

To: Board of Directors
Bow Mar Water and Sanitation District

From: Cynthia Lane

CC: Michael, Haynie & Co.
Scott Hand, Platte Canyon WSD

Date: September 8, 2023

Subject: Capital Improvement Plan for Water & Sewer Infrastructure

Water Projects

Based on the previously accepted criteria for determining the need for water main replacements in the Bow Mar Water and Sanitation District, and pursuant to an extensive review of all remaining unprotected cast iron pipe water mains not yet replaced, five (5) water main replacement projects are proposed through 2037.

The priority and schedule for pipe replacements continues to be heavily weighted toward the number of pipe failures (main breaks) and water quality concerns. However, other factors such as hydraulic adequacy, age of pipe, potential property damage, and repair costs are also considered.

The total capital improvement costs for the proposed water main replacement projects equals \$4,436,490. For financial planning purposes, the replacements are scheduled to begin in 2025 and then occur every third year thereafter.

Sewer Projects

In 2023 additional evaluation of the district's wastewater collection system was completed using the Pipeline Assessment Certification Program (PACP). This is a program that provides for proper and consistent assessment condition coding of pipelines, laterals and manholes. As a result of this assessment, three additional (3) sewer rehabilitation projects are proposed in the next ten years. Three sewer rehabilitation projects were successfully completed in 2023.

The goal of using PACP is to create a comprehensive database to properly identify, plan, prioritize, manage, and renovate their assets based on condition evaluation. Segments of pipe are inspected and assigned a "condition grade" in two categories: structural or operations and maintenance. Scoring is on a numerical scale with the highest (5) denoting the worst conditions and the lowest (1) designating minor defects—and zero indicating no defects at all. Defects may include observations like cracks, fractures, or broken segments of pipe. They could also be deformed or collapsed pipe or even displaced joints.

In the district's collection system, the primary defects observed were extensive cracks along the pipe and at joints causing severe root intrusion. In some cases, point repairs are the most appropriate approach and for other segments it is necessary to line/replace the entire segment.

Additionally, there have been a number of sewer tap replacements within the district which may have caused additional cracks that can allow roots to infiltrate the pipe. The total cost of the proposed sewer rehabilitation projects equals \$261,000. We recommend these projects use the design-build process due to the shorter length of sewer rehabilitation work and potential cost efficiencies of the design-build process.

Summary of All Proposed Projects

The following table provides a detailed breakdown of the value of the water and sewer projects proposed through 2037. All costs presented in Table 1 and in the subsequent project summaries are in 2024 dollars and reflect anticipated construction and design engineering charges based on actual costs realized by Platte Canyon, Southwest Metropolitan, and Bow Mar in recent years.

Table 1 – Summary of Capital Projects by Type and Year

Year	Water Projects	Sewer Projects	Annual Total
2024	\$0	\$50,000	\$0
2025	\$702,000	\$0	\$702,000
2026	\$0	\$211,000	\$211,000
2027	\$0	\$0	\$0
2028	\$1,423,00	\$0	\$1,423,00
2029	\$0	\$0	\$0
2030	\$0	\$0	\$0
2031	\$934,000	\$0	\$934,000
2032	\$0	\$0	\$0
2033	\$0	\$0	\$0
2034	\$393,000	\$0	\$393,000
2035	\$0	\$0	\$0
2036	\$0	\$0	\$0
2037	\$987,000	\$0	\$987,000
TOTAL	\$4,439,000	\$261,000	\$4,700,000

A summary of the location, rationale, and cost for each project follows. Additionally, maps are attached that depict the location of the proposed water and sewer projects.

Capital Improvement Plan Project Summary

(Project 2024-1S)

On Prospect St. between Bow Mar Dr and W. Bellview Ave. (8" VCP)

Rationale

There have been no sanitary sewer backups on this segment of main.; however, there is significant deterioration in the pipe including a number of cracks and roots in the pipe. Rehabilitation includes the cured-in-place lining process for the pipe and SpectraShield epoxy lining for the three manholes. This is proposed as a design-build project due to the size and potential for cost efficiencies associated with that approach.

467 feet of 8-inch CIPP with associated appurtenances	\$41,600
Contingency (20%)	<u>\$8,400</u>
TOTAL PROJECT COST	\$50,000

(Project 2025-1W)

On Sombrero Dr. between Sunset Dr. and Bow Mar Dr. (6" C.I.P.)

Rationale

There have been three water main failures on this segment of pipe. The proposed type of pipe for replacement is 6-inch C-900 PVC pipe. This project is proposed to be placed in the existing asphalt as to reduce disruption of customer's private property and landscape.

1,402 feet of 6-inch PVC with associated appurtenances	\$554,700
Engineering (10%)	<u>\$55,470</u>
	\$610,170
Contingency (15%)	<u>\$91,530</u>
TOTAL PROJECT COST	\$701,700

(Project 2026-1S)

On Sombrero St. between Bow Mar Dr. and Sunset Dr. (8" VCP)

Rationale

There have been no sanitary sewer backups on this segment of main.; however, there are a significant number of cracks and roots in the pipe. Rehabilitation includes the cured-in-place lining process for the pipe and SpectraShield epoxy lining for the four manholes. This is proposed as a design-build project due to the size and potential for cost efficiencies associated with that approach.

1,065 feet of 8-inch CIPP with associated appurtenances	\$90,800
Contingency (20%)	<u>\$18,200</u>
TOTAL PROJECT COST	\$109,000

(Project 2026-2S)

On Ridge Trail between Bow Mar Dr. and Sheridan Blvd. (8" VCP)

Rationale

There have been no sanitary sewer backups on this segment of main.; however, there are a significant number of cracks and roots in the pipe. Rehabilitation includes the cured-in-place lining process for the pipe and SpectraShield epoxy lining for the five manholes. This is proposed as a design-build project due to the size and potential for cost efficiencies associated with that approach.

655 feet of 8-inch CIPP with associated appurtenances	\$60,900
Contingency (20%)	<u>\$12,200</u>
TOTAL PROJECT COST	\$73,100

(Project 2026-3S)

In Easement behind 5400 Beach Rd. (8" VCP)

Rationale

There have been no sanitary sewer backups on this segment of main.; however, there are a significant number of cracks and roots in the pipe. Rehabilitation includes the cured-in-place lining process for the pipe and SpectraShield epoxy lining for the two manholes. This is proposed as a design-build project due to the size and potential for cost efficiencies associated with that approach.

233 feet of 8-inch CPP with associated appurtenances	\$23,000
Contingency (20%)	<u>\$4,600</u>
TOTAL PROJECT COST	\$27,600

(Project 2028-1W)

On Bow Mar Dr. between Ridge Trail and S. Sheridan Blvd. (8" C.I.P.)

Rationale:

This section of 8" cast iron pipe has experienced three water main failure to date. The existing pipe is proposed to be replaced with 12-inch C-900 PVC pipe. This project is proposed to be placed in the existing asphalt as to reduce disruption of customer's private property and landscape.

2,397 feet of 12-inch PVC with associated appurtenances	\$1,125,000
Engineering (10%)	<u>\$112,500</u>
	\$1,237,500
Contingency (15%)	<u>\$185,600</u>
TOTAL PROJECT COST	\$1,443,100

(Project 2031-1W)

On Bow Mar Dr. between Quincy Master Meter Vault and Ridge Trail (12” C.I.P.)

Rationale:

There has been one water main failure on this section of water main. The criticality of this segment is a main feed into the district’s system. The proposed type of pipe for replacement is 12-inch C-900 PVC Pipe. This project is proposed to be placed in the existing asphalt as to reduce disruption of customer’s private property and landscape.

1,572 feet of 12-inch PVC with associated appurtenances	\$738,000
Engineering (10%)	<u>\$73,800</u>
	\$811,800
Contingency (15%)	<u>\$121,800</u>
TOTAL PROJECT COST	\$933,600

(Project 2034-1W)

On Yellowstone between Ridge Trail and S. Sheridan Blvd. (4” C.I.P.)

Rationale:

This section of 4” cast iron pipe has experienced one water main failure to date. Fire flows may not be met through 4 inch main in Yellowstone. The existing pipe is proposed to be replaced with 6-inch C-900 PVC pipe. This project is proposed to be placed in the existing asphalt as to reduce disruption of customer’s private property and landscape.

785 feet of 6-inch PVC with associated appurtenances	\$310,600
Engineering (10%)	<u>\$31,060</u>
	\$341,660
Contingency (15%)	<u>\$51,300</u>
TOTAL PROJECT COST	\$392,960

(Project 2037-1W)

On Sunset Dr. between Bow Mar Dr. and S. Sheridan Blvd. (6" & 8" C.I.P.)

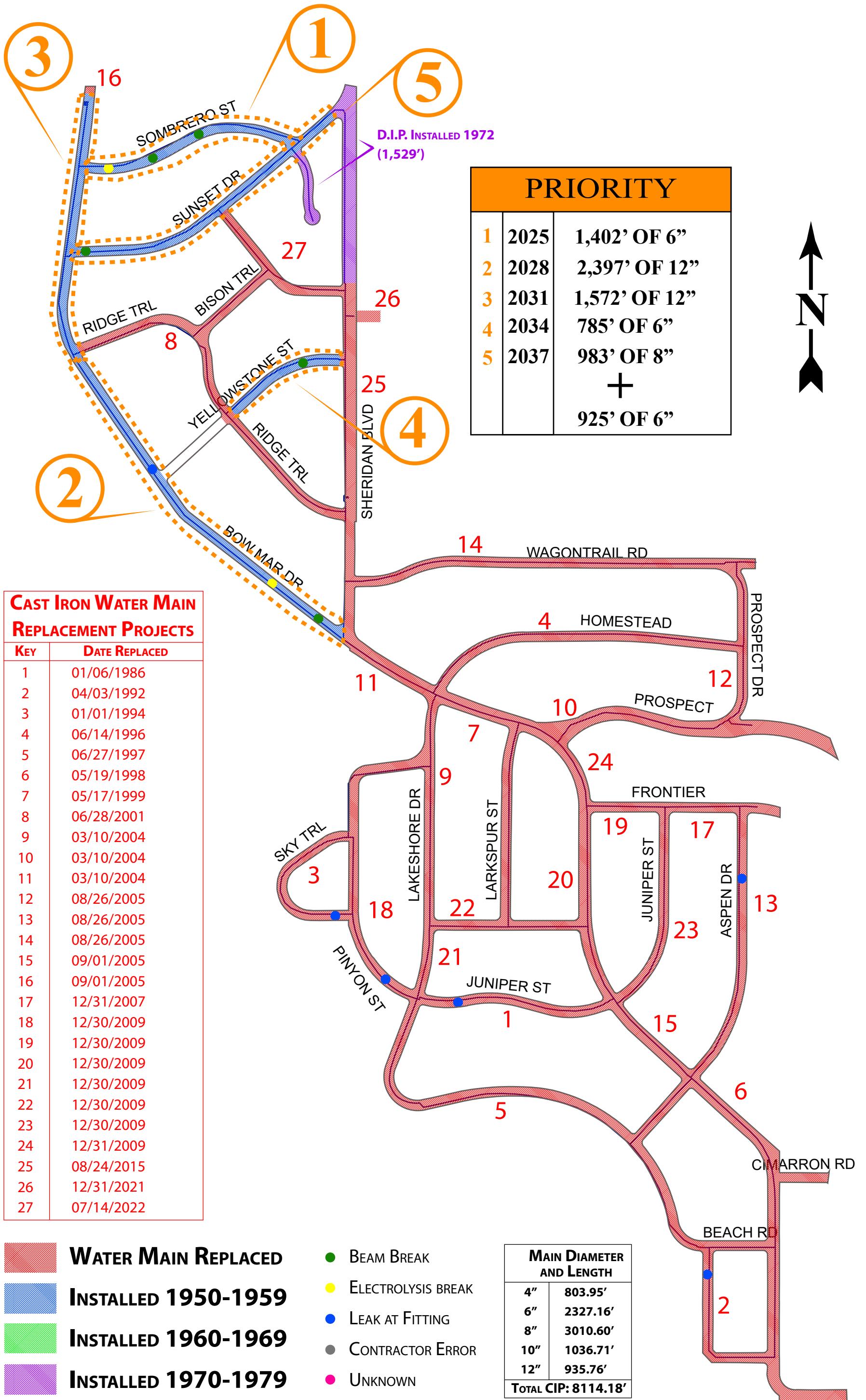
Rationale:

This section of 6" and 10" cast iron pipe has experienced one water main failure to date. The existing pipe is proposed to be replaced with 6-inch and 8-inch C-900 PVC pipe. This project is proposed to be placed in the existing asphalt as to reduce disruption of customer's private property and landscape.

925 feet of 6-inch PVC with associated appurtenances	\$366,000
983 feet of 8-inch PVC with associated appurtenances	\$414,000
	<u>\$780,000</u>
Engineering (10%)	<u>\$78,000</u>
	\$858,000
Contingency (15%)	<u>\$128,700</u>
TOTAL PROJECT COST	\$986,700

BOW MAR WATER & SANITATION DISTRICT

WATER MAIN REPLACEMENTS 1986-2022 & PROPOSED REPLACEMENTS 2024-2037



BOW MAR WATER & SANITATION DISTRICT

SEWER MAIN REHABILITATION PROPOSED REHABILITATION 2024-2026

