REPORT TO THE BOARD OF DIRECTORS
BOARD MEETING OF MAY 2, 2024
AGENDA ITEM NO. 8. D.

SUBJECT: **RECEIVE REPORT AND FINDINGS OF WATER SYSTEM RELIABILITY STUDY UPDATE**

PREPARED BY: Adam Brown, Operations Manager

APPROVED BY: Nicholas Schneider, General Manager

BACKGROUND

The District provides treated water, irrigation water, and sewer services to communities throughout the Georgetown Divide. District customers consist of approximately 3,800 treated water customers, 375 irrigation customers, and 1,100 wastewater customers. In order to meet customer demands the District operates and maintains significant infrastructure, including over 70 miles of raw water conveyance, 200 miles of treated water distribution lines, two water treatment plants, 10 storage tanks, 5 pumping stations, 3 reservoirs with 2 State-regulated dams, 2 miles of sewer pipelines and community disposal field.

A *Water System Reliability Study* was completed by KASL Consulting Engineers (KASL) in 2002 that assessed District assets and deficiencies in order to assist the District's technical staff in the development of a long-term Capital Improvement Program. Multiple projects were identified, of which some have been completed in the previous 20 years. In May 2022, the District entered into an agreement with KASL to complete a *Water System Reliability Study Update* (Study).

DISCUSSION

The scope of the Study included a detailed field evaluation of approximately 35 miles of raw water conveyance systems upstream of the Walton Lake and Sweetwater Treatment Plants. Seasonal conveyance systems were not included in this Study. The scope of the Study also included evaluation of the entire treated water distribution system including; pipelines, storage tanks, booster pump stations, pressure-reducing valve stations, hydrants, and valves. System improvements completed over the last 20 years and the District's water system operation and maintenance costs were used to prioritize improvements for the next 20 years. Treatment plants, Walton Lake, and Sweetwater along with wastewater system evaluations were not included in this Study.

Due to the sensitive infrastructure details discussed in the report, a summary of deficiencies and summary documents are provided in the following sections.

***Section I - Introduction*:** This section details the project scope which is detailed above.

***Section II – Executive Summary*:** This section summarizes reliability measures and construction cost of the raw water conveyance and treated water distribution systems. Each reliability measure was estimated at current construction cost and projected into short-term (2024-2030), moderate-term (2030-2035), and longer-term construction cost (2040-2045). Total current construction cost for raw water conveyance reliability measures is $19,315,450 compared to future construction cost totaling $27,992,700. Total current construction cost for distribution facilities reliability measures is $16,180,250 compared to future construction cost totaling $21,831,350. The summary table of reliability measures is included as **Attachment A**.

***Section III – Inventory of Asset Improvements and Conditions*:** This section of the Study inventoried each asset and assigned a condition repair priority. The repair priorities (i.e. short-term, moderate-term, and long-term) were applied to Section II reliability measures. Inventory of District assets is included as **Attachment B**.

***Section IV – GDPUD GIS Update*:** This section of the report details the digitalization of infrastructure as-builts and condition assessment and how District staff can electronically retrieve. As a larger effort District staff will be incorporating these findings into the asset management software.

***Section V – Findings and Recommendations, Raw Water Conveyance System*:** This section discusses in detail what is summarized in the attached tables.

***Section VI – Findings and Recommendations, Treated Water Distribution System*:** This section discusses in detail what is summarized in the attached tables.

In summary, this Study has identified, delineated, and prioritized deficiencies within the raw water conveyance system and distribution facilities. Major deficiencies include:

Raw Water Conveyance

- Installing HDPE pipe along large sections of the upper canal to improve water delivery reliability;
- Concrete large sections of ditch segments to reduce water losses;
- Key improvement to control/valve structures along conveyance system;
- Improve access and construct safety systems to remote and existing infrastructure;
- Implement erosion control methods along canal segments to improve reliability; and
- Ongoing vegetation management;

Distribution Facilities

- Pump station resiliency/reliability improvements;
- Distribution tank structural/cosmetic/capacity improvements;
- Valve system and pressure management replacement/improvements;
- Aging distribution main replacement; and
- Distribution line capacity replacement and increase of storage capacity to meet standard fire flows.

The major system deficiencies outlined above, and other systems deficiencies will continue to be inserted into the Capital Improvement Plan, applied towards available grant funding, operating budget, and all other funding sources so the District can continue to supply clean and reliable drinking water to residents of Divide communities.

FISCAL IMPACT

This study was funded by the District's CIP. A total of $200,000 was funded from the capital reserve fund and $50,000 through El Dorado County Water Agency (ECWA) from American Recover Plan Act (ARPA) funds. Long-term fiscal impact will be detailed in annual budgets and CIP.

CEQA ASSESSMENT

This is not a CEQA project.

RECOMMENDED ACTION

Staff recommends the Board of Directors of the Georgetown Divide Public Utility District receive this study and confirm the findings.

ATTACHMENTS

A. Reliability Measure Summary Tables
B. Inventory of District Assets Tables

Attachment 1

TABLE II-1
ESTIMATED CONSTRUCTION COSTS AND ANNUAL MAINTENANCE COSTS,
RAW WATER CONVEYANCE RELIABILITY MEASURES

Current
(Jan. 2024) ENRCC = 13,900

RELIABILITY MEASURE	ESTIMATED CURRENT CONSTR. COSTS	PROJECTED FUTURE COSTS[1]			
		SHORT TERM MEASURE (2024-2030)	MODERATE TERM MEASURE (2030-2035)	MODERATE TERM MEASURE (2035-2040)	LONGER TERM MEASURE (2040-2045)
	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Pilot Creek Diversion to Bacon Creek Diversion					
• Complete Trail Clearing and Restoration (3900 FT).[2]	$ 35,000	$ 38,150			
• Construct Modular Type Bridge Crossing of Pilot Creek.	$ 250,000	$ 272,500			
• Construct Safety & Access Improvements, Pilot Creek Diversion Structure.	$ 25,000	$ 27,250			
• Repair Pilot Creek Diversion Concrete.	$ 15,000	$ 16,350			
• Upgrade Pilot Creek Diversion Valve.	$ 35,000			$ 53,800	
• Install Automatic Valve Control and Remote Monitoring Equipment.	$ 50,000			$ 76,900	
• Widen Trail to 12 Feet for Vehicle Access, Bacon Creek Diversion to Pilot Creek Crossing (± 3000 FT).	$ 1,275,000				$ 2,328,000
Bacon Creek Diversion to Structure 1					
• Widen Trail to 12 Feet to Extend Vehicle Access, Bacon Creek Connection to Bacon Creek Diversion (± 2000 FT).	$ 850,000		$ 1,100,100		
• Replace Open Ditch Sections with HDPE Piped Improvements (± 500 FT).[3]	$ 120,000	$ 130,800			
• Surface Vehicle Access with Minimum 6" A. B. Section (± 4300 FT).	$ 120,000		$ 155,300		
Structure 1 to Structure 2					
• Widen Access through Narrows to Provide GDPUD Maintenance & Construction Vehicle Access (± 800 FT).	$ 425,000	$ 463,200			
• Replace Open Ditch Section in the "Narrows" with HDPE Piped Improvements (± 600 FT).[3]	$ 144,000	$ 156,950			

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	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Structure 1 to Structure 2 cont'd)					
• Replace Remaining Open Ditch Sections (± 1900 FT) with Piped Improvements.	$ 855,000		$ 368,850	$ 438,200	$ 520,400
• Surface Vehicle Access with Minimum 6" A.B. Section (± 6450 FT).	$ 180,000	$ 196,200			
Structure 2 to Structure 3					
• Replace with HDPE Piped Improvements, Priority Repair Open Ditch Sections, Downstream of Structure 2 (± 300 FT).[3]	$ 78,000	$ 85,000			
• Replace Remaining Open Ditch Sections with HDPE Pipe (± 4615 FT).	$ 2,076,750		$ 895,950	$ 1,064,300	$ 1,264,000
• Widen Ditch Access Road to Minimum 12 Feet. Surface with Minimum 6" A.B. Section (± 9465 FT).	$ 950,000	$ 1,035,450			
Structure 3 to Structure 4					
• Replace Open Ditch Sections w/ HDPE Piping (± 1315 FT).	$ 591,750		$ 255,300	$ 303,250	$ 360,150
• Widen Ditch Access Road to Minimum 12 Feet. Surface with Minimum 6" A.B. Section (± 2100 FT).	$ 111,300		$ 144,050		
Structure 4 to Structure 5					
• Complete Replacement of Open Ditch Section with HDPE Pipe, Priority Repair Area Downstream of Structure 4(± 450 FT).[3]	$ 108,000	$ 117,700			
• Replace with HDPE Pipe Remaining Open Ditch Sections (± 5260 FT).	$ 2,367,000		$ 1,021,150	$ 1,213,000	$ 1,440,650
• Widen Ditch Access Road to 12 Feet. Surface with Minimum 6" A.B. Section (± 7465 FT).	$ 395,650		$ 512,050		
Structure 5 to Structure 6					

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	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
• Replace with HDPE Pipe Open Ditch Sections (± 3435 FT).	$ 1,545,750		$ 666,850	$ 792,150	$ 940,800
• Widen Ditch Access Road to 12 Feet. Surface with Minimum 6" A.B. Section (±4325 FT).	$ 229,250		$ 296,700		
• Upgrade Structure 6 with Galvanized Steel Access Platforms and Safety Railings.	$ 10,000	$ 10,900			
Structure 6 to Structure 7					
• Replace with HDPE Pipe Open Ditch Sections (± 2900 FT).	$ 1,305,000		$ 563,000	$ 666,800	$ 794,300
• Widen Ditch Access Road to 12 Feet. Surface with Minimum 6" thick A.B. Section (± 2990 FT).	$ 150,500			$ 243,700	
• Upgrade Structure 7 with Galvanized Steel Access Platforms and Safety Railing.	$ 10,000	$ 10,900			
Structure 7 to Tunnel Hill Inlet					
• Replace with HDPE Pipe Open Sections (± 480 FT).	$ 216,000			$ 332,100	
• Widen Ditch Access Road to 12 Feet. Surface with Minimum 6" thick A.B. Section (± 1880 LF).	$ 99,500		$ 128,800		
Bacon Creek Diversion to Tunnel Hill Inlet					
• Purchase Heavy Duty Tree Clearing Removal and Lift Equipment.	$ 250,000	$ 272,500			
• Maintain Erosion Control Measures (annual cost).	$ 20,000[4]	$ 21,800[4]	$ 25,900[4]	$ 30,750[4]	$ 36,500[4]
• Improve Grizzly Debris Racks with Stepped Platforms, (± 12 Locations).	$ 60,000	$ 32,700	$ 38,850		
Tunnel Hill Outlet to Buckeye Powerhouse					

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	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
• Construct Concrete Ditch Lining Improvements Downstream of Balderston Road Crossing (± 650 FT).[3]	$ 32,500	$ 35,450			
• Stabilize Balderston Wastegate Foundation; Place Erosion Control Measures at Wastegate Discharge.	$ 23,500	$ 25,600			
• Gas Powered Steel Blade Cutter and Skid Steer Mounted Tiller.	$ 85,000	$ 92,650			
• Conduct Semi Annual Clearing of Berry Vines (annual cost).	$ 12,800[4]	$ 13,950[4]	$ 16,550[4]	$ 19,700[4]	$ 23,400[4]
• Dredge Walton Lake to Restore Storage Capacity. (± 14.0 ac-ft).	$ 252,000		$ 326,150		
• Record Permanent Pipeline and Access Easements for the Tunnel Hill Penstock, Canyon Creek Conduit and Buckeye Conduits. (Est. @ 19 parcels).	$ 66,500	$ 36,250	$ 43,050		
• Conduct Annual Clearing of Trees and Brush Within Tunnel Hill Penstock, Canyon Creek Conduit and Buckeye Corridors (annual cost).	$ 9,000[4]	$ 9,800[4]	$ 11,650[4]	$ 13,850[4]	$ 16,450[4]
• Line and Coat Tunnel Hill Penstock.	$ 15,000		$ 19,400		
<u>Buckeye Powerhouse to Taylor Mine Outlet</u>					
• Construct Concrete Ditch Lining of Open Ditch Section Downstream of Concrete Lined Section, Upstream of Taylor Mine Outlet (± 700 FT).[3]	$ 35,000	$ 38,150			
• Construct New Water Storage Reservoir near GDPUD Office and Shop; Estimated Capacity 20 to 25 acre-ft.	$ 2,521,000			$ 3,875,800	
<u>Buckeye Powerhouse to Taylor Mine Outlet (cont'd)</u>					
• Record Permanent Pipeline and Access Easements for	$ 59,500	$ 32,500	$ 28,500		

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the Schroeder and Buffalo Hill Pipeline Conduits. (Est. @ 17 Parcels).					
• Conduct Semiannual Clearing of Berry Vines (annual cost).	$ 18,000[4]	$ 19,600[4]	$ 23,300[4]	$ 27,700[4]	$ 32,850[4]
• Conduct Annual Clearing of Brush & Trees within Schroeder Conduit and Buffalo Hill Pipeline Corridors (annual cost).	$ 6,500[4]	$ 7,100[4]	$ 8,400[4]	$ 10,000[4]	$ 11,900[4]
Taylor Mine Outlet to Jackass Wastegate					
• Construct Concrete Ditch Lining Upstream Growlersburg Wastegate (± 200 FT).	$ 10,000	$ 10,900			
• Upgrade Spools Wastegate and Flume Similar to Improvements Completed at Summers Wastegate.	$ 25,000		$ 35,350		
• Provide Waterproof Coating for Summers Wastegate and Flume and Spools Wastegate and Flume.	$ 10,000		$ 12,950		
• Construct Concrete Ditch Lining Upstream of Summers Wastegate (± 1000 FT).[3]	$ 50,000	$ 54,500			
• Construct Concrete Ditch Lining Between Spools Wastegate and Hocket Hollow Pipeline Outlet (± 1200 FT).[3]	$ 60,000				
• Conduct Semiannual Clearing of Berry Vines (annual cost).	$ 3,500[4]	$ 3,850[4]	$ 4,500[4]	$ 5,400[4]	$ 6,400[4]
Jackass Wastegate to Sweetwater Trail WTP					
• Construct Concrete Lining of Ditch Between Syd Road and Kaiser Pipeline (± 2200 FT).[3]	$ 110,000	$ 119,900			
• Concrete Line Ditch Downstream of Jackass Wastegate and Upstream of Falls Section (± 1350 FT).[3]	$ 67,500	$ 73,600			
Jackass Wastegate to Sweetwater Trail WTP (cont'd)					
• Concrete Line Ditch Upstream of Greenwood	$ 150,000			$ 230,600	

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Reservoir (± 3000 FT).[3]					
• Replace with 24" DIP Remaining Sections of 22" Steel Pipe, Kaiser Pipeline and Kaiser Siphon (± 1650 FT).	$ 247,500		$ 320,350		
• Conduct Maintenance Dredging of Greenwood Reservoir and Sweetwater Trail Reservoir to Restore/ Enhance Capacity.	$ 450,000		$ 582,400		
• Record Permanent Pipeline and Access Easements for Kaiser Siphon, Kaiser Pipeline and Ford Siphon. (Est. 6 Parcels).	$ 21,000	$ 11,500	$ 13,600		
• Line Ditch Between Ford Siphon Outlet and Rita Court Pipeline Crossing, (± 100 FT).	$ 50,000	$ 54,500			
• Conduct Annual Clearing of Brush & Trees within Kaiser Pipeline, Kaiser Siphon, Ford Siphon Corridors (annual cost).	$ 2,500[4]	$ 2,750[4]	$ 3,250[4]	$ 3,850[4]	$ 4550[4]
• Conduct Semiannual Clearing of Berry Vines (annual cost).	$ 7,500[4]	$ 8,200[4]	$ 9,700[4]	$ 11,550[4]	$ 13,700[4]
• Replace Manual Sweetwater Trail WTP Supply Gate with Automatic Controls.	$ 40,000				$ 73,050
TOTAL ESTIMATED CURRENT CONSTRUCTION COSTS[4]	$ 19,314,450				
TOTAL ESTIMATED FUTURE CONSTRUCTION COSTS[4]		$ 3,452,050	$ 7,528,700	$ 9,290,600	$ 7,721,350

(1) FUTURE COSTS ASSUME AVG 3.5% PER YEAR INCREASE IN ENRCC, ENRCC CALCULATED FOR MIDPOINT OF EACH TERM.
(2) WORK TO BE COMPLETED BY GROWLERSBURG CONSERVATION CORPS FORCES.
(3) IMPROVEMENTS TO BE CONSTRUCTED BY GDPUD STAFF.
(4) ANNUAL ESTIMATED MAINTENANCE COSTS NOT INCLUDED IN ESTIMATED CONSTRUCTION COSTS.

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TABLE II-2
ESTIMATED CONSTRUCTION COSTS AND ANNUAL MAINTENANCE COSTS,
TREATED WATER PUMPING, STORAGE AND DISTRIBUTION FACILITIES

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		SHORT TERM MEASURE (2024-2030)	MODERATE TERM MEASURE (2030-2035)	MODERATE TERM MEASURE (2035-2040)	LONGER TERM MEASURE (2040-2045)
	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Booster Pump Stations					
• Modify Pump Control Panels for Connection to Portable Generator (all 5 locations).	$ 267,500	$ 291,550			
• Install Unit Heaters and/or Insulate Booster Pump Piping to Protect from Freezing (4 locations).	$ 14,000	$ 15,250			
• Replace Black Ridge Pump Station with Duplex Pump Station Equipment, New Control Panel, SCADA Capability and New Pump Station Structure.	$ 148,000	$ 161,300			
• Replace Chipmunk Trail Pump Station Pumps & Motors.	$ 15,000		$ 19,400		
• Reconnect Chipmunk Trail Pump Station Controls with Hotchkiss Hill Sub-Tank Level Signals.	$ 39,000		$ 50,500		
• Improve Instrumentation at Irish Lane Pump Station.	$ 22,500		$ 29,100		
• Modify Angel Camp Tank SCADA to Include Angel Camp Pump Station Controls.	$ 39,000			$ 59,950	
• Install Remote Monitoring of Pump Operating Control Signals with Cellular Based SCADA System.	$ 62,500				$ 114,100
• Conduct Annual Servicing of Booster Pump Station Equipment by Pump Station Equipment Supplier(s). (annual cost).	$ 15,000[2]	$ 16,350[2]	$ 19,400[2]	$ 23,100[2]	$ 27,400[2]
Water Storage Tanks					
• Conduct Tank Inspection by Certified Corrosion and Coating Consultants Every 3 to 5 Years.	$ 50,000	$ 54,500	$ 64,700	$ 76,900	$ 91,300
• Install Motion or Switch Operated Service Lighting at Tank Access Gates and at Tank Exterior Ladders.	$ 45,000	$ 49,050			
• Recoat Angel Camp Tank Interior and Exterior Surfaces.	$ 261,000	$ 284,500			

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	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Water Storage Tanks (cont'd)					
• Recoat Interior and Exterior Surfaces, Hotchkiss Hill Tank and Hotchkiss Hill Sub-Tank.	$ 327,000	$ 356,400			
• Conduct Coating Repairs (7 Tank locations).	$ 35,000	$ 38,150			
• Recoat Interior and Exterior Surfaces Black Oak Mine Tank, Deer Ravine Tank.	$ 345,000		$ 446,500		
• Recoat Interior and Exterior Surfaces Spanish Dry Diggins, Garden Park, Kelsey Tanks.	$ 480,500			$ 747,950	
• Recoat Interior and Exterior Surfaces Walton Lakes WTP Tanks.	$ 364,400				$ 665,350
• With Recoating of Tanks, Install Passive Cathodic Protection.	$ 350,000	$ 114,450	$ 90,600	$ 161,450	$ 127,800
• Improve Grading and Install All Weather Surfacing Walton Lakes WTP Tanks, (± 300 FT).	$ 27,500				$ 50,200
• Repair or Replace 12 Inch Water Main Within Hotchkiss Hill Tank Access Road, (± 650 FT).	$ 81,250	$ 88,550			
• Regrade and Install All Weather Surfacing, Hotchkiss Hill Tank Access Road.	$ 47,500	$ 51,800			
• Replace 1/2 Tank Level Gauge, Hotchkiss Hill Tank.	$ 5,000	$ 5,450			
• Install Pressure Transducer and Level Transmitting Equipment Hotchkiss Hill Sub-Tank.	$ 34,500	$ 37,600			
• Install Mechanical Mixing Equipment, Hotchkiss Hill Sub-Tank.	$ 17,500	$ 19,100			

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Water Storage Tanks (cont'd)					
• Install Second Kelsey Tank; Include Flexible Tank Connections, Modify Inlet and Outlet Piping , Add Pipe Mixing and Sample Ports.	$ 852,000		$ 1,102,700		
• Install Second Garden Park Tank; Include Flexible Tank Connections, Modify Inlet and Outlet Tank Piping, Tank Mixing and Sample Ports.	$ 852,000			$ 1,309,900	
• Install All Weather Surfacing and Grading Improvements, Garden Park Tank Access Road, (± 2200 FT).	$ 161,000			$ 247,500	
• Install Grading, Retaining Wall, Drainage, Slope and Erosion Protection, Black Oak Mine Tank Site.	$ 43,800		$ 56,700		
• Replace Damaged Asphalt and Regrade Finished Pavement, Black Oak Mine Tank Site, (± 3000 sq.ft).	$ 18,800		$ 24,350		
• Rehabilitate / Replace Deer Ravine Tank Altitude Valve and Tank Inlet / Outlet Valves.	$ 40,000	$ 43,600			
• Install All Weather Surfacing, Grading Improvements, Deer Ravine Tank Access Road, (± 500 FT).	$ 36,500		$ 47,250		
• Install Second Spanish Dry Diggins Tank; Include Flexible Tank Connections, Modify Tank Inlet and Outlet Piping, Add Tank Mixing and Sample Ports.	$ 852,000				$ 1,555,650
• Wrap and Protect Spanish Dry Diggins Pressure Transducer Service Line.	$ 2,500	$ 2,750			
• Install Second Angel Camp Tank; Install Valve Vault and Pressure Reducing Valve to Provide Bypass of Pumped Supply from Sweetwater Trail WTP to Cascade Trail Main.	$ 1,280,000	$ 1,395,100			

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	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Water Transmission and Distribution Mains					
• Replace with C 900 Pressure Class 235 or Pressure Class 305 Class Pipe Existing PVC SDR 21 Pipelines Located at:					
° Reservoir Road; ± 12,000 LF, 8" Pipe.	$ 960,000	$ 1,046,300			
° Sliger Mine Road; 8800 LF, 8" Pipe.	$ 704,000	$ 767,300			
° Chrysler Circle / Johntown Creek Road; ± 7000 LF, 8" Pipe.	$ 360,000	$ 392,400			
° Fain Lane and Prospect Hill Road; ± 5800 LF, 12" Pipe.	$ 580,000	$ 632,150			
° Aaron Cool Drive ±1200 LF, 8" Pipe	$ 96,000		$ 124,250		
° Cherry Acres Road, Hamblin Way, Overton Road; ± 7500 LF, 8" Pipe.	$ 600,000		$ 776,550		
° Meadowbrook Road, ± 1800 LF, 8" Pipe	$ 144,000		$ 186,400		
° Towzen Dr,. Oak Lane; ± 1250 LF, 8" Pipe.	$ 100,000		$ 129,400		
PRV Stations					
• Repair / Upgrade Sweetwater Trail System PRV Stations, (6 locations).	$ 240,000	$ 261,600			
• Repair / Upgrade Walton Lake PRV Stations (10 locations).	$ 400,000		$ 362,400	$ 184,500	
Fire Hydrants					
• Flow Test Hydrants at Max. 5 Year Intervals (annual cost). (± 525 Hydrants; Flow Test ± 105/Yr).	$ 13,125[2]	$ 14,300[2]	$ 17,000[2]	$ 20,200[2]	$ 23,950[2]
Water System Valves					
• Exercise Water System Valves Annually (annual cost).	$ 30,000[2]	$ 32,700[2]	$ 38,825[2]	$ 46,125[2]	$ 54,800[2]

CONSULTING KASL ENGINEERS

TABLE II-2
ESTIMATED CONSTRUCTION COSTS AND ANNUAL MAINTENANCE COSTS,
TREATED WATER PUMPING, STORAGE AND DISTRIBUTION FACILITIES

Current
(Jan. 2024) ENRCC = 13,900

RELIABILITY MEASURE	ESTIMATED CURRENT CONSTR. COSTS	PROJECTED FUTURE COSTS[1]			
		SHORT TERM MEASURE (2024-2030)	MODERATE TERM MEASURE (2030-2035)	MODERATE TERM MEASURE (2035-2040)	LONGER TERM MEASURE (2040-2045)
	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Fire Flows					
• Replace 4" Diameter Mains with Minimum 8" Diameter PVC C900 Pressure Class 235 or Pressure Class 305 Pipe.					
° Water Main Connection Hidden Gold Park to Tegra Road, (± 8000 LF).	$ 640,000			$ 983,950	
° Longview Ln., Reservoir Ct. to Longview Ln., (± 2400 LF).	$ 192,000			$ 295,200	
° Marshall Road, Johntown Creek Road to Garden Valley Road, (± 6000 LF).	$ 480,000			$ 737,950	
° Roller Coaster Road, South of Chrysler Road, (±2500 LF).	$ 200,000			$ 307,500	
° Garden Park Drive South of Shasta Road, (± 2650 LF).	$ 212,000			$ 325,950	
° Pikes Peak Circle, (± 3350 LF).	$ 268,000			$ 412,050	
° Shasta Road, (± 1950 LF).	$ 156,000				$ 284,850
• Tegra Road, Replace and Increase Pipe from 6" to 10" Diameter, Hidden Gold Trail to Buds Alley, (± 2100 LF).	$ 189,000		$ 244,600		
• Brinks Lane, Upper Black Rock Road, Replace and Increase Pipe from 6" to 8" South of Balloon Ridge Trail, (±2950 LF).	$ 236,000		$ 305,450		
• Rattlesnake Bar Road, Replace and Increase Pipe from 6" to 8", (±3350 LF).	$ 262,000		$ 337,400		
• Greenwood Road, Replace and Increase Pipe from 6" to 10", Marshall Road to FH 106, (±8900 LF).	$ 801,000		$ 1,036,700		
• Hackomiller Road, Replace and Increase Pipe from 6" to 8" Black Oak Mine Road to end, (± 4900 LF).	$ 392,000		$ 504,800		

CONSULTING KASL ENGINEERS

TABLE II-2
ESTIMATED CONSTRUCTION COSTS AND ANNUAL MAINTENANCE COSTS,
TREATED WATER PUMPING, STORAGE AND DISTRIBUTION FACILITIES

Current
(Jan. 2024) ENRCC = 13,900

RELIABILITY MEASURE	ESTIMATED CURRENT CONSTR. COSTS	PROJECTED FUTURE COSTS[1]			
		SHORT TERM MEASURE (2024-2030)	MODERATE TERM MEASURE (2030-2035)	MODERATE TERM MEASURE (2035-2040)	LONGER TERM MEASURE (2040-2045)
	(ENRCC = 13,900)	(ENRCC = 15,150)	(ENRCC = 17,990)	(ENRCC = 21,370)	(ENRCC = 25,380)
Fire Flows (cont'd)					
• Tiger Lane, Veterans Way and Ciabria Lane, Replace and Increase Pipe from 6" to 10" (± 2500 LF).	$ 225,000			$ 345,900	
• Meadowbrook Road, Replace and Increase Pipe from 6" to 8" (± 1350 LF).	$ 108,000			$ 166,050	
• Dogwood Lane / Breadline Road, Replace and Increase Pipe from 6" to 8", (± 2100 LF).	$ 168,000			$ 258,300	
• Conduct Detailed Evaluation of GDPUD Network Model to Identify Adding Booster Pump Station, Water Storage Facilities and Treatment Plant Improvements to Further Improve Fire Flows.	$ 250,000	$ 272,500			
TOTAL ESTIMATED CURRENT CONSTRUCTION COSTS[2]	$ 16,180,250				
TOTAL ESTIMATED FUTURE CONSTRUCTION COSTS [2]		$ 6,381,350	$ 5,939,750	$ 6,621,000	$ 2,889,250

(1) FUTURE COSTS ASSUME AVG 3.5% PER YEAR INCREASE IN ENRCC, ENRCC CALCULATED FOR MIDPOINT OF EACH TERM.
(2) ANNUAL ESTIMATED MAINTENANCE COSTS NOT INCLUDED IN CONSTRUCTION COSTS.

Attachment 2

TABLE III-1
RAW WATER CONVEYANCE FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[4]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L[(2)]
Pilot Creek Diversion, Pilot Creek to Bacon Creek Diversion Pipeline						
• Access	1964	UC5-010	1	• Complete Trail Clearing Bacon Creek to Pilot Hill Diversion.		H
				• Complete Trail Widening for Vehicle Access.		L
					• Install New Modular Bridge Crossing of Pilot Creek.	H
• Pipeline	1964	UC5-011	8			
• Diversion Structure	1964	UC5-012	2	• Repair Spalled Concrete,		H
				Install Safety Ladder, Safety Railings, Diversion Channel Crossing.		H
• Diversion Valve & Valve Operator	1964	UC5-013	3		• Install Motor Operated, Automatically Controlled Diversion Valve Equipment.	M
UpCountry Ditch, Bacon Creek to Tunnel Hill						
• Access	1964	UC4/5-011	2	• Construct Ditch Maintenance Access Road through the Narrows.		H
				• Extend Ditch Maintenance Access Road to Bacon Creek Diversion.		M
				• Widen Existing Ditch Maintenance Access Road and Install Base Rock Improvements.		H

TABLE III-1
RAW WATER CONVEYANCE FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[4]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
UpCountry Ditch, Bacon Creek to Tunnel Hill (cont'd)						
• Piped Sections	1964-2023	UC4/5-011	8	• Replace Grizzly Debris Racks with Stepped Platforms.		H
• Open Ditch Sections	1964	UC4/5-014	3	• Maintain / Update Straw Bale Erosion Control Measures.		H
					• Acquire Heavy Duty Clearing and Lifting Equipment.	H
				• Replace Priority Repair Ditch Sections with HDPE Pipe.		H
				• Replace Remaining Open Ditch Sections with HDPE Pipe.		H,M,L
				• Update Wildfire Response Plan.		H
• Structures	1964	UC4/5-012	7	• Modify Structure 6 and 7 with Steel Access Platforms and Safety Railings.		H
• Flow Monitoring	1990	UC4-015	8		• Replace Flow Measuring Equipment, Tunnel Hill Inlet.	M

TABLE III-1
RAW WATER CONVEYANCE FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[4]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
Tunnel Hill to Buckeye Powerhouse Ditch System						
• Access	1964	UC2/3-010	2		• Acquire Steel Blade Brush Cutting Equipment. (3)	H
				• Improve Mechanical Removal of Berry Vine Intrusion. (3)		H, M, L
					• Acquire Skid Steer Masticator / Tiller Equipment. (3)	H
• Wastegates	1964	UC2-012	3	• Repair Balderston Wastegate Structure, Install Channel Erosion Control Measures.		H
•Conduits	1964	UC2/3-016	5	• Record Permanent Easements, Tunnel Hill Penstock, Canyon Creek Conduit, Buckeye Conduit.		H,M, L
				• Line and Coat Tunnel Hill Penstock.		M
				• Clear Vegetation / Tree Growth within Conduit Corridors.		H,M,L
• Ditch Sections	1964	UC2/3-014	7	• Complete Ditch Lining of Priority Repair Area, 650 FT. Balderston Road.		H
• Storage	1964	UC2-017	4	• Expand Walton Lake Capacity.		M

TABLE III-1
RAW WATER CONVEYANCE FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[4]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
Buckeye Power Plant to Taylor Mine Outlet Ditch System						
• Access	1964	UC1/K4/ PH7-010	2	• Improve Mechanical Removal of Berry Vine Intrusion. (3)		H, M, L
					• Acquire Steel Blade Brush Cutting Equipment. (3)	H
					• Acquire Skid Steer Masticator / Tiller Equipment (3)	H
• Ditch Improvements	1964-2020	UC1/K4/ PH7-010	7	• Complete Ditch Lining, Priority Repair Area, ±700 Feet, Upstream Taylor Mine Outlet.		H
• Conduits	1964	UC1/K4/ PH7-016	5	• Clear Vegetation / Tree Growth Schroeder and Buffalo Hill Conduit Corridors.		H
				• Record Permanent Easements, Schroeder and Buffalo Hill Conduits.		H, M, L
• Storage	N/A	K4-017	N/A		• Construct New Raw Water Reservoir at GDPUD Office / Shop Area Parcel.	M
Taylor Mine Outlet to Jackass Wastegate Ditch System						
• Access	1964	PH7/PH5-010	2	• Improve Mechanical Removal of Berry Vine Intrusion. (3)		H, M, L
					• Acquire Steel Blade Brush Cutting Equipment. (3)	H
					• Acquire Skid Steer Masticator / Tiller Equipment (3)	H

TABLE III-1
RAW WATER CONVEYANCE FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[4]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
Taylor Mine Outlet to Jackass Wastegate Ditch System (cont'd)						
• Ditch Improvements	1964	PH7/PH5-014	5	• Ditch Lining Improvements; Upstream Growlersburg Wastegate, Upstream Summers Wastegate, Spools Wastegate to Hockett Hollow Outlet, Replace Old Deteriorated Lining.		H, M, L
• Structures	1964	PH7/PH5-018	5	• Upgrade Spools Wastegate.		M
				• Line and Coat Flumes.		M
Jackass Wastegate to Sweetwater Trails WTP Ditch System						
• Access	1964	PH5/PH4-010	2	• Improve Mechanical Removal of Berry Vine Intrusion. (3)		H, M, L
					• Acquire Steel Blade Brush Cutting Equipment. (3)	H
					• Acquire Skid Steer Masticator / Tiller Equipment (3)	H
• Conduits	1964	PH5/PH4-016	4		•Replace ± 1250 FT Section and ±400 Ft Section of Kaiser Siphon.	M
				• Record Permanent Easements, Kaiser Siphon.		H, M

TABLE III-1
RAW WATER CONVEYANCE FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[4]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
Jackass Wastegate to Sweetwater Trails WTP Ditch System (cont'd)						
• Ditch Improvements	1964	PH4/PH5-014	4	• Clear Vegetation along Falls, Spanish Dry Diggins to Syd Road.		H, M, L
				• Complete Concrete Ditch Lining ± 3000 Ft Upstream of Greenwood Res, ± 2200 Ft., Syd Road to Kaiser Wastegate, Upstream of Rita Ct. Crossing.		H, M, L
					• Install Flow Control Equipment, Sweetwater Trail WTP Supply.	L
• Storage	1964	PH4/PH5	5	• Increase Capacity of Greenwood Reservoir.		M

Footnotes:

(1) Condition Score; 1 = Poor to 10 = Very Good.

(2) **H**, High, Short Term Priority, Recommended for Implementation 2024 - 2030.
M, Moderate Term Priority, Recommended for Improvements 2030 -2040.
L, Longer Term Priority , Recommended for Improvements 2040-2045.

(3) Asset Improvements Recommended for Use in All Open Ditch Sections.

(4) Temp Asset Numbers
UC1-5 UpCountry Ditch System Plans
K4 Kelsey Ditch System Plans
PH4-7 Pilot Hill Ditch System Plans
010 Access
011 Piped Ditch Section
012 Structure
013 Valve
014 Open Ditch Section
015 Flow Monitoring
016 Conduit, Siphon
017 Storage
018 Flume

TABLE III-2
TREATED WATER FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[3]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
GDPUD Booster Pump Stations						
All (5) Pump Stations	1972-1979	(Refer to Following Specific Pump Structures)		• Conduct Annual Servicing of Pump Station Mechanical and Electrical Equipment.		H,M,L
				• Modify Pump Control Panels for Manual Transfer to Portable Generator.		H
				• Install Freeze Protection Insulation for Pump Station Piping or Unit Heaters for Pump Stations.		H
					• Install Cellular Based Booster Pump Station SCADA System.	L
Specific GDPUD Pump Stations						
•Chipmunk Trail	1974	WL2-020	5	• Rehabilitate / Replace Chipmunk Trail Booster Pumps.		M
				• Reinstall Hotchkiss Hill Subtank Level Control Signal.		M
•Irish Lane	1979	WL7-020	4	• Replace / Upgrade Pump Stations Instruments and Gauges.		M
• Black Ridge	1975	ALT7-020	1		• Install new Duplex Pump Station Equipment.	H
					• Replace Existing Pump Station Structure.	H
					• Replace Pump Control Panel.	H
• Angel Camp	1972	ALT1-020	7	• Modify Angel Camp Tank SCADA Improvements to Include Booster Pump Station Controls and Alarms.		M

INVENTORY OF GDPUD ASSET IMPROVEMENTS

TABLE III-2
TREATED WATER FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[3]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
• Reservoir Road	1977	WL3-020	6	• Refer to Recommended Asset Improvements for all GDPUD Pump Stations.		H, M, L
GDPUD Water Storage Tanks						
All (10) Water Storage Tanks	1971-1990	(Refer to Specific Water Storage Tanks).		• Inspect Tanks for Corrosion and Coating Conditions, Every 3 to 5 years.		H, M, L
					• Install Motion Operated or Switch Operated Trouble Lights.	H
					• Install Tank Cathodic Protection .	H,M, L
• Walton Lake WTP Storage Tanks	1974	WL1-021	9	• Complete Grading and All Weather Surfacing of Tank Access Road.		L
• Hotchkiss Hill	1974	WL2-021	5	• Repair / Replace Tank Water Supply Main.		H
				• Regrade, Improve Tank Access Road with All Weather Surfacing.		H
				• Repair 1/2 Tank Level Gauge.		H,M
• Hotchkiss Hill Subtank	1974	WL2-021	5	• Furnish Pressure Reducer and Level Transmission Equipment.		H
					• Install Tank Mixing Equipment.	H
• Kelsey Tank	1990	WL10-021	7		• Install Second Water Tank.	M
					• Install Tank Mixing Equipment.	M, L

TABLE III-2
TREATED WATER FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[3]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
• Garden Park	1976	WL9-021	7		• Install Second Water Storage Tank.	M, L
					• Install Tank Mixing Equipment.	M, L
				• Regrade, Improve Tank Access Road with All Weather Surfacing.		M
• Black Oak Mine	1975	WL7-021	5	• Conduct Site Grading, Drainage and Erosion Protection Improvements.		M
				• Remove / Replace Tank Site Pavement.		M
• Deer Ravine	1971	ALT2-021	5	• Replace / Upgrade Tank Altitude Valve Equipment and Vault.		H
• Spanish Dry Diggins	1997	WL4-021	7	• Wrap, Protect Pressure Reducer Sensing Line.		H
					• Install Second Water Storage Tank.	L
					• Install Tank Mixing Equipment.	L
• Angel Camp	1972	ALT-021	2		• Install Second Water Storage Tank.	L, H
					• Install Pressure Reducing Valve and Tank Bypass Piping.	H

INVENTORY OF GDPUD ASSET IMPROVEMENTS

TABLE III-2
TREATED WATER FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[3]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
GDPUD Water Distribution and Transmission Main	1971-1991	(Refer to Table VI-1)	Varies 1-9		• Replace Substandard PVC SDR 21 and PVC SDR 18 Pipelines with PVC Class 235 or 305 C900 Pipe Material per AWWA Standards; Min. Replacement Pipeline Size = 8 Inches.	H, M
					• Schedule Replacement of Existing ACP Mains with PVC Class 235 or 305 C900 Pipe Material per AWWA Standards.	M, L
					• Furnish and Install New Pipelines with Select Bedding, Backfill Material and Thrust Restraints.	H, M, L
• GDPUD Pressure Reducing Stations	1971-2022	(Refer to Table VI-2A & 2B).	Varies 1-7	• Replace / Upgrade Pressure Reducing Valve Equipment Installed in 1970's and 1990's.		H,M
				• Replace / Upgrade Other Pressure Reducing Valve Equipment Over 20 Years Old.		M
				• Install Joint Restraint and Pipeline Lining and Coating with PRV Station Upgrades.		H,M
GDPUD Fire Hydrants	1971-1991		Varies 4-8		• Install New Fire Hydrants and Replacement Hydrant Installation with Isolation Valves, Thrust Blocks and Snow Poles.	H
				• Flow Test Fire Hydrants at Least Every 5 Years.		H
					• Standardize New Fire Hydrant Installations.	H

INVENTORY OF GDPUD ASSET IMPROVEMENTS

TABLE III-2
TREATED WATER FACILITIES

EXISTING ASSET	YEAR INSTALLED	(TEMP.) ASSET NUMBER[3]	CONDITION SCORE (1-10)[(1)]	RECOMMENDED ASSET IMPROVEMENTS		PRIORITY
				Rehabilitate / Modify Existing Asset	Furnish / Install New Asset; Replace Existing	H, M, L [(2)]
GDPUD Water Main Valves	1971-1991		Varies 4-8	• Exercise Water Main Valves Annually.		H
					• Install Resilient Seated Wedge Type Valves, 200 psi Rated conforming to AWWA C 900 Standards.	H
					• Standardize New Valve Installations.	H
GDPUD Fire Flows	1971-1991		Varies 1-9		• Replace 4 Inch Diameter Water Mains with Minimum 8 Inch Diameter Mains.	M, L
					• Increase Pipelines Within ALT Pressure Zones that do not Meet Minimum Fire Flow Standards (Refer to Section VI, Specific Locations).	H, M, L
					•Increase Pipelines within WL Pressure Zones that do not meet Minimum Fire Flow Standards (Refer to Section VI, Specific Locations).	H, M, L
				• Conduct Comprehensive Testing of GDPUD Hydraulic Network Model to Identify Long Term Treatment, Booster Pump and Storage Alternatives to Improve Available Fire Flows.		H, M, L

Footnotes:

(1) Condition Score; 1= Poor to 10 = Very Good.

(2) **H**, High, Short Term Priority, Recommended for Implementation 2024-2030.
M, Moderate Term Priority, Recommended for Implementation 2030-2040.
L, Low Term Priority, Recommended for Implementation 2040-2045.

(3) Temporary Asset Number
WL-Walton Lake Treated Water System Plans
ALT-Auburn Lake Trails (Sweetwater) Treated Water System Plans
020-Pump Stations
021-Storage Tanks
022-Distribution Mains
023-Pressure Reducing Stations
024-Fire Hydrants
025-Distribution Main Isolation Valves