KINNELOA IRRIGATION DISTRICT

Special Meeting – Board of Directors
1999 Kinclair Drive, Pasadena, CA 91107
Tuesday, January 26, 2021
3:00 P.M.

AGENDA

This meeting will be conducted only by teleconference under the provisions of Executive Order N-29-20. Public comments may be submitted via email to kinneloa@outllook.com prior to the meeting and any information submitted will become part of the official record. The public may participate via computer or telephone using the following information:
https://us02web.zoom.us/j/85823718385?pwd=WDdmdm9CNU5qZ1FHTVZsUTM0VU5VUT09
+1 669 900 9128
Meeting ID: 858 2371 8385
Passcode: 647890

1. **CALL TO ORDER –** 3:00 P.M.
   a. Declaration of a quorum
   b. Review of agenda

2. **PUBLIC COMMENT –** Comments from the Public regarding items on the Agenda or other items within the jurisdiction of the District
   In compliance with the Brown Act, the Board cannot discuss or act on items not on the Agenda. However, Board Members or District Staff may acknowledge Public comments, briefly respond to statements or questions posed by the Public, ask a question for clarification, or request Staff to place item on a future Agenda (Government Code section §54954.2)

3. **KINNELOA IRRIGATION DISTRICT MASTER PLAN –** General Manager and Board to review draft capital improvement plan and discuss the scope of a capital improvement or other plan as the successor to the current Water Master Plan
   Recommended Action: General Manager to respond to questions and receive input from the Board regarding preparation of master plan documents

4. **DIRECTOR REPORTS AND/OR COMMENTS –**
   In accordance with Government Code §54954.2 Directors may make brief announcements or brief reports on their own activities. Directors may ask a question for clarification, provide a reference to staff or other resources for information, request staff to report back to the Directors at a subsequent meeting, or act to direct staff to place a matter of business on a future agenda.

5. **CALENDAR –** February 16, 2021 March 16, 2021 April 20, 2021

6. **ADJOURNMENT**

In compliance with the Americans with Disabilities Act, if you are a disabled person and need a disability-related modification or accommodation to participate in this meeting, please contact the District office 48 hours prior to the meeting at 626-797-6295. Each item on the agenda, no matter how described, shall be deemed to include any appropriate motion, whether to adopt a minute motion, resolution, payment of any bill, approval of any matter or action, or any other action. Material related to an item on this agenda submitted after distribution of the agenda packet is available for public review at the District office or online at the District's website https://kinneloairrigationdistrict.info.

KINNELOA IRRIGATION DISTRICT
SPECIAL DISTRICT • PUBLIC WATER AGENCY
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TELEPHONE (626) 797-6295 • FAX (626) 794-5552
WEBSITE: kinneloairrigationdistrict.info

Memo

Date: January 20, 2021

To: Board of Directors

From: Mel Matthews

Subject: Master Plan for the Kinneloa Irrigation District

Recommended Action: Review Draft Capital Improvement Plan and Discuss Scope of Recommended Master Plan Documents and Provide Input to the General Manager

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Background

The current *Water Master Plan* was primarily developed to address fire flow issues and general emergency preparedness issues that were raised after the 1993 Kinneloa Wildfire. Revision 4 of the plan provides a description of the KID's domestic water distribution system and prioritizes necessary improvements and provides cost estimates for implementing the improvements. It is a dynamic document that has been revised periodically to reflect completed projects, new projects and updated project costs.

Although many operational improvements are gained through completion of recommended projects, this master plan does not address many worthwhile projects that would improve the operational efficiency and reliability of the production and distribution system and is not intended to be a complete list of all capital improvement projects and does not address issues such as future water supplies. However, some of the other recommended projects are outlined in the Executive Summary and all major projects on the planning horizon are presented to the Board periodically for discussion and approval along with funding options when applicable. Revision 4 was approved by the Board at its meeting on July 31, 2018.

I have prepared a draft *Capital Improvement Plan* to serve as the successor to current *Water Master Plan*. However, additional document(s) or added sections to the draft *Capital Improvement Plan* may be beneficial for planning purposes.

Suggested Topics for Discussion

1. Should the District adopt the attached *Capital Improvement Plan* when finalized and continue to pursue the recommended pipeline and other projects at the current pace using funds from our reserve accounts?

2. Should additional documents be developed to address other issues such as water supply?

3. The original master plan was prepared by an outside consultant, but the revisions by me have kept the document current and useful without additional expense. However, should a consultant be used again to provide a fresh approach to the issues that the Board would like addressed?

4. What other planning documents does the Board think should be prepared?

Summary and Conclusion

Although the original document was created as a reaction to the 1993 firestorm for developing an improved emergency capability, the remaining projects in the revision provide general benefit to the District in both emergency and non-emergency situations. It has been used in conjunction with the recommended project list and the 10-year financial statement which includes actual and forecasted net income including capital and preventative maintenance projects.

As stated in the Executive Summary of the current plan, some projects such as construction of new or expanded reservoirs would be difficult to be achieve due to the extraordinary costs and the need for a complete environmental review process including an Environmental Impact Report. Increased storage is a desirable goal, but the current plan is intended to present the projects that can reasonably be expected to be completed in an affordable manner using District reserves or financing. Since pipeline and booster pump improvements are usually legislatively or categorically exempt from this costly and time-consuming process, the District has prioritized these projects. Storage projects and new wells provide operational redundancy and improve emergency preparedness, but these projects do not create additional water supplies.

The desired scope of new master plan documents will determine if it can be accomplished in-house by me or whether it would be a worthwhile investment to engage a consultant who has experience in developing a new master plan with a greater scope than my capital improvement plan.

Recommendation

I have limited time to spend on master plan documents without sacrificing other goals and objectives as well as continuing to manage the daily operations of the District. Therefore, after discussion of the scope of the District's master plan documents, I request that the board direct me to accomplish the following items:

1. Finalize the draft *Capital Improvement Plan* to serve as the primary master plan document.

2. Engage a consultant to prepare a completely new master plan with the scope desired by the Board or prepare documents to supplement the *Capital Improvement Plan.*

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Kinneloa Irrigation District

Capital Improvement Plan (CIP)

2021

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Appendices

1. Introduction and CIP Overview

This Capital Improvement Plan (CIP) consists of documents that identify current and future needs for the replacement of water system components for the Kinneloa Irrigation District (KID). This document will assist the KID in planning for necessary future component replacements and to determine the amount of revenue needed. Proactive maintenance of a public water system is vital to providing our customers with safe and reliable access to drinking water and protecting public health.

This document is comprised of seven main sections:

- Background: An overview of the CIP development and purpose
- Existing Water Facilities: Presents a background on the KID's water system.
- Need for Improvements: Presents on-going maintenance issues that need to be addressed to keep the system in good working order.
- System Components and Original Cost Summary.
- Preliminary Capital Improvement Plan: Presents the analysis of the funds the KID should be setting aside for Capital Replacement and presents recommendations by KID staff for high priority components to be replaced.
- Funding Options: Discussion of possible funding scenarios with information on necessary water rate increases to fund improvements and impacts to rate payers.
- Summary: Presents the final budget information.

2. Background

To continue documenting the value of the Kinneloa Irrigation District's existing infrastructure and begin planning for future replacements, the Board of Directors of the KID has requested that the General Manager develop an updated CIP for the KID's water system, as the successor document to Revision 4 of the *WATER MASTER PLAN FOR THE KINNELOA IRRIGATION DISTRICT*, adopted by the Board of Directors on June 20, 2018.

Company Profile

The Kinneloa Irrigation District was formed in October 1953 by Resolution of the Los Angeles County Board of Supervisors. It operates under the rules and regulations of Division 11 of the State of California Water Code and is not under the jurisdiction of the Public Utilities Commission. A five member publicly elected Board of Directors serves as the governing body. The KID started serving customers on December 15, 1955, when it acquired the assets of the Kinneloa Water Company. Additional water services have been added over the years including the following:

- Between 1956 and 1973, 75 additional homes were built in the Kinneloa Canyon and Kinneloa Estates developments.
- In 1974, the KID acquired the assets of the Mira Loma, Canyon Mutual and Osborn Water

Companies and 225 additional services were added to the District. The KID formed an improvement district to upgrade and replace infrastructure in those areas.

- In 1978, 24 new homes were built on Villa Highlands and Villa Knolls roads.
- In 1983, 27 homes were built in an undeveloped area of the District know as Hastings Heights.
- In 1990, 48 town homes were built at a site near New York Drive and Altadena Drive.
- In 2003, 21 building sites were completed in the Kinneloa Canyon area known as Kinneloa Ridge and homes were constructed on 20 of the lots over a two-year period.
- Water service to additional individual building lots and common landscape irrigation sites over the years account for the current 587 services.
- Approximately 25 vacant lots remain in the District.

Our Customers

The customers of the Kinneloa Irrigation District (KID) offer a varied profile. Most of our 587 metered customers live in single-family homes in hillside or canyon settings adjacent to the Angeles National Forest. The homes vary widely in age from newly built to more than 100 years ago. The average household numbers 3.3 persons and the homes vary in size from small cottages to large ranch-style or multi-story mansions. Some of the properties are zoned for horses. Some of our customers live in a 48-unit townhouse complex that was built in 1990. One hundred homes were rebuilt after the 1993 Kinneloa-Altadena wildfire.

In addition, KID serves a few commercial customers that include a church, a school, a nursery, the Los Angeles County Flood Control and the Eaton Canyon Equestrian Center. The KID also supplies water for fire protection throughout its service area.

3. Existing Facilities and Infrastructure

The KID's water system infrastructure includes wells, reservoirs, pump stations, valves, fire hydrants, water treatment plant and distribution system piping. A schematic is shown in Figure 1 in Appendix A. Figure 2 in Appendix A shows the District's boundaries.

The water supply needs for our service area were originally met by individual wells, water tunnels and springs serving a small number of homes and extensive ranches and orchards. Various private and mutual water companies served the Kinneloa Ranch area before the formation of the KID. Some of the water system components were constructed after World War II before the formation of the District. The KID then undertook the funding of improvements to meet the needs of major home construction between 1953 and 2000 as well as system improvements to increase emergency preparedness, operational efficiency and reliability. The details of our water system are as follows:

System Description

General

The KID is divided into two geographic areas which is generally divided by the Wilcox Canyon watercourse. These areas are connected by pipelines between the East and West reservoirs, the Holly and the Vosburg reservoirs and the Eucalyptus and Wilcox reservoirs. There are several pressure zones within each area which contain additional reservoirs, a distribution piping network and booster pump stations that receive water from the KID's wells and

horizontal water tunnels.

Water Sources

The KID operates two water wells which are the primary source of water for the District. The Wilcox and K-3 Wells supply the Wilcox and Eucalyptus Reservoirs. Both wells pump from the Raymond Basin aquifer from which the District has 516 acre-feet adjudicated pumping allowance. Both wells are equipped with vertical turbine pumps. The KID also has nine water supply tunnels which were originally constructed by hand in the 1800's to serve the ranches in the area. Currently, five of these tunnels supply water directly to the KID system and four tunnels release water in the local spreading basins. Tunnel flow rates vary according to the time of year and the annual rainfall and can supply anywhere from a few gallons per minute up to a hundred gallons per minute or more.

Water Treatment

Water is treated using sodium hypochlorite produce on site at some locations and purchased sodium hypochlorite at other sites. Water quality at the sources and in the distribution system is tested on a schedule established by the Drinking Water Division of the State Water Resources Control Board and must meet the water quality standards established by the State and Federal agencies.

Interconnections and Emergency Equipment

The KID currently maintains six emergency interconnections with the City of Pasadena which can deliver water to the Vosburg, Wilcox and Eucalyptus Reservoirs. The KID also has six trailer-mounted diesel-powered portable generators for emergency operations at District facilities in the event of a power failure. Redundant pumps are in place at most facilities in case of pump failures.

Reservoirs

The KID maintains ten water storage facilities at elevations ranging from 940 feet to 1,637 feet with a total capacity of approximately 4 million gallons.

Booster Pumping Facilities

The KID system includes five booster pumping facilities to move water into the five pressure zones in the system. They are the Eucalyptus, Sage, Vosburg, Glen and Wilcox facilities. Horsepower of the pumps range from 25 to 75 HP depending on location and purpose. Redundant pumps are in place at most facilities in case of pump failures.

Pipelines

There are approximately 75,000 linear feet of transmission and distribution mains in the KID service area. Piping materials include galvanized steel, AC, PVC and ductile iron and range in size from 1" to 16" in diameter. There are 115 fire hydrants providing flows of between 750-4000 gpm with a 20-psi minimum residual pressure.

Vehicles

The KID's fleet consists of three light-duty pickup trucks with toolboxes and two heavy-duty trucks with service bodies and ladder racks, one of which has a lift gate.

Information Technology System

The KID maintains a computer network at the office for general use and for customer information and billing purposes. The KID also has a Supervisory Control and Data Acquisition (SCADA) system for operation and control of the pumping, storage, water treatment and distribution system components.

Water Meters and Meter-Reading Components

Water meters are installed on all customer service lines and vary in size from ¾" to 2" depending on the flow requirements. Most meters have a radio transmitter installed to facilitate once a month drive-by meter reading using a handheld computer. Data from this computer is uploaded to the office computer for billing purposes and for leak detection. A more advanced system is currently being tested in a pilot program. This system provides real time data transmission.

The KID has invested considerably in its water system since adoption of the original plan in 2000 which included pipeline and booster replacements as well as additional storage facilities. A preventative maintenance program was also established to maximize the useful life of all the KID's assets.

4. Need for Improvements

Proposed improvement projects presented in this section provide benefits for health and safety, system operation and maintenance, and capacity for growth. The project elements are discussed under each heading. The Board of Directors considers and approves all major projects and established the priority order with input from the KID staff.

4.1 Distribution Pipelines and Appurtenances

The KID's water distribution system originated from the consolidation of private systems and construction of new sections over time. The resulting system serves the incremental new developments well but leaves some of the older areas where piping is 6" or smaller deficient in providing adequate fire flow for protection of homes based on the current standards. Valves and hydrants that do not operate properly need to be replaced. Older pipes of all types also tend to have higher water leak rates; therefore, replacing these pipes would provide the additional benefit of improving water conservation.

4.2 Booster Pump Stations

The KID already has redundant pumps at all critical stations except for the Pasadena Glen Station. Although redundancy is currently provided by the Holly/Sage to Vosburg transfer station, replacement of the Pasadena Glen Booster Station should be considered because the source of its water is the large Wilcox reservoir. The 50 hp booster pump at the Wilcox Reservoir also needs to be replaced due to its age and condition. The former Holly Booster Station needs reconfiguration to serve as a transfer station between the East/West and

Holy/Sage pressure zones. All booster pumps and motors require periodic maintenance or replacement to maintain efficiency and reliability.

4.3 Wells and Water Tunnels

The KID's K-3 Well currently produces 82% of District's water. Although the pump and motor have been replaced or maintained periodically, a complete replacement may be necessary to improved efficiency and avoid a catastrophic failure. The Wilcox Well is not considered to be major production source because of its inefficiency. A major rehabilitation is needed to recover this asset. In the meantime, its use is relegated to emergencies since it cannot provide sufficient production to meet normal system demands. As an alternative, a new well could be constructed, perhaps as a joint project with the City of Pasadena.

4.4 Reservoirs and Tanks

The KID's five concrete reservoirs need periodic maintenance to seal cracks, replace liners and repair the roofs. The KID's five steel tanks are currently under a maintenance contract which ensures that they receive periodic safety upgrades, repairs and exterior painting and interior coating. Although increased storage is desirable, currently there are no plans to add capacity to any of the sites or to build new reservoirs or tanks.

4.5 Standby Generators

The KID's six standby generators were purchased used over a 12-year period. Although they receive little use except for periodic testing and would have a long-expected lifetime, more stringent rules by the South Coast Air Quality Management District may make these units obsolete unless pollution control equipment can be installed at a reasonable cost to prolong the life of these units.

4.6 Vehicles

The KID currently has three light-duty pickup trucks with toolboxes and two heavy-duty trucks with service bodies. Periodic replacement is needed when normal maintenance costs cannot maintain the serviceability and safety of these vehicles.

4.7 SCADA System

A major upgrade of the SCADA system hardware and software was done in 2018 and 2019 including computer hardware, software and data communication radios. Periodic major and minor upgrades are needed to the hardware and software to maintain and improve functionality as well as receive support from the hardware and software vendors.

4.8 Water Meters and Advanced Meter Infrastructure (AMI)

The KID currently has Automated Meter Reading (AMR) drive-by capability via a handheld radio receiver. To totally automate the meter reading process and provide real-time water usage and leak detection, the radio endpoints at each water meter need to be replaced to continuously collect data for the District and the customer. It may be in the best interests of the District and the Customer to install an AMI system in the entire district now rather than making a slow transition to the new technology.

4.9 Information Technology System (IT System)

The IT system consists of onsite devices including desktop computers, laptop computers, monitors, routers, modems, data storage devices, ethernet cabling, backup devices and uninterruptible power supplies (UPS). Software includes standard office applications as well as specialized software for customer information, billing and accounting. Most application software is purchased on a subscription basis such that it is constantly updated to the latest version. However, new hardware is purchased on a periodic basis only as needed due to failures, obsolescence and to obtain new features or increased performance.

5. System Components and Original Cost Summary

The KID water system was constructed over many decades by the KID and its predecessors. Adequate records were not maintained prior to the formation of the KID to determine when various components were constructed. Therefore, it is not possible to estimate the remaining useful life of many of the components. However, a summary is useful in identifying the assets of the KID. System components are listed in Appendix B.

The table below is a summary of the original cost of the various assets, not necessarily the replacement value.

Table 2 – Summary of Original Water System Costs

Summary of Original Water System Costs	
5.1 Distribution Pipelines and Appurtenances	$ 5,913,620
5.2 Booster Pump Stations	$ 2,460,668
5.3 Wells and Water Tunnels	$ 1,226,992
5.4 Reservoirs and Tanks	$ 300,606
5.5 Standby Generators	$ 128,657
5.6 Vehicles	$ 186,273
5.7 SCADA System	$ 362,118
5.8 Water Meters and Meter Infrastructure	$ 118,736
5.9 Information Technology System	$ 77,353
TOTAL ORIGINAL COST	**$ 10,775,023**

5.1 Distribution Pipelines and Appurtenances

There are approximately 75,000 linear feet of transmission and distribution mains in the KID service area. Piping materials include steel, galvanized steel, AC, PVC and ductile iron and range in size from 1" to 16" in diameter. The age some of the pipelines is not known although from experience we know the materials that were used for specific expansion of the system as new homes were built. Asbestos-Concrete (AC) was used in the 1950's and 1960's. Polyvinyl Chloride (PVC) was used in the 1970's, 1980's and 1990's. Ductile Iron (DI) was used starting in 2004 and is the material of choice for future projects. From our experience in repairing leaks, the age of a pipeline is not necessarily an indicator of the remaining useful life.

5.2 Booster Pump Stations

The KID system includes five booster pumping facilities to move water into the five pressure zones in the system. They are the Eucalyptus, Sage, Holly, Vosburg, Glen and Wilcox facilities. Horsepower of the pumps range from 25 to 75 HP depending on location and purpose. Although the original pumps and motors were installed over time, the components receive maintenance or replacement on a regular schedule to minimize unexpected failures.

5.3 Wells and Water Tunnels

The KID operates two water wells which are the primary source of water for the District. The Wilcox and K-3 Wells supply the Wilcox and Eucalyptus Reservoirs. Both wells pump from the Raymond Basin aquifer from which the District has 516 acre-feet adjudicated pumping allowance. Both wells are equipped with vertical turbine pumps. The KID also has nine water supply tunnels which were originally constructed by hand in the 1800's to serve the ranches in the area. Currently, five of these tunnels supply water directly to the KID system and four tunnels release water in the local spreading basins. Tunnel flow rates vary according to the time of year and the annual rainfall and can supply anywhere from a few gallons per minute up to a hundred gallons per minute or more.

The K-3 Well supplies approximately 80% of the water needed for our customers. The Wilcox Well is currently only used for emergencies due to operational problems and inefficiencies. The emergency interconnection with the City of Pasadena's system is used whenever the K-3 Well needs major maintenance.

5.4 Reservoirs and Tanks

The KID maintains ten water storage facilities at elevations ranging from 940 feet to 1,637 feet with a total capacity of approximately 4 million gallons. The five reservoirs are partially buried concrete structures with roofs. The five tanks are constructed of welded steel sections are coated on the interior with an epoxy. The concrete reservoirs are periodically inspected for leaks and

cleaned by a contractor who uses a diver to enter the reservoir without draining it unless major work is needed to repair the concrete or the liner. The steel tanks are covered by a maintenance contract that ensures that any needed work is performed as needed to maintain the tanks in near new condition.

5.5 Standby Generators

The KID has six trailer-mounted diesel-powered portable generators for emergency operations at District facilities in the event of a power failure. These generators were purchased over a twelve-year period and were previously owned.

5.6 Vehicles

The KID's fleet consists of three light-duty pickup trucks with toolboxes and two heavy-duty trucks with service bodies and ladder racks, one of which has a lift gate. They range in age from 22 years to less than one year. Two of the light-duty pickups were purchased in 2020. The two heavy-duty trucks were purchased in 2008.

5.7 SCADA System

.The KID has a Supervisory Control and Data Acquisition (SCADA) system for operation and control of the pumping, storage, water treatment and distribution system components. The original system was installed in 1998 and has been periodically upgraded. A major upgrade of the SCADA system hardware and software was done in 2018 and 2019 including computer hardware, software and data communication radios. Periodic major and minor upgrades are needed to the hardware and software to maintain and improve functionality as well as receive support from the hardware and software vendors.

5.8 Water Meters and Advanced Meter Infrastructure (AMI)

Water meters are installed on all customer service lines and vary in size from ¾" to 2" depending on the flow requirements. Most meters have a radio transmitter installed to facilitate once a month drive-by meter reading using a handheld computer. Data from this computer is uploaded to the office computer for billing purposes and for leak detection. A more advanced system is currently being tested in a pilot program. This system provides real time data transmission.

5.9 Information Technology System (IT System)

The KID maintains a computer network at the office for general use and for customer information and billing purposes.

6. Capital Improvement Plan

Several of the system components have exceeded their expected service lives and planning for the replacement of these components has already started. It is also clear that the cost of replacing or saving for the replacement of everything that currently should be addressed would be a severe hardship on the KID's water customers if borne all at once. Proactive asset management practice suggests implementing a comprehensive, multi-year capital improvement plan as part of the KID's annual water budget process.

A preliminary Capital Improvement Plan was developed from the current Water Master Plan and the staff's knowledge and experience with the various components. The CIP was developed assuming that the useful life of many components could be extended with good maintenance, and the collection of funds for those projects could be delayed by 10 years to better disburse the bulk of the costs to the customers. Table 2 below list the recommended projects to be undertaken in the next five years and excludes projects with an estimated useful life greater than 30 years.

The analysis assumes an interest rate of 2% (an average over the past 10 years) in the KID's reserve account and an inflation rate on capital goods of 2% (May 2020 Rate).

The components that are agreed to be most urgently in need of repair or replacement at the present time (January 2021) are listed in Table 2.

Table 2 – Summary of Priority Water System Projects

PIPINLINE IMPROVEMENT COST ESTIMATES

Priority	Main Size	Description		Category	Cost
		From	To		
1	4”	Xxxx Clarmeya Ln.	East end of Clarmeya Ln.	PM	$50,000
2	8"	Kinclair Dr.	Rear of 2150 Kinclair Dr.	EP 250 ft.	$40,000
3	8"	Kinclair Dr.	#4 Cricklewood Path	EP 400 ft.	$60,000
4	8"	Kinneloa Canyon Rd.	Rear of 2044 Piccadilly Ln.	EP 250 ft.	$40,000
5	8"	Intersection of Vosburg St. & Lower Pasadena Glen Rd.	Front of 1658 Pasadena Glen Rd.	EP/PM 350 ft.	$50,000
6	8”	Larmona Drive & Kinneloa Mesa Road	1908 N. Kinneloa Canyon Rd.	EP 2000 ft.	$575,000
7	8”	Villa Knolls Drive	End of Harwood Point	EP/PM 1960 ft.	$300,000
8	8”	Sierra Madre Villa	3336 Villa Mesa	EP/PM 300 ft.	$50,000
9	12"	Glen Reservoir	Intersection Villa Highlands & Sierra Madre Villa Includes Slope from Pasadena Glen to Barhite	EP/OPS 3100 ft.	$600,000
SUBTOTAL					**$1,765,000**
Engineering, Design, and Planning					$500,000
Construction Management and Inspection					$200,000
SUBTOTAL					**$700,000**
TOTAL PIPELINE PROJECTS					**$2,465,000**

BOOSTER PUMP STATION IMPROVEMENTS

Priority	Description	Estimated Costs
1	Replace the existing 50 HP oil lubricated booster pump at Wilcox Reservoir with a water-lubricated pump.	$30,000
2	Construct improvements to the Booster Pump at Glen Reservoir	$60,000
	Total Pump Station Improvements	**$90,000**

TUNNEL IMPROVEMENTS

Priority	Description	Cost Estimate
1	Replace the combined High/Low Pressure Tunnel Pipeline from combiner to Kinneloa Canyon West Debris Basin	$200,000
2	Replace the lower Low-Pressure Tunnel Pipeline	$ 61,000
3	Replace other tunnel pipelines as required	$100,000
	Total Tunnel Improvements	**$361,000**

OTHER IMPROVEMENTS

Priority	Description	Estimated Cost
1	Purchase 250 kw portable generator for Wilcox and K-3	$60,000
2	Purchase 75 kw portable generator (replacement)	$40,000
3	Water meters and AMI	$250,000
	Total Other Improvements	**$350,000**

PLANNED MAINTENANCE PROGRAM

Priority	Description	Est. Cost
1	Glen Reservoir - Install waterproof coating on interior	$30,000
2	Holly Tanks Erosion Control (All Phases)	$140,000
3	Wilcox Reservoir - Pump stand/other repairs	$25,000
4	Tunnel Maintenance (avg. $7,000 per year for a 10-year period)	$70,000
5	Valve Maintenance (replacement cost averages $2,500 per valve)	$25,000

6	Office Maintenance & Improvements: 1. Replace carpet and do interior painting; 2. Add storage shed to exiting concrete pad	$40,000
7	Upgrading of Fire Hydrant Heads ($500.00 to	$34,000
8	Service Area - Emergency prep. - install or replace "Blue Dot" Markers for Fire Hydrants	$1,000
9	Wilcox Well - Modify dump line to dispose of water on site	$1,000
	Total	**$366,000**

The above costs represent our opinion of probable construction costs in 2021 dollars.

7. Funding Options

The KID needs to consider how it will pay to replace its aging water infrastructure and save for future replacement of newly installed components before increased wear and tear and deferred maintenance create a situation where the KID is unable to satisfactorily fulfill its dedication to providing clean, safe, and reliable drinking water supply to its customers. The recommended approach is to create a plan for systematic component replacement working closely with KID staff and KID Engineer recommendations.

The KID has a planned for capital improvements based primarily on customer water revenues. Unfortunately grant funds are not likely to be available for our improvements and our existing project loan has reduced our borrowing ability. Therefore, we have created a simple 5-year Capital Plan to implement the KID's priority projects using reserve funds whenever possible.

Table 3 – (EXAMPLE) Five Year Capital Plan to Address Priority Projects.

Priority Project	2021Capital Cost	Year 1	Year 2	Year 3	Year 4	Year 5
	$125,000	$25,000	$25,000	$25,000	$25,000	$25,000
	$500,000	$100,000	$100,000	$100,000	$100,000	$100,000
	$90,000	$18,000	$18,000	$18,000	$18,000	$18,000
	$75,000	$15,000	$15,000	$15,000	$15,000	$15,000
	$210,000	$42,000	$42,000	$42,000	$42,000	$42,000
Total (Just an example)	$1,000,000	$200,000	$200,000	$200,000	$200,000	$200,000
Average Monthly Cost per Water Connection (587 active connections)		$28.40	$28.40	$28.40	$28.40	$28.40

8. Summary

The Kinneloa Irrigation District has already invested over $8 million in its system since 2002. The Capital Improvement Plan provide the KID a framework for planning for the eventual replacement of water system infrastructure. The KID should be collecting between $400,000 and $1,400,000 a year for replacement of water system components at the end of their useful life. Additional borrowing will also need to be explored.

Appendix A – System Schematic

Appendix B – System Components

Table B.1: System CIP Inventory - 2021

Pipelines and Appurtenances

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
TOTAL										**$ x,xxx,xxx**

Table B.2: System CIP Inventory - 2021

Booster Pumps

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
Eucalyptus Booster 1										
Eucalyptus Booster 2										
Eucalyptus Booster 3										
Sage Booster 1										
Sage Booster 2										
Wilcox Booster – 75 hp										
Wilcox Booster – 50 hp										
Glen Booster										
Vosburg Booster 1										
Vosburg Booster 2										
Vosburg Booster 3										
TOTAL										**$ x,xxx,xxx**

Table B.3: CIP Inventory - 2021

Wells and Tunnels

Asset –Wells	Description	Installation Date	Expected Useful Life	Remaining Useful Life	Condition	Service History	Adjusted Useful Life	Importance (Low, Medium, High, Critical)	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
K-3 Well											
Wilcox Well											
Eucalyptus Tunnel											
High-Low Tunnel											
House Tunnel											
Far Mesa Tunnel											
Delores Tunnel											
Long Tunnel											
Tent Tunnel											
TOTAL											**$ x,xxx,xxx**

Table B.4: CIP Inventory - 2021

Reservoirs and Tanks

Asset - Storage	Description	Installation Date	Expected Useful Life	Remaining Useful Life	Condition	Service History	Adjusted Useful Life	Importance (Low, Medium, High, Critical)	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
Wilcox											
Glen											
Brown											
Vosburg											
Eucalyptus											
Sage											
Holy East											
Holy West											
East											
West											
TOTAL											**$ x,xxx,xxx**

Table B.5: System CIP Inventory - 2021

Generators

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
TOTAL										**$ x,xxx,xxx**

Table B.6: System CIP Inventory - 2021

Vehicles

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
2008-1 Ford 350	20	Good			12	8				
2008-2 Ford 350	20	Good			12	8				
2020-1 Ford 150	20	Excellent			1	19				
2020-2 Ford 150	20	Excellent			1	19				
1999 Ford 150	20	Poor			22	0				
TOTAL										**$ x,xxx,xxx**

Table B.7: System CIP Inventory - 2021

SCADA

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
TOTAL										**$ x,xxx,xxx**

Table B.8: System CIP Inventory - 2021

Water Meters and Meter Reading Infrastructure

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
TOTAL										$ x,xxx,xxx

Table B.9: System CIP Inventory - 2021

Information Technology

Asset -	Expected Useful Life	Condition	Service History	Adjusted Life	Age	Remaining Useful Life	Importance	Redundancy	Priority (1=highest) (5=lowest)	TOTAL 2021 COST
TOTAL										**$ x,xxx,xxx**

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