. grants or loans) that have not yet been approved and explain how the project will be affected if such funding is denied.*

In addition, please identify whether the budget proposal includes any project costs that have been or may be incurred prior to award. For each cost, describe:

- *The project expenditure and amount*
- *The date of cost incurrence*
- *How the expenditure benefits the Project*

North Kern Water Storage District (North Kern or District) has identified the need to designate monetary funds from their construction capital account to be available for the Project, which is a District revenue account. North Kern does not have the staff available to contribute large amounts of in-kind resources for the construction components. North Kern has participated with neighboring water districts, Cawelo and ID4, on past projects and has collaborated with Cawelo on the planning, design, and construction of the previous Calloway Canal Lining Project. The District is participating in and cost sharing for the construction of several projects with the intent to continue the shared contribution for this Project. On past projects, this included selling bonds.

Summary of Non-Federal and Federal Funding Sources

Funding Sources	Funding Amount
Non-Federal Entities	
North Kern WSD	$ 1,633,029
State Funding	$ -
Non-Federal Subtotal:	$ 1,633,029
Other Federal entities	
None	
Other Federal Subtotal:	$ -
Requested Reclamation Funding:	$ 1,500,000
Total Project Funding:	***$ 3,133,029***

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

North Kern authorized consultant costs for preliminary design to allow project definition in preparation for this application. Further authorizations will be made for consultant costs that will continue to be incurred as design progresses. North Kern does not anticipate including any in-kind costs incurred as project costs. The design is being completed under a contract cost for consulting services. Preliminary design work has supported the preparation of construction cost estimates.

Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment

No Letters of Commitment are provided for this Project. However, a Letter of Support for the Calloway Canal Lining (north of Snow Road) and WDI has been provided by Poso Creek IRWM Group on behalf of its member districts.

Describe any funding requested or received from other Federal partners

No other Federal funding has been requested or received for the proposed work.

Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied

No other funding has been requested or received for the proposed work.

4.2 General Requirements

The total Project budget for the *Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements Project* (Project) is estimated at $3,133,029, with $1,500,000 in requested grant funds (Federal Cost Share), $1,633,029 in District cost share, thereby totaling the Non-Federal Cost Share funds to $ 1,633,029. Of the total Project budget, $ 2,687,054 was estimated for construction, which represents the cost to complete the Project Work. Ultimately, the construction costs will be determined when bid solicitation packages are received for constructing the project works. The requested grant funds (Federal Cost Share) will be allocated among the project tasks, in an amount not to exceed 50 percent of the total budgets by task. The total requested grant funds amount to about 48 percent of total project costs, with the remainder (52 percent) funded by the Applicant and the Funding Partner. Refer to Table 1a, which provides a summary of the estimated budget, by task, including Reclamation and Applicant contributions.
The Project budget was prepared based on the level of effort required to implement the project as discussed in Section 3 – Project Work and Approach. The Work Plan identifies and describes seven tasks used to define the overall Project Scope, Schedule, and Budgets:

Task 1: Administration
Task 2: Grant Reporting
Task 3: Design

Task 4: Environmental Documentation
Task 5: Permits/Approvals
Task 6: Construction
Task 7: Construction Administration

4.3 Budget Summary Tables

Several tables have been prepared in support of these budget estimates, which immediately follow this section in the order shown below.

a. Table 1a provides a task-by-task summary of the estimated budget, including Reclamation and Applicant contributions shown in Table 1b.
b. Tables 2 through 8 provide a summary of project costs by task and follow the "sample budget proposal format" from the FOA.
c. Table 9 provides a summary of the aggregated costs for implementation of the Project.
d. Tables 10a – 10e are detailed estimates of construction costs, which support the estimate presented in Task 6 – Construction, Table 7.

Table 1a

Budget Summary by Task[1]

Task Number - Name[2]	Total Cost
Task 1 - Administration	$45,260
Task 2 - Reporting	$36,535
Task 3 - Design	$80,066
Task 4 - Environmental Documentation[3]	$86,136
Task 5 - Permits and Approvals	$14,460
Task 6 - Construction	$2,687,054
Task 7 - Construction Administration[4]	$183,518
TOTAL[5] [6]	**$3,133,029**

Table 1b

Program Funding Sources[1]

Funding Sources	Percent of Total Project Costs	Total Cost by Source
Applicant Funding	52%	$ 1,633,029
Reclamation Funding	48%	$ 1,500,000
TOTAL PROGRAM COSTS	**100%**	**$3,133,029**

Notes:

(1) Tables are supported by detailed tables included immediately following the Budget Narrative

(2) Reference the Work Plan in Section 3.3 for task descriptions

(3) The cost for this task was estimated based on actual cost incurred to prepare EA-17-23-MP, which was prepared as part of the previous canal lining and WDI effort

(4) Salaries and Wages with Fringe Benefits for District office and field staff are shown in Table 8

(5) Refer to Table 9 for a Budget Summary of all Projects cost

(6) The amount of personnel hours was estimated from District and Consultant engineer experience based on the previously completed NK-611 Calloway Canal Lining Project and NK-612 Water Delivery Improvements Project

4.4 Budget Narrative

In addition to the following discussion, the above-listed tables include cost-estimating notes.

Salaries and Wages – Ram Venkatesan, District Engineer for North Kern WSD, and licensed Civil Engineer in the state of California is the representative for the Applicant and will provide overall Project Management, technical design and construction of the project components. The District will have an Administrative Assistant responsible for providing project-related administrative and grant reporting support. Additionally, the District 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 funding partners as required for meeting Project cash-flow requirements.

Concerning District staff, the work under the Project will be completed as part of the Districts' daily operations. In this regard, the District will be asking for reimbursement for any Salaries and Wages cost as part of this Project. The District is proposing to track these costs separately from daily operations for employees who will be providing services necessary for implementation of the grant-funded Project. Accordingly, expenses under "Salaries and Wages" have been included. For the District Engineer and Administrative Assistant. The number of hours for each District representative was calculated based on the recently completed Calloway Canal Lining project (NK-611 - Calloway Canal Lining project), and WDI project (NK-612 – Water Delivery Improvements, that is expected to be constructed in summer 2019), experience of the District and experience of the Consulting Engineer. The hourly rate and fringe benefits of the District staff can be found on Table 11a.

Fringe Benefits – The District staff's hourly rate includes the Fringe Benefits. A detailed breakdown can be found in Table 11a.

Travel - The District will not be charging any travel expenses to the Project, nor will they be asking for reimbursement of any incidental travel costs. However, travel costs have been included in the "Contractual" category as show in Table 4. These costs represent travel expenses for local travel by the engineering consultant and sub consultants. Travel expenses have also been included as part of Task 6–Construction as show in Table 7. Travel expenses for the above-mentioned tasks were determined by the number of miles driven for a roundtrip at the mileage rate of compensation determined by the 2018 Internal Revenue Service (currently $0.535).

Below is a summary of how the travel expenses that were estimated by task.

For Task 6–Construction, travel expenses were included for the geotechnical engineering consultant and the surveyor, under "Travel/Mileage". As part of the construction work, the geotechnical engineering consultant will be required to travel to the project site to conduct concrete and earthwork testing during construction. Similarly, the surveyor will be required to travel to the project site to survey the project prior to construction commencing. The mileage for each sub consultant was calculated as follows:

Surveyor (in support of Design) =25 miles/roundtrip x 2 roundtrips =50 miles

Surveyor (in support of Construction) =25 miles/roundtrip x 2 roundtrips =50 miles

Equipment - The proposed Project will be advertised for bid and the District will be soliciting sealed bids for construction of the Project work. In this regard, the District will contract with a local contractor who will provide costs to "furnish and install" the necessary project components. Equipment expenses have not been included since the District will not be purchasing or leasing

any equipment to construct the project works, but rather the successful contractor will be providing such equipment. Accordingly, no "Equipment" expenses have been included.

Materials and Supplies - Acquisition of materials and supplies for office use is not anticipated. Rather, the District will provide any incidental supplies. Accordingly, no "Materials and Supplies" expenses have been included.

General Contractual/Construction - With regards to contractual costs common to both the Canal Lining and Water Delivery Improvements, the District will use an existing professional services contract with GEI Consultants, one of the District's engineering consultants, to assist with implementing the Project including providing administrative and reporting assistance, design, bid-phase support, and construction management assistance as needed. The District operates with minimal professional staff and has maintained a long-standing relationship with the consultant, who is familiar with District facilities and operations. Sub consultants will be retained to supplement the engineering consultant's technical expertise. Work described in the work plan other than construction will be completed primarily by the engineering consultants, with assistance from the District. Costs for the engineering consultant and sub consultants have been estimated under the category "Contractual" for all tasks. Refer to Tables 2 through 8 under the category "Contractual" for a summary of the contractual costs. A copy of the fee schedules for the engineering consultant is included following Table 11b. The fee schedules list the billing rates by job classification. The contractual costs were determined by multiplying the total number of hours by the applicable labor rate identified in the fee schedules. The budgets under the "Contractual" category for each task are estimates at this time. However, they have been prepared based on the level of effort to complete past projects (such as NK-611 and NK-612) by the consultants and sub consultants, whom over the years, have provided similar services to the District for projects that have been similar in scope and complexity.

Also under contractual costs are costs for other consultants , including the District's legal counsel. The estimate presented is based on recent experience and recent work done by the consultant for implementation of the NK-611 and NK-612 projects. The total was determined by multiplying the number of hours by job classification by the applicable hourly rate.

Task – 7 (Table 8) includes District staff and the Engineering Consultant hours towards site inspection, periodic walk-through and As-built preparation and review for this Project. An estimate of 7% of the construction cost has been allotted for this task based on the consulting engineer's experience from the previously lined portion of the same canal (NK-611). This 7% estimate also includes the cost to implement the WDI component of this project based on the consultant's experience in estimating the cost to implement NK-612.

Other contractual costs, including costs for local travel, equipment, and supplies incurred by the consultant or sub consultants as part of the contractual work are discussed in the applicable sections above.

Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements – Both components of the proposed Project will be advertised for bid and the District will solicit sealed bids for construction of the project work. The District will contract with a local contractor who will provide costs to "furnish and install" the necessary project components. For the canal lining

component, the construction cost was calculated by calculating the cost per linear feet (LF) of the recently completed 5,553 LF long Calloway canal lining project (NK-611). The cost per LF for this project amounted to $618.52. Therefore, the cost for the proposed lining project was estimated by multiplying the length of the proposed lining project with $618.52. The complete construction contract summary of this project is shown as Table 10a.

The cost for the WDI component of this project was estimated by the District's consultant after conducting a well site survey and radio site survey to determine the necessary infrastructure required to build a telemetry system that links all the proposed sites to the District's SCADA network. The cost analysis for this component has broken down by site type – water supply wells, monitoring wells, and RTUs. Tables 10b, 10c, and 10d show the total cost estimated per water supply wells site, monitoring well site, and RTU site respectively. Table 10-6e shows the estimated cost to power the RTUs. These costs were estimated by District's consultant for the NK-612 project.

Ultimately, the construction cost of the upcoming Canal Lining project and the WDI project will be determined when bid solicitation packages are received for constructing the project works.

Environmental and Regulatory Compliance Costs – Environmental and Regulatory Compliance costs include costs associated with filing an Incidental Take permit (ITP). The ITP is a cost associated with the Metropolitan Bakersfield Habitat Conservation Plan (MBHCP), which charges a fixed rate of $2,145.00 per acre of land disturbed. Therefore, a total of $ 10,932.00 has been estimated for this Project and the fee is to be paid directly by the District based on the calculated 5.10 acres (2,200 LF (length) x 100 F (width)/43560) of land disturbed. The costs for NPDES SWPPP permit and PM-10 permit have been estimated as part of the construction costs. With regards to compliance with CEQA and NEPA, the district intends to work with Reclamation to determine the potential environmental effects the proposed Project may have in relation to NEPA, NHPA, ESA, and the Clean Water Act to ensure compliance with all applicable environmental laws. All of the work is located on district-owned and maintained rights of way. Accordingly, it is anticipated that it will not be difficult to obtain permits or approvals necessary for the work that is the subject of this Proposal. Since it is anticipated that the environmental documentation may be completed with a reasonable level of effort, the estimate for this project was prepared based on the expenses incurred to provide the compliance support services for the NK-611 and NK-612 projects (EA-17-23-MP). Based on inspection of the FOA, it is understood that Reclamation will determine who will perform the work under this category (i.e. Reclamation, the Applicant, or a consultant). The estimate for the proposed project also includes cultural resources field survey and rare plants survey.

An estimated fee of $1,411.00 has included for a pre-construction biological survey. This cost was estimated by based on previous pre-construction biological surveys performed for NK-608 and NK-611 projects.

Reporting - Any work related to "Grant Reporting" will be completed by the Engineering Consultant and the work is covered under the "Contractual" work under Task 2- Grant Reporting.

Other Expenses – No "other expenses" are included in the budget. Accordantly, this category does not apply.

Indirect Costs - No indirect costs are included in the budget. Accordingly, this category does not apply.

Table 2

Task 1 - Administration[1]

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	40	Hours	**$3,563.20**
Administrative Staff	40.43	40	Hours	**$1,617.20**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	0	Hours	**$0.00**
Senior Professional-Grade 7	$255.00	60	Hours	**$15,300.00**
Senior Professional-Grade 6	$214.00	0	Hours	**$0.00**
Senior Professional-Grade 5	$188.00	40	Hours	**$7,520.00**
Project Professional-Grade 4	$160.00	65	Hours	**$10,400.00**
Project Professional-Grade 3	$142.00	0	Hours	**$0.00**
Senior CAD Drafter/Designer/GIS	$142.00	0	Hours	**$0.00**
Administrative Staff	$106.00	50	Hours	**$5,300.00**
Legal Counsel				
Junior Associate Attorney	195.00	8	Hours	**$1,560.00**
TRAVEL				
				$0.00
SUPPLIES/MATERIALS				
				$0.00
ENVIRONMENTAL/REG.				
				$0.00
OTHER				
				$0.00
TOTAL DIRECT COSTS				**$45,260.40**
INDIRECT COSTS - __%				**$0.00**
TOTAL PROJECT COSTS				**$45,260.40**

Notes:

(1) Estimated to be 1% of overall project costs, based on previously completed Calloway Canal Lining Project experience

Table 3

Task 2 - Reporting [1]

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	20	Hours	**$1,782**
Administrative Staff	40.43	40	Hours	**$1,617**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	26	Hours	**$7,436**
Senior Professional-Grade 7	$255.00	30	Hours	**$7,650**
Senior Professional-Grade 6	$214.00	35	Hours	**$7,490**
Senior Professional-Grade 5	$188.00	0	Hours	**$0**
Project Professional-Grade 4	$160.00	66	Hours	**$10,560**
Project Professional-Grade 3	$142.00	0	Hours	**$0**
Senior CAD Drafter/Designer/GIS	$142.00	0	Hours	**$0**
Administrative Staff	$106.00	0	Hours	**$0**
TRAVEL				
				$0
SUPPLIES/MATERIALS				
				$0
ENVIRONMENTAL/REG.				
				$0
OTHER				
				$0
TOTAL DIRECT COSTS				**$36,535**
INDIRECT COSTS - __%				**$0**
TOTAL PROJECT COSTS				**$36,535**
Notes				

(1) Estimated to be 1% of overall project costs, based on previously completed Calloway Canal Lining Project experience

Table 4

Task 3 - Design [1]

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	20	Hours	**$1,782**
Administrative Staff	40.43	0	Hours	**$0**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	24	Hours	**$6,864**
Senior Professional-Grade 7	$255.00	48	Hours	**$12,240**
Senior Professional-Grade 6	$214.00	80	Hours	**$17,120**
Senior Professional-Grade 5	$188.00	40	Hours	**$7,520**
Project Professional-Grade 4	$160.00	40	Hours	**$6,400**
Project Professional-Grade 3	$142.00	0	Hours	**$0**
Senior CAD Drafter/Designer/GIS	$142.00	60	Hours	**$8,520**
Administrative Staff	$106.00	25	Hours	**$2,650**
Surveying				
2-Man Survey Crew	266.00	40	Hours	**$10,640**
Senior Licensed Land Surveyor	252.00	20	Hours	**$5,040**
Office Engineer	158.00	8	Hours	**$1,264**
TRAVEL				
Survey Crew - 2 roundtrips @ 25 mi/trip	0.535	50	Miles	**$27**
SUPPLIES/MATERIALS				
				$0
ENVIRONMENTAL/REG.				
				$0
TOTAL DIRECT COSTS				**$80,066**
INDIRECT COSTS - __%				**$0**
TOTAL PROJECT COSTS				**$80,066**

Notes:

(1) Estimated to be 3% of overall Construction Costs, based on previously completed NK-611 Calloway Canal Lining Project, NK-612 Water Delivery Improvement Project, and District and consulting engineer experience

Table 5

Task 4 - Environmental Documentation[1]

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	5	Hours	**$445**
Administrative Staff	40.43	5	Hours	**$202**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	34	Hours	**$9,724**
Senior Professional-Grade 7	$255.00	0	Hours	**$0**
Senior Professional-Grade 6	$214.00	47	Hours	**$10,058**
Senior Professional-Grade 5	$188.00	71	Hours	**$13,348**
Project Professional-Grade 4	$160.00	141	Hours	**$22,560**
Project Professional-Grade 3	$142.00	140	Hours	**$19,880**
Senior GIS	$142.00	37	Hours	**$5,254**
Word Processor	$106.00	44	Hours	**$4,664**
TRAVEL				**$0**
				$0
SUPPLIES/MATERIALS				**$0**
				$0
CONTRACTUAL				
				$0
ENVIRONMENTAL/REG. COMPLIANCE [1]				
				$0
OTHER				
				$0
TOTAL DIRECT COSTS				**$86,136**
INDIRECT COSTS - __%				**$0**
TOTAL PROJECT COSTS				**$86,136**

Notes:

(1) Based on previously completed EA-17-23-MP

Table 6

Task 5 - Permits and Approvals[1]

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	5	Hours	**$445**
Administrative Staff	40.43	5	Hours	**$202**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	0	Hours	**$0**
Senior Professional-Grade 7	$255.00	0	Hours	**$0**
Senior Professional-Grade 6	$214.00	0	Hours	**$0**
Senior Professional-Grade 5	$188.00	5	Hours	**$940**
Project Professional-Grade 4	$160.00	0	Hours	**$0**
Project Professional-Grade 3	$142.00	0	Hours	**$0**
Senior CAD Drafter/Designer/GIS	$142.00	0	Hours	**$0**
Administrative Staff	$106.00	5	Hours	**$530**
TRAVEL				
				$0
SUPPLIES/MATERIALS				
				$0
CONTRACTUAL				
				$0
ENVIRONMENTAL/REG. COMPLIANCE [1]				
MBHCP - Incidental Take Permit	2,145.00	5.10	Filing/ Ac	**$10,932**
OTHER				
Biological Survey	1,410.71	1	Each	**$1,411**
TOTAL DIRECT COSTS				**$14,460**
INDIRECT COSTS - __%				**$0**
TOTAL PROJECT COSTS				**$14,460**

Notes:

(1) Based on previously completed Calloway Canal Lining and WDI Project. Other permits including NPDES and PM-10 are included as part of the construction costs

Table 7
Task 6 - Construction

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	0	Hours	$0
Administrative Staff	40.43	0	Hours	$0
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	0	Hours	$0
Senior Professional-Grade 7	$255.00	0	Hours	$0
Senior Professional-Grade 6	$214.00	0	Hours	$0
Senior Professional-Grade 5	$188.00	0	Hours	$0
Project Professional-Grade 4	$160.00	0	Hours	$0
Project Professional-Grade 3	$142.00	0	Hours	$0
Senior CAD Drafter/Designer/GIS	$142.00	0	Hours	$0
Administrative Staff	$106.00	0	Hours	$0
Surveying				
2-man Survey Crew	266.00	40	Hours	$10,640
Senior Licensed Land Surveyor	252.00	16	Hours	$4,032
Canal Lining				
Canal Lining[1]	(2,200 ft * $ 618.52) See Table 10a			$1,360,744
Water Delivery Impr.				
Water Supply Wells[2]	See Table 10b			$921,621
Monitoring Wells [3]	See Table 10c			$88,600
Remote Terminal Units (RTUs) [4]	See Table 10d			$243,390
Power for RTUs [5]	See Table 10e			$58,000
TRAVEL				
Survey Crew - 2 roundtrips @ 25 mi/trip	0.54	50	Miles	$27
ENVIRONMENTAL/REG.				
				$0
OTHER-EQUIPMENT RENTAL				
				$0
TOTAL DIRECT COSTS				$2,687,054
INDIRECT COSTS - __%				$0
TOTAL PROJECT COSTS				$2,687,054

Notes:
(1) See Table 10a
(2) See Table 10b
(3) See Table 10c
(4) See Table 10d
(5) See Table 10d

Table 8

Task 7 - Construction Administration [1] [2] [4]

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)[3]				
District Engineer	89.08	40	Hours	**$3,563**
Administrative Staff	40.43	0	Hours	**$0**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	250	Hours	**$71,500**
Senior Professional-Grade 7	$255.00	225	Hours	**$57,375**
Senior Professional-Grade 6	$214.00	0	Hours	**$0**
Senior Professional-Grade 5	$188.00	0	Hours	**$0**
Project Professional-Grade 4	$160.00	0	Hours	**$0**
Project Professional-Grade 3	$142.00	300	Hours	**$42,600**
Senior CAD Drafter/Designer/GIS	$142.00	0	Hours	**$0**
Administrative Staff	$106.00	80	Hours	**$8,480**
TRAVEL				
				$0
SUPPLIES/MATERIALS				
				$0
CONTRACTUAL				
				$0
ENVIRONMENTAL/REG.				
				$0
OTHER				
				$0
TOTAL DIRECT COSTS				**$183,518**
INDIRECT COSTS - __%				**$0**
TOTAL PROJECT COSTS				**$183,518**

Notes:

(1) Estimate based on cost incurred in the previously completed Calloway Canal Lining project, approximately 7% of construction costs

(2) Construction Administration activities include field inspection and oversight

(3) Salaries and Wages and Fringe Benefits for District staff will be charged to a general accounting number as part of their daily operations

(4) Activities include preparation of solicitation packages, selection of vendors, issuance of Purchase Orders and coordination of delivery of equipment and material

Table 9
Overall Budget Summary

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	$/Unit	Quantity		
SALARIES AND WAGES (INCLUDING FRINGE BENEFITS)				
District Engineer	89.08	130	Hours	**$11,580**
Administrative Staff	40.43	90	Hours	**$3,639**
CONTRACTUAL				
Engineering Consultant				
Senior Consultant-Grade 8	$286.00	334	Hours	**$95,524**
Senior Professional-Grade 7	$255.00	363	Hours	**$92,565**
Senior Professional-Grade 6	$214.00	162	Hours	**$34,668**
Senior Professional-Grade 5	$188.00	156	Hours	**$29,328**
Project Professional-Grade 4	$160.00	312	Hours	**$49,920**
Project Professional-Grade 3	$142.00	440	Hours	**$62,480**
Senior CAD Drafter/Designer/GIS	$142.00	97	Hours	**$13,774**
Administrative Staff	$106.00	204	Hours	**$21,624**
Legal Counsel				
Junior Associate Attorney	195.00	8	Hours	**$1,560**
Surveying				
2-Man Survey Crew	266.00	80	Hours	**$21,280**
Senior Licensed Land Surveyor	252.00	36	Hours	**$9,072**
Office Engineer	158.00	8	Hours	**$1,264**
Canal Lining				
Canal Lining[1]	(2,200 ft * $ 618.52) See Table 10a			**$1,360,744**
SUPPLIES/MATERIALS				
EQUIPMENT PROCUREMENT				
Water Delivery Improvements				
Water Supply Wells[2]	See Table 10b			**$921,621**
Monitoring Wells[3]	See Table 10c			**$88,600**
Remote Terminal Units (RTUs)[4]	See Table 10d			**$243,390**
Power for RTUs[5]	See Table 10e			**$58,000**
TRAVEL				
Survey Crew - 4 roundtrips @ 25 mi/trip	0.54	100	Miles	**$54**
ENVIRONMENTAL/REG.				
MBHCP - Incidental Take Permit	2,145.00	5.10	Filing/ Ac	**$10,932**
OTHER				
Biological Survey	1,410.71	1	Each	**$1,411**
Equipment Rental				
				$0
TOTAL DIRECT COSTS				**$3,133,029**
INDIRECT COSTS - __%				**$0**
TOTAL PROJECT COSTS				**$3,133,029**

Notes:
(1) See Table 10a
(2) See Table 10b
(3) See Table 10c
(4) See Table 10d
(5) See Table 10d

Table 10a (NK-611 construction contract summary for 5,553 LF)

GEI Consultants

ESTIMATE NO.: 005-FINAL RETENTION RELEASE
PROJECT: NK-611 CONSTRUCTING THE CALLOWAY CANAL LINING PROJECT
OWNER: NORTH KERN WATER STORAGE DISTRICT

CONSTRUCTION CONTRACT SUMMARY

Item No.	Description	Estimated Quan.	Unit	Quantity Period	Quantity To Date	Unit Price	Bid Amount	Earnings Period	Earnings To Date
	BASE CONTRACT ITEMS SCHEDULE "A" - Reaches A and B								
1.0	Mobilization	1	LS	0%	100%	$128,750.00	**$128,750.00**	$0.00	$128,750.00
2.0	Demobilization	1	LS	0%	100%	$65,600.00	**$65,600.00**	$0.00	$65,600.00
3.0	Develop and Provide Water Supply	1	LS	0%	100%	$17,400.00	**$17,400.00**	$0.00	$17,400.00
4.0	Environmental Compliance and Permitting	1	LS	0%	100%	$49,700.00	**$49,700.00**	$0.00	$49,700.00
5.0	Prepare, Maintain, and Restore Access Routes	1	LS	0%	100%	$31,950.00	**$31,950.00**	$0.00	$31,950.00
6.0	Finish Grading of Project - Roads, Canal Banks & Sideslopes, Around Structures, Ramps, etc.	1	LS	0%	100%	$298,200.00	**$298,200.00**	$0.00	$298,200.00
7.0	Clearing and Grubbing	20.80	Acres	0.00	20.50	$2,662.50	**$55,380.00**	$0.00	$55,380.00
8.0	Remove and stockpile rip-rap, remove east wing liner on north side of weir (Approximately 460 SF)	1	LS	0%	100%	$12,000.00	**$12,000.00**	$0.00	$12,000.00
9.0	Scarify, over excavate and re-Compact Sub-grade (585,530 +480)	586,010	SF	-	586,010	$0.70	**$410,207.00**	$0.00	$410,207.00
10.0	Construct/Modify Canal Section - "In Place Fill"	1,880	CY	0	1,880	$21.00	**$39,480.00**	$0.00	$39,480.00
11.0	Non-Reinforced Canal Lining (water stop at north end = 104 LF)	585,530	SF	-	585,530	$3.75	**$2,195,737.50**	$0.00	$2,195,737.50
12.0	Patch west liner at weir, replace east liner at weir (Approx. 480 SF), install water stop (Approx. 170 LF)	1	LS	0%	100%	$26,200.00	**$26,200.00**	$0.00	$26,200.00
13.0	Safety Ladders	7	EA	0	7	$1,885.00	**$13,195.00**	$0.00	$13,195.00
14.0	Construct Olive Drive access ramps & 465 SF aggregate Base	6,567	SF	0	6,567	$13.50	**$88,654.50**	$0.00	$88,654.50
	Total of Base Bid and Additive Bid Items						**3,432,454.00**	0.00	**3,432,454.00**
	Contract Change Orders						**2,164.13**	**$0.00**	**$2,164.13**
	Total Contract Earnings						**3,434,618.13**	**$0.00**	**$3,434,618.13**

Table 10b (Water supply wells)

Number	Quantity	Description	Price (Ea.)	Total Price
1	1	Enclosure with back panel	$ 500.00	$ 500.00
2	1	PLC with I/O	$ 2,700.00	$ 2,700.00
3	1	Radio/misc Hardware/antenae	$ 3,000.00	$ 3,000.00
4	1	Wood pole	$ 500.00	$ 500.00
5	1	Power monitor	$ 1,013.00	$ 1,013.00
6	3	CT	$ 89.00	$ 267.00
7	1	Transformer (480 to 120)	$ 120.00	$ 120.00
8	1	Misc panel items (ethernet switch, power supply , terminal blocks, wires)	$ 600.00	$ 600.00
9	1	Flowmeter	$ 2,500.00	$ 2,500.00
10	1	Well level (ashcroft) with 500 ft cable	$ 1,669.00	$ 1,669.00
11	100	Conduit (PVC) per FT	$ 6.50	$ 650.00
12	1	Fittings/Bends/Box connection	$ 50.00	$ 50.00
			SubTotal	$ 13,569.00
			Tax	$ 1,221.21
			Total	$ 14,790.21

Labor	Qty (hrs.)	Description	Price (Per hour)	Total Price
1	10	Fabricate panel	$ 75.00	$ 750.00
2	10	Install Panel/Wire/Install Wood	$ 75.00	$ 750.00
3	1	Trenching	$ 75.00	$ 75.00
4	2	Conduit Run	$ 75.00	$ 150.00
5	1	Wire pull	$ 75.00	$ 75.00
6	16	Flow meter install	$ 75.00	$ 1,200.00
7	6	Level Install	$ 75.00	$ 450.00
8	2	Power monitor install	$ 75.00	$ 150.00
9	1	CT install	$ 75.00	$ 75.00
10	1	Transfomer install	$ 75.00	$ 75.00
11	4	FAT	$ 75.00	$ 300.00
12	8	Commisioning including caliberation	$ 75.00	$ 600.00
13	0.25	Submittals	$ 75.00	$ 18.75
14	2	Drawings	$ 75.00	$ 150.00
			Total :	$ 4,818.75
			Grant Total	**$ 19,608.96**

Table 10c (Monitoring wells)

Number	Quantity	Description	Price (Ea.)		Total Price	
1	1	Enclosure with back panel	$	500.00	$	500.00
2	1	PLC with I/O	$	2,700.00	$	2,700.00
3	1	Radio/misc Hardware/antenae	$	3,000.00	$	3,000.00
4	1	Wood pole	$	500.00	$	500.00
5	1	Solar Panel	$	7,000.00	$	7,000.00
6	1	Misc panel items (ethernet switch, power supply , terminal blocks,wires)	$	600.00	$	600.00
7	1	Well level (ashcroft)	$	1,605.00	$	1,605.00
8	20	Conduit (PVC) per FT	$	6.50	$	130.00
9	1	Fittings/Bends/Box connection	$	20.00	$	20.00
			SubTotal		$	16,055.00
			Tax		$	1,444.95
			Total		$	17,499.95

Labor	Qty (hrs.)		Description	Price (Per hour)		Total Price	
	1	10	Fabricate panel Install Panel/Wire/Install	$	75.00	$	750.00
	2	10	Wood Pole	$	75.00	$	750.00
	3	1	Conduit Run	$	75.00	$	75.00
	4	1	Wire pull	$	75.00	$	75.00
	5	6	Level Install	$	75.00	$	450.00
	6	4	FAT	$	75.00	$	300.00
	7	8	Commisioning	$	75.00	$	600.00
	8	16	Solar Panel Install	$	75.00	$	1,200.00
	9	6	Drawings	$	75.00	$	450.00
				Total :		$	4,650.00
				Total (Labor + Material)		**$**	**22,149.95**

Table 10d (RTUs)

Number	Quantity	Description	Price (Ea.)	Total Price
1	1	Enclosure with back panel	$ 500.00	$ 500.00
2	1	PLC with I/O	$ 2,700.00	$ 2,700.00
3	1	Radio/misc Hardware/antenae	$ 3,000.00	$ 3,000.00
4	1	Wood pole	$ 500.00	$ 500.00
5	1	Misc panel items (ethernet switch, power supply , terminal blocks)	$ 500.00	$ 500.00
6	0	Flowmeter	$ 2,500.00	$ -
7	2	Canal Level (Dwyer)	$ 532.00	$ 1,064.00
8	2	Stilling Well	$ 622.00	$ 1,244.00
9	100	Misc Cables (per ft)	$ 0.60	$ 60.00
10	100	Wires (per ft)	$ 0.60	$ 60.00
11	150	Conduit (PVC) per FT	$ 6.50	$ 975.00
12	1	Fittings/Bends/Box connection	$ 100.00	$ 100.00
			SubTotal	$ 10,703.00
			Tax	**$ 963.27**
			Total	$ 11,666.27

Labor	Qty (hrs.)	Description	Price (Per hour)	Total Price
1	10	Fabricate panel	$ 75.00	$ 750.00
2	10	Install	$ 75.00	$ 750.00
3	4	Trenching	$ 75.00	$ 300.00
4	4	Conduit Run	$ 75.00	$ 300.00
5	16	and install	$ 75.00	$ 1,200.00
6	2	Wire pull	$ 75.00	$ 150.00
7	16	Level Install	$ 75.00	$ 1,200.00
8	4	FAT	$ 75.00	$ 300.00
9	8	including caliberation	$ 75.00	$ 600.00
10	0.25	Submittals	$ 75.00	$ 18.75
11	2	Drawings	$ 75.00	$ 150.00
			Total :	$ 5,718.75
			Total (Labor + Material)	$ 17,385.02

Table 10e (Power for RTU sites)

New RTU Sites	Description	Description	Total Price
Famoso	PG&E meter on site, please confirm NKWSD owns the meter	Exiting NK PG&E meter	$ 2,000.00
Cally Res	Install PG&E meter or solar equipment	Solar	$ 7,000.00
9-22 Head	Install Solar Panel. Power pole is 1000FT away.	Solar	$ 7,000.00
9-26 Head	Power pole is 250FT away. Install PG&E meter or solar equipment	Solar	$ 7,000.00
9-26 Terminal	PG&E meter on site, please confirm NKWSD owns the meter	Exiting NK PG&E meter	$ 2,000.00
8-29 Head	PG&E meter on site, please confirm NKWSD owns the meter	Solar	$ 7,000.00
8-17 Head	Power line runs along canal. Install PG&E meter or solar equipment	Exiting NK PG&E meter	$ 2,000.00
Cally Lerdo	Power pole is 100FT away. Install PG&E meter or solar equipment	solar	$7,000
CT-2 South	PG&E meter on site, please confirm NKWSD owns the meter	Exiting NK PG&E meter	$ 2,000.00
CT-1 South	PG&E meter on site, please confirm NKWSD owns the meter	Exiting NK PG&E meter	$ 2,000.00
8-3 Ditch	PG&E meter on site, please confirm NKWSD owns the meter	Exiting NK PG&E meter	$ 2,000.00
9-28 Ditch	Power line runs along pond. Install PG&E meter or solar equipment	Solar	$ 7,000.00
Station B	PG&E meter on site, please confirm NKWSD owns the meter	Exiting NK PG&E meter	$ 4,000.00

Table 11a
Calculation of Burdened Labor Hourly Rate for District Staff

Job Classification	Hourly Rate[1]	Fringe Benefits[2]	Total Burdened Hourly Rate
District Engineer	$61.82	$27.26	$89.08
Staff Accountant	$26.00	$14.43	$40.43
Well Maintenance	$27.55	$17.19	$44.74
Utility Worker	$21.86	$15.12	$36.98

Notes:

[1] Fixed annual base salary divided by 2080 hours.

[2] Fixed total yearly benefits divided by 2080 hours.

Table 11b
Calculation of Burdened Labor Hourly Rate for Consultants

Job Classification	Hourly Rate
Senior Consultant - Grade 8	$286.00
Senior Professional - Grade 7	$255.00
Senior Professional - Grade 6	$214.00
Senior Professional - Grade 5	$188.00
Project Professional - Grade 4	$160.00
Project Professional - Grade 3	$142.00
Staff Professional - Grade 2	$130.00
Staff Professional - Grade 1	$118.00
Senior CADD Drafter	$142.00
Technician (same as Administrative Staff)	$106.00

FEE SCHEDULE AND PAYMENT TERMS

GEI Consultants

FEE SCHEDULE

Personnel Category	*Hourly Billing Rate* $ per hour
Staff Professional – Grade 1	$ 118
Staff Professional – Grade 2	$ 130
Project Professional – Grade 3	$ 142
Project Professional – Grade 4	$ 160
Senior Professional – Grade 5	$ 188
Senior Professional – Grade 6	$ 214
Senior Professional – Grade 7	$ 255
Senior Consultant – Grade 8	$ 286
Senior Consultant – Grade 9	$ 348
Senior Principal – Grade 10	$ 348
Senior CADD Drafter and Designer	$ 142
CADD Drafter / Designer and Senior Technician	$ 130
Field Professional	$ 107
Technician, Word Processor, Administrative Staff	$ 106
Office Aide	$ 83

These rates are billed for both regular and overtime hours in all categories.
Rates will increase up to 5% annually, at GEI's option, for all contracts that extend beyond twelve (12) months after the date of the contract. Rates for Deposition and Testimony are increased 1.5 times.

OTHER PROJECT COSTS

Subconsultants, Subcontractors and Other Project Expenses - All costs for subconsultants, subcontractors and other project expenses will be billed at cost plus a 15% service charge. Examples of such expenses ordinarily charged to projects are subcontractors; subconsultants: chemical laboratory charges; rented or leased field and laboratory equipment; outside printing and reproduction; communications and mailing charges; reproduction expenses; shipping costs for samples and equipment; disposal of samples; rental vehicles; fares for travel on public carriers; special fees for insurance certificates, permits, licenses, etc.: fees for restoration of paving or land due to field exploration, etc.; state sales and use taxes and state taxes on GEI fees.

Billing Rates for Specialized Technical Computer Programs – Computer usage for specialized technical programs will be billed at a flat rate of $10.00 per hour in addition to the labor required to operate the computer.

Field and Laboratory Equipment Billing Rates – GEI-owned field and laboratory equipment such as pumps, sampling equipment, monitoring instrumentation, field density equipment, portable gas chromatographs, etc. will be billed at a daily, weekly, or monthly rate, as needed for the project. Expendable supplies are billed at a unit rate.

Transportation and Subsistence - Automobile expenses for GEI or employee owned cars will be charged at the rate per mile set by the Internal Revenue Service for tax purposes plus tolls and parking charges or at a day rate negotiated for each project. When required for a project, four-wheel drive vehicles owned by GEI or the employees will be billed at a daily rate appropriate for those vehicles. Per diem living costs for personnel on assignment away from their home office will be negotiated for each project.

PAYMENT TERMS

Invoices will be submitted monthly or upon completion of a specified scope of service, as described in the accompanying contract (proposal, project, or agreement document that is signed and dated by GEI and CLIENT).

Payment is due upon receipt of the invoice. Interest will accrue at the rate of 1% of the invoice amount per month, for amounts that remain unpaid more than 30 days after the invoice date. All payments will be made by either check or electronic transfer to the address specified by GEI and will include reference to GEI's invoice number.

THE LAW OFFICES OF

Young Wooldridge, LLP

A LIMITED LIABILITY PARTNERSHIP INCLUDING PROFESSIONAL CORPORATIONS

Westchester Corporate Plaza
1800 30th Street, Fourth Floor • Bakersfield, CA 93301-5298
Telephone 661-327-9661 • Facsimile 661-327-1087

September 2, 2015

NORTH KERN WATER STORAGE DISTRICT
33380 CAMELO AVENUE
BAKERSFIELD, CA 93308-9575

2111-23 EAC
Invoice # 19105

AMOUNT: _____

STATEMENT FOR PERIOD THROUGH 8/31/15

LEGAL SERVICES REGARDING: ENCROACHMENTS

PRIVILEGED AND CONFIDENTIAL ATTORNEY-CLIENT COMMUNICATIONS

8/03/15	REVIEW AND EDIT HSRA MASTER AGREEMENT; REVIEW FEDERAL FLOW THROUGH AND ARRA REIMBURSEMENT REQUIREMENTS	JJP	2.24	$414.00
8/05/15	DRAFT AMENDMENT TO SO. CAL. GAS LICENSE AGREEMENT; CORRESPONDENCE WITH RAM VENKATESAN RE SAME	JJP	.90	$166.50
8/06/15	TELEPHONE CALL WITH CHARLIE STRINGER REGARDING PROPOSED SWI TRANSFER; EMAIL.	EAC	.60	$120.00
8/28/15	REVIEW MASTER AGREEMENT RE: MEETING; TRAVEL TO/FROM: SWID; ATTEND MEETING WITH CLIENTS	JJP	1.16	$216.26

TIMEKEEPER	TIME	RATE	VALUE
ERNEST A CONANT	.50	240.00	120.00
JEFFREY J. PATRICK	2.24	184.82	414.00
JEFFREY J. PATRICK	.90	185.00	166.50
JEFFREY J. PATRICK	1.16	186.43	216.26

TOTAL FEES $916.76

COSTS AND EXPENSES

8/03/15	COLOR PRINTING	$3.09
8/28/15	JEFFREY J. PATRICK TRAVEL EXPENSES: HIGH SPEED RAIL MASTER AGREEMENT MEETING	$9.38

TOTAL COSTS AND EXPENSES $12.47

CURRENT CHARGES $929.23

Description of Work:

1.Project Administration and Coordination
-Review HSR Agreement

A FINANCE CHARGE OF 1.5% WILL BE ADDED TO YOUR BALANCE 30 DAYS AFTER STATEMENT DATE

Young Wooldridge
I.D. #95-3498027

PAYMENTS RECEIVED AFTER DATE OF STATEMENT WILL APPEAR ON YOUR NEXT STATEMENT

9 of 24

McINTOSH & ASSOCIATES

McIntosh & Associates
2001 Wheelan Court
Bakersfield, California 93309
Phone - 661-834-4814
Fax - 661-834-0972

Dana Munn
North Kern Water Storage Dist.
P.O. Box 81435
Bakersfield, CA 93380

October 25, 2014
Project No: 008-171-001
Invoice No: 00117695

Project 008-171-001 Surveying Services N. Kern Water Storage

Professional Services from September 28, 2014 to October 25, 2014

Phase 009 ~~Interim Canal at BNSF RR Crossing~~ Calloway Lining

NK-607

Professional Personnel

	Hours	Rate	Amount	
2-MAN SURVEY CREW	12.00	133.00	1,596.00	Combined rate of $ 258.00/hr assumed for the crew while estimating the budget.
SENIOR LICENSED LAND SURVEYOR	1.60	252.00	403.20	
Totals	13.60		1,999.20	
Total Labor				1,999.20

Unit Billing

10/20/2014	Coordinate-4000/5800	110.00	
10/20/2014	Materials-Lath, Hubs & Flagging	14.00	
10/20/2014	Mileage	4.55	
	Total Units	128.55	128.55

Total this Phase $2,127.75

Phase 010 Travel Time for Phase 009

Professional Personnel

	Hours	Rate	Amount	
2-MAN SURVEY CREW	.80	116.50	93.20	
Totals	.80		93.20	
Total Labor				93.20

Total this Phase $93.20

Total this Invoice $2,220.95

INVOICE APPROVAL NAME	INITIALS	DATE
R. DIAMOND		
R. MUTZ		
D. MUNN		
A.		
R.		
G.L.	25906	

NORTH KERN
NOV 21 2014
WATER STORAGE DIST.

Reach A: $645.13

McINTOSH & ASSOCIATES

McIntosh & Associates
2301 Wineridge Court
Bakersfield, California 93311
Phone - 661-834-4614
Fax - 661-834-0972

DEC 31 2014

Dana Munn
North Kern Water Storage Dist.
P.O. Box 81435
Bakersfield, CA 93380

November 22, 2014
Project No: 008-171-001
Invoice No: 0011769

Project 008-171-001 Surveying Services N. Kern Water Storage
Professional Services from October 26, 2014 to November 22, 2014

Phase 005 Calloway Canal Lining Project
Professional Personnel

	Hours	Rate	Amount	
3-MAN SURVEY CREW	18.00	105.00	1,890.00	
OFFICE ENGINEER/LSIT	.80	118.00	94.80	
SENIOR LICENSED LAND SURVEYOR	1.10	252.00	277.20	
Totals	19.70		2,262.00	
Total Labor				2,262.00

Unit Billing

10/27/2014	GPS-Trimble	176.00	
10/27/2014	Materials Paint	12.00	
10/27/2014	Mileage	14.30	
Total Units		202.30	202.30
	Total this Phase		$2,464.30

Phase 006 Travel Time for Phase 005
Professional Personnel

	Hours	Rate	Amount	
3-MAN SURVEY CREW	1.20	84.33	101.19	
Totals	1.20		101.19	
Total Labor				101.19
	Total this Phase			$101.19
	Total this Invoice			$2,565.49

INVOICE APPROVAL	NAME	INITIALS	DATE
	R. DIAMOND		
	R.MIZE		1-5-15
	P.M.V.		12/15/14
	A. ROCHA		
	F. RIZO		1-8-15
	GLs	25906	

NORTH KERN
DEC 11 2014
WATER STORAGE DIST.

Reach A: $745.21

5.0 Environmental and Cultural Compliance

In February 2006, North Kern completed an Initial Study (IS) for the 2006 System Operations Improvement Project, which included lining over a six-mile portion of the Calloway Canal. In January 2007, based on the IS, North Kern adopted a Negative Declaration for the 2006 System Operations Improvement Project.

For lining of the Calloway Canal, Reclamation completed four Environmental Assessments (EAs), including the *Cawelo Water District Calloway Canal Lining Project – Reach A* (12-08-MP in December 2012), *Cawelo Water District Calloway Canal Lining Project – Reach B* (EA-14-02-MP in July 2014), *Cawelo Water District and North Kern Water Storage District Calloway Canal Lining Project – Reaches C1, C2, and D* (EA-15-01-MP in March 2015), *North Kern Water Storage District Calloway Canal Lining and Water Delivery Improvements* (EA-17-23-MP in October 2017).

Having completed the necessary California Environmental Quality Act (CEQA) requirements for this Project, the District will continue towards completing the National Environmental Protection Act (NEPA) requirements for this Project.

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

The extent (footprint) of the Project is relatively small and located exclusively within maintained rights-of-way owned and operated by North Kern. These rights-of-way are surrounded by lands that have been fully developed into urban or industrial areas (i.e., associated with the City of Bakersfield) for decades.

For the canal lining, earth-disturbing activities would include trimming the canal to conform to the lined prism (i.e., trapezoidal profile), which is not an extensive movement of quantities of material. All work on the site is subject to the requirements of an approved dust control plan as part of the San Joaquin Valley Air Pollution Control District's Rule 8021. The District will engage a qualified biologist to conduct a pre-activity survey shortly before the start of construction to ensure that the construction area remains unoccupied by sensitive (endangered) species. In addition, standard avoidance and minimization protocols will be included in the Project specifications and will be followed during construction. Moreover, the duration of the construction activity is expected be relatively short (i.e., construction to occur over period of few months within the two-year window for utilizing the grant funds).

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 these be affected by any activities associated with the proposed project?

The District is participating in the Bakersfield Habitat Conservation Plan (BHCP) for the Callaway Canal Lining Project for potential impacts to the federally-listed San Joaquin kit fox. The BHCP, created by the city of Bakersfield and the County of Kern, establishes a multi-species HCP with U.S. Fish and Wildlife Service (USFWS) under Section 10 of the Endangered Species Act (ESA). Additionally, the EAs addressed the potential presence of Tipton kangaroo rat, blunt-nosed leopard lizard, Kern mallow and San Joaquin woolly-threads. It is anticipated that these federally listed species would not be affect by the proposed project with the incorporation of avoidance and minimization measures. Moreover, designated critical habitat is not located within or near the proposed project area.

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

There are no wetlands or other surface waters inside the Project boundaries that fall under CWA jurisdiction as "waters of the United States".

When was the water delivery system constructed?

As discussed in Section 3.2, North Kern's canal and pipeline distribution system and related works were originally completed in the 1950s, with additional features and enlargements (e.g., pumping stations, discharge pipelines, and reservoir systems) constructed with the expansion of the District's service area (i.e., increased water demand). Kern County Land and Water Company, who subsequently lengthened it to its current 30-mile length, originally constructed the Calloway Canal between 1875 by O.P. Calloway and 1877. Over time, the canal's prism (i.e., trapezoidal shape), head gates, weirs and other features have been replaced, repaired, or improved to allow for greater capacity and flow delivery to water users (Districts). As of late, modifications have been made to accommodate commercial, housing, and road development as the City of Bakersfield has slowly been expanding to the north. It is worth noting that the Project will not result in any modifications or effects to individual irrigation system features (e.g., headgates, canals, or flumes).

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.

As explained in Section 3, the District's irrigation delivery system was completed in the mid-1970s. The District's irrigation delivery system is composed of two canal reaches referred to as the Pond-Poso and Buttonwillow Ridge Canal. In addition, the District operates a series of turnouts, spillway basins, recharge basins, pump stations and discharge pipelines as part of its conveyance system. The District began importing State Water Project water in 1973. The Pond-Poso Spreading and Recovery Facility became operational in 2010. The proposed Project will not alter any existing features of an irrigation system.

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.

Based on the previous Environmental Assessment (2017), the Calloway Canal was the only cultural resources located within the Area of Potential Effect (APE). The canal, however, was determined to not be eligible for inclusion on the National Register of Historic Places. Therefore, it is assumed the proposed project would receive a finding of no historic properties affected during Section 106 consultation with the Office of Historic Preservation.

Are there any known archeological sites in the proposed project area?

Based on the previous Environmental Assessment (2017), which included a pedestrian survey and record search, no prehistoric or historic-era archaeological sites or materials were found. Therefore, it is assumed there are no know archeological sites in the proposed project area.

Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

Based on the previous Environmental Assessment (2017), Reclamation did not identify adverse human health or environmental effects on any population. Therefore, it is assumed the proposed project would not have a significant or disproportionately negative impact on low-income or minority individuals.

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

Based on the previous Environmental Assessment (2017), the nearest Indian Trust Asset (ITA) is a public domain allotment located approximately 40 miles northeast of the Project site. The Project would not impact the ITA. Moreover, the Project would not affect and/or prohibit access to and ceremonial use of Indian sacred sites.

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?

North Kern would implement conservation measures for federally listed species and ensure that the proposed project would not contribute to the introduction or spread of noxious weeds or non-native invasive species.

6.0 Required Permits or Approvals

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.

The Project is located exclusively within maintained rights-of-way owned and operated by North Kern. As such, permitting and approval issues regarding lining of the Calloway Canal should be minimal (i.e., especially since an Intertie that adjoins to the canal has been lined in a similar fashion). Recall that the following potential permitting or approval concerns will be addressed under Task 5 of the Project Work (Section 3).

(1) Bids for construction will be solicited through the competitive bidding process on the basis of final plans and specifications. The standard specifications will include language relating to obtaining permits and approvals prior to construction. In particular, the standard language in the specifications state "The Contractor is an independent contractor and shall, at his sole cost and expense, comply with all laws, rules, ordinances and regulations of all governing bodies having jurisdiction over the work, obtain all necessary permits and licenses therefore..." This would include, but is not limited to, preparing and implementing a Stormwater Pollution Prevention Plan pursuant to the National Pollution Discharge Elimination System (Clean Water Act Section 402) and obtaining a Construction Notification and Dust Control Plan to the San Joaquin Valley Air Pollution Control District.

(2) A pre-construction survey for special-status species will be conducted by a qualified biologist immediately prior the start of construction.

Pursuant to Section 17.28.040(B)(5) of the Kern County Code of Ordinances, the District is exempt from obtaining a grading permit. Likewise, pursuant to Section 17.66.020(C)(7) of the City of Bakersfield Municipal Code, the District is exempt from obtaining a grading permit. Accordingly, the District will not seek a County or City grading permit. .

7.0 Letter of Support

POSO CREEK IRWMP
Management Office

March 5, 2019

Mr. Richard Diamond
General Manager
North Kern Water Storage District
33380 Cawelo Avenue
Bakersfield, CA 93308

Subject: Proposed Project – Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements

Dear Mr. Diamond:

We would like to acknowledge support of North Kern Water Storage District's continued efforts to install water delivery improvement components throughout the District and improve the Calloway Canal as a regional conveyance facility. The Poso Creek Integrated Regional Water Management (IRWM) planning group is clearly interested and supportive of the *Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements* project, as the project will conserve groundwater by allowing surface supplies to be delivered into the basin more efficiently, and improve operational flexibility and efficiency within the region. The added well instrumentation, SCADA, and data management will allow North Kern to manage deliveries on-farm for growers more efficiently. This Project is a vital improvement that will be of great benefit to both North Kern and Districts within the Poso Creek IRWM Region.

We hope that our expression of support is helpful in your efforts to secure grant funding assistance to implement your plans. If the funding agency would like to discuss our interest and support of your project, we would be happy to do so.

Sincerely,

Dana Munn
Chairman
Poso Creek IRWM Regional Water Management Group

Semitropic WSD • Shafter-Wasco ID • North Kern WSD • Cawelo WD • Delano-Earlimart ID • North West Kern RCD
Kern-Tulare WD • Southern San Joaquin MUD • Disadvantaged Communities Representative

8.0 Official Resolution

The following draft of an Official Resolution will be presented to the District's Board of Directors for signature at their next Board Meeting.

BEFORE THE BOARD OF DIRECTORS
OF THE NORTH KERN WATER STORAGE DISTRICT
ON BEHALF OF ITSELF AND ROSEDALE RANCH IMPROVEMENT DISTRICT
IN THE MATTER OF: RESOLUTION NO._____
RESOLUTION OF INTENTION OF NORTH KERN WATER STORAGE DISTRICT
TO FILE AN APPLICATION WITH THE BUREAU OF RECLAMATION FOR A GRANT
UNDER THE *WATERSMART GRANTS: WATER AND ENERGY EFFICIENCY GRANTS FOR FISCAL YEAR 2019*

WHEREAS, North Kern Water Storage District partnered with several neighboring water districts and formulated the Poso Creek Integrated Regional Water Management Plan (Plan), adopted in July 2007 and updated in 2014 by each of the districts for their collective area; and

WHEREAS, District staff, in conjunction with surrounding water districts, communities, and stakeholders, has formulated a plan of improvements; and

WHEREAS, the Plan identified regional projects that, once implemented, would improve the water management of the Region and the ability for North Kern to regulate water supplies available to the district; and

WHEREAS, the Plan promotes a regional recharge, reduction of overdraft, and operation changes in responding to reductions in water supply reliability to the region; and

WHEREAS, District staff has formulated a project improvement, referred to as *Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements*, which has the support of surrounding water districts and communities; and would be funded by a combination of North Kern Water Storage District funds, in-kind services, and grant funds; and

WHERAS, water will be conserved by lining improvements made to the Calloway Canal and implementing water delivery improvements; and

WHEREAS, the United States Bureau of Reclamation is currently soliciting proposals for grant funding assistance under their *WaterSMART Grants: Water and Energy Efficiency Grants for Fiscal Year 2019* (Funding Opportunity No BOR-DO-19-F004); and

WHEREAS, District staff has formulated a grant proposal to line a portion of the Calloway Canal, install meters, and integrate telemetry into their water management system.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the North Kern Water Storage District as follows:

a. The District's Board of Directors has reviewed and supports the submission of a grant application to Reclamation entitled *Calloway Canal Lining (north of Snow Road) and Water Delivery Improvements*
b. The District's Manager, Richard Diamond, is hereby authorized and directed to submit the grant application and is authorized to enter into an agreement with Reclamation on behalf of North Kern Water Storage District for grant funding under Reclamation's *WaterSMART Grants: Water and Energy Efficiency Grants*
c. The Applicant is capable of providing the amount of funding and in-kind contributions specified in the application; and
d. The Applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement

PASSED APPROVED AND ADOPTED on this _____ day of _____, 20 ___ by the following roll-call vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

NORTH KERN WATER STORAGE DISTRICT

_____
President/Board of Directors

ATTEST:

_____
Board of Directors

9.0 System of Award Management (SAM) Registration

All applicants (unless the applicant has an exception approved by Reclamation under 2 CFR §25.110[d]) are required to: be registered in the System for Award Management (SAM) before submitting its application; provide a valid unique entity identifier in its application; and continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency.

The screenshot below is provided as proof of the District's current and active System of Award Management registration.

DUNS: 081783946

CAGE Code: 5P2X5.

The District is also registered under ASAP.

North Kern Water Storage District - SAM Registration Details

NOT VERIFIED

What is a Verified Vendor?

Get Verified Now

Registration Status: ACTIVE

If your business is still pursing new federal opportunities, the federal registration must be renewed on or before **11-19-2019**. This date is 60 days before your true expiration date of 01-18-2020.

Why should I renew 60 days early?

Renew Registration

North Kern Water Storage District

http://www.nkwsd@northkernwsd.com

DUNS: 081783946
CAGE: 5P2X5

33380 Cawelo Ave
Bakersfield, CA 93308, USA

Public Business Name: Yes
Delinquent Federal Debt: No

Government Point of Contact

RICHARD DIAMOND
33380 CAWELO AVE.
BAKERSFIELD, CA 93308, USA
RDIAMOND@NORTHKERNWSD.COM

Phn: 6613932696
Fax: 6613936884