Technical Memorandum

Prepared for: Christian Valley Park CSD

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DRAFT

Subject: Christian Valley Park CSD Water System Capital Improvements Plan

Date: August 13, 2018

Purpose

The purpose of this memorandum is to develop a capital improvement plan (CIP) for the water treatment and distribution facilities serving the Christian Valley Park Community Services District (District). The CIP includes an asset inventory, condition assessment, estimate of remaining life of facilities and planning level costs for repair and replacement projects that can be used for budgeting and rate setting.

Background

The District was formed in November of 1962. The majority of the water supply facilities were originally constructed in the early 1960's and 70's. The District's major facilities include the 1-million-gallon per day water treatment plant, approximately seventeen miles of distribution pipelines, a pump station, and a 1.5-million-gallon storage reservoir. Raw water is purchased from the Placer County Water Agency's (PCWA) Bowman Canal and is the sole source of raw water for the District.

For the purpose of this report the system components have been broken into three categories including water treatment plant, storage and transmission/distribution system as outlined below.

Water Treatment Plant. Additions and upgrades have been made to the water treatment plant to comply with new regulatory requirements and increase reliability of the system. The water treatment plant was completed in 1963 and has been upgraded since its original construction during the late 1990s through current. The District budgets funds each year for various upgrades to the water treatment plant. A summary of major upgrades to the facility include:

- Electrical and controls including a supervisory control and data acquisition (SCADA), new motor control center for the electrical and back up generator for emergency power in 1995.

- Two of the original pressure filters were replaced in two projects between 2000 and 2007. One of the existing original filters is still in place.

- Chemical feed systems have been upgraded including feed pumps and chemical storage tanks over the last 10 years and completed in various phases.

- Rebuilt the original filter feed pumps that transfer water from the treatment plant through the filters to the existing reservoir.

- Installed new flocculation basin mixers and rebuilt sedimentation basin redwood baffles.

- Installed a backwash water recycle system.

- Upgraded water quality monitoring and alarm instrumentation including chlorine analyzer, turbidimeters and streaming current analyzer.

- Constructed retaining wall and paved water treatment plant area.

- Replaced original hydropneumatic tank that supplies the upper pressure zone near the water treatment plant.

- Upgraded electrical system at the booster pump station including motor controls and installed a manual transfer switch that can be connected to a portable generator. (Generator was not a part of the project.)

Funding for water treatment plant improvements has been from reserves generated through water rates. In addition to large CIP projects, the District funds small projects on an annual basis totaling between $15k-$30k per year.

Storage. Storage is necessary for proper operation of the system and provides flow equalization, emergency storage and fire flow capacity. The existing reservoir was originally constructed in the early 1960's and was an uncovered reservoir. As such the treated water was vulnerable to contamination by birds, airborne debris and vandalism. In the early 1990's a floating cover was installed. Even when covered, these types of inground reservoirs with floating covers are undesirable and the State Water Resources Board - Division of Drinking Water will reluctantly permit them, but will not fund them through grant or loan programs. The reservoir cover has deteriorated to the point it needs to be replaced. A number of alternatives have been investigated including replacing the cover or replacing the entire facility with steel tanks. The District has opted to construct two steel tanks to replace the facility.

Reservoir replacement will be funded using a combination of District reserves and a loan from the United States Department of Agriculture's Rural Utilities Services division (USDA-RUS). Existing water rates will cover debt service for the project.

Transmission and Distribution System. The District owns and operates approximately 17 miles of transmission and distribution system piping that also includes service lines, meters, hydrants and valves. Historically the system has performed well. There have been few major distributions system improvements to the system over the years, other than normal operations and maintenance, including leak repairs. Major distribution system improvements have included:

- **Gayle Loop Project.** The Gayle Loop project included construction of approximately one mile of pipeline that serves homes that historically did not receive District water and were on failing wells. The project also created a loop within the distribution system that increased system pressure in areas that had low water pressure during peak demand periods. The majority of the cost of the project was borne by homeowners in the project area that received District water. A portion of the project was paid by the District to acknowledge the benefit to existing customers for the operational flexibility and increased pressure in areas of the system with low pressure during peak demand periods.

- **Pressure Reducing Station.** A pressure reducing station (PRS) was installed on Stanley to reduce system pressures in the areas of Stanley and Virginia Drive. The PRS was recently upgraded and upsized to accommodate additional demands sine the PRS was installed in the mid-1990s.

- **Hydrants.** Fire hydrants are owned and maintained by the District. The hydrants were installed during the initial construction of the system. Internal components are wearing and result in either a leaking hydrant that will not shut off, or units that will not open correctly. Hydrants are inspected annually and are repaired, and in some instances replaced as needed.

- **Meter and Service Line Replacement.** Water meters are replaced on an as needed basis when they no longer record water useage or the register is unreadable. Similarly, service lines are replaced when they become prone to leaks.

Overall the transmission and distribution system has operated satisfactorily. However, the system continues to age. Areas of the system have exhibited frequent leaks of various size and failure modes. Eventually the system components will reach the end of their useful life and will need to be replaced as discussed later in this report.

The CIP includes the following for the water treatment plant and distribution system:

- Major asset inventory
- Condition assessment
- Estimated useful remaining life and replacement cost
- Cost estimates for major facility replacement

The CIP plan address each system in separate sections of the report.

Water Treatment Plant

The WTP was constructed and put into service in the early 1960s. Since the original construction the plant upgrades to meet regulatory requirements for drinking water have been completed. Upgrades have also included modernizing the instrumentation and repair and replacement of chemical feed pumps. Two of the original filters have been replaced.

Asset Inventory and Condition Assessment - The inventory was developed utilizing the major system components at the water treatment facility. As noted in the previous section upgrades to the water treatment plant have been ongoing. The majority of the systems are in good working order and will need to have maintenance performed but are not considered to be major CIP projects. The CIP projects identified for the WTP are listed below.

Headworks – The headworks consists of a control valve actuated using a pneumatic actuator that turns the flow on and off and separate flow control valve used to adjust the flow rate. The existing configuration operates but should be replaced in the 1-5 year time frame with a new control valve and manual isolation valve. A new magnetic flow meter would also be provided to replace the insertion type meter to improve accuracy and reliability for setting chemical dosages.

Flocculation/Sedimentation Basin. The floc/sed basin is a serpentine basin that provides gentle mixing to form floc that will settle in the basin. The solids are removed prior to filtration to increase the filter performance. There are two floc motors that drive paddles. The units are less then $1,000 and considered to be a maintenance item. Other than that, there are no other mechanical components in the basin. The basin is coated with gunite which is in good condition. Over time a second layer of gunite should be applied to maintain the structural integrity of the basin and in anticipated within the next 6-10 year horizon.

Filter Feed Pumps. Three filter feed pumps are used to pump settled water from the basin through the filters to the reservoir site. The filter feed pumps are summarized in the Table 1 below. All the pumps are currently fixed speed. Two of the pumps will be replaced as part of the storage tank project. The third pump is a 40 Hp unit and used as a stand-by pump that has very few hours on it.

Table 1
Filter Feed Pumps

Pump ID	Size, Hp/Flow, gpm	Status
Filter Feed Pump 1	5 Hp/300 gpm	Duty pump and used during winter/spring as primary pump and for backwashing filters. Will be replaced as part of the storage tank project and converted to a variable speed drive pump.
Filter Feed Pump 2	20 Hp/600 gpm	Duty pump and used during summer/early fall as primary pump and for backwashing filters. Will be replaced and upsized to a slightly large pump as part of the storage tank project and converted to a variable speed drive pump.
Filter Feed Pump 3	40 Hp/800 gpm	Back up pump to remain in place.

Filters. Originally three pressure filters were installed at the plant as part of an upgrade to comply with the Surface Water Treatment Rule in the mid 1970's. Two of the filters have been replaced, the third remains in service, but its condition is poor. Table 2 includes the existing filter parameters. Two used filters were located and rehabilitated including new coating, underdrains, media and reinforcement of the interior baffles.

Table 2
Pressure Filter Size and Capacity

Filter ID	Size/Capacity, gpm[(a)]	Status
Filter 1	8'x22'/530 gpm	Replaced one of the original filters after rehabilitation and new media.
Filter 2	8'x22'/530 gpm	Replaced one of the original filters after rehabilitation and new media.
Filter 3 [(b)]	6'x18'/325 gpm	Original filter. Needs to be refurbished or replaced.

Notes:
(a) Based on maximum allowable loading rate of 3 gpm/SF
(b) Last remaining original filter.

The District has been trying to identify another used filter that could be refurbished and installed. The filter must be of similar size and a 4-cell unit to enable the system to operated in conjunction with the other filters during backwash. Finding such a filter can be difficult. Options include:

- Purchase a new filter
- Identify used filter and refurbish
- Rehabilitate the remaining filter

Generator. The existing 65 Kw propane generator was installed as part of the 1995 electrical upgrades. The unit has minimal hours on it and is in good condition. The generator was not sized to operate the 40Hp filter feed pump but operates the 5 and 20 Hp units adequately. The unit runs well and could likely perform adequately for at least another 10 years. Replacement of the unit is anticipated in >10 year timeframe.

SCADA Controls. The existing SCADA system was installed in 1995 and has minimal upgrades. The system will be replaced as part of the Storage Tank Project. The improvements include enabling remote plant start/stop and backwash and reporting capabilities.

Cost estimates for the improvements are summarized later in this report.

Transmission and Distribution System

There is approximately 17 miles of pipeline within the District. Transmission pipelines are larger and do not have service connection located on them. The transmission pipelines in the District are limited to the 10-inch diameter main that runs from the reservoir down to Greg. The rest of the pipelines are considered to be distribution system pipelines.

Asset Inventory and Condition Assessment - The asset inventory was developed based on the existing drawings and the geographical information system (GIS) that has been under development for the last three years. The majority of the system was constructed using asbestos concrete (AC) pipe.

When installed properly, particularly proper bedding material, the AC pipe has a long useful life and provides reliable service. AC pipe is not susceptible to corrosion like steel pipe. AC pipe is susceptible to point loads such as rocks that may place a point load on the pipeline or roots from trees that grow into the trench and can put stress on the pipe. The largest leaks encountered in the District were caused by these types of failures.

Useful life estimates vary for AC pipe. The United States Environmental Protection Agency (USEPA), the California Public Utilities Commission (CPUC) and the American Water Works Association (AWWA) have published useful service life estimates for pipelines. The AWWA and CPUC estimates are specific to AC pipe. The AWWA includes a long and short useful service life which is based on a regional basis to account for varying soil types as shown in Table 3. As noted, there is high variability in the estimated useful life.

Table 3
Useful Life Estimates – Asbestos Concrete Pipe

Entity	Years
CPUC	60
USEPA	35-40
AWWA	75 - 105

The majority of the AC pipe in the District is over 50 years. Based on the performance the estimate from USEPA is likely very conservative. AC pipe was commonly used from the early 1960s through the 1970's. Therefore most of the AC pipelines installed throughout the United States has not been in operation much more than 50 to 60 years, so the estimates are just that, and are affected by the soil conditions, construction quality and water pressure/quality.

Table 4 includes a summary of the pipelines within the District based on size and location. The system has been reliable and operated well overall to date with the exception of a few pipelines that are known to be problematic based on historical repairs and rated as 'Poor'.

Table 4
Pipeline Inventory, Useful Life Estimate & Condition

CHRISTIAN VALLEY PARK CSD						
DISTRIBUTION SYSTEM REPLACEMENT COSTS SORTED ROAD						
MAINLINE PIPE BY SIZE AND LOCATION		MAINLINE PIPE	UNIT	APPROX YR		District Road/County Road
	Time Frame	QTY, FT		INSTALLED	CONDITION	
2-inch Diameter Pipeline (PVC) - Pheasant Hill	>10	1,740	LF	1990	Good	D
2-inch Diameter Pipeline (PVC) - Mary Extension	>10	650	LF	2015	Good	D
2-inch Diameter Pipeline (Steel) - Extension off of Allen	1-5	500	LF	1965	Poor	D
4 - inch Diameter Pipeline (AC) - Gava	>10	370	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Ginger	>10	450	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Lorin	>10	880	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Louis	>10	370	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Morningside	>10	2,650	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Northgate	>10	610	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Paul	>10	320	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Pondorex	>10	2,700	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Ralph	>10	430	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Ray	>10	870	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Ross backcountry	>10	460	LF	1965	Good	
4 - inch Diameter Pipeline (AC) - Upland	>10	1,770	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Wanda	>10	300	LF	1965	Good	D
4 - inch Diameter Pipeline (AC) - Westridge	>10	2,400	LF	1965	Good	D
4 - inch Diameter Pipeline (PVC) - Frontier Oaks	>10	420	LF	2008	Good	D
4 - inch Diameter Pipeline (PVC) - Happy Valley	>10	880	LF	2008	Good	D
6-inch Diameter Pipeline (AC) - WTP to storage	>10	2,850	LF	1965	Good	
6-inch Diameter Pipeline (AC) - Allen from Gayle to Stevens	>10	3,820	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Barbara	>10	3,150	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Christian Valley Rd (William to Stanley)	>10	3,600	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Christian Valley Rd (Stanley to Mary)	6-10	1,400	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Christian Valley Rd (Mary to Nacy)	>10	1,100	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Florence	>10	620	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Gayle	>10	2,060	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Gregg from 10" toward CV Rd	>10	650	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Helen	>10	3,200	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Kenneth	>10	3,400	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Mary	>10	3,100	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Nancy	>10	1,150	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Otto	>10	1,100	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Ross	>10	2,650	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Stanley (Christian Valley Rd to Gayle)	>10	1,900	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Stanley (Gayle to Virgina)	6-10	3,500	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Stanley (Virginia to End of Line)	>10	3,800	LF	1965	Good	C
6-inch Diameter Pipeline (AC) - Stevens	>10	2,000	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Thomas	>10	3,200	LF	1965	Good	D
6-inch Diameter Pipeline (AC) - Virginia	>10	2,650	LF	1965	Good	C
6-inch Diameter Pipeline (PVC) - Hidden Pines	>10	850	LF	2008	Good	D
6-inch Diameter Pipeline (Steel) - Witt	1-5	2,300	LF	1965	Poor	D
8-inch Diameter Pipeline (AC) - From Ross to William and CV Road	>10	1,350	LF	1965	Good	D
8-inch Diameter Pipeline (PVC) - Campbell	>10	3,800	LF	2008	Good	D
8-inch Diameter Pipeline (PVC) - To CCC	>10	260	LF	2010	Good	C
8-inch Diameter Pipeline (PVC) - Gayle Loop	>10	2,400	LF	1965	Good	D
8-inch Diameter Pipeline (PVC) - Sunshine Meadow	>10	2,200	LF	2008	Good	D
8-inch Diameter Pipeline (Steel) - Gregg to Allen	1-5	2,500	LF	1965	Poor	D
10-inch Diameter Pipeline (AC) - Main system feed	6-10	1,550	LF	1965	Good	XC
10-inch Diameter Pipeline (PVC) - Gayle from Sunshine Meadow to Stanley	>10	480	LF	2008	Good	D

CAPITAL IMPROVEMENT PLAN

The physical components of the system include: the water treatment plant and transmission and distribution system. The assets generally lose value over time as the system ages and deteriorates. As systems age, costs of operation and maintenance will increase as the assets age and operation and maintenance costs will increase. All assets will eventually reach the end of their useful life. Some assets will reach this point sooner than others depending on a number of variables.

This section includes an estimate of the remaining useful life of the various assets identified in the previous section. Costs to replace facilities are identified with the goal providing and maintaining the necessary level of service while minimizing operations and maintenance costs. Planning level cost estimates are included for various projects over time to provide guidance for budgeting capital improvements.

Useful Life Estimates - There are many factors affecting the useful life of infrastructure assets. Factors such as installation, materials, poor maintenance, and corrosive environment will shorten an asset's life, while factors such as good installation practices, high quality materials, proper routine and preventative maintenance tend to lengthen an asset's life. Because of these site-specific characteristics, asset life must be viewed on a case by case basis and the particular conditions that are site specific.

Water treatment plant assets are relatively easy to assess due to accessibility enabling a thorough condition assessment during daily inspections and operation activities. Pipelines are more difficult to assess other than utilizing historical leak records and investigation of the failure mode.

Useful life estimates from the United States Environmental Protection Agency, the California Public Utilities Commission and the American Water Works Association are available but have a high degree of variability. These typical values have been used as guidance for this analysis and modified based on engineering judgement and the onsite condition assessment of actual conditions. The asset inventory and condition assessment were used to develop useful life estimates included in Table 5 along with cost estimates. The higher useful life estimated by the AWWA (see Table 3) was used for the AC pipe in the system, which makes up the majority of the pipelines.

Cost Estimates – Planning level cost estimates have been developed for the water treatment plant facilities based on specific projects that have been identified and included in Table 5. Distribution system improvements are based on unit costs on a per inch diameter for pipelines and unit costs for hydrants and service lines included in the tables. Unit cost for pipelines was increased by 20-percent in County Roadways to account for additional plan review, testing and inspection costs.

Capital Improvement Projects - Capital improvement projects are described in this section for the water system. The timing of the projects will vary from the target dates provided herein for guidance and planning purposes. Costs presented are based on current Engineering News Record 20-Cities Construction Cost Index (ENR 20 CCI) of 11,200. The ENR 20 CCI is an index used for adjusting project costs based on inflation specific to the construction industry. Future costs are not escalated and inflation should be accounted for in budgeting and rate setting

Water Treatment Plant. The water treatment plant improvements identified previously in this report are included in the recommended improvements. The District has invested in the WTP on a regular basis making improvements and replacing obsolete equipment and instrumentation. As a result, there are not a lot of major CIP type projects necessary at the WTP for continued operation. The CIP projects identified are intended to maintain the current level of service and will not increase the capacity of the facility. Future improvements to increase capacity should be borne by future development that would be served by the additional capacity. Planning level cost estimates have been provided for each of the improvements along with an anticipated timeline for the improvement. The District has historically budgeted $15k to $30k per year.

Headworks – Replace existing control and isolation valves as well as the influent flow meter. Assumed to use the existing vault and pipeline between the canal and water treatment plant.

Timeline: 1-5 years

Project Cost Estimate: $10,000

Floc/Sedbasin – Crackfill basin and recoat with gunite in areas requiring repair. Baffles have been replaced in previous projects.

Timeline: 5-10 years

Project Cost Estimate: $30,000

Filter Feed Pump – Replacement of the standby 40-hp pump. (Both the 5 and 20 Hp pumps will be replaced as part of the storage tank project.) Improvement includes replacing pump and electrical components with similar sized unit.

Timeline: 10-15 years

Project Cost Estimate: $50,000

Filter 3 Rehab – Filter 3 is the last remaining original filter since they were installed in the 1970's. The media was replaced in in the late 1990s, but the filter structure itself including internal baffles, underdrain and coating are original. The unit should be rehabilitated or replaced.

Timeline: 1-5 years

Project Cost Estimate: $50,000

Generator Replacement – The 65 Kw generator was installed in 1995. The unit has very few hours on it and is in good shape. The assumption is it will need to be replaced at some point.

Timeline: 10-15 years

Project Cost Estimate: $50,000

Transmission and Distribution System. Ultimately the transmission and distribution system replacement represent a large future cost to the District. The timing of these costs is difficult to determine as evident by the large range of estimated useful life for pipeline facilities previously discussed.

Utilizing the remaining useful life of the various pipelines within the District and assuming that the segment will be replaced by the end of its projected useful life would result in more than $100/month on each water bill beyond the current charges just to accumulate reserves for pipeline replacement. An increase of that magnitude would be devastating to the customers. This estimate is based on the longer estimate useful life proposed by the AWWA. Utilizing the shorter useful life duration increases the rate impact dramatically.

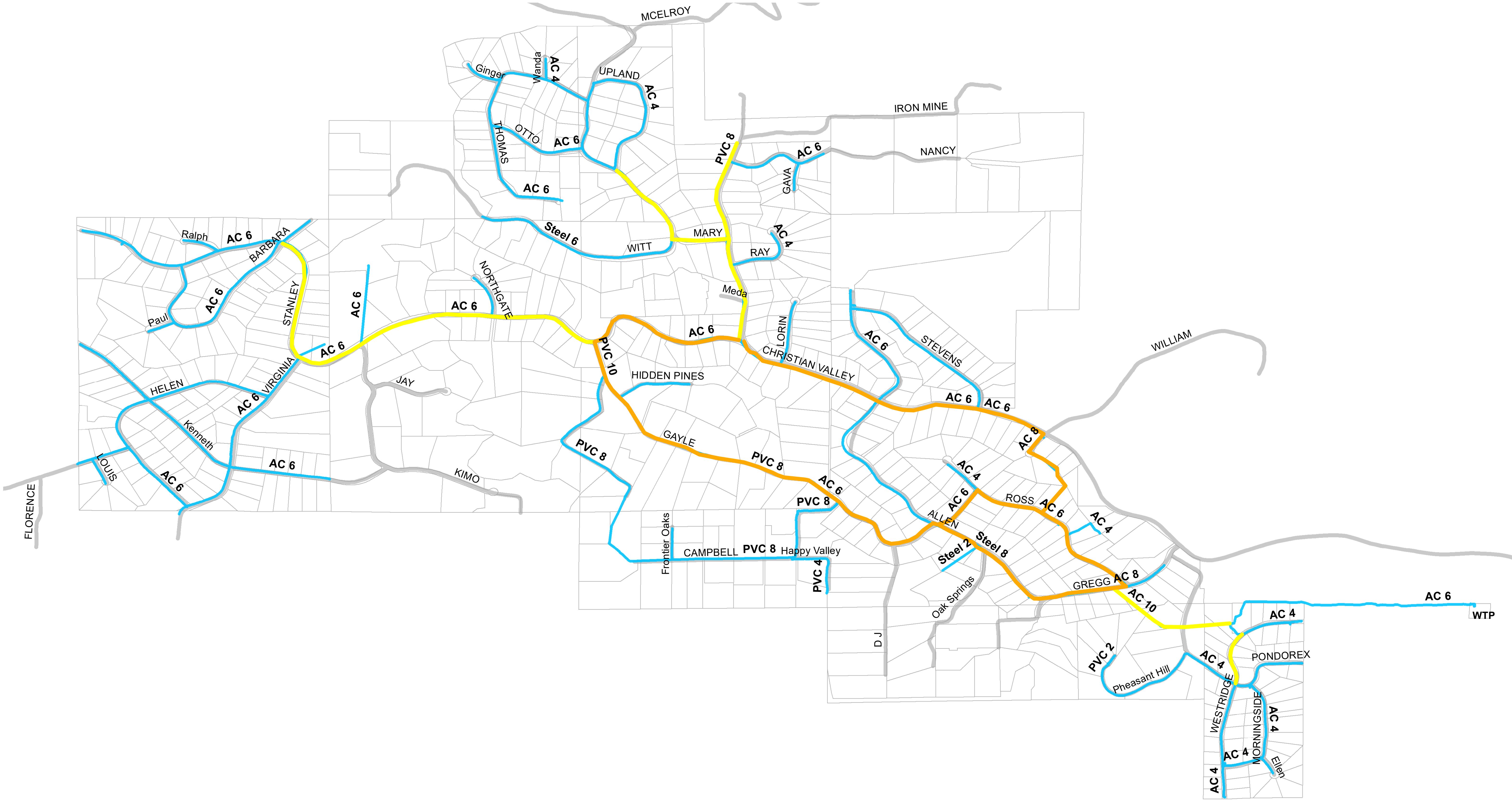
Table 5 includes each segment and the estimated cost to replace, as well as the associated Annual Replacement Revenue Requirement (ARRR) to build a reserve adequate to replace the pipeline within the projected useful life timeline. The sum of each segments' ARRR was then added, that total was then divided by the number of existing service connections to calculate the rate impact. Figure 1 shows prioritization of the various pipelines. Higher priority pipelines will impact more customers than lower priority due to the system layout and lack of looping.

For this analysis the pipelines were not upsized, which would add additional cost to existing residents. If the additional capacity was necessary, the cost to upsize the pipelines would be borne by developers requesting the capacity. As projects are completed, better cost data will be available. The District may desire to upsize portions of the system to increase fire flows, but that determination can be made during design based on economic factors.

Fire hydrant spacing within the District varies and in general the distance between hydrants is further than modern systems. For the cost estimate, new hydrants have been assumed to be located at approximately 500-foot intervals which would increase the number of hydrants from 63 to approximately 170.

Adjusting rates to accumulate reserves to replace all of the pipes as each segment reaches the end of the estimated useful life probably not realistic or palatable from a rate perspective. There is discussion on a regional and national level regarding the need to upgrade water pipeline infrastructure. There may be other sources of funding beyond water rates at the State or Federal level. New technology is also being developed involving in place (in situ) rehabilitation that avoids or minimizes excavation. Lastly, the actual longevity of the pipes may be longer than estimated. The District may also consider low interest loans from USDA, US EPA and State infrastructure financing entities.

Over time the frequency of pipeline failures will increase as the system ages. When this occurs is unknown, but a category of improvements deemed Reliability and Redundancy Improvements (RRI) has been identified throughout the distribution system. The RRIs include the creation of loops and addition of valves to provide operations staff the ability to isolate smaller portions of the system when making repairs. Shutdowns resulting in service interruptions will be reduced. The RRIs will reduce the urgency of full pipeline replacement projects and are shown on Figure 2. Projects include the RRIs discussed below in addition to the pipeline replacement projects.



Christian Valley Park CSD 2018 CIP

Figure 1 – Distribution system – Pipeline prioritization

Roads | Parcels | Low Priority Pipelines | High Priority Pipelines | Medium Priority Pipelines

NORTH
Not To Scale

COORDINATE SYSTEM:
CALIFORNIA STATE PLANE, ZONE II, NAD83, U.S. SURVEY FEET

SOURCES:
- HYDROS ENGINEERING
- PLACER COUNTY GIS DATA

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Table 5
Remaining Life and Replacement Cost

CHRISTIAN VALLEY PARK CSD
DISTRIBUTION SYSTEM REPLACEMENT COSTS SORTED ROAD

MAINLINE PIPE BY SIZE AND LOCATION	Time Frame	MAINLINE PIPE QTY, FT	UNIT	APPROX YR INSTALLED	CONDITION	District Road/County Road	MAINLINE PIPE UNIT COST ($/FT)	PIPE COST	VALVES APPROX QTY	VALVES UNIT COST ($) (a)	UNIT	VALVE COST	HYDRANTS APPROX QTY	HYDRANTS UNIT COST ($) (a)	UNIT	HYDRANT COST	SERVICE LINES APPROX QTY	SERVICE LINES UNIT COST ($) (a)	UNIT	SERVICE COST	REPLACEMENT COST	YEAR INSTALLED	APPROX AGE (YR)	USEFUL LIFE LOW - CPUC	USEFUL LIFE HIGH - AWWA	REMAINING LIFE, YRS LOW	REMAINING LIFE, YRS HIGH	Annual Replacement Revenue Requirement (ARRR), $/YR LOW	Annual Replacement Revenue Requirement (ARRR), $/YR HIGH
2-inch Diameter Pipeline (PVC) - Pheasant Hill	>10	1,740	LF	1990	Good	D	$ 60	$ 104,400	12	2,500	EA	$ 31,100	3	5,500	EA	$ 19,140	7	$ 2,500	EA	$ 17,500	$ 172,140	1990	28	60	105	32	77	$ 5,379	$ 2,236
2-inch Diameter Pipeline (PVC) - Mary Extension	>10	650	LF	2015	Good	D	$ 60	$ 39,000	6	2,500	EA	$ 14,750	1	5,500	EA	$ 7,150	2	$ 2,500	EA	$ 5,000	$ 65,900	2015	3	60	105	57	102	$ 1,156	$ 646
2-inch Diameter Pipeline (Steel) - Extension off of Allen	1-5	500	LF	1965	Poor	D	$ 60	$ 30,000	5	2,500	EA	$ 12,500	1	5,500	EA	$ 5,500	2	$ 2,500	EA	$ 5,000	$ 53,000	1965	53	55	55	2	2	$ 26,500	$ 26,500
4 - inch Diameter Pipeline (AC) - Gava	>10	370	LF	1965	Good	D	$ 90	$ 33,300	4	2,500	EA	$ 10,550	1	$ 5,500	EA	$ 4,070	7	$ 2,500	EA	$ 17,500	$ 65,420	1965	53	60	105	7	52	$ 9,346	$ 1,258
4 - inch Diameter Pipeline (AC) - Ginger	>10	450	LF	1965	Good	D	$ 90	$ 40,500	5	2,500	EA	$ 11,750	1	$ 5,500	EA	$ 4,950	5	$ 2,500	EA	$ 12,500	$ 69,700	1965	53	60	105	7	52	$ 9,957	$ 1,340
4 - inch Diameter Pipeline (AC) - Lorin	>10	880	LF	1965	Good	D	$ 90	$ 79,200	7	2,500	EA	$ 18,200	2	$ 5,500	EA	$ 9,680	14	$ 2,500	EA	$ 35,000	$ 142,080	1965	53	60	105	7	52	$ 20,297	$ 2,732
4 - inch Diameter Pipeline (AC) - Louis	>10	370	LF	1965	Good	D	$ 90	$ 33,300	4	2,500	EA	$ 10,550	1	$ 5,500	EA	$ 4,070	6	$ 2,500	EA	$ 15,000	$ 62,920	1965	53	60	105	7	52	$ 8,989	$ 1,210
4 - inch Diameter Pipeline (AC) - Morningside	>10	2,650	LF	1965	Good	D	$ 90	$ 238,500	18	2,500	EA	$ 44,750	5	$ 5,500	EA	$ 29,150	13	$ 2,500	EA	$ 32,500	$ 344,900	1965	53	60	105	7	52	$ 49,271	$ 6,633
4 - inch Diameter Pipeline (AC) - Northgate	>10	610	LF	1965	Good	D	$ 90	$ 54,900	6	2,500	EA	$ 14,150	1	$ 5,500	EA	$ 6,710	6	$ 2,500	EA	$ 15,000	$ 90,760	1965	53	60	105	7	52	$ 12,966	$ 1,745
4 - inch Diameter Pipeline (AC) - Paul	>10	320	LF	1965	Good	D	$ 90	$ 28,800	4	2,500	EA	$ 9,800	1	$ 5,500	EA	$ 3,520	6	$ 2,500	EA	$ 15,000	$ 57,120	1965	53	60	105	7	52	$ 8,160	$ 1,098
4 - inch Diameter Pipeline (AC) - Pondorex	>10	2,700	LF	1965	Good	D	$ 90	$ 243,000	18	2,500	EA	$ 45,500	5	$ 5,500	EA	$ 29,700	16	$ 2,500	EA	$ 40,000	$ 358,200	1965	53	60	105	7	52	$ 51,171	$ 6,888
4 - inch Diameter Pipeline (AC) - Ralph	>10	430	LF	1965	Good	D	$ 90	$ 38,700	5	2,500	EA	$ 11,450	1	$ 5,500	EA	$ 4,730	4	$ 2,500	EA	$ 10,000	$ 64,880	1965	53	60	105	7	52	$ 9,269	$ 1,248
4 - inch Diameter Pipeline (AC) - Ray	>10	870	LF	1965	Good	D	$ 90	$ 78,300	7	2,500	EA	$ 18,050	2	$ 5,500	EA	$ 9,570	12	$ 2,500	EA	$ 30,000	$ 135,920	1965	53	60	105	7	52	$ 19,417	$ 2,614
4 - inch Diameter Pipeline (AC) - Ross backcountry	>10	460	LF	1965	Good		$ 90	$ 41,400	5	2,500	EA	$ 11,900	1	$ 5,500	EA	$ 5,060	4	$ 2,500	EA	$ 10,000	$ 68,360	1965	53	60	105	7	52	$ 9,766	$ 1,315
4 - inch Diameter Pipeline (AC) - Upland	>10	1,770	LF	1965	Good	D	$ 90	$ 159,300	13	2,500	EA	$ 31,550	4	$ 5,500	EA	$ 19,470	11	$ 2,500	EA	$ 27,500	$ 237,820	1965	53	60	105	7	52	$ 33,974	$ 4,573
4 - inch Diameter Pipeline (AC) - Wanda	>10	300	LF	1965	Good	D	$ 90	$ 27,000	4	2,500	EA	$ 9,500	1	$ 5,500	EA	$ 3,300	5	$ 2,500	EA	$ 12,500	$ 52,300	1965	53	60	105	7	52	$ 7,471	$ 1,006
4 - inch Diameter Pipeline (AC) - Westridge	>10	2,400	LF	1965	Good	D	$ 90	$ 216,000	16	2,500	EA	$ 41,000	5	$ 5,500	EA	$ 26,400	29	$ 2,500	EA	$ 72,500	$ 355,900	1965	53	60	105	7	52	$ 50,843	$ 6,844
4 - inch Diameter Pipeline (PVC) - Frontier Oaks	>10	420	LF	2008	Good	D	$ 90	$ 37,800	5	2,500	EA	$ 11,300	1	$ 5,500	EA	$ 4,620	4	$ 2,500	EA	$ 10,000	$ 63,720	2008	10	60	105	50	95	$ 1,274	$ 671
4 - inch Diameter Pipeline (PVC) - Happy Valley	>10	880	LF	2008	Good	D	$ 90	$ 79,200	7	2,500	EA	$ 18,200	2	$ 5,500	EA	$ 9,680	3	$ 2,500	EA	$ 7,500	$ 114,580	2008	10	60	105	50	95	$ 2,292	$ 1,206
6-inch Diameter Pipeline (AC) - WTP to storage	>10	2,850	LF	1965	Good		$ 120	$ 342,000	19	5,000	EA	$ 95,500	6	$ 5,500	EA	$ 31,350		$ 2,500	EA	$ -	$ 468,850	1965	53	60	105	7	52	$ 66,979	$ 9,016
6-inch Diameter Pipeline (AC) - Allen from Gayle to Stevens	>10	3,820	LF	1965	Good	D	$ 120	$ 458,400	25	3,500	EA	$ 87,220	8	$ 5,500	EA	$ 42,020	28	$ 2,500	EA	$ 70,000	$ 657,640	1965	53	60	105	7	52	$ 93,949	$ 12,647
6-inch Diameter Pipeline (AC) - Barbara	>10	3,150	LF	1965	Good	D	$ 120	$ 378,000	21	3,500	EA	$ 73,150	6	$ 5,500	EA	$ 34,650	22	$ 2,500	EA	$ 55,000	$ 540,800	1965	53	60	105	7	52	$ 77,257	$ 10,400
6-inch Diameter Pipeline (AC) - Christian Valley Rd (William to Stanley)	>10	3,600	LF	1965	Good	C	$ 144	$ 518,400	16	3,500	EA	$ 56,000	7	$ 5,500	EA	$ 39,600	33	$ 2,500	EA	$ 82,500	$ 696,500	1965	53	60	105	7	52	$ 99,500	$ 13,394
6-inch Diameter Pipeline (AC) - Christian Valley Rd (Stanley to Mary)	6-10	1,400	LF	1965	Good	C	$ 144	$ 201,600	4	3,501	EA	$ 14,004	3	$ 5,501	EA	$ 15,403	8	$ 2,500	EA	$ 20,000	$ 251,007	1966	52	60	105	8	53	$ 31,376	$ 4,736
6-inch Diameter Pipeline (AC) - Christian Valley Rd (Mary to Nacy)	>10	1,100	LF	1965	Good	C	$ 144	$ 158,400	4	3,502	EA	$ 14,008	2	$ 5,502	EA	$ 12,104	9	$ 2,500	EA	$ 22,500	$ 207,012	1967	51	60	105	9	54	$ 23,001	$ 3,834
6-inch Diameter Pipeline (AC) - Florence	>10	620	LF	1965	Good	C	$ 144	$ 89,280	6	3,500	EA	$ 20,020	1	$ 5,500	EA	$ 6,820	3	$ 2,500	EA	$ 7,500	$ 123,620	1965	53	60	105	7	52	$ 17,660	$ 2,377
6-inch Diameter Pipeline (AC) - Gayle	>10	2,060	LF	1965	Good	D	$ 120	$ 247,200	14	3,500	EA	$ 50,260	4	$ 5,500	EA	$ 22,660	20	$ 2,500	EA	$ 50,000	$ 370,120	1965	53	60	105	7	52	$ 52,874	$ 7,118
6-inch Diameter Pipeline (AC) - Gregg from 10" toward CV Rd	>10	650	LF	1965	Good	D	$ 120	$ 78,000	6	3,500	EA	$ 20,650	1	$ 5,500	EA	$ 7,150	7	$ 2,500	EA	$ 17,500	$ 123,300	1965	53	60	105	7	52	$ 17,614	$ 2,371
6-inch Diameter Pipeline (AC) - Helen	>10	3,200	LF	1965	Good	C	$ 144	$ 460,800	21	3,500	EA	$ 74,200	6	$ 5,500	EA	$ 35,200	23	$ 2,500	EA	$ 57,500	$ 627,700	1965	53	60	105	7	52	$ 89,671	$ 12,071
6-inch Diameter Pipeline (AC) - Kenneth	>10	3,400	LF	1965	Good	C	$ 144	$ 489,600	22	3,500	EA	$ 78,400	7	$ 5,500	EA	$ 37,400	33	$ 2,500	EA	$ 82,500	$ 687,900	1965	53	60	105	7	52	$ 98,271	$ 13,229
6-inch Diameter Pipeline (AC) - Mary	>10	3,100	LF	1965	Good	C	$ 144	$ 446,400	21	3,500	EA	$ 72,100	6	$ 5,500	EA	$ 34,100	25	$ 2,500	EA	$ 62,500	$ 615,100	1965	53	60	105	7	52	$ 87,871	$ 11,829
6-inch Diameter Pipeline (AC) - Nancy	>10	1,150	LF	1965	Good	D	$ 120	$ 138,000	9	3,500	EA	$ 31,150	2	$ 5,500	EA	$ 12,650	5	$ 2,500	EA	$ 12,500	$ 194,300	1965	53	60	105	7	52	$ 27,757	$ 3,737
6-inch Diameter Pipeline (AC) - Otto	>10	1,100	LF	1965	Good	D	$ 120	$ 132,000	9	3,500	EA	$ 30,100	2	$ 5,500	EA	$ 12,100	6	$ 2,500	EA	$ 15,000	$ 189,200	1965	53	60	105	7	52	$ 27,029	$ 3,638
6-inch Diameter Pipeline (AC) - Ross	>10	2,650	LF	1965	Good	D	$ 120	$ 318,000	18	3,500	EA	$ 62,650	5	$ 5,500	EA	$ 29,150	30	$ 2,500	EA	$ 75,000	$ 484,800	1965	53	60	105	7	52	$ 69,257	$ 9,323
6-inch Diameter Pipeline (AC) - Stanley (Christian Valley Rd to Gayle)	>10	1,900	LF	1965	Good	C	$ 144	$ 273,600	4	3,500	EA	$ 14,000	4	$ 5,500	EA	$ 20,900	14	$ 2,500	EA	$ 35,000	$ 343,500	1965	53	60	105	7	52	$ 49,071	$ 6,606
6-inch Diameter Pipeline (AC) - Stanley (Gayle to Virgina)	6-10	3,500	LF	1965	Good	C	$ 144	$ 504,000	6	3,500	EA	$ 21,000	7	$ 5,500	EA	$ 38,500	28	$ 2,500	EA	$ 70,000	$ 633,500	1965	53	60	105	7	52	$ 90,500	$ 12,183
6-inch Diameter Pipeline (AC) - Stanley (Virginia to End of Line)	>10	3,800	LF	1965	Good	C	$ 144	$ 547,200	6	3,500	EA	$ 21,000	8	$ 5,500	EA	$ 41,800	28	$ 2,500	EA	$ 70,000	$ 680,000	1965	53	60	105	7	52	$ 97,143	$ 13,077
6-inch Diameter Pipeline (AC) - Stevens	>10	2,000	LF	1965	Good	D	$ 120	$ 240,000	14	3,500	EA	$ 49,000	4	$ 5,500	EA	$ 22,000	20	$ 2,500	EA	$ 50,000	$ 361,000	1965	53	60	105	7	52	$ 51,571	$ 6,942
6-inch Diameter Pipeline (AC) - Thomas	>10	3,200	LF	1965	Good	D	$ 120	$ 384,000	21	3,500	EA	$ 74,200	6	$ 5,500	EA	$ 35,200	26	$ 2,500	EA	$ 65,000	$ 558,400	1965	53	60	105	7	52	$ 79,771	$ 10,738
6-inch Diameter Pipeline (AC) - Virginia	>10	2,650	LF	1965	Good	C	$ 144	$ 381,600	18	3,500	EA	$ 62,650	5	$ 5,500	EA	$ 29,150	18	$ 2,500	EA	$ 45,000	$ 518,400	1965	53	60	105	7	52	$ 74,057	$ 9,969
6-inch Diameter Pipeline (PVC) - Hidden Pines	>10	850	LF	2008	Good	D	$ 120	$ 102,000	7	3,500	EA	$ 24,850	2	$ 5,500	EA	$ 9,350	3	$ 2,500	EA	$ 7,500	$ 143,700	2008	10	60	105	50	95	$ 2,874	$ 1,513
6-inch Diameter Pipeline (Steel) - Witt	1-5	2,300	LF	1965	Poor	D	$ 120	$ 276,000	16	3,500	EA	$ 55,300	5	$ 5,500	EA	$ 25,300	12	$ 2,500	EA	$ 30,000	$ 386,600	1965	53	55	55	2	2	$ 193,300	$ 193,300
8-inch Diameter Pipeline (AC) - From Ross to William and CV Road	>10	1,350	LF	1965	Good	D	$ 160	$ 216,000	10	4,000	EA	$ 40,400	3	$ 5,500	EA	$ 14,850	8	$ 2,500	EA	$ 20,000	$ 291,250	1965	53	60	105	7	52	$ 41,607	$ 5,601
8-inch Diameter Pipeline (PVC) - Campbell	>10	3,800	LF	2008	Good	D	$ 160	$ 608,000	25	4,000	EA	$ 99,200	8	$ 5,500	EA	$ 41,800	15	$ 2,500	EA	$ 37,500	$ 786,500	2008	10	60	105	50	95	$ 15,730	$ 8,279
8-inch Diameter Pipeline (PVC) - To CCC	>10	260	LF	2010	Good	C	$ 192	$ 49,920	4	4,000	EA	$ 14,240	1	$ 5,500	EA	$ 2,860		$ 2,500	EA	$ -	$ 67,020	2010	8	60	105	52	97	$ 1,289	$ 691
8-inch Diameter Pipeline (PVC) - Gayle Loop	>10	2,400	LF	1965	Good	D	$ 160	$ 384,000	16	4,000	EA	$ 65,600	5	$ 5,500	EA	$ 26,400	16	$ 2,500	EA	$ 40,000	$ 516,000	1965	53	60	105	7	52	$ 73,714	$ 9,923
8-inch Diameter Pipeline (PVC) - Sunshine Meadow	>10	2,200	LF	2008	Good	D	$ 160	$ 352,000	15	4,000	EA	$ 60,800	4	$ 5,500	EA	$ 24,200	6	$ 2,500	EA	$ 15,000	$ 452,000	2008	10	60	105	50	95	$ 9,040	$ 4,758
8-inch Diameter Pipeline (Steel) - Gregg to Allen	1-5	2,500	LF	1965	Poor	D	$ 160	$ 400,000	17	4,000	EA	$ 68,000	5	$ 5,500	EA	$ 27,500	23	$ 2,500	EA	$ 57,500	$ 553,000	1965	53	55	55	2	2	$ 276,500	$ 276,500
10-inch Diameter Pipeline (AC) - Main system feed	6-10	1,550	LF	1965	Good	XC	$ 180	$ 279,000	11	5,000	EA	$ 56,500	3	$ 5,500	EA	$ 17,050		$ 2,500	EA	$ -	$ 352,550	1965	53	60	105	7	45	$ 50,364	$ 7,834
10-inch Diameter Pipeline (PVC) - Gayle from Sunshine Meadow to Stanley	>10	480	LF	2008	Good	D	$ 180	$ 86,400	5	5,000	EA	$ 24,400	1	$ 5,500	EA	$ 5,280		$ 2,500	EA	$ -	$ 116,080	2008	10	60	105	50	95	$ 2,322	$ 1,222

Notes:

1) All costs based on 20 Cities ENR Construction Cost Index of 11,200

2) Unit cost for pipelines in County roads increased by 20% to account for County requirements including review, testing and inspections.

Recommended projects are summarized herein and shown on Table 6. As noted below, there may be a need to make adjustments to reduce the costs depending on rate impacts. Figure 3 includes the projects identified between the 1-10 year horizon.

The 1-5 year projection is the most important to create a rate structure that provides funding for the projects. Proposition 218 limits rate setting to a maximum of 5-years in California. There are approximately $1.3 million dollars of projects identified within the 1-5 year horizon. These are projects that address known problem areas previously discussed as well as reliability and redundancy projects. The CIP will be used as part of an ongoing rate study that is underway. There may be a need to reconsider the projects and possible delay or reduce the scope of the project(s) to reduce costs.

The 6-10 year interval includes approximately $2.1 million of improvements. The distribution system makes up approximately $2 million, of which $750,000 includes the Kenneth Loop. The loop is a large project and would provide a significant level of redundancy to the system, although may be cost prohibitive.

Projects beyond 10-years will consist of addressing problematic areas in the system as they arise, similar to those already known to be problematic. Estimated costs for replacement of these pipelines in today's dollars is about $13.5 million. Accuracy of the cost estimates decreases the further out the project planning horizon moves. Figure 3 includes the various projects throughout the District between the 1-10 years.

1 to 5 Year Projects – These include the elimination of known problem areas. These include:

- Allen Drive Extension – Replacement of a 2-inch diameter steel pipeline extending from Allen up to three homes at the top of the hill. The pipeline goes cross country through easements on private property. The pipeline has exhibited leaks and is in poor condition. Additionally there are pressure problems due to buildup of nodules restricting flow in the pipe. This section of pipe runs through private property, presumably through an easement which will enable replacement of the pipe along the same alignment.

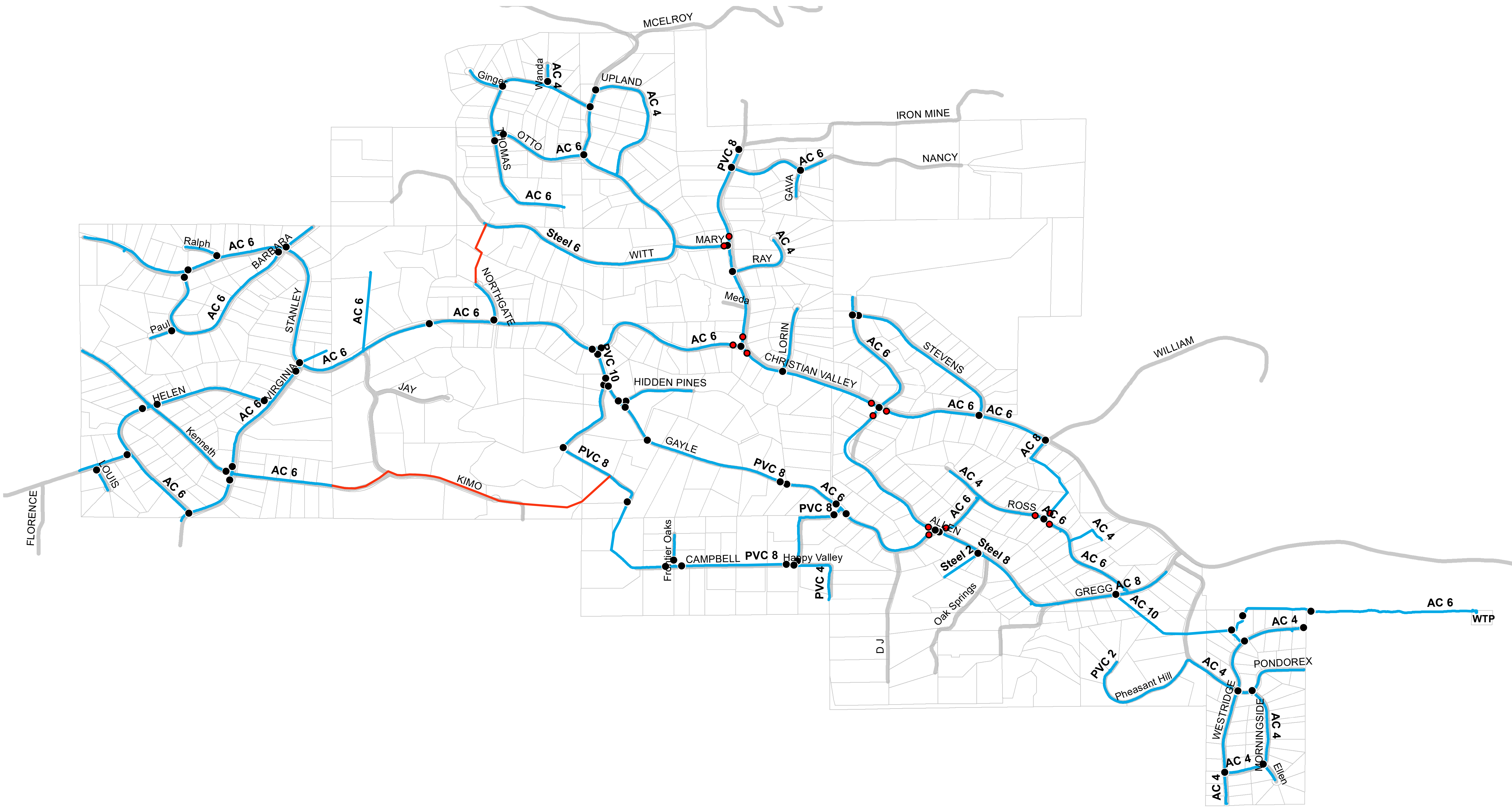
- Allen Drive – Replace 8-inch mortar lined and coated steel pipe. Pipe has had large leaks in past particularly at service connections.

- Witt Road – Replace 6-inch mortar lined and coated steel pipe. Pipe has leaked in past, steel is susceptible to corrosion. No isolation valve on Witt, shutdown affects large area including Mary, Thomas, Upland, Otto, etc. (This project is a lower priority than the other projects in the 1 to 5 year projects.

- Reliability/Redundancy Project – Valve Clusters - Install valve clusters to provide ability divert flow and isolate problems to minimize shutdowns. See Figures 2 and 3 for proposed locations.

Total estimated cost of the projects in 2018 dollars is $1.1 million and distributed as shown on Table 6

6 to 10 Year Projects – Projects in this time period include some of the high priority pipeline segments as shown in Figure 3. To date these facilities have not been problematic but are critical to maintaining service. Replacement of these mains should be reevaluated as time goes on, other areas of the system may become problematic as they continue to age. If that is the case, funding for projects listed below could be reallocated. Projects include:



COORDINATE SYSTEM:
CALIFORNIA STATE PLANE, ZONE II, NAD83, U.S. SURVEY FEET

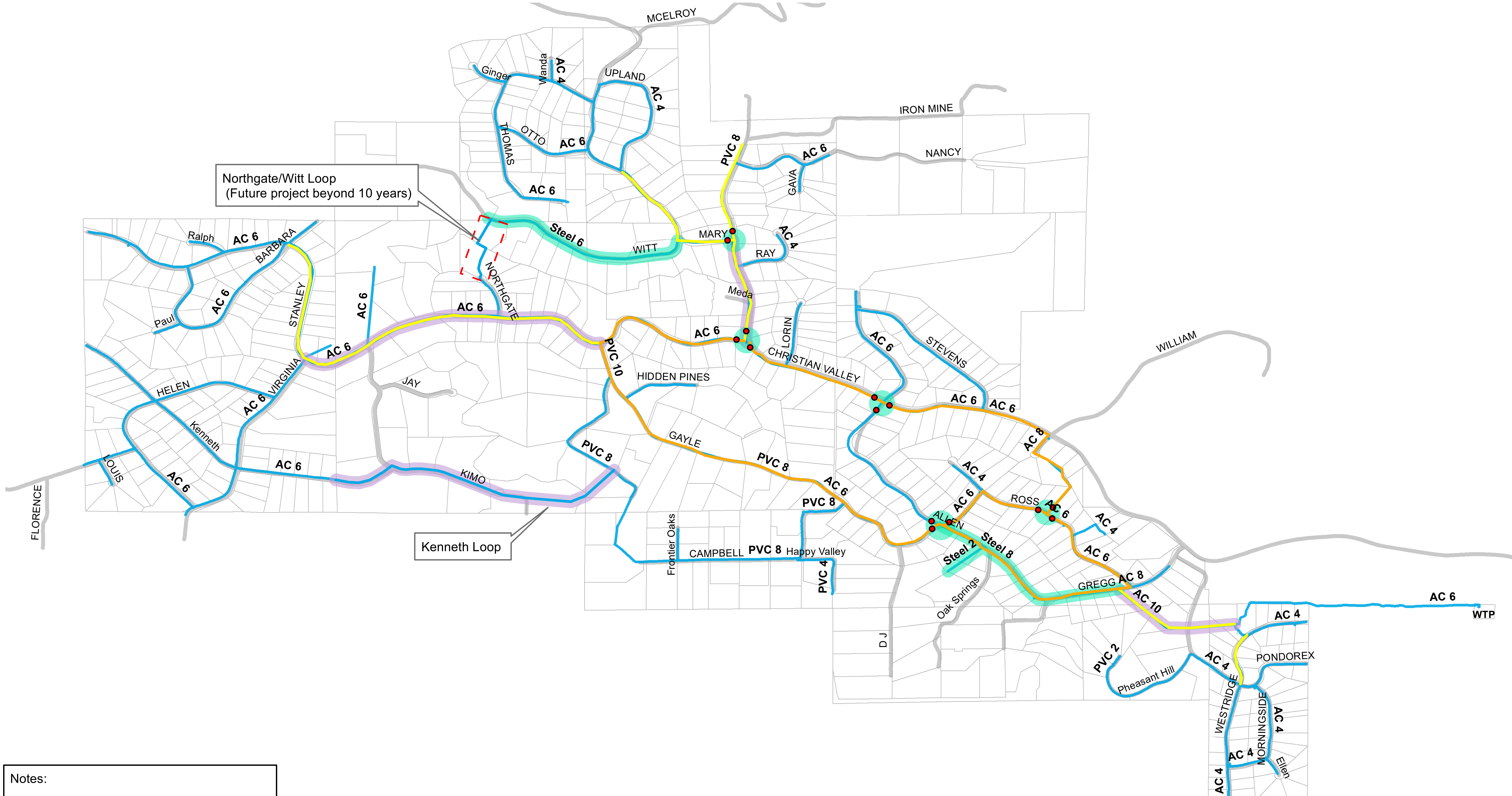
SOURCES:
- HYDROS ENGINEERING
- PLACER COUNTY GIS DATA

Christian Valley Park CSD 2018 CIP

Figure 2 - Reliability Improvement Projects

Proposed Valves
Proposed Pipelines
Roads
Parcels
Existing Mainline Valves
Existing Pipelines

HydrosEngineering
Planning · Design · Operations
PO Box 81
Weimar CA, 95736
(530) 637-4441
hydros-engineering.com



Notes:

1) Existing valves not shown

NORTH

Not To Scale

COORDINATE SYSTEM:
CALIFORNIA STATE PLANE, ZONE II, NAD83, U.S. SURVEY FEET

SOURCES:
- HYDROS ENGINEERING
- PLACER COUNTY GIS DATA

Christian Valley Park CSD 2018 CIP

Figure 3 – One to Ten Year CIP Projects (with pipeline priority)

1 - 5 Years | 6 - 10 Years | Proposed Valves | Roads | Parcels
High Priority Pipeline | Medium Priority Pipeline | Low Priority Pipeline

HydrosEngineering
Planning · Design · Operations
PO Box 81
Weimar CA, 95736
(530) 637-4441
hydros-engineering.com

Table 6
Remaining Life and Replacement Cost

Numerical Year	1	2	3	4	5	6	7	8	9	10
Calendar Year	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Water Treatment Plant										
1 to 5 Years										
Headworks	$ 10,000									
Filter 3 Rehab/Replacement	$ 50,000	$ 50,000								
General Repair/Replace	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000					
6 to 10 Years										
Floc/Sed Basin Rehab						$ 30,000				
General Repair/Replace						$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000
Transmission and Distribution										
1 to 5 Years										
2-inch Extension on Allen			$ 65,900							
6-inch - Witt Rd Replacement				$ 386,600						
8-inch - Allen Replacement (steel portion)			$ 553,000							
Valves - Total of 6 - (Reliability/Redundancy Project)	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 30,000					
6 to 10 Years										
10-inch From Reservoir to Greg						$ 352,550				
6-inch - CVR (Stanley to Mary)							$ 251,007			
6-inch - Stanley (Gayle to Virginia)								$ 633,500		
Kenneth Loop (Reliability/Redundancy Project)									$ 350,000	$ 400,000

Notes:
1) All costs based on 2018 ENR 20 Cities Construction Cost Index - 11,200 (August 2018)

1 to 5 Total		**6 to 10 Total**	
Dist	$ 1,095,500	Dist	$ 1,987,057
Plant	$ 185,000	Plant	$ 105,000
Total	**$ 1,280,500**	**Total**	**$ 2,092,057**

- Stanley From Gayle Road to Virginia – Replacement 6-inch diameter pipe. This is a critical section of pipeline. Historically has not been problematic, but is currently the only segment of pipeline that service the eastern portion of the District. The construction of the Kenneth Loop would reduce the importance of this segment. If the Kenneth Loop were constructed, reevaluation of this segment should be made.

- Christian Valley Road From Stanley to Mary – Replace 6-inch diameter pipeline from Stanley to Mary. This segment provides service to the northern end of the District. There is a creek crossing as well. Failure on this segment would interrupt service to the California Conservation Corp, Upland, Mary, Thomas, etc. Historically this segment has not been problematic.

- Reliability/Redundancy Project –Kenneth Loop - Intertie the east and west side of the system with a parallel pipeline to the Stanely main. This improvement would provide a substantial amount of reliability. There is also the potential to add approximately 10 new connections if there was a desire by the land owners to receive service. Acquiring easements and right of way will be necessary and could be time consuming and should occur early in the planning phase. See Figures 2 and 3 for the project area.

Total estimated cost of the 6-10 year projects in 2018 dollars is $2.1 million and distributed as shown on Table 6.

> 10 Year Projects – Projects in this realm will address areas of the system that become problematic. As noted, if all of the distribution system projects identified between 1-10 years were completed, over $13.5 million of projects will remain.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations resulting from the CIP are included in this section.

Conclusions

Conclusions include:

1. The District owns and operates the water system including treatment plant, storage reservoir and transmission/distribution system. The system complies with State and Federal drinking water requirements.
2. Over the years improvements have been made to the water treatment plant in increase reliability and meet changing regulatory requirements. There have not been many major distribution system projects other than the Gayle Loop project. There are about 16 miles of pipe in the system. The average age is just over 50 years. There are known problem spots in the distribution system that have a high occurrence of leaks, but overall the system operates well.
3. The District is in the process of replacing the existing inground storage reservoir with two steel tanks. The project will be funded through a loan from the USDA and District reserves. The 2013 rate increase will cover debt service on the storage tank project.

4. The majority of the system was constructed using AC pipe. The estimated useful life of AC pipe varies, but the AWWA suggests that in the Western United States it can be up to 105 years on the upper range. 105 years was used as the projected useful life for this analysis.
5. Projects have been identified within the treatment plant and distribution system. Funds should be accumulated for pipeline repair and replacement. The majority of the costs are in the distribution system, with a small portion of the remainder at the water treatment plant.
6. Improvements have been identified for the 1-5 year, 6-10 year and >10 year time horizons. Water customer bills would need to increase by nearly $100 per month in order to accumulate reserves to replace all of the pipelines before the end of their useful life. Such an increase is not realistic.
7. A CIP plan was developed for the next 10 years. The 1-5 year horizon will be used to evaluate current water rates as part of a planned Rate Study.

Recommendations include:

1. The District Board of Directors review this Draft CIP Plan. If acceptable, provide the information to the Financial Consultant for evaluation of rate impacts. Based on the results of the rate evaluation, reevaluate CIP and determine if the plan should be adjusted to increase more or less budget for projects.
2. Utilize the finalized CIP for budgeting and setting rates for the next increase.
3. Proceed with recommend CIPs from the finalized CIP; adjust priority of the replacement projects based on system status and operation.
4. Adjust the CIP as projects develop based on system performance and revenue requirements.