Auburn Valley Community Service District

Capital Improvement Plan 2023-2028

4/21/2023

Developed by:
AVCSD Board and CIP Committee

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1 District Background

The Auburn Valley Community Services District is a small service district in northern Placer County providing water and sewer to the Auburn Sierra Golf Course (ASGC) and the homes surrounding ASGC since 1979. The District serves a population of 290 and has 139 residential and 4 commercial water service connections, all metered. The 4 commercial connections provide potable water only to the golf course. The ASGC irrigation water is provided by the Nevada Irrigation District and there are no cross-connections between the irrigation system and AVCSD's potable water system.

The meters in the District measure water in both cubic feet and gallons, and the District has established a single rate tier based on number of water units used by each meter connection. One unit is equivalent to 100 cubic feet or 748 gallons and the cost per unit is $2.40. The metered water charge is billed quarterly. The District also assesses a monthly water operations and maintenance charge of $45 per month. Average monthly billing is approximately $112 for a single household, for a yearly average of about $1,350. While the District occasionally has customers pay their bills late, the District has not had any major cash flow issues due to nonpayment.

Over the past few years the District has noticed an uptick in emergency repairs due to the aging infrastructure. The District needs to begin planning for the costs incurred with replacing aging infrastructure and providing redundancy in the system.

1.1 Water System

District water supply is sourced from five groundwater supply wells spread throughout the District's service area. A sixth supply well, Well 1, was abandoned in 1999, Well 5 and 7 were never developed. Wells 2 and 6 are located on Auburn Valley Property Owners Association (AVPOA) land near the AVPOA gazebo. Wells 4 and 8 are located on the northern half of the AVGC and are difficult to access due to the terrain and tree growth in the area. Water quality in all wells meets current standards except for Well 8, which contains high levels of manganese. The District is required to run Wells 8 and 4 simultaneously when using Well 8 so the manganese concentration is diluted to an acceptable level. Water quality standards will continue to become more stringent and the district will need to

Well 3 is located on private property, and although the District has an easement to access and maintain the well, the easement is not large enough for any major well rehabilitation and therefore proper maintenance of Well 3 has been difficult. The Well 3 pump is the original pump from 1993 and in need of replacement. Well 3 has been taken offline as of December 2021 due to complete failure of the pump. The District is working to replace the pump and motor in 2022 once temporary construction easements can be agreed upon with homeowners.

A summary of the District's five wells and their pumping capacity and pump power can be found in Table 1.

Table 1 - Summary of AVCSD Supply Wells

Well Name	Pump Capacity (gpm)	Pump Horsepower
Well 2	23	15
Well 3	46	30
Well 4	217	50
Well 6	76	25
Well 8	50	20
Total Well Capacity	412	140

The actual production capacity of Well 6 is limited by the refill rate of the well. The existing pump is oversized and empties the well when run at full capacity; the District must run the pump at a capacity of 27 gpm to maintain constant supply from Well 6. The Placer County rating of Well 8 is only 50 gpm, although it typically produces 108 gpm. Due to drought conditions and potentially over pumping, all wells experience a decrease in average daily production rates during the summer months.

The District owns two storage facilities, a 200,000-gallon bolted steel water tank and an in-ground reservoir with 340,000-gallons capacity. The District also owns a water pump station with 4 pumps for distribution of supply water. The pump station, storage tank, and reservoir are located on the same property just north of the intersection of Auburn Valley Road and View Ridge Drive. The District owns two backup generators for the water system; one is used for Well 2 and the other is installed at the pump/tank station.

The District's wells and pump station maintain appropriate flow to the storage facilities by way of an aging cellular supervisory control and data acquisition (SCADA) system that communicates by way of antennae at each well and the pump station. On October 27, 2021, the SCADA system lost communication with Well 4, resulting in an overflow of the aboveground storage tank. The operators were also not notified by alarms in the SCADA system even though they should have gone off at Well 4 and the aboveground tank. The remote location of the District, especially Well 4, means loss of communication from the SCADA system is common, and the aging nature of the infrastructure makes repairing and improving the system increasingly difficult. The estimated loss of water from the October overflow was around 50,000 gallons. The District replaced the antenna at Well 4 with one twice as tall to hopefully improve communications between Well 4 and the rest of the system.

In the event of a power shutoff, the District estimates the storage facilities can provide up to 4 days of water at normal use rate and 10 days of water if used conservatively. Normal use in the District is higher than in surrounding communities due to the size of the properties served. Well 2 can provide water with it's backup generator but is the smallest of all the District's supply wells and cannot maintain maximum daily demand (MDD) on its own.

District water usage varies seasonally. Current estimated summer usage is close to 250,000 gallons per day (gpd) due to landscaping irrigation, while winter usage is approximately 25,000 gpd. Recent power outages have prevented recovery of historic production data from the system, and an evaluation of the system to determine MDD has not been conducted since 2006. The 2006 system evaluation reported current MDD and projected MDD at buildout, shown in Table 2.

Assuming average summer usage occurs six months of the year and average winter usage the other six months, the average daily consumption of the current system can be estimated at 962 gpd per EDU. Assuming maximum daily consumption in the system will be 10% greater than the average summer usage, the same assumption used in the 2006 system evaluation, maximum daily consumption can be calculated as shown in Table 2. It is assumed consumption will not change between the current system conditions and full buildout.

Table 2 - Recent Calculations of Maximum Day Demand

Condition	Total # EDUs served	Average Daily Consumption*	Maximum Daily Consumption	Average Demand*	Maximum Demand
		gpd/EDU	gpd/EDU	gpm	gpm
Existing (2005)	100	1130	2250	78	156
Buildout (Calculated 2006)	140			110	219
Existing (2021)	143	962	1923	95	191
Buildout (Calculated 2022)	146			97	195

*Average Daily Consumption is less than the average summer usage used to calculate MDD

Table 2 shows that consumption has decreased since 2006; however, current water consumption data is likely lower than actual consumption because of drought restrictions placed on the District by the State. Lack of availability of historic data due to collection issues limits the ability to calculate an accurate MDD for non-drought conditions. As drought conditions and public safety power shutoffs become more frequent, AVCSD has expressed concern over meeting their maximum day demand (MDD) with their existing wells. The District has previously considered developing a new supply well to alleviate supply concerns and identified a potential well site, but the location was denied by Environmental Health for proximity to surface water and several other concerns. Increasing the reliability of systems and communications on well sites may alleviate some of the District’s supply concerns.

No water treatment is required apart from dilution of water from Well 4 to reduce manganese concentrations at this time.

The distribution system is split into two zones; the lower system contains the older parts of the system, while the upper system is the newer portion of the system. In total the system has approximately 21,500 linear feet of pipe. The lower system does not rely on pressurization of supply water from the pump station, but the upper system does. The lower system consists of primarily 6- and 8-inch asbestos concrete pipe, while the upper system is primarily 6- and 8-inch PVC pipe. Approximately 28 fire hydrants are installed across the distribution system. All wells are connected to the system by 4- or 6-inch PVC pipe, except for Well 2 which is connected by 6-

inch asbestos concrete pipe. The distribution system lacks a sufficient amount of isolation valves making rehabilitation and replacement difficult.

1.2 Sanitary Sewer System

In 2002, a new treatment plant (WWTP) was constructed for the Auburn Valley Residential Subdivision and the Auburn Valley Country Club (now Auburn Sierra Golf Club). The WWTP replaced a system of six earthen non-aerated oxidation and percolation ponds which were abandoned with the construction of the WWTP as the ponds were no longer consistent with current plans and policies of the State Board.

The WWTP is located on assessor parcel number (APN) 026-370-041, which is owned by Harvego Real Estate, LLC (Harvego) and AVCSD has an easement for the WWTP to exist on the land. The WWTP is a tertiary level activated sludge system capable of processing 60,000 gallons per day of domestic wastewater. It employs a 24,000 gallon equalization aerated grit chamber with grinder, 40,000 gallon activated sludge reactor, 16,000 gallon batch clarifier, 5,000 gallon disinfection ozone contact chamber, approximately 10 square feet of filter area, 9,000 gallon effluent pumping tank and 16,000 gallon aerobic sludge digester. Final wastewater disposal will be accomplished via subsurface drip emitters. The WWTP is equipped with a generator for power outages.

Estimated influent wastewater strength is as follows Biochemical oxygen demand 298 mg/L, Total Suspended Solids 252 mg/L, and Total Nitrogen 35 mg/L. Effluent quality per the Report of Waste Discharge is as described in Table 3.

Table 3 - Effluent Concentrations

Constituent	Secondary Concentration	Tertiary-Final Effluent Concentration
Biochemical Oxygen Demand	12 mg/l	2 mg/l
Total Suspended Solids	10 mg/l	2 mg/l
Turbidity	5.0 NTU	1.0 NTU
Total Nitrogen	< 5 mg/l	< 5 mg/l
Total Coliform	Variable	< 2.2 MPN/100 ml
Total Dissolved Solids	461 mg/l	461 mg/l
pH	7-8 units	7-8 units

Treated Effluent is disposed via six subsurface disposal fields; three are primary (4.743 acres) and three are replacement disposal fields (4.741 acres). The disposal fields were designed using a disposal rate of 0.29 gpd/sq ft.

There are two lift stations; one is a primary that pumps the wastewater from the community to the WWTP, and the second is a pump station that delivers wastewater from private laterals into the sanitary sewer system.

The primary lift station consists of SCADA telemetry for the pump, a back up generator, 15,000 gallon wet well and an overflow well with 20,000 gallons of storage. The overflow well was installed to provide additional capacity during large rain events when the system incurs inflow and infiltration. Only the wet well is equipped with a pump, thus when the overflow well is used a submersible trash pump must be used to pump wastewater into the main wet well to be conveyed to the WWTP.

The sanitary sewer system includes approximately 20,000 linear feet of sanitary sewer gravity and forcemain and 69 manholes. All gravity sewer pipes are 6-inches in diameter and force mains vary from 2 to 4-inches in diameter. Portions of the sanitary sewer system have been rehabilitated with cured in place pipe, and epoxy lining of manholes. The system still experiences inflow and infiltration during heavy rain events, and is overdue for smoke testing to determine if there are other leaks within the system.

2 Deficiencies

2.1 Water System

2.1.1 Water Supply

The existing five wells that provide water to the system are in need of repairs, SCADA upgrades, additional backup power and replacement. Over the years AVCSD has seen a decline in production at Well 2 and Well 3, likely due to the prolonged drought.

2.1.2 Water Piping

The upper system consists of newer PVC pipe which appears to be in good condition. The lower system consists of aging asbestos cement pipe, which according to a leak detection survey that was completed in 2022 has no leaks. Asbestos cement pipes are known to have a long life cycle, but the gaskets are known to fail and leak over time.

2.1.3 Water Valves

The water system lacks sufficient valves to isolate portions of the water system. This makes it difficult to replace meters, and install valves or hydrants when the majority of the system will need to be turned off.

2.1.4 Fire Hydrants

The existing fire hydrants were installed at least 20 years ago and may contain lead. Currently the hydrants are in good working condition, but depending on future requirements to remove lead from water systems they may need to be replaced.

2.1.5 Water Storage

The existing tank is in good working condition, but the above ground reservoir is nearing the end of its useful life. It is expected that once the reservoir nears the end of its life the County will require that an above ground tank be installed.

2.1.6 Meters

The meters within the community are old, and outdated compared to new industry standards. Many meters were placed in poor locations and are sometimes submerged in mud or irrigation water. Some meters have valves that are frozen or do not close all the way that need to be replaced.

2.1.7 SCADA

The SCADA system used for the water system is very old and outdated based on current industry standards. Replacement parts are no longer available for purchase and must be fabricated or bought used from a third party website. The system does not have the ability to archive data such as; pumping rates, water surface elevations in the wells and tanks, and daily production data. Due to the age of the system the operators have limitations on what types of calls and alarms can be set; and the engineers have limited data.

2.2 Sanitary Sewer System

2.2.1 Sanitary Sewer Treatment

The Wastewater Treatment Plant (WWTP) is in good working condition but will need improvements in the long-term future. The WWTP has had no violations for treatment and has only had SSO incidents due to heavy rains and one blockage due to fat, oils and grease (FOG). The onsite SCADA is newer than the SCADA used on the water system. The existing generator for the WWTP is diesel, which may need to be replaced with a propane generator in the future due to air quality regulations.

2.2.2 Sanitary Sewer Lift Station

The primary sanitary sewer lift station is in need of an additional pump that can be installed in the overflow wet well that would be connected to the SCADA and telemetry at the lift station. An additional pump would reduce the amount of man hours that are needed on site when the overflow wet well is used. If an additional pump was installed the SCADA would call the pump once the main wet well was empty.

2.2.3 Sanitary Sewer Pipes

The existing sanitary sewer pipes condition is unknown. The existing system is overdue for a Closed Caption Television Inspection (CCTV) and smoke test. The operators still report an influx of flow during heavy rain events and a recent SSO was found to be caused by a large FOG blockage.

2.2.4 Sanitary Sewer Manholes

Upon visual inspection the sanitary sewer manholes appear to be in good working condition. The manhole lids are seated well and do not contain any holes that would allow inflow. The oldest manholes in the system have been epoxy lined and do not have any cracks upon visual inspection.

2.2.5 Sanitary Sewer Laterals

The existing condition of sanitary sewer laterals is unknown. See section 2.2.3.

2.2.6 SCADA

The SCADA system for the wastewater treatment plant is newer than the water system and is cloud based. The operators can monitor pump activity, and wastewater levels in the tanks from their cellphones.

3 Water System Recommendations

The following Capital Improvement Projects are recommended based on this desktop study. Table 4 summarizes the project, implementation period and approximate cost.

The cost estimates in Table 4 were provided by the operators and a 20% contingency was added. The following projects are assumed to not be completed via a competitive bid process. Projects with an implementation of 6+ years are not included in this CIP.

Table 4 - Water System Capital Improvement Projects

Project #	Project Name	Priority Level	Implementation Period	Cost Estimate	Grant Funding?
W-1	Well #3 Repairs	1	2023/24	$96,000	N/A
W-2	Feasibility Study: NID Piped Water Supply (Bell Rd)	1	2023/24	$18,000	N/A
W-3	Install Isolation Valves (Viewridge & Fairway)	2	2024/25	$12,000	N/A
W-4	Reservoir Cover Replacement	2	Years 6+	$-	N/A
W-5	Below Ground Water Reservoir	2	2027/28	$120,000	N/A
W-6	Pump House Electronics	2	2026-2028	$108,000	N/A
W-7	Pumps for Wells 3, 4, 6 & 8	2	2024-2028	$108,000	N/A
W-8	Well #4 VFD	3	2024/25	$30,000	N/A
W-9	Water Meter Replacement/Monitoring Upgrades	3	Years 6+	$-	Possibly, EPA.
W-10	SCADA Upgrades (Construction Cost Only)	3	2027/28	$96,000	N/A
W-11	Well #4 Back Up Generator	3	Years 6+	$-	N/A
W-12	Above Ground Storage Tank Rehab	3	Years 6+	$-	N/A
W-13	Extend 8" NID Domestic Water Pipe Line	3	Years 6+	$-	N/A
W-14	New Domestic Water Well	3	Years 6+	$-	N/A

W-1. Well #3 Repairs

This project includes the replacement of the well motor and pump, relocation of a privately owned power pole and relocation of existing electrical panel and SCADA equipment. Community grant funding has been applied for through the Kevin Riley Appropriation Funds in March 2023.

W-2. Feasibility Study for Piped Water Supply from NID (Bell Rd)

This project will include the preparation of a Feasibility Study rehabilitation of the storage tank. Rehabilitation of the tank may include cathodic protection, recoating/repainting the tank and other electrical upgrades.

W-3. Install Isolation Valves

This project includes the installation of four new isolation vales. There will be two isolation valves installed on Viewridge Drive, and two on Fairway Drive. This project will be done in house as maintenance and utilize existing equipment that the District has already purchased.

W-4. Reservoir Cover Replacement

This project will include the replacement of the existing water reservoir storage cover.

W-5. Below Ground Water Reservoir

This project will include the rehabilitation of the existing water reservoir storage cover. This may include new valving, a new reservoir liner and/or an addition of capacity.

W-6. Pump House Electronics

This project will include ??

W-7. Pumps for Wells 3, 4, 6 & 8

This project will include the replacement and upgrades required at each well to provide a reliable water source.

W-8. Well #4 VFD

This project includes the installation of a VFD, associated electronics and pump protection to prolong the life of the existing well motor and pump will be installed as part of a different project. Engineering and plans have already been constructed and the project is shovel ready.

W-9. Water Meter Replacement/Monitoring Project

This project would include replacing old, aging water meter valves within the Community that have been flagged by the operators. It is assumed that the meters would be replaced for the top 20 users in the system. This project would replace approximately 15% of the meters within the system.

W-10. SCADA Upgrades

This project includes construction costs only for SCADA upgrades. For wells? Pump house? Entire system??

W-11. Well #4 Back Up Generator

This project will include installation of a back up generator at the Well #4 site on an easement to AVCSD on the golf course property. Installation would include the generator, a propane or diesel tank, additional fencing, clearing and grubbing and other electronics.

W-12. Above Ground Storage Tank Rehabilitation/Replacement

This District does not intend to rehabilitate the tank as it cannot be lined. Instead the District will plan to replace the Tank at the end of it's useful life.

W-13. Extend 8" NID Domestic Water Pipe From Bell Rd

This project will be contingent on the analysis of the Feasibility study from Project W-12.

W-14. New Community Well Project

This project will include the planning and technical studies and construction cost for drilling a new well for the District. This may include hiring a hydrogeologist, completing environmental documents and obtaining easements. Depending on the location and depth of the new well the cost may be higher or lower.

4 Sanitary Sewer Recommendations

The following Capital Improvement Projects are recommended based on this desktop study. **Error! Reference source not found.** summarizes the project, implementation period and approximate cost.

The cost estimates in **Error! Reference source not found.** were provided by the operators and a 20% contingency was added. The following projects are assumed to not be completed via a competitive bid process. Projects with an implementation of 6+ years are not included in this CIP.

Table 5 - Wastewater System Capital Improvement Projects

Project #	Project Name	Priority Level	Implementation Period	Cost Estimate	Grant Funding?
WW-1	Inflow & Infiltration Study	1	2024/25	$75,000	N/A
WW-2	Sanitary Sewer I&I Reduction	2	2025-2028	$225,000	N/A
WW-3	Primary Lift Station Upgrades	2	2027/28	$50,000	N/A
WW-4	Disposal Field Repairs	2	2024-2026	$50,000	N/A
WW-5	Treatment Plant Pump Replacement	2	2024-2027	$30,000	N/A
WW-6	WWTP Building Repairs	2	Years 6+	$-	N/A
WW-7	Air Blowers	2	2026/27	$10,000	
WW-8	Pipe Line Camera & Reels	2	2026/27	$10,000	N/A
WW-9	Hallberg Lift Station Transmitter	3	2026/27	$10,000	N/A
WW-10	Primary Lift Station – Wet Well Replacement	3	Years 6+	$-	N/A
WW-11	WWTP Back Up Generator Replacement	3	Years 6+	$-	N/A

WW-1. Inflow and Infiltration Study

This project will include a closed-circuit television (CCTV) inspection of approximately 5,000 LF of sewer pipe and manholes. The inspection may include rodding of the lines depending on the existing condition of the pipes. Upon completion of the study recommendations will be given to reduce the Inflow &Infiltration (I&I) in the system.

WW-2. Sanitary Sewer I&I Reduction

This project will include improvements or repairs that are recommended to reduce I&I from the I&I Study. It is assumed that each I&I Reduction project will include 2,000 LF of sanitary sewer rehabilitation or replacement.

WW-3. Primary Lift Station Upgrades

This project will include the installation of an additional pump in the overflow wet well, additional SCADA and telemetry, and float switches. This project does not include any work to upsize the existing back up generator if needed.

WW-4. Disposal Field Repairs

This project will include the repair/replacement of approximately XX LF of Disposal Field piping. It is assumed that XXLF will be done per Fiscal Year of the project.

WW-5. WWTP Pump Replacement

This project will include the replacement of one pump pe Fiscal Year of the project.

WW-6. WWTP Building Repairs

This project will include the repair of the existing building, may include roofing, doors, video and audio surveillance equipment and fencing.

WW-7. Air Blowers

This project will include the replacement of three air blower equipment at the WWTP.

WW-8. Pipe Line Camera and Reels

This project will include the repair of the existing building, may include roofing, doors, video and audio surveillance equipment and fencing.

WW-9. Hallberg Lift Station Upgrades

This project will include the installation of alarms and electronics to monitor the lift station which serves three parcels. The electronics will be tied into the Primary Lift Station alarms and calls.

WW-10. Primary Lift Station Wet Well Replacement

This project will include the replacement of the existing wet well and overflow tank. It is recommended that an overflow weir is installed between the two tanks for operational flexibility.

WW-11. WWTP Back Up Generator

This project will include the replacement of the existing permanent generator, and replacement of the diesel tank with a propane tank.